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CHALLENGES OF EUROPE

FINANCIAL CRISIS AND CLIMATE CHANGE

May 21-23, 2009
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IV

Eighth International Conference on Challenges of Europe

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CONTENTS

II
CLIMATE CHANGES

III
GOVERNANCE, COMPETITIVENESS AND INNOVATION

FOREWORD

Financial and climate crisis: Lessons for new political economy

> *Market fundamentalist laissez-faire of the last 20 years has dramatically failed the test. Financial deregulation created the build-up of huge risky positions whose unwinding has pushed the global economy into a debt deflation that can only be countered by government debt inflation. Blind faith in the efficiency of deregulated financial markets and the absence of a cooperative financial and monetary system created an illusion of risk-free profits and licensed profligacy through speculative finance in many areas.*
> *(Report by the UNCTAD Secretariat Task Force on Systemic Issues and Economic Cooperation; United Nations, New York and Geneva, 2009).*
>
> *We are living beyond our means, on resources borrowed from the future and the model of capitalism we use today is inadequate?*
> *Both the environmental crisis and the financial crisis have the same root cause – living beyond our means, on resources borrowed from the future.*
> *(Kajfež-Bogataj L., Key-note speech at the 8th International Conference „Challeneges of Europe", Faculty of Economics, Split, Croatia, 2009)*

We live in a very dynamic and hyper-active world that is intertwined by unthinkable possibilities for development on the one hand and shocks of different sorts on the other. The spontaneity and automatism of the movement of market economies, so praised and advocated by the classical and neoclassical tradition and by the recent neoliberal concepts even more, seems to be well shaken. Recent blows are arising from the lessons of the current financial crisis and permanent deepening of the climate changes. The whole set of modern institutions, incentives and relationships together with the economic basis point towards a need for returning to the scientific concepts which adopt the political economy approach. The behaviour of individuals, firms and households led by profit maximisation or utility maximisation directs the world towards living beyond means exploiting the resources borrowed from future generations. The changes are more than necessary and are taking place under the pressures of current disturbances. The nature of these changes is of crucial importance for the future. Whether these changes will be only minor, directed towards elimination of the consequences of the current crises without investigating the underlying causes of these crises, or major, requiring a deeper insight into the causes of these crises, remains to be seen. I think that the global science, both the social (the economic and political in particular) as well as the natural sciences are given a historical opportunity to, through a thorough investigation of the causes, determine the mechanisms that would make the future development more balanced. This requires the defining of a degree of interdependence between the market and political regulation through mediation of the global civil society, the defining of the extent of interdependence between the private and the public, the national and the global as well as the interdependence between present and future times. Reliance upon

supremacy of the global market principle and the dominance of the private will lead to a further search for mechanisms that will enhance the greed and motivation for endless acquisition of wealth, harming each and every person (as has been the case with the sub-prime credits during the current world crisis).

It seems that the time has come for a new research concept within the discipline of political economy. Particularly, if political economy is to be understood as a discipline that investigates the forms of interconnectedness of the economic and political institutions and that seeks for possibilities of these connections that will stimulate the balance between efficacy and fairness. If this effort fails, we can expect the comeback of the current crisis, through different mechanisms and with different players. As warned by Daniel Thorniley: "In 2005-08 about 25,000 rich or very rich men decided they wanted to get even more rich. These 25,000 senior executives in the US, European and global financial sector were earning $1-2 million a year, some were receiving $5-20 million a year and a few were ranking in $25-100 million a year. But this was not enough for them; they wanted more. Their greed has led to the great economic and business crash of 2008-2010 which will diminish the earnings and welfare of billions of people around the globe". Globalisation processes, world compression (R. Robertson), result in a rising interdependence and an insatiable greed on one side causes deterioration of welfare all around the global world. The belief in the neoliberal concept with individualism and a rational homo economicus as its spiritus movens necessarily produces these states.

Several key elements should be formulated as a response to the current global crisis. These are listed below:

- ***Direct government involvement in the economy; a variation of a modern "New Deal"***. This involvement primarily deals with a thorough examination of the existing "rules of the game" and their modification along the lines of connecting the individual, private patterns of behaviour of economic agents with social welfare. Refined "rules of the game" should not thwart or eliminate private initiative, but instead direct and connect it with desirable social outcomes. The process should be directed towards the following reasoning: "permitted behaviour is the one that increases the social welfare together with the individual welfare" instead of the reasoning "permitted behaviour is the one which is not forbidden".

- ***A thorough institutional regulation of global finances***. The increase in financial stocks in last 30 years has reached enormous levels. While the financial stocks were only 20% higher than the nominal world GDP in 1980, in 2009 they have reached a level of $ 220 trillion which amounts to a number almost four times higher than the world GDP. This sort of increase in the virtual capital and its separation from the real sector of the world economy makes it an end in itself and also an inflating bubble whose burst in a certain point has to follow proportionally with the coefficient of its multiplication in relation to the GDP level. Therefore, a new and a more substantial architecture of the global financial system is a necessity.

- ***Financing of the developing Third World countries***. The poorest countries are particularly dramatically hit by disturbances of the current crisis. Firm promises by the rich countries on increasing the help to the poor economies on many occasions in the last 10 years have proved to be false. The existing international institutions (the IMF, World Bank and WTO in particular) together with the G-20 countries need to play a

substantially different role in initiating and stimulating the development of the poor countries in the world. World compression, annihilation space by time and international division of labour connect all individuals and countries in the global system the sustainability of which depends greatly on the differences in development between different regions of the world. Further increase in these differences leads the whole world into a long lasting crisis that will be reflected on all. Not even the rich regions of the world will be spared by this global process. The internal laws of movement require an urgent and substantial change in dealing with the poor. In order to achieve success in hitting the UN millennium targets towards the Third World countries, particularly in the light of the current crisis, a new definition of the role of international institutions and the leading world economies is required. The "Washington Consensus" principles are not sufficient to achieve a substantial change in the speed of development of developing countries.

- *Creation of a global fund to fight the crises*. There is a sizeable disproportion between the limited possibilities of the IMF and the World Bank and the huge needs for this sort of a fund among the large number of members of these institutions. A possible solution is in creating a considerable amount of the IMF money (Special Drawing Rights), but this requires a joint action of the world political leaders, the US in particular.

- *The reform of international institutions*. The leading international institutions such as the IMF, World Bank and WTO are still functioning as in the period when the USA were the leading world creditor and the governance of these institutions was strongly influenced by American political elites, together with a minor European influence. There is a need for a big change in the system of governance of these institutions, making it global and giving a necessary importance to the fast growing economies (China, India) as well as to the poor countries. The functioning of these institutions need to be more in line with the development needs of their constituents, in particular the poor ones, and less so with the free markets reasoning.

- *A new definition of activities in relation to climate changes*. The same causes that are pushing economic agents in a greedy battle for profit and which, by following the neoliberal concept as something divine, lead to economic and financial crises, also lead to climate changes that endanger our future. Therefore Dietz and Stern (2008) warn that: "Scientists would favour strong action, economists would not (wrong perception). Strong and urgent action is in fact good economics. Previous economics on climate change has failed to grasp the necessary scale and timing of action because it has failed to simultaneously assign the necessary importance to issues of risk and ethics".

All of the above elements, in the presence of enough individual and social, scientific and political forces, could lead to development of a new paradigm of political economy. "It will require longer-term and appropriate vision on the part of state leaders and peoples, particularly in the industrialized nations who now exercise most control over events- not the vision of a free-market, level-playing-field, global economy for which many now seem to muster enthusiasm, but rather a vision of humane global governance, with celebration of humanity's diversity, promotion of democratic processes, and social and economic justice and human rights for all. Such (the latter) vision will see trade, financial flows and macroeconomic

stability as no more than instruments of its objectives rather than as ends in themselves." (G.K. Helleiner, 2000).

In front of you are the Proceedings of the 8th International Conference "Challenges of Europe: Financial Crisis and Climate Changes" organised by the Faculty of Economics, University of Split. I use this opportunity to kindly thank all the authors, the members of the Programme and Organising Committees as well as to the Management board and the staff at the Hotel "Elaphusa" in Bol for their valuable contributions to the Conference. A special thanks goes to the key-note speakers: Ms. Lučka Kajfež-Bogataj, Mr. Jan Svejnar and Mr. Peter Sanfey. I also thank all the participants at the round tables on financial crisis and climate changes that were held during the Conference. Last but not least I particularly thank our sponsors and donors that recognised the importance of this Conference, especially given that they have also been burdened by the current economic and financial crisis.

Hoping that the papers that were reviewed, presented and discussed at the 8th International Conference "Challenges of Europe: Financial Crisis and Climate Changes" which was held in Bol on the island of Brač in May 2009 will add to your knowledge and spur interest on the considered issues I invite you to join our efforts with your contributions and active participation in investigating the current and up-to-date political-economic issues at the 9th International Conference which will be held in May 2011.

Split, July 2009

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Programme Committee Chairperson
Professor Zlatan Reić

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I

FINACIAL CRISIS
- VARIOUS ASPECTS

GLOBAL FINANCIAL CRISIS AND RELATED COUNTRY-LEVEL FINANCIAL SECTOR DISASTERS: THE CASE OF MICROFINANCE IN CROATIA

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1. INTRODUCTION

The year 2008 has gone down in history as marking the official collapse of the short-lived US Treasury/Wall Street-driven model of neoliberal capitalism (also denoted as the 'Washington Consensus'). This brings to an end an experiment that was pushed through from the early 1980s onwards by the US Treasury/World Bank/IMF nexus largely on behalf of the US government and Wall Street's (now deceased) high-profile investment banks (see Gowan, 1999; Stiglitz, 2002; Krugman, 2005; Elliot and Atkinson, 2008). The principal reason for this strong policy preference was that it was a policy regime overwhelmingly of benefit to the US economy and to US elites, particularly the US financial sector elite that had positioned itself as the cornerstone of the US economy by the 1980s. More widely, as Chang (2002, 2007) convincingly argues (see also Amsden, 2007 and Reinart 2007), the neoliberal model was seen as vitally important in maintaining the economic power of the US in a potentially protectionist world. Neoliberalism would instead allow the US economy, and some of its developed country allies, the freedom to export their accumulated industrial, financial and other forms of expertise around the globe. This wealth and expertise was built up in the 19th and early 20th century thanks to highly interventionist, protectionist, subsidised (i.e., infant industry) and largely state-coordinated development policies. Developing countries, on the other hand, were implored (and often threatened) to base their future development solely on the basis of the free market mechanism and thus completely open borders to finance, trade and FDI. Their main export was to be raw materials. As Chang (2002) argued, the neoliberal model thus became associated with the developed countries deliberately 'kicking away the ladder' – that is, barring the poor developing countries from basing their development on variations of the development policies that the well-established developed countries and the most dynamic developing countries (i.e., the original Asian 'Tiger' economies plus China, India and Vietnam) had earlier and extensively used to successfully develop and grow rich(er).

At any rate, many development economists did not believe the rhetoric that the Wall Street-neoliberal policy regime was primarily designed to benefit the poor countries that were adopting it. For one thing, since its introduction in the early 1970s under Structural Adjustment Programs (SAPs), neoliberal policies had pretty much destroyed the economic

and social fabric of most developing countries (see Chossudovsky, 1997; MacEwan, 1999; Chang and Grabel, 2004; Amsden, 2007; Chang, 2007; Oyelaran-Oyeyinka and Rasiah, 2009). Economists with Latin American experience (for example, Taylor, 1994) were acutely aware of the huge damage inflicted upon weak economies thanks to the neoliberal policy regime. The introduction of neoliberalism into post-Communist Eastern Europe after 1990 then quite predictably precipitated an almost identical economic and social disaster (see Andor and Summers, 1998), including in previously quite advanced South East Europe (Bateman, 2001, 2004). Such was the extreme belief in neoliberalism that institutions coming to help in the region, such as the World Bank and EBRD, became quite immune to the ongoing economic and social pain. What mattered far more to them, in truth, was that Eastern European governments stood fast to the set of neoliberal 'markers' they had earlier been told to pursue, such as 'extent of privatisation completed', 'extent of price liberalisation' and 'extent of free labour market'.[1] Market fundamentalism triumphed over pragmatism. Worse, as Turner (2008) reports today, we now know that many of the trends in Eastern Europe that *were* trumpeted by such institutions as a sign of neoliberal policy success – new shopping centres, private house-building, consumer goods imports, etc - were actually just temporary bubbles inflated by spectacular amounts of foreign debt (approx $1.5 trillion) - debt that has now dried up and is being called in.

Today, the global economy has changed to an extent unimaginable just three or so years ago. Indeed, just a few years after the apotheosis of neoliberalism in the early 2000s, notably encapsulated in the now embarrassing claims made for 'the New Economy' model (for example, see OECD, 2001), the neoliberal capitalist policy regime is now effectively dead.[2] It is universally seen as directly responsible for the most serious (and still growing) global economic crisis since the Great Depression (which was itself, of course, a direct outcome of an almost identical extreme free market policy regime [see Polanyi, 1944: Galbraith, 1955]). Thanks to the simultaneous popping of a number of bubbles in the US economy from 2007 onwards (i.e., housing, credit, investment, speculation, hedge fund), a 'perfect storm' of global economic problems was set in motion. The US economy itself is now effectively bankrupt. The huge US trade deficit and national debt are now manifestly unsustainable. Largely financed to date by the Chinese government's purchase of (supposedly safe) US Treasury bonds and other assets, the most recent growth is being underpinned by simple money issue. The housing and stock market has been in free-fall for most of 2008, leading to massive cutbacks in consumer spending as personal wealth is destroyed. At the same time, the new US President Obama is leading the desperate struggle to rescue vast swathes of collapsing US industrial and financial assets, notably including the banks and the auto industry. Economic management strategies previously held in US mythology to be 'quasi-Communist' are now being deployed with alarming speed. The rapid introduction of Keynesian-inspired spending plans, government bail-outs and state ownership is an indication of the growing severity of the economic crisis. The palpable fear arose that the US economy might well collapse completely unless radical measures were taken, a fear famously captured in the words of past President George W Bush when he remarked that, unless massive financial support (subsidies) were urgently provided to the US financial system, "…this sucker's going down!"

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[1] The EBRD has been by far the most egregious offender in this regard, producing what it calls 'transition indicators' which are really nothing more than crude (neoliberal) ideological markers. See EBRD Annual Reports, various.

[2] For example, see the excellent series of articles on 'The Future of Capitalism' published in the *Financial Times* through February and March 2009.

In today's globalised world, it was inevitable that the economic destruction begun in the USA on Wall Street would be followed by parallel episodes of economic and financial sector destruction in those countries that most closely followed the Wall Street-neoliberal policy model. First and foremost, this meant the UK. The US government's closest ideological ally since the Reagan-Thatcher axis of the 1980s, the UK economy has dramatically declined since late 2007. The UK government has had to nationalise almost its entire banking system, raising public debt to levels last seen just after the Second World War. It has also had to begin bailing out large areas of the economy in order to stave off potentially massive job losses. Several previously high-performing 'role model' economies that, like the UK, also chose to closely follow Wall Street-neoliberal policies have already effectively collapsed (Iceland), are on the verge of collapse (Ireland) or have registered dramatic economic decline (Spain). The other major world economies much less enamoured with the Wall Street-neoliberal policy regime have also been plunged into a vicious economic downturn (Japan, Italy, France, Germany). After some delay, the fast developing and transition countries have now begun to feel the pain, with huge problems registered in Hungary, Ukraine, the Baltic states, Russia, China, South Korea and elsewhere. The least developed countries are also expected to decline substantially moving into 2009.

The Croatian economy has not been able to escape the damage wrought by the neoliberal policy regime, either earlier in the 1990s and early 2000s, or today as the impact of Wall Street's recent meltdown finally begins to arrive in the region. There has been some rather bizarre backtracking on the part of those previously fully enamoured of the neoliberal policy model, who have claimed that because neoliberal policy was not fully and completely implemented in Croatia it therefore cannot be blamed for any of the economic damage underway (for example, see Šonje and Vujčić, 2003). Notwithstanding, most analysts consider that the neoliberal policy model as unrolled in Croatia, as elsewhere in Eastern Europe, pretty much caused not just the severe economic problems facing Croatia over the 2000s, but also the most recent Wall Street-precipitated tsunami of problems.[3] Currently, there are few optimistic portents that suggest that Croatia will avoid a serious economic downturn. With a spectacularly large foreign debt (the largest foreign debt/GDP ratio in the region), a growing budget deficit problem, declining FDI flows, rapidly rising unemployment,[4] declining remittance payments, and many markets for Croatian goods in the EU now declining (including tourism – projected to decline over 20% in 2009 compared to 2008), the stage is actually being set for significant economic pain in the years to come.

Impact of the global financial crisis on microfinance

This paper looks at one policy area where, we argue, the flawed neoliberal policy regime has had an important negative impact, including in Croatia. The collapse of Wall Street has huge implications for the concept of **microfinance.** Microfinance is the provision of tiny loans

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[3] For example, see Turner, 2008. Consider also the case of neighbouring Slovenia. Slovenia decided after 1990 to adopt a much more state-coordinated economic model compared to virtually all other transition economies, including Croatia, in the process abandoning many of the neoliberal aspects that have undone neighbouring countries. Notably the financial sector has been largely under government control, thus avoiding speculative excesses and maintaining support for the crucial SME sector (now Eastern Europe's most developed by some considerable way). The overall result has been steady and equitable growth and stability. Slovenia also remains – so far, at any rate – outside of the orbit of the current financial crisis.

[4] The March 2009 figure for unemployment represented an almost 5% increase on March 2008, as well as a nearly 2% increase on the previous month's total. Note that previous March figures have all tended to register a fall on February's total, among other things in anticipation of summer tourism activity. Information accessed on 12 April, 2009 at www.hzz.hr.

(microloans) to the poor for use in opening or expanding some simple income-generating project, thereby to create employment or some additional income.[5] The concept was popularised in Bangladesh in the 1970s thanks to the work of Professor Muhammad Yunus who established the now famous Grameen Bank. Yunus and the Grameen Bank received the Nobel Peace Prize in 2006 for their work. The international development community saw in the Grameen Bank model a way of inviting the poor to remedy their plight through micro-entrepreneurship (see Yunus, 2001). The international donor community was initially quite willing to invest in/subsidize microfinance because it seemed to be offering a way to deal with poverty that did not upset the economic and social arrangements (i.e., capitalism and elite control) that prevailed in most poor countries.

Today, however, the microfinance model is under threat from virtually all quarters, including from Muhammad Yunus himself.[6] Pressure has been growing for some time to undertake a major re-evaluation of the entire microfinance model as development policy. Several reasons account for this. A growing number of independent analysts now argue that the hugely optimistic narrative constructed around the microfinance model is actually quite dangerously flawed, if not, as Lont and Hospes (2004:3) contend, "in many respects a world of make-believe."[7] Many long-time high-profile advocates of the microfinance model have also begun to identify major drawbacks within the paradigm they helped create (see Dichter and Harper, 2007). Even Jonathan Morduch, the co-author of a major international textbook on the economics of microfinance and a very high-profile advocate for microfinance, has been forced to admit that, while economic theory suggests micro-finance has benefits, "[r]igorous evidence that shows it happening just doesn't exist **…** The evidence is pretty dicey".[8] Finally, it is of some importance that a very recent (2009) World Bank flagship publication ('*Moving out of Poverty: Success from the bottom up*') has been allowed to publicly conclude as one of its principal findings that microcredit does not work.[9]

Crucially, it is a major blow to the microfinance model to find that we are also seeing the dimming of the international development community's nearly forty year love affair with the informal sector – the destination for the vast bulk of microfinance everywhere. It is now impossible to ignore the overwhelming evidence pointing to the fact that everywhere the globalisation-driven informalisation trajectory is associated with economic and social destruction (for example, see Breman and Das, 2000; UN Habitat, 2003; Davis, 2006: Seabrook, 2007; ILO, 2008, 2009a). It is precisely because of the many negative impacts associated with the growth of the informal sector, for example, that the ILO has argued against a policy of supporting informal sector microenterprises as a possible solution to the growing unemployment crisis in developing countries (see ILO, 2009b). Put bluntly, Hernando De Soto's famous idea that expanding the 'extra-legal' sector would be the ultimate solution to poverty in developing countries (see De Soto, 1989) has been nothing short of a disaster for the poor. The immediate conundrum for the microfinance industry then is this: if the link between microfinance and the informal sector is now clearly breaking down, on the grounds that experience shows 'informalization' actually represents a *deleterious* economic

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[5] For an excellent overview of the microfinance concept, see Armendáriz de Aghion and Morduch, 2005.
[6] Professor Yunus has been one of the most vocal critics of the way microfinance has developed along commercial lines, even calling the recent commercialising changes 'the death of microfinance'.
[7] For example, see Rogaly, 1996; and Nissanke, 2002.
[8] See 'Online Extra – Microlending: It's no Cure-all', *Businessweek Online*, December 13th, 2007).
[9] See World Bank, 2009. The press release (March 11th, 2009) highlights as one of its five key findings the fact that, "Microcredit can help the poor subsist from day to day, but in order to lift them out of poverty, larger loans are needed so that the poor can expand their productive activities and thereby increase their assets".

and social trajectory for the poor, then there is really nowhere for MFIs to go in order to find the client numbers that will ensure their own survival.

Most importantly, microfinance's intimate association with the now collapsed Wall Street model of neoliberal capitalism will likely be its final undoing. This is because in the 1990s many of the flawed character traits that have ultimately destroyed Wall Street were deliberately extended into microfinance: namely, its core anti-social values, its short time horizons, its inherently risky operating methodologies ('borrowing short to lend long'), its reflexive antipathy to all forms of even minimal regulation, its greed-based incentive structures, its asymmetric risk-reward profile (profits, subsidies and grants can be privatised while losses can be socialised), and its consistently bogus attempts at self-validation ('we over-extended sub-prime loans because we were desperately concerned to help America's homeless poor').[10] The key institutions that originally pushed this Wall Street-style 'make-over' were USAID, the World Bank and its IFC affiliate, the World Bank housed and multi-donor financed Consultative Group to Assist the Poor (CGAP), as well as some US-based international NGOs (notably Accion) and high-profile US-based University research and consulting units (e.g., the Harvard Institute for International Development, HIID). All of these institutions were ably assisted by many of the major private international financial institutions (banks and investment funds) keen to identify new opportunities for profitable investments. The end result of this movement was the 'new wave' microfinance model (Bateman, 2003), a model that its supporters widely claimed would revolutionize development policy as dramatically and positively as Wall Street was then supposedly revolutionizing the global economy (for example, see Robinson, 2001; Drake and Rhyne, 2002). However, the signs that Wall Street-style 'new wave' microfinance is beginning to collapse alongside its institutional role model are all around.[11] The extreme reaction to the 2007 Compartamos IPO, and the subsequent schism within the microfinance industry that this event precipitated, is one obvious indication. Growing repayment problems everywhere, rising 'drop-out' rates and the proliferation of Wall Street-style moral-ethical transgressions everywhere (e.g. in India 'hard selling' microfinance to subsistence farmers with no hope of escaping rising indebtedness, with large numbers of client-farmers going on to commit suicide as a result – see Shiva, 2004) are important symptoms of impending collapse.

2. THE MICROFINANCE MODEL IN CROATIA

Against this global background of extreme flux, how has microfinance fared in Croatia? This paper explores the evidence of microfinance impact in Croatia. Microfinance arrived in Croatia following the end of the Yugoslav civil war in 1995. Making use of significant international technical and financial support, three major microfinance programmes were established in the main conflict-affected regions, the objective being to facilitate quick poverty reduction and help underpin a 'bottom-up' economic and social recovery and integration process. A little later, newly privatised and largely foreign-owned commercial banks operating in Croatia massively jumped into the provision of simple household microloans. Rising from almost nothing in 1999, by 2006 the volume of household microloans in Croatia had begun to approach 35% of GDP, probably the highest level in all of

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[10] For an excellent in-depth analysis of the culture, values and operating modalities that destroyed the Wall Street model of liberal capitalism, see Stiglitz, 2003; Krugman, 2005; Elliot and Atkinson, 2008.

[11] We should also refer here to the parallel commercialised Business Development Services (BDS) model that was promoted by the World Bank, USAID, ILO, the UK government's DFID aid arm, and other development institutions throughout the 1990s. For many of the same reasons that have undermined 'new wave' microfinance, the commercialised BDS model has also pretty much collapsed everywhere - see Bateman, 2000.

Eastern Europe (Kraft, 2006). By the early 2000s, therefore, microfinance was pretty much available to all those in Croatia who might have a need to use it.

With more than ten years of operation, it is now possible, and very timely as well, to reflect upon and identify the most important positive and negative impacts and trends associated with microfinance in Croatia. Unlike in neighbouring Bosnia and Herzegovina, the Croatian microfinance sector has to date been subject to very little serious reflection and formal assessment. Latterly, a few short studies of the microfinance sector and individual MFIs were undertaken (for example, see Tsilikounas and Klajić, 2004: Ohmann-Rowe, 2005). However, these studies all effectively start from an implicit assumption that *by definition* microfinance always produces a positive development impact, and so the point of departure is simply to explore important operational issues – for example, how to ensure an MFI's sustainability, how to extend outreach, how to ensure 'best practise' management techniques are deployed, and so on. Such studies are in the main 'preaching to the converted' and are therefore of little value to those exploring the association, if there is one, between microfinance and sustainable economic and social development impact. Using some standard tools from local labour market analysis, Bateman and Sinković (2007, 2008) have more recently attempted to inject a greater degree of objectivity and realism into the study of microfinance impact in Croatia. This paper is essentially a summary of much of this previous work.

The rest of the paper is structured as follows. We begin by providing a brief description of developments in the microfinance industry in Croatia. The main part of the paper reports on the results of a data collection exercise undertaken in 2007 involving the three MFIs currently operating in Croatia. We then turn to very briefly consider the role of household microloans in Croatia, the rise of which has been a major feature of financial sector development since the early 2000s. A conclusion summarises the main issues raised.

For a number of reasons, Croatia was one of the last of the countries in South East Europe after 1990 to welcome the microfinance paradigm, and even then it was only a hesitant acceptance. The main emphasis of post-independence economic policy was on moving towards membership of the EU, privatising the best of the large-scale socially-owned enterprises inherited from the former Yugoslavia, and upgrading the general infrastructure (especially road transport links) linked to the crucial tourism industry. The main developments in Croatia with regard to microfinance had to wait until the reconstruction and development of the country following the end of the Yugoslav Civil War in late 1995. The international development community was particularly interested to promote microfinance in the post-conflict zones (the so-called 'Areas of Special State Concern'), believing that this would help to address the very serious issues of endemic poverty, high levels of unemployment, the collapse in social capital/solidarity and severe intra- and inter-community regional marginalisation.

As the post-conflict reconstruction phase began to get underway in 1996, the international community proposed that microfinance had a role to play in the process. However, it was not easy to convince the Croatian government at the time that microfinance was the best way forward. In fact, the Croatian government in this period remained rather sceptical of the entire microfinance concept. In the light of its intimate association with poor and under-developed countries, such as Bangladesh and Bolivia, many government officials in Croatia were reluctant to sanction a local financial system that implied comparability with poor non-industrialised countries. As they saw it, Croatia as it developed within the former Yugoslavia had very successfully abandoned its pre-1940 state of relative under-development and

emphasis upon small-scale informal enterprises. This development was largely thanks to a range of policies pretty much the opposite of microfinance: that is, an emphasis on large-scale coordinated investments, achieving scale and scope economies in the enterprise sector as quickly as possible, and a determined push to introduce new technologies right across the industrial sector (see Horvat, 2002). At the same time, government officials in Croatia after 1995 were also concerned not to repeat the recent traumatic experience they had had with the Savings and Loans Cooperatives (S&Ls). Historically the most well-established of the community-level financial institutions in Croatia, in recent times (i.e., post-Yugoslavia) it became apparent that many of the S&Ls had been captured by local business interests and turned into nothing more than money laundering, loan sharking and other equally unwholesome operations. Supporting microfinance might just be giving such shady business interests another opportunity to manipulate and exploit poor individuals and distressed local communities, as well as profit from public/donor funding streams.

Notwithstanding such reservations, following the end of the civil war the microfinance concept was immediately introduced into Croatia. In spite of the views of the Croatian government, key members of the international development community nevertheless felt that Croatia needed microfinance - and they were determined to bring this situation about. By far the most important institution pushing for microfinance was the World Bank. Although not directly involved in any microfinance programmes, unlike in neighbouring Bosnia, the World Bank undertook to use its conditionality veto to ensure that microfinance would come to Croatia (Bogdanić, 2002). Other supporters of the microfinance model included the EBRD, USAID and UNDP. A raft of local microfinance activists was also identified to work with the World Bank and other institutions in order to 'independently' lobby to have microfinance embedded within Croatian government law and practise (Bogdanić and Schmitz, 2006). As elsewhere in the transition and developing countries (Bateman, 2003), the main international development agencies and microfinance support bodies working in Croatia all insisted that the 'new wave' microfinance model had to be the operational template to use.

A total of three MFIs were established with financial assistance from the international donor community. The US government provided the bulk of the financial support used to establish the three MFIs, mainly through its USAID arm. Technical advice was provided by a number of the international microfinance advisory bodies under contract either to USAID or to the international NGOs involved in managing the project overall. The first MFI established after the war was MikroPlus. Effectively operating from 1996 onwards, it was initially part of the activities of Catholic Relief Services (CRS), which was then providing a number of forms of humanitarian aid in Croatia. MikroPlus received an initial financial donation from USAID of around $750,000 to capitalise its micro-lending activities. NOA was the second MFI in Croatia, established in 1996 as a Savings and Loan Cooperative (S&L) thanks to a $US3mn donation from USAID. It began working in the war-affected eastern region of Croatia around Osijek. NOA's initial TA was provided by one of the world's most recognised microfinance support institutions, Opportunity International, which was then becoming heavily involved in helping establish and advising MFIs right across Eastern Europe. Finally, DEMOS was founded in July 1999 by the International Catholic Migration Commission (ICMC) and, like NOA, it was registered as an S&L. Technical support was provided to DEMOS by the US-based Mercy Corps. DEMOS initially received a donation of $585,000 from the United States Bureau of Population, Migration and Returnees (BPRM), followed in 2001 by a further $682,000 donation from USAID's Economic and Community Revitalisation Activity programme (ECRA). Initially based in the town of Karlovac a couple of years later it opened a branch office in the heavily destroyed Western Slavonia region.

At least partly because of the Croatian government's resistance to its proliferation, the microfinance sector in Croatia has effectively remained confined to the three above MFIs. All three MFIs have attempted to expand. However, as Bogdanić (2002) shows, this has not really been possible in the face of such resistance. For example, a cap on interest rates introduced in 2001 forced the MFIs to respond by introducing 'membership fees', in this way maintaining what the MFIs felt to be an adequate margin on each microloan. The most important recent change in government legislation now stipulates that the MFIs must abandon their original legal status as Savings and Loans institutions, and either downscale into a traditional credit union, or else upscale into a full-blown private savings bank (or they can opt to close down). Brought forward following new banking regulations in Croatia related to deposit safety, capital adequacy and other security issues, this new stipulation will fundamentally overhaul the Croatian microfinance sector. The MFIs themselves, their financial supporters and others in the development community are thus right now making decisions that will determine the future shape and direction of Croatia's microfinance sector. It is perhaps an appropriate juncture, therefore, at which to explore a little further the sustainable development impact of microfinance in Croatia to date.

3. ASSESSING THE IMPACT OF THE THREE MFIS IN CROATIA

Data collection took place in Croatia in 2007 using two simple research methodologies. First, a semi-structured questionnaire was designed to provide background data on the history, operations and strategy of all three MFIs. Following receipt of the completed questionnaire, a follow up face-to-face meeting was arranged with the Director of each MFI in order to complete the questionnaire (both unanswered questions and unclear responses), to explore certain answers in more depth, and to gain a more nuanced qualitative feel to the goals and aspirations of the MFI in question. All three face-to-face meetings lasted more than two hours, with the interview notes circulated as requested to two of the MFIs in order to ensure complete accuracy. Second, a sample survey instrument was developed for use with a number of MFI clients involving six areas of basic enquiry. Perhaps because they had a history of working with evaluation teams in order to explore issues of impact (for example, see Copestake, Greely, Johnson, Kabeer and Simanowitz, 2005), DEMOS was persuaded to cooperate on this aspect, while the other two MFIs refused, citing commercial confidentiality. However, DEMOS would only provide a list of current clients upon which a sample survey could be designed: they were not willing to divulge any contact information relating to previous clients. From this very narrow list, then, a random sample of clients to be approached was identified. After negotiating (a surprising) number of wrong and disconnected contact telephone numbers, alongside the usual refusals to cooperate, a 30-40 minute telephone interview was successfully arranged with 30 DEMOS clients. In around 10 cases, when the initial information received was unclear or suggestive of something important we had to explore further, a follow-up telephone call was undertaken at a later date.

We are aware that the traditional 'impact-evaluation' methodologies used within the microfinance industry have been subject to serious criticism of late, notably by Ellerman (2007). In particular, the use of a simple 'client versus non-client' methodology either fails to pick up, or else distorts, a whole variety of possible impacts. Interestingly, as Ellerman (*ibid*, 158-9) points out, most of the impacts such methodologies fail to register are likely to be negative impacts or important opportunity costs that challenge the fundamental basis for microfinance (i.e., would an alternative project using the same resources have done better at quickly reducing poverty?). Partly to avoid some of these problems, our approach to assessing

impact is derived from standard local labour market analysis. We therefore set out explore a number of wider impact factors than those typically explored by the microfinance industry. The brief reflections that follow are necessarily limited due to data and space constraints, but we nevertheless feel that they illustrate what we believe to be the core factors that have helped shape microfinance impact through these three MFIs to date.

3.1. Exit or failure rates

Client exit (defined as the closure of the business activity originally financed by any microloan, in contradistinction to mere exit from the microfinance program) is an obviously important downside to microfinance and microenterprise development (see Storey, 1994). It contains the potential not just to wipe out the income stream and financial resources accumulated during the life of the microenterprise, but also the owners' initial investment, family assets, guarantees, reputation and social networks. These negative aspects were, for example, key downsides with regard to the UK's unemployment-push self-employment 'boom' in the 1980s (Blanchflower and Freeman, 1993), including with regard to the Enterprise Allowance Scheme (EAS), a quasi-microfinance experiment that ran for some years in the early 1980s (Bendick and Egan, 1987). Further debts are typically incurred in attempting to 'save' a failing microenterprise, a factor often seen in the growing numbers of multiple microloans held by poor people across the developing countries. The crucial end result is, therefore, that the individual failing in an attempt to establish a viable microenterprise – probably the majority (Storey, 1994) - *is very often left even deeper in debt and poverty than before the microloan was obtained*. It is therefore of critical importance in terms of public policy evaluation to assess whether the gains made by the winners/survivors exceed the losses incurred by the losers/exits (Mishan, 1981). If, for example, the gains made by the (often highly publicised) winners/survivors are actually swamped by the losses incurred by the losers/exits, then microfinance is clearly making the economic situation worse.

However, even though it can have potentially huge consequences for the individual concerned, the issue of exit is almost *never* factored into the assessment of microfinance impact. We say this because we have been unable to find any meaningful examples of an impact assessment factoring in clients standing after several years and which includes a facility for exploring the long-term results of exit.[12] The issue of 'survivor bias' – when those units that survive are evaluated simply because they 'exist', but those units that do not exist (because they have failed/exited) are simply left out of the analysis – is well known and is routinely factored into other areas of economics (e.g., industrial policy); but it is entirely absent in microfinance. This omission raises many serious problems of likely bias in impact evaluations of microfinance.

To include an understanding of the possible impact of exit, we first need to obtain some idea about microenterprise failure rates. As noted above, the issue of microenterprise (client) failure proved to be a very sensitive area indeed for Croatia's three MFIs, particularly with regard to DEMOS and MikroPlus. It was very clear that the MFIs felt significant microenterprise failures would reflect badly on their operations and profile, which might in turn curtail the possibility of important future external funding from the international donor community. At any rate, it turned out that there was little existing data indicating the extent of

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[12] One exception is a very interesting piece of research by Peter Davis in Bangladesh, showing that failure in a microenterprise project is one of a number of factors associated with the slide into chronic poverty – see Davis, 2007.

client failures since both MFIs had been established in the late 1990s. Compiling such data was both too time-consuming and expensive to collect and maintain, and, pointedly, it was also considered of no particular use to them: what mattered was repayment. Nonetheless, all three MFIs were very wary of allowing the research team to explore the issue on their behalf by passing on contact details of both current and previous clients.

Notwithstanding, with its small number of larger clients, NOA was the most open about client exit/failure. It reported that of the 350 new microenterprises it had financially supported since 1996, 'probably around 300 were still in business today' ('today' being May 2007). If true, this would appear to be a reasonably good track record compared with, for example, EU SME development programmes (see Storey, 1994). However, on further exploring the actual size of the typical clients supported by NOA it transpired that nearly all were, in fact, SMEs rather than microenterprises. The obvious conclusion was that NOA has actually been operating more or less since it inception as a small business fund, rather than as a typical MFI. When this issue was raised with NOA itself, the explanation was that the original donor behind NOA - USAID - had insisted on NOA supporting larger projects having, as they saw it, 'the potential for much greater impact' (see also the discussion below).

Eventually, DEMOS was persuaded to release to the research team its *current* client contact list. This at least allowed for the sample of 30 current clients to be compiled. Of the 30 DEMOS clients comprising the sample survey, we found 10 were using their funds simply for consumption goods purchase. Of the other 20 clients, the microloan was used to purchase an additional cow, and in some cases, two cows. Crucially, the interviews revealed that half (50%) of this group had 'failed' in the sense that they were now being forced into selling off the additional cow(s) bought with their microcredit. This reversal was necessary because the client could not earn sufficient revenue to cover the costs, still less realise a surplus. It also transpired that many of these failed clients were also left with additional debts, lost long-held assets and had encountered other problems. It was therefore clear that the overall situation of these individuals was now appreciably worse than before they decided to access their first microloan. In the case of the other 10 DEMOS clients involved in the dairy sector, they reported that they were able to keep the cow(s) purchased with the microloan, but they added that they were just about surviving. Crucially, they were 'only just about surviving' because, on DEMOS's advice, after purchasing their additional cow(s) they had immediately been able to enter into the Croatian government's dairy subsidy programme. Pointedly, all but two of the 20 DEMOS clients in this group reported that they had only been able to survive and repay their microloan (with half eventually 'failing', as just noted), because they enjoyed the government subsidy.

We therefore found a 50% failure rate over the previous two years of this one particular stream of clients in the dairy sector. Since we know that microenterprise failure typically rises considerably with time, this suggests that the failure rate in the longer term may be considerably higher. Moreover, with the subsidy element clearly an important part of the reason why some dairy sector clients 'survived', without this unorthodox non-market support for market-driven microfinance we might expect that the failure rate would have been higher over the two year period than the simple 50% estimate we came to.[13]

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[13] However, part of the attraction of taking a microloan was that the subsidy element could be used to largely cover the repayment. Hence, the absence of a subsidy might have forced many potential clients to more realistic in their appraisal of what earnings were possible through very small-scale dairy farming, and so many of the least productive farms might well have desisted from accessing a microloan.

We can now move on to the issue of determining what impact this high failure rate might have had upon clients with regard to their poverty profile. Overall, we found very strong indications from the telephone survey that 'failure' was very much associated with a descent into even deeper poverty status than before the microloan was accessed. As is typically the case with microfinance, several of the respondents described how the microloan they obtained was not the only form of investment they had vectored into their new microenterprise: also important were some additional personal savings, other loans, loans from friends, physical assets and land. If not only the microloan is lost as a result of failure, but all or part of this wider bundle of assets too, then it is not difficult to see how the poverty status of the client would be significantly and permanently deteriorated. Indeed, of the ten 'failures' on our revised definition, more than half remarked upon the difficulty involved in not just having to repay the microloan, but also upon the difficulties caused by other assets that were lost or would now be wasted. For example, the purchase of an additional cow also required an investment in simple equipment, transport, improved or expanded accommodation, fodder purchased in advance, and so on. The market value of such now redundant assets was very limited. One should not forget also the opportunity costs involved here. Given the time and hassle involved in expanding ones previously subsistence farm in order to approach the market, but then having to retrench when it became quickly obvious that the market was not accommodating, represented an enormous effort that could have been directed towards other activities. Another form of asset that we found to be important, and its loss lamented in several cases, was the bundle of intangible assets people had accumulated over the years, such as local reputation, social position, trust and social contacts or connections.

Albeit with a very small sample, we found evidence to suggest that microenterprise failure was routine and, much more importantly, it was quite closely associated with being propelled into even deeper poverty. Unlike in the developed economies, where business failure can often be quickly remedied by starting a new business, and real poverty avoided thanks to the social safety net and personal savings, this 'recovery' scenario appears to be a relatively weak factor with regard to the poorest and most marginalised regions of post-war Croatia.

3.2. Displacement

One explanation for the high microenterprise failure rates across the developed, developing and transition countries focuses not on the new microenterprise entrants, but on *incumbent* (non-client) microenterprises instead. 'Displacement effects' are present whenever the entry of any new business displaces from the local market incumbent enterprises operating in the same sector or locality. Sometimes the impact can be very large indeed. For example, the UK's 1980s quasi-microfinance scheme, the Enterprise Allowance Scheme (EAS), was almost totally dominated by the very high rates of displacement, which meant that very few net additional jobs were created (see Hasluck, 1990). New jobs and income created in the new entrants is thus counter-balanced by the jobs and incomes lost in incumbent enterprises that are forced to either collapse or contract. Importantly, unlike in the case of SMEs where displacement is geographically registered more widely (and so not felt as much locally), and where productivity-gains might generate some additional demand or consumer welfare through price effects, this is not generally the case with regard to microenterprises.[14] Instead, because microenterprises typically depend almost entirely upon finite local demand for the very simple non-tradable outputs they produce, new microenterprise entrants very directly take market share from incumbent local microenterprises. Gradually declining prices are one

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[14] We can also discount the possibility of significant positive Schumpeterian 'creative destruction' effects here.

obvious result. In addition, incumbent microenterprises are also affected by lower volumes, which raise unit costs and so produce lower returns from this direction.

Thanks to such displacement effects, a microfinance-based policy of job generation and income support operating under conditions of local market 'saturation' therefore might achieve no positive impact whatsoever: it might even make matters considerably worse by helping to actually *reduce* average incomes right across the microenterprise sector (for example, see Davis, 2006). The most recent confirmation that this is a real problem in developing and transition countries comes from the ILO. As noted above, the ILO has strongly warned that the simple microfinance-induced expansion of the informal sector in developing and transition economies cannot be seen as a solution to the current financial crisis, since, "*As was the case in previous crises, this could generate substantial downward pressure on informal-economy wages, which before the current crisis were already declining*" (ILO, 2009a, page 8 - see also the broad discussion in ILO, 2009b). Standard local labour market analysis therefore dictates that we must attempt to assess the net extent of displacement on employment and incomes, and factor the results into the overall evaluation of an MFIs real sustainable impact.

In general, we found that displacement was indeed an outcome of the operations of the MFI sector in Croatia. This downside to the microfinance model was most graphically illustrated by the local market dynamics we uncovered in the dairy sector in the Karlovac region. With very small-scale dairy farming the previous or prevailing livelihood of many of the very poorest and most vulnerable individuals targeted for support in the Karlovac region, this was an obvious area for the MFI sector to engage with. However, the subsequent wave of microfinance-induced new dairy sector entrants, and consequent increase in local supply of raw milk, very quickly brought about locally declining prices for raw milk. This lower price affected many of the clients. For example, the ongoing microfinance-induced declining price of raw milk was one of the reasons why several of the earlier DEMOS clients had reluctantly ceased working for the market: the price was falling to below the break-even point, and so they exited. Even with the Croatian government's subsidies, it was simply not possible to survive in such an over-crowded low price environment. This fact also strongly suggests that incumbent dairy farmers in the locality were also being affected by the lower price of raw milk. Unfortunately, the 2007 survey did not contain any facility to examine this group, but future surveys plan to do this.[15]

The problems facing dairy farmers in the region were then compounded by the actions of the two major regional milk processors. Initially incorporated into the local supply chain because of the mediating efforts of DEMOS, many new entrants later found themselves being extruded from the local supply chain. With so many new suppliers beginning to operate, at least partly thanks to DEMOS, the two milk processors found themselves in a strong market position.[16] They were thus able to 'cherry-pick' their local suppliers much more carefully than before, and thereby cut the transport and other costs associated with the very smallest suppliers. Gradually the local supply chain involved only those local suppliers able to meet high delivery volumes, with the minimum threshold rising from 75 litres to 100 litres per day in 2006, eventually rising to 200 litres by the end of 2007. The problem here was that as by

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[15] One of the authors (Bateman) is currently involved in designing and undertaking a major survey in Medellin in Colombia that will include not just microfinance clients but also 'counterpart' non-client microenterprises operating in exactly the same sub-sector and locality.

[16] In general, too, the low raw milk prices did not translate into lower prices for processed milk and milk products because the local processors largely captured the entirety of this price effect.

far the smallest of the local producers, this effectively meant that the majority of DEMOS clients were the ones chosen to be later edged out of the local supply chain. Of the ten interviewees reporting that they had 'failed' in their activity, their failure/exit was put down to either (a) that they had later on found themselves cut out of the local supply chain, or (b) that they felt in real danger of being cut out of the local dairy supply chain in the near future, and so took pre-emptive action by selling off the additional cow(s) bought with the microcredit. Thus, DEMOS clients were clearly both displacing incumbent dairy units, but many of them were, after a lag, also displaced themselves. However, the lower raw milk price also precipitated the exit of many non-client incumbent producers from the local supply chain. That is, they were 'displaced' directly because of the microfinance program.

We also found evidence of another form of displacement that likely undermines the development impact of microfinance. With external support from the international community coming to an end, and because of the generally low margins on its microloans, continuing 'drop-outs' and increasing difficulty to find clients, both DEMOS and MikroFin have been under threat for some time. As a result of its increasingly shaky financial situation, in 2003 DEMOS took the radical decision to try to generate a profit by entering into the highly profitable consumption lending field. Starting from more or less nothing in 2003, by 2004 more than 50% of DEMOS's microloans were straight-forward consumption loans. This decision was made even though there was no perceivable shortage of consumption loans in the Karlovac region. In fact, the city of Karlovac was well-served by at least three other exclusively consumption lending-based local financial institutions (savings and loan cooperatives), of which at least one (Duga) was located no more than 30 metres from the DEMOS main office. Moreover, it was also known that the supply of good quality clients in the region was actually drying up and so existing consumption-lending institutions were having some problems remaining in operation. DEMOS's move into this sector thus not only considerably diluted its original 'local development' mandate, it also very likely produced some negative displacement effects with regard to the other small consumption lending organisations trying to survive in the region.[17] The mere fact of an MFIs's 'survival' does not equate to there being a positive impact, especially if 'survival' has been secured, as appears to be the case with DEMOS, by effectively abandoning the core objectives it was originally set up to pursue. Mere 'survival' cannot be an objective. Overall, therefore, we find it likely that 'displacement' in the financial sector has also probably generated an overall adverse impact within the locality.

3.3. Deadweight issues

Deadweight effects arise when an event is undertaken regardless of the stimulus provided by an outside body. In the current context, this means that a microenterprise is either created or expanded regardless of the fact that a microloan is obtained. The importance of this point is related to the opportunity cost. In general, if funds are channelled into projects which would anyway have gone ahead, then there is no important 'additionality' effect here: and vice versa.

In the case of NOA, it was very much a case that the projects supported would have gone ahead anyway in the absence of the microloan, so 'additionality' impacts were minimal. In fact, NOA was quite explicit about this, freely reporting that their current and future growth strategy was increasingly based on taking a small financial position in much larger projects, rather than providing 100% of funding for smaller microenterprise and SME projects. This

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[17] MikroPlus were also becoming more interested in consumption loans, but by 2007 only 10% of its microloans were in this sector.

strategy was arrived at in order to minimise risk and to allow NOA to benefit from the proceeds of scale economies – that is, larger projects achieving optimum scale and having adequate capitalisation are more likely to succeed, and also produce higher profits, than those struggling to reach scale and acquire sufficient capital right from the start. One recent project given as an example by NOA involved them taking 10% share of the total loan amount required. However, a 10% stake in a larger project may well be a risk-free and financially advantageous move from the point of view of the MFI, but this confers little if any additional development impact generated within the community. To the extent that subsidiary financing becomes a main operational feature of NOA, its developmental value within the community is reduced significantly and deadweight diseconomies come into play.

In the case of DEMOS and MikroPlus, however, the situation was quite different, and deadweight effects were not in evidence. In the case of DEMOS, the telephone survey indicated very clearly that the large majority of clients found the microloan to be one of the key factors in them going ahead and establishing their microenterprise. Three interviewees specifically mentioned that the two MFIs were willing to accept guarantees that the commercial banks or anyone else would not accept (such as the use of personal guarantors), so that the MFI was the *only* source of formal microcredit in practise. Poor individuals in the post-war regions were to an extent credit constrained, so the microloans provided were generally decisive in allowing a microenterprise project to go ahead.

3.4. Scale

In all enterprise sectors there exists a minimum efficient scale of production, which is the level of production below which, for a variety of reasons (required technology, economies of scale and so on), it is very difficult indeed to become competitive at both the enterprise and sectoral levels. It is well known in economic theory that economic development, and thus also sustainable poverty reduction, is very much facilitated by an industrial or agricultural enterprise being able to reap economies of scale, thereby to allow for to enjoy lower unit costs, higher margins, and the chance to maximise the investible surplus (for example, see Thirlwall, 1989). Governments increasingly recognise the importance of scale economies too, and an important aspect of economic success in some countries, notably in East Asia since the 1970s (see Wade, 1990; Chang, 1993) has been the way that government policy has been able to encourage enterprises of all sizes to quickly achieve economies of scale.

Symptomatic of the sort of scale-related problems associated with microfinance that began to emerge in Croatia is the experience of one programme supporting refugees and displaced persons in Croatia's borderlands of Western Slavonia and Knin County. A major post-project evaluation (see W.M. Global Partners, 2003) found that the microloans and grants disbursed as 'start-up' packages generated almost no sustainable development impact whatsoever, precisely because none of the recipients could use this financial support to establish any sort of a sustainable microenterprise. The crux of the problem was that individual recipients were able to undertake only very simple, but largely unsustainable, activities commensurate with the tiny sums of money allocated to them. And in farming communities this just '..committed the village to remaining at a level of subsistence and denied the opportunity of building a farming community with complementarity between the farming activities' (ibid: 45). The evaluation concluded that the microloans were simply '..too small, with too short repayment periods, and thus inadequate for longer term investment in farm businesses and buildings'

(ibid: 46). This adverse outcome thus compounded the many problems already readily apparent in the agricultural sector thanks to the very limited scale of most agricultural units.[18]

In Croatia one of the most important sectors around which recovery could take place was the dairy sector. With a long history in this sector, plenty of good quality pasture land and solid local demand for processed milk products in Croatia, the recovery of the dairy sector became an obvious development and rural poverty reduction priority for the Croatian government. It was also clear to agricultural specialists what had to be done to facilitate the process. A major analysis of the dairy sector (see Agropolicy, 2005) concluded that,

> *'..as far as the economics and development of milk production are concerned, Croatia lags far behind the EU Member States. Most Croatian milk is produced on family farms and that production is expensive and insufficient to meet the needs of the dairy industry. There are a large number of small farms (2.8 cows per farm on average) with poor production capacities, 10,000 of the farms producing only 6,000 litres each per year (23).*

As Agripolicy (2005: 5) saw it, the crucial task for the Croatian government was to try to ensure that, 'The farms which are not market oriented (presently almost half of the all milk farms) (..) disappear while bigger farms with modern technology (..) develop'. Bearing in mind the need to coordinate policy across all agricultural sectors, the Croatian government was also implored to ensure that, 'Agricultural policy initiatives should encourage only those programmes which will ensure the long term survival of this sector in a competitive market and/or those programmes which ensure some desirable social benefits'. The core recommendation provided by Agripolicy, as well as by many other specialised studies analysing the dairy industry, was above all for the country's scarce financial and technical resources to be used to rationalise the sector principally on the basis of scale. In other words, for a healthy dairy sector to emerge in Croatia and for scarce financial and other resources to be used effectively, *the smallest dairy producers should be encouraged to quickly exit the market*.

With this important background in mind, we need to reflect on the fact that the overwhelming majority of both DEMOS and MikroPlus dairy sector clients were established well below the required minimum efficient scale. Rather than working with what many agricultural specialists consider to be the minimum efficient herd size of around 10-15 head of cattle, most of the MFI clients provided with microfinance still operated with no more than 3-5 head of cattle. In practise, the farmers supported with microfinance were all attempting to move from subsistence farming into semi-commercial farming operations. However, the futility of attempting such a potentially important move with the help of microfinance was quickly exposed in practise, as we noted above. Most farmers quickly found themselves in real difficulty because they were simply too small, and so unit costs were relatively high. Predictably, as we noted above, the two regional processors began to extrude the smallest dairy units from their supply chains. Furthermore, we need to reiterate the fact that almost all DEMOS clients managing to survive as dairy farmers, were actually doing so because they had been encouraged by DEMOS to tap into the Croatian government's agricultural subsidy scheme. Without this support nearly all the farmers interviewed felt that they would have not have been able to survive at all. In other words, the initial lack of scale was being compensated for by government subsidies. All told, the microfinance-induced expansion of

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[18] For example, see 'Croatian farmers hoping quality wins over quantity in EU', *International Herald Tribune*, 10th August, 2008.

the dairy sector we have reported on significantly frustrates the Croatian government's development objectives. So, not only did microfinance absorb a significant amount of financial resources simply to support 'here today but gone tomorrow' dairy units, *it ended up creating a significant new strategic hurdle for the Croatian government to overcome in its attempt to restructure the dairy sector into the most efficient configuration possible*.

In contrast to the approach of both DEMOS and MikroPlus, as we noted above, NOA started its own micro-lending activities very much with an idea to avoid scale diseconomies in its client base. NOA's main technical assistance provider in its early years – Opportunity International – had initially proposed that NOA provide microloans up to a maximum value of $3,500. However, USAID was the other main supporter of NOA and the source of its starting capital (a $3mn donation), and they had a different idea. USAID advised NOA to provide microloans up to $10,000 on the basis, apparently, that 'nothing much below this will have any impact'. Accordingly, NOA emerged with a quite different approach to both DEMOS and MikroPlus, in that right from the start it was veering towards becoming a small business bank rather than a straight-forward commercial microfinance provider.

3.5. Economic structure

We know from at least as far back as Alfred Marshall that sustainable economic development is preceded by the establishment of a particular local economic structure characterised by the presence of large numbers of dynamic small and medium enterprises all attempting to develop and use the latest technologies, build a skilled workforce, reinvest as much as possible, and work together with each other (clusters, networks) as well as with large firms (sub-contracting) (see Pyke and Sengenberger, 1991). Many developing countries have attempted to create such an important enterprise foundation since 1945, with some spectacular successes, notably in East Asia (Wade, 1990). An emerging trend in many developing and transition countries today, however, is the effective *dismantling* of the required foundation for sustainable economic development, especially in relation to the progressive infantilisation and informalisation of the enterprise sector (for example, see Amsden, 1994). We must therefore also attempt to assess microfinance impacts in Croatia in terms of whether or not the country is being helped to move towards an ultimately more sustainable economic and social structure.

Everywhere across South East Europe as the post-communist transition began in the early 1990s, the first MFIs into the field were almost completely taken up with supporting petty shuttle-trading microenterprises, simple retail operations (street trading and kiosks) and simple services-based entities (see Bateman, 2003). Clients in this market segment were (at least initially) very much associated with the generation of high and quick financial returns, so the MFIs naturally gravitated towards them and helped to extend their operations considerably. However, the consolidation and extension of such a primitive economic structure carries with it significant drawbacks for any country wishing to survive and prosper in today's global economic framework. It is a development trajectory that not only undermines the establishment of the best possible economic foundation for growth and development, it also promotes import dependency in many cases. Moreover, as the market developed, and as some large-scale retail and other developments came on stream, most of the new microenterprises were quickly forced to exit.

In Croatia, for example, initially both DEMOS and MikroPlus quickly moved into supporting the establishment and expansion of the small-scale retail sector. However, quite predictably,

very many of these first clients were then caught up in the inevitable 'shake-out' of the retail sector associated with the quick recovery of local supermarket chains (Konzum) and the entry of new hyper-markets (Metro, Getro), including many foreign-owned units (Mercator, Bauhaus). Accordingly, by 2002 the share of small shops in retail trade had fallen from around 70% of the market to 45%. In 2002 alone, more than 4,500 small shops were forced to close (Reardon, Vrabec, Karakas and Fritsch, 2003), very many of which were the earliest clients of the MFIs.

The client base of both DEMOS and MikroPlus has, of course, changed over time to recognise these downside developments as well as to include other perhaps more sustainable microenterprises operating in other sectors. But it is still clear that they both still work with only the very simplest of microenterprises. Notwithstanding the immediate poverty reduction benefits (if there are any) it is the case that such a local microenterprise structure is a manifestly unsustainable basis for future growth and development, and thus also poverty reduction. Another worrying factor here is that with DEMOS hoping to convert itself into a savings bank, the probability is that local infantilisation trends will be intensified to the extent that DEMOS is successful in recycling local savings back into the no-growth informal microenterprise sector. As Beck, Büyükkarabacak, Rioja and Valev (2008) report across 46 countries, such a dynamic is a much less efficient use of financial resources.

Our work also pointed to similar problems in the agricultural sector. NOA is something different from both DEMOS and MikroPlus here, in that it appears to specifically target microenterprises and small enterprises with at least some growth potential. This seems to be helping to build a cluster of microenterprises and small enterprises with a reasonable chance of becoming a platform for future sustainable growth.

3.6. Social capital

Microfinance is often said to promote social capital. However, in a number of ways microfinance also destroys social capital in the local community. For example, promoting and legitimising the informal sector typically undermines social capital accumulation through the increased toleration for illegal activities, lack of tax paying culture, refusal to abide by regulations regarding health and safety, and so on. A more recent form of social capital destruction is associated with the 'hi-jacking' of an MFI by its employees and close supporters, and its effective conversion into a vehicle primarily catering for their personal financial enrichment. In many cases, ownership of the institution is legally transferred at an extremely favourable price to a group of the employees/managers in an unethical wealth-generating process Harvey (2000) has termed 'accumulation by dispossession'.[19] The case of Compartamos in Mexico graphically shows the extent to which a determined group of insiders can effectively 'dispossess' a poor local constituency of an initial institutional endowment. It is also a truism to say that separating an institution from its original constituency of poor and marginalised people will lead to a loss of trust, goodwill, reciprocity

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[19] Two obvious examples in the UK recently include the 2003 privatisation of the defence industry company Qinetiq and the 2004 creation of Actis from CDC, the government-owned group that invests in developing countries. In the case of Actis, a group of its senior managers paid £373,000 for a 60% stake in a company they knew could be worth several hundreds of millions of pounds (it was later valued at between £182mn and £535m). In both cases, senior public sector managers were decisive in initiating, lobbying for and then designing the privatisation/divestment program. That these same managers then emerged as the owners of highly profitable companies that instantly made them into multi-millionaires was said to be entirely coincidental. The UK government under Gordon Brown was blasted in the House of Commons by the Opposition for allowing such developments to take place, but little was done to re-open either case. See *The Observer*, 25th November, 2007.

and voluntary action (for example, see Putnam, 1993), and the case of microfinance provides many such examples (see Bateman, 2003, 2008). Social capital is also egregiously destroyed whenever external financial investors are introduced into an MFI, and as a result begin to encourage it to adopt a much more aggressive commercial approach within the local community in order to maximise profits and, ultimately, their final dividends.

In Croatia, we found that two of the MFIs - DEMOS and MikroPlus - are strongly associated with the proliferation of informal sector microenterprises, particularly in agriculture. Our survey results therefore pretty much agree with the estimate provided by Ohmann-Rowe (2005) that approximately 90% of the agricultural clients of the MFIs operating in Croatia are not registered. The implications for social capital accumulations of such 'creeping informalisation' within the agricultural community have been largely negative, including very restricted local government-farmer trust and communication, a minimal local tax base and weak commercialisation of farms (for example, see IMC Consulting, 2004).

However, we suspect that the largest negative impact on social capital in Croatia will arise because of the ongoing commercialisation pressures affecting the three MFIs. For example, many of the 30 DEMOS clients interviewed complained about being confused because the real interest rate turned out to be considerably above what they had been lead to believe it would be when the loan was accessed.[20] Another confusion for clients was the size and purpose of the 'one-off' membership fee which they had to pay in order to obtain a loan (600 Kuna or around €100). Many in the telephone interviews found it disturbing that the MFIs were increasingly 'becoming like businesses' by charging unclear up-front fees and monthly membership subscriptions on top of providing loans at what they considered to be high interest rates.

Perhaps the most far reaching development of all with regard to social capital, however, is the MFIs' ongoing conversion into formal financial institutions. For example, NOA's planned transition to a commercial savings bank will endow its initial employees and some key clients as shareholders who will then effectively personally 'inherit' the original $3mn donation given to the wider community. Given that this move has created some confusion and even some resistance from others in the local community, NOA clearly risks losing some of its accumulated trust and goodwill in the local community. DEMOS are in the same position. And even though MikroPlus's less favourable overall financial position has meant it has been forced to consider avoiding closure by becoming a credit union, and so it has opted for a narrow constituency within which to work,[21] this strongly shows that it is now the financial survival 'cart' that determines what service is provided to the community 'horse'.

By first engaging with poor communities in Croatia under the watchful eye of the donors, and then effectively abandoning their primary concerns in favour of internal considerations, it was predictable that Croatia's MFIs would be increasingly being looked upon with increasing cynicism, mistrust and suspicion. That is, the MFIs in Croatia are now effectively eating away at the accumulations of social capital they constructed from the time when they were first established to unselfishly support the local community recover from conflict.

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[20] The confusion that arises with regard to interest rates, and which always seems to confuse the client into thinking the interest rate is much less than it is in practise, seems to be a widespread and deliberate practise everywhere within the microfinance industry (for example, see 'Setting Standards for Microfinance', *BusinessWeek*, July 28th 2008).

[21] At the time of the interviews, it was felt that a sufficiently large client base would be possible if they opted to work with 'disadvantaged women'.

4. MICROFINANCE SUPPLIED THROUGH THE COMMERCIAL BANKS

A second significant area where microfinance began to emerge in Croatia was in the early 2000s through the activities of newly privatised commercial banks, most of which were bought up by foreign banking groups based in Italy and Austria. As profit-seeking entities, these new commercial banks naturally sought out business areas expected to register high and riskless returns. They found what they were looking for in microfinance, officially termed 'household microloans'. As Kraft (2006) reports, rising from almost nothing in 2000, by 2006 the volume of household microloans in Croatia had begun to approach 35% of GDP, probably the highest level in all of Eastern Europe (see also the discussion in Turner, 2006). The key potential problem we want to highlight here is an opportunity cost one: if the commercial banks are recycling scarce local savings into household microloans, and therefore not into productive loans involving SMEs or larger companies in potential growth markets, this might represent a very deleterious financial sector trajectory for Croatia. We certainly need to reflect upon the fact that recent World Bank research covering 46 countries shows that in all 46 countries household micro-lending imparts significantly less impact on growth compared to enterprise lending (see Beck, Büyükkarabacak, Rioja and Valev, 2008).

Figure 1 shows the growth and structure of the loan portfolio of the Croatian banking sector since 1999. The two most important categories are firm loans and household loans, both of which have grown substantially since the late 1990s.
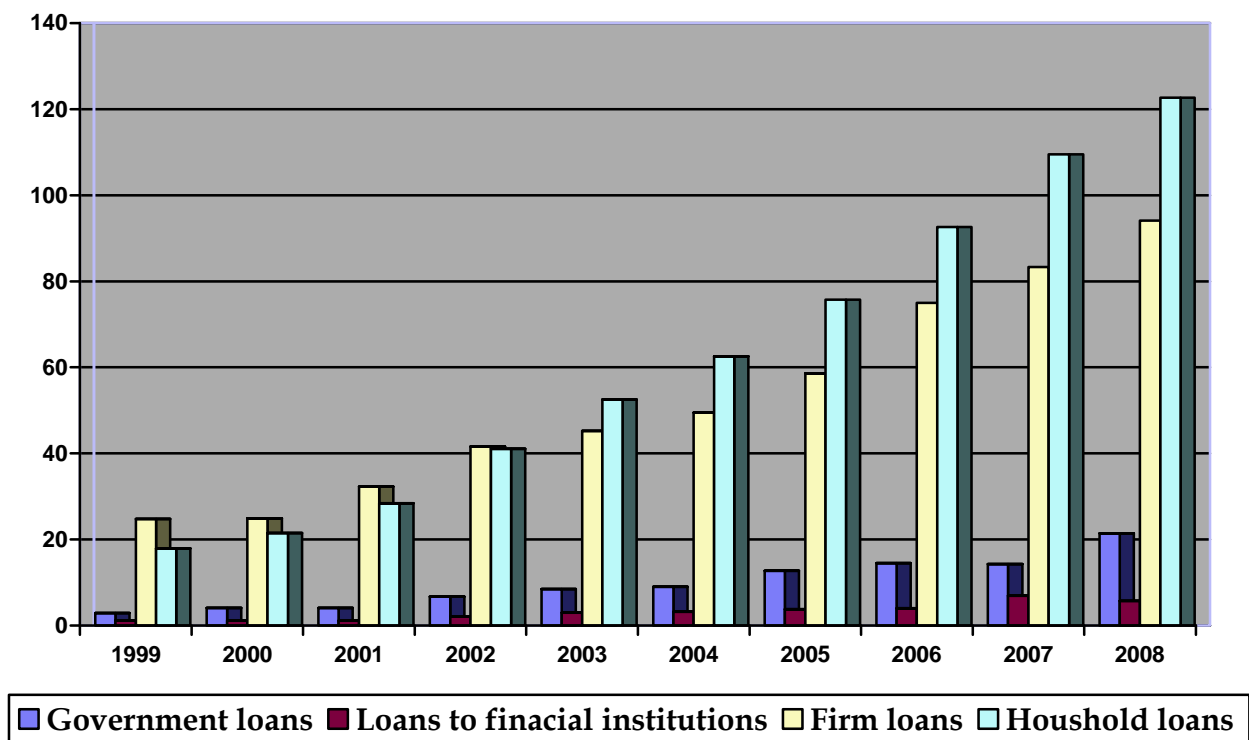
Figure 1. Loan portfolio for Republic of Croatia (in billion kn)
Source: HNB, 2009.

In terms of 'firm loans', it is important to note that this category includes straight-forward enterprises loans for productive investment, but also simple trade finance provided to SMEs and larger companies keen to import consumption and, to a much lesser extent, capital goods into Croatia. Given the significant import dependency of Croatia that has arisen since the end

of the 1990s, there is good reason to think that this component of 'firm loans' is quite significant.[22] The crucial capital investment requirements of the SME sector in Croatia are not necessarily being directly addressed here then. In terms of 'household loans', this initially included car loans and credit cards, but after 2003 (as Table 1 below shows) these items were separated out. We are left with a significant amount of what we might call 'traditional' microloans (up to €5,000) that can be used for virtually whatever use the borrower wishes – consumption spending or simple income-generating projects.

Table 1. Houshold loans portfolio for Republic of Croatia (in billion KN)

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	Total
1.Housing	7,289	7,983	9,137	11,989	16,519	21,087	27,250	36,624	44,869	51,943	234,69
2.Other	10,635	13,586	19,327	29,121	36,067	28,113	34,264	40,648	47,813	52,885	312,441
3.Cars	-	-	-	-	-	7,988	8,503	9,035	9,196	9,449	44,171
4.Credit cards	-	-	-	-	-	2,823	3,259	3,797	4,876	5,448	20,203
5. Leverage loans	-	-	-	-	-	2,639	2,435	2,577	2,816	3,015	13,482
TOTAL	17,925	21,570	28,464	41,111	52,587	62,652	75,713	92,682	109,545	122,742	624,987
TOTAL (Excluding housing)	10,636	13,587	19,327	29,122	36,068	41,565	48,463	56,058	64,676	70,799	390,297

Source: HNB, 2009.

The importance of the growth in household microloans is the opportunity cost in terms of the 'crowding out' of SME lending possibilities. As a host of international organizations report (for example, see OECD, 2007), Croatia's SMEs continue to have major problems accessing affordable finance. The much-mooted SME lending fillip that would come with privatisation and foreign ownership was very much less than expected. In terms of new start-ups, expansions and for routine productivity-raising investments (e.g., equipment, business accommodation, training), the situation is that few financial institutions want to develop a major loan portfolio here. Moreover, the comparison with neighbouring Slovenia is quite instructive. Slovenia emerged from the wreckage of the former Yugoslavia with a determination to retain much of its banking system under de facto state control, not least to avoid speculation but also to ensure that scarce financial resources would be channelled toward SME lending by design. The result is Eastern Europe's most developed and technologically advanced SME sector by some considerable way.

In Croatia, it seems that the newly privatised and now foreign-owned commercial banks were almost totally unconcerned with the development impact of their operations. Faced with the choice of very risky and low profit SME projects, or else high profit/low risk household microloans, the commercial banks widely opted for the latter. Even overt and covert Croatian government pressure upon the commercial banks to lend more to the SME sector has been

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[22] The Croatian National Bank (HNB) data is not disaggregated to show this feature, unfortunately.

insufficient to challenge this massively profitable dynamic. However, as predicted would be the case (for example, see Bateman, 1996), and as Beck, Büyükkarabacak, Rioja and Valev (2008) conclude across 46 countries, we suggest that this effective diversion of domestic savings into simple 'Grameen-style' microfinance programmes has been damaging for Croatia's economy. By all accounts, the Croatian SME sector has failed to develop through incremental reinvestment and industrial upgrading. Worst of all, valuable industrial facilities and technological know-how built up under the former Yugoslavia - a legacy that many developing countries would love to have at their disposal - has been allowed to disappear without any real attempt to ensure that associated employees could at least try to establish new and spin-off relatively technology-intensive microenterprises and SMEs. This microfinance-led strategy entirely contradicts the development experience of all developed countries and the richest developing countries of the last forty years. As Ha-Joon Chang (2002, 2007), Alice Amsden (2007) and Erik Reinart (2007) all vividly point out, today's rich developed economies and the more recently wealthy East Asian 'Tiger' economies all managed to succeed in sustainably reducing poverty not through microfinance and the resulting volume of simple informal sector microenterprises, but by deliberately channelling a very large percentage of national financial resources (i.e., domestic savings) into relatively technology-intensive microenterprises and SMEs and larger business projects located in potentially growth-oriented markets.

All told, we would argue, Croatia's current trajectory recycling its domestic savings base largely into consumption spending and informal sector microenterprises, as opposed to it going into enterprises with some development and productivity-growth potential, has been instrumental in keeping the country trapped in a far higher degree of poverty and under-development than would otherwise have been the case. Indeed, fearing just such an outcome, the Croatian National Bank (HNB) has at various times in the past taken legislative and other steps to curtail the very rapid rise of household microloans in Croatia (for example, see Kraft, 2006). But it has seemingly not been very successful in capping the flow of funds into such activities, just as much as other Ministries and government institutions (e.g., the National Competitiveness Council) have been quite unsuccessful in encouraging the commercial banks to increase their volume of SME lending (e.g., through guarantee mechanisms, project co-financing, and the like). As even the HNB is now starting to realise (for example, in terms of stimulating imports and undermining the balance of payments - see Kraft, 2006), it is now becoming much more widely accepted that damage has been done to the Croatian economy through the preference for this particular form of microfinance.

Even worse, there are today growing fears that a household microloan repayments crisis is around the corner (see Coricelli, Mucci and Revoltella, 2006). The current reversal in global economic fortunes is for sure undermining those income-generating projects started in Croatia with household microloans. Moreover, the fact that most (around 80%) household microloans are Euro- or Swiss Franc-denominated, and thus subject to inevitable adverse exchange rate movements against the local currency, means that today average monthly repayment rates are actually moving higher. As Kraft (2006) emphasises, this household microloan risk is not confined to Croatia by any means: it is a particular risk to all those East European countries that privatised their commercial banks into the hands of foreign banking groups exhibiting little real concern for host countries (Slovenia's action in carefully retaining banks under public ownership/control has spared it from a both a household microloan overhang and an informal microenterprise overhang). Even if current repayment rates are nevertheless maintained in Croatia in the face of deteriorating economic conditions, which Kraft (2006) reported in 2006 was the case, we also know that this means problems elsewhere. Here we

mean the fact that many individuals in micro-debt are typically forced to repay their microloans through other means. Three are most important:

- going into even further indebtedness (there is evidence that multiple microloans are indeed rising)

- depleting other important financial flows (e.g., remittance income, pensions)

- liquidating important family assets (e.g., savings, land, buildings, apartments, etc).

However, all three 'fall-back' methods of repayment imply that the poor in Croatia are being stripped of many of their most important family assets and income flows at a time when they will need them in order to survive the coming financial firestorm intact. But whichever way we look at it, there are few optimistic portents to be found in the predilection of the commercial banking sector in Croatia for household microloans.

5. CONCLUSION

The US government/Wall Street-led global financial crisis has impacted negatively right around globe, including in Croatia. Neoliberal capitalism (the Washington Consensus) has now been officially declared dead. One important offshoot of the neoliberal policy model was microfinance. Our data suggests to us that the microfinance model as it has played out in Croatia is associated with very little positive impact. We come to this conclusion, first, through our analysis of the activities of the three main MFIs operating in Croatia. It is clear, we should say right away, that the MFI sector in Croatia is professionally very well managed and that local staff are clearly dedicated to their work. Notwithstanding, we found little evidence to suggest a contribution was being made to sustainable development: quite the opposite, in fact. Across a range of standard labour market milestones, we found little or no real impact and, worse, a worrying number of deleterious developments and trends set in motion thanks to microfinance. A particular worry is the possibility that failures (and individuals) are being propelled into even deeper poverty than before they accessed microfinance, a dynamic which has enormous consequences given the typically very high rates of failure in Croatia and everywhere else. Our results are also indicative of the fatal weakness of simple 'client versus non-client' impact evaluations: none of the major downsides we found associated with the operations of DEMOS, for example, were even broached by the microfinance industry's own 'impact-evaluation' exercise that included DEMOS (see Copestake, Greely, Johnson, Kabeer and Simanowitz, 2005). Our brief discussion of the issue of household microloans in Croatia then revealed a potentially major opportunity cost, one that is now being increasingly recognised by the wider international community: potentially effective SME sector lending is increasingly being 'crowded out' by much less effective but highly profitable/low risk household microloan activity. On top of this, there is also the possibility of serious repayment problems, which would reverse even the few gains that have been made through household microloans. Overall, our analysis of microfinance in Croatia tends to support the view that microfinance constitutes an emerging 'poverty trap' and a barrier to sustainable development and poverty reduction. Alternatives to microfinance are therefore required that will, among other things, place 'developmental' finance at the centre of developmentally focused policies (for example, see Bateman, 2007b).

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"EURO? WHAT EURO?" THE FINANCIAL CRISIS AND 'BUSINESS AS USUAL' UK ATTITUDES TO ECONOMIC AND MONETARY UNION

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1 INTRODUCTION

The effects of the 2008/9 financial crisis have prompted the governments of several European Union (EU) states to revise their positions on Euro entry. Iceland, which has so far experienced the most serious economic crisis of all, is in the process of revising its position on EU entry and could even accede by 2011. The Icelandic re-think has been motivated mainly by the fact that Euro adoption is the key goal but that cannot be attained without first joining the EU.[1] Hesitant new member states such as Hungary and Poland are now looking for earlier rather than later possibilities to adopt the Single Currency. In fact, due to the perceived gravity of the economic situations of many new EU member states, in April 2009 the International Monetary Fund (IMF) recommended that those states should be fast-tracked into Economic and Monetary Union (EMU). Denmark has recently announced plans for a new referendum on scrapping the krone for the Euro in 2011. On October 30 2008 Danish Prime Minister Fogh Rasmussen said that the "Euro ensures political and economic stability in Europe and the current financial turmoil makes it evident that Denmark has to join the Euro" (Times Online, 30/10/08). There is however, no evidence of a currency policy u-turn in the UK. In fact this issue has hardly figured at all in public debates on the financial and economic crisis and has been largely absent in the mass media apart from a brief hysterical reaction to European Commission President Manuel Barroso's comment made on 30 November 2008 that UK Euro adoption was "now closer than ever before". Downing Street's reaction was that there was "no comment" on Barroso's statement and the "position on the euro is the same – it has not changed".

This paper will discuss why it is that the financial crisis has prompted revision of the stance on Euro entry in a number of EU member states, even fellow Eurosceptics such as Denmark, but not in the UK. Is this easily explained by the UK's long term image as reluctant EU member and the ongoing 'political taboo' surrounding debates on the Euro and EU more broadly? The UK has, historically in its relationship with the EU, usually accepted sovereignty transfer to the EU only as a last resort when it has been deemed vital for the

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[1] The decision on whether Iceland goes forward in an EU membership endeavour will depend on the outcome of negotiations within the new ruling coalition in Iceland. Following the elections of April 26 Iceland is governed by a coalition between the Social Democrats and the Left-Green Party. The pro-EU leader of the coalition, Johanna Sigurdardottir, will attempt to persuade the eurosceptics within the coalition that entry to the eurozone is necessary. See *The Guardian,* 27 April 2009, p. 31.

country's economic interests. This occurred in the 1950s when neither the Commonwealth nor EFTA were viable substitutes for access to the EEC market and again in the 1980s, when the need to genuinely liberalise the EC market via the Single European Act (SEA) was the dominant priority. Is it the case that Euro entry is not perceived to have the requisite economic benefits that would outweigh the political costs of further, dramatic in the this case, sovereignty transfer? Or have there been rational economic arguments against Euro entry at the current time? The paper will propose that the political obstacles to Euro entry definitely remain valid and relevant. Yet during this time of financial crisis they have been reinforced by recent analyses in a small section of the serious press which find no evidence that a Euro entry agenda would not fail to address the UK's current economic troubles and currency flexibility is the most advantageous strategy at the current time.

The article begins by looking at the extent to which Euro entry as a possible response to the UK's economic troubles figured in reports of the mass media and public interventions of British politicians over the last six months or so, and particularly around the end of 2008/beginning of 2009 when Sterling depreciated sharply against the Euro, almost reaching parity. The next section focuses on the political explanation of the non-debate on UK Euro entry. It draws on both the contribution of the longstanding UK approach to the European project and fundamental obstacles to support for deepening the UK engagement with the EU generally, in conjunction with the influence of the present political climate. The promotion of the single currency for the UK is completely off the agenda of both the current Labour government and the Conservative opposition which opinion polls suggest is now a 'government-in-waiting'. The third section reviews some of the economic arguments connected to UK currency policy which were in circulation during this same period. Though these contributions were not huge in number there was an active debate in which the economic rationale of Euro entry as a response to the effects of the financial crisis was discussed. However, this debate took place in a relatively closed circle in that it did not involve the general media and was focused very much on the *Financial Times (FT)*[2].

The overall conclusion of the 'restricted debate' was that there was no sufficiently strong economic case for targeting Euro entry at the current time, and that on balance staying outside EMU was probably the most advantageous approach. This was based on various arguments, including the fact that the 'vulnerability' of the UK economy and creditworthiness of the UK itself could not be compared to the crisis situations unfolding in certain new EU member states, for example Hungary and Lithuania. Also, certain Euroland countries with similar symptoms to the UK, including exposure to property 'bubbles', such as Spain and Ireland were not being protected from the real economic consequences by the single currency and in fact were maybe even in a position of having less options than the UK because of inability to devalue. Finally, following on from the last point, some commentators welcomed the sharp depreciation of Sterling due to the expected relief and stimulus it would offer to both UK exporters and suppliers to the domestic market.

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[2] The FT not only leans more towards specialist than general press but is also very much a newspaper with a European circulation and is the only UK 'broadsheet' that debates the EU and European integration within its pages in a non-biased way. Moreover, the FT audience falls into the minority pro-EU part of the UK population so is in any case 'preaching to the converted' when it comes to lauding the merits of EU membership.

2. UK EURO ENTRY AS A RESPONSE TO THE EFFECTS OF THE 'CREDIT CRUNCH' – MASS MEDIA COVERAGE AND POLITICIANS' INTERVENTIONS.

Winston Churchill once said to Charles De Gaulle that "if we have to choose between Europe and the open sea we will always choose the open sea" (reproduced in Wall, 2008, 118). When it comes to any choice that the UK may presently have in its currency policy, the preference throughout the current crisis has been for Sterling to carry on swimming in the stormy waters of the open sea rather than look toward the relatively calm and allegedly safe straits of Euroland. As mentioned above, the most notable aspect of the debate over whether the UK's exposure to the fallout of the global credit crisis should include an attempt to participate in EMU was that there was not one. Not only was there no reference to Euro entry as a strand of government's strategic approach to repairing the UK economy compared to what took place in several other EU members, there was also very little substantial discussion of the matter in the mass media.

The most notable instances of the Euro entry issue featuring in the popular press were stimulated by the Barroso comment noted above. It was reported that he remarked that the "global credit crunch has sparked a debate about joining the Euro among 'people who matter in Britain'...'I'm not going to break the confidentiality of certain conversations, but some British politicians have already told me, 'If we had the euro, we would have been better off,' he said." (Kubosova, 2008). The main thrust of the British media's reaction to this intervention was less to do with the merits of Euro entry and more about the identity of the 'people who count'. Unsurprisingly the finger was pointed at Lord Mandelson, perennial 'bête noire' of British politics and beloved mass media target. Right wing tabloid the *Daily Mail* produced probably the most hysterical reaction when it spoke of Mandelson being "at the centre of a row last night over 'secret plans' to ditch the pound after an explosive claim that Britain is ready to join the euro" (MailOnline, 2/12/2008). A more grown-up response appeared a couple of days later in the politically neutral broadsheet for more open-minded readers. *The Independent* – broadly supportive of the EU and tending to favour Euro entry - carried a somewhat 'for the layman' feature on 'Should Britain now consider joining the single currency?'. The Independent ran this because "some influential people in the higher echelons of government have been talking about it to the European Commission, apparently" and also because the "pound is now plummeting – again – and there are some fairly obvious signs that we do not seem to be able to run our economy very well" (Independent, 4/12/2008). The verdict was inconclusive, stating main the broad advantages and disadvantages and stating that joining the Euro made sense for all the established reasons rather than any clear advantage in terms of a solution to present difficulties.

Things then went quiet and the Euro issue retreated into the usual 'lack of interest' category until, in the context of ongoing decline of Sterling, in early January the *Times* reported 'renewed calls' (but did not state who was making them) for Britain to join the Euro. While acknowledging the importance of the debate (again, providing no evidence that a debate was actually going on or who was participating) but stressed that the "issue arises not now because of inherent problems with a system of monetary independence, but because UK policymakers have made mistakes. Those errors would not have been avoided, might have been aggravated and will not be resolved by joining the euro." (The Times, 5 January 2009). The article then continued in a way that confirmed the Times' anti-EU bias by saying that the "strongest objection to joining the euro, however is political...monetary union is a stage towards political union. Political union is neither desirable nor democratic. British foreign and defence policy,

welfare provision and economic priorities are the prerogative of Britain's Parliament, and must remain so". (The Times, 5 January 2009). In sum, the few mass media interventions on Euro entry for the UK, were far from a constructive, balanced and comprehensive discussion of the relative merits of British entry into EMU. Stimulated either by exploiting the interest in who in the government might have might have mentioned euro entry rather than its actual merits, or by the depreciation of the pound, the best that could be said is that at least the latter contributions rather correctly pointed out that a falling currency was not necessarily the right reason to think about abandoning that currency.

As far as political interventions were concerned, three things were particularly noticeable. First, Downing Street only raised the Euro issue in response to the furore that followed the Barroso claim. The government distanced itself from any claims made about the likelihood or desirability of an imminent push for Euro entry and reiterated that its stance on the Euro had not altered. Second, the Conservative opposition were, as to be expected, silent on the Euro issue in that they certainly expressed no argument that EMU could somehow be beneficial to the UK's current or future economic health, This was totally in line with their steadfast opposition to EMU (and any advance in European integration generally) and policy of keeping *any* discussion of the EU out of their public debates on policy preferences and to retain a low profile for the EU in their general electoral manifesto. This is partly due to the serious damage intra-party squabbles have done to them in the past, and the backfiring of previous strategies of basing the electoral campaign on anti-EU positions.[3] The third noticeable aspect of this was that the Liberal Democrats were the only major party that raised the Euro issue in a pro-active way. Writing in the *Independent* on 26 January 2009 'LibDem' leader Nick Clegg argued that the British "must look not only within Britain for new ideas, but to our neighbours in Europe. And that means keeping an open mind about whether Britain would be better off in the long run as a member of the single currency...I am not suggesting we could or should join the euro today...But the future will be dramatically different from the past. As the depth of the crisis becomes more apparent, we must start asking if a change to our currency arrangements will need to be part of the profound reconstruction of the British economy in the years ahead. The vexed issue of independent monetary policy should not be exempt just because it is controversial". (The Independent, 26 January 2009).

In sum, while other EU member states have pushed EMU entry to the forefront of the political agenda in the context of various economic pressures, including currency depreciation, this was absolutely not the case in Britain. Euro entry was not pushed at the political level; at the popular media level it was hardly raised at all and on some of the occasions when it was, the interest was more in the personalities involved more than the issue itself. Otherwise the issue surfaced in pockets of the popular press, stimulated by the sharp fall in Sterling around the turn of the year and was therefore only in the very margins of the debate and policy response to the fallout of the financial crisis. There was, however, what we might call a restricted economic policy debate in the more specialised, Europeanised, section of the press, which touched on Euro entry. Before turning to that, a closer analysis of the political barriers to abandoning the Pound for the Euro, and to integration-deepening in the EU in general, is needed.

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[3] There was a lot of nervousness in the Conservative Party that the recent restoration of Kenneth Clarke, doyen of the party's pro-Europe wing, to front-line politics due the fear that this could reawaken damaging divisions between the pro-EU and Eurosceptic wings of the party.

3. RELUCTANT' EUROPEANS: POLITICAL OBSTACLES TO INTEGRATION-DEEPENING

The lack of a recent debate on Euro entry as a policy tactic at the current time can easily be explained by the longstanding position of the UK when it comes to European integration, and image of at best 'reluctant' and at worst 'awkward' Europeans. The conditions and context in which a state begins its experience in the European project leave a deep mark on the nation's political culture and shapes future discourses on the relationship with Europe. When entry to the European project represents not a victory but, rather, essentially a 'defeat, then the future pattern is set. As Stephen Wall, former UK ambassador to the EU, put it: "The advice of both the Treasury and the Foreign Office in the mid-1950s was that the best option for the Britain, politically and economically, was for there to be no EEC. But if there was an EEC we might just have to join" (Wall, 2008, 119). Wall continues to say that the logic of signing up for the European project "became compelling within four years of the signature of the Treaty of Rome in 1957" (Wall, 2008, 119).

Thirteen years after the UK joined the EC, the Single Market issue was a further manifestation of the UK's uneasy relationship with Europe. The UK not only supported the Single Market project as a necessary move forward in *economic* integration, but was also a key sponsor of the move to eliminate non-tariff barriers and create a genuinely open economic space for the EC. Strong pressure from key UK firms and the Conservative government's neoliberal creed lay behind a hard choice between accepting further erosion of UK sovereignty or a continuation of protectionism in the EC market. The latter would also mean Margaret Thatcher (so it seemed) missing a perhaps not to be repeated opportunity to firmly place the EC on a more free market and less 'Social Europe' footing. Soon after the 1984 Fontainbleau EC summit at which she forged her 'Iron Lady' reputation, Margaret Thatcher "embarked on her campaign to make the European single market work properly by tearing down national barriers – including myriad different standards and regulations –which inhibited free trade. The only trouble was that every country hid behind its special standards in order to thwart this ideal. Thatcher was lobbied by British banks struggling to get into German markets. She saw no alternative: she supported the scrapping of national vetoes to ensure that Single-market legislation could be passed...her single market push was a great success – the UK does about 60 per cent of its trade with the EU – but the cost was a huge erosion of public sympathy for the European project" (Parker, 2008, 27).

Of course it was not signing up for the Single Market itself that eroded public sympathy as the bulk of the UK population failed to appreciate that the SEA had actually occurred, let alone understand the implications or even care about it generally. Rather, it was what the SEA unleashed that was to count. As we know, the SEA presaged the next big step in completing the Single EC economic space, which was of course the move to a single currency. Under the energetic Commission Presidency of Jacques Delors, and in an especially permissive climate for major moves forward in European integration, the EMU project gathered pace during the late 1980s. The chances of UK participation were, however, minimal, for various reasons. First, this development was hot on the heels of the increased supranationalism associated with the SEA. While the political implications of the latter were somewhat lost on the British public, the dramatic and identity-wrenching sovereignty transfer entailed by EMU would resonate across the whole population. Second, Thatcher and Delors had been on collision course in the aftermath of the SEA. Not only was the single currency plan totally abhorrent to the most of the Conservative party, there was also Delors' vision of using the new governance mechanisms installed in the EC to build a 'Social Europe' to counterbalance the free trade

Europe component of the SEA. As Parker reminds us a "furious Thatcher claimed she had been 'tricked' as the French socialist attempted to apply his vision to the newly deregulated British economy. Delors' appearance before an adoring Trades Union Congress audience in 1988 hardly helped her mood. This vision of a political Europe, with its own single currency, foreign, tax and justice policies was anathema to Thatcher" (Parker, 2008, 27-8). Though Margaret Thatcher was ousted from office in 1990, the John Major government were faithful to her mantra on Europe which remained a key continuity. John Major emerged 'victorious' from the 1991 Maastricht Treaty negotiations, having secured the UK's permanent opt-out from EMU (together with the new Social Charter). The fiasco around the UK's short-lived experience in the European Monetary System (EMS) only hardened the case – at government and popular levels - against any more European adventurism. Parker also reminds us of the important role the popular press played in cultivating and reinforcing anti-European attitudes amongst the general public: "In many respects, Britain's view of Europe is still shaped by the tumultuous final years of Thatcher's reign, a period chronicled with tabloid brilliance by Kelvin Mackenzie, editor of the Sun from 1981 to 1994. He encouraged his millions of readers to shout 'Up yours Delors' in the direction of France. People living on England's south coast were told they could locate this Gallic threat if they faced the sea and turned 'steadily to the left until they smell the garlic'" (Parker, 2008, 28).

It seems rather indisputable that the 1985-1992 period was also a vital one in shaping the UK's view of Europe. It meant that signing up for any further integration would face tremendous political difficulty in the foreseeable future no matter what party was in power. Even though the Blair period was supposed to herald a more active and constructive engagement with the EU, continuity rather than change was the real outcome. New labour's approach to Europe soon reverted to EU summitry behaviour based on fighting the 'UK cause' and taking no chances that the British public could somehow get the impression that the UK government was yielding to Brussels pressure. Defending so-called 'red lines' became a key source of domestic political capital for new labour as far as EU affairs were concerned. Even where the UK looked to be taking a lead role in EU integration in 1998 with the St. Malo Declaration when Blair (together with French President Chirac) initiated the European Security and Defence Policy (ESDP), closer inspection revealed that the main motivation was really to impede any potential military integration in the EU. Concerned that certain other EU states could seek to develop the EU defence capacity as an alternative to NATO, the British intervention was designed to steer ESDP away from that concept. A key factor as far as the prospects for Euro entry were concerned was the position of Gordon Brown as Chancellor of the Exchequer and the sole control of UK economic policy he enjoyed. In 1997 Brown announced that the UK would not join the Euro during Labour's first term of office, but he would however review the case for British entry into EMU under appropriate economic conditions. Five 'economic tests' would have to be passed, including: degree of economic convergence between the UK and the Eurozone; sufficient economic flexibility; impact upon investment into the UK; impact on financial services; impact on employment. The UK Treasury's report on the five economic tests in 2003 was negative and the UK government announced that the UK was not yet ready for the Euro. The main interpretation of the labour government's 'scientific' approach to EMU entry was that it was basically a disingenuous attempt to appear engaged with the EU and the real agenda was to neutralise EMU as an electoral issue and manage some disagreement within the government during the Blair leadership. Above all it reflected the dominance of Brown's stance: "Despite the appearance of rational decision-making, policy on EMU has been shaped primarily by political considerations and the strained relationship between Blair and Brown. Brown has been

cautious about EMU, wary of the impact membership would have on a British economy enjoying low inflation and increased public spending" (Garnett and Lynch, 2007, 293.)

Some analyses suggested that by 2003 the point at which the more important *political* test could be met had however already long passed. A rather influential analysis on the prospects for UK Euro adoption under new Labour came from Bob Worcester in 2000. Worcester, a veteran of UK opinion polling and also staunch supporter of Euro adoption, argued that upon election the Blair government had a short window in which to persuade the population to endorse EMU entry in a referendum. The basic argument was that the 1975 EU entry (more specifically whether to remain in under the re-negotiated conditions) question was confusing to voters in the UK. The issue of Euro entry would be equally if not more confusing and the population would not be able to make an informed choice between the arguments of those who would claim that Euro entry would be beneficial to the UK economy, worker and consumer and those who would contend the opposite. The key to winning a referendum on EMU would, according to Worcester, be timing. In 1975 the yes campaign won because "when an issue confuses voters, they place their trust in politicians they favour" (Glendening, 2000, 22). Thus if the Blair government were genuinely committed to Euro entry, they would have needed to hold the referendum very early into their term of office when the electorate's trust in them was high and their recommendation would be most likely carried: "the crucial lesson of the 1975 referendum is that an initially sceptical public was won over by the attractive personalities leading the pro-EEC campaign" (Daily Telegraph, 19/6/2001). Whatever the merits of the above analysis, as Budge et al argue some key events in the 2003-2005 were particularly important for governmental and public attitudes to the EU and made an EMU entry agenda ever more remote. In 2003 Sweden rejected EMU entry in a referendum and this "seemed to confirm in the minds of policy makers that the future would see a 'two-speed' Europe with Sweden, Denmark, Britain and many of the new EU states remaining outside the single currency…Together with the comparatively good performance of the British economy relative to 'Euroland' these events effectively postponed British membership, and a possible referendum, into the indefinite future. This was confirmed by the fact that the EMU was hardly an issue in the 2005 general election" (Budge et al, 2007, 169). The draft EU Constitutional Treaty also appeared in 2003 and the plan was for the government to put the Treaty to a referendum was announced in 2004. Yet the surprise rejection of the Constitutional treaty in France and then Netherlands in May and June 2005 respectively led to an effective abandonment of any UK referendum. "By 2006, therefore the whole question of Britain's status in the EU had been transformed. Both EMU membership and the ratification of the constitution were postponed indefinitely" (Budge et al, 2007, 169).

Regardless of any compelling economic grounds against countenancing Euro entry as part of the longer term economy strategy for the UK it is absolutely clear that there was no political momentum for this whatsoever. There are no outstanding saleable advantages but lots of political risks. In fact the logic of keeping the EU/EMU out of electoral politics is the main imperative for the main two parties and even the Liberal Democrats see that any championing of the EU/EMU issue could only do them damage. For the government and labour party generally, it is currently so far adrift in the opinion polls there could be no political logic for further embracing EU integration in the form of a push for Euro. Moreover, even with the supposed the merits of the British economic model laid bare there are no signs that the British Prime Minister sees this as a reason to adjust his sceptical view of EMU, even though Gordon Brown's recent charm offensive towards Brussels may have suggested otherwise. Following Brown's surprise acceptance of an invitation to address the European Parliament on 24 March Philip Stephens of the *Financial Times* commented: "Mr Brown's view of the European

Union has hitherto hovered between disdain and contempt. No longer, it seems…I am told that he accepted with alacrity the invitation to address parliamentarians of the 27 European Union states. Not too long ago he would have done almost anything to avoid the short hop from London to Strasbourg" (Stephens, 2009). Rather than a symptom of a desire to engage with the EU in a more fundamental way, most commentators viewed this as an acceptance that the UK's chance to influence the G20 summit on its own was limited and needed to be based within a wider EU consensus. As Stephens went on to say that "hard as it was to make Britain's voice heard above the din of failing banks and collapsing output, it was utterly impossible unless Mr Brown could show he had leverage elsewhere in Europe. Why should India, China, Russia or anyone else pay attention to the British prime minister if he cannot carry his closest partners?" (Stephens, 2009). Much more instructive was the content of the Brown speech during that address to the European Parliament. It was noticeable that in listing the major achievements of the EU the UK Prime Minister noted the "greatest and biggest single market in the world, now bringing opportunity to 500 million people and the most successful endeavour in economic cooperation anywhere in the world" (PM Speech to European Parliament, 2009) but the Euro/EMU was not included in his list and was not mentioned on a single occasion during that speech.

What about the Conservative Party, widely expected to win the next UK General Election? The discourse of the leader of the opposition (and of William Hague, the even more Eurosceptical shadow foreign secretary) is ongoing hostility to European integration. Currently they vow, if elected, to hold a referendum on the Lisbon Treaty and urge the UK electorate to reject it.[4] This is in addition to the other notable aspect of the current Conservative action on the EU front which is the decision to withdrawal Conservative Party MEPs from the EP centre-right grouping the European People's Party (EPP). Clearly there is no need to elaborate further why EMU entry will not be on the Conservatives' agenda. Finally, the Liberal Democrats position is essentially that while the two leading figures in the party (Nick Clegg and Christopher Huhne) are ardent supporters of EMU and strongly favour UK entry, they are both political realists and recognise that it is neither a vote-winner nor an issue which could ignite an electoral campaign for them. The financial crisis provided a context to state the advantages of EMU in principle but the overall position is as it was last September when Clegg admitted that tax and other domestic policy areas completely overshadowed the 'neutered' euro debate while Huhne said that "(t)he truth is, within the British debate, it's completely off the radar and there is simply no point in regarding it as a runner worth investing political time in" (Merrick, 2008).

In sum, the financial crisis did not act a stimulant for a political debate on Euro entry as an option for the UK. A longstanding set of UK reservations about the EU in general, the anti-EU momentum which developed in the UK around the late 1980s and 1990s which in turn created extremely negative prospects for EMU entry and an ongoing decline in reputation and popular approval the EU has experienced over the last decade or so have all played their part. Those politicians in the rare position of having developed their political careers in the EU institutions and then returned to domestic politics with more of a 'Brussels' than a 'Westminster' mentality (such as Clegg and Mandelson) are still in the minority.

The major political parties all prefer to keep the EU on the sidelines of electoral politics in the UK and the UK business community seems to have no appetite for Euro entry either. As Norman remarked the "main review of the tests came in June 2003 when Brown decided they

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[4] The pledge to revisit UK approval of the Lisbon Treaty is part of the Conservative Party's campaign for the 2009 European Parliament elections.

had not been met, although the government remained committed in principle to joining. Since then, Brown has replaced Blair, the opposition Conservative Party has remained implacably opposed and even the last bastion of pro-EU sentiment, the Liberal Democrats, has sounded more cautious about pushing for euro membership soon…Nor has the business community shown much zeal. The Confederation of British Industry, which campaigned for early membership in the late 1990s hasn't consulted members on the issue in the last five years and no longer leans in favour " (Norman, 2008). Hostility on the part of most of the British newspapers and predominant anti-EU attitudes amongst the public seem particularly deep-rooted in the UK and the main political parties either cultivate and feed on these or are forced to sacrifice their pro-EU instincts in the interest of electoral priorities. This is the context in which the Euro issue, even in times of extraordinary financial and economic crisis, gets played out in Britain, leaving any serious debates on the matter which may be conducted somewhat on the fringes and not being part of the mainstream political discourse. The next section turns to whether a rationale for UK entry for EMU could be found in the limited 'specialist' debate which did take place.

4. THE EURO AS AN OPTION FOR THE UK: WHAT THE SPECIALIST PRESS SAID

Early proclamations of certain Eurozone member state governments that the financial crisis was a disease of Anglo-US neoliberal, deregulated capitalism were somewhat premature. The latest official economic forecast for Germany, whose Angela Merkel was one of those European leaders confident that their countries would reap the rewards of a more socially oriented and responsible form of market economy, predicts a 6% shrinkage of German GDP in 2009. Of the world's largest economies, only Japan is forecast to undergo a sharper contraction.[5] Looking at the Eurozone more broadly, recession continued to gather speed in early 2009: "The rapid pace of the eurozone's economic contraction shows no signs of slowing with industrial output down almost 20 per cent year-on-year in February and inflation dissipating, official data showed yesterday" (*Financial Times,* 17/4/2009). As the financial crisis unfolded into a broader crisis in the real economy, any arguments about attractiveness of the Euro for the UK would have gradually lost resonance against the background of these developments. Not only has the Eurozone become embroiled in a deep recession also, but the Eurozone interest rate has fallen to 1.25% (with a further imminent cut to 1% forecast at the time of writing) and the public finances of Eurozone countries are deteriorating fast. Significant breaches of the Growth and Stability Pact rules have already occurred and, further equalising the broader picture in the UK and Eurozone, "Jean-Claude Trichet, ECB President, in a German paper raised expectations the bank would extend 'non-conventional' policies. 'Extraordinary' circumstances required 'extraordinary measures', Mr Trichet said. The ECB could follow the Federal Reserve and Bank of England in embarking on asset purchases" (*Financial Times,* 30/4/2009). Sterling has also partially recovered of late and stabilised around the £1 = €1.12.

Yet in the period around Sterling's sharp decline against the Euro in December 2008/January 2009 a number of analyses directly and indirectly addressed whether the time was right for the UK to consider Euro entry. For example, in early January 2009 two commentators writing in the *Financial Times* used the case of Spain to illustrate the relevance of EMU. They remarked that as "the credit crisis begins to bite with particular severity in the UK and Spain, opinions about the pros and cons of the single currency on its 10th birthday are once again

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[5] *Financial Times,* (30 April 2009, 6)

fluid" (Giles and Mallet, 2009). The key point made was that both the UK and Spain have suffered from runaway housing and credit bubbles which have imploded with devastating economic consequences. The fallout for the UK included an 'old-fashioned sterling crisis' which suddenly showed the downside of currency independence, while Spain faced inability to engineer a timely devaluation and a long and painful period of structural adjustment with unemployment and real wage stagnation. In sum, this comparison, showed that "the euro, whether in or out, has had less effect on each economy than is often supposed. Linking to a bigger economic zone did not protect Spain from a housing and credit bubble and nor did currency flexibility in Britain." (Giles and Mallet, 2009). Another 'comparative' analysis which appeared in the pages of the 'FT' focused in Ireland, with some interventions attributing Ireland's difficulties to Eurozone membership, particularly the role of an inappropriately low interest rate. Responses to this stressed that a major housing boom in Ireland would have occurred even outside Euro membership and "even if Ireland had been able to raise interest rates, policy rates have relatively limited impact on the housing market when bubble psychology dominates investor sentiment…it is clear that Emu was not a fundamental factor in driving the Irish credit boom. (Lane, 2009). The main sentiment of these arguments was currency policy was somewhat neutral as far as cause and solution of property/credit bubble related economic crises were concerned.

The advantages of Euro membership for small vulnerable European economies at the time of the financial crisis was lauded however. Lane remarked in his defence of Irish membership of EMU that without it Ireland would most likely suffer the kind of severe currency crisis that several of the central and east European new EU member states were undergoing. This linked to another set of arguments that the Euro was less relevant to the British context than to the new EU member states in superficially similar currency crises in that the UK situation could not be compared to that of say, Hungary, which had a much smaller and vulnerable open economy and which was also suffering additional complications of foreign ownership of banks and a very high proportion of Euro-denominated mortgages. This linked with other interventions which complained of 'misplaced hysteria' about sterling and any idea that the UK was heading for the doomsday scenario of a sovereign default crisis were completely overblown. For example, in late January 2009 Magnus (of USB Bank) argued that it was "hysterical to imagine that a debt default and currency crisis are likely. The country's debt metrics and economic management potential are nowhere near flashing red, and the government has plenty of opportunity to stabilise public finances over the next few years, and sterling is by no means finished against the euro in a long slowdown in which world trade has stalled" (Magnus, 2009).

Finally, some analyses questioned assumptions that the Euro was in fact a safe haven. In February 2009, respected Financial Times columnist Wolfgang Munchau argued that various destructive tendencies including a lack of Eurozone coordination of stimulus packages, 'protectionist' nature of certain (France's was highlighted) stimulus packages, and particularly vulnerable Eurozone countries getting near real danger of sovereign default (Italy, Spain, Ireland, Greece) were not only undermining the integrity of the Eurozone itself but were also seriously damaging to the EU's single market. Munchau's comment that "for the Eurozone, I always argued in the past that a break-up is in effect impossible. I am no longer so sure" was the reverse of the rosy scenario needed encourage applications to join it, especially from eurosceptics nations needing no excuse to maintain their distance form EMU. Finally, sterling's depreciation against the Euro was by no means universally seen as bad news and the competitive upside devaluation was recognised. A Financial Times editorial remarked that since "UK domestic demand is weak and last year's trade deficit was 6.5% of

GDP, a depreciation is what any economic doctor would order. A rise in net exports is essential for sustained recovery. It is not the UK's fault that Eurozone member countries in the same plight chose to tie themselves to the euro mast".[6] Meanwhile, in more evidence that the balance of informed opinion has stayed firmly in favour of retaining sterling, the UK has had to face charges from its EU partners in the Eurozone of manipulating sterling to gain competitive advantage and that it was in breach of article 124 of the EU treaties which requires states outside the single currency to "treat their exchange rates as a matter of common interest". Now that the pound has stabilised somewhat "the Bank of England now sees the benefits of a lower currency, not in rising imports but in a rapid fall in imports contributing positively to economic growth" (Financial Times, 8/4/2009).

Clearly, some serious debates of the UK's currency policy has taken place, but mainly outside the mass media and in the relatively confined pages of the more specialised press, and particularly in the Financial Times which as well as its reputation for rigorous debate is also the one British newspaper that has truly 'Europeanised' its analytical sections. The key observation is that in the interventions that appeared over the past few months no strong case for UK entry in EMU on grounds of the cause, effects and resolution of the current financial and economic could be found.

5. CONCLUSIONS

It is clear that there was absolutely no prospect that the UK would join the ranks of other EU (and non-EU in the case of Iceland) states, including fellow Eurosceptics, and look for sanctuary in EMU in these extraordinarily troubled times. Longstanding, deep-rooted formidable political barriers to Euro entry have remained as decisive as ever and were reinforced by the considerations of the current political cycle. Neither was there any persuasive economic analysis to push the Euro agenda coming out of the restricted, relatively non-public debate that did take place. Indeed, as the months have gone on and thoughts have turned to recovery, the competitiveness advantages of currency flexibility are being increasingly lauded. Moreover, as economic and financial pressures in the Eurozone have moved more into line with the UK, any arguments for Euro adoption have waned anyway. It also seems that momentum may stall in other European countries drive towards Euro adoption as the more underlying 'anti' pressures reassert themselves. In Iceland for example, only 38% of the population now favour EU membership compared with 52% at the height of the financial crisis last October and many believe that the longstanding no-go areas of the EU will prove decisive for Iceland as time goes on. As Peel put it "although EEA membership means Iceland has signed up to about two thirds of EU legislation, the potential sticking points on fisheries and farming could yet prove fatal…The prospect of EU membership is a nice insurance policy in bad times but when they contemplate the terms the islanders may well balk at paying the price" (Peel, 2009). As for the UK, if the recent financial crisis did not even generate a case for Euro entry as a 'nice insurance policy in bad times', one could not even begin to predict when the world might say goodbye to the pound!

The UK voluntarily took two massive steps in terms of relinquishing sovereignty to Brussels, once when it joined the EC in 1973 and then again when it signed up to the SEA in 1986. Joining the EEC in 1973 was the only viable opportunity to recover economic dynamism and rescue some political influence in the bipolar world. In 1986 British desperation to truly

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[6] *Financial Times,* 11 April 2009, 12

liberalise the EEC marketplace outweighed the political cost of acquiescing to the required expansion of supranational governance, however unpalatable that was. EMU does not currently have the status of the only alternative for a successful UK's currency policy and the results of UK Euro adoption are loaded with uncertainty. More significantly, EMU is not, as was the case with accession to the EEC and acceptance of the SEA, an indispensible factor in the UK's ability to successfully pursue its free marketeer instincts and access its most vital trading partners. The absolutely key point is that the UK's longstanding tradition of free market economics and liberal trade policies have always been keen drivers in the UK's willingness to accept and participate in the supranational dimensions of EU economic governance. Since EMU is not a 'market-openning' project as such, it is no surprise that the UK's aversion to EU integration-deepening continues to prevail. Indeed, with evidence that the flexibility of sterling to respond to market signals is going to be a factor in aiding recovery in Britain it is the faith in market forces impact on the value of the national currency that is prevailing over a currency union that would in fact impede the functioning of those market processes so cherished in the UK traditional approach to economic governance.

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FISCAL SUSTAINABILITY UNDER FINANCIAL CRISIS AND LATEST ECONOMIC POLICY RESPONSES: EMPIRICAL ANALYSIS FOR EU MEMBER STATES

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1. INTRODUCTION

In recent financial crisis economies are forced to undertake necessary policy actions to overcome effects of financial crisis. Lately most of EU policy makers (besides policies in USA and other economies) already adopted some policy measures that usually involve massive use of public funds, used directly or indirectly in their economies aiming to boost economic growth, tackle liquidity problems of banking sector etc. The use of public funds resulted in many academic and professional debates; not mainly on the effectiveness of such policy actions but rather on the potential conflict with Maastricht Criteria. In Slovenia, for example, the expected revision of state budget for 2009 lies on the presumption to be in accordance to Maastricht Criteria, which is – according to our view – irrational.

At least in political debates it is broadly accepted that Maastricht fiscal criteria correspond to long-term public finance's sustainability and that economies, fulfilling these criteria, cannot have fiscal difficulties: their public finances should therefore be "healthy". However many academic debates and empirical studies[1] show that the two Maastricht fiscal criteria were politically motivated and really do not have much in common with sustainability as such. With adoption of single European currency a country already loses its monetary policy, therefore is it unreasonable or economically irrational to limit also its fiscal policy. These debates started mostly soon after the acceptance of the criteria and stopped immediately after most of EU member states successfully adopted euro in 1999. And further, it is the fact that most of (also *academic*) critics of Maastricht criteria originated from countries, where public debt and budget deficit was significantly higher than a defined limit (that is mostly from Italy and Belgium). However, these debates all stand on common critics of administratively defined 3% and 60% which cannot guarantee *per se* a fiscal sustainability[2].

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[1] For example Pasinetti (1998), Papadopoulos and Sidiropoulos (1999), Fatás and Mihov (2003), Eichengreen and Wyplosz (1998) and others.

[2] For the pro and contra of the suitability of EU fiscal surveillance rules see Dabrowski e.a. (2005).

Slovenia is a good example of the above. Even though fiscal criteria were in accordance with Maastricht criteria well before Slovenia actually entered EMU in 2007, empirical study clearly showed a doubtful sustainability of public finances in the period before 2004 (see Dolenc 2006). However, later on the situation changed and with higher economic growth (see Žižmond and Novak 2006), lower cost of public debt financing, and even budged surplus in recent years, Slovenia was not only in accordance with Maastricht Criteria, but also in accordance with objective criteria for fiscal sustainability (see Dolenc 2007).

This paper tackles the mentioned dilemmas and focuses on one possible solution in determining the objective limitations for policy makers in EU economies. Our main hypothesis is the following:

> $H1_1$: For most EU member states the 3% limit for total budget balance in 2009 and 2010 would not be sustainable according to our fiscal sustainability set of criteria.

> $H1_2$: Taking into consideration our fiscal sustainability set of criteria most EU member states still have enough space in expanding public expanses (i.e. for tackling financial crisis) in 2009 and 2010.

We have confirmed the two hypotheses. First, we have proved that for most EU member states the 3% limit for total budget balance in 2009 and 2010 would not be sustainable according to our fiscal sustainability set of criteria. The only exceptions are Greece, Cyprus and Hungary. And second, we have proved that taking into consideration our fiscal sustainability set of criteria most EU member states still have enough space in expanding public expenses (i.e. for tackling financial crisis) in 2009 and 2010. In fact, only Portugal, France, Hungary and United Kingdom would have to improve their budget balance in 2009 and 2010 in order to be fiscally sustainable.

To our view in taking necessary actions in current economic and financial environment policy makers in EU countries should be aware of objective limitations rather that simply looking at fiscal Maastricht criteria. They should take into account and respect the necessary prepositions of long-term financial sustainability and not cross these limits. We believe the accordance to simply Maastricht criteria might not be rational.

Section 2 reviews some theories and empirical studies on fiscal sustainability and introduces the underlying theory of our empirical analysis. In section 3 data and methodology is described. Section 4 with three subsections concentrates to results of the analysis and offers discussion on these results. We sum up with concluding remarks and some policy implications.

2.   ON FISCAL SUSTAINABILITY

Academic studies on fiscal sustainability can be divided in two main groups: 1) studies that analyze the sustainability of fiscal stance thought the perspective of (if simplified) sustainable (growth of) public debt on condition of some macroeconomic parameters; and 2) studies that focus on cointegration between public revenues and consumption. In next two subsections we present the main assumptions and arguments of these studies, and in subsection 2.3 we present the theoretical arguments and assumptions for our empirical study.

Sustainability of public finances' according to Blanchard

The first group of studies of fiscal stance's sustainability take as an underlying assumption (if simplified) that movements in public debt are crucial for estimation of fiscal sustainability – these studies usually seek for the optimal level of public debt. Economic theory finds the fiscal sustainability in the level of budget deficit that does not change (significantly) public debt-budget incomes ratio (Easterly e.a., 1995). According to Collignon and Mundschenk (1999) such a definition relates not only to solvency of public finances (that is the capability of the country to service its public debt's obligations) but primarily on its willingness to fulfill these obligations. If a country allows a constant growth of public debt, it can be eventually trapped into so-called *Ponzi trap*, which can at the end cause the inability to service its public debt's obligations. McCallum (1984) argues that is still better for a country to finance its budget deficit with borrowing and not inflationary (with money printing). In his analysis McCallum has not explicitly suggested what the optimal level of public debt is, but has proved, that long-term sustainable growth of public debt-to-GDP ratio should not exceed the average level of (nominal) interest rate, paid on public debt.

Several researchers[3] have tried to determine the optimal level of public debt with one of the basic macroeconomic identities – so called (dynamic) budget constraint:

$$\frac{dB}{ds} = G + H - T + i \cdot B \,, \qquad\qquad [1]$$

where:

- $\dfrac{dB}{ds}$ – increase (+) or decrease (−) of public debt,
- G – budget consumption (without interests payments on public debt),
- H – transfer payments,
- T – collected taxes,
- $i \cdot B$ – interests payments on public debt and
- s – time (years).

Blanchard e.a. have methodologically best solved the problem of optimal level of public debt (in the framework of the analysis of public finances' sustainability). Their reference text is the debate on public finance's sustainability as "a new answer to old question" (Blanchard e.a., 1990). They believe the question of fiscal sustainability is mostly the question whether a country's long-term trend of public debt accumulation goes over limit; the best indicator is therefore public debt-to-GDP ratio.

They begin their arguments with basic identity [1], where they define first three elements as primary budget balance. Turning to relative terms they get the following equation:

$$\frac{db}{ds} = g + h - t + (r - \theta) \cdot b = d + (r - \theta) \cdot b \,, \qquad\qquad [2]$$

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[3] For example Blanchard e.a. (1990), Papadopolous and Sidiropoulos (1999), Herring (1995), De Haan and Sierman (1993), Heinemann (1993), Mac Donald and Speight (1990), Uctum and Wickens (1997) and others.

where:

- b – public debt-to-GDP ratio,
- $\dfrac{db}{ds}$ – increase (+) or decrease (–) of public debt-to-GDP ratio,
- g – government spending-to-GDP ratio (without interests payments on public debt),
- h – transfer payments-to-GDP ratio,
- t – collected taxes-to-GDP ratio,
- d – primary balance-to-GDP ratio,
- θ – real growth of GDP and
- r – (*ex post*) real interest rate[4].

Public debt-to-GDP ratio is a function of two factors. The first is primary balance; it shows current budget spending, transfer payments and tax policy. The other factor – product of accumulated public debt (relative to GDP) and the difference between real interest rate and growth of GDP – shows past evolution of public finances. If the real interest rate exceeds the growth of GDP, a country needs primary surplus to keep the level of public debt-to-GDP ratio constant.

Authors explain the fiscal policy as a complex of rules (on public spending, transfer payments, taxes, etc.) and *inherited* public debt (relative to GDP). Sustainable fiscal policy is considered as policy, which enables the public debt-to-GDP ratio to converge into its initial level.

In order to have a sustainable fiscal policy a country with existing/initial public debt has to reach budget surplus sooner or later. The later should be high enough to fulfill the following condition:

$$\int_0^\infty d_s e^{-(r-\theta)} \cdot s \cdot ds = -b_0 \,, \tag{3}$$

where:

- b_0 – initial public debt-to-GDP ratio.

The implicit assumption is that real interest rate on public debt is higher that growth of GDP. On the other hand, if real interest rate on public debt is lower that growth of GDP, the conclusion is somehow different and a bit less limited for fiscal policy: in this case the public debt-to-GDP ratio would be falling with a rate of $(r-\theta)$ in an economy with budget surplus. However, also with budget deficit a country could easily have constant (but positive) level of public debt (relative to GDP). In both cases highest cost of debt narrows the possibility of fiscal maneuvers that not threat the public finances sustainability.

The later case is more or less theoretical, because on long-run real interest rate, lower than economic growth, is not sustainable. This fact has been empirically proven by Papadopoulos and Sidiropoulus (1999) in their discussion of fiscal sustainability in EU member states.

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[4] This is nominal interest rate, calculated to real terms by Fisher's theorem.

In his research of the causes of excessive deficits in the EU Castro (2007) found that on the pure macroeconomic side the growth rate of real GDP is the most important determinant of the probability for an excessive deficit.

As strange as it may seem Blanchard e.a. (1990) did not solve the question of optimal level of public debt (relative to GDP). They only showed what a fiscal policy should be (in connection to public debt) in order to be sustainable on long run. They explicitly state that a country with a stable, 40 per cent public debt-to-GDP ratio is no less sustainable than a country with a stable, 20 per cent public debt-to-GDP ratio (on condition that they all have similar other characteristics). A country should only adopt its fiscal policy in the way that keeps the public debt-to-GDP ratio stable on long run.

Note than none of these theoretical discourses cannot help us in determining the limit in public spending of economic policy under current macroeconomic conditions.

Cointegration of public revenues vs. consumption as a concept of sustainability

As strange as it may seem the authors and theoretical analyses presented so far have not solved practically the question of fiscal sustainability. There are, however empirical studies that tackle the problem from a practical point of view. Five types of empirical testing are mainly used if we take into consideration historical (longitudinal) studies. These studies start from partial equilibrium model and assume no future changes in structural form of the economy. They all use some kind of autocorrelation and cointergation tests and in fact analyze if public revenues follow adequately public consumption (and vice versa) on long-run.

Hamilton and Flavin (1986) and Wilcox (1989) take into consideration three variables: 1) public debt; 2) change of public debt; and 3) primary public balance[5]. Public finances are sustainable on long-term if and only if: 1) public debt is integrated in the 1st level; and 2) other two variables, i.e. change of public debt and primary public balance, are stationary. There are two drawbacks of this test: 1) fixed interest rate on public debt is assumed; and 2) the analysis gives only alternative answers: public finances are sustainable or not.

Trehan and Walsh (1988) argue that public finances are sustainable if public debt (integrated in the 1st level) and primary public balance are cointegrated with vector $(1, r)$, where r represents interest rate on public debt. They too implicitly assume fixed interest rate on public debt and can only give alternative answers: public finances are sustainable or not. In 1991 they present a new version of empirical testing where they abolish a problematic assumption of fixed interest rate (see Trehan and Walsh 1991). In this case they test the stationarity of total public balance (similar to, but somehow different as Hamilton and Flavin (1986)).

Hakkio and Rush (1991), Ahmed and Rogers (1995) and Quintos (1995) test the cointegration between public revenues and public consumption expenses, and can give three specters of answers:

1) public finances are strongly sustainable if: a) both public revenues and public consumption expenses are integrated in the 1st level; b) public revenues and public consumption expenses are cointegrated with coefficient of 1; and c) residuals are stationary;

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[5] I.e. public balance without interests paid on public debt.

2) public finances are weekly sustainable if: a) both public revenues and public consumption expenses are integrated in the 1st level; b) public revenues and public consumption expenses are cointegrated with coefficient of more than 0 and less than 1; and c) residuals are stationary;

3) public finances are not sustainable if: public revenues and public consumption expenses are cointegrated with coefficient of less than 0.

Bohn (1998) offers another solution, i.e. testing the cointegration of primary public balance with public debt, where cointegration coefficient should be greater than 0 in order public finances to be sustainable.

Even though one of the above analyses might be most reliable in determining the long-run fiscal sustainability in EU economies, none of these solutions help in determining the limit in public spending of economic policy under current macroeconomic conditions and in attempt to find what degrees of freedom in current policy actions are.

The Myth of Maastricht fiscal criteria

We could easily solve our main question simply by looking at data on public debt and budget deficit (both relatively to GDP) and address these data to Maastricht fiscal criteria. However, 60 and 3% limit are questionable as these two figures have no underlying theoretical background in public finance's sustainability analysis. These figures are of course administratively defined and as such do not guarantee sustainability of fiscal stance.

Among numerous critics of these criteria, Pasinetti's critic on "the Myth (or Folly) of Maastricht criteria" might be the most profound (Pasinetti 1998). The core of his critics is that Maastricht treaty does not either mention the concept of public finance's sustainability nor it defines the relation between public debt-to-GDP ratio (as one limit or criteria) and budget deficit-to-GDP ratio (as the other limit or criteria). In his analysis he showed that the two defined references are only two (of infinite) points in the area of public finance's sustainability.

According to Pasinetti the limit of 60% for public debt-to-GDP ratio comes from average figures of EU member states in years when the treaty was being accepted. At the time Germany and France were on the limit, but Italy and Belgium stepped out significantly. Because public debt cannot be (without significant macroeconomic consequences) lowered relatively fast, the crucial is article 104c of the Maastricht Treaty, which later reduced this limit to long-term trend to reference value as satisfactory condition.

Pasinetti founded his analysis on Blancard's definition of optimal level of public debt (Blanchard e.a., 1990), taking into account only one year's time horizon. Similar as Blancard e.a. also Pasinetti considers the level of public debt-to-GDP ratio as exogenous variable, because – as he argues – it is "theoretically impossible to set the optimal level of public debt-to-GDP ratio". Therefore public debt-to-GDP ratio is not crucial; what is crucial is its dynamics. Pasinetti defines the fiscal sustainability as[6]:

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[6]   Symbols have the same meaning as above.

$$\left(\frac{B}{Y}\right)_{(s)} \leq \left(\frac{B}{Y}\right)_{(0)}, \qquad [4]$$

where:

- $B > 0$ – public debt,
- Y – nominal one year's GDP and
- s – time (years).

Public debt is sustainable if it has a falling trend or at least constant. Therefore the following should hold:

$$\frac{\dfrac{db}{ds}}{\theta_n} \cdot \frac{B}{Y} \leq \frac{B}{Y} \Rightarrow \frac{db}{ds} \leq \theta_n, \qquad [5]$$

where:

- $\dfrac{db}{ds}$ – increase (+) or decrease (–) of public debt-to-GDP ratio and
- θ_n – yearly nominal growth of GDP.

He included total and primary budget balance and nominal interest rate on public debt and so defined the two conditions of fiscal sustainability slightly differently[7] than Blanchard e.a. (1990). The two conditions are as follows:

$$\frac{D}{Y} \geq -\theta_n \cdot \frac{B}{Y} \text{ and} \qquad [6]$$

$$\frac{D_p}{Y} \geq (i - \theta_n) \cdot \frac{B}{Y}, \qquad [7]$$

where:

- $D = -dB$ – total (yearly) budget balance (this defines the change of public debt in one year),
- D_p – (yearly) primary budget balance and
- i – (yearly) nominal interest rate on public debt.

Public finance's sustainability can therefore be defined with a connection to:

    a)   total budget balance ([6] and Figure 1) or

    b)   primary budget balance ([7] and Figure 2).

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[7] He focused primarily on connection between public debt-to-GDP ratio and budget deficit-to-GDP ratio.

The example a) connects total budget balance with growth of GDP and public debt-to-GDP ratio. This is the basis for the determination of Maastricht treaty's 3% limit for total budget balance-to-GDP ratio. A country with 60% public debt-to-GDP ratio and 5% growth of GDP should not exceed 3% total budget deficit. Maastricht fiscal criteria are therefore only one of infinite number of points (combinations) in the area of public finances' sustainability.

The example b), which corresponds to primary budget balance, offers more information. In fact three external factors: 1) public debt-to-GDP ratio, 2) interest rate on public debt, and 3) growth of GDP. If, for example, the interest rate on public debt exceeds the growth of GDP for more than 2 percentage points and if public debt-to-GDP ratio is 60%, the primary surplus-to-GDP ratio should be 1,2%. Or expressed alternatively: if a country has 60% public debt-to-GDP ratio and the interest rate on public debt exceeds the growth of GDP for more than 2 percentage points, it has to have 1,2% primary budget surplus-to-GDP ratio in order to have stable public debt and sustainable public finances. With the same difference between interest rate on public debt and growth of GDP the sustainable primary budget surplus-to-GDP ratio should be double if public debt-to-GDP ratio is 120%. But if the interest rate on public debt is lower than growth of GDP[8] conditions for fiscal sustainability are adequately loosened: fiscal policy could be sustainable even with primary budget deficit (instead of surplus).

The core of Pasinetti's analysis is therefore the following: public debt-to-GDP ratio and budget balance-to-GDP ratio are connected with well defined relation. At a given economic growth higher public debt-to-GDP ratio corresponds to higher total budget balance-to-GDP ratio. At the same time a country should have – in order to stay in the area of fiscal policy's sustainability and if a nominal interest rate on public debt exceeds economic growth – higher primary budget surplus if it has higher public debt-to-GDP ratio.

Note that Passinetti's solution offers a good (and in fact simple) analytical tool in determining the flexibility of policy measures in recent times of expected expansion of public expenses used to ease the effects of financial and economic crises. We need only to take into consideration condition from [6] and [7] in recent years and – of course – predictions for immediate future period.

3. DATA AND METHODOLOGY

In order to find as broad insight in fiscal position of EU zone as possible, we included in our analysis all EU member states. However, required data for some countries[9] was rather poor and was thus exempt from further analysis.

The analysis is based on yearly data for the period from 1996 until 2007[10] and the variables included are those, needed to calculate equations [6] and [7]:

- total and primary budget balance,

- gross public debt and

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[8]　And this might happen in EMU area, because we have the same monetary policy and very homogenous economies.

[9]　These were Czech Republic, Estonia, Lithuania, Luxembourg and Romania.

[10]　For GDP growth projections for 2009 and 2010 were obtained as well.

- yearly economic (i.e. GDP) growth.

Definitions of total and primary budget balance, and gross public debt are in accordance to ESA95 standards. These data was obtained from Eurostat online database.
Cost of debt was estimated as:

$$i = \frac{\left(\dfrac{D_p}{Y}\right) - \left(\dfrac{D}{Y}\right)}{\left(\dfrac{D}{Y}\right)_{-1}} \cdot \left(1 + \theta_n\right)$$ [8]

where: subscript *-1* denotes lagged variable for 1 period (i.e. 1 year).

There are several reasons why we estimated cost of debt rather than simply taking into account market yield on sovereign securities (say 10-year bond):

1. not all countries have a liquid market for government securities and not all countries issue regularly such bonds,

2. i.e. 10-year bond yield might not be the best estimate for actual cost of debt servicing because of different actual structure of public debt,

3. current market yields might not reflect appropriately the cost of debt servicing, because public debt portfolio usually incorporates current and past issues of debt.

Estimated cost of public debt – however – proved to be strongly correlated to market yields of government securities for countries with liquid and efficient market for these securities (e.g. Italy, Germany, France, etc.).

To estimate past sustainability conditions parameters from equations [6] and [7] were calculated by countries and years.

We found that countries are quite homogenous in selected variables. In order to get a general insight in homogenous groups of countries, cluster analysis was performed, where clustering variables were 2000-2007 averages of total and primary balance-to-GDP ratio, debt-to-GDP ratio, economic growth and cost of debt. Average values of selected variables were calculated for obtained homogenous groups and analysis of variance was performed to confirm statistical differences between groups.

To simulate possible flexibility of policy makers in 2009 the following procedure was used:

1. due to lack of data for 2008 it was assumed the same total and primary balance-to-GDP ratio as in 2007,

2. estimates for GDP growth in 2008, 2009 and 2010 were calculated from the estimated GDP (market prices in national currencies) obtained from Eurostat online database,

3. value of cost on public debt was assumed to be the same in 2008, 2009 and 2010 and was calculated as difference between total and primary budget balance in 2007,

4. nominal interest rate on public debt for 2008, 2009 and 2010 was estimated according to equation [8],

5. total budget balance-to-GDP ratio was calculated as difference between primary budget balance-to-GDP and interests-to-GDP ratio,

6. current total budget balance was simulated under condition from equation [6], or more precisely, under condition

$$\frac{D}{Y} + \theta_n \cdot \frac{B}{Y} = 0 \qquad [9]$$

7. public debt-to-GDP in 2008, 2009 and 2010 ratio was estimated as[11]:

$$\left(\frac{B}{Y}\right) = \left(\frac{B}{Y}\right)_{-1} \cdot \frac{1}{1 + \theta_n} - \left(\frac{D}{Y}\right) \qquad [10]$$

8. if condition from equation [7] was not satisfied, parameters from steps 6 and 7 were recalculated until both conditions [6] and [7] hold.

Detailed country based data, including historical data, estimates of selected variables and relevant forecasts are presented in Appendix 1, while relevant data for discussion is presented directly in the main text.

4. RESULTS AND DISCUSSION

Summary statistics and cluster analysis

Table 1 shows some basic statistical data for selected countries: country averages for the period 2000-2007[12] and group averages and standard deviations for selected parameters. We can see (Table 1) that the selected group of countries is quite diversified with extensive differences mostly in fiscal policy parameters.

Indeed, further analysis using hierarchical clustering confirms, that selected countries are quite heterogenous taking into account selected variables, but there are clearly three more homogenous groups (see dendrogram, Figure 3). Group membership is presented in Table 2 and Table 3 presents detailed statistical information on these groups including analysis of variance for testing statistical differences between groups for all selected variables.

The above analyses (see Table 3) show that there is a group of countries (group 1) with highest average debt-to-GDP ratio (more than 70%). These countries have on average positive

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[11] The difference between primary and total budget balance is under ESA95 standards in fact interests on public debt including flows on swaps and FRAs used for debt management and represent the actual nominal cost of debt servicing.

[12] Due to the lack of relevant data for Bulgaria and Slovenia, the averages were calculated for the period 2002-2007.

primary balance (primary surplus of 1% of GDP), but due to high interest payments on public debt have a relatively high average total budget deficit (2,5% of GDP). With exception of Cyprus and Malta these countries are all »old« EU member states and developed economies. They have lowest average economic growth and higher relative cost of public debt servicing (probably due to high debt-to-GDP ratio).

The second group of countries is again the group of »old« EU member states and developed economies[13] with significantly lower public debt-to-GDP ratio, lower cost of public debt servicing, primary and total budget surplus and higher economic growth.

And in the last group are countries that joined EU in last big bang in 2004, i.e. transition economies. These have on average the lowest public debt-to-GDP ratio, high economic growth and high relative cost of public debt servicing. They also have both primary and total budget negative balance (i.e. deficit).

Note that for all selected variables between group differences are statistically significant at negligible significance level.

Historical data on fiscal sustainability

Past data shows that many EU member states, also those already in EMU, exceeded famous Maastricht criteria (see Appendix 1). For out-of-EMU countries this is not a violation of Stability and Growth Pact, but for EMU member states, this is in fact a violation. One example may be Germany and France in years 2002-2005 with more than 3% total budget deficit, or Greece in nearly all recent years, or Austria in 2004, etc.

However, as argued above, we do not focus our analysis on Maastricht criteria and are not attempting to find "bad guys". Our attempt is to focus on fiscal sustainability based on one of possible sustainability set of criteria. Table 4 shows figures of fiscal sustainability, expressed with total budget balance, for selected countries and time framework. The figures are in fact the sum of total budget balance-to-GDP ratio and economic growth multiplied with public debt-to-GDP ratio from equation [6]. It is clear that some countries in some periods was under the limit, but this fiscal non-sustainability in these years is sometimes in line with exceeding of Maastricht criteria (e.g. Germany form 2002 to 2006, France in 2002 to 2005, Hungary from 2002 onwards, etc.) and sometimes not (e.g. the Netherlands from 2002 to 2004). It is, however, mostly so that countries in periods with negative subjective measure for total budget balance exceeded Maastricht 3% budget deficit criteria as well.

As much as 15 (out of 22) countries had a negative value of first sustainability criteria (equation [6]), and 10 of them have had a negative values for at least three subsequent years. The most vulnerable economies in this respect are Hungary, Poland and (surprisingly?) United Kingdom. However, in 2007 (the last year of published) the negative value had only Hungary and United Kingdom and these negative values were quite low (less that 0,5 in absolute terms). This means that (neglecting actual situation in 2008 due to the unavailability of actual data) practically all selected countries enter 2009 with sustainable fiscal stance according to this criteria.

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[13] With the exception of Bulgaria (with low public debt, cost of debt etc.) that is clustered to this group as well.

Similar are results for the second sustainability criteria (equation [7]): difference between of primary budget balance-to-GDP ratio and interest rate spread over economic growth multiplied with public debt-to-GDP ratio – see Table 5. Here the sustainability criteria is even less correlated to 60% Maastricht limit and clearly shows that high(er) public debt-to-GDP ratio might not be problematic if a country sustains a sound economic growth at given interest rates and budget balances (see e.g. Greece). And vice versa: low public debt-to-GDP ratio does not guarantee fiscal sustainability if economic growth and interest rates are not properly balanced, ceteris paribus budget balances (see e.g. Germany and United Kingdom).

Here 13 (out of 22) countries had a negative value of our second sustainability criteria, and 9 of them have had a negative values for at least three subsequent years. The most vulnerable economies in this respect are (again) Hungary, Poland and (surprisingly?) United Kingdom, and Portugal. However, in 2007 (the last year of published) the negative value had (again) only Hungary and United Kingdom and these negative values were quite low (less that 0,8 in absolute terms). This means that (neglecting actual situation in 2008 due to the unavailability of actual data) practically all selected countries enter 2009 with sustainable fiscal stance according to this criteria.

To sum up, we might say that selected economies enter year 2009 (and onwards) fiscally sound (taking into account the assumption made at the beginning on the data for 2008). Even though countries are quite diversified in fiscal balances, public debt and other parameters, our sustainability set of criteria shows that all countries (except two, where the numbers are almost positive) countries are fiscally sustainable taking into account both sustainability measures. But how many *degrees of freedom* do they have for tackling unexpected situation, like current financial and economic crisis? How much of GDP can they afford for policy measures and still sustain positive fiscal stance? We try to find some answers in next subsection.

And finally: the near future and financial crisis

Our main preoccupation for the analysis is in fact not the past, but the future. Policy makers (and academics) have been debating largely lately on policy measures that have to be undertaken in order to battle current financial and economic crisis. Usually large economic programs are argued and accepted (such as in the USA, France, United Kingdom, Germany, etc.), involving mass of fiscal budget funds for direct and indirect support of the economy, nationalization of banks, etc. These policy measures account couple of % of GDP and usually end-up in expansion of budget deficit or significantly lowering budget surplus. Our aim here is not to judge and analyze the potential effect of such policy measures, but strictly offer a plain technical solution answering the question, how much space a country has for funding these policy measures and still sustain fiscal sustainability.

The answer offered is two-sided. First we calculate for each selected country, what primary and total budget balance is sustainable in 2009 and 2010 (under our sustainability set of criteria). It seems that lately at least EMU member states all take 3% budget deficit as a sound limit and try not to cross this limit with adopted policy measures[14]. Second we calculate the difference in budget balance in 2009 and 2010, respectively, against 2008[15]. We even believe that these figures are more useful: these figures namely show how many % of GDP these

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[14] Some countries (e.g. Slovenia) even publically announced higher budget deficit in last budget rebalance for 2009 and 2010.

[15] Note that according to our assumptions values of fiscal variables in 2008 are same as 2007.

countries can really spend on *crisis policy measures* keeping other structures of fiscal policy constant (at the level of 2007/2008).

Figure 4 shows estimated sustainable total budget balance-to-GDP ratio in 2009 and 2010. We can see that in most countries Maastricht 3% limit for total budget deficit-to-GDP ratio is critically unsustainable in 2009 and 2010. For only three countries (Greece, Cyprus and Hungary) reaching this limit would not raise the question on fiscal sustainability (at least not according to our fiscal sustainability set of criteria). All other have critically less space in their policy measures (especially Spain, Denmark, Sweden, United Kingdom, Latvia and Ireland in this respect).

However, to our opinion the difference compared to the year 2008 (i.e. 2007) is much more relevant and these estimates are presented in Figure 5. We can see that some countries have plenty of space for their *crisis policy measures*, the most flexible four countries can spend even more than 4% of GDP for such measures and not jeopardizing fiscal sustainability (keeping constant other fiscal structures and relative levels the same as in 2007). There is, however, the majority of countries with less than 2% of possible decrease of budget balance. But the situation is least favorable in four countries (Portugal, France, Hungary and United Kingdom), where policy makers have no room for *crisis policy measures*. On the contrary, they would even have to improve budget balance-to-GDP ratio in order to be in line with estimated fiscal sustainability measures. And this might make it quite difficult in current times and would probably imply a thorough public spending consideration.

The above analyses allow us to confirm our two hypotheses. First, we have proved that for most EU member states the 3% limit for total budget balance in 2009 and 2010 would not be sustainable according to our fiscal sustainability set of criteria. The only exceptions are Greece, Cyprus and Hungary. And second, we have proved that taking into consideration our fiscal sustainability set of criteria most EU member states still have enough space in expanding public expanses (i.e. for tackling financial crisis) in 2009 and 2010. In fact, only Portugal, France, Hungary and United Kingdom would have to improve their budget balance in 2009 and 2010 in order to be fiscally sustainable.

5. SUMMARY AND POLICY RECOMMENDATIONS

The main idea of the presented paper was to look deeply into fiscal sustainability matters of EU member states. In recent times of financial and economic crisis all EU member states (and most other economies) tackle with necessary policy measures that have to taken in order to preserve the economy before negative effects of the crisis. However, these steps usually cost money, and this money is usually public money. Therefore obvious question arises: will these policy measures be fiscally sustainable.

When talking about fiscal sustainability we do not consider Maastricht fiscal criteria as relevant (and objective) criteria for fiscal sustainability. We rather take into account a set of objective criteria for fiscal sustainability that take into account relevant macroeconomic performances of the selected economies (i.e. total and primary budget balance, interest rate of public debt and public debt as such, and economic growth).

In our main hypothesis we assumed that 1) for most EU member states the 3% limit for total budget balance in 2009 and 2010 would not be sustainable according to our fiscal

sustainability set of criteria; and 2) taking into consideration our fiscal sustainability set of criteria most EU member states still have enough space in expanding public expanses (i.e. for tackling financial crisis) in 2009 and 2010.

We have confirmed the two hypotheses and found, first, that for most EU member states the 3% limit for total budget balance in 2009 and 2010 would not be sustainable according to our fiscal sustainability set of criteria. The only exceptions are Greece, Cyprus and Hungary. Further we have proved that taking into consideration our fiscal sustainability set of criteria most EU member states still have enough space in expanding public expenses (i.e. for tackling financial crisis) in 2009 and 2010. In fact, only Portugal, France, Hungary and United Kingdom would have to improve their budget balance in 2009 and 2010 in order to be fiscally sustainable.

As a policy recommendation we can clearly state that – to our view – all the necessary steps for tackling the current financial and economic crisis should be taken in order to avoid negative effects of the crisis. However, when deciding on the public funds used for such measures, fiscal sustainability has to be taken into consideration most carefully. We believe that even in times of crisis fiscal policy should stay sustainable and should not exceed sustainability limits – one possible set of such rules being presented (theoretically and analytically in our paper). Extended public consumption – even in times of crisis – might be risky for future attempt in trying to make fiscal stance of the economy sustainable again.

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Appendix I: Historical, estimated and forcasted country data for the analysis

Belgium

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	-3,9	-2,2	-0,9	-0,6	0,0	0,5	0,0	-0,1	-0,2	-2,6	0,3	-0,3	*-0,3*	*-2,0*	*-2,3*
Public debt	% of GDP	127,0	122,3	117,1	113,6	107,8	106,5	103,5	98,7	94,3	92,1	87,8	83,9	*80,8*	*80,8*	*80,8*
Primary budget balance	% of GDP	4,5	5,5	6,4	6,3	6,6	6,9	5,7	5,2	4,5	1,6	4,3	3,5	*3,5*	*1,8*	*1,5*
Growth of GDP	%	1,74	4,63	3,79	3,78	5,66	2,84	3,39	2,64	5,42	4,31	5,33	5,25	*4,17*	*2,55*	*2,95*
Cost of public debt	%		6,3	6,2	6,1	6,1	6,1	5,5	5,3	5,0	4,6	4,6	4,6	*4,7*	*4,8*	*4,8*
1st sustainability criteria		**-1,7**	**3,5**	**3,5**	**3,7**	**6,1**	**3,5**	**3,5**	**2,5**	**4,9**	**1,4**	**5,0**	**4,1**	***3,1***	***0,1***	***0,1***
2nd sustainability criteria		**6,7**	**3,4**	**3,6**	**3,6**	**6,1**	**3,4**	**3,5**	**2,6**	**4,9**	**1,3**	**5,0**	**4,1**	***3,1***	***0,0***	***0,0***

Bulgaria

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	.	.	.	.	.	.	-0,8	-0,3	1,6	1,9	3,0	0,1	*0,1*	*-1,8*	*-1,6*
Public debt	% of GDP	:	105,1	79,6	79,3	74,3	67,3	53,6	45,9	37,9	29,2	22,7	18,2	*15,4*	*15,5*	*15,5*
Primary budget balance	% of GDP	.	.	.	.	.	.	1,5	1,7	3,4	3,6	4,4	1,1	*1,1*	*-0,8*	*-0,6*
Growth of GDP	%	.	.	28,62	6,11	12,45	11,05	9,06	6,87	12,11	10,24	15,34	14,50	*17,28*	*12,65*	*11,06*
Cost of public debt	%	.	.	.	.	.	.	3,7	4,0	4,4	4,9	5,5	5,0	*6,4*	*7,3*	*7,2*
1st sustainability criteria		**.**	**.**	**.**	**.**	**.**	**.**	**4,1**	**2,9**	**6,2**	**4,9**	**6,5**	**2,7**	***2,8***	***0,2***	***0,1***
2nd sustainability criteria		**.**	**.**	**.**	**.**	**.**	**.**	**4,4**	**3,0**	**6,3**	**5,1**	**6,6**	**2,8**	***2,8***	***0,0***	***0,0***

Denmark

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	-1,9	-0,5	0,1	1,5	2,4	1,5	0,3	0,1	2,0	5,2	5,1	4,9	*4,9*	*-0,5*	*-0,6*
Public debt	% of GDP	69,2	65,2	60,8	57,4	51,5	48,7	48,3	45,8	43,8	36,4	30,5	26,2	*20,3*	*20,2*	*20,1*
Primary budget balance	% of GDP	.	.	.	.	5,9	4,8	3,3	2,7	4,3	7,0	6,7	6,4	*6,4*	*1,0*	*0,9*
Growth of GDP	%	4,90	5,25	3,37	4,28	6,63	3,22	2,78	2,04	4,68	5,39	5,40	3,64	*4,15*	*2,77*	*3,44*
Cost of public debt	%	.	.	.	.	6,5	6,6	6,3	5,5	5,3	4,3	4,6	5,1	*6,0*	*7,6*	*7,7*
1st sustainability criteria		**1,5**	**2,9**	**2,2**	**4,0**	**5,8**	**3,1**	**1,6**	**1,0**	**4,0**	**7,2**	**6,7**	**5,9**	***5,7***	***0,1***	***0,1***
2nd sustainability criteria		**.**	**.**	**.**	**.**	**6,0**	**3,1**	**1,6**	**1,1**	**4,0**	**7,4**	**6,9**	**6,0**	***6,0***	***0,0***	***0,0***

Germany

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	-3,3	-2,6	-2,2	-1,5	1,3	-2,8	-3,7	-4,0	-3,8	-3,3	-1,5	-0,2	*-0,2*	*-1,6*	*-2,1*
Public debt	% of GDP	58,4	59,7	60,3	60,9	59,7	58,8	60,3	63,8	65,6	67,8	67,6	65,1	*63,6*	*63,8*	*64,1*
Primary budget balance	% of GDP	0,2	0,7	1,2	1,7	4,5	0,2	-0,7	-1,1	-1,0	-0,5	1,3	2,6	*2,6*	*1,2*	*0,7*
Growth of GDP	%	1,50	2,10	2,60	2,37	2,51	2,46	1,42	0,96	2,18	1,46	3,49	4,37	*2,74*	*2,12*	*2,93*
Cost of public debt	%		5,8	5,8	5,4	5,4	5,1	5,2	4,9	4,5	4,3	4,3	4,3	*4,4*	*4,5*	*4,5*
1st sustainability criteria		**-2,4**	**-1,3**	**-0,6**	**-0,1**	**2,8**	**-1,4**	**-2,8**	**-3,4**	**-2,4**	**-2,3**	**0,9**	**2,6**	***1,5***	***-0,2***	***-0,2***
2nd sustainability criteria		**1,1**	**-1,5**	**-0,8**	**-0,2**	**2,8**	**-1,4**	**-3,0**	**-3,6**	**-2,5**	**-2,4**	**0,8**	**2,6**	***1,5***	***-0,3***	***-0,3***

Ireland

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	-0,1	1,1	2,4	2,7	4,7	0,9	-0,4	0,4	1,4	1,7	3,0	0,2	*0,2*	*0,1*	*-0,9*
Public debt	% of GDP	73,5	64,3	53,6	48,5	37,8	35,5	32,2	31,1	29,4	27,3	24,7	24,8	*25,1*	*25,1*	*25,1*
Primary budget balance	% of GDP	4,4	5,2	5,7	5,0	6,7	2,5	1,0	1,7	2,5	2,7	3,9	1,2	*1,2*	*1,1*	*0,1*
Growth of GDP	%	10,59	15,77	15,60	15,18	15,85	11,58	11,28	7,11	6,84	8,86	9,32	7,51	*-2,12*	*-0,22*	*3,57*
Cost of public debt	%		6,5	5,9	4,9	4,8	4,7	4,4	4,3	3,8	3,7	3,6	4,4	*3,9*	*4,0*	*4,1*
1st sustainability criteria		**7,7**	**11,2**	**10,8**	**10,1**	**10,7**	**5,0**	**3,2**	**2,6**	**3,4**	**4,1**	**5,3**	**2,1**	***-0,3***	***0,0***	***0,0***
2nd sustainability criteria		**12,2**	**11,2**	**10,9**	**10,0**	**10,9**	**4,9**	**3,2**	**2,6**	**3,4**	**4,1**	**5,3**	**2,0**	***-0,3***	***0,0***	***0,0***

Greece

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*2008*	*2009*	*2010*
Total budget balance	% of GDP	.	.	.	.	-3,7	-4,5	-4,7	-5,7	-7,5	-5,1	-2,8	-3,5	*-3,5*	*-5,2*	*-5,2*
Public debt	% of GDP	111,3	108,2	105,8	105,2	103,2	103,6	100,6	97,9	98,6	98,8	95,9	94,8	*92,2*	*92,2*	*92,3*
Primary budget balance	% of GDP	.	.	.	.	3,6	2,0	0,7	-0,7	-2,6	-0,7	1,3	0,6	*0,6*	*-1,1*	*-1,1*
Growth of GDP	%	9,87	10,66	8,74	6,55	8,03	7,45	6,96	9,45	8,43	6,35	7,87	7,02	*6,91*	*5,91*	*5,87*
Cost of public debt	%	.	.	.	.	7,5	6,8	5,6	5,4	5,4	4,7	4,5	4,6	*4,6*	*4,7*	*4,7*
1st sustainability criteria		**.**	**.**	**.**	**.**	**4,6**	**3,2**	**2,3**	**3,5**	**0,8**	**1,2**	**4,8**	**3,2**	***2,9***	***0,3***	***0,2***
2nd sustainability criteria		**.**	**.**	**.**	**.**	**4,1**	**2,7**	**2,1**	**3,2**	**0,4**	**0,9**	**4,6**	**2,9**	***2,7***	***0,0***	***0,0***

Spain

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,8	-3,4	-3,2	-1,4	-1,0	-0,6	-0,5	-0,2	-0,3	1,0	2,0	2,2	*2,2*	*-0,6*	*-0,9*
Public debt	% of GDP	67,4	66,1	64,1	62,3	59,3	55,5	52,5	48,7	46,2	43,0	39,6	36,2	*32,4*	*32,5*	*32,4*
Primary budget balance	% of GDP	0,4	1,3	1,0	2,1	2,2	2,4	2,2	2,1	1,7	2,8	3,7	3,8	*3,8*	*1,0*	*0,7*
Growth of GDP	%	5,96	6,34	7,06	7,50	8,68	8,00	7,13	7,37	7,42	8,06	8,09	6,95	*4,49*	*1,81*	*2,92*
Cost of public debt	%		7,4	6,8	5,9	5,6	5,5	5,2	4,7	4,4	4,2	4,3	4,3	*4,6*	*5,0*	*5,1*
1st sustainability criteria			**-0,8**	**0,8**	**1,3**	**3,3**	**4,1**	**3,8**	**3,2**	**3,4**	**3,1**	**4,5**	**5,2**	**4,7**	***3,7***	***0,0***	***0,0***
2nd sustainability criteria			**4,4**	**0,6**	**1,2**	**3,1**	**4,0**	**3,8**	**3,2**	**3,4**	**3,1**	**4,5**	**5,2**	**4,8**	***3,8***	***0,0***	***0,0***

France

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,0	-3,3	-2,6	-1,8	-1,5	-1,5	-3,1	-4,1	-3,6	-2,9	-2,4	-2,7	*-2,7*	*-1,2*	*-1,6*
Public debt	% of GDP	58,0	59,2	59,4	58,9	57,3	56,9	58,8	62,9	64,9	66,4	63,6	63,9	*64,5*	*64,5*	*64,4*
Primary budget balance	% of GDP	-0,4	0,1	0,7	1,2	1,4	1,5	-0,2	-1,3	-0,9	-0,3	0,2	0,1	*0,1*	*1,6*	*1,2*
Growth of GDP	%	2,73	3,27	4,44	3,35	5,37	3,87	3,43	2,99	4,10	3,97	4,72	4,69	*3,47*	*1,89*	*2,57*
Cost of public debt	%		6,1	5,8	5,2	5,2	5,4	5,3	4,9	4,5	4,2	4,1	4,6	*4,5*	*4,4*	*4,5*
1st sustainability criteria			**-2,4**	**-1,4**	**0,0**	**0,2**	**1,6**	**0,7**	**-1,1**	**-2,2**	**-0,9**	**-0,3**	**0,6**	**0,3**	***-0,5***	***0,0***	***0,1***
2nd sustainability criteria			**1,2**	**-1,5**	**-0,1**	**0,1**	**1,5**	**0,6**	**-1,3**	**-2,5**	**-1,1**	**-0,4**	**0,6**	**0,2**	***-0,6***	***0,0***	***0,0***

Italy

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-7,0	-2,7	-2,8	-1,7	-0,8	-3,1	-2,9	-3,5	-3,5	-4,3	-3,4	-1,6	*-1,6*	*-2,2*	*-2,7*
Public debt	% of GDP	120,9	118,1	114,9	113,7	109,2	108,8	105,7	104,4	103,8	105,9	106,9	104,1	*102,4*	*102,4*	*102,3*
Primary budget balance	% of GDP	4,6	6,6	5,1	4,9	5,5	3,2	2,7	1,6	1,2	0,3	1,3	3,4	*3,4*	*2,8*	*2,3*
Growth of GDP	%	5,96	4,48	4,06	3,27	5,68	4,84	3,73	3,10	4,21	2,65	3,61	3,75	*3,23*	*2,28*	*2,77*
Cost of public debt	%		8,0	7,0	5,9	5,9	6,0	5,3	5,0	4,7	4,5	4,6	4,9	*5,0*	*5,0*	*5,0*
1st sustainability criteria			**0,2**	**2,6**	**1,9**	**2,0**	**5,4**	**2,2**	**1,0**	**-0,3**	**0,9**	**-1,5**	**0,5**	**2,3**	***1,7***	***0,1***	***0,1***
2nd sustainability criteria			**11,8**	**2,4**	**1,8**	**1,9**	**5,3**	**1,9**	**1,0**	**-0,4**	**0,7**	**-1,7**	**0,2**	**2,3**	***1,6***	***0,0***	***0,0***

Cyprus

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	.	.	-4,1	-4,3	-2,3	-2,2	-4,4	-6,5	-4,1	-2,4	-1,2	3,5	*3,5*	*-3,1*	*-3,3*
Public debt	% of GDP	.	.	58,6	58,9	58,8	60,7	64,7	68,9	70,2	69,1	64,6	59,5	*51,5*	*51,5*	*51,5*
Primary budget balance	% of GDP	.	.	0,0	-0,4	1,0	0,4	-2,1	-3,1	-0,8	1,1	2,1	6,5	*6,5*	*-0,1*	*-0,3*
Growth of GDP	%	4,18	4,84	8,13	7,31	9,05	7,54	3,31	7,12	7,59	6,39	7,23	8,04	*8,26*	*6,32*	*6,88*
Cost of public debt	%		.	.	7,1	6,1	4,8	3,9	5,6	5,2	5,3	5,1	5,0	*5,5*	*6,2*	*6,2*
1st sustainability criteria			**.**	**.**	**0,0**	**3,0**	**2,4**	**-2,3**	**-1,6**	**1,2**	**2,0**	**3,5**	**8,3**	***7,8***	***0,2***	***0,2***
2nd sustainability criteria			**.**	**.**	**-0,3**	**2,7**	**2,1**	**-2,5**	**-2,1**	**0,9**	**1,9**	**3,5**	**8,3**	***7,9***	***0,0***	***0,0***

Latvia

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-0,4	1,2	0,0	-3,9	-2,8	-2,1	-2,3	-1,6	-1,0	-0,4	-0,2	0,1	*0,1*	*-0,1*	*-0,4*
Public debt	% of GDP	13,9	11,1	9,6	12,5	12,3	14,0	13,5	14,6	14,9	12,4	10,7	9,5	*8,2*	*8,2*	*8,2*
Primary budget balance	% of GDP	1,0	2,1	0,8	-3,2	-1,8	-1,2	-1,5	-0,9	-0,3	0,2	0,3	0,5	*0,5*	*0,3*	*0,0*
Growth of GDP	%	19,66	16,06	9,34	7,40	11,39	9,87	10,31	11,02	16,29	21,85	23,32	24,94	*13,91*	*1,34*	*5,17*
Cost of public debt	%		7,5	7,9	7,8	8,9	8,0	6,3	5,8	5,6	4,9	5,0	4,7	*4,8*	*4,9*	*5,1*
1st sustainability criteria			**2,3**	**3,0**	**0,9**	**-3,0**	**-1,4**	**-0,7**	**-0,9**	**0,0**	**1,4**	**2,3**	**2,3**	**2,5**	***1,2***	***0,0***	***0,0***
2nd sustainability criteria			**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1,3**	**2,3**	**2,3**	**2,4**	***1,3***	***0,0***	***0,0***

Hungary

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,7	-6,2	-8,2	-5,5	-2,9	-4,0	-8,9	-7,2	-6,4	-7,8	-9,3	-5,0	*-5,0*	*-2,9*	*-3,1*
Public debt	% of GDP	73,7	64,0	62,0	61,1	54,3	52,1	55,7	58,0	59,4	61,7	65,6	65,8	*66,5*	*66,4*	*66,3*
Primary budget balance	% of GDP	5,2	3,6	-0,4	1,9	2,4	0,6	-4,9	-3,1	-2,0	-3,7	-5,4	-0,9	*-0,9*	*1,2*	*1,0*
Growth of GDP	%	22,80	23,89	18,11	12,95	18,77	12,86	12,28	10,30	9,41	6,29	8,13	6,87	*7,01*	*4,66*	*5,04*
Cost of public debt	%		16,5	14,4	13,5	10,3	9,6	8,6	8,1	8,3	7,3	6,8	6,7	*6,7*	*6,5*	*6,5*
	$-\theta*B/Y$	-16,8	-15,3	-11,2	-7,9	-10,2	-6,7	-6,8	-6,0	-5,6	-3,9	-5,3	-4,5	*-4,7*	*-3,1*	*-3,3*
	$(i-\theta)*B/Y$		.	.	0,3	-4,6	-1,7	-2,0	-1,3	-0,7	0,6	-0,8	-0,1	*-0,2*	*1,2*	*1,0*
1st sustainability criteria			**12,1**	**9,1**	**3,0**	**2,4**	**7,3**	**2,7**	**-2,1**	**-1,2**	**-0,8**	**-3,9**	**-4,0**	**-0,5**	***-0,3***	***0,2***	***0,2***
2nd sustainability criteria			**.**	**.**	**.**	**1,6**	**7,0**	**2,3**	**-2,9**	**-1,8**	**-1,3**	**-4,3**	**-4,6**	**-0,8**	***-0,7***	***0,0***	***0,0***

Malta

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-8,0	-7,7	-9,9	-7,7	-6,2	-6,4	-5,5	-9,9	-4,7	-2,8	-2,3	-1,8	-1,8	-2,5	-2,6
Public debt	% of GDP	40,1	48,4	53,4	57,1	55,9	62,1	60,1	69,3	72,1	69,9	63,8	62,2	61,1	61,1	61,1
Primary budget balance	% of GDP	-5,7	-5,0	-6,7	-4,0	-2,5	-3,1	-1,9	-6,4	-1,1	0,9	1,2	1,6	1,6	0,9	0,8
Growth of GDP	%	4,14	5,96	5,53	5,34	9,42	1,60	5,91	2,64	2,71	6,58	6,19	6,78	4,91	4,28	4,42
Cost of public debt	%		7,1	7,0	7,3	7,1	6,0	6,1	6,0	5,3	5,5	5,3	5,7	5,7	5,8	5,8
1st sustainability criteria		-6,3	-4,8	-6,9	-4,7	-0,9	-5,4	-1,9	-8,1	-2,7	1,8	1,6	2,4	1,2	0,1	0,1
2nd sustainability criteria		.	.	.	.	-1,2	-5,8	-2,0	-8,7	-3,0	1,7	1,8	2,3	1,1	0,0	0,0

Netherlands

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-1,9	-1,2	-0,9	0,4	2,0	-0,2	-2,1	-3,1	-1,7	-0,3	0,6	0,3	0,3	-1,2	-1,2
Public debt	% of GDP	74,1	68,2	65,7	61,1	53,8	50,7	50,5	52,0	52,4	51,8	47,4	45,7	43,7	43,7	43,7
Primary budget balance	% of GDP	3,4	3,7	3,8	4,7	5,6	2,9	0,7	-0,6	0,7	2,1	2,8	2,6	2,6	1,1	1,1
Growth of GDP	%	4,75	7,03	5,91	6,55	8,23	7,12	3,90	2,52	2,99	4,52	5,17	5,03	3,81	2,92	2,79
Cost of public debt	%		7,1	7,3	7,0	6,4	6,2	5,7	5,1	4,8	4,8	4,5	5,1	5,2	5,4	5,4
1st sustainability criteria		1,6	3,6	3,0	4,4	6,4	3,4	-0,1	-1,8	-0,1	2,0	3,0	2,6	2,0	0,1	0,0
2nd sustainability criteria		6,9	3,7	2,9	4,4	6,6	3,4	-0,2	-1,9	-0,2	2,0	3,1	2,6	2,0	0,0	0,0

Austria

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,0	-1,8	-2,4	-2,3	-1,7	0,0	-0,7	-1,4	-4,4	-1,5	-1,5	-0,4	-0,4	-1,6	-1,7
Public debt	% of GDP	68,3	64,4	64,8	67,2	66,5	67,1	66,5	65,5	64,8	63,7	62,0	59,5	57,2	57,2	57,1
Primary budget balance	% of GDP	-0,1	1,8	1,2	1,1	1,8	3,4	2,5	1,5	-1,5	1,4	1,2	2,3	2,3	1,1	1,0
Growth of GDP	%	3,17	1,85	4,02	3,73	4,82	2,39	2,99	2,04	4,25	5,01	5,25	5,26	4,82	2,90	3,20
Cost of public debt	%		5,4	5,8	5,4	5,5	5,2	4,9	4,4	4,6	4,7	4,5	4,6	4,8	4,9	4,9
1st sustainability criteria		-1,8	-0,6	0,2	0,2	1,5	1,6	1,3	-0,1	-1,6	1,7	1,8	2,7	2,4	0,1	0,1
2nd sustainability criteria		2,1	-0,5	0,0	0,0	1,4	1,5	1,2	-0,1	-1,7	1,6	1,7	2,7	2,3	0,0	0,0

Poland

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,9	-4,6	-4,3	-2,3	-3,0	-5,1	-5,0	-6,3	-5,7	-4,3	-3,8	-2,0	-2,0	-2,8	-2,7
Public debt	% of GDP	43,4	42,9	38,9	39,6	36,8	37,6	42,2	47,1	45,7	47,1	47,7	44,9	42,8	42,8	42,8
Primary budget balance	% of GDP	-0,3	-0,1	-0,3	0,6	0,0	-2,0	-2,1	-3,3	-2,9	-1,5	-1,1	0,5	0,5	-0,3	-0,2
Growth of GDP	%	25,27	22,00	16,60	10,78	11,82	4,73	3,72	4,28	9,65	6,36	7,80	10,17	10,02	7,06	6,74
Cost of public debt	%		12,6	10,9	8,3	8,5	8,8	8,0	7,4	6,5	6,5	6,2	5,8	6,1	6,3	6,2
1st sustainability criteria		6,1	4,8	2,2	2,0	1,4	-3,3	-3,4	-4,3	-1,3	-1,3	-0,1	2,6	2,3	0,2	0,2
2nd sustainability criteria		.	.	.	1,6	1,2	-3,5	-3,9	-4,8	-1,5	-1,6	-0,3	2,5	2,2	0,0	0,0

Portugal

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,5	-3,5	-3,4	-2,8	-2,9	-4,3	-2,8	-2,9	-3,4	-6,1	-3,9	-2,6	-2,6	-2,0	-1,8
Public debt	% of GDP	59,9	56,1	52,1	51,4	50,5	52,9	55,6	56,9	58,3	63,6	64,7	63,6	64,6	64,6	64,5
Primary budget balance	% of GDP	0,5	0,4	-0,2	0,2	0,1	-1,3	0,0	-0,2	-0,7	-3,5	-1,2	0,2	0,2	0,8	1,0
Growth of GDP	%	6,31	8,17	8,78	7,23	7,07	5,76	4,74	2,32	4,00	3,47	4,24	4,94	2,61	3,20	2,97
Cost of public debt	%		7,0	6,2	6,2	6,2	6,3	5,5	5,0	4,9	4,6	4,4	4,5	4,5	4,5	4,5
1st sustainability criteria		-0,7	1,1	1,2	0,9	0,7	-1,3	-0,2	-1,6	-1,1	-3,9	-1,2	0,5	-0,9	0,1	0,1
2nd sustainability criteria		4,3	1,0	1,1	0,7	0,5	-1,6	-0,4	-1,7	-1,2	-4,2	-1,3	0,5	-1,0	0,0	0,0

Slovenia

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-1,2	-2,4	-2,5	-3,1	-3,7	-4,0	-2,5	-2,7	-2,2	-1,4	-1,2	0,5	0,5	-1,4	-1,5
Public debt	% of GDP	.	.	.	.	.	26,8	28,0	27,5	27,2	27,0	26,7	23,4	21,0	21,0	21,0
Primary budget balance	% of GDP	1,0	0,0	-0,2	-0,7	-1,3	-1,6	-0,3	-0,7	-0,5	0,1	0,2	1,8	1,8	-0,1	-0,2
Growth of GDP	%	15,27	13,84	10,81	12,28	9,96	11,76	11,98	8,58	7,80	6,02	8,03	11,17	8,83	7,07	7,66
Cost of public debt	%		.	.	.	.	.	9,2	7,8	6,7	5,8	5,6	5,4	6,0	6,6	6,7
1st sustainability criteria		.	.	.	.	.	-0,8	0,9	-0,3	-0,1	0,2	0,9	3,1	2,4	0,1	0,1
2nd sustainability criteria		.	.	.	.	.	.	.	.	-0,2	0,1	0,8	3,1	2,4	0,0	0,0

Slovakia

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-9,9	-6,3	-5,3	-7,4	-12,3	-6,5	-8,2	-2,7	-2,3	-2,8	-3,5	-1,9	*-1,9*	*-2,4*	*-2,5*
Public debt	% of GDP	31,1	33,8	34,5	47,8	50,3	48,9	43,4	42,4	41,4	34,2	30,4	29,4	*28,4*	*28,5*	*28,6*
Primary budget balance	% of GDP	-7,4	-3,9	-2,8	-4,0	-8,2	-2,5	-4,7	-0,2	-0,1	-1,1	-2,1	-0,6	*-0,6*	*-1,1*	*-1,2*
Growth of GDP	%	11,40	10,88	9,69	7,40	10,90	8,59	8,81	10,29	11,34	9,08	11,69	11,65	*10,97*	*8,74*	*9,03*
Cost of public debt	%		8,6	8,1	10,6	9,5	8,6	7,8	6,4	5,8	4,5	4,6	4,8	*4,9*	*5,0*	*5,0*
1st sustainability criteria		-6,4	-2,6	-2,0	-3,9	-6,8	-2,3	-4,4	1,7	2,4	0,3	0,1	1,5	*1,2*	*0,1*	*0,1*
2nd sustainability criteria		.	.	.	.	-7,5	-2,5	-4,3	1,5	2,2	0,5	0,1	1,4	*1,1*	*0,0*	*0,0*

Finland

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-3,5	-1,2	1,7	1,6	6,9	5,0	4,1	2,6	2,4	2,9	4,1	5,3	*5,3*	*-1,0*	*-1,1*
Public debt	% of GDP	56,9	53,8	48,2	45,5	43,8	42,3	41,3	44,3	44,1	41,3	39,2	35,1	*27,9*	*27,8*	*27,8*
Primary budget balance	% of GDP	0,6	3,0	5,2	4,6	9,7	7,7	6,2	4,3	3,9	4,4	5,5	6,8	*6,8*	*0,5*	*0,4*
Growth of GDP	%	3,48	8,43	8,81	4,81	7,76	5,74	2,94	1,36	4,39	3,28	6,17	7,60	*5,85*	*3,80*	*4,09*
Cost of public debt	%		8,0	7,1	6,5	6,6	6,5	5,1	4,2	3,5	3,5	3,6	4,1	*4,5*	*5,6*	*5,6*
1st sustainability criteria		-1,5	3,3	5,9	3,8	10,3	7,4	5,3	3,2	4,3	4,3	6,5	8,0	*6,9*	*0,1*	*0,0*
2nd sustainability criteria		2,6	3,2	6,0	3,8	10,2	7,4	5,3	3,1	4,3	4,3	6,5	8,0	*7,2*	*0,0*	*0,0*

Sweden

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-3,2	-1,5	1,1	1,3	3,7	1,6	-1,2	-0,9	0,8	2,4	2,3	3,6	*3,6*	*-0,5*	*-1,2*
Public debt	% of GDP	73,0	71,0	69,1	64,8	53,6	54,4	52,6	52,3	51,2	50,9	45,9	40,4	*36,0*	*35,9*	*36,0*
Primary budget balance	% of GDP	2,1	3,6	5,8	5,2	7,2	4,4	1,7	1,1	2,4	4,0	4,0	5,4	*5,4*	*1,3*	*0,6*
Growth of GDP	%	2,34	4,04	4,42	5,56	5,93	3,39	4,07	3,90	4,37	4,20	6,05	5,54	*2,02*	*1,56*	*3,44*
Cost of public debt	%		7,3	6,9	6,0	5,7	5,4	5,5	4,0	3,2	3,3	3,5	4,1	*4,5*	*5,1*	*5,2*
1st sustainability criteria		-1,5	1,4	4,2	4,9	6,9	3,4	0,9	1,1	3,0	4,5	5,1	5,8	*4,3*	*0,1*	*0,0*
2nd sustainability criteria		3,8	1,3	4,1	4,9	7,3	3,3	0,9	1,1	3,0	4,5	5,2	6,0	*4,5*	*0,0*	*0,0*

United Kingdom

Variable	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total budget balance	% of GDP	-4,3	-2,2	-0,1	0,9	3,6	0,5	-2,0	-3,3	-3,4	-3,4	-2,7	-2,8	*-2,8*	*-0,5*	*-1,0*
Public debt	% of GDP	.	49,8	46,7	43,7	41,0	37,7	37,5	38,7	40,6	42,3	43,4	44,2	*45,2*	*45,2*	*45,1*
Primary budget balance	% of GDP	-0,7	1,4	3,3	3,7	6,3	2,8	0,0	-1,4	-1,5	-1,3	-0,6	-0,6	*-0,6*	*1,7*	*1,2*
Growth of GDP	%	6,61	6,19	5,90	5,65	5,15	4,64	5,26	5,97	5,34	4,32	5,54	6,08	*4,21*	*1,21*	*2,42*
Cost of public debt	%	.	.	7,2	6,3	6,5	5,9	5,6	5,4	5,2	5,4	5,2	5,4	*5,2*	*4,9*	*5,0*
1st sustainability criteria		.	0,9	2,7	3,4	5,7	2,2	0,0	-1,0	-1,2	-1,6	-0,3	-0,1	*-0,9*	*0,0*	*0,1*
2nd sustainability criteria		.	.	2,7	3,4	5,7	2,3	-0,1	-1,2	-1,4	-1,8	-0,5	-0,3	*-1,0*	*0,0*	*0,0*

Notes:
1. Estimates are in bold.
2. Forecasts are in italics.

Appendix II: Tables and Figures

Table 1: *Averages on selected parameters for countries and some statistical parameters for the group*

Country	D/Y	B/Y	D_p/Y	θ_n	i
Belgium	-0,3	96,8	4,8	4,4	5,2
Bulgaria	0,9	43,6	2,6	11,5	4,6
Denmark	2,7	41,4	5,1	4,2	5,5
Germany	-2,3	63,6	0,7	2,4	4,7
Ireland	1,5	30,4	2,8	9,8	4,2
Greece	-4,7	99,2	0,5	7,7	5,6
Spain	0,3	47,6	2,6	7,7	4,8
France	-2,7	61,8	0,1	4,1	4,8
Italy	-2,9	106,1	2,4	3,9	5,1
Cyprus	-2,5	64,6	0,6	7,0	5,1
Latvia	-1,3	12,7	-0,6	16,1	6,1
Hungary	-6,4	59,1	-2,1	10,6	8,2
Malta	-5,0	64,4	-1,4	5,2	5,9
The Netherlands	-0,6	50,5	2,1	4,9	5,3
Austria	-1,5	64,5	1,6	4,0	4,8
Poland	-4,4	43,6	-1,6	7,3	7,2
Portugal	-3,6	58,3	-0,8	4,6	5,2
Slovenia	-2,2	26,7	-0,3	9,4	6,7
Slovakia	-5,0	40,1	-2,4	10,3	6,5
Finland	4,2	41,4	6,1	4,9	4,6
Sweden	1,5	50,2	3,8	4,7	4,3
United Kingdom	-1,7	40,7	0,5	5,3	5,6
Average	**-1,6**	**54,9**	**1,2**	**6,8**	**5,5**
Standard deviation	**2,7**	**22,4**	**2,3**	**3,2**	**1,0**
Minimum	**-6,4**	**12,7**	**-2,4**	**2,4**	**4,2**
Maximum	**4,2**	**106,1**	**6,1**	**16,1**	**8,2**

Table 2: *Group membership according to cluster analysis*

Group 1	Group 2	Group 3
Belgium	Bulgaria	Latvia
Germany	Denmark	Hungary
Greece	Ireland	Poland
France	Spain	Slovenia
Italy	Finland	Slovakia
Cyprus	Sweden	
Malta		
The Netherlands		
Austria		
Portugal		
United Kingdom		

Table 3:   Basic statistics on selected groups and total, and ANOVA test

Group	Parameter	*D/Y*	*B/Y*	*D_p/Y*	*θ_n*	*i*
Group 1	Mean	-2,510	70,040	0,998	4,868	5,204
	N	11	11	11	11	11
	Standard deviation	1,504	21,094	1,692	1,476	0,3664
	Minimum	-5,0	40,7	-1,4	2,4	4,7
	Maximum	-0,3	106,1	4,8	7,7	5,9
Group 2	Mean	1,853	42,433	3,830	7,127	4,685
	N	6	6	6	6	6
	Standard deviation	1,377	6,874	1,467	3,018	0,4644
	Minimum	0,3	30,4	2,6	4,2	4,2
	Maximum	4,2	50,2	6,1	11,5	5,5
Group 3	Mean	-3,86	36,431	-1,398	10,752	6,961
	N	5	5	5	5	5
	Standard deviation	2,112	17,569	0,938	3,267	0,804
	Minimum	-6,4	12,7	-2,4	7,3	6,1
	Maximum	-1,3	59,1	-0,3	16,1	8,2
Total	Mean	-1,627	54,872	1,226	6,821	5,462
	N	22	22	22	22	22
	Standard deviation	2,726	22,970	2,376	3,308	0,9904
	Minimum	-6,4	12,7	-2,4	2,4	4,2
	Maximum	4,2	106,1	6,1	16,1	8,2
Anova	F	20,2	8,3	16,7	10,3	29,6
	Significance	0,000	0,003	0,000	0,001	0,000

Table 4:   First sustainability measure: sum of total budget balance-to-GDP ratio and economic growth times public debt-to-GDP ratio

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	*-1,69*	3,46	3,54	3,69	6,10	3,52	3,51	2,51	4,92	1,37	4,98	4,10
Bulgaria	.	.	.	.	.	.	4,06	2,85	6,19	4,89	6,48	2,74
Denmark	1,49	2,92	2,15	3,96	5,82	3,07	1,64	1,03	4,05	7,16	6,75	5,85
Germany	*-2,42*	*-1,35*	*-0,63*	*-0,06*	2,80	*-1,36*	*-2,84*	*-3,39*	*-2,37*	*-2,31*	0,86	2,64
Ireland	7,68	11,24	10,76	10,06	10,69	5,01	3,23	2,61	3,41	4,12	5,30	2,06
Greece	.	.	.	.	4,58	3,21	2,30	3,55	0,81	1,17	4,75	3,16
Spain	*-0,78*	0,79	1,32	3,27	4,15	3,84	3,24	3,39	3,13	4,46	5,20	4,72
France	*-2,41*	*-1,36*	0,04	0,17	1,57	0,70	*-1,08*	*-2,22*	*-0,94*	*-0,27*	0,60	0,30
Italy	0,20	2,59	1,87	2,02	5,40	2,16	1,04	*-0,27*	0,87	*-1,50*	0,46	2,31
Cyprus	.	.	.	0,01	3,02	2,37	*-2,26*	*-1,60*	1,23	2,02	3,47	8,29
Latvia	2,33	2,98	0,90	*-2,98*	*-1,40*	*-0,72*	*-0,91*	0,01	1,43	2,31	2,30	2,47
Hungary	12,10	9,09	3,03	2,41	7,29	2,70	*-2,06*	*-1,23*	*-0,81*	*-3,92*	*-3,97*	*-0,48*
Malta	*-6,34*	*-4,82*	*-6,95*	*-4,65*	*-0,93*	*-5,40*	*-1,95*	*-8,07*	*-2,75*	1,80	1,65	2,42
The Netherlands	1,62	3,60	2,98	4,40	6,43	3,41	*-0,13*	*-1,79*	*-0,14*	2,04	3,05	2,60
Austria	*-1,83*	*-0,61*	0,20	0,21	1,51	1,61	1,29	*-0,07*	*-1,65*	1,69	1,76	2,73
Poland	6,07	4,84	2,16	1,97	1,35	*-3,32*	*-3,43*	*-4,29*	*-1,29*	*-1,31*	*-0,08*	2,56
Portugal	*-0,72*	1,08	1,18	0,91	0,67	*-1,25*	*-0,17*	*-1,58*	*-1,07*	*-3,90*	*-1,16*	0,54
Slovenia	.	.	.	.	.	*-0,85*	0,85	*-0,34*	*-0,08*	0,23	0,94	3,11
Slovakia	*-6,35*	*-2,62*	*-1,96*	*-3,87*	*-6,82*	*-2,30*	*-4,38*	1,66	2,39	0,30	0,05	1,53
Finland	*-1,52*	3,34	5,95	3,79	10,30	7,43	5,31	3,20	4,34	4,25	6,52	7,97
Sweden	*-1,49*	1,37	4,15	4,90	6,88	3,44	0,94	1,14	3,04	4,54	5,08	5,84
United Kingdom	.	0,88	2,66	3,37	5,71	2,25	*-0,03*	*-0,99*	*-1,23*	*-1,57*	*-0,30*	*-0,11*

Note: Negative (i.e. unsustainable) values are in italics.

Table 5:   *Second sustainability measure: difference between of primary budget balance-to-GDP ratio and interest rate spread over economic growth times public debt-to-GDP ratio*

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	6,71	3,40	3,59	3,65	6,09	3,42	3,48	2,62	4,88	1,29	4,97	4,08
Bulgaria	.	.	.	.	.	.	4,36	3,02	6,33	5,15	6,63	2,82
Denmark	.	.	.	.	5,97	3,15	1,58	1,12	4,05	7,39	6,93	6,02
Germany	1,08	*-1,49*	*-0,76*	*-0,16*	2,78	*-1,38*	*-2,96*	*-3,58*	*-2,51*	*-2,45*	0,77	2,63
Ireland	12,18	11,19	10,88	9,97	10,89	4,94	3,22	2,57	3,40	4,11	5,31	1,98
Greece	.	.	.	.	4,15	2,70	2,09	3,22	0,36	0,88	4,56	2,92
Spain	4,42	0,59	1,16	3,11	4,04	3,81	3,21	3,40	3,09	4,45	5,21	4,75
France	1,19	*-1,55*	*-0,12*	0,10	1,50	0,61	*-1,28*	*-2,51*	*-1,14*	*-0,43*	0,59	0,15
Italy	11,80	2,40	1,77	1,88	5,30	1,88	1,00	*-0,36*	0,70	*-1,71*	0,25	2,26
Cyprus	.	.	.	*-0,30*	2,73	2,09	*-2,49*	*-2,07*	0,91	1,85	3,46	8,30
Latvia	.	.	.	.	.	.	.	.	1,30	2,30	2,26	2,43
Hungary	.	.	.	1,57	7,00	2,32	*-2,86*	*-1,83*	*-1,34*	*-4,34*	*-4,55*	*-0,77*
Malta	.	.	.	.	*-1,20*	*-5,83*	*-2,04*	*-8,71*	*-3,00*	1,68	1,76	2,28
The Netherlands	6,92	3,67	2,89	4,44	6,59	3,38	*-0,23*	*-1,93*	*-0,23*	1,96	3,13	2,57
Austria	2,07	*-0,47*	0,04	*-0,05*	1,38	1,49	1,22	*-0,08*	*-1,74*	1,60	1,69	2,70
Poland	.	.	.	1,60	1,23	*-3,54*	*-3,91*	*-4,78*	*-1,47*	*-1,58*	*-0,33*	2,47
Portugal	4,28	1,03	1,14	0,74	0,52	*-1,58*	*-0,45*	*-1,70*	*-1,24*	*-4,23*	*-1,32*	0,45
Slovenia	.	.	.	.	.	.	.	.	*-0,19*	0,15	0,85	3,15
Slovakia	.	.	.	.	*-7,50*	*-2,52*	*-4,26*	1,47	2,20	0,47	0,06	1,42
Finland	2,58	3,23	6,04	3,82	10,19	7,37	5,30	3,06	4,28	4,30	6,51	8,02
Sweden	3,81	1,31	4,08	4,94	7,31	3,30	0,92	1,07	3,00	4,48	5,15	5,97
United Kingdom	.	.	2,68	3,40	5,75	2,34	*-0,12*	*-1,17*	*-1,43*	*-1,75*	*-0,47*	*-0,29*

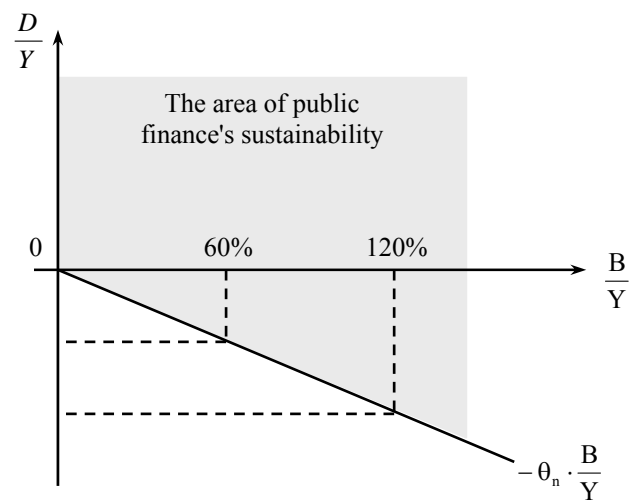Note: Negative (i.e. unsustainable) values are in red.

Figure 1:   *Public finance's sustainability with a connection to total budget balance*
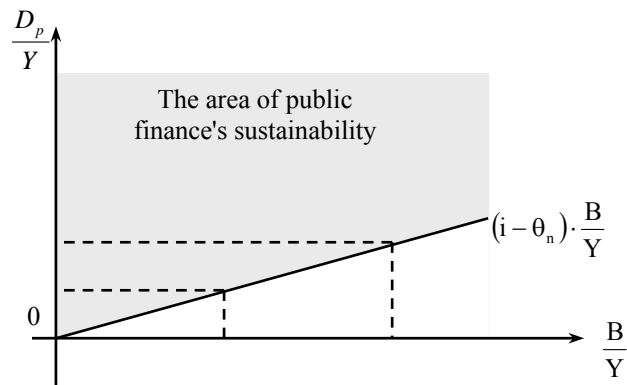
Figure 2:   Public finance's sustainability with a connection to primary budget balance

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                       Rescaled Distance Cluster Combine

      C A S E         0         5        10        15        20        25
   Label        Num   +---------+---------+---------+---------+---------+

   Germany        4   -+
   France         8   -+
   Austria       15   -+---+
   Netherlands   14   -+   |
   United Kingdom 22  -+   +---+
   Cyprus        10   -+   |   |
   Malta         13   -+-+ |   +------------------+
   Portugal      17   -+ +-+   |                  |
   Greece         6   ---+     |                  |
   Belgium        1   -+-------+        +------------------+
   Italy          9   -+                |                  |
   Denmark        3   -+---+            |                  |
   Finland       20   -+   +----------------------+        |
   Bulgaria       2   -+-+ |                                |
   Ireland        5   -+ +-+                                |
   Spain          7   -+-+                                  |
   Sweden        21   -+                                    |
   Poland        16   -+                                    |
   Slovakia      19   -+-+                                  |
   Slovenia      18   -+ +-----+                            |
   Hungary       12   ---+     +------------------------------------+
   Latvia        11   ---------+
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Figure 3:   Dendrogram using Ward method of hierarchical clustering
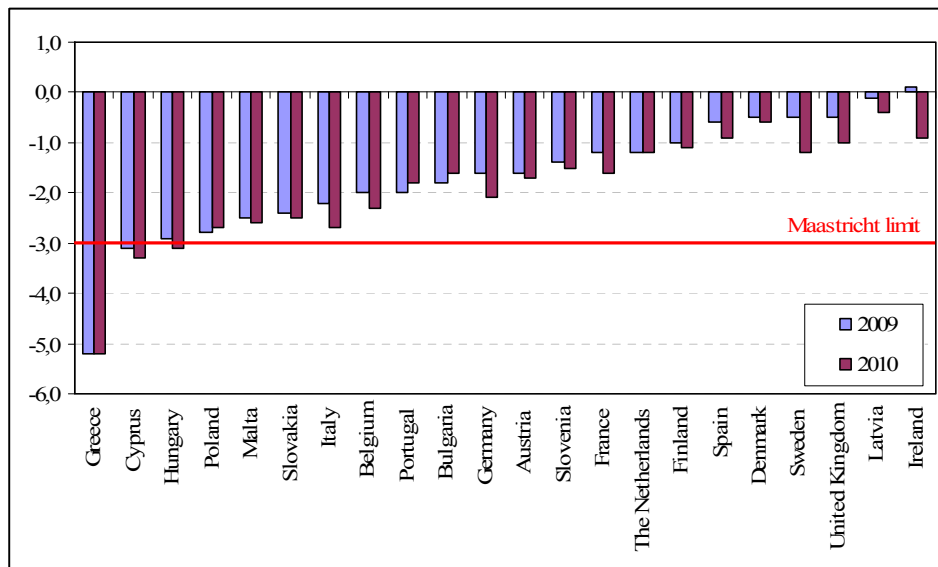
Figure 4:   Estimated sustainable total budget balance (as % of GDP) in 2009 and 2010
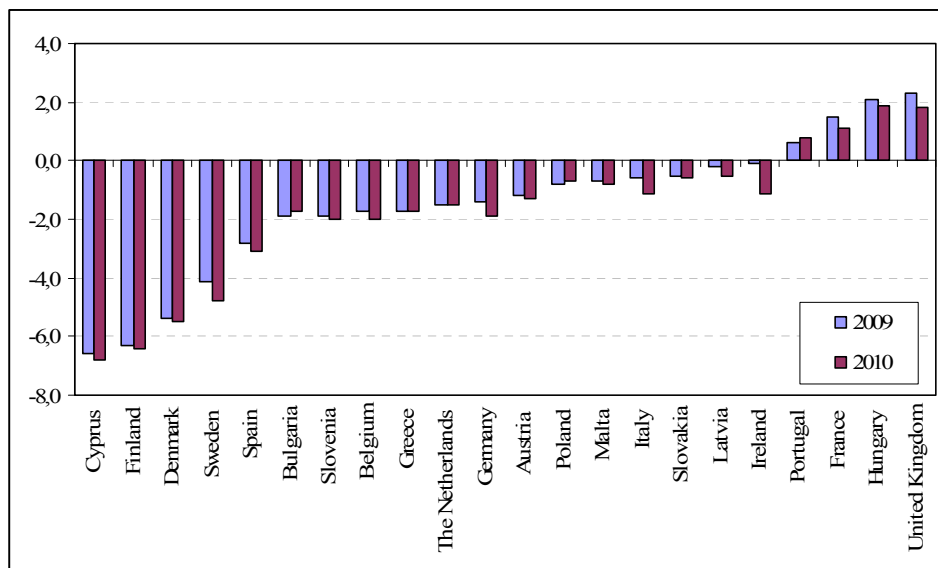
Figure 5:   Estimated sustainable change in total budget balance (as % of GDP) in 2009 and 2010 with respect to 2008 (i.e. 2007)

TEACHING ALTERNATIVES TO NEOLIBERALISM – A FACULTIES OF ECONOMICS' RESPONSE TO THE FINANCIAL CRISIS

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1. INTRODUCTION

In the paper the author analyzes a need for systematic studying and teaching alternatives to the neoliberal doctrine as one of the major subjects at faculties of economics. This need is based on following assumption: there is insufficient knowledge among students, businessman, politicians and public in general, of the main principles, philosophy and goals of neoliberal capitalism system, whose global influence on the world could be seen as one of the crucial causes of the current financial crisis. And only after understanding the ideology of such biocidal, profit- and violence-driven[1], short-term-focused economic model, deprived of morality and ethics and humanity, a serious quest for alternatives could be undertaken. When one searches through the curriculums of numerous economic courses that are taught at Croatian Faculties of Economics a lack of such topics could be easily detected. That fact fits in with the main belief of the neoliberal concept, that There Is No Alternative (TINA). However, with the global financial crisis the infallibility of neoliberal economic system has been questioned more vocally, and the basic ideas and cultural meme of neoliberalism as well as the efficacy of such an economic system have know become debatable.

There are already economists who have been for years pointing out all the flaws and self-destructive characteristics of the dominant neoliberal capitalism, but their voices could be heard usually only on non-mainstream independent media and conferences (forums, gatherings). The financial crisis and the uncertainty it brings could now make the public sensitive to alternative economic models. The Faculties of Economics in Croatia should not miss this opportunity. And although such topics should have been taught years earlier (the faculties of economics shaped today's young businessmen and politician beliefs and attitudes), their role in fostering discussion about the rationale behind the neoliberal concept and its alternatives could initiate important change of direction in the Croatian economic development process.

2. TEACHING REAL WORLD ECONOMICS

Free market fundamentalism, a juggernaut ideology on which the functioning of WTO and IMF is also based, has made national and local governments into servants of the international

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[1] Kulić, S.: **Neoliberalizam kao socijaldarvinizam, Rat za dominaciju ili za bolji svijet**, Prometej, Zagreb, 2004.

capital (i.e. corporations). And when the profit- and violence-driven corporations get more power than states in which they are operating, the questions of ethics, morality, development as freedom, and dignity are being put aside. Free flaw of the capital without strong constraints aimed at protecting the interests of citizens is not a good precondition for local and regional development. The financial crisis has forced even the USA, the main proponent of free trade and free capital movement to re-think the benefits of economic nationalism. In an era of profit cultural meme it takes courage and extra effort to teach the students of economics about immaterial values and the concept of real economic development measured not by the GDP, but by the more appropriate measures of progress and welfare such as Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), Fordham Index of Social Health (FISH), UN's Human Development Index, Index of Economic Well-Being (IEWB), Happy Planet Index (HPI) and others.[2] The students of economics must learn to look at the concept of economic development through all its dimensions. They should be taught about the concept of uneconomic growth.[3]

There is an open niche in economic higher education programs which could be filled in not just by offering new „Alternatives to Neoliberalism" courses to students, but also to businessmen, politicians and representatives of non-profit sector. Taking in account a lack of such courses in Europe, Croatian Faculties of Economics could use this opportunity to create and develop a significant competitive advantage. It is up to the management and staff of these particular faculties to use this market niche before others. But, more importantly, it is their duty as public institutions to study, teach and communicate the ideology and scope of neoliberal capitalism and especially its alternatives, to the society as a whole.

In the time of constant reforms of educational systems that are mostly preoccupied with form, a more emphasis should be placed on the content and value of topics taught in the courses of business economics. Students of economics should be confronted with holistic economic models that present economics in its sociological and environmental context and they should be encouraged to consider critically the neoliberal concept (as a currently dominant economic model), and its alternatives. The European model of eco-social-market economy and its basic principles and ideas should be therefore thoroughly studied.

3. THE POST-AUTISTIC ECONOMICS MOVEMENT

A need for changing the tendency toward a one-sided education in economics has been evolving over the last two decades. However, one event could be seen as a trigger to such change. It happened in June 2000, when a few economics students in Paris circulated a petition calling for the reform of their economics curriculum. Its first part, "We wish to escape from imaginary worlds!", summarizes what they were protesting against. „Most of us have chosen to study economics so as to acquire a deep understanding of the economic phenomena with which the citizens of today are confronted. But the teaching that is offered, that is to say for the most part neoclassical theory or approaches derived from it, does not generally answer this expectation. Indeed, even when the theory legitimately detaches itself

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[2] **The Well-being of Nations: The Role of Human and Social Capital**,
  www.oecd.org/dataoecd/36/40/33703702.pdf, (accessed 20.04.2009).
[3] More about new measures of progress at: www.neweconomics.org. New Economics Foundation is an independent think-and-do tank that inspires and demonstrates real economic well-being under the slogan "Economics as if People and the Planet Mattered". NEF was founded in 1986 by the leaders of The Other Economic Summit (TOES) which forced issues such as international debt onto the agenda of the G7 and G8 summit. They are devoted to the creation of new ways of measuring progress.

from contingencies in the first instance, it rarely carries out the necessary return to the facts. The empirical side (historical facts, functioning of institutions, study of the behaviors and strategies of the agents…) is almost nonexistent. Furthermore, this gap in the teaching, this disregard for concrete realities, poses an enormous problem for those who would like to render themselves useful to economic and social actors."[4] The students opposed the uncontrolled use of mathematics, when it is not an instrument, but rather an end in itself, and asked for a pluralism of approaches in economics. "Too often the lectures leave no place for reflection. Out of all the approaches to economic questions that exist, generally only one is presented to us. This approach is supposed to explain everything by means of a purely axiomatic process, as if this were THE economic truth. We do not accept this dogmatism. We want a pluralism of approaches, adapted to the complexity of the objects and to the uncertainty surrounding most of the big questions in economics (unemployment, inequalities, the place of financial markets, the advantages and disadvantages of free-trade, globalization, economic development, etc.)."[5] In the conclusion the students stated that they no longer want to have this autistic science imposed on them. One month later, in July 2000, economic teachers of the France have given their full support to the claims made by the students.[6] They also expressed their hope that these issues will be heard by all economics students in universities everywhere. To facilitate this they were ready to enter a dialogue with students and to be associated with the holding of conferences that will allow the opening of a public debate for all. Major newspapers and magazines gave extensive coverage to the students' complaints, economic students from all over France signed the petition, and a growing number of French economists have supported the petition. The result of all these events was that the Minister of Education set up a high level commission to investigate the student's complaints, which in September 2001 acknowledged that there had indeed been "an excess of modelisation and very little concern for its empirical relevance".

In the same year of the Parisian economics students' petition the International Confederation of Associations for Reform in Economics (ICARE) changed its name into the International Confederation of Associations for Pluralism in Economics (ICAPE), „pluralism" superseding „reform".[7] The goals of this Confederation were set by its founders already in 1993: to publicize and help develop a multiplicity of approaches to the scientific analysis of economic activity, to promote a new spirit of pluralism in economics, involving critical conversation and tolerant communication among different approaches, within and across the barriers between the disciplines, to campaign for greater pluralism in the range of contributions to economic journals and in the training and hiring of economists, and to coordinate the activities of economist and economic associations who share one or more of the above aims.[8]

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[4] **Open Letter from Economic Students to Professors and Others Responsible for the Teaching of this Discipline**, www.paecon.net/petitions/a-e-petition.htm, (accessed 20.04.2009).

[5] Ibidem.

[6] **Petition for a Debate on the Teaching of Economics**, www.paecon.net/petitions/Fr-t-petition.htm, (accessed 20.04.2009).

[7] ICAPE is a consortium of over 30 groups in economics working cooperatively to maintain diversity and innovation in methods, approaches, policy analyses, and higher education in the profession. This network of groups seeks to foster intellectual pluralism and a sense of collective purpose and strength among these heterodox organizations. For more details about the organizations that make up the ICAPE see in www.icape.org, (accessed 20.04.2009).

[8] The formative meeting of ICARE occurred over a two-day period, 13-14 September 1993, at Utrecht University in The Netherlands, under the banner, "The Future of Economics." The conference convened at the International Center for Social Economics, and was hosted by its chairman, Professor Y. S. Brenner, and its director, J. T. J. M. van der Linden. The structure and functions of ICARE were devised by two dozen invited participants who were involved in the leadership of American, British, and continental heterodox associations such as the Association for Evolutionary Economics, the European Association for Evolutionary Political

However, only in 2000 the board issued a statement of purpose that emphasized their belief that methodological pluralism and intellectual progress are complements.

In June 2001, almost exactly a year after the French students had released their petition, 27 PhD candidates at Cambridge University in the UK launched their own, titled "Opening up Economics". Besides reiterating the French students' call for a broadband approach to economics teaching, the Cambridge students also champion its application to economic research. „This debate is important because in our view the status quo is harmful in at least four respects. Firstly, it is harmful to students who are taught the 'tools' of mainstream economics without learning their domain of applicability. The source and evolution of these ideas is ignored, as is the existence and status of competing theories. Secondly, it disadvantages a society that ought to be benefiting from what economists can tell us about the world. Economics is a social science with enormous potential for making a difference through its impact on policy debates. In its present form its effectiveness in this arena is limited by the uncritical application of mainstream methods. Thirdly, progress towards a deeper understanding of many important aspects of economic life is being held back. By restricting research done in economics to that based on one approach only, the development of competing research programs is seriously hampered or prevented altogether. Fourth and finally, in the current situation an economist who does not do economics in the prescribed way finds it very difficult to get recognition for her research."[9] In August of the same year economics students from 17 countries who had gathered in the USA in Kansas City, released their International Open Letter to all economics departments calling on them to reform economics education and research by adopting the broadband approach. Their letter includes the following seven points[10]:

- **A broader conception of human behavior**. The definition of *economic man* as an autonomous rational optimizer is too narrow and does not allow for the roles of other determinants such as instinct, habit formation and gender, class and other social factors in shaping the economic psychology of social agents.

- **Recognition of culture**. Economic activities, like all social phenomena, are necessarily embedded in culture, which includes all kinds of social, political and moral value-systems and institutions. These profoundly shape and guide human behavior by imposing obligations, enabling and disabling particular choices, and creating social or communal identities, all of which may impact on economic behavior.

- **Consideration of history**. Economic reality is dynamic rather than static – and as economists we must investigate how and why things change over time and space. Realistic economic inquiry should focus on process rather than simply on ends.

- **A new theory of knowledge**. The positive-vs.-normative dichotomy which has traditionally been used in the social sciences is problematic. The fact-value distinction can be transcended by the recognition that the investigator's values are inescapably involved in scientific inquiry and in making scientific statements, whether consciously

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Economy, the Karl Polanyi Institute of Political Economy, the Association for Institutional Thought, the Belgian-Dutch Post-Keynesians, the International Society for Ecological Economics, and others.

[9] **Opening up Economics: A Proposal by Cambridge Students**, www.paecon.net/petitions/Camproposal.htm, (accessed 20.04.2009).

[10] **An International Open Letter to all Economics Departments: The Kansas City Proposal**, www.paecon.net/petitons/KC.htm, (accessed 20.04.2009).

or not. This acknowledgement enables a more sophisticated assessment of knowledge claims.

- **Empirical grounding**. More effort must be made to substantiate theoretical claims with empirical evidence. The tendency to privilege theoretical tenets in the teaching of economics without reference to empirical observation cultivates doubt about the realism of such explanations.

- **Expanded methods**. Procedures such as participant observation, case studies and discourse analysis should be recognized as legitimate means of acquiring and analyzing data alongside econometrics and formal modeling. Observation of phenomena from different vantage points using various data-gathering techniques may offer new insights into phenomena and enhance our understanding of them.

- **Interdisciplinary dialogue**. Economists should be aware of diverse schools of thought within economics, and should be aware of developments in other disciplines, particularly the social sciences.

In March 2003 economics students at Harvard launched their own petition, demanding from its economics department an introductory course that would have "better balance and coverage of a broader spectrum of views" and that would "not only teach students the accepted modes of thinking, but also challenge students to think critically and deeply about conventional truths." In their mission statement The Harvard University Students for a Humane And Responsible Economics (SHARE) expressed their belief that without providing a true marketplace for economic ideas, Harvard fails to prepare students to be critical thinkers and engaged citizens. Their goals reflected a need for intellectual diversity in the faculty of economics and for education about alternatives to the dominant model, as well as raising awareness of the social and political implications of economics.[11]

The last in these series of petitions was «Economics at Notre Dame: An Open Letter», from April 2008, created out of the fear that, in pursuit of higher department rankings, Notre Dame will sacrifice the Department of Economics and Policy Studies, which is committed to issues relating to socioeconomic justice and ethics, openness to alternative methodological approaches, and the roles of history and institutions in the broader political economy, in favor of the Department of Economics and Econometrics, which is a neoclassical economics department committed to rigorous theoretical and quantitative analysis in teaching and research. In the petition the students have stated that the current stunted education in economics is one of mostly memorization and unchallenging acceptance rather than a critical examination of assumptions, logic, and implications. The signers of this petition also plead for a plurality of ideas and therefore recommend that economics faculty strive to contextualize mainstream neoclassical economics within its historical development, thus placing it in the broader discourse of diverse economic thought. They further asked all professors who include economics content in their courses to present economics not as a set of hard-and-fast models befitting a natural science, but, more appropriately, as an evolving and dynamic social science.[12]

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[11] **The Harvard Students' Manifesto**, www.paecon.net/petitions/Harvard2.htm, (accessed 20.04.2009).
[12] **Economics at Notre Dame: An Open Letter**, www.paecon.net/petitions/petitionNotreDame.htm, (accessed 20.04.2009).

Out of all these pleadings for pluralism in economics a Post-Autistic Economics movement was born, under the slogan «sanity, humanity and science»[13]. The PAE movement was not about trying to replace neoclassical economics with another partial truth, but rather about reopening economics for free scientific inquiry, making it a pursuit where empiricism outranks a priorism and where critical thinking rules instead of ideology.[14] The Post-Autistic Economics ideas have found their place in the Post-Autistic Economics Review (now the Real-World Economics Review, an email-delivered economics journal with 10,698 subscribers from over 150 countries[15]).

4. CHANGE IN THE ECONOMICS CURRICULUM

Neoclassical (neoliberal) theory dominates the economics curriculum throughout the world and has become a single thought.[16] This one-sided narrowband approach to economics, which is presented as THE truth, discourages critical thinking among students. Instead of that students should be taught to question the basic assumptions of different economic theories and they should have the opportunity to learn about alternative economic approaches. Pluralism must become part of the basic culture of the economists, which assumes that change begins with teachers. If they have little knowledge about alternative economic approaches, intellectual progress in economics will not take place.

The situation could be improved by introducing specialized courses dedicated to alternative economic theories, by forming specialized departments, by organizing conferences and conducting regular discussion groups, by creating links between economics teachers / students and alternative economic policy research institutes and by incorporating interdisciplinary approach in economics curriculum. The students should learn to contextualize the presented theories in the broader discourse of the social sciences, i.e. to analyze economic problems in relation to the power structures, institutional and ecological constraints, non-market driven economic behaviors etc. The fragmentation of economics should be fought against in order to bring the economic theories closer to reality. Economists need other disciplines' knowledge to define and explain complex economic problems such as economic development and growth or global crisis, for example. Economics is especially closely related to the philosophy, sociology, political sciences and history and these disciplines should be incorporated in economics curriculum. Therefore some say that an economist that is only economist is a poor economist.[17] In reality there are no economic and non-economic problems. Problems are not economic, social, ecological, psychological etc., they are just problems, complicated and interconnected,[18] and should be therefore studied by taking into consideration its interdisciplinary character.

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[13] Post-autistic movement was formed to oppose "the autism" or detachment from reality, evident in a passion for formal models. More about post-autistic economics ideas see in: Fullbrook, E., ed.: **Real World Economics: A Post-Autistic Economics Reader**, Anthem Press, London – New York, 2007.

[14] **A Brief History of the Post-Autistic Economics Movement**, www.paecon.net/HistoryPAE.htm, (accessed 20.04.2009).

[15] The editor of the Review is Edward Fullbrook.

[16] Herrera, R.: **Neo-classical Economic Science Fiction and Neo-liberal Reality, Is There a Single Thought in Political Economics?**, ftp://mse.univ-paris1.fr/pub/mse/cahiers2003/R03036.pdf, (accessed 20.04.2009).

[17] Sharma, S.: **Economics does Matter. About Economics and Economists (IZABRANI RADOVI)**, Mikrorad, Zagreb, 2002, p. 2.

[18] Myrdal, G.: **The Unity of the Social Sciences**, Human Organization, Vol. 34, 1948, in Sharma, S.: **Economics does Matter. About Economics and Economists (IZABRANI RADOVI)**, Mikrorad, Zagreb, 2002, p. 9.

In the time of global financial crisis arises the question of introducing the more thorough and critically approached study of transnational companies and the role of international organizations such as WTO and IMF into the economics syllabus.[19]

It would be of great interest to examine and observe the influence of values, theories, and approaches acquired through the higher education programs in economics on the managerial behavior in Croatia. A study of the values orientations of 3836 managers in 16 countries representing established EU, new EU, and candidate EU country groups has shown that managers in established EU countries were more self-transcendent[20] and less conservative than their counterparts in new EU and candidate EU countries.[21] These values are more consistent with a societal reference system, a system that depicts a worldview in which managers and corporations act as stewards for the collective good, i.e. corporate strategic objectives are developed in collaboration with a diversity of internal and external stakeholders. Western European countries have traditionally had a more societal welfare orientation than Anglo free market capitalistic countries which have had a more financial orientation. The financial reference system is based on the agency theory in which the strategic corporate imperative is to maximize shareholder wealth. As such, individuals subscribing to a financial reference system world-view would be expected to be highly motivated to maximize their own self-interest (self-enhancement) rather than sacrificing these for communitarian goals. Although the study has shown within-Europe managerial values convergence in a relatively high openness to change and low self-enhancement values, it is to be questioned the cause of less self-transcendency and more conservativism among managers in the new EU and candidate EU countries. To what extent do these differences in values represent a conflict between the Western European Rheinish capitalism tradition that emphasizes social welfare and environmental sustainability concerns, and neo-liberal capitalism with its accompanying "ethical shortcomings" in the transitional economies of former Eastern Bloc countries?[22] And what influence does the economics curriculum, i.e. lack of pluralism, have on the managerial or government representatives' behavior?

5. TEACHING METHODS AND RELEVANT LITERATURE – ENCOURAGING PLURALISM IN ECONOMICS

The discussion about teaching methods should succeed (not precede!) the discussion about the relevant subjects in the economics curriculum. In fact, teaching methods are always connected to the specific contents and should be analyzed in that context.

In explaining different economic theories experientially based learning approaches could be used, through which the students are introduced to a series of conceptual, theoretical lenses. The objective is twofold: first, to introduce them to the key characteristics of each theoretical approach/paradigm, and, second, to enable them to utilize these lenses as a way to analyze and interpret current (inter)national events. In that way students will personally experience

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[19] Fullbrook, E., ed.: **A Guide to What's Wrong with Economics**, Anthem Press, London – New York, 2004.

[20] Self-transcendence indicates a propensity to promote the well-being of others (friends or not) and nature (according to Schwartz values typology).

[21] Reynaud, E. et. al.: **The Differences in Values Between Managers of the European Founding Countries, the New Members and the Applicant Countries: Societal Orientation or Financial Orientation?**, European Management Journal, Volume 25, Number 2, April 2007.

[22] Ibidem.

how each lens directs their view toward certain facets and aspects of (inter)national politics, and how the lenses themselves influence how they make meaning out of events.[23]

Active learning approaches to teaching about abstract sociopolitical processes or a particular economic phenomenon are also Simulations, Games and Role Play (SGRP).[24] Examples of simulations include computer-based simulations such as ICONS, and a range of in-class exercises that place students in the roles of delegates to an international conference or organization and ask them to negotiate a treaty or debate a set of issues from a specific person or country's standpoint. Games are similar to simulations, but contain specific structures or rules that dictate what it means to „win" the simulated interactions. Games place the participants in positions to make choices that affect outcomes, but do not require that they take on the persona of a real-world actor. Students still learn how actions affect outcomes, and understand rules, constraints, and strategies, but they can „take the actions of" a type of actor without „dramatizing" or „inhabiting" a specific role. Example of a game as active learning exercise is interactive prisoner's dilemma game. Role play, on the other hand, allows students to create their own interpretation of the roles in large part because of its less „goal-oriented" focus. In a role-play exercise, it is the dramatization of the phenomena of interest or the relationships between actors that provides the essence of learning. Role play is particularly effective in bridging the gap between academic knowledge and everyday life. Moreover, when students take on the roles and perspectives of others, they are better able to empathize. Excellent example of role play is the Hunger Banquet, an Oxfam America's project.[25] The goal of the project is to deepen the understanding of hunger and poverty problems in the world by serving a breakfast / lunch to the group of students. Students draw tickets at random that assign them each to either a high-, middle-, or low-income tier and receive a corresponding meal. The 15 percent in the high-income tier are served a sumptuous meal. The 35 percent in the middle-income section eat a simple meal of rice and beans. The 50 percent in the low-income tier help themselves to small portions of rice and water. All groups can see one another at all times during the Hunger Banquet, and students are allowed to talk across groups during the course of the meal. Many do, which leads to interesting questions being raised about fairness, equity and hunger. It also led, in a few cases, to food „aid" (sharing of food across tables and classes), although not as often as could be expected.

A precondition for practicing such teaching approaches is to ensure that the students get familiar with the different economic theories. As in the current situation the neoclassical (neoliberal) economics textbooks dominate the economics syllabus, a list of alternative economics sources should be developed. Here we mention some authors that should not be left out: Galbraith, J. K., Bakan, J., Barber, B. R., Kulić, S., Stiglitz, J., Klein, N., Monbiot, G., Polanyi, K., Gelinas, J. B., Nelson, J. A., Rifkin, J., Sen, A., Albert, M., Radermacher, F. J.[26]

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[23] Shinko, R.: **Thinking, Doing, and Writing International Relations Theory**, International Studies Perspectives, Volume 7, Number 1, February 2006, Portland, p. 44-49.

[24] Krain, M.: **Starving for Knowledge: An Active Learning Approach to Teaching about World Hunger**, International Studies Perspectives, Volume 7, Number 1, Februrary 2006, Portland, p. 52-63.

[25] Oxfam America is a member of Oxfam International, a confederation of 13 organizations working together with over 3,000 partners in more than 100 countries to find lasting solutions to poverty, suffering and injustice., www.oxfamamerica.org, (accessed 20.04.2009).

[26] For suggested listed bibliography of the above mentioned authors see in section Bibliography at the end of this paper.

6. THE ROLE OF FACULTIES OF ECONOMICS

By the author's opinion Croatian Faculties of Economics should engage their forces in order to present alternative economic theories to the dominant one, not just to students but also to the business and government representatives and to the public as a whole. It is up to the Faculties of Economics to open and facilitate the public discussion about the causes and possible solutions for the current global financial crisis. The basic principles of the dominating capitalism model, which led to the crisis, should be questioned and critically approached, and alternative models should be thoroughly considered.

In the constant reform of the educational system, the content and importance of the economics curriculum' subjects get in the second plan. In the discussion about the quality matters we agree with the author of the Logic of Social Sciences: "As all the other sciences, social sciences are also successful or unsuccessful, interesting or empty, productive or unproductive according to the relevance i.e. interest of the problems they are dealing with."[27]

The Faculties of Economics should abandon the race for a place on the rank list, which is based only on the quantitative indicators of scientific productivity and begin to fight for real competition by developing different worldviews, methods and theories, and therefore by creating distinctive academic cultures.[28] This is especially important for the public institutions of higher education that should develop as a public space for the exchange of ideas and for building a better understanding and closer relations between science, business and society.

To improve the response of higher education institutions to regional (national) economic and non-economic needs the faculties should first determine their current role in the economic development. The curriculums should be reformed by inclusion of pluralism and interdisciplinary approach in explaining economics topics. It would be interesting to question the Croatian students of economics' familiarity with the post-autistic movement and their opinion about current economics curriculum, or perhaps begin the research with the teachers and alumni and explore their knowledge about the basic assumptions of the neoliberal economic model and its alternatives.

In the way economics is taught today the students are not encouraged to question the main principles of presented theories. And it is not a good indication that most of the economics students have never heard that the same author that has written worldly known An Inquiry into the Nature and Causes of the Wealth of Nations has also written The Theory of Moral Sentiments, in which he states that the wise and virtuous man is at all times willing that his own private interest should be sacrificed to the public interest of his own particular order of society.[29]

A positive course of events is reintroducing economic history and the history of economic thought in the curriculum. This could be a starting point for introducing the courses which

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[27] Popper, K.: Die Logik der Sozialwissenschaften, p. 105, in Prpić, K. et. al.: **Onkraj mitova o prirodnim i društvenim znanostima**, Institut za društvena istraživanja, Zagreb, 2008, p. 247.

[28] According to Liesmann, K. P.: **Teorija neobrazovanosti, Zablude društva znanja**, Naklada Jesenski i Turk, Zagreb, 2008, p. 69.

[29] Smith, A.: The Theory of Moral Sentiments, A. M. Kelly, New York, 1966, p. 346., in Key, S., Popkin, S. J.: **Integrating Ethics into the Strategic Management Process: Doing Well by Doing Good**, Management Decision, Vol. 36, Number 5, 1998, p. 332.

will cover alternative economic models and for including pluralism and interdisciplinary approach in all economics curriculum subjects.

It is interesting to see that also in Croatia the discussion about the way economics is taught has started with the students. In June 2009 a 1ˢᵗ International Student Conference will be held in Zagreb, with the main theme: "Time to Rethink Economics" and its sub-themes: The European New Deal, Financial Crisis and its Implications on the World Order, Knowledge-based Economy: Is the Bologna Process Helping?, Is the Education of Economists Open Enough for Interdisciplinary Approaches and Ideas?, Subsidiarity: The New Stage in the Evolution of Welfare Economics, Social Psychology in Economic Studies.[30] It will be interesting to observe the response of the students and the discussion that will follow the conference.

7. CONCLUSION

In the way economics is taught today the students are not encouraged to question the main principles of presented theories. It could be said that there is only one dominant theory in the economics curriculum, a neoclassical (neoliberal) theory. However, the students are not advised to examine and question the main principles, philosophy and goals that are behind this theory. The result of such narrow approach is that students, i. e. future businessmen, or statesmen, take the neoliberal capitalist system for granted without considering alternative economic systems. It is up to the Croatian Faculties of Economics to start the discussion about the dominant form of capitalism, whose global influence on the world could be seen as one of the crucial causes of the current financial crisis. The economics curriculum should be reformed in order to include pluralism of economic ideas and thoughts and to cultivate interdisciplinary approach to the complex economics issues, and in that way bring the economics higher education programs closer to the Real World. The European model of eco-social-market economy and its basic principles and ideas should be therefore especially thoroughly studied. In the time of global financial crisis, when the public searches for answers, Croatian Faculties of Economics should act according to their role as the public scientific institutions and therefore open up to the study, teaching and communicating the ideology and scope of neoliberal capitalism and especially its alternatives, to the society as a whole.

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[30] International Student Conference 2009, http://sites.google.com/site/isc2009croatia/conference-topic, (accessed 20.04.2009).

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INTRADAY INFORMATION FLOW ON THE EUROPEAN STOCK MARKETS

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1. INTRODUCTION, MOTIVATION AND RELATED LITERATURE

Developments in emerging capital markets have long been characterized by less developed financial institutions and higher returns associated with higher volatility. While higher volatility is still present to a large extent (Kaminsky and Reinhard, 2002), since the late 1990s the development of institutions in these markets attracted a large number of foreign institutional investors from developed countries who begun to consider emerging markets as a risk-sharing domain.[1] In addition, financial globalization brought emerging markets under the increasing influence of economic information flows. General consensus in the literature is that macroeconomic announcements have significant effects on financial markets, both in terms of asset returns and their volatility, but their impact, specifically on volatility, is generally ambiguous (Andritzky, Bannister and Tamirisa, 2007). While the effect of macroeconomic news is necessarily well documented in developed markets, emerging counterparts are lagging behind and new markets in Europe are still under-researched. At the same time the presence of foreign institutional investors from developed markets in new European markets is heavy. Bekaert, Harvey and Lundblad (2001) document that financial liberalizations that open emerging capital markets to foreign investors are associated with significant increases in real economic growth. Hence, knowing how new European markets process economic information is important from a development perspective.

A large number of studies approach the issue of price formation on the emerging markets with the help of causality techniques to show that price movements on developed markets influence their emerging counterparts. This paper is differentiated from this array of literature

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[1] Devereux and Sutherland (2009) note unprecedented improvements in the financial environment of the emerging markets during the last decade and analyze the determinants of an optimal risk-sharing portfolio for an emerging market economy and an advanced economy.

in that we show how information in terms of macroeconomic news and expectations on developed markets is able to affect price formation on emerging markets. This we show even when accounting for price developments on developed markets.

We approach our analysis by using the data in an intra-day frequency in order to capture information flowing from developed markets and to illustrate its power on price formation in emerging markets. Modern research draws attention to the use of intraday data that are able to reveal the effect of macroeconomic announcements on stock market movements (Bollerslev and Cai, 2000; Nikkinen et al., 2006; Jones, Lin and Masih, 2005; Erenburg, Kurov and Lasser, 2005; Rigobon and Sack, 2006). In our paper we contribute to the related literature in several ways. Most of the literature targets the developed capital markets in the U.S. and Europe, while European emerging markets are still under-researched. Therefore we investigate new EU members: the Czech Republic, Hungary, and Poland. Further, as an extension to the above literature, we use stock price data based on 5-minute intervals to provide more robust estimates of public information on stock returns in the new EU markets, which is not covered in the literature.[2]

Further, the majority of studies focus only on a few macroeconomic announcements. In particular, most of them analyze only one event, namely the impact of monetary policy news on stock returns.[3] However, if there are other major announcements in the same time frame, then focusing only on monetary policy or only a few announcements may bias the estimated coefficients and hence may explain the poor performance of macroeconomic announcements in explaining asset returns.[4] Hence we use a larger set of macroeconomic releases than employed in previous studies; the announcements and their grouping are specified in the data section. In this respect we also differentiate between local and foreign announcements as the countries under research are small and highly open economies and as such they exhibit significant trade and financial linkages or institutional arrangements with respect to the EU.[5]

Finally, previous studies tend to investigate the impact of macro news only on conditional returns, assuming that stock returns do not exhibit time-varying volatility.[6] In this study, we model both conditional returns and the conditional variance of returns simultaneously in a time-varying (GARCH) framework to better capture the impact of macroeconomic announcements of stock returns and to assess intra-day and daily effects in stock market volatility at three new EU markets.

By improving on several deficiencies in the existing research we are able to produce accurate evidence of the effect of macroeconomic news on developments in the new EU capital markets. The rest of the paper is organized as follows. In Section 2 we introduce our modeling

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[2] An exception is Hanousek, Kočenda, and Kutan (2009). Other literature deals with emerging markets in Europe but on a lower frequency and without the specific effect of macroeconomic announcements (see e.g. Korczak and Bohl, 2005 and Serwa and Bohl, 2005, among others).

[3] These studies include Jensen and Johnson (1995), Jensen, Mercer, and Johnson (1996), Patelis (1997), Thorbecke (1997), Siklos and Anusiewicz (1998), Bomfim (2001), Ehrmann and Fratzscher (2004, 2006), Gurkaynak, Mann, Atra and Dowen (2004), Rigobon and Sack (2006), Bredin, Hyde, and O'Reilly (2005), He (2006), and Wongswan (2006).

[4] To our knowledge, exceptions are Flannery and Protopapadakis (2002) and Andersen et al. (2007) who employed 17 and 25 U.S. macroeconomic news announcements, respectively.

[5] To our knowledge, there are only a few studies that investigate the impact of both local and foreign announcements on stock market returns. See e.g. Nikkinen and Sahlström (2004) or Albuquerque and Vega (2006).

[6] These studies include Jensen et al. (1996), Patelis (1997), Siklos and Anusiewicz (1998), Flannery and Protopapadakis (2002), Gurkaynak et al. (2004), Nikkinen and Sahlström (2004), Bredin et al. (2005), Albuquerque and Vega (2006), He (2006) and Ramchander et. al (2006). On the other hand, Bomfim (2001), Kim et al. (2004), and Jones et al. (2005) utilize time-varying (GARCH) models.

approach, data and definitions. Detailed empirical findings are presented in Section 3. A concluding summary follows.

2. DATA AND METHODOLOGY

We analyze the price discovery on the new EU stock markets and concentrate on the stock exchanges in Budapest, Prague, and Warsaw in particular. These markets are the largest European emerging markets in terms of market capitalization as well as the extent of liquidity (Égert and Kočenda, 2007).

We analyze the impact of macroeconomic announcements by employing an augmented version of the generalized autoregressive conditional heteroskedasticity (GARCH) model attributed to Bollerslev (1986). This approach allows us to assess the impact of news on stock returns and assess market volatility, as well as to account for the fact that errors from the mean equation are heteroskedastic. We deviate from the standard sequencing and introduce our data prior to describing the model since a description of the news announcements is needed to better describe our model.[7]

2.1. Data Set: Stocks and News

We constructed our dataset from intraday data on three emerging EU markets recorded by Bloomberg. Stock exchange index quotes ($I_{i,t}$) for market i are available in five-minute intervals at time t (ticks) for the stock markets in Budapest (BUX), Prague (PX-50), and Warsaw (WIG-20). In addition to these markets we also employ data from the Frankfurt stock exchange (the German DAX index) and the U.S. Dow Jones Industrial Average of 30 stocks index. Based on these quotes we construct a five-minute stock market index return $R_{i,t}$ ($R_{i,t} = \ln(I_{i,t} / I_{i,t-1})$) for each market i from time t-1 to time t. The time period of our data starts on 1 June 2004 at 9:00 and ends on 30 December 2007 at 16:30 Central European Daylight Time (CEDT). The beginning of our sample intentionally starts after the entry of the four countries to the European Union in May 2004. After accounting for weekends and public holidays, the time span gives the following numbers of trading days for each of the three new EU markets: 878 (Budapest), 880 (Prague), and 879 (Warsaw).

Further, we compiled an extensive data set on 15 different macroeconomic announcements (news) that are divided into four categories. These are announcements on prices, real economy (GDP, current account, production, sales, trade balance, unemployment, etc.), monetary policy (monetary aggregate and interest rate), and economic confidence (consumer and industry confidence, business climate, etc.). We provide details on the types and origin of the announcements later in this section.

The macroeconomic announcements we employ are surveyed by Bloomberg and Reuters with a clearly defined calendar and timing of the news releases; as publication schedules of the releases is publicly available we do not report it for the sake of space. The available information from Bloomberg and Reuters also contains surveyed market expectations of the specific news that provide a market consensus on the expected values relevant for specific announcements. The surveyed values then constitute the best proxy for market expectation

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[7] The theoretical framework linking macro announcements to stock returns is underdeveloped. We refer readers to the account of bond pricing with announcement effects of Piazzesi (2001), the equities modeling framework with announcements' effect of Mamaysky (2002), and an equilibrium asset pricing model with public announcements by Cenesizoglu (2007).

available. In our analysis we consider all scheduled macroeconomic announcements but for estimation purposes we employ only the major releases. A complete set of announcements from the Bloomberg database allows us to isolate the timing of other (i.e. not employed in the analysis) announcements and therefore minimize possible bias stemming from the fact that market expectations are formed and announced only for the major announcements.[8]

The above arrangement is particularly important since it enables us to analyze the effect of the news from its *excess impact* perspective. Because markets form expectations about scheduled important news, it is not the news itself that matters but its difference from what the market expects it to be (market consensus). The news deviation, or its excess, has then an impending impact on stock prices. Following this logic, we construct a data set of announcements. There is news associated with indicator i in the form of various macroeconomic releases or announcements that are known ahead of time to materialize on specific dates t. The extent of such news is not known but expectations on the market form a forecast. The excess impact news announcement is then defined as a deviation of the news from the market expectation formed earlier. Further, announcements are often reported in different units and therefore they are standardized to allow their meaningful comparison (see e.g. Andersen et al., 2007). Formally, the excess impact news variable is labeled as xn_{it} and defined as $(sn_{it} - E_{t-1}[sn_{it}]) / \sigma_i$, where sn_{it} stands for the value or extent of the scheduled announcement i at time t and $E_{t-1}[sn_{it}]$ is the value of the announcement for time t expected by the market at time t-1, and σ_i is the sample standard deviation of the announcement i. The standardization does not affect the properties of the coefficients' estimates as the sample standard deviation σ_i is constant for any announcement indicator i.

From a practical perspective, we consider the immediate effect of each new announcement at the time of its release and account for its impact for 5 minutes as extension of the interval does not yield an improvement because the impact of the scheduled announcements dissipates very quickly. This is consistent with observation that the significant differences in price discovery concentrate in transactions that immediately follow the news release (Greene and Watts, 1996). Following the *excess impact* approach described above, we differentiate the positive (+) and negative (-) impact of the announcement in terms of its relation to market expectations.[9] An announcement has a zero impact if it is exactly in line with the market or not further than 5% of the news sample standard deviation from market consensus. The excess impact approach *per se* assumes that the difference of the announcement from its market expectation is in the form of a certain function (say linear or quadratic). Given the emerging character of the markets under research we simplify this assumption and consider only three types of impact: negative, in-line and positive. In this case our findings should be robust with respect to the particular excess impact response.

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[8] The classification of news as a major announcement is based on a survey of experts (Bloomberg) anticipating the given announcement. The survey works in this context as a market expectation for the particular announcement. By the same token we do not consider a time when no other macro announcement was made as "no news". Similarly like other researchers in the field, we are unable to account for announcements for which the market expectations are not formed and not made available.

[9] In the majority of cases the announcement has a positive (negative) impact if it is above (below) market expectations. For example, news release about say 3.5% GDP growth under market expectation of 2.5% will be considered as a positive surprise of 1%. However, there are some announcements where the impact direction is reversed. For example, empirics suggest that a lower-than-expected unemployment rate has a positive impact as its consequence means higher tax collection, decreased payments from the state, etc. On other hand, higher-than-expected inflation has a negative impact. Other variables whose announcement shows a reverse impact direction are, for example, debt, deficit, interest rate, and labor costs.

In our analysis we concentrate chiefly on foreign news originating in the Eurozone and the U.S.A. because the majority of local news is released intentionally before the market opening and thus they are absorbed by the market before trading begins and they are factored into stock prices without delay. The time difference between the markets is accounted for by setting CEDT time for all news releases, which eliminates the time difference between the U.S. and continental Europe. The news announcements are divided into four categories. The first category contains prices measured by Consumer and Industry Price Indices. News on the real economy covers industrial production, GDP, factory orders, retail sales, trade balance, current account, and unemployment. Monetary indicators are represented by the money aggregate and central banks' key interest rates. The category business climate and consumer confidence contains four measures. The first two are official indicators of the business climate and consumer confidence that provide an assessment of the current and expected business situation by surveying companies and the degree of optimism about the current and future state of the economy by surveying consumers. Then, there are two indices published by the Institute for Supply Management (ISM) in the U.S. and their equivalents for the Eurozone. These are the ISM index on business activities (non-manufacturing) and the Purchasing Managers' Index (PMI). Both indices are widely used by financial analysts and traders worldwide.

There is total of 536 U.S. announcements entering the Czech stock market during trading hours (9:30–16:00 CEDT) for the period under research. News with negative, in line, and positive impact are roughly in a ratio of 3:1:3 in total, but proportions differ across news types. Announcements on unemployment are represented most frequently, followed by those on prices, real economy activities, and business confidence. The Eurozone news group is represented by 899 announcements and contrary to the U.S., all three types of news enter the market in almost equal proportions. News on business confidence, prices, and real economy are the most frequent. The Eurozone announcements are more evenly distributed among various types than U.S. news because the trading hours overlap with Central European markets is much larger. Budapest receives the broadest sample of news due to the longest span of the trading session (9:00–16:30 CEDT). There are 700 announcements originating in the U.S. and those with negative/positive impact are equal in number (307/307). Only about 11% of announcements are in line with market expectations. The distribution of the announcements is similar to that in Prague. Unemployment announcements is the single most frequent category, followed by prices. Representation of Eurozone news totals 934 announcements, with negative and positive impacts carrying almost equal weights (315/320). The trading session in Warsaw is the shortest among the countries (10:00–16:00 CEDT) and that is why the number of foreign news announcements is also the smallest. The numbers of the announcements originating in the U.S. and Eurozone are 535 and 731, respectively. Their division among various types is naturally similar to that in Prague and Budapest.

2.2. Estimation Methodology

We employ the augmented generalized autoregressive conditional heteroskedasticity (GARCH) model attributed to Bollerslev (1986) to empirically test for the effect of macroeconomic announcements on stocks and to assess stock market volatility. We augment the mean specification by parameters to account for the effect of macroeconomic news in the form of deviations of scheduled releases from market expectations and the effects of spillovers from neighboring emerging markets as well as two major developed markets (Germany and the U.S.). The volatility equation is augmented by a set of dummy variables to capture intraday and daily effects. Thus, our model effectively captures the effect of news and

market spillovers on stock returns and the effect of trading patterns on stock volatility. The baseline model is specified in the following form:

$$R_{i,t}^E = \sum_{y=2004}^{2007} \lambda_y + \sum_{k \in \{EU,US\}} \sum_{j=1}^{p} \pi_k R_{k,t-j}^M + \sum_{i=1}^{2} \sum_{j=1}^{q} \gamma_i R_{i,t-j}^E + \sum_{j=1}^{n} \sum_{l=1}^{3} \delta_{l,j} xn_{EU}^j + \sum_{j=1}^{n} \sum_{l=1}^{3} \kappa_{l,j} xn_{US}^j + \varepsilon_t \qquad (1)$$

$$h_{i,t} = \omega + \sum_{m=1}^{r} \alpha_m \varepsilon_{t-m}^2 + \sum_{m=1}^{s} \beta_m h_{i,t-m} + \sum_{\tau \in T} \mu_\tau D_\tau + \sum_{d=1}^{4} \psi_d W_d \qquad . \qquad (2)$$

The variables in the mean equation (1) are coded as follows. Our dependent variable $R_{i,t}^E$ is the return on a specific emerging (*E*) market stock index *i* (Budapest, Prague, Warsaw) at time *t*. The parameter $R_{k,t-j}^M$ is the lagged return on a specific mature and developed (*M*) stock market index in the European Union (*EU*) and the United States (*US*). As a proxy for the Eurozone we employ the German DAX index from the Frankfurt stock exchange and for the U.S.A. we employ the Dow Jones Industrial Average of 30 stocks index.[10] Coefficients π_k capture the effects of market spillovers from the two developed markets. The parameter $R_{i,t-j}^E$ is the lagged return on a specific emerging market stock index other than that employed as a dependent variable and coefficients γ_i capture the effects of spillovers from emerging markets (e.g., in the case of the Prague index being the dependent variable, lagged indices from Budapest and Warsaw are right-hand side variables). Coefficients λ represent a set of year-specific dummy variables that provide information on stock index returns in a specific year during the period 2004–2007.

A vector of the news announcements defined in section 2.1 is denoted as xn_{EU}^j for the announcements originating in the Eurozone (*EU*) and xn_{US}^j for those originating in the U.S.A. (*US*). Further, subscript *j* indexes news announcements according to their type or class that we described in section 2.1. Finally, subscript *l* indexes the three qualities of the news entering our specification. This way we are able to disclose a different reaction expected from a behavioral point of view to announcements that are below market expectations (excess negative news, $\delta_{1,j}$), announcements that are in-line with market assessment (news with no-impact, $\delta_{2,j}$), or announcements above market expectations (excess positive news, $\delta_{3,j}$). Thus, coefficients $\delta_{l,j}$ capture the contemporaneous effects of various types of news on stock index returns. The numbers of lags *p* and *q* are equal to 2 and were chosen by the lag selection information criteria. Hence, in terms of lag structure we estimate the same model that is consistent across the three markets. Finally, intercepts in different years captured by λ_y are allowed to vary for the sake of filtering away effects of potentially different means during the consecutive years.

The conditional variance $h_{i,t}$ specification (2) is of the GARCH(1,1) type with lags *r* and *s* chosen by the lag selection information criteria. The ARCH term, $\alpha \varepsilon_{t-1}^2$, primarily reflects the impact of news or surprises from previous periods that affect stock price volatility. A significant and positive value of α that is less than one characterizes the extent to which shocks do not destabilize volatility. When α is greater than one, shocks from the past are

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[10] Germany is the most important trading partner for the three new EU countries under research. Using a composite Stoxx 50 or EuroStoxx 50 index is not feasible as these are not available historically at the desired intra-day frequencies.

destabilizing. The GARCH term βh_{t-1} measures the impact of the forecast variance from previous periods on the current conditional variance or volatility. Hence, a significant value for β that is close to one indicates a high degree of persistence in stock price volatility. The sum of both coefficients, i.e., α plus β, indicates the speed of the convergence of the forecast of the conditional volatility to a steady state. The closer its value is to one, the slower the convergence.

Further, behavior on stock markets has been documented to follow periods of lower and higher activity during a trading day in the form of a *U*-shape pattern (e.g. McMillan and Speight, 2002; Fan and Lai, 2006; Égert and Kočenda, 2007). Such a pattern can be explained by the arrival and incorporation of news during the beginning of the trading session or by intraday trading activity, implying the opening and closing of positions at the beginning and at the end of the trading session. In order to avoid mixing periods of varying volatility our specification includes a dummy variable D_τ associated with five-minute intraday intervals (ticks) at the beginning and end of the trading day. The associated coefficients μ_τ capture intraday volatility whose presence has been documented in the literature for quite a time (see Andersen and Bollerslev, 1998). The volatility at the beginning and end of the trading session is considerably higher than during the rest of the trading day and this decline in volatility is captured by the constant ω. The range of the intra-day-effect dummies (*T*) was selected based on the results of a standard *F*-test. Finally, dummy variable W_d allows accounting for the effect of specific days during a business week. Four coefficients ψ_d capture these day-of-the-week effects well documented in the empirical literature including European markets (see e.g. Tonchev and Kim, 2004; Chang, Pinegar and Ravichandran, 1993; Kiymaza and Berument, 2003). To sum up, the volatility specified by equation (2) represents a simple yet comprehensive specification allowing for assessment as well as the influence of trading patterns on volatility.

Based on the Akaike information criterion, the Schwarz-Bayesian information criterion and the significance of the coefficients, we select a specific version of the baseline model that corresponds best to the data on each stock index. The standardized residuals from such a specification are free from ARCH effects. Estimation of the model uses a log-likelihood function, $\ln L_t = -0.5(\ln(2\pi h_t) + \sum_{t=t_0}^{T} \varepsilon_t^2 / h_t)$, as in Bollerslev (1986). The maximum-likelihood estimates are obtained by using the numerical optimization algorithm described by Berndt et al. (1974). To avoid the risk of overestimating volatility, we do not impose the normality condition on the distribution of errors. Rather, we allow for generalized error distribution (GED) following Nelson (1991). The volatility of stock prices is likely to follow a leptokurtic data distribution that is reflected by an actual GED parameter considerably lower than 2, which is the value in the case of normal distribution. Leptokurtosis implies that daily stock price volatility tends to concentrate around the mean during tranquil market periods but that shocks to volatility are large during turbulent times.

The above specification accounts for the effect of various types of news on the firms' market value, hence the value of the market index. The emerging European stock markets are documented to be influenced by EU news but also by U.S. macroeconomic announcements at 14:30 CEDT and by the opening of the U.S. stock market at 15:30 CEDT. The news announcements from these two regions are hypothesized to exhibit the most direct influence on the new EU stock markets. The specification also accounts for the spillover effects through the lagged index returns of neighboring emerging stock markets as well as lagged German and U.S. returns. Since trading hours in different markets span over different time periods we

treat this difference by estimating the set of mean and volatility equations for each of the three emerging markets separately.

3. EMPIRICAL FINDINGS

The results of our analysis show substantial spillovers affecting the new EU markets together with the news impact on the index returns in general. The German DAX exhibits the strongest spillover effects, followed by the Dow-Jones and regional indices whose impact varies. The impact of announcements differs with respect to the extent and origin of the news as well as the impacted stock market. We credit these differences to the varying extent of foreign, mostly institutional, investors on the three markets and their shares on traded volumes. The presence of foreign investors on the Czech and Hungarian markets is heavy and varies around 55–60% and 75% of the traded volume, respectively, over time. The Hungarian market is dominated by investors from the old EU while U.S. investors prevail on the Czech market. This is in sharp contrast to the Polish market where only about one third of the traded volume is due to foreign investors. Different perceptions and sensitivity to news origin are conjectured as reasons behind the differences in our results.[11]

The general finding is that the three markets are not efficient in the sense of efficient market theory because numerous significant coefficients associated with the impact of the news testify that news is not absorbed by the market immediately and reflected instantaneously in prices. Announcements originating in the Eurozone exhibit more effects than U.S. news. In terms of specific news, EU current account, consumer confidence and PMI affect all three markets while U.S. prices are the only news of the same reach. The volatility of the returns is accounted for at the beginning and end of the trading session and it declines dramatically during the rest of the day. The differences in the extent of volatility at the three markets should be credited to differences in trading hours on these markets.

3.1. Czech Republic

The returns on the Prague stock index PX-50 reflect most heavily spillovers from Frankfurt whose impact is double that of Dow-Jones. Regional spillovers are smaller but comparable to the U.S. spillovers and they come from Budapest. All spillovers are positive and hint at the market being efficient but this finding is contested by the multiple effects of news announcements. Among these the effects of prices and real economic indicators from the Eurozone stand out. A positive outcome of consumer price development has a positive effect on the stock index return, while less favorable announcements below market expectations on industrial production, current account, and unemployment all exhibit negative effects on stock returns. Further, the effect of a consumer confidence release that is in line with the market shows a negative impact. Higher-than-expected growth in the Purchasing Managers' Index (PMI) exhibits a positive impact on stock returns while a value that is in line with the market assessment shows negative impact of similar extent. While the positive impact of positive news does not pose an intellectual challenge, the negative impact of the in-line outcome of consumer confidence and PMI is not clear. A possible interpretation is that markets expect a specific value of a particular indicator but hope for a better result, which turns an in-line outcome into negative news. This interpretation also fits with the empirical facts that negative

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[11] We rule out the different trading hours as the cause of the different results across the markets. When constraining the data sample to the common trading window as in Hanousek, Kočenda, and Kutan (2009) the differences remained of the same extent.

news impacts stocks more than positive news of the same caliber; the same result is found by Kaminsky and Schmukler (1999) on Asian emerging markets.

The only announcements originating in the U.S. that impact index returns are consumer and producer prices. A favorable development in producer prices has a positive impact while consumer prices that are in line with expectations exhibit a negative impact. The findings show that the market index is affected by spillovers from other markets as well as specific news where most of the announcements exhibit an intuitively correct impact on the return. This finding rules out market efficiency in the sense of the strict theoretical definition.

3.2. Hungary

The Hungarian stock index exhibits considerable spillover effects from the other two regional markets; the spillovers are of unequal magnitudes and the effect of the Prague market dominates that of Warsaw. On the contrary, the impact of the Frankfurt and New York markets are of equal caliber but only Frankfurt retains further influence.

The Hungarian index is also impacted by the number of announcements whose majority originates in the Eurozone and they generate the following impacts. In terms of news from the real economy, announcements on GDP and trade balance that are in line with market expectations prompt positive and negative effects on stock market index returns, respectively. Better-than-market announcements on current account development generate a positive effect, while lower-than-market results on unemployment are reflected in a negative impact on stock returns. Survey indicators on the climate and confidence regarding the EU economy provide unambiguous interpretations. A lower-than-expected consumer confidence indicator triggers a negative effect while in-line or better-than-market developments of the Purchasing Managers' Index (PMI) yield positive effects.

3.3. Poland

The Polish stock index is affected by spillovers from key world as well as regional markets. The effect of the Frankfurt market is larger and more prolonged than that of the U.S. In a similar manner the effect of Prague is smaller and less extended than that of Budapest. The impact of spillovers is complemented by numerous effects of news. In terms of prices, there is no effect from the Eurozone but an important and intuitively meaningful effect of U.S. announcements. Below-market development in consumer prices is reflected by a negative impact while movement in producer prices better than market expectations impacts stock returns positively. At the same time, producer prices in-line with market assessment impact the stock index negatively, a sign of the tendency of markets to undervalue positive changes. The impact of real economy announcements on stock returns depends on the region of origin. Above-market progress in industrial production and currency account in the EU results in a positive effect. In-line announcements on retail sales and trade balance in the U.S. are reflected in a strong and positive effect while in-line unemployment brings a negative impression on the index return. Survey indicators produce adequate reactions no matter in which region they originate but the impact of U.S. news is less frequent than that of the Eurozone. The EU consumer confidence announcements that are below and above market expectations produce negative and positive effects of comparable extent, respectively. Further, lower-than-expected growth in the Purchasing Managers' Index (PMI) from the U.S. negatively impacts stock returns while its above-EU market outcome shows a positive effect.

Finally, in-line movement in the Eurozone monetary aggregate is echoed by a negative influence on stock returns.

3.4. Robustness Check

As a robustness check we also performed estimations with local news originating at the three markets. These announcements are intentionally made before trading begins in most cases. For example there is only a single announcement emerging during trading hours at the Budapest stock market. More local news is present during trading at markets in Prague and Warsaw but their extent is marginal when compared to those coming from the Eurozone and the U.S. In any event, the effect of local news is mostly insignificant and for that reason we do not report them. Additionally, by not employing a handful of the local news we further minimize the bias and improve the identification of the effect of the Eurozone and the U.S. announcements on the stock returns.

4. CONCLUDING SUMMARY

We analyze price discovery on three emerging EU stock markets: the Czech Republic, Hungary, and Poland. In our analysis we employ high-frequency five-minute intraday data of stock market index returns. We analyze the effect of the four classes of Eurozone and U.S. macroeconomic announcements from the *excess impact* perspective, e.g. we account for the difference of each announcement from its market expectation. Further, we jointly model the volatility of the returns accounting for its intra-day movements as well as day-of-the-week effects.

Despite varied effects inferred from estimates we can draw some generalizations specific to all three countries. The effects of other stock markets are dominated by spillovers from Frankfurt stock exchange while reaction to the New York market is smaller. The findings are sensible given the ongoing process of European integration that also affects financial markets and the narrow time window during which trading at the U.S. and European markets overlap. Spillovers from the neighboring markets are smaller or comparable in cumulative magnitudes to the effect of New York. Among them the Budapest stock market produces the strongest spillover effects, followed by Prague, and the smallest effect is from Warsaw.

The effects of macroeconomic announcements need more detail to summarize. Among the four classes of macroeconomic announcements, monetary news has virtually no impact on stock returns. The reason might rest in the relative detachment of monetary policy figures from stock market developments. Rigobon and Sack (2006) claim that the "detachment" of monetary policy expectations and asset prices from incoming economic news is partly related to the difficulties associated with measuring the surprise component of that news. Since we account for the surprise component our findings show that the detachment might be due to the low value stock markets place on monetary announcements.

Prices on the other hand affect all three markets, mostly in a very intuitive manner: worse (better) than expected results bring negative (positive) effects on stock returns. This result upholds the market's ability to effectively incorporate inflation into stock prices. The interesting trait in the price effect findings is the dominating influence of U.S. prices while the

Eurozone announcements pass nearly unnoticed.[12] The possible and sensible explanation might be credited to the well-mapped expectations of the European Central Bank's operations that in the integrating Europe pose little challenge to financial market assessment.

The real economy class of announcements offers varied results from which the news on the EU current account stand out as it affects all three markets in the same manner without exception: better-than-expected results prompt a positive reaction and worse-than-expected results prompt a negative one. This finding should be paired with the heavy dependency of the three economies on foreign trade with other EU countries, the presence of EU firms in these markets, the similarity of supply and demand shocks (Fidrmuc and Korhonen, 2003), and a relatively high degree of business cycle correlation (Fidrmuc and Korhonen, 2006) between the old and new EU members. Needless to say that the most important companies present in the new EU economies as owners or co-owners of the major local firms and banks are also often quoted on the local stock markets. Other real economy announcements are limited in their reach to one or two markets. Industrial production influences Prague and Warsaw, while announcements on trade balance and unemployment are echoed in Prague and Budapest. Announcements on factory orders and retail sales do not provoke any market reactions. Real economy announcements originating in the U.S. bring only scarce evidence of their effects on stock returns. Many announcements are simply not available during the Europe-U.S.A. trading window. The Prague stock market is not affected by U.S. news at all while Budapest and Warsaw are only sparingly.

Finally, business climate and confidence announcements provide valuable insights to the previous categories. Practically no effect of the U.S. survey announcements has been found in any of the three markets and the effect of those originating in the Eurozone is limited. Only the news on consumer confidence and the Purchasing Manager's Index (PMI) impact all three markets in an intuitive manner common to developed markets: a worse-than-expected outcome provokes a negative effect on stock returns and better-than-expected results prompt a positive one. All the above results thus validate the *excess impact* approach that highly reduces difficulties in measuring "news" correctly.

News affects the volatility of the stock return indices in a similar manner but specific features vary across the three markets. The volatility of the Prague index is affected by the past announcements most but in no market is the effect destabilizing. The Budapest index exhibits the highest persistence of volatility. The volatility of the Warsaw index shows the slowest convergence to the steady state. In terms of the intra-day features the Budapest market exhibits the highest volatility at the beginning and end of the trading sessions while Prague records the lowest volatility during the two periods. Volatility declines dramatically on the three markets during the rest of the trading day and its extent is comparable across the markets. All three markets also show a decrease in volatility by the middle of the business week.

Our findings show that real-time interactions on the new EU markets are strongly determined by matured stock markets as well as the macroeconomic news originating thereby. The differences in results across the three markets seem to be driven by differences in the composition and origin of the key market participants. The discovered detailed effects are complemented by a characterization of market volatility. Our findings yield insights into the process of the development of new European capital markets and stock market integration in

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[12] The importance of the consumer and producer price information on the U.S. market found by Kim, McKenzie and Faff (2004) is in line with our findings.

the EU. As these new markets become more mature and globally integrated they become more important for the real economy of specific countries. Information flows related to developed economies, their ups and downs, were shown to affect emerging European capital markets, whose developments then affect the real economy. This is because smaller emerging markets are quite sensitive to changes in the economic situation in developed markets as well as to changes in perceptions that are conveyed via macroeconomic news. As the recent financial problems unfold globally, we can expect increases in sensitivity to the information flows reaching emerging markets and the need to understand them better.

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THE FINANCIAL CRISIS AND BUSINESS ANGELS: A COMPARATIVE STUDY OF POLAND AND SLOVENIA

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1. INTRODUCTION

Recently, the supply of start-up and early stage equity finance has become even more acute due to current crisis in the banking sector that has made lending to small enterprises less attractive thereby contributing to the finance gap. The primary factors underpinning the banking sector's position on SME lending are the low margins, high overhead costs and risk involved (moral hazard). Some of these issues are well recognised and explained in the literature on the subject. However, the current crisis has amplified these problems further. As for venture capital funds they are finding it increasingly difficult to accommodate the large number of small deals with heavy due diligence requirements. Here the main theoretical framework such as information asymmetry, agency theory, and portfolio concepts are used to explain the functioning of formal venture and informal venture capital industry.

Therefore, in the process of creating a more entrepreneurial culture and encouraging individuals to establish new businesses, start–up companies in most countries are facing the immediate issue of raising capital. This is further compounded by the current global financial crisis.

One of the potential solutions to these problems is informal investment markets, where finance is provided by investors known as Business Angels (BAs). Angel investors are crucial in financing entrepreneurs once they have exhausted their own resources. This type of investment is at the juncture of two approaches: equity investing and entrepreneurship (Wiltbank, 2005).

This paper will explore some of the issues indicated above, paying particular attention to the worsening financial environment using two EU member states of Central and Eastern Europe (Poland and Slovenia) as case studies. It is based on a series of interviews with the representatives of Business Angel networks and with Business Angels themselves. Most of the interviews were conducted by using a semi-structured questionnaire as it provided some degree of flexibility which was required as themes and questions varied from interview to interview. The need for flexibility stems from the fact that the interviews were conducted in different organizational contexts in relation to the research topic (Saunders, 2007). Most of the interviews were audio-recorded, and in other cases extensive notes were taken.

With these ideas in mind, the remainder of the paper proceeds as follows: (1) it identifies the current trends in financial markets and venture capital investment in Poland and Slovenia ; (2) investigates the Business Angels phenomenon examining their networks and highlighting their activities in Poland; (3) evaluates the development of Business Angels activities in Slovenia; (4) finishes with a comparison of Poland and Slovenia from which conclusions regarding the functioning of BAs markets are drawn.

2. THE CURRENT TRENDS IN FINANCIAL MARKETS IN POLAND AND SLOVENIA

The macroeconomic indicators for both Poland and Slovenia were positive and most enterprises were in a financially sound position at the beginning of the current financial crisis, but this does not mean that they are immune to it.

It is widely accepted that the effects of the world crisis will indirectly affect both countries due to their ties to financial markets and foreign trade. Although, when compared with other Central and East European countries (e. g. Latvia and Estonia) the Polish economy has shown a degree of immunity to the global crisis. Similarly, Slovenia has not experienced the crisis that intensively. This is often explained by the relative independence of the Slovene banking sector which has only a small proportion of foreign ownership by large multinational banks; and is thus to a great extent still owned by the government. However, given that 60 % of Polish exports go to euro zone countries and Britain, Polish exporters are affected by currency fluctuations and most importantly by declining demand from these economies (Zajączkowska-Jakimiak, 2009). As for the Polish banking system, its short-term liabilities account for only 8% of Poland's GDP while in the United States this figure is 15%. There are other reasons why the consequences of the global financial crisis should be less pronounced in the Polish case. Firms in Poland are less dependent on loans, and businesses fund their investment projects from their own resources to a greater degree than in other countries. Furthermore, banks which operate in Poland were not involved in risky operations in the sub-prime markets (Lemańska, 2009). However, this is not to say that the economic climate in these two countries is favourable for entrepreneurs. A survey by the Polish Chamber of Commerce found that 80% of Polish entrepreneurs expect in the country's economic situation to deteriorate; and more worryingly, in the last few months, around 75% of Polish entrepreneurs have been refused a bank loan (Polish Market, 2008).

The situation in Slovenia appears to be very similar to the one in Poland. Exports to the euro zone account for more than a half of total exports, and consequently these are suffering from decreased demand from these economies. The short-term liabilities of the banking sector are reasonably low (under 10%). Slovenian banks are, with two exceptions, not members of large

multinationals, and were therefore not involved in many risky operations; having lost in aggregate only about 15 million Euro in the Lehman brothers case. The results of opinion surveys in Slovenia do not show much optimism, with as much as 75% of small business owners thinking that their businesses will face at least some difficulties in coping with the present crisis. Slovenian entrepreneurs are also challenged by so the called loan-cramp. Most banks 'sit on their money' and are extremely precocious in their lending activities, being aware of the severe drop of prices in both the real estate market and stock exchange. These two areas represent the most preferred instruments for collateral.

In response to the worsening crisis, the Polish government adopted a 'Stability and Development Plan' in November 2008 as one of its anti-crisis measures aimed to increase the availability of loans for businesses and strengthen the system of guarantees for small and medium sized companies. Some of the measures are still in a draft form and will not be implemented until later on in 2009. In the meantime, entrepreneurs and potential business owners are turning their attention to formal and informal (BAs) venture capital as alternative sources of finance. Similar crisis induced programmes were adopted in Slovenia in late 2008. Regarding SMEs, there is a strong interest in subsidized investments for new machinery and equipment. Certain financial initiatives were also offered in the form of soft loans and grants to facilitate mainly R & D activities with a clear export orientation for SMEs. The first state-owned venture capital fund was also established. However, due to unresolved issues of this state-aid scheme with the EU authorities, the fund has not made a single investment within its first year of operation, although the funds are secured from the national budget.

As for the formal venture capital market in Poland, it is still underdeveloped. At the beginning of the 1990s, a majority of venture capital in Poland (in excess of 90 per cent) came from abroad. By the mid-1990s, 12 companies had conducted venture capital type activities and managed total capital funds of around $660 million (Tamowicz and Stola, 2003). In response, the Polish government has intensified its efforts to stimulate endogenous venture capital. Its first venture capital/private equity operations began in 1990 with the establishment of the 'Polish American Enterprise Fund' followed by the National Investment Funds. However, venture capital firms that operate in Poland set minimum investment levels of several million Polish Zloty which are difficult to match by start-up firms. As for Polish venture capital firms, they still have a very small share of the market and are reluctant to invest in small start-up companies due to a continued perceived high risk associated with the SME sector. In a similar manner in Slovenia, there is a major start-up initiative to assist and stimulate self-employment. However, with a grant limit of 4000 Euro, it is hardly enough to cover one's living expenses let alone use it as seed or start-up capital.

Under these circumstances, the start-up firms in Poland and Slovenia have to rely mainly upon self-financing sources, and once these are exhausted they turn their attention to the informal venture capital markets (BAs).

2.1. Business Angel Networks in Poland

This section of the paper examines the development of Business Angel investment and networks in response to an increasing funding gap associated with current banking crisis; and the more generic and persistent lack of publicly funded programmes providing financial support for SMEs. The analysis comprises a discussion of Business Angel networks at both national and regional levels followed by an examination of the main characteristics of Polish Business Angels.

At the national level there are three Business Angel networks in Poland: PolBAN, Lewiatan Business Angles (LBA) (operating within the Polish Confederation of Private Employers), and Business Angels Seedfund (BASF). PolBAN and LBA have the same aims and objectives as other members of the European Business Angel Network (EBAN): acting as honest brokers and a 'marriage bureau' for private investors and entrepreneurs who are seeking funds for their new ventures. The third national level network, Business Angels Seedfund, was very recently set up by leading Polish entrepreneurs. While at a regional level there are three newly established networks of Business Angels: SilBAN in Silesia, Resik in Małopolska and LSAB in Lublin. The major features and activities of these organisations at national and regional levels are presented below.

PolBAN was established in December 2003 by Wojciech Dołkowski and three friends as a non-profit organisation. It finances its activities from a variety of sources: sponsorships from private individuals and companies, membership fees, and more recently from commissions based on PolBAN led projects (interview with Wojciech Dołkowski, 13th July 2007, Warsaw). However, funding is still limited though PolBan hopes to get some support from EU sources in the very near future. The organisation is based in Bydgoszcz but also operates through a network of representatives across Poland. PolBAN works closely with more than 30 Business Angels but it is associated with further 70 potential investors and it receives around 150 projects a year. PolBAN is very strict in selecting both projects which require funding as well as potential investors BAs. When commenting on the characteristics of BAs who are associated with PolBAN, Wojciech Dołkowski said "available capital and good will are not enough as business experience preferably in running one's own firm is equally important" (Błaszczak, 2009a).So far PolBAN had successfully completed 5 projects (see Table 1).

Lewiatan Business Angels (LBA) was established in April 2005, with 85 per cent of its funding coming from EU sources. On average, LBA receives around 170 projects a year but only a small proportion of these get funded. So far LBA was instrumental in negotiating 14 deals. Since the beginning of 2007, Lewiatan Business Angels started charging for its services (interview with its new manager Jacek Błoński, 13th July 2007, Warsaw). In December 2008, LBA received 14 million PZL from EU sources to train Polish Business Angels and their client companies. Training will include such issues as firm valuation and managing portfolio investment, and will be delivered by both European and American experts. Who seeks funding from Business Angels associated with LBA? According to Jacek Błoński it is "a variety of people, both young and old. More and more projects come from individuals who work for various corporations but would like to set up their own business" (Błaszczk, 2009b). LBA does not seem to have any sectoral preferences when selecting projects for funding. However, they look for large ventures with an obvious growth potential.

Business Angel Seed Fund (BASF) administers a fund of 40 million PZL and was set up by Polish multimillionaires (Maciej Duda, Maciej Grabski, Jacek Kawalec and Jędrzej Wittchen). These BAs provide new entrepreneurs with not only capital but also contacts with experienced business people and advisors. Unlike LBA this fund focuses on projects in information technology and biotechnology. It also targets those who have extensive experience of working in large companies and who would like to start their own business. So far it has invested in three high technology ventures Screen Network, WebsGo and Polymem (Boguszewicz, 2008).

SilLBAN, a regional BA network, was established in April 2006 in Katowice by three government sponsored organisations (Fundusz Górnośląski SA; Górnośląskie Towarzystwo

Gospodarcze, and Górnośląska Agencja Przekształceń Przedsiębiorstw SA). Its aim is to link angels with investment projects in Silesia.

RESIK –the Regional Network for Equity Investors is one of the early regional Business Angel networks operating in Poland, and first of its king in the Małopolska region of Poland. This network is financed by the European Social Fund and the Polish government under the Integrated Regional Operational Programme. Its aim is to help overcome a lack of capital and limited access to financing by SMEs in Małopolska (www.resik.pl). So far, the fund's managing team has looked at 50 projects and chose five of them for financial support (all of them are associated with new technologies for a greener environment).

Lublin Business Angles (LSAB) was set up with the support of the European Social Fund under the Integrated Regional Operational Programme for 2004-2006 and is managed by the Lublin Development Agency. Although the network works closely with 12 local Business Angels so far there are no completed projects.

Most of the Business Angel networks in Poland are relatively young especially the regional ones and the Business Angels Seed Fund is just over a year old. Therefore, it is too early to assess their effectiveness given a small although steadily growing number of completed investment projects.

Despite the relatively recent formation of BA networks, and the expectation that they will respond to the current global financial crisis, there are some observations that can be made. First, there is now a realisation by the Polish Government that alternative financial support should be made available to entrepreneurs and small businesses along side the conventional banking system that is risk averse. Therefore, there are two emergent forms of BA networks – private and publicly supported that operate in parallel. Second, these networks function at two levels. The private BAs tend to be focused on local or regional investment projects where their knowledge and networks are firmly rooted. Whereas the Government sponsored networks are centrally funded and have a greater national role and presence. As a result of these two distinguishing features, the actual investment projects seem to cluster locally for the private BA networks; with the Government funded BAs casting their net more widely. Third, there are some differences in the economic sectors targeted by the two types of network as we will discuss below in the next section of the paper. It is clear that the private BAs are highly selective and focused on a narrow band of projects such as IT, retail, and catering services. As these areas represent high growth opportunities, it will be interesting to monitor how this is being affected by the current economic downturn. The publicly sponsored BA networks seem to display a more strategically driven agenda as one might expect. They tend to have a more general outlook and act as an instrument for funding start-ups, and with government policy objectives as a backdrop. Fourth, the size of projects funded by the two types of network varies. The privately funded BA networks have a range of investments that vary in the amount of finance offered to a range of small to medium sized projects (with the exception of the Business Angels Seed Fund which supports large, high tech projects).

The role and actions of BAs and their emerging networks is to take risk with investments in exchange for equity and for high return, but outside the commercial banking and investment sectors. These networks are likely to grow further (as they have done in the last three years since our study began) as both types of network develop in an attempt to fill the current vacuum in availability of finance to entrepreneurs and SMEs. However, the expansion of BANs is not a quick fix and they often confront problems with identifying opportunities for

potential investors. For example, the Lewiatan Business Angels group are contacted by large numbers of wealthy and experienced investors who want to act as BAs rather than risk their money on the stock market (Warsaw Voice, 2009). This situation illustrates some interesting features of BANs and potential developments that may emerge during the current economic circumstances.

Business Angel networks tend to be difficult and rather slow to establish. However, they enable potential investors to pool resources since individually they may not have the capacity to go alone on a project. Networks also provide the capacity to gather and share information and expertise. The Government, by using its own funds (and from EU sources), can play a major role in promoting BANs by supporting their initial costs and even jumpstarting investment projects with co-funding agreements in order to reduce risk at an early stage of BAN formation (San José et al, 2005; Aernoudt et al, 2007). This market intervention enables faster network construction and encourages investors by reducing costs, and risk. However, as the Lewiatan network example suggests, one of the factors that may inhibit network operations is the capacity to identify business opportunities, and the need for support in the training of both potential investors and staff in the investment process. Although entrepreneurs may be experienced in running their businesses and can provide valuable advice, they do not necessarily have the knowledge required when engaging in the investment process, especially in areas and sectors where they do not have experience. Therefore, in order to strengthen these networks and ensure that they function more effectively, new areas for them to explore could include: the attraction of more 'virgin' angels as well as facilitating involvement by those who cannot find an investment opportunity; addressing the knowledge and skill asymmetries of business angels concerning unfamiliar areas of investment; using Government sponsored initiatives to market their services to entrepreneurs seeking capital and thus expanding the range and type of investment opportunities for BAs; responding to Government incentives for start-up ventures such as tax relief and loan guarantees; and finally, establishing an organisation that can cope with the increasing complexity of the economic environment for otherwise lone investors.

Therefore, although the current crisis may be relatively less severe in Poland, the Government will be more likely to adopt policies that promote BANs as one mechanism to shore up a growing SME sector and entrepreneurial culture by ensuring that the finance and knowledge gaps do not widen; soon after 'family and friends' sources of capital are exhausted.

2.1 Polish Business Angels - case studies

Venture capital investors (both formal and informal- BAs) can fill in the finance gap and provide their portfolio companies with not only money but also with knowledge and experience in areas where the entrepreneurs lack expertise (Hellmann, Puri, 2002; Bertoni, Colombo, 2005). Several authors have suggested that BAs are involved in similar sets of activities to formal private sector venture capitalists when it comes to their portfolio companies. It is also worth noting that some of the features of formal venture capital are relevant for BA investment while others are not.

First, although in both cases knowledge provided is thought to add to the success of the investee company, the findings and the literature on the subject are somewhat contradictory (Barney et al., 1996; Tykvova, 2006). Second, when examining due diligence, it is clear that it plays a crucial role in formal venture investing but there is less evidence of this process being

consistently applied to BA financing. In a study of American BAs, Wiltbank (2005) suggests that due diligence ranged from only a couple of hours spent prior to investing to over 200 hours. Interestingly, data from our Polish research indicates that BAs closely associated with their networks spend considerable time and effort on due diligence. This is also the case in Slovenia where the two business angels' networks are hosted by financial institutions that are able to provide informal support in due-diligence processing since they have specialized knowledge and the personnel available.

Third, agency risks are of lesser importance in BA type investment as they use their own money, and therefore are not under pressure to prove their competence to outside investors (Luukkonen, 2008). However, the Polish study suggests that some of the agency risks are recognized and dealt with by BA networks. Fourth, communication either face-to-face or via telecommunication contacts with their investee companies are crucial in both formal and informal venture capital situations. Polish Business Angels tend to keep the communication channels open for quite a considerable amount of time (well passed the initial stage of investment) as this increases the chance of a venture being successful and assures early conflict resolution. Despite a lack of empirical evidence, we can speculate that this would also be the case in Slovenia. Even further, in order to give the impression of readiness for more open communication channels, business angels from one of the two networks now place their CVs on the network's web page.

Fifth, when it comes to fund seeking, as BAs invest their own money they do not need to spend any time on this type of activity unlike formal investors. Sixth, BAs invest small amounts of capital and are often one–person organisations so the selection of investment projects takes them less time than is the case with formal investors (Luukkonen, 2008). Seventh, traditionally geographical proximity played a crucial role in both forms of investment. With the advent of modern communication technologies this has changed, and while it is still important in BA type investment (perhaps due to fewer resources and smaller staff numbers) it is of lesser importance for formal venture capital investors (Luukkonen and Maunula, 2007).

When it comes to BA investment, it is a risky business but at the same time presents large potential successes. BAs not only fill in an important investment gap but they also provide advice and access to valuable business contacts and networks. The first Business Angel investment projects in Poland can be traced to the mid-1990s (Nasz Rynek Kapitalowy, 2004). In most cases, projects have to meet certain criteria in order to be eligible for Business Angel's investment (especially those that are to be brokered by Business Angel networks both at national and regional levels). Despite their desire to remain anonymous there are a thousand or more potential Business Angels in Poland who are ready to invest between 50,000 PLZ to several million PLZ in each project (between 12, 000 and a quarter of a million Euro; Puls Biznesu, 2004).

The following analysis is based upon a series of interviews conducted in Poland in 2006 and 2007 with Business Angel networks' representatives, and with BAs themselves. This data illustrates and further supports the analysis developed at the beginning of this section of the paper concerning the nature of BA investment.

Table 1. Categories of Investments funded by Polish Business Angels

ICT/ADVANCED TECHNOLOGY	SERVICES AND RETAIL
Investment in insurance and IT (PolBAN)	Legic an importer of Western produced branded goods (LBS).
Investment in IT consulting (PolBAN)	Investment in two coffee bars ('w biegu café') (LBS).
Investment in Internet based company delivering greeting cards and flowers www1.100lat.pl (PolBAN)	Investment in a company Likwidator involved in enforcing indemnities and insurance claim handling etc (LBS).
Investment in software and equipment for b2b use (PolBAN)	Investment in a company producing guide books (LBS).
Funding for ANT Industria Software Systems for monitoring and controlling water and sewage systems ((LBS).	Investment in a company of independent financial advisers (LBS)
Investment in a world wide company involved with Medical Algorytmics (LBS)	
Two BAs investing in data retrieval company based in Katowice (SilBAN)	
Investment in software for advertising and marketing using LCD/Plasma screens (BASF)	
Investment in a company called Polymem Ltd. specializing in producing membranes for micro and nano filtration of industrial waste (BASF)	
Investment in an innovative company called WebsGo which specializes in internet based products (BASF)	

Source: Interviews with Business Angles and representatives of PolBAN and Lewiatan Business Angels and Business Angels Seed Fund.

Table 1 provides an analysis of Business Angel investment made with the help and support of three national Business Angles networks (with the exception of one investment which was made by a group of individuals in Silesia). It is evident from the table that the features of Polish Angels and their investment practices are very similar to those in the West. A similar view is expressed by Osborn and Slomczynski (2005) who confirm that many conventional features of entrepreneurial activity dominant in capitalist systems were also important in the formation of the 'new' Polish entrepreneurial class, and in the emergence of a growing number of Business Angels.

In terms of the personal characteristics of Polish Business Angels, they are better educated than the national average and better off with respect to ownership of, or having access to, economic assets. Our case studies support the general observation that Business Angels are mainly male (we could find no female business angels in Poland), between 40 and 60 years of age and in most cases have had experience of running a firm. They prefer to invest in a business that is known to them personally or in an industry or sector in which they have prior knowledge and experience. The main sectors in which they invest are technology and ICT (nine out of fifteen investments described in Table 1 are in ICT and technology sectors). At the same time, although angels invest in order to make money they are cautious when in comes to the amount and phasing of investment. So, in a number of cases they invested gradually making sure that their investment was progressing successfully.

The following quote from an interview with a BA in Katowice (2006) illustrates how one of the angels described the relationship to projects in which they become involved:

We give advice on organisation and support to new businesses. Three of us sit here, in our office and talk to these people and agree on a business plan for next year or next month. In consequence, the new entrepreneur performs together with us, and with our involvement from time to time.

Geographical distance is also important for Polish angels who prefer to invest in close proximity to the place where they live and work. As one of the interviewed Silesian Angels put it:

Let's say a distance of 50km or 50 miles, not far so we can go and visit the guy, visit the business. Easy. That's our experience.

Distance matters even more in the case of BAs in Warsaw as they tend to invest mainly in the capital city as it offers more and better business opportunities. However, there are exceptions to this rule since two of the Business Angels featuring in Table 1 come from abroad (one from the US, and the other form the UK).

Some of the Polish Angels are wary of banks and various public bodies as they are still reluctant to lend to small businesses, or expect substantial security. This is increasingly the case under current conditions and is causing a higher rate of business failure. Therefore, networking and personal contacts seem to be a key factor not only in the success of many Business Angels but in providing a mechanism for circumventing the squeeze on finance that firms experience in the current banking crisis. For example, the Silesian angels interviewed for this project have developed a unique relationship with local authorities in a town adjacent to where they live, due to networking and prior involvement in other projects and this benefited them in their next business endeavour (real estate). This type of local, closely coupled networking can provide alternative sources of funding to those businesses and entrepreneurs who are subject to the current credit crunch.

The Polish case studies confirm the crucial role and importance of the national BAs networks. All 15 investments featuring in Table 1 were made with extensive support from PolBAN, Lewiatan BA, and Business Angels Seed Fund. The striking feature of BA networks and their particular strategies for involvement in investment projects is that they chose predominantly from opportunities in knowledge based ventures that have longer term commitments and growth potential. These high-tech firms are more likely to weather the current financial storm since they do not rely upon short-term consumer confidence and spending patterns.

The other organizational features emerging from the data and the effects that may result from the current crisis are perhaps less detectable at present, but may surface over the next year or two. However, a significant characteristic of BA networks at local and regional levels is the extent to which local knowledge and involvement provides key linkages between investor and entrepreneur based upon their social capital. On the other hand, the nationally supported networks have the financial clout to sustain firms and larger investment projects during a prolonged funding famine if the crisis persists.

We now turn to examine the role of venture capital and business angels in the Slovenian economy and consider their specific role in providing finance to new start up businesses and SMEs, and the effects of the current financial crisis.

2.2. BA networks in Slovenia

The BAS network "Business Angels of Slovenia" was established in the beginning of 2007. Up until the August 2008, 20 people have joined (but among them, there is only one woman). They committed themselves to invest a minimum of 50.000 euro a year each. However, as classical business angels they would also provide companies with their knowledge, experience and social capital. A formal system of evaluating proposal has been established. The four levels of the evaluating process starts with management board, followed by a professional evaluation, interviews and presentation of the project in front of investors at investor's 'dinners'. The planned investments in high-growth potential companies (mostly start-up and spin-off) in Slovenia will be between 50.000 and 300.000 euro, and expect that the majority of investment projects will be syndicated. The expected investment cycle is between three and five years with an anticipated 30 % yearly rate of return. Although there is some interest from the potential angels to join, the expansion of membership is not expected to go beyond 40 members.

Despite very ambitious reports about the number of potential investments in the pipeline, and optimistic plans about expected number of investments before the end of 2007 (Helinska-Hughes et al., 2007) there is nothing much to add after almost two years of operation. The representatives of the network keep on being very active in exploiting all public relations and promotional opportunities (entrepreneurs' award ceremonies, business plan contests etc.). There have been official announcements of the first two investments made through the BAS network. Both investments were made in the development of internet based applications, one with a focus on tourism and the second on hardware optimisation. This probably again confirms the finding from Vadnjal and Glas (2003) that Slovenians are rather reluctant to accept external (non-family) financing as equity into their businesses.

The second Business Angels' network was established in April 2008 as an initiative launched by the club of young executives (under 40 years old). This brought together 17 business angels; 9 of them entrepreneurs, with the rest comprising top-ranking managers from medium and large enterprises. They operate as a forum, organizing three to four events per year where three to four business projects are presented to the audience. So far, they haven't succeeded in closing any deals in the terms of cash investments; however, a couple of strategic alliances between business angels and entrepreneurs have been established. It has been noted, that BAs with an entrepreneurial background are more proactive in attempting to close any deals. On the other side, the demand for funding is huge; however, it is clear that there is a serious lack of ambitious and high quality projects coming forward.

2.3. Slovenian Business Angel case studies

Because of the modest outcome from the business angels' network activities we were only able to interview three business angels. The interviews revealed more about the personal characteristics of business angels rather than providing data about the investments they have made.

Case study 1: Igor (50) can be regarded as a typical self-made man. His parents were blue collar workers in the local factory. He moved to the capital to become a law student with "only a plastic bag" in his hands. He had to work to pay for his living. He graduated from the law school and got his first job as an apprentice at the court of justice. "*Everything was simply*

too slow for me," Igor says today. After only few months he left the job and started his first business and quickly became a serial entrepreneur starting new businesses and selling them (tourist agency, bookstore, gambling machines). He made his fortune while speculating with privatisation bonds and is now among 20 richest men in Slovenia. His two main businesses are stock exchange brokerage and personal asset management. Apart from these two he is involved in at least ten other businesses (he avoids revealing an exact number) in different industries such as: restaurant, hotel, consulting service (specializing in mergers and acquisitions), real estate development etc. In his main two businesses he is the sole owner while all other businesses look like partnerships (although other partners' names tend to be the same with Igor possibly retaining the leading role). He has also established a charity to fund education for orphaned children. He doesn't like the term "business angel" and prefers to be called an investor. He likes investments connected with real estate and food processing and hospitality. He has already invested in former Yugoslav republics. He regrets that he does not understand technology (*"I have hard time with my computer."*) so he does not see himself investing in more sophisticated businesses. However, he always likes to find time to listen to new business proposals. He prefers syndicated (but not more than 3 or 4 partners) investments. He avoids giving an exact answer to a question about how much he would be ready to invest: *"Money is not a matter if the proposal is good."* He believes that business angels' networks make no sense. He gets involved in business proposals mainly through his personal network although he is very family oriented (wife and three primary school sons) and claims he never works after 6 P.M. or during the weekends. He believes that risk is the essential part of business success but *"You have to know all the time how fast you are able to drive."* He is mainly a hands-off type of angel.

Case study 2: Rok One (27) inherited business from his father who had been a successful entrepreneur before he suddenly died in a car accident five or six years ago. Rok took over at the age of 21 and within five years their business (processing equipment) is making five times more revenues and ten times more profits as in the year when his father was still in charge. Meanwhile he managed to graduate with a degree in mechanical engineering. However, he feels that running the family business does not bring him as much fun and satisfaction as it used to. Furthermore, an on-going expansion of the present business activity would demand a serious restructuring of the company and acquisition of new resources for which he has no motivation at the moment. He has already started first negotiations to sell the business facing opposition from members of his family (his sister, mother, grandfather) who think that selling the family jewel would be something inappropriate. However, he already invested some extra profits from the existing business. He co-invested in one real-estate project and in a high-profile restaurant. He is really eager to invest in to some more technology based businesses, *"This is what I, after all, graduated from."* He says he has several project in the pipeline. He gets involved in projects and with entrepreneurs mainly through his personal network of friends, colleagues, classmates etc. (*"I love to take short courses in various business disciplines. You meet at least 30 people there."*). He does not have a family of his own yet but he likes to be invited to different social events where he entertains people with his humorous way of telling stories, discussing up-to-date news etc. He says that always liked to meet entrepreneurs with fresh business ideas. However, he complains that nobody is able to explain the business model to him but everybody is just emphasizing technological superiority. He would be delighted to invest in some more technology oriented business idea if it was attractive enough and close to a more hands-on type of investment management. On the question of how much he would be ready to invest he says *"I can afford loosing a couple of hundred thousand dollars."* As for the business angels' networks, he thinks that they are

"more for personal affirmation of those who initiate them" and is not interested in joining them any time soon.

Case study 3: Rok Two (40) started his business with a partner in flexy-packaging printing industry at the age of 30. Before that he served as a sales manager in different companies, mostly in food processing industry for almost ten years. He left his studies after his first daughter was born and started to study business again when his printing business was well on its way. He sold his business to a bigger company for "*less than 10 but close*" million euro. "*We didn't plan to sell but their offer was irresistible.*" He now serves as an adviser to the new director of the company appointed by new owners and gets his salary for staying at home and being available for consulting to the new director. After one year of doing this, he says that he is terribly bored and needs to get involved in some entrepreneurial activity. Although he personally sees many opportunities he says that he doesn't feel like starting up a business on his own very soon, because "*I remember too well the first year of my entrepreneurial career, when we really had hard times.*" So he has decided to seek some opportunities to become an investor in new companies. He made two minor investments in internet-based companies, both working on more free-time and/or leisure service projects. In both cases, he made the investment with his former business partner. He says that he is hands-off type on an entrepreneur, but in one of the invested companies (which I as co-author of this paper personally know) they say he is really hands-on. He would not mind investing in a syndicate but only with people whom he would personally know very well. Investing outside Slovenia would not be a realistic option for him, as he perceives this as being too risky. He is very much attracted by technology although he admits that he does not possess a very good understanding of it. He smiles instead of an answer to a question about how much he would be ready to invest: "*I told you for how much I sold my company.*" His opinion about business angels' networks is rather reserved: "*Maybe, some day, but I prefer doing business with a certain level of privacy and not a high level of publicity…*"

Common characteristics of the studies cases can be summarised as follows: (1) they are all men with very different family and experience background; (2) all interviewees were or still are entrepreneurs; (3) the source of wealth is mostly their own entrepreneurial success; (4) they all have made investments or they at least have some deals in the pipeline; (5) they came in touch with companies through their own networking and generally don't appreciate business angels' networks very much; (6) they all express a preference for syndicated investments; (7) their geographic proximity is more or less Slovenia and partly western Balkan countries; (8) their industry preferences are not clearly articulated; (9) they tend not to be very clear regarding hands-on or -off type of supervising their investments; and (10) the available sum for investment would not be revealed.

3. CONCLUSION

Neither Poland nor Slovenia has experienced the current economic crisis as severely as most other Central and East European countries. This is partly because the banking sectors in these two economies are less exposed to the US and west European financial systems, and the high risk 'toxic' loans that have destabilised many banks. However, there is still a significant degree of interdependence between Poland and Slovenia, and the rest of Europe since they trade heavily within the Euro-zone; and therefore, the knock-on effects are still serious. The direct implications are in terms of lower growth and demand, but the Polish and Slovene banks are also adopting a similarly cautious posture towards lending, especially to

entrepreneurs, small businesses, and new ventures. This crisis has also resulted in falling real estate values and lower shares prices on the stock exchanges. Both countries have implemented anti-crisis measures such as targeted state-backed loans to small and medium sized businesses with varying degrees of success. The Slovenes ran into trouble with their's due to EU state-aid regulations that has prevented an immediate response to the situation.

Since the BA networks in Poland and Slovenia are still relatively young and underdeveloped, this source of capital was unlikely to have a significant impact under current circumstances. However, they are recognised by both governments as potentially significant actors in the venture capital market place. Therefore, there is a concerted effort by governments in both countries to take a more active role in supporting informal sources of venture capital and promoting Business Angel networks. These networks also provide social capital through the range of non-financial benefits including advice and access to networks of investors. However, since this social capital takes a fairly long time to accumulate, the networks are slow to form and develop. Hence, they were not able to act swiftly during the onset of the 'credit crunch'.

Business Angel networks in Poland and Slovenia share similar characteristics in terms of investor profile, network operations and fairly localised geographical reach. They also display the basic difference within the Business Angel community, such as those who prefer to work independently and those who participate in syndicated investment projects, and modes of participation – hands-on or off. Despite the networks' relative youth and comparatively small sizes, the state support which they receive indicates that they will play a greater role in the future. For the moment, their lack of critical mass in the venture capital market means that they will only have a minor impact on easing the credit-cramp currently being experienced by entrepreneurs and small businesses.

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FINANCIAL CRISIS AND EU ENLARGEMENT- SHOULD ICELAND AND CROATIA BECOME EU MEMBER STATES AT THE SAME TIME?

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1. INTRODUCTION

The crisis of global capitalism started from summer 2007 and has become a manifest crisis of the "the real economy" of productive and commercial capital since summer 2008. The financial crisis has reached a maximum in the autumn of 2008. That is the largest banking crisis since 1929-33 caused by price bubble that was stocked by financial innovation and increases in lending. The crisis had started first in the USA and has sent shock waves around the globe so the former giants of the financial world have found themselves suddenly facing bankruptcy.

The financial crisis with its numerous negative features created the idea of the new European integration process. Many were surprised to hear that precisely Iceland could become the 28th Member State of the European Union (EurActiv, 2008). Until now, it has not been likely for a country which faced bankruptcy to be accepted by the EU. On the other hand, Iceland's EU accession does not seem so odd since we know it is an EFTA (European Free Trade Area) and EEA (European Economic Area) member and has a widespread cooperation (common market) with the EU. Besides, the cases when the EFTA members (such as UK, Austria, Finland, Sweden) have entered the EU have also been seen before.

Although the European Commissioner for Enlargement, Oli Rehn, talks a lot about the enlargement of the EU on Croatia and lately also on Iceland, at this moment, there is a restriction that prevents further enlargement of the EU. The Treaty of Nice that permanently regulates the questions about the EU functioning doesn't predict further EU enlargement. Namely, for that it is necessary to set up a new contract (the Lisbon Treaty) which is still in the process of ratification.

We have been well informed on the accession process of the Republic of Croatia into the EU - there are numerous national documents as well as the European Commission reports. The process follows the similar procedure which the CEE countries had to go through when entering the EU (for the Croatia as a Western Balkan country it is also important to satisfy the special criteria such as the cooperation with the Hague Tribunal, return of the refugees and displaced persons, minority rights etc.). Iceland's accession into the EU raises a number of questions: why the EU? Why now, amid financial crisis? What are the positive and negative implications of the potential EU membership?

The aim of this study is to review the EU's motives for encouraging Iceland so openly to become a member state as soon as possible. In order to understand this, we need to examine the historical relations between the EU and Iceland; analyse Iceland's economic features and based on this to investigate the EU accession perspective. The second chapter presents the comparative analysis of economic development of Iceland and Croatia, the causes and consequences of the financial crisis with a special emphasis on Iceland as a country facing the worst consequences. The third part of the paper describes the relations between Iceland and the EU through the EEA relations, examining the pros and cons of the EU membership, as well as shows the results of a public opinion survey in the EU. The fourth part brings a short review on the relations between Croatia and the EU. Finally, the fifth part deals with the comparison of Iceland and Croatia in the EU accession process. The analysis and comparison determine whether Iceland should become a full EU's member state and what would be the strengths, weaknesses, opportunities and threats of membership. In addition, a parallel is drawn with the Croatian situation and it is also reviewed the possibility of the simultaneous EU accession.

2. ECONOMIC DEVELOPMENT OF ICELAND VS. CROATIA AND FINANCIAL CRISIS

2.1. Economic development of Iceland and Croatia

In order to understand the similarities/differences between the economies of these two countries we have looked into their macroeconomic indicators for 2007. The table shows that Iceland is a highly developed country with a high GDP per capita, with a large share of adult population in lifelong education programmes, it allocates considerable resources for R&D, ranks high in competitiveness index, economic freedoms and low level of corruption. Regarding the fact that Iceland is about three times more developed than Croatia (GDP per capita), it is expected that Iceland will be the net contributor to the EU budget.

Table 1. Macroeconomic performance of Iceland and Croatia in 2007

	Iceland	Croatia	EU27
GDP in 1000 million euros	14.6	37.5	12276
GDP per capita in PPP (2006)	31900	11700	23500
GDP per capita (PPS, EU27=100)	119	62	100
Unemployment rate in %	1,63	8.4	7.1
Inflation in %	3.6	2.9	2.3
Export in 1000 million of euro	1.05	9.00	1241
Import in 1000 million euro	1.48	18.83	1434
Trade balance in 1 000 million euro	-1.40	-9.83	-242

Export to EU (% of total export)	74.6	43.6	68.1
Import from EU (% of total import)	60.0	48.7	64.3
Current account in % of GDP	-15.5	-8.6	-
Foreign debt in % of GDP	323.3	87.8	-
Lifelong learning*	27	2.4	9.5
GDP expenditure on R&D (2005)	2.83	1.22	1.84
International rankings			
GCI rank**	20	61	-
Economic Freedom	14	113	-
Corruption	7	62	-

* % of the population aged 25 to 64 participating in education and training

** The Global Competitiveness Index (GCI) ranks 134 countries on their global competitiveness; provides a weighted average of over 113 different variables, where each variable is considered to reflect one aspect of competitiveness.

Source: Central Bureau of Statistics (Croatia), 2009; Croatian National Bank, 2009; Eurostat, 2009a; Heritage Foundation, 2009; Statistics Iceland, 2008 and 2009; Transparency International, 2008; WEF, 2009.

However, these seemingly totally different countries have something in common: trade deficit (import-export ratio lower in Croatia), current account deficit (higher in Iceland) and high foreign debt (Iceland's foreign debt is four times the value of its GDP).

In the process of integration, the trade connection between the country and the integration is especially important because in that way the benefits of the integration are higher. Iceland is mostly oriented toward trade with the EU member states precisely due to its EEA membership. Iceland's export is mostly directed to the EU and EFTA member states, in 2007 the EEA share in export was 78,4% (EU-27=74,6) and in import 64,6% (EU-27=60%). That shows high trade integration with the EU, especially regarding export. The export structure is mostly based on marine products, although their share fell from 71.4% to 41.8% of the overall export, while, at the same time, the export of manufacture products is growing (from 21.9% to 38.9%). Iceland mostly imports industrial goods (26.7%), capital goods (apart from transport equipment) 21.5% and transport equipment 20.5%. In the period from 2004 to 2007 Iceland records a growing trade deficit which reached its maximum value in 2006 amounting to as much as 13.57% of GDP, and in 2007 it was reduced to 7% of GDP. (Statistics Iceland, 2008, 2009).

On the other hand, the share of Croatia's trade in goods with the EU has been reducing every year as a consequence of regional trade liberalization: the CEFTA membership and CEFTA's enlargement to the South European countries, which stimulated the development of trade between the countries from this region. This can also be a result of an insufficient demand for Croatian products abroad due to the lack of competitiveness, that is, qualitative and quantitative product characteristics. Particularly, Croatia's export to the EU, apart from ships, mostly consists of low value products: wood, clothes, raw material.

2.2. Financial Crisis – Causes and Consequences

Onado (2007) presented four characteristics of the present financial system that are worth remembering: the dramatic rise of financial assets and derivatives all over the world (at the end of 2005 total financial assets stood at an level of 3.7 times world GDP, the notional amount of total derivatives was double than the volume of total financial assets…), the historical low level of interest rates and very low levels of the price for risk required by the

market; the growing weight of stocks and bonds as a percentage of total financial assets and the decrease of government bonds on total debt securities. Elevated losses on USA supreme mortgages has spread, risk spreads have ballooned, liquidity in some market segments has dried up and large complex financial institutions have admitted significant looses (Fannie Mae-Federal Mortgage Associations, Freddie Mac-Federal Home Loan Mortgage Corporation, Lehman Brothers, American International Group, Washington Mutual…). According to Markowitz (2009) a basic cause of the current financial crisis is the USA was the mandate by the US Congress for the Federal National Mortgage Association (Fannie Mae) to vastly increase its support of low-income housing which required a lowering of lending standards. The collapse of trust and subsequent credit freeze in the case of the Lehman Brothers was shock for the system but also to most economists and market participants as well. The rise and fall of financial institutions and instruments occurs as a part of a lending boom-and-bust cycle financed by bank credit (Bordo, 2007).

The European Central Bank has injected reserves in unprecedented volumes, the Bank of England participated in the bailout and the nationalization of a depository, Northern Rock, the US Federal Reserve has introduced a variety of new facilities and extended its support beyond the depository sector. CEPR (2008) in its publication "The First Global Financial Crisis of the 21st Century" compile contributions by leading economists that attempt to answer the questions why the crisis developed, how it is unfolding and what can be done. Today's financial crisis is the biggest in recent history, when measured by its speed, the scale of its capital losses or its global reach. The crisis is surprisingly ordinary, following the same path as dozen of previous bubbles (Cooper, 2009).

2.3. Iceland – The First European "Sacrifice"

The worst consequences of crisis so far were suffered by Iceland - a European country which has faced bankruptcy even though that is the country with an impressive economic development during the last decade. In the 1990s Iceland experienced the most positive economic period in its history, due to several years of economic growth, in 2005 the economy boomed, but it suffered a setback in spring 2006 when credit ratings agencies and other international financial firms released a number of reports, which were raising questions about the state of the Icelandic economy and the stability of Iceland's major banks[1]. After that, certain imbalances have emerged in the Icelandic economy (high current account deficit, high inflation and high private sector debt levels). Foreign confidence in the Icelandic economy is especially important to maintain the country's use of foreign capital especially because Icelandic businessmen have become well known for risk taking in their investments. Furthermore, Iceland presents international businesses and investors with a wide range of opportunities for investments (attractive fiscal and tax environment for locating holding companies and multinational headquarters). The rules for foreign investors are for the most part the same as those in the European Union.

After a long period of unbalanced growth, the Iceland economy has entered a deep recession in 2008. According to the OECD Economic Outlook for Iceland (2008) the economy is

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[1] Annual average growth rate of real gross domestic product was 5,78% in the period 1970-1980, 3,06% in the period 1980-1990 and 3,91% in the period of 2005-2005. In 2007, annual average growth rate in Iceland was 3,8% (EFTA: 3,23%; EU: 2,80%) (UNCTAD, 2009). The Central Bank forecast a sharp downturn in GDP and domestic demand in 2009. GDP is expected to contract by just over 10% during the year (Central Bank of Iceland, 2009). "Nordic Tiger" was a term used to refer to the period of economic prosperity in Iceland but it ended when the country's major banks failed and were taken over by the country's government.

projected to shrink until early 2010 and unemployment to soar over the next two years (from 2,8% in 2008 to 8,6% in 2010), inflation is projected to spike higher, though to fall back sharply once the exchange rate effects have passed through, the current account deficit (as a percentage of GDP) should decline markedly (from -24% in 2008 to -11,3% in 2010).

The Iceland's basis industries for centuries have been agriculture, fishing and fish processing[2]. Marine products account for the majority of Iceland's export of goods but also important products are aluminium, ferrosilicon alloys, equipment and electronic machinery for fishing and fish processing and pharmaceuticals (CIA, 2009). Iceland has favourable conditions for various kinds of marine life so the fishing territory as a main natural resource, requires strict protection. The Northeast Atlantic is the most important fishing area for the EU-27 member states with 73 % of their catches being taken from this area in 2005 (European Communities, 2007). The majority of Iceland's exports go to the EU and the EFTA countries[3], which is followed by the United States and Japan. Iceland's relatively liberal trading policy was strengthened by accession to the EEA and the Uruguay Round agreement. That also brought significantly improved market access for Iceland's exports of seafood products even though the agricultural sector remains heavily subsidized and also protected.

Another Iceland's advantages are definitely abundant hydroelectric and geothermal power sources, which allow the majority of the population to enjoy electricity and heating from proven natural resources. Iceland is also exploring the feasibility of exporting hydroelectric energy via submarine cable to mainland Europe and also actively seeks to expand its power intensive industries.

Iceland's banking system collapsed in October 2008 when the government took control (within the space of a few days) of three largest banks that experienced major liquidity problems[4]. The Government was forced to take over the major banks for lack of liquidity and give up protecting the plugging króna, also arranged emergency financing from the International Monetary Fund and several European countries. The Central Bank of Iceland draws on currency swap lines with the central banks of Norway and Denmark for EUR 400 million, on October 15, 2008 (Central Bank of Iceland, 2008). The Faroe Islands, that has close historical and cultural ties with Iceland, offered Iceland a loan of DKK 300 million (October 29, 2008). Norway announced a EUR 500 million loan to Iceland (November 3, 2008), Poland also participated in the International Monetary Fund's economic stabilization program for Iceland by granting a EUR 155 million loan (November 7). This makes Poland the first Central and Eastern European country that is contributing to one of the rich European country that faced with the consequences of the financial crisis. Poland and Iceland have deep roots in (North) European history and the largest foreign population in Iceland is Polish. These nations have been important trading partners for years so Iceland has entrusted Poland with the task of constructing and upgrading their trawlers and fishing vessels. Another important reason for helping Iceland is certainly Poland's political agenda. Namely, Poland's lack of economic weight has been the mean reason preventing it from being a real power broker in Europe (it is still poor by standards of the Western Europe) and it has been the

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[2] Total catches in all fishing regions in 2006 were in EU 27: 5 410 725 tones, in EFTA countries 3 593 186 tones and in Iceland 1 344 532 tones (Eurostat, 2009b).
[3] See comment below the Table 2, on p. 3.
[4] On September 29, 2008 Financial Supervisory Authority in Iceland (FME) acquired 75% share Iceland's third largest bank, Glitnir. On October 6, 2008 Iceland's parliament passed emergency legislation enabling the government to intervene in Iceland's financial system which was the most radical economic measure ever taken in that country. The FME used the emergency legislation to take over Landsbank, Glitnir (October 7, 2008) and Kaupthing bank (October 8, 2008).

largest recipient of EU development aid for yeas. Poland decided to sacrifice some of the financial funds in order to advance its political position, the position of real power broker. In accordance with that is also the reason that Russia, a common foe of Poland, has also offered a loan to Iceland. On November 20, 2008 IMF approves 2,1 bn $ loan for Iceland (after the agreement on a comprehensive economic stabilization program) (The Icelandic Government Information Centre, 2008). That was the first loan approved to the Western European nation since the U.K. in 1976. Iceland also ask for financial help from European Commission but the problem arises because of the question about Dutch and British accounts in Iceland's banks. More than half a million depositors (more than the entire population of Iceland) found their bank accounts frozen.

The nation enjoyed one of the world's highest living standards during the stock market boom but the crisis has stunned that nation. Government resigns following breakdown of coalition on January 26, 2009[5]. Thousands of Icelanders lost their savings and jobs when financial sector crumbled in October 2008[6]. The financial difficulties have had a profound effect on Iceland and its population, the Icelandic króna depreciated and lost nearly half its value[7], foreign currency transactions were virtually suspended for weeks, external debt has increased substantially[8], increases in unemployment and inflation are having substantial and adverse effect on population, and the problems have affected every sector of the economy.

Graph 1. Exchange rate ISK/EUR 1999-2009
Source: European Central Bank, 2009.

Icelandic authorities have taken co-ordinated action to protect the interests of savings bank customers and to ensure that banking services will be provided throughout Iceland, by

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[5] The prime Minister was Geir H. Haarde, who announced the resignation of the coalition government of the Independence Party and the Social Democratic Alliance. A government of the Social Democratic Alliance and the Left-Green Movement takes office on February 1, 2009.

[6] In December 2008, registered unemployment rate was 4,8 %, with average unemployment in January 2009 estimated at 6,4-6,9 %. Therefore, unemployment for first quarter in 2009 will probably approach 8 % (Central bank of Iceland, 2009).

[7] The króna plummeted in November 2008, recovered in December, after the inter-bank foreign exchange market was re-established and restrictions on current account foreign exchange transactions were lifted, but remained extremely volatile. During the first weeks in 2009, the króna has appreciated but remains weaker than was assumed in the forecasts (Central Bank of Iceland, 2009).

[8] In the end of the second quarter in 2008, Iceland's external debt was 50 bn EUR.

enabling the savings bank to take an active role in rebuilding the economy. The economic policy of the Government will be based on the programme established by the authorities and the IMF, which is based on a prudent fiscal policy under the fundamentals of the welfare system. The Government also announced measures to help business sector (debt relief and investment measures), it appointed banking expert and special prosecutor, the Ministry of Finance published a re-assessment of the Treasury's assets and liabilities due to the financial situation, Iceland's Economic Recovery Programme was made public, major changes are made to the Central Bank's administrative structure and the Monetary Policy Committee has been established.

3. ICELAND AND THE EU

3.1. EU Membership as a Solution for Iceland?

Iceland maintains diplomatic and trade relations with almost all nations, but particularly close ties has with another Nordic states, with the USA and with the NATO member states[9]. Although located in the North Atlantic, Iceland has historical relations with the European countries, especially Norway and later Denmark under the administration of which it had been until 1944. In the post-war division of Europe into three groups of countries, Iceland approached the group which in 1959 signed the agreement on founding the EFTA. This integration is a kind of intergovernmental cooperation and was intended, in the first place, for mutual trade liberalization. It should be pointed out that Iceland was not EFTA's member from the moment it was founded, but it joined the association in 1970. The majority of EFTA members passed to the EU from 1970is till now. Today, Iceland is one of the three EFTA member states (other two being Lichtenstein and Norway). Since 1972 Iceland has had a bilateral free trade agreement with the European Economic Community.

A step forward in the cooperation with the EU is the act of signing the EEA Agreement which came into effect on 1 January 1994 and which enables the EFTA members to approach the internal (common) market, while respecting the common laws.[10] The EEA includes 27 EU member states and three EFTA member states respect the free flow of goods, services, capital and people. This common market area provides all companies with same operating conditions (through competition policy and the state subsidy rules), observes the horizontal provisions relevant to the four freedoms, as well as cooperation outside the four freedoms in so-called flanking areas (research and technological development, information services, education, training and youth, employment, enterprise and entrepreneurship and civil protection) (Thornhallsson, 2002a). The central part of this agreement presents the principle of homogeneity which refers to the timely acceptance and implementation of the EC legislation into the agreement. This means that as soon as a piece of legislation is adopted by the Council of European Ministers and the European Parliament, the EEA Joint Committee has to decide on the amendment to the EEA agreement denoting the implementation of the relevant legislation in the EEA area. In order for the Single market of the EU and EFTA to be able to

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[9] Iceland became a charter member of the NATO in 1949. The bilateral defence agreement signed in 1951 remains in force, even though the USA military forces are no longer permanently stationed in Iceland. Icelanders are especially proud of the role Iceland played in hosting the 1986 summit which set the stage for the end of the Cold War. In 1998, Iceland bolstered its delegation to NATO.

[10] The EEA Agreement is made up of 129 articles, 22 annexes and 49 protocols. The annexes refer to the acquis communautaire applicable in the EEA. The protocols include provisions on specific areas such as rules of origin of goods, transition periods for the EEA EFTA States in certain fields, and simplified customs procedures. (EFTA, 2007)

function, common bodies have been formed: EEA Council, EEA Joint Parliamentary Committee. Iceland adopts around 80 per cent of the EU laws and regulations through the EEA agreement, which can be its shortcut to the EU membership.

It is interesting that the EEA agreement does not cover the following areas: Common Agricultural Policy, Fisheries Policies, a Customs Union, a Common Trade Policy, a Common Foreign and Security Policy, Justice and Home Affairs and the Monetary Union (EFTA, 2007). Trade in fisheries products is regulated by a special bilateral agreement. During the negotiation of the EEA Agreement, special attention was given to trade in fisheries products. That resulted with an agreement that stipulates concessions in tariffs for the majority of Iceland's most important fisheries product. Iceland has the same standing as EU member states in respect of veterinary and phytosanitary matters. Icelandic representatives are also invited to take part in meetings at Commission level in the field of food safety with the possibility to take part in the proceedings and make proposals but without voting rights.

Iceland can be compared with the North European countries - Scandinavian countries: Sweden, Finland and Norway. The country cooperates with them in the cultural and social field through the Nordic Council. Sweden and Finland entered into the EU in 1995 (relatively late in comparison with other West European countries), while Norway on two occasions submitted the EU membership application (in 1962 and 1992), concluded the Accession Treaty, but the citizens rejected Norway's entrance into the EU at the 1972 and 1994 referendum. The dominant strategy in the Nordic countries comprise a positive attitude towards economic integration, free trade and intergovernmental co-operation, but also the scepticism about political integration and supranational features which is the strongest in Norway and Iceland and the weakest in Finland. Nordic co-operation has been Iceland's bridge to Europe, and has also been an important pool of information on European affairs (Lægreid, Steinthorsson and Thorhallsson, 2004).

It is interesting to underline the Greenland[11] example which entered the EU in 1973 along with Denmark but very soon it requested to leave the EU due to unfavourable position of fishing and fishing industry. The EU membership provided Greenland with the privilege of the exclusive right to fish within the coastal zone of 12 miles and when it left the EU Greenland obtained the right to fish within the zone of 200 miles. In addition, Greenland could sell the right to fish in this zone to other countries. In 1982 a referendum was held on whether Greenland should leave the EU and 52% were in favour of Greenland's leaving the EU. Greenland officially left the EU on 1 January 1985 and this has been the only country that ever left the EU in the history of this integration.

As an EEA member, Iceland enjoys all the advantages of the common market. Apart from trade liberalization, Iceland has the possibility of participating in numerous agencies and programmes of the EU, e.g. entrepreneurship, education and research. In return, Iceland has already taken a part (as the other EFTA members) in financing the EU social and economic cohesion (the EU budget). The role of Iceland in decision making in the EU is limited, because being a non-member means it cannot have its representatives in the Council of Ministers nor the Parliament. However, Iceland plays a part in Commission's preparations

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[11] An Arctic island situated in the North America, but is politically, historically, ethnically and geographically closer to Europe. Greenland had been under the Norwegian administration from the 11th century until 1814, when Denmark seized power, although Denmark and Norway had been in personal union for centuries. Greenland became the integral part of Denmark in 1953. On June 21, 2009 Greenland expanded its autonomy, taking control of the police and the courts and making the Greenlandic Inuit tongue the official language, which is the result of the referendum held in November 2008.

when expert consultations are needed in different fields. Iceland has been a member state of the Schengen Agreement since 2000, which requires the cooperation with the EU in internal affairs and judiciary in order to enable the free flow of people within the whole Schengen zone. Croatia, as the neighbour of the Shengen countries, is gaining useful experience, but for now it is still doing on the preparation of measures in order to fulfil the requirements of the Schengen Acquis. The question of Shengen zone will be deeply considered when Croatia becomes the EU member state.

There is no consensus on the EU accession in Iceland: Independence Party, Progressive Party[12] and Left Green Movement are against the EU membership. The Social Democratic Alliance is in favour of the membership negotiation. The scepticism of the political elite in Iceland towards EU membership can be explained because of the reasons mentioned hereinafter: the influence of the primary economic sectors combined with the electoral system and the role of interest groups in decision making of the government, the political discourse concerning independence and sovereignty, the geographical location of Iceland and its defence treaty with the United States.

Regarding that the pro-EU Social Democratic Party won on the elections in May 2009, some say that the process of the accession could expand (and perhaps to be even the shortest ever). In the five waves of enlargement so far, the shortest term for the EU membership application was the one of Finland which finished the whole process in less than three years. On July 16, 2009, Parliament in Iceland has voted to set in motion an application to join the EU and Iceland will probably make its application for European Union membership very soon.

Although, at the moment, Iceland has a great deal of problems caused by the crisis, this is an extremely rich country which makes it attractive for the European Union.

3.2. Pros and Cons of Iceland's Potential EU Membership

Until 2008 Iceland had been a modern growing economy with social and political stability, technologically innovative, competitive at international level, characterized by the young, well-educated population, flexible labour market. One of the most developed world economies: at the top in competitiveness, level of economic freedom and quality of life.

Iceland has never submitted the EU membership application; nevertheless, it has had strong trade relations with the EU.

Scientific researches on the Iceland's accession to the EU are very rare, since the idea of the EU accession has not been seriously considered before the beginning of the financial crisis. However, there are some researches we would like to emphases. Kunz (1993) describes Iceland's dilemma on the EU membership, negotiations on forming the EEA, with a special emphasis on the problem of EC's Common Fisheries Policy as an obstacle to EC membership. The European Free Trade Agreement and the European Union in relation to Iceland is also discussed in the article of Katsioloudes, Thordardottir and Balasmeier (1996), with the emphasis on the fisheries sector. Thorhallsson (2002b) argued that the heavy reliance of Iceland on its fish resources and the importance of agrarian and fisheries lobby partly explain the distinctive strategy of the Icelandic political elite toward European integration. The divergent approach of the Nordic states toward European integration can be explained by their different economic sectors because economic interest groups representing leading sectors influence the responses of Nordic governments to European integration (Ingebritsen, 1998). Goodeve (2005) examines the costs and benefits that membership in the European Union

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[12] The Progressive Party held its national congress in mid January 2009 accepting a changed policy towards EU membership. The party is now in favour of starting membership negotiations with the EU.

could bring to Iceland based on the fact that the EU offers significant economic and political opportunities, but it also poses a great threat to the extremely independent and culturally unique nature of Iceland.

Although formally Iceland is not negotiating with the EU, the adjustment of Iceland to the EU requirements could be easier and faster than with the CEE countries and Croatia. Therefore, the announcements of Iceland and Croatian entering the EU on the same date should not be a surprise. The question is whether the EU membership would be worth Iceland's while. It is presumed that if Iceland had been the EU zone member, the implications of the crisis would have been much less severe. On the other, fishing is of strategic importance for Iceland and its fisheries policy is not in compliance with the EU, so the main stumbling block in the negotiations with the EU could be precisely fishing.

   a) *Common Fisheries Policy in the EU and Iceland*

The EU fisheries policy enables equal access for fishing vessels of a member state to the waters of other (relevant) member states under the conditions of relative stability and specific accession regimes. This right is limited by prescribing quotas divided between the EU member states. In addition, the member states with a coastline have a wide discretion within a 12 nm zone within which fishing is limited to those fishing vessels traditionally sailing from adjacent ports.

The importance of fishing for Iceland's economy in the second half of the 20th century was studied by Agnarsson and Arnason (2003). Using data on GDP, marine production, capital stock and labour for the period 1963-1996, it was found that a 1% increase in the value of production of the fishing industry will in the long-run increase GDP by 0.42%. The authors take into consideration the direct and indirect effects of fishing on Iceland's GDP and establish that fishing has been two to three times undervalued by national calculation. Therefore, the fishing of Iceland could be affected by the serious consequences of natural (global warming, pollution accidents) and economic phenomena (stock collapses, tariff barriers).

Iceland's laws do not allow non-nationals to become the majority owners of companies in the fishing industry, and if Iceland decides to enter the EU this law will have to be changed or they will ask for exemptions or transition periods during the process of negotiation.[13] Even though the exemptions from the European Community law do exist (but they are rare), it is hardly likely that Iceland will be able to win that battle, considering that Malta did not succeed in this when entering the EU in 2004. The better option would be finding other solutions with the same effect: request for the ships fishing within Iceland's quota to be licensed and registered with the relevant Icelandic authorities; request for foreign ships to create a bona fide economic link with the population of adjacent coasts. The prevention of over-fishing of stocks is possible through potential specific emergency measures. The above mentioned present only some of the possible solutions, but that doesn't mean that it will be realized during the negotiation process.

The main opponents against EU membership are Iceland fishermen who fear that their nation's financial meltdown will make their nightmares real, that Iceland will join the

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[13] Icelandic law requires that direct foreign ownership in Icelandic fisheries companies be restricted to 25% of share capital; total direct and indirect foreign ownership in harvesting and processing companies may extend to a maximum of 49% (Foss, Thorolful and Ulrichsen, 2003).

European Union, surrendering management of its ocean to a distant bureaucracy with a poor conservation record. The Icelandic fishing industry has been booming (it is on the 13th place in the world) for a long time and it is not subsidized like the EU. Iceland has managed its fisheries successfully, in contrast to the EU's Common Fisheries Policy which has often failed to control over fishing and the government subsidies. Fishing policies can be kept intact if Iceland will join the European Union so Iceland must be able to negotiate permanent exemptions for its fisheries.

On the other hand, fisheries sector may be an argument for EU membership because the EU is also the largest market for Icelandic fisheries products (over 70 % of fisheries products exports goes to that market and it is of great importance to ensure access to that area).

b) Currency Stability

The main argument for EU membership is swapping the battered króna for the euro which could definitely take several years. By the failure of Iceland's banking system the króna is depreciated and it is viewed as irreparably tarnished so they have to rebuild its status in the international financial world and to return to the world of business as a credible entity. The Icelandic króna has declined more than 35 % against the euro from January to September 2008 and that was even worst in October 2008 (Central Bank of Iceland, 2009a). The reestablishment of the króna as a strong currency will be very difficult but that is one of the reasons why some Icelanders think that it is good to enter the EU.

But even if Iceland enters the EU soon (the year 2011 is mentioned?), it could not introduce the euro at the same time. According to the Maastricht Treaty, countries have to comply with the convergence criteria one or two years before making the decision on entering the Economic and Monetary Union (EMU). Although, at the end of March 2009 a discussion took place about the question of whether the EU should allow the introduction of euro in the new member states during the crisis regardless of whether they meet the criteria or not. The EU firmly believes that all countries have to meet the same conditions for the common currency introduction. The European Central Bank rejected the IMF's recommendations on the need of introducing the euro to all the EU Member States without meeting the criteria. Therefore such policy could be expected toward Iceland, and along with meeting all the convergence criteria after entering the EU, Iceland could introduce the euro in 2014 at the earliest. This way the euro cannot help the stabilization of monetary movements Iceland is facing at the moment.

There is another possibility as well, Iceland could introduce the euro even if it does not enter the EU nor the EMU (e.g. Montenegro), but the EU does not approve such a move and by doing this Iceland could only make the relations with the EU more complicated[14]. Iceland's króna had been the smallest freely traded currency in the world (only 300000 inhabitants) and after the downfall of Lehman Brothers Iceland's economy was too small to save the institutions. Iceland had been implementing the policy of independently floating currency and this lead to bankruptcy (Woodard, 2009). It is presumed that the króna cannot be the foundation for rebuilding the credibility and structures in the world of finance. Roberts (2003) argues that the euro is one of the most convincing reasons for Iceland to join the EU.

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[14] That would be the unofficial way of introducing the euro, without fulfilling the Maastricht criteria and the ECB approval.

3.3. Public Opinion on EU Membership

Iceland has not had a continuous and unique methodology of surveying the public opinion related to the EU membership. According to Capacent Gallup in 2005 43% of the citizens supported Iceland's EU membership, while at the end of 2008 the situation was considerably different i.e. 80% of the surveyed citizens supported the EU accession.

Table 2. Attitudes towards the EU membership in Iceland from 2005 to 2009

	August 2005	**February 2006**	**September 2007**	**November 2008**	**January 2009**	**May 2009**
Support	43	34	48	80	60	61
Do not support	37	42	34	20	40	27
Do not know	20	24	18	0	0	12

Source: AbsoluteAstronomy, 2009; Icenews, 2008; Kirk, L., 2006; Valdimarsson, J.S., 2005; Valdimarsson, J.S., 2007; Vísir, 2009.

The reasons for the seen euro-scepticism in Iceland are the following: the primary sector has been especially important in Iceland for years, policies of the political parties have opposed joining the EU until the elections in 2009, the geographical location of Iceland and USA-Iceland defence relations. The low level of pro-European attitudes has changed, especially in November 2008, when the consequences of the crisis are already seen. These results are expected since it is considered that the financial crisis would have lower negative effects if the Iceland had been protected within the integration. The pro-EU trend is also seen during the 2009 even though it is important to say that also exist the differences between the public opinion regarding starting accession negotiations and opinion of joining the EU.

Pro-European attitude is explained by the following factors: most of the Icelanders are employed in economic sectors other than fisheries and agriculture, so their attitude toward EU application reflects this fact; a considerable number of Icelanders seem to be more concerned with the economic prosperity than the political discourse of the political elite and a part of electorate fears that Iceland will become isolated by not taking an active part in European integration (Thornhallsson, 2002b). It is the question whether the EU membership would solve a problem or it would be only a short time solution especially when the current members of the euro area are not immune to the crisis? EU membership can be a solution for Iceland on the road towards economic recovery and that is also good for the reputation of the EU.

4. CROATIA AND THE EU

The relations between the European Union and Croatia are considerably different from those with Iceland, in terms of duration as well as its content. Regional trade liberalization and belongingness to a strong integration is very important for a small developing country, such as Croatia. That is why Croatia was interested in signing an agreement with the European Union since its achievement of independency.

After the breakdown of socialist economies of Central and East Europe, Croatia faced the challenges of transforming its economy into a market economy, and in addition it had to fight for the integrity of its occupied territories until mid-1990s. At the time Croatia had been isolated from the Eurointegration processes, therefore the statement that it lost a decade in the relations with the EU can be justified. Regarding the EU policy, Croatia belongs to the group

of the South East European countries (Western Balkans) toward which the EU established a special approach in 1999 (when the wars and conflicts ended), the so called Stabilization and Association Process (SAP). This process includes the following: asymmetrical and reciprocal trade liberalization, regional cooperation, the right of establishment, political dialogue, cooperation in justice and culture etc. As a result of participating in this process Croatia signed the Stabilisation and Association Agreement (SAA) with the EU in 2001. According to the SAA, six years are given to Croatia for the gradual liberalization of its foreign trade system for industrial products from the EU. Agricultural products are under specific regime which guaranteed six years transitional period.

Croatia submitted a full membership application in 2003, and in 2004 it became a candidate country for the EU accession. After fulfilling its obligations toward the International Criminal Tribunal in The Hague, the accession negotiations were opened in October 2005 and are still underway. In fact, at the moment the negotiations are blocked by Slovenia due to the dispute over the maritime border in the Piran bay. Even without the above mentioned limitations the negotiations are quite difficult and comprehensive, therefore the EU set rules not only for closing the negotiations in certain chapters but even for opening certain chapters. In addition, at this stage, in the chapter on Competition Policy, the EU explicitly requires the privatization of the Croatian shipyards without guaranteeing the survival of the most significant industrial and export branch in Croatia. The Unions oppose this idea, regardless of this the privatization will take place and the results are uncertain. All this effects the average and below-average dynamics of the negotiation process. It should be noted that the EU negotiated with the CEE countries from 1998 (2000) until December 2002, meaning 2-4 years, and this time-limit for Croatia will elapse at the end of this year. Having in mind the slow pace of opening and closing chapters in the negotiation process, it is doubtful whether Croatia will succeed in finishing the negotiations by the end of 2009 and be able to become the full EU member state in 2011. In addition, one should not ignore the public opinion surveys in the Republic of Croatia showing slightly negative attitudes toward the EU membership, which may increase along with social dissatisfaction.

As early as 1990s some researches were carried out in Croatia about its relations with the EU (Samaržija, 1994a; Samardžija 1994b; Jovančević, 1998), in which authors describe the existing relations (policy) of the EU toward Croatia, models for Croatian integration into the EU, analyze the EU policy toward the CEE countries and explore the particularities of certain policies within the EU and the Croatian situation (position) in these segments. Numerous publications by the Ministry of Foreign Affairs and European Integrations have appeared such as: Croatia on the Road to the European Union, Stabilisation and Accession Agreement, How to join the EU?- 85 questions and answers for Croatian farmers about the EU, etc. There are also the conference proceedings from international conference which was held biennaly at the Faculty of Economics in Rijeka on the actual topics regarding European Union and Croatia. The Institute of Public Finance and Friedrich Ebert Stiftung have published 4 editions of the «Croatian Accession to the European Union» conference proceedings where authors analyze different areas of the EU policies and point out the challenges and recommendations for Croatia. Except these studies, there are a numerous individual researches and studies of EU-Croatia relations.

The latest researches have been directed to the potential effects of Croatia's EU accession on certain segments of the Croatian economy (Samardžija, Staničić, Nikić, 2001). The newest study of the Institute of Economics, Zagreb from 2007, assesses the effects of Croatia's EU accession on the overall economic activity and basic macroeconomic indicators, as well as the

effects on different areas of economy (agriculture, tourism, fishing, budget). The main conclusions are that the level of GDP, consumption, export and well-being could be higher than if Croatia stays out of the EU. Increase in prices is not expected, but a negative net financial impact on the budget is. The EU accession will bring a higher level of capital inflow which will influence the increase of the real estate prices, high expenditures for environmental protection, whereas tourism will benefit from the EU accession (improvement of general image of the country). The economic preparedness for big competition, which accompanies the participation on the common market is crucial for prevailing the benefits/costs of the EU accession.

Every year the EU publishes the report on the progress of Croatia, which analyzes the achievements and problems in the reform process toward the full membership. In the 2008 report the EU points out the following problem areas in meeting the Copenhagen criteria: judiciary reform, corruption, minority rights, high trade deficit, shipbuilding, slow pace of structural reforms (European Commission, 2008a).

While preparing for the EU membership, at the same time, the Republic of Croatia works on the regional trade liberalization with the Western Balkans countries. Croatia became a full member of CEFTA (Central European Free Trade Agreement) in 2003. The aim was trade liberalization with Central and Eastern European Countries. After the majority of its members have become the EU member countries, CEFTA was in the partial form. In December 2006, Albania, Romania Bulgaria, Croatia, Macedonia, Montenegro, Kosovo, Moldova and Serbia signed the Agreement on CEFTA Enlargement (so called «CEFTA 2006»). Some of its goals are: trade liberalization; increase of mutual trade and direct investments in SEE; facilitation of running a business, improvement and strengthening of overall trade and economic relations in the region (Official Gazette of Republic of Croatia, 6/2007). New CEFTA Agreement comes into force in July 2007 and the creation of the free trade area is scheduled for December 31, 2010 at the latest. Even though the New CEFTA is functioning for a very short time, the foreign trade statistics shows that the mutual trade among the member states was increased in 2007 in comparison with the earlier periods. (Statistical yearbooks of member states)
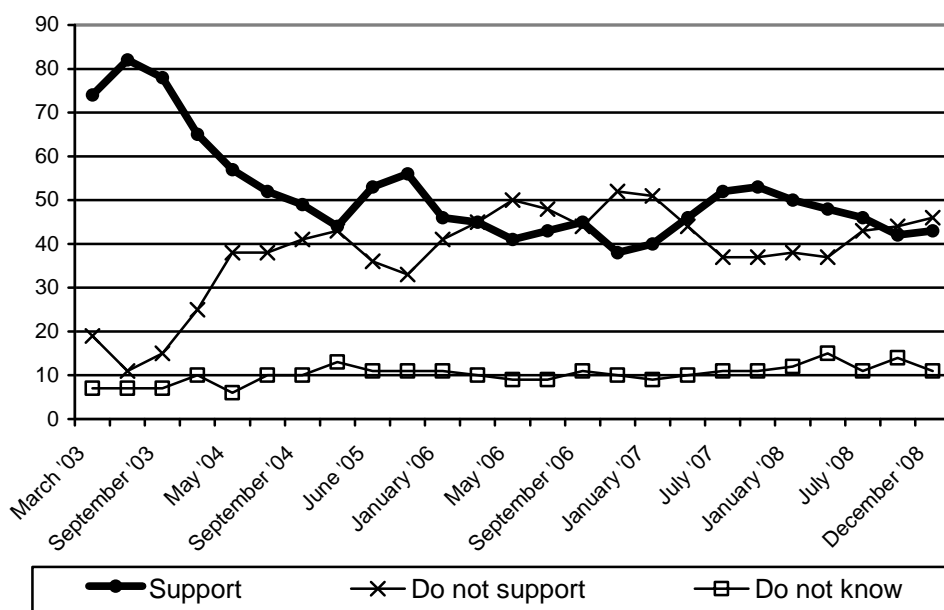
Graph 2. Trends in support of Croatian membership in the EU from 2003 to 2008
Source: PULS, 2009.

It can be noticed that the support towards the entrance of Croatia in the EU was the biggest in 2003 (82%), it drastically fell down in February 2005, at 44%, after the SAA was brought into legislative force and then for a longer period it was around 50%. In the end of 2008, only 41% of Croatian people gave support to the integration process. Decline in support in 2008 could be caused by many rigid reforms that are imposed to Croatia. Example is Croatian shipbuilding; where there was talk about a rapid privatization and a sheer existence of that sector within Croatian economy. Namely, shipbuilding is the most important export industry in Croatia that has strong multiplicative effect on other industries and the whole economy, so the deterioration of this sector would have multiple negative effects on the employment and industrial production.

5. ICELAND AND CROATIA TOWARDS POTENTIAL EU MEMBERSHIP

After examining the relationships of Iceland and Croatia toward the EU, pointing out the advantages and disadvantages or problems which the EU membership could bring, we drew up the TOWS matrix for each country summing up the strengths, weaknesses, opportunities and threats of potential EU membership.

Table 3. Croatia's TOWS Matrix- challenges of membership in the EU

INTERNAL ENVIRONMENT	
STRENGTHS (S)	WEAKNESSES (W)
□ favourable geographic position (connection between Europe and Middle East) □ availability of the natural resources, diverse countryside, cultivated land, fruitful areas for different products cultivation, water wealth □ closeness of the developed EU countries □ tourism and developed plans for better positioning □ FDI inflow.	□ uncompetitiveness □ current account deficit (deficit in the balance of foreign trade) □ unfavourable production and export structure □ unfavourable structure of FDI inflows □ unused natural potentials □ intransparency of the legislative □ high unemployment rate (especially of the young labour force) □ corruption □ low technological development and business sophistication □ brain drain □ inadequate protection of the intellectual property
EXTERNAL ENVIRONMENT	
OPPORTUNITIES (O)	THREATS (T)
□ participation on the Single market (common rules and standards) □ common currency □ EU funds financing (structural funds)	□ agriculture □ shipbuilding □ competition □ Croatian Protected Ecological and Fisheries Zone

Source: authors' research

Table 4. Iceland's TOWS Matrix- challenges of membership in the EU

INTERNAL ENVIRONMENT	
STRENGTHS (S)	WEAKNESSES (W)
□ fisheries □ clean water □ resources of geothermal energy (low-cost industrial steam and electricity) and hydro energy □ high GDP per capita □ high education level of working population □ favourable business and investment environment (profit tax rate 15%) □ developed relationship with the EU through EEA □ openness to innovation and specialist know-how □ FDI- limitation in the fisheries sector, in exploiting sources of waterfalls and geothermal energy	□ financial crisis and collapse of banking system □ instability of domestic currency
EXTERNAL ENVIRONMENT	
OPPORTUNITIES (O)	THREATS (T)
□ common currency □ participation in decision-making process in the EU's institutions	□ fisheries □ competition.

Source: authors' research

6. CONCLUSION

The detailed analysis of the EU relationship toward Iceland and Croatia presented the historical course, characteristics and particularities of this relationship toward each country individually. Croatia's wish and efforts to become the full EU's member state are the result and a logical continuation of the transition process as well as of following the CEE countries practice. The idea of Iceland becoming the full member state of the EU is recent and is a result of the great financial crisis which brought the country to the brink of disaster and resulted in great depreciation of the national currency which can no longer be the basis/support for Iceland's financial recovery.

While Croatia is negotiating about the EU accession and must, of course, meet all the EU requirements, the major issue that puts Iceland's EU membership in question is the fishing industry where Iceland could suffer limitations/damage if it adjusted to the EU standards. Iceland's biggest concern related to the potential EU membership is the loss of control over national resources and the loss of a part of national sovereignty (transferring a part of national sovereignty to supranational institutions). Those who advocate the EU membership point out the economic reasons for the EU accession: the euro as a common currency could prevent huge fluctuations to which króna has been exposed; high grocery prices in Iceland would lower due to competition. Further relationship of Iceland toward the EU depends on the parliamentary election results possibly followed by a referendum to find out the public opinion. According to the public opinion surveys, the population gives a growing support to the EU membership because of the dissatisfaction with Iceland's economy in 2008 and 2009.

Based on the analysis of the existing relations of Iceland and Croatia with the EU, it can be concluded that the Republic of Croatia, although it started the negotiations in the autumn of 2005, is still faced with numerous reforms which need to be implemented in order to conclude the negotiations (the crucial question being the privatization of shipbuilding industry). Iceland, although not yet an official candidate for the EU accession, due to its EEA membership has good preconditions for finishing the negotiations quickly, so that there is a possibility of both countries entering the EU in 2011. Assuming, of course, Croatia continues its negotiations (which are blocked at the moment) and Iceland decides to join the EU, in which process the fisheries will be the biggest stumbling block.

Both countries are small and have economic development problems (Croatia's are long-term and structural, Iceland's are related to its financial system), therefore their participation in the common market as well as the subsequent introduction of the common currency could contribute to their development and stability.

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CAPITAL REGULATION, ASSET RISK AND CREDIT GROWTH IN CROATIA

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1. INTRODUCTION

For the last 20 years, bank regulators have attempted to raise bank stability and to level the international banking playing field via minimum capital regulation. However, as Van Hoose (2007) shows in his recent survey, academic literature provides rather mixed support of the effects of capital regulation on banking system safety and soundness. Both theoretical and empirical literature reach conflicting or ambiguous findings.

One strand of the literature, associated primarily with Furlong and Keeley (1990), associates low capital levels with increased risk-taking in the form of "gambling for resurrection." This view also suggests that the increased value of the put option implicit in deposit insurance in situations of capital impairment drives increased risk taking. Hence this strand of the literature is supportive of high regulatory capital requirements to prevent "gambling for resurrection" and to minimize risk shifting.

Another strand of literature emphasizes banks' search for profitability, and the possibility that banks will undertake increased risk as a means to meet profitability targets when higher capital requirements are imposed. Rochet (1992), Estrella (2004) and Jeitschko and Jeung (2005) provide models where this occurs, and increased capital requirements lead to increased probabilities of bank default. In short, this strand of the literature doubts whether regulators can improve on market allocations of capital.

A further refinement introduced by Jeitschko and Jeung (2005) is the observation that banks under special supervisory scrutiny may exhibit lower levels of asset risk because of the intervention of supervisors. For this reason, they attempt to identify such banks and to treat the capital-asset risk nexus for these banks separately from that of banks under normal supervisory regimes.

Papers from both sides of the debate provide supporting empirical evidence for their point of view (e.g. Furlong and Keeley (1990) for the US and Jeitschko and Jeung (2005 for the US, 2007 for South Korea).

This paper provides empirical evidence for Croatia, which experienced strong lending growth and increased regulatory capital requirements in recent years. With monetary policy constrained by high levels of Euroization to maintain a fairly stable exchange rate, the central bank (the Croatian National Bank) was unable to resort to conventional monetary tightening to moderate credit expansion. (see Kraft 2003 and Kraft and Jankov 2005).

In these circumstances, higher regulatory capital requirements were seen as a way to cushion banks from losses that might be sustained due to increased risk-taking, and thus as a way to enhance system stability when the credit boom would someday run its course. Minimum capital adequacy requirements were raised above the international standard by law in 1999, and regulations requiring rapidly growing banks to retain dividends were enacted in 2003. Furthermore, high reserve requirements on foreign borrowing enacted in 2004 and tightened thereafter favored equity over debt financing. Finally, special, higher risk weights were imposed on exposures denominated or linked to foreign exchange to unhedged borrowers.

The analysis below builds on the framework used in Jeitschko and Jeung (2007). Panel regressions are run on individual bank data to determine whether increased capital adequacy led to increased asset risk. Three groups of banks are distinguished: 1) capital-impaired banks, who would come under enhanced regulatory scrutiny and thus should display lower asset risk 2) extremely well-capitalized small banks, who usually answered to a small circle of owners and would not be subject to strong rate-of-return pressure and 3) large banks with moderate capitalization (10-20% capital adequacy ratios) that would be likely subject to rate-of-return pressure from owners (usually foreign bank groups) and might respond to increased capital adequacy by raising asset risk.

The econometric results suggest that increased capital leads to increased risk-taking precisely among the large, moderately capitalized banks. During the credit boom, banks chose higher levels of capital and higher levels of asset risk simultaneously. This provides an important caveat to the regulatory efforts to improve system soundness and stability by raising capital levels.

The structure of the paper is as follows. Section 2 briefly outlines the main theoretical analyses of the capitalization-asset risk relationship. Section 3 provides an overview of the Croatian experience, with emphasis on the lending boom from 2001 to 2007. Section 4 presents the model and data. Section 5 reviews the regression results, and section 6 concludes.

2. THEORETICAL VIEWS OF CAPITAL REQUIREMENTS AND ASSET RISK

This section provides a brief overview of a few of the main papers in the rather large literature on capital requirements and bank risk. Van Hoose (2007) and Jackson et al (1999) provide more detailed summaries.

The key papers suggesting that increased capital requirements unambiguously lower asset risk are Keeley and Furlong (1990), Furlong and Keeley (1989) and Flannery (1989).[1] Both papers by Keeley and Furlong emphasize the role played by the option value of deposit insurance. As a bank moves closer to exercising this put option, its value rises in a non-linear fashion. This behavior of the deposit insurance put invalidates the use of mean-variance models, since the assumption of constant borrowing costs cannot be upheld. Indeed, Ellis and Flannery (1992) finds evidence that interest rates paid on uninsured certificates of deposit included significant risk premia, supporting Keeley and Furlong's argument.

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[1] For a more detailed survey of both sides of the argument, the reader is encouraged to consult Van Hoose (2007).

Once the deposit insurance put is taken into account, Keeley and Furlong find that increased capital adequacy, by moving the bank away from the area of sharply rising probability of default, decreases funding costs and asset risk.

Flannery (1989) reaches a similar conclusion with a somewhat different model. He finds that capital requirements may reduce asset diversification, but nonetheless decrease asset risk.

In a more recent contribution, Repullo and Suarez (2004) examine capital regulation in a situation of imperfect competition in deposit markets and moral hazard in lending. They find that capital regulations may well succeed in curbing risk-taking, particularly when banks' market power is large.

Among the first authors to question this conclusion was Rochet (1992), who argued that commercial banks whose objective is to maximize the market value of their future profits may choose very specialized and very risky portfolios, even under minimum capital regulation. He argues that "actuarial" pricing of deposit insurance could deal with this issue. Whether such precise pricing of deposit insurance is actually feasible is a complex question; the preponderance of the literature doubts this very much (see for example Kupiec and O'Brien (1998), and, for a recent survey, Galac 2005). But for our purposes here, the key point is that Rochet argues against the existence of a simple, monotonic, decreasing relationship between asset risk and capitalization.

Repullo and Suarez (2004), in their study of the implications of the Basel II framework for loan pricing, risk-taking and capital requirements, show that it would be theoretically possible for banks to specialize in low-risk or high-risk assets. Those holding low-risk assets would have a lower cost of capital and lower capital requirements if they used the model-based IRB approach, while those specializing in high-risk assets would do best under the standardized approach, which is similar to Basel I. Although the authors do not focus on the risk-capitalization issue, their model clearly results in a positive relationship between capital requirements and asset risk.

Jeitschko and Jeung (2005) develop a model in which three stakeholders of the bank, the shareholders, the managers and the deposit insurer, have influence over the choice of asset risk. In a situation where the bank's capital is impaired, the deposit insurer is likely to have the main say, and to insist on decreasing levels of risk. However, in other situations, control by the managers or the shareholders can lead to different outcomes. Managers, seeking to maximize the expected value of the private benefit of control, may choose higher risk since this results in greater expected size and market share. Shareholders, who seek to maximize the expected value of bank equity, will choose lower asset risk with increasing capital in a mean-variance set-up, but may choose higher asset risk if higher return, higher risk assets are available.

Estrella (2004) also provides a model aimed at evaluating the usefulness of the three pillars of the new capital accord (Basel II): minimum capital requirements, bank supervision, and market discipline based on public disclosure of bank information. Estrella concludes that none of these tools alone can align banks' behavior with social preferences. Banks may choose higher levels of asset risk than desired by regulators representing the social interest, and minimum capital requirements may not curb this behavior fully.

Complementing the inconclusive view of the theoretical literature, a survey by the Basel Committee on Banking Supervision (Jackson et al 1999), concludes that "there is no reliable evidence one way or the other as to whether capital requirements do encourage banks in some periods to increase risk-taking, as implied by theoretical models" (p. 21). This conclusion underlines the importance of empirical work, to which I now turn.

3. THE CROATIAN LENDING BOOM

Croatia experienced a banking crisis in 1998-99 (see Kraft and Škreb 2002, Jankov 1999). As part of the resolution of the crisis, the largest banks in the country were sold to European banking groups during 1999 and 2000. Foreign ownership jumped from 6.7% in end-1998 to some 84.1% of total banking assets in end-2000. (CNB 2009) The entry of the foreign banks stabilized the banking system, facilitating the investment of new capital and the beginning a new lending cycle.
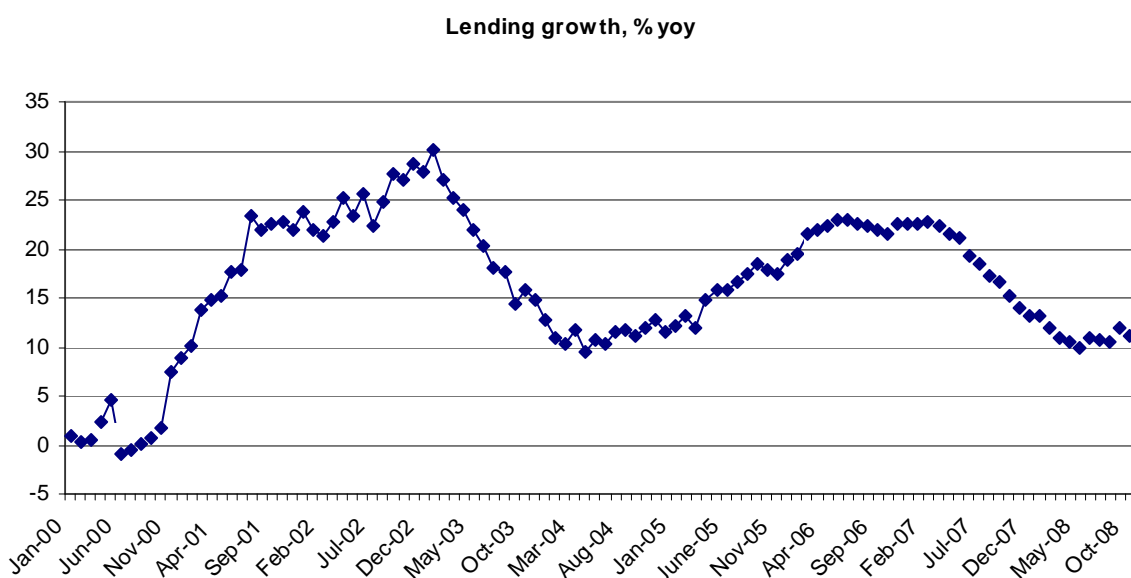
Lending growth, % yoy

Source: Croatian National Bank Bulletin, Table D5.

As Figure 1 shows lending accelerated sharply in late 2000 and early 2001, and lending growth peaked at just over 30% annually at the end of 2002. A restrictive penalty on "excessive" lending growth was imposed by the central bank in 2003, and this resulted in a sharp decrease in bank lending growth. However, with the removal of these restrictions at the end of 2004, lending growth accelerated again, reaching roughly 24% during 2006.

Lending growth was particularly difficult to contain in Croatia because of the high level of liability dollarization (Kraft 2003, Kraft and Šošić 2006). Roughly two-thirds of deposits were held in foreign currency, mainly Euros, and banks matched these liabilities by indexing loan principal to the exchange rate. This approach removed direct interest-rate risk from bank balance sheets, but created credit risk in the case of significant exchange rate movements (for a general treatment of this issue, see Cayazzo et al 2006).

In light of the balance sheet effects, as well as the potential inflationary pressures that would be created by exchange rate depreciation, monetary policy has heeded Mishkin's warning and

focused on financial stability, rather than countercyclical policy (Mishkin 1997). Arguably, the Croatian authorities had little room to stimulate economic activity, and little choice other than to maintain a fairly stable exchange rate.

In this situation, there was no room for active use of interest-rate policy to slow down the lending boom. In fact, a stability-oriented policy lowered the cost of credit by keeping exchange rates stable, thus avoiding major effects of the indexation clauses and encouraging capital inflows. Thus it could be said that stability-oriented monetary policy actually created excellent conditions for a lending boom.

To be fair, even countries with low levels of liability dollarization are faced with the "Tošovsky dilemma". Raising interest rates to cool off a lending boom financed from abroad can backfire if increased capital inflows provide enough funding for further loan expansion. However, in the Croatian case, in addition to the Tošovsky dilemma problem, monetary policy was further limited by high levels of liability dollarization.

Faced with this situation, the central bank tried a number of unorthodox measures. To begin with, in 2003, it stipulated that banks' whose loan book grew faster than 16% per annum would have to invest in low-yield central bank securities in an amount twice that of the lending overrun.

After this limit was removed at the end of 2003, the CNB imposed a marginal reserve requirement that initially required banks to hold 24% of any increase in foreign liabilities as non-remunerated reserves at the central bank. The marginal reserve requirement was raised in several steps during 2005 and 2006, reaching 55%. It was removed during the financial crisis in October 2008.

Furthermore, the lending limit was brought back into force in 2006, with permitted growth lowered to 12% and later even to 6% (0.5% monthly).

It is important to note that the marginal reserve requirement tilted incentives very strongly towards financing bank expansion via recapitalization rather through borrowing. In addition, in 2006, the central bank decreed new, higher risk weights on indexed loans to unhedged borrowers. Since the vast majority of households, and a significant portion of firms, did not have appropriate foreign exchange income sources, these increased risk weights implied significant increases in regulatory capital requirements.

Finally, in 2003, the central bank decreed a ban on distribution of dividends by banks that increased their loans by more than 30% per annum. This measure was intended to require rapidly-growing banks to hold higher levels of capital. However, very few banks were actually subject to the requirements of the measure, since the growth parameters were set very high.

To summarize these regulatory measures, the central bank essentially tried to deal with the lending boom in three ways. First, it tried direct financial disincentives for on-balance sheet bank lending. Second, it tried to increase the cost of foreign funding. Third, it increased capital requirements and created incentives for banks to raise their capital ratios. (Kraft and Jankov 2005 see this as an attempt to make banks more robust to shocks that would be likely to occur given the high rates of loan growth).

In light of this regulatory response, the Croatian case should provide a good testing ground about the unintended consequences of increased regulatory capital requirements. In the next two sections, I will examine whether these increased regulatory capital requirements were associated with increased risk-taking in Croatia.

4. MODEL AND DATA

The model is taken from Jeitschko and Jeung (2006). They posit that banks simultaneously decide on capital levels and asset risk. Asset risk is therefore a function of contemporaneous capital levels and a vector of bank characteristics:

$$\text{Risk} = a_0 + a_1 \text{ leverage} + a_2 X + e$$

where X is a vector of bank characteristics, and e is an iid error term.

A first question is how to measure asset risk. Non-performing loans might seem a logical candidate, but in fact NPL's are a very backward-looking, ex-post indicator. Therefore, Jeitschko and Jeung prefer the ratio of risk-weighted assets to total assets. This variable fits well with Croatian practice and data and is also adopted here. It is worthwhile noting that the risk-weighted assets figure includes risky off-balance sheet items. Because of this, the ratio can actually be above 100%.

A second question is how to measure capitalization. Jeitschko and Jeung oppose the use of risk-weighted capital adequacy, largely because such a measure includes within it asset risk in the denominator. They propose to measure capitalization by simple leverage (capital to asset ratio).

In the analysis below, I will use the leverage variable in the regressions, but will classify groups of banks by the risk-weighed capital ratio, since regulation in Croatia prescribes intervention to remedy any shortfalls of the risk-weighed capital ratio below 10%. The leverage ratio is not prescribed in Croatian regulation, so that it seems inappropriate to use the leverage ratio to identify institutions that would be considered undercapitalized by the regulatory and would therefore be subject to special regulatory treatment.

The control variables are the following: return on assets, interest rate spread, log (assets), non-performing loan ratio and loan to deposit ratio. Inclusion of return on assets makes sense in the context of profitability targeting. If a bank is below some return threshold, it is hypothesized to accept increased asset risk, while an above-threshold return would lead to a decrease in risk-taking.

The interest-rate spread variable is related to asset-risk in that banks may charge riskier clients higher interest rates. Furthermore, spreads may be related to banks' market power. This may also be reflected in bank size, which conventionally in the literature is considered to be non-linear and is modeled by the variable log (total assets). Additionally, larger banks may face better investment opportunities because of their superior market position, name recognition and branch network. Brewer and Jackson (2006) find evidence that banks with greater market power take less asset risk.

The contemporaneous non-performing loan ratio should be negatively related to asset risk, in that banks already experiencing high levels of loan losses would be expected to lower risk so as to restore their capitalization. However, a positive coefficient might be possible, if banks suffering substantial loan losses seek to improve earnings to compensate for losses by gambling on risky assets.

Finally, the loan to deposit ratio indicates something about the funding strategy of the bank. High loan to deposit ratios suggest a reliance on interbank loans (wholesale funding is virtually non-existent in Croatia), which may drive up funding costs and lead to greater asset risk to compensate.

The data comes from Croatian National Bank reports on individual banks. Annual reports are used. Quarterly data is also available, but the reliability of the income and loan classification data is superior at the annual level, so that there is most likely little benefit to using quarterly data for the analysis.

The data series begins in 1999, and ends in 2006. Since the years 1999 to 2000 were marked by the banking crisis and its immediate aftermath, in some of the regressions below these years are distinguished from the rest of the sample.

Table 1: Descriptive Statistics (% and million HRK)

	Mean	Median	Maximum	Minimum	Standard Deviation
Risk-weighted assets/total	66,9	67,7	129,2	9,0	16,1
Capital-asset ratio	19,7	14,4	9,6	-12,9	16,3
Return on Average Assets	0,2	1,2	1,2	-60,4	5,8
Interest Rate-Spread	1,0	8,1	124,2	-4,9	1,1
Non-performing loans share	13,0	9,1	80,8	0,0	12,3
Loan to deposit ratio	108,0	88,0	949,5	22,7	88,0
Total assets (million HRK)	4.190,1	6.846,1	70.166,0	2,5	1,0

5. RESULTS

The regressions are run using OLS, with White errors to correct for heteroskedasticity. For the whole sample, the results are shown in Table 2.

Table 2: Regressions on Risk-weighted assets/total assets, 1999-2006

Variable	(1)	(2)	(3)
Capital-asset ratio	-0.177	-1.478	0.956
	(1.48)	(0.14)	(2.65)**
Low-capitalization dummy x capital-asset ratio		0.036	-0.846
		(0.238)	(2.93)**
High-capitalization dummy x capital asset ratio			-0.996
			(3.49)**
Return on Average Assets	0.051	0.053	0.105
	(0.25)	(0.26)	(0.48)

Interest Rate Spread	-0.179	-0.179	-0.167
	(1.02)	(1.01)	(0.97)
NPL share	0.147	0.145	0.166
	(1.50)	(1.45)	(1.89)+
Loan-to-deposit ratio	0.051	0.051	0.038
	(3.06)**	(3.05)** (2.38)*	
Log (total assets)	-2.449	-2.447	-2.99
	(6.66)**	(6.59)** (10.06)**	
Constant	80.776	80.762	78.56
	(22.29)**	(22.16)**	(21.01)**
Adjusted R-squared	0.131	0.128	0.208
F-statistic	10.10	8.64	12.91
N	364	364	364

** significant at 1% * significant at 5% + significant at 10%

Looking at the three regressions together, we see that for the banks as a whole, the capital-asset ratio is insignificant. Distinguishing the poorly-capitalized banks in regression two does not change this. However, in regression three we see that there does seem to be a relationship between the capital-asset ratio and asset risk among those banks that were neither poorly-capitalized and under special supervisory scrutiny, nor extremely well-capitalized (over 20% capital-adequacy). Furthermore, Wald tests confirm that we cannot reject the hypothesis that the capital-asset ratio for both the very low and very high groups had a zero coefficient, that is, that there was no statistically significant relationship between asset risk and capitalization even in regression three.

What is the economic interpretation of this finding? The lack of a relationship between capitalization and asset risk for poorly-capitalized banks is in line with Jeitschko and Jeung (2005): when banks are under special supervisory regimes, asset risk is reduced and has no particular relation to capitalization. The case of adequately but not highly capitalized banks is more central to our discussion. The findings suggest that increasing capitalization amongst these banks leads to increased asset risk, confirming the "return-targeting" thesis. These banks, including the main market leaders in Croatia, simultaneously took on high levels of capital and higher levels of risk. This raises important questions about the effects of regulatory measures in Croatia.

The case of highly capitalized banks is also intriguing. Generally speaking, these were smaller banks, sometimes with extremely high capital-adequacy levels over 25%. Apparently, these banks high levels of capital did not push them to higher levels of risk. Most likely, this can be explained by the fact that these banks held such high levels of capital in anticipation of rapid expansion. Relatively large amounts of capital were invested in these banks initially, and capital levels were not adjusted frequently. Also, these banks probably faced limited investment opportunities relative to the market leaders.

The coefficients on the control variables are generally as expected. The most significant of these variables are the log total assets variable and the loan to deposit ratio. The former accords with Brewer and Jackson (2006), confirming that scale and market share per se decrease risk appetite. The latter suggests that riskier funding models, proxied by higher loan to deposit ratios, lead to riskier asset portfolios.

A question about these results is whether they might be affected by the immediate effects of the banking crisis. For this reason, the regressions were run for the period 1999-2000 and 2001-2006 separately. In addition, in light of the numerous regulatory changes over the period, there could be time effects. This is most relevant for the 2001-2006 period, so a third regression is run with time intercept dummies. The results are shown below.

Table 3: Results for 1999-2000 and 2001-2006

Variable	(1999-2000)	(2001-2006)	
		no time dummies	time dummies
Capital-asset ratio	0.054	1.258	0.794
	(0.20)	(3.67)**	(3.71)**
Low-capitalization dummy x capital-asset ratio	-0.199	-0.03	0.055
	(1.19)	(0.02)	(0.38)
High-capitalization dummy x capital asset ratio	-0.152	-1.256	-0.819
	(0.88)	(4.62)**	(6.06)**
Return on Average Assets	-0.117	0.669	0.615
	(18.12) **	(2.98)**	(4.70)**
Interest Rate Spread	-.180	-0.253	0.054
	(1.21)	(0.44)	(0.10)
NPL share	0.195	0.270	0.398
	(5.56)**	(3.05)**	(5.07)**
Loan-to-deposit ratio	0.040	0.037	0.058
	(2.12)*	(2.10)*	(2.57)*
Log (total assets)	-3.197	-2.868	-2.788
	(12.89)**	(5.63)**	(6.29)**
Constant	80.776	75.303	71.71
	(22.29)**	(9.71)**	(9.53)**
Adjusted R-squared	0.239	0.221	0.367
F-statistic	5.67	9.61	11.82
N	120	244	244

** significant at 1% * significant at 5% + significant at 10%

The results show clear differences between the two subperiods. During the earlier, crisis period, there was no statistical relationship between asset risk and capitalization at all. Furthermore, there is a negative relationship between profitability and asset risk. This could be explained in the manner that profitable banks maintained their profitability by decreasing their asset risk and in that way tried to minimize losses. At the same time, it is possible that loss-making banks maintained high levels of risk, perhaps because they were unable to cut exposures to bad clients, or perhaps because they were trying unsuccessfully to help these clients survive by providing further credit.

In contrast, in the post-crisis period, which was also a period of rapid credit growth, we find the same phenomenon as in the whole sample. There is a positive relationship between capitalization and asset risk for the adequately capitalized banks and no relationship for the highly capitalized banks.

During the 2001-2006 sample, however, we come to the somewhat surprising finding that poorly capitalized banks displayed a positive coefficient for capitalization. Given the small number of such observations, this may be spurious. Or it may be that regulators imposed less stringent restrictions on poorly capitalized banks that were nonetheless close to the legal minimum capital levels, and more stringent restrictions on more poorly capitalized banks.

6. SOME CONCLUDING THOUGHTS

This paper explores the relationship between bank capitalization and asset risk, using recent Croatian data. The main finding is that, for a crucial set of adequately but not extremely well-capitalized banks, asset risk is increasing in capitalization.

There are two possible interpretations of this finding. The first is that regulatory efforts to make the banking system more robust to the risks inherent in rapid credit growth pushed banks to raise their capital above desired levels. To compensate for this, banks increased asset risk. The second interpretation is that banks themselves, aware of increased risk inherent in increased lending, themselves selected higher capital levels to neutralize increased risk.

Certainly, there were numerous regulatory changes that compelled or incentivized banks to increase capital. For example, increased risk-weights on lending in foreign currency to borrowers lacking adequate foreign income directly decreased banks' capital adequacy ratios. Many banks responded to this by raising additional capital, which in our model would be seen as an increase in the capital-asset ratio.

Furthermore, the marginal reserve requirement, which placed very large reserve requirements on all foreign liabilities, provided an incentive for banks to substitute capital for debt. This regulatory initiative also resulted in increased capital-asset ratios for a given asset portfolio.

However, these regulatory initiatives should be largely captured by time dummies. The fact that a robust positive relationship between capitalization and asset risk survives the inclusion of time dummies suggests that, in addition to regulation, banks themselves chose to match higher asset risk with higher capital. Anecdotally, it is widely believed that the subsidiaries of European banks active in Croatia were subject to Return on Equity targets from their parent banks. This would readily explain the positive capitalization-asset risk relationship.

The most important question emerging from all of this is whether increased capitalization, whether due to regulation or return targets, actually decreased default risk in light of increased asset risk taken. It is important to note that these results do not in and of themselves imply that the system became less stable because of increased capital requirements. Instead, the results should lead to further research and reflection on the usefulness and limits of capital requirements as a tool to increased system robustness, particularly in the presence of persistent and hard to control credit booms.

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CAPITAL MANAGEMENT DURING LIQUIDITY CRUNCH: BALTIC STATES IN THE CONTEXT OF CEE EQUITY MARKETS

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1. RESEARCH BACKGROUND

1.1. Need for Liquidity

A number of reasons are mentioned to explain the emergence of liquidity crisis, which has spread all over the global financial markets. Extensive innovations within financial derivatives field, huge bonuses for top management and profits of the financial institutions coupled with interest rates hike, easy access to unsecured loans - it all led to severe downturn of financial sector, the problems of which has later spread over basically to every industry sector of national economies.

Deep problems started in USA in subprime loan sector spread not only to the whole financial sector. Troubled financial industry has had an adverse effect on national economies all over the world. It caused uncertainty of probable development scenarios and provoked significant reaction on stock exchange markets, which reflected mainly by strong risk aversion of the investors.

Liquidity crisis became a major challenge for corporate managers who are under pressure to reasonably manage capital for the company to stay profitable and continue its development. Contractions or expansions in bank lending by firms may be affected by the firms' balance sheet liquidity (or solidity) position. Banks are likely to be more reluctant to lend to firms in difficulty. This is reinforced when the banks are in lack of liquidity themselves and, thus, the companies that needed to attract external funds to finance business operations were badly affected during the crisis diminishing their shareholders' value.

Public companies domiciled in the emerging markets (China, India, Russia, Eastern Europe) were under scrutinized attention as in the conditions of tight liquidity equity markets of developing countries are first to suffer. Thus, there was a major money outflow seen in the emerging countries. Management of the companies were forced to make significant efforts to

persuade investors to stay loyal, to demonstrate that companies are able to generate enough cash flows to self-finance and that balance sheet are strong enough to overcome the downturn in the global economy.

According to the information at our disposal, there was not any research conducted on whether strong balance sheet and cash generation ability were able to retain investors during strong risk aversion, which especially affected developing equity markets, i.e. Baltic and Central and Eastern European markets.

This problem is becoming more topical as institutional investors become more sophisticated and understand that the abnormal growth, which was experienced on the emerging markets in early years of 21st century, has expired and now one needs to make well-thought decisions. Moreover, the tendency to analyze corporate balance sheet more thoroughly is seen not only on the emerging markets but also on developed equity markets, which is nowadays emphasized on the daily basis by such authorities as *McKinsey, BCG* consulting corporations. Also rating agencies *Moody's* and *Standard and Poor's* are warning investors to carefully consider financial stability of the companies as in the near future huge number of well-known companies could go bankrupt: *Kodak, General Motors, Ford* etc.

Therefore, the hypothesis of the present research was stated as follows: in the environment of limited access to the resources the companies with sufficient capital are favoured the most by the shareholders. The aim of the research was to evaluate the impact of quality of balance sheet and sufficiency of capital of Baltic and Central and Eastern European (CEE) companies on the performance. We focused our research on the time period, when the access to the funding was limited, i.e. period of global financial crisis.

The methods chosen for conducting a research were mainly quantitative, which include descriptive statistical analysis of differences in stock price performances of companies located in CEE. Though it was not our primary aim, using qualitative analysis methods we tried to find out what is the typology of companies which turn out to be winners in the end.

1.2. Optimal capital management

The topical issue about balance sheet leverage and optimal financing structure is being discussed by leading economists and financiers for several decades already. The choice of financing reflects the trade-off between the tax benefits of debt and associated bankruptcy and agency costs. Company's capital structure largely depends on company-specific factors such as the probability of bankruptcy, profitability, quality and structure of assets. Beyond these factors, company's industry affiliation and characteristics of country the company operates. Thus, choice of the capital structure is an individual decision of each company. However, some patterns and common traits of companies with similar financing structure can be found.

Leverage increases the potential volatility of company's earnings and cash flows and increases the risk of lending to or owning a company. Choice of capital structure has a strong influence on the company's market value, and it becomes crucial during the period of limited access to the financing, which occurred during the liquidity crisis. Highly leveraged companies usually have a discount in valuations as they pose a greater chance of incurring significant losses during downturns.

There have been a number of studies and academic researches to find out what is the best policy of capital management corporate executives should stick to in order to win investors' respect, praise and loyalty.

Modigliani and Miller (1958; 1963) state that in the tax-free world there should not be any dependence of market value of the company and its capital structure. In real world, however, static trade-off theory suggests that the optimal level of leverage should be the level at which value of the company is maximized; this is the level at which any additional debt increases the costs of financial distress by an amount greater than the benefit from interest deductibility.

Masulis (1983) argues further that when firms, which issue debt, are moving towards the industry average (debt ratio) from below, the market will react more positively than when the firm is moving away from the industry average.

Professor of Columbia Business School, Gur Huberman (1984), explains the empirical evidence showing negative relation of the firm's external financing and its market value. Income from operations is an important source of liquidity and, therefore, low earnings lead to low liquidity. The company anticipating decreasing earnings favours external financing. Thus, high level of external financing is associated with the low earnings that tend to diminish the value of a company.

The results of the empirical study conducted by the Heyman, Deloof and Ooghe (2003) relate the level of external and internal financing not only to the value of the company but also to the other aspects of the entity. The results of their study state that high growth firms have a lower debt ratio. The same study, which research universe included primarily Belgian privately held firms, shows that more profitable firms tend to have less debt and that the leverage is negatively correlated with the company's size. They have found out that asymmetric information and agency costs of debt are major determinants of the financial structure of the privately held firms.

Academics Mesquita and Lara (2003) studied the capital structure of 70 Brazilian companies, focusing their attention to the companies operating in the environment of instability that is especially characteristic for companies domiciled in the emerging markets. They have found out that there is an inverse relationship between rates of returns and debt on the accounts. Accordingly, the companies had higher rates of return if they used mainly self-financing and had low share of debt on the accounts.

As the present study is concerned with the companies operating in emerging countries, it is worth noticing that the companies in developed markets typically use more long-term debt and tend to have higher long-term debt to total debt ratios compared to their emerging market peers, which was proved by several research works (Booth et al.). Companies in high inflationary environment usually exhibit lower levels of financial leverage, rely more on equity financing, and have a shorter debt maturity structure compared to their peers in lower inflation countries – as high inflation has a negative impact on both the level of debt financing and desired debt maturity.

2. RESEARCH METHODOLOGY

2.1. Quality of Balance Sheet Check

To assess the quality of balance sheet we chose the following fundamental analysis ratios related to the balance sheet and capital management per se:

1. Equity ratio calculated as
Shareholder's equity/Total assets *100%   (1)

2. Level of net debt relative to equity capital calculated as
((Short-term debt +Long-term debt – Cash & equiv.)/ Shareholder's equity)*100%   (2)

3. Sufficient equity index calculated as
Sufficient equity index = (Shareholder's equity/Sufficient equity)*100   (3)

The third concept used in the course of the study is relatively new ratio of the financial theory. Capital sufficiency helps to understand if the business entity is financed in the way that ensures its sustainable development. The methodology of sufficient equity calculation was developed by Riga Technical University professors Natalja Lace and Zoja Sundukova, taking into account asset financing rules: long-term capital should take responsibility for less liquid assets. Sufficient equity for the present research purposes was calculated according to the following formula:

  Sufficient equity = Long-term assets + Inventories – Provisions – Long-term liabilities   (4)

Having calculated sufficient equity, one needs to consider relative ratio, i.e. sufficient capital index. If it is significantly above 100 points, it should be considered that the company has too low share of debt, which needs to be increased to raise shareholder's value. In opposite, if the index tends to be below 100, then the balance sheet is highly levered, and the management should think about decreasing its total debt in the capital structure. However, it should be taken in the account, that one never gets 100. So, certain deviations from 100 points are acceptable (20 points within the course of present research).

We tried to find the relationship between the share price performances and the entities' choice of financing structure by using mainly statistical analysis methods.

2.2. Regional and Timing Scope of Research

Above discussed concepts (equity ratio and the level of net debt) were primarily applied to check the balance sheets of 200 companies listed in 11 CEE countries: Czech Republic, Croatia, Slovakia, Slovenia, Bulgaria, Hungary, Poland, Romania, Baltic States (Lithuania, Latvia, Estonia).

In addition, sufficiency of capital and its influence of share performance was checked for the largest 40 CEE companies and compared to the sufficiency of capital that provide 30 companies quoted on the Baltic stock exchanges. It should be noted, however, that the representatives of financial industry (banks, insurance companies, asset managers) were systematically excluded from the research corpus when analyzing equity capital sufficiency

due to the balance sheet structure that significantly differs from the classical balance sheet structure.

One of the research objectives of the study was to focus on the behaviour of the listed companies during the liquidity tightening on the market. Therefore, the time period of global financial crisis development was chosen for analysis (September 2007 - December 2008).

The data necessary to carry out a study were extracted from the annual reports of the companies published on the corporate web-sites. The authors used the following set of data for the research needs: monthly stock prices, total assets, shareholder's equity, long-term assets, inventories, provisions, long-term liabilities, total liabilities, cash and equivalents. Only the companies with quotation history of not less than 3 years and with financial reporting figures available in English on a quarterly basis (information downloaded form corporate web-pages) were considered for the analysis.

3. RESULTS OF THE RESEARCH

3.1. Safest Investment - Companies with Conservative Balance Sheet

The research process was started with the general characterization of the CEE domiciled companies' balance sheet quality. Indeed, the results confirmed previous research that emerging markets companies tend to have more conservative balance sheets than their peers in developed countries. With exception of 3 regions under review: Czech Republic (41%), Slovakia (47%) and Slovenia (46%), the companies in other CEE countries are self-financed by more than 50% with Romanian companies being the most conservative as they have equity ratio of 63%, according to latest available data of FY2008. To compare, average equity ratio of US-based companies is 37% and Western European companies is 33%. Baltic companies stick to relatively conservative financing policy (average equity ratio is 54%) and during 2008 they managed to strengthen their balance sheets by increasing share of equity in total capital, while the majority of CEE companies showed an increase in their balance sheet leverage in FY 2008.

Considering the case of net debt to equity ratio the highest debt one sees with Slovenian companies (0.74 in average), while Romanian companies again have the most conservative capital management policy by having negative net debt (-0.27 in average). Baltic companies have moderate net debt on their accounts as net debt to equity in average is 0.24%, however they managed to decrease this ratio by 13% in the first nine months of 2008 in contrast with the majority of CEE operating companies which demonstrated increase of net debt. This fact is explained by the reduced cash holdings on the corporate accounts.

The results of the conducted research show that there is a certain positive correlation between stability of balance sheet and shareholder's value (share price performance) generated by the company. Regression equation $y = 0.106x - 0.689$, where x is corporate equity ratio and y is stock price performance of the company, explains the relationship between these two multiples. However, it should be noted that coefficient of determination (R^2) is rather on the low level of 0.013, which points to quite weak explanation of the variation.
F-test of the regression is 2.33, while F-test significance is 0.12, which points to the existing relationship between equity ratio and share price performance. When testing for serial

correlation, we have used Durbin-Watson statistic: DW=2*(1 - r), where r is sample correlation between regression residuals. In the result we got 1.77, which points to positive serial correlation. However, the results is close to 2 (no serial correlation), so we can neglect the correlation and consider the regression to be valid.

Figure 1.   CEE and Baltic stocks performance relationship with equity ratio

The analysis of equity ratio quartiles was made afterwards, which demonstrated that the companies from second and third quartiles, which are by 45%-65% financed by equity capital, tend to show the best results in the conditions of strong risk aversion.
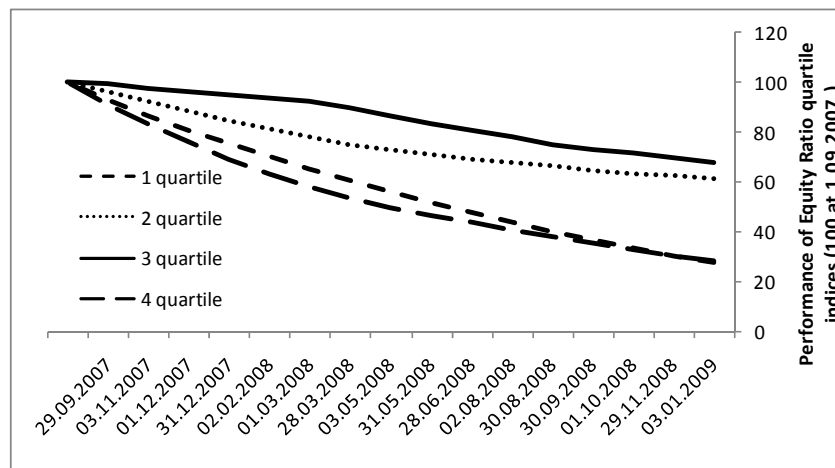
Figure 2.   CEE and Baltic stocks performance according to equity ratio quartiles

It is interesting, however, that the companies with the highest equity ratios (over 80%) are not the best performers even during the shortage of liquidity on the markets. This fact can be explained by their inability to expand the business due to saturation on the market, thus, this type of companies (e.g. telecoms) has limited growth potential which is being negatively evaluated by the market players. The findings of the previous study (J.Grigorjeva, N. Lace) carried out within the Baltic equity market showed that for the investors in Baltic equities the future perspective of the business model is the key criterion to consider.

Moreover, the companies with obvious financial stability were the most favoured by the equity investors in the period of high growth and capital inflows. Hence, they have also

suffered the most (being overpriced before) when large investors were leaving emerging markets as of the beginning of the global financial crisis.

We have also checked the relationship between share price performance and another important for shareholders indicator – net debt to equity, which also helps to judge the balance sheet of the company and estimate the risk of solvency carried by the company under review. It was found out that there exists negative relationship between the level of net debt and share price performance which is explained by the following linear regression $y = -0.021x -0.638$, where x is net debt to equity ratio and y is share price performance, with coefficient of determination (R^2) of 0.008. Thus, though the relationship is not as obvious as one would expect, the investors could consider it as a guide when taking decision on asset allocation on the CEE and Baltic States equity markets.

F-test of the regression is 1.24, while F-test significance is 0.27, which points to the existing relationship between net debt to equity and share price performance, which, however, is not as significant as in the case of equity ratio. When testing for serial correlation, again we have used Durbin-Watson statistic: DW=2*(1 - r), where r is sample correlation between regression residuals. In the result we got 1.82, which points to positive serial correlation. However, the results is close to 2 (no serial correlation), so we can neglect the correlation and consider the regression to be valid.
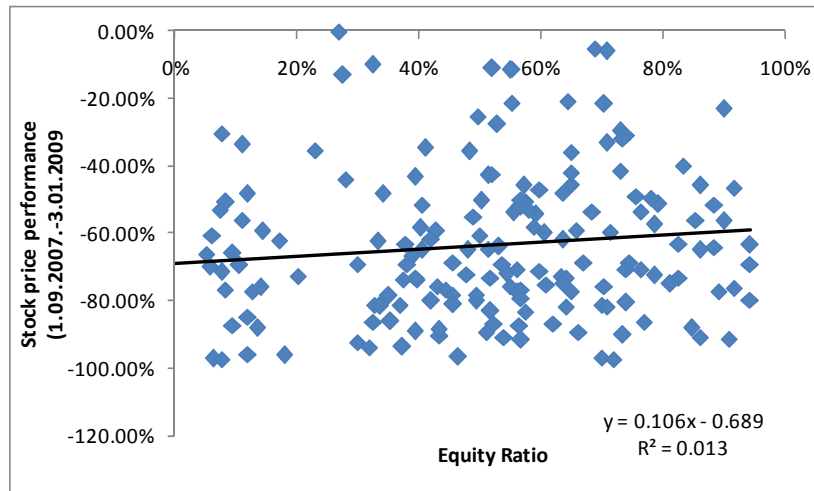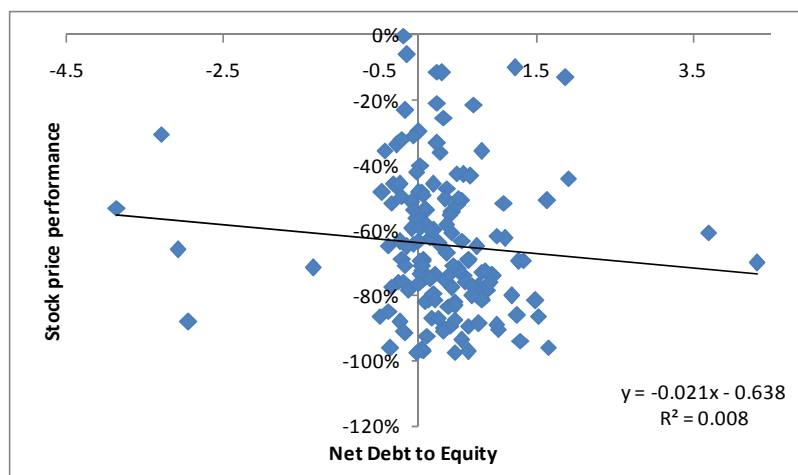

Figure 3.   CEE and Baltic stocks performance relationship with net debt to equity ratio

Similarly as in the equity ratio case, the corpus of the research was divided into four parts, quartiles, with first to include companies the lowest net debt to equity ratio and fourth – companies with the highest net debt to equity, thus having higher risk. The results demonstrate that the best performers were the companies with negative net debt – companies of the first quartile. Thus, it proves that cash on the accounts is favoured by the investment professionals in the conditions of tight liquidity.
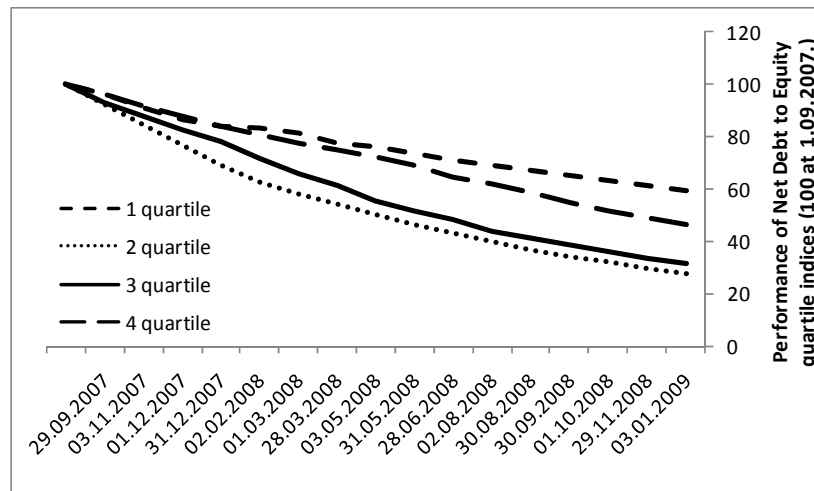
Figure 4.   CEE and Baltic stocks performance of net debt to equity ratio quartiles

It is worth noticing that the companies of the fourth quartile with net debt to equity of 1.5 points in average performed well in FY 2007-2008. After a deeper analysis one could be surprised to find among these companies large number of banks (B*ank Millennium, OTP Bank, Kredyt Bank*), which actually caused this setback of equity markets. Most probably Central and Eastern European financial institutions followed their US and Western European peers, which though created the turmoil, in terms of share price performance did relatively well compared to such real economy sectors as car manufacturers, steel makers, semiconductors, where the price drops of shares were over 70-80%.

3.2. Best Management Policy – Towards Higher than Needed Equity Capital

The second part of the study was dedicated to comparison of level of sufficient equity and shareowner's capital the companies hold on their balance sheets. As it was indicated before, the ideal variant, when real equity capital equals level of sufficient equity capital, can never occur. Therefore, the authors of the paper extended the range of optimal equity level from 80 points to 120 points.

The findings of the study show that in the environment of the financial crisis and liquidity shortage investors prioritize the companies with equity capital exceeding its sufficient level by more than 20%. The research conducted also shows that it is not the best strategy during the usual market environment when access to external financing is not as tight as it is now. This is true for both cases checked: for Baltic companies as well as for Central and Eastern European companies.

The table 1 shows the average performance of the companies divided into groups according to the capital sufficiency. Monthly performance, which is lately averaged to create performance index, is calculated by dividing share price of each company at the end of month by the share price at the beginning of month. Stock price performance was calculated for three periods: FY 2007, FY 2008 and a joint period for two years 2007-2008.The results clearly demonstrate that the companies with sufficient and more than sufficient equity capital dominated the market (-49% and -46% respectively) compared to the companies which obviously lacked self-financing (-61%).

Table 1. CEE stocks average performance in FY 2007 and 2008 according to the sufficiency of capital

Equity capital sufficiency index	Stock price performance		
	FY 2008	FY 2007	FY 2007-2008
Insufficient equity capital (<80)	-61%	15%	-50%
Sufficient equity capital (<120 and >80)	-49%	18%	-41%
To large equity capital (>120)	-46%	0%	-47%

In fiscal year 2007 the results, however, are quite different, which is mainly explained by the fact that the first half of financial year 2007 was positive performance-wise and investors saw record peaks of major world equity indices. In such market environment the companies, which have too high equity financing, are significantly losing even to those companies, which have insufficient capital financing.

The relevance of equity capital sufficiency was also separately checked for Baltic stock market. According to the results seen on the figure 5, the situation in Baltic equity market to a great extent resembles the situation in the CEE markets. Companies with insufficient equity capital (less than 80 points) are lagging behind those, which have enough equity financing and those who have too high equity financing.
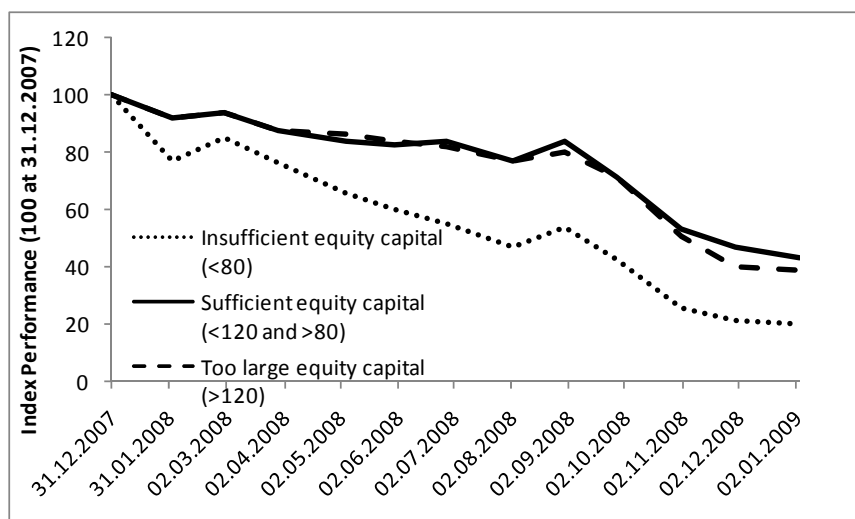
Figure 5.   Baltic stocks performance according to equity capital sufficiency

Previous research on the Baltic listed companies (J. Grigorjeva, N. Lace) showed that during the FY 2007, when the liquidity on the market was not such an obvious problem, the best investment strategy was to favour the companies which are having equity financing in range of 80-120, while the significant setback in performances was seen in the group of the business entities, which either had too conservative (sufficient equity capital exceeding 120) or too aggressive (sufficient equity capital being below 80) capital management policy. This corresponds to the situation seen on the CEE equity markets.

4. CONCLUSIONS AND RECOMMENDATIONS

The main target of the present research was to assess the quality of the balance sheet of CEE and Baltic States companies during the period of the global financial crisis and to find out the effect of its influence on the share performance of the listed companies. The hypothesis that in

the conditions of tight liquidity on the market and restricted access to the funds investors prefer companies with sufficient equity capital was proved.

The results of the study demonstrate that the companies operating in CEE and Baltic countries pursue conservative capital management policy and the balance sheets possess low leverage characteristics, which is typical for the emerging markets. During the financial year 2008, when the liquidity crisis was felt the most, the quality of balance of the companies under review was not changed dramatically compared to the balance sheet quality in the beginning of the financial crisis. However, the trend towards balance sheet quality deterioration anyway could be seen.

The choice of financing the operations of the company evidently influences share price performance as positive relationship between equity ratio and performance was found. We also found out that there is a negative relationship between the level of the net debt to equity and company's performance on the stock market. Companies with negative net debt and, therefore, substantial portion of cash on the accounts were among the favourites where investors allocates their funds. However, one should be careful with the companies which have too high equity financing (over 80%) as these companies were not able to ensure a hedge during the strong risk aversion.

It was discovered that CEE and Baltic equity market investors are concerned with the financing structure of the companies they invest in. The companies with the sufficient equity capital tend to demonstrate higher performance in the conditions of normal economic environment. However, during the times of abnormal equity market volatility and uncertain macroeconomic situation equity investors seek for a hedge and, therefore, favour more those companies, which have equity capital that exceeds necessary level to ensure that the company would not lack funds and would be able to develop further despite adverse market conditions.

Therefore, the recommendations to the investors in CEE and Baltic equities would be to carefully consider the financing structure of the entity, that the balance sheet leverage is not highly leveraged and that the company has fast and easy access to liquid funds. Undoubtedly, growth perspectives and the attractiveness of the business model should also be checked as it is a prerequisite for the company's high performance on the equity market. Besides, it is crucial to consider also the sufficiency of equity financing and put more emphasis on those companies that ensure sufficient and even more than sufficient (in the conditions of the restricted access to the funds) level of capital.

We strongly advise to continue the examination of the attractive investors' resources allocation during the global financial crisis, when the all asset classes lose in value. Particular attention could be dedicated to the company's cash generation ability and ability to self-finance the development as well as the level of WACC (weighted average cost of capital) and its influence on the performance of the quoted companies.

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INVESTIGATING INFLATION-GROWTH TRADE-OFF IN TRANSITION COUNTRIES

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1. INTRODUCTION

This paper investigates the inflation-growth relationship in transition countries. There is a generally accepted consensus that price stability is the ultimate objective of monetary policy; central banks in the last few years have often opted either for a quantitative target or for qualitative definition of price stability. Inflation targets are often specified as ranges rather than levels, and are usually set at 4 percent or less per year. Recently, theoretical arguments that imply that the long-run Phillips curve may not be vertical at low inflation rates have been put forward. This could also imply that the inflation-growth relationship may be positive at low inflation rates. As Akerlof et al. (2000) note, a little inflation, when accompanied with nominal rigidities, can lower the minimum sustainable rate of unemployment. This, in turn, results in increased productivity and more employment than would exist in a non-inflationary environment, which results in higher capacity utilization and the narrowing of the output gap. Another line of argument explains the observed positive inflation-growth relationship through financial markets (Khan and Senhadji, 2006; Rousseau and Wachtel, 2002). Namely recent theoretical literature suggests that low inflation induces individuals to substitute away from cash and into investments, which leads to higher growth. In view of the fact that high inflation, on the other hand, leads to misallocation of resources, which, in turn, is likely to reduce the rate of growth of an economy, this paper considers this relationship in transition countries. In particular, we will present some studies that investigate the non-linearities in the inflation-growth relationship. They find that this trade-off is different for developing and developed countries. We will next analyze the inflation-growth relationship in a set of transition countries empirically. Finding a kink in this relationship, i.e. a level of inflation when its effect on growth turns from positive to negative, is of special interest.

The paper is organized as follows. Section 2 overviews the non-linearities in the inflation-growth relationship in theory, section 3 is a literature overview of the papers that empirically analyze this trade-off in developed and developing countries, while section 4 contains our empirical analysis of the non-linearities in a set of transition countries via dynamic panel. Finally, section 5 concludes.

2. NON-LINEARITIES IN THE INFLATION-GROWTH RELATIONSHP IN THEORY

Akerlof et al. (2000) develop a model that allows a trade-off between inflation and unemployment, but only at low rates of inflation. The most important implication of their work is that low, but not zero, inflation rate, goes along with the lowest sustainable rate of unemployment. The main assumption behind their model is that lay public do not use the same model of economy as do economists, i.e. lay public are not fully but rather near rational. Akerlof et al. list three reasons why individuals do not treat inflation and its costs in the way assumed in economic models. Firstly, when inflation is low people may ignore inflation when setting wages and prices. More precisely, they tend to edit decision problems, discarding less important factors in order to be able to concentrate on more important ones. Secondly, even if individuals do take inflation into account, they might not account for it completely, i.e. an increase in inflation would lead to an increase in wages or prices but not on a one to one basis. Finally, workers misperceive nominal changes as real changes. An increase in nominal wage, even if it does not fully reflect inflation, may increase their job satisfaction. This decline in real wages leads to less unemployment. Therefore, a positive rate of inflation cools down real wage growth and "greases" the wheels of the economy. The misperception caused by nominal wage increase may, in turn, lead to less shirking and higher productivity than in the case of no inflation. The bottom line is that at low inflation rates prices and wages will be set at consistently lower level than they would be at zero inflation. As a result, higher level of employment would be sustained. When inflation increases more notably, on the other hand, people stop being near-rational and take full account of inflation, as it is now costly to ignore it. Hence, unemployment rate corresponding to low, positive inflation rate is lower than the one related to both, zero inflation and high inflation. Low, positive inflation rate, thus, minimizes the sustainable rate of unemployment. The results from estimating their model indicate that this low, positive inflation rate should be in the range 1.5 to 4 percent. At higher rates of inflation the trade-off is reduced, while at high enough rates it disappears completely.

Palley (2003) criticizes Akerlof et al.'s (2000) assumptions for two reasons. First, it is unclear why workers would systematically underestimate inflation at low rates and then suddenly take full account of it after the inflation rate reaches a threshold. Secondly, some workers will tend to ignore predicable inflation even at fairly high levels. Palley explains the downward rigidity of nominal wages by moral hazard. Namely, when firms want to lower wages workers do not know whether this is the result of market conditions or opportunistic behaviour by employers. Workers will more readily accept real wage reductions resulting from increased inflation because the general price level is beyond the control of individual firms, so firms cannot opportunistically exploit workers in this way. However, workers are not willing to accept a too rapid real wage adjustment. Once the inflation rate reaches the threshold, they demand matching nominal wage increases, and this cancels out the grease effects of inflation. A further reason for downward wage rigidity is that workers are usually indebted in nominal terms. In the case of nominal wage reduction their debt burden, measured by the debt-to-income ratio, would increase. Therefore, they oppose nominal wage cuts. Workers are able to prevent employers from cutting wages since employing new workers would be costly in terms of training. In Palley's paper, workers are always aware of inflation, but they only refuse to accept a reduction in real wages when inflation is too high. Because of the downwardly rigid nominal wages, the resulting Phillips curve is backward bending. This backward bending Phillips curve implies that there is a Minimum Unemployment Rate of Inflation (MURI), corresponding to that unemployment rate at which the Phillips curve bends backwards. The MURI provides a rationale for low inflation targeting.

Next we look at the relevance of inflation-unemployment trade-off for the inflation-growth relationship. Irrespective of the reason why wages are downwardly rigid, the bottom line of Akerlof et al.'s and Palley's paper is that a little inflation 'helps' to achieve less unemployment than implied by the natural rate of unemployment, or less unemployment than would exist had there been no inflation at all. In addition to concluding that the workers do not differ between nominal and real changes and are hence willing to accept real wage reductions, Akerlof et al. also conclude that workers' satisfaction and, consequently, productivity, might increase. This means that a little inflation enables firms to achieve more (higher productivity) at the same cost (wage). Therefore, in the presence of low inflation both employment and productivity will be higher. Given that the changes in output can result from changes in overall productivity and/or quantity of labor, low, positive inflation facilitates higher capacity utilization, and results in narrowing of the output gap. Thus, a little inflation by 'greasing the wheels of labor market adjustment' helps reduce the output gap. This, furthermore, enhances incentives to increase capacity through more investment, which results in higher output growth.

Steady, low inflation may be beneficial for the economy not only because of its effects on the labor market as explained above, but also because of its effects on financial markets. Indeed, the explanation via financial markets is more plausible in the context of transition countries. Firstly, in the period under investigation (in our case 1991-2003) inflation in transition countries fell and unemployment rose. Therefore, Akerlof et al.'s and Palley's reasoning does not seem to apply to this case unless there were significant and sustained increases in the Non-Accelerating Inflation Rate of Unemployment (NAIRU) in these countries. It should be noted, though, that the reason why we discussed it here is because this is the line of explanation usually used when explaining a non-linear inflation-growth relationship. To the best of our knowledge, previous studies have not sought to distinguish between the underlying theory for developed and developing and/or transition countries. It seems logical that uncertainty and reduction of uncertainty played a more important role in transition countries.

Khan and Senhadji (2001, 2006) explain the real effects of inflation through its impact on financial market conditions. The non-linearity in the relationship between inflation and growth stems from the non-linear impact of inflation on the financial market. Namely, the effects of increases in the rate of inflation, they argue, are different at initially low versus initially high rates of inflation; i.e. there is a threshold in this relationship. Let us first explain why higher inflation would have a negative effect on financial depth. Inflation acts like a tax on real money balances. This means that if this tax is borne (at least partly) by bank depositors, higher inflation actually lowers real rates of return on bank deposits. Since these deposits compete with various other assets, reduced real returns on deposits result in reduced real returns on these other assets[1]. Therefore, higher inflation leads to lower real rates of return on a broad range of financial assets. This, in turn, increases incentives to borrow and reduces incentives to lend, which intensifies the severity of the adverse selection problem and results in credit rationing. Credit rationing means that banks will lend less, and thus fund less investment. Finally, this would lead to slower real rates of growth and/or reduced long-run levels of real activity.

The link between financial depth and real activity will be explained in more detail below; at this point we concentrate on the threshold effects in the influence of inflation on financial market conditions. Let us now look at why inflation at low rates would exert a positive, i.e. a

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[1] Namely, the imposition of the non-arbitrage condition yields, as noted by Khan and Senhadji (2006), equalization of risk-adjusted rates of return.

different impact than at higher rates. As noted by Khan and Senhadji (2006), if the initial rate of inflation is sufficiently low and real rates of return are sufficiently high, the adverse selection problem in credit markets does not bind. In other words, there is no need for credit rationing. In this situation an increase in (low) inflation induces individuals to substitute away from cash and into investment in physical and/or human capital. This is in effect the Mundell-Tobin effect. Consequently, long-run growth is stimulated. However, after inflation increases above a certain threshold, real rates of return fall to the point when credit market frictions become binding (i.e. it again leads to credit rationing), and this leads to the negative consequences for real activity discussed above. All in all, Khan and Senhadji conclude that there is a critical rate of inflation below which modest increases in inflation can stimulate financial depth and thus real activity, but above which further increases in inflation interfere with efficient allocation of investment capital and, therefore, have negative growth consequences.

Levine (1997) surveys the vast literature on the topic, therefore in what follows we rely heavily on the conclusions of that survey. Financial markets and intermediaries arise to address endogenous frictions or imperfections that are present in the process of allocating credit and investment capital. These market frictions largely reflect information and transactions costs. The main functions of financial systems in relaxing these frictions are: to facilitate trading, hedging, diversifying and pooling of risk; to allocate resources; to monitor managers and exert corporate control; to mobilize savings; and to facilitate the exchange of goods and services (Levine, 1997: 691). These financial functions affect economic growth through two channels: capital accumulation and technological innovation; i.e. by influencing the rate of capital formation and/or by altering the rate of technological innovation. We next explain each of these functions in more detail. High-return projects usually require a long-run commitment of capital, and savers are reluctant to give up their savings for long periods. The financial system, which enables them to sell their assets quickly if they are in need of cash, through increasing liquidity increases the chances of long-run investment being undertaken. Therefore, with liquid markets, equity holders can readily sell their shares, while firms have permanent access to the capital invested by initial shareholders. Hence, by facilitating trade, stock markets reduce liquidity risk. Similarly, by providing demand deposits and choosing an appropriate mixture of liquid and illiquid investments, banks provide insurance to savers against liquidity risks, while, at the same time, facilitating long-run investments. In addition, the financial system has the ability to diversify risk and can, thus, affect long-run economic growth through altering resource allocation and the savings rates. Furthermore, sometimes high information costs may discourage capital from flowing to its highest value use. Intermediaries emerge here as they can economize on the costs of acquiring and processing information, acquiring skills and conducting evaluations, instead of each individual doing it for himself/herself. This facilitates the acquisition and processing of information about investment opportunities and therefore improves resource allocation. Financial intermediaries and markets that are better at selecting the most promising firms will induce a more efficient capital allocation and faster growth. In addition, they may also boost the rate of technological innovation by identifying those entrepreneurs with the best chances of successfully initiating new goods and production processes. Similarly, besides reducing the costs of acquiring information, financial intermediaries and markets may also arise to mitigate information acquisition and the enforcement costs of monitoring firm managers and exerting corporate control after financing activity. This tends to promote faster capital accumulation and growth through improving the allocation of capital. As for the function of mobilizing savings, without access to multiple investors many production processes would be constrained or not undertaken at all. By enhancing diversification, liquidity and the size of feasible firms,

mobilization of savings improves resource allocation and boosts technological innovation via expanding the set of production technologies available to an economy. Finally, the financial system can promote specialization. More specialization requires more transactions. Since each transaction is costly, financial arrangements that lower transaction costs will facilitate greater specialization. Therefore, markets that promote exchange encourage productivity gains. All in all, intermediaries become essential when frictions are present. Because of this, economic exchange is costly and may even not occur at all. Financial intermediaries through offsetting market imperfections make these exchanges affordable and facilitate the allocation of resources over space and time (Khan and Senhadji, 2000b).

3. INFLATION-GROWTH RELATIONSHIP IN EMPIRICAL RESEARCH

Many empirical studies find that there are non-linearities in the inflation-growth relationship. Firstly, it is found that this relationship is kinked: positive below a certain threshold and negative above it. Secondly, as emphasized by Ghosh and Phillips (1998), this trade-off is convex, which means that an increase in the annual inflation of 10-20 percent is associated with a much larger decline in growth, than an increase of 40-50 percent. The issue of the kink becomes increasingly important in transition context as inflation rates in these countries fall to low levels. The issue of kink was not central for countries in transition in the period of hyperinflation. After stabilization programs were implemented and inflation decreased to lower levels (below 20 percent), the issue of the relationship between inflation and growth became more significant.

Sarel (1996) finds that a negative effect of inflation on growth starts at inflation rates above 8 percent. Bruno and Easterly (1998) take 40 percent as a breakpoint between low and high inflation since, when testing inflation stability across ranges of inflation, they notice that above 40 percent the risk of even higher inflation rises sharply, although they admit some arbitrariness in their choice of the threshold. Their results suggest that there is a strong and robust relationship between this high inflation and growth. Ghosh and Phillips (1998) employ panel regression on a large data set covering IMF (International Monetary Fund) member countries for the period 1960-1996. In order to capture the 'kink' in the inflation-growth relationship they follow Sarel (1996) and use a spline technique, with turning point at an inflation rate of 2.5 percent. The placement of the kink in their study is based on visual inspection of the inflation-growth relationship, but that also happens to be the placement of the kink that yields the best fit in the multivariate growth regression. The results are not sensitive to this placement. At very low inflation rates, 2-3 percent, the authors find this relationship to be positive, otherwise, it is negative. Christoffersen and Doyle (1998) estimate the threshold level for transition economies to be at 13 percent inflation. Khan and Senhadji (2000) use a dataset of 140 countries comprising of both industrial and developing countries and covering the period 1960-1998. The authors find that the threshold above which inflation significantly slows growth differs between developed and developing countries. Namely, this threshold is estimated to be at 1-3 percent for industrial countries and 7-11 percent for developing countries. The optimal threshold level is estimated as the one that minimizes the sequence of the residual sum of squares in two sub-samples: industrial and developing countries. Below this inflexion point there is a positive and statistically significant relationship between inflation and growth in both groups of countries. The negative and significant relationship between inflation and growth was found for high inflation rates (above the threshold). Burdekin et al. (2004) also test for the non-linearities in industrial and developing economies separately. Within the group of developing countries they find three

thresholds: at 3, 50, 102 percent, whereas in the group of industrial countries two thresholds are 8 and 21 percent. The thresholds are identified by combining different inflation rates and selecting the one that yields the highest R^2. The results for industrial countries show that there is no significant impact of inflation on growth for rates less than 8 percent, whereas the relationship is significantly negative for higher inflation rates. For developing countries it is estimated that below the 3 percent inflation threshold, the coefficient is positive and highly significant, while for the higher inflation rates it is significantly negative. The results of Burdekin et al. (2004) are in contrast with the results of Khan and Senhadji (2000), since the growth costs of inflation are found to be much higher for industrial than for developing countries. However, when they use the logarithm rather than the level of inflation, their results change and indicate that the threshold for developing countries is 10 percent (and not 3 percent anymore). They explain this by the fact that using logs disables one from taking negative inflation rates into account, since we cannot take logs of negative numbers. Usually this problem is approached in the way Sarel (1996) did, i.e. by replacing negative inflation rates with very small positive number. Burdekin et al. (2004) argue that when the negative inflation rate observations are deleted, the estimate of their threshold drops substantially, pointing to the importance of taking negative rates into account. However, countries in transition (developing countries) rarely had negative inflation rates, so these conclusions do not hold in that case. Furthermore, as noted by Sarel (1996), inflation in levels has very asymmetric distribution (the lowest tenth of its range contains 88 percent of the observations in his sample), which would put an enormous weight on the very few observations with the highest inflation rate. Therefore, it seems more logical to use the log of inflation as an independent variable. This is precisely what we do in our own empirical research.

4. AN EMPIRICAL ANALYSIS OF THE INFLATION-GROWTH RELATIONSHIP IN A SET OF TRANSITION COUNTRIES

The main aim of this section is to identify whether there exists a statistically significant threshold level of inflation in a set of transition economies, below which inflation influences growth differently than at higher rates of inflation. Empirical studies on the non-linear relationship between inflation and growth usually include only developed countries or make distinction between developed and developing countries. Transition economies are rarely analyzed.

The theory is not straightforward regarding the variables that should be included in growth regressions i.e. what belong to the 'true' regression. Sala-i-Martin (1997), for example, finds a total of 62 variables used in the literature. This lack of a clear theoretical background "has led empirical economists to follow theory loosely and simply "try" various variables relating the various potentially important determinants of growth" (Sala-i-Martin, 1997a: 2).

Levine and Renelt (1991) and Sala-i-Martin (1997) are the two most cited papers that check the robustness of a variety of variables used in empirical growth literature. Levine and Renelt use a variant of Leamer's (1983) extreme bounds analysis, whereby they firstly include a vector of fixed variables that always appear in growth regressions (the initial level of income, the investment rate, the secondary school enrolment rate and the rate of population growth), a vector of up to three variables taken from the pool of the remaining variables usually used in the literature and the variable of interest (that is tested for robustness). Their conclusion is that very few variables are robust, i.e. systematically correlated with growth. One problem is that there is a lot of multicollinearity among the variables included as they reflect similar

economic phenomena. The only variables that do robustly affect growth rate in this setting are the average share of investment in gross domestic product (GDP) and the level of initial income.

Sala-i-Martin's (1997) approach differs from the one of Levine and Renelt in that instead of labeling variables just as either robust or non-robust, he assigns some level of confidence to each of the variables. The fixed variables he includes (that appear in all regressions) are the initial level of income, life expectancy and the primary school enrolment rate. Besides these three variables, he finds 22 significant variables. Interestingly, inflation is not among them. However, as noted by the author, this is possibly due to the linear instead of the non-linear treatment of this variable.

Table 1 gives an overview of some of the papers that use growth regressions and lists variables used in each paper. Of the papers listed below, two are chosen because they give an extensive overview of the variables commonly used in growth regressions and test their robustness (Sala-i-Martin, 1997 and Levine and Renelt, 1991), while the rest of the papers analyze growth determinants either in developing countries (Khan and Senhadji, 2000 and Burdekin et al., 2004) or in transition economies (Christoffersen and Doyle, 1998), which is of interest for our research. Finally, the paper by Ghosh and Phillips (1998) was chosen because it is a commonly cited empirical analysis of the non-linear effects of inflation on growth.

Table 1 Overview of the variables used in papers that use growth regressions

Variables	Levine and Renelt (1991)	Sala-i-Martin (1997)	Christoffersen and Doyle (1998)	Ghosh and Phillips (1998)	Khan and Senhadji (2000)	Burdekin et al. (2004)
Data set Time span	*Cross-section 1960-1989*	*Cross-section 1960-1992*	*Panel 1990-1997*	*Panel 1960-1996*	*Panel 1960-1998*	*Panel 1965-1992*
Dependent variable Independent variables	*Average annual growth rate in GDP per capita*	*Average growth rate of per capita GDP between 1960 and 1992*	*Percentage growth rate of GDP per capita*	*Real per capita GDP growth*	*Growth rate of real GDP*	*Real GDP per capita*
Initial GDP pc	✓	✓			✓	
Life expectancy		✓		✓		
Primary (Secondary) School Enrolment	✓	✓		✓		
Equipment investment		✓				
Number of years open economy		✓				
Rule of law		✓				
Political rights		✓				
Civil liberties		✓				
Revolutions and coups		✓				
Fraction of GDP in mining		✓				
Black market premium		✓		✓		✓
Primary exports in 1970		✓				
Degree of capitalism		✓				
War dummy		✓	✓	✓		
Non-equipment investment		✓				
Exchange rate distortions		✓				
Transition index			✓			
Change in transition index			✓			
Share of exports in GDP			✓			
Inflation			✓	✓	✓	✓
First difference of inflation rate						✓
Threshold inflation			✓	✓	✓	✓
Investment as a share of GDP	✓			✓	✓	
Population growth	✓			✓	✓	✓
Change of terms of trade				✓	✓	✓
SD of terms of trade					✓	
Ratio of real govt. expenditure to real GDP						✓
Ratio of revenues to GDP				✓		
Ratio of public consumption to GDP				✓		
Fiscal balance				✓		
Ratio of US per capita income to country *j*'s per capita income				✓		
Ratio of exports plus imports to GDP				✓		

4.1. Data and variables overview

As indicated above, there are no clear theoretical guidelines as to which variables to include in growth regression. Mankiw et al. (1992), Arnold (1994), Mankiw (1995) and Keller and Poutvaar (2005) conclude that the neoclassical model should be augmented by human capital, but that the basic structure need not change. Therefore, our approach is to firstly include variables such as initial income, investment and population growth in the spirit of neoclassical theory. We additionally include measures of human capital, such as primary and/or secondary school enrolment rates and life expectancy, and a measure of openness to trade (as suggested by some endogenous theories). A measure of fiscal policy is also included. Both neoclassical and new growth theories suggest that the effect of fiscal policy on growth exists, but differ in estimation of its overall impact. There are different endogenous growth models, and not all of them agree upon the specification of the regression, i.e. theory offers no unique approach to modeling growth. Therefore, following previous empirical work, we additionally include certain variables that reflect the specific characteristics of countries in transition, such as the war dummy, and the transition index.

We proceed as follows. We firstly include those variables that Sala-i-Martin (1997) and Levine and Renelt (1991) include as fixed variables when testing robustness. These variables include the level of income at the beginning of the period under investigation, life expectancy and the primary (and/or secondary) school enrolment rate, the investment rate, and the rate of population growth.

In empirical growth literature the initial level of income is used to take account of the conditional convergence. Conditional convergence holds if the coefficient on this variable is negative. In a practical sense, this means including the level of GDP per capita in the initial year under investigation in the regression. However, given that we will use panel data approach, by using the level of GDP only in, say, 1990, as an explanatory variable, we would have the same value of that variable for each year, i.e. no variability. In order to still examine the possible existence of the catch-up process we use the ratio of USA's GDP per capita to country *j*'s GDP per capita for each year in the sample (in constant 2000 $)[2]. In this way we create a variable that measures the gap between the two countries and whether it has narrowed. We tested the same hypothesis using the Germany's GDP per capita and the results did not differ significantly.

Life expectancy is usually used as a measure of non-educational human capital, while the primary and/or secondary school enrolment rate serves as a measure of educational human capital. An increase in human capital per worker leads to increased output per worker. Workers who are better educated and trained are better able to perform their tasks, learn new tasks and adopt new production techniques. Although some papers include primary school enrolment rates in the regression, this, in our view, does not seem to be the best option. Namely, there is too little variability in this variable, given that elementary schooling is compulsory in the majority of countries. Hence, we suggest using secondary school enrolment rates as a measure of educational human capital. Sala-i-Martin includes only the secondary enrolment rates in the initial year under investigation (presumably because the effects of this variable on growth are not felt in the same year, but maybe 10 years later). However, including the secondary enrolment rates only in the initial year under investigation is not feasible in our model for the same reasons the initial GDP could not be used in panel data

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[2] We follow Ghosh and Phillips (1998) and Harris, Gillman and Matyas (2001) in this.

analysis. Another option is to include (enough) lags of this variable so that the effects of human capital on growth could be felt. However, another problem arises at this point (besides the lack of data for majority of previous years and majority of countries). Namely, as noted by Berryman (2000), the previous education system was poorly matched to the needs of the new market economy. There is, thus, no point in including the lags of this variable in our regression. At the same time the flow from current post-compulsory secondary enrolments has little impact on the quality of the stock of the current workforce. However, given that we have no alternative we do use the current enrolment rates as they may serve as a proxy for the willingness of the population to respond to the skill requirements of the new labor market.

Investment is one of the most widely used variables in growth literature. If investment is not included in the regression, then it is unclear whether the other explanatory variables affect growth directly or through the incentives to save and invest. When, on the other hand, investment is included in the growth regression, the only channel through which other explanatory variables can affect growth is through the efficiency of resource allocation channel.

The rate of population growth affects GDP growth in the spirit of neoclassical theory. Namely, high population growth lowers income per capita because the amounts of human and physical capital have to be divided over the, now larger, population (Mankiw, Romer and Weil, 1992).

Many papers also include the black market premium and the terms of trade variable. The black market premium, as noted by Ghosh and Phillips (1998), is a measure of the overvaluation of the real exchange rate and, in some instances, of economic mismanagement more generally. This variable could also be interpreted as a sign of economic uncertainty which should tend to discourage investment (Sala-i-Martin, 1997a). It is reasonable to suppose that the existence of sizable black market premium over long periods of time reflects a wide range of policy failures. It is also reasonable to think that these failures will be responsible for low growth. As for the terms of trade, this variable should account for the impact of external shocks. It should be noted, however, that worsening of the terms of trade can seriously disrupt growth only in countries with fixed exchange rate regimes. Countries with flexible exchange rate regimes will experience a lot milder contraction in output. It should be stressed, furthermore, that terms-of-trade shifts in developing countries are largely exogenous (Broda and Tille, 2003). However, the two variables, black market premium and terms of trade, are not obtainable for the whole period and for all countries under investigation. Given that these are not our core variables (they are neither our main variable of interest nor fixed variables that always appear in growth regressions) and that the missing data would deprive the possibility of analysis of certain years, we shall not include these variables in our model.

The endogenous growth literature suggests that countries that are open to trade seem to grow faster that those that do not have liberal trade policies (Arnold, 1994). The most basic measure of trade intensity is the so-called ''trade openness'' i.e. the ratio of exports plus imports to GDP. We use this variable to take account of the arguments put forward by the new growth theory. We include general government expenditure (percent of GDP) as an additional explanatory variable.

In addition to commonly used variables in growth regressions, we want to address particular problems of transition. We use the EBRD transition index as a proxy for economic progress

towards a fully-fledged market economy. This composite index is created as the un-weighted average of the following indices: Price Liberalization; Foreign Exchange and Trade Liberalization; Small-Scale Privatization; Large-Scale Privatization; Enterprise Reform; Competition Policy; Banking Sector Reform; Reform of Non-Banking Financial Institutions[3].

Additionally, our model contains a war dummy, also regularly included in growth regressions, and especially important for the period of early transition in Croatia (1991-1995), and to a lesser extent Slovenia (1991). The war dummy is included as a supply shock that distorts growth. It might also stand for direct destruction of capital stock.

Finally, our main variable of interest is the inflation rate and its effect on growth. This variable was found to be insignificant in Levine and Renelt (1991) and Sala-i-Martin (1997). However, it was included in a linear manner, whereas the theory (see section 2) suggests that it should be included non-linearly. Therefore, we include inflation in the growth regression in a non-linear fashion. The precise description of this non-linearity is explained below.

It is common practice in growth regressions that use panel data analysis to use four or five year averages rather than annual data in order to smooth out the business cycle fluctuations. We have 14 years at hand. It would, thus, be possible to create three 5-year averages in our sample (with the last one containing only 4 years). However, there are certain problems with applying this method when analyzing different countries. Namely, this method assumes that all countries in the sample are at the same state of the business cycle, which need not be correct. In addition, the evaluation of business cycles for countries in transition was extremely complicated until the second half of 1990s (Tamla, 2003). Furthermore, it might be the case that, for example, it makes more sense to join/average the first three years (in the case of Croatia this belongs to the pre-Stabilization period) and then another, say, 7 years. Given these problems, we do not use averaged, but rather annual data in our analysis. Temple (2000) notes that using annual observations, or even four or five year averages may in effect be picking up government policy responses, aggregate supply shocks or some other short-lived effect, and not the long-run impact of inflation on growth. Hence he suggests it would be more sensible to use ten-year averages. This is, however, not feasible in our sample given the short time span. In support of using annual data, Alexander (1997) notes that this (higher) frequency is preferable in order not to obscure useful information in the data. Namely, the average inflation rate may be unduly influenced by a few extreme observations. Of considerable importance, in cross-sectional work and panel examination is the point that countries with vastly differing experiences of inflation may turn out to have a similar average rate over a lengthy period. Averaging simply results in the loss of too much information. In addition, Khan and Senhadji (2000) find that, although the confidence region is narrower for the averaged sample, the two methods yield similar results.

The description and the definition of the variables we use are given in Table 6 in Appendix.

4.2. The econometric model

We start by analyzing our main variable of interest, inflation, in more detail. Figure 1 shows the distribution of inflation across the full sample of countries (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia) and time periods (1990-2003). The *y*-axis presents the number of observations that correspond to each inflation range (on the

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[3] We follow Zeitler (2005) in this.

x-axis)[4]. It can be observed that the distribution is extremely skewed, with the vast majority of observations pertaining to inflation rates up to 40 percent (not surprisingly). Using levels of inflation in our regression would, therefore, give much weight to the extreme inflation observations. Sarel (1996) suggests using the logarithm of inflation rates instead, as this would, at least to a certain degree; eliminate the observed asymmetry in the inflation distribution. The distribution of the natural logarithm of inflation is presented in Figure 3[5]. This transformation seems to have eliminated the pronounced skewness observed before. If we take a look at descriptive statistics (to the right of Figures 1 and 3), it is evident that the coefficient of variation (obtained as standard deviation/mean) significantly decreases when the variable is logged (from 2.629 to 0.574). The median is also much closer to the mean than in the case with levels of inflation. Skewness also decreases with the logged model from 4.9 to 0.181. All in all, given the discussion above, we decide to proceed using the logarithm of the inflation rate as the independent variable.
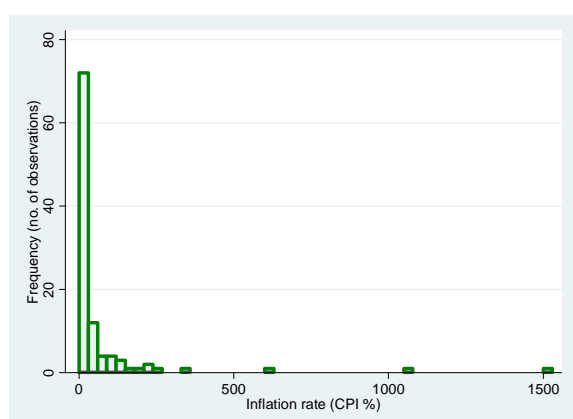
Variable: inflation (CPI %)	
Mean	76.243
Median	11.880
Standard Deviation	200.420
Kurtosis	28.001
Skewness	4.900
Range	1499.898
Minimum	0.102
Maximum	1500.000
Count	112

Figure 1. Distribution of the level of inflation
Source: ESDS
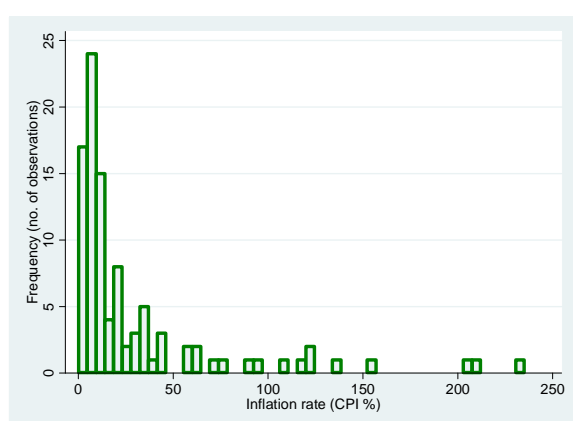
Figure 2. Distribution of the level of inflation (<250%)

Source: ESDS

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[4] Ranges are arbitrary; the first range is from 0 to 5 percent inflation and each next increases by 5 percentage points, up to inflation rate of 250. All inflation observations higher than 250 are joined into category "More", as not many observations belong to this range.
[5] We were able to use the log transformation of the inflation variable without dropping any observations as there were no negative inflation rates in the sample.
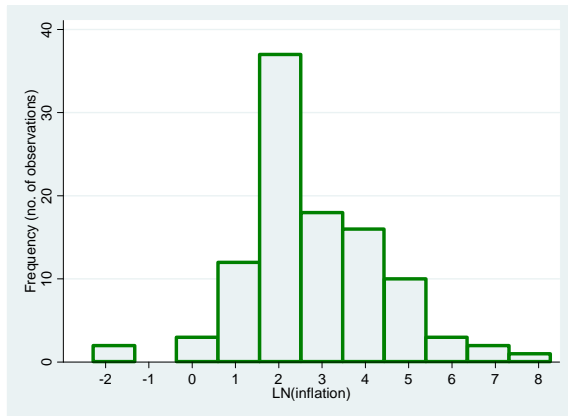
Variable: LN(inflation)	
Mean	2.862
Median	2.475
Standard Deviation	1.643
Kurtosis	1.140
Skewness	0.181
Range	9.601
Minimum	-2.288
Maximum	7.313
Count	112

Figure 3. Distribution of the logarithm of inflation

Source: ESDS

Next, in order to investigate the possible non-linearity in the inflation-GDP growth relationship we start by plotting the two variables. We smooth the data by converting the sample to 11 categories[6]. The *y*-axis presents the average real GDP growth rate that corresponds to each inflation range (on the *x*-axis). We can see from Figure 4 that the relationship between real GDP growth and the log of inflation is slightly positive (or at least non-negative) for low inflation rates, and then becomes negative. This negative relationship persists for all higher inflation rates. The inflexion point on the graph seems to be where the natural logarithm of inflation is between 1 and 2. This includes inflation rates in the range from 3.323 percent to 7.361 percent. Overall, inflation rates up to roughly 20 percent (LN(inflation)=3) seem to have a non-negative impact on growth. It should be noted, though, that we do not have the same number of observations for each range of inflation, as shown in Figures 1 and 2.
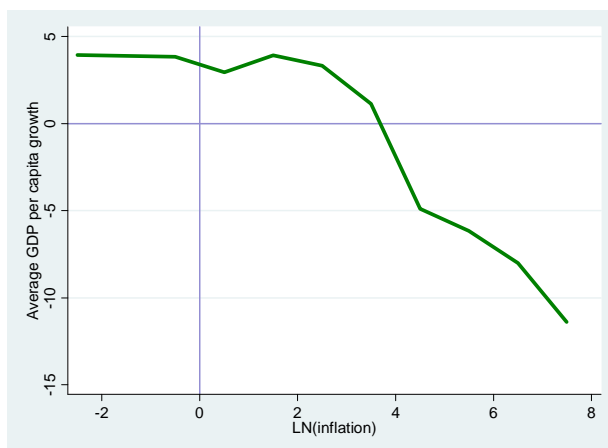
Figure 4

Next we turn to empirical estimation of the kink in the relationship between inflation and growth. Most papers that investigate non-linearities in the inflation-growth relationship use the following model (see for example Ghosh and Phillips, 1998; Khan and Senhadji, 2000; Sepehri and Moshiri, 2004; Mubarik, 2005):

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[6] The first category includes those observations where ln(inflation) is from -3 to -2, the second is from -2 (included) to -1, third -1-0, etc, while the last category includes all those observations where ln(inflation) is greater than 7 (and less than 8).

$$d \log(Y_{it}) = \alpha + \beta_1 \log(\pi_{it}) + \beta_2 D[\log(\pi_{it}) - \log(\pi^*)] + \gamma X_{it} + \varepsilon_{it}$$

(1)

$$D = \begin{cases} 1 \text{ if } \pi_{it} > \pi^* \\ 0 \text{ if } \pi_{it} \leq \pi^* \end{cases} \quad i = 1,...N; \quad t = 1,...T$$

where $d\log(Y_{it})$ is the growth rate of real GDP per capita, π_{it} is the inflation rate, π^* is the threshold level of inflation, D is a dummy that takes the value of 1 for inflation levels greater than the threshold inflation and zero otherwise, X_{it} is a vector of control variables. The index "i" is the cross-sectional index and "t" is the time-series index. For inflation rates higher than the threshold level[7] the impact of inflation on growth is given by $\beta_1 + \beta_2$, and for those less or equal to the threshold level by β_1. The threshold level of inflation, π^*, is usually estimated at that value that minimizes the sum-of-squared residuals from the regression, i.e. that maximizes the R^2 (this approach is used in Sarel, 1996; Ghosh and Phillips, 1998; Khan and Senhadji, 2000 and Burdekin et al., 2004).

We use dynamic panel analysis, which is a relatively newly developed technique and not used previously, to the best of our knowledge, for this sort of investigation. Bond (2002: 1) observes that "even when coefficients on lagged dependent variables are not of direct interest, allowing for dynamics in the underlying process may be crucial for recovering consistent estimates of other parameters". In other words, if the dynamic relationships are present in the model, estimating a static model leads to severe misspecification. Even though we are not directly interested in the growth regression itself, a dynamic model will provide a more reliable estimate of the parameter on our variable of interest, inflation. Therefore, we use dynamic panel analysis to assess the impact of inflation on growth. We test for the presence of non-linearities and the placement of the kink through several models, given below:

$$gY_{it} = Intercept + \alpha_1 gY_{it-1} + \alpha_2 gY_{it-2} + \alpha_3 gY_{it-3} + X_{it}\beta_1 + Z_{it}\beta_2 + \gamma_1 \pi_{it} + \gamma_2 \pi_{it}^2 + u_{it}$$

(2)

$$gY_{it} = Intercept + \alpha_1 gY_{it-1} + \alpha_2 gY_{it-2} + X_{it}\beta_1 + Z_{it}\beta_2 + \gamma_1 \ln(\pi_{it}) + u_{it}$$

(3)

$$gY_{it} = Intercept + \alpha_1 gY_{it-1} + \alpha_2 gY_{it-2} + X_{it}\beta_1 + Z_{it}\beta_2 + \gamma_1 \ln(\pi_{it}) + \gamma_2 D_{threshold} + u_{it}$$

(4)

$$gY_{it} = Intercept + \alpha_1 gY_{it-1} + \alpha_2 gY_{it-2} + X_{it}\beta_1 + Z_{it}\beta_2 + \gamma_1 \ln(\pi_{it}) + \\ + \gamma_2 D_{threshold}[\ln(\pi_{it}) - \ln(\pi^*)] + u_{it}$$

(5)

$$u_{it} = v_i + e_{it}$$

$$D_{threshold} = \begin{cases} 1 \text{ if } \pi_{it} > \pi^* \\ 0 \text{ if } \pi_{it} \leq \pi^* \end{cases} \quad i = 1,...N; \quad t = 1,...T$$

where gY_{it} stands for the per capita growth rate of GDP in country i in time t, gY_{it-1} and gY_{it-2} are the first and second lag of GDP growth, respectively. X_{it} is a vector of strictly exogenous variables, and includes GDP gap, secondary school enrolment rate, population growth, life expectancy, share of government expenditures in GDP, share of exports + imports in GDP, a war dummy and transition index, in country i at time t). π_{it} stands for our variable of interest,

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[7] An assumption is that the threshold is the same in each country and year in the sample.

the inflation rate, and π^* for the threshold level of inflation. Z_{it} is a vector of endogenous covariates, and includes only investment in our final model. However, since we did try putting some other variables as endogenous (inflation, for example); we present Z_{it} as a vector. u_{it} is a composed error term, made up of two components: v_i - the group-level effects, which control for all unobserved influences on GDP growth that can be assumed constant over the sample period; and e_{it} - the observation-specific error term.

The core specification of Equations 2-5 can be derived from the Solow growth model augmented to include the accumulation of human capital, as shown by Mankiw, Romer and Weil (1992) and many others (see for example Knight, Loayza and Villanueva, 1993; Arnold, 1994; Mankiw, 1995; Clark, 1997 and Keller and Poutvaar, 2005). Therefore, the underlying theory is Solow's augmented production function with physical capital (proxied by investment as a share of GDP), human capital (proxied by secondary school enrolment rates and life expectancy) and labor (proxied by the rate of population growth) as the factors of production. The share of government expenditures in GDP and openness measured as the share of exports + imports in GDP serve as indicators of fiscal and trade policy, respectively. These two variables are assumed to affect growth through uncertainty. Inflation, as our main variable of interest should indicate how much monetary policy matters for the long-run growth.

We expect positive signs on the physical and human capital variables, as they are assumed to increase growth. The GDP gap is also expected to exert a positive impact. Namely, were we to use initial income we would expect a negative sign (because the lower the initial GDP the higher the expected growth according to convergence theory). GDP gap represents the ratio of USA's and country j's GDP per capita in each year, hence the higher the GDP gap (the lower the initial GDP) the higher the growth. Population growth is expected to affect growth adversely. As for the other variables, we expect openness ((exports + imports)/GDP) to have positive impact on growth. We do not have prior expectations with respect to sign regarding the variable representing fiscal policy. We anticipate a positive sign on the transition index, as it serves as a proxy for economic progress towards market economy, and the better progress the countries make, the higher their growth. The war dummy should have an adverse effect on growth. Finally, we anticipate a positive sign on the level of inflation and a negative one on the squared term, indicating an inverted U-shape relationship between inflation and growth.

Our sample consists of 8 transition countries (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia) and 13 years (1991-2003[8]), i.e. 104 observations per each variable.

4.3. The results

We include all the variables outlined previously and the year dummies, and use robust standard errors. The first decision we have to make is whether to treat some variables as endogenous. If endogeneity exists and is not accounted for, it causes biased and inconsistent estimates, thus invalidating the results of the analysis. As noted by Temple (2000), a returning topic in the literature is that inflation and growth may be two endogenous variables. He, furthermore, notes that insufficient effort has been directed at identifying the pattern of causation. Slow growth might spur inflation in various ways. Temple lists several reasons

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[8] We had to exclude 1990 from our sample as too many variables were missing for this year. Namely, GDP per capita growth for Croatia, Czech Republic, Poland and Slovenia; Government expenditure for Croatia; (exports + imports)/GDP for Croatia and Secondary school enrolment rates for Croatia and Slovenia.

following the literature on the topic. Namely, if growth slows and government tries to maintain seigniorage revenue as a constant proportion of GDP, inflation rises; slow growth and inflation may be the joint outcome of adverse supply shocks; governments may respond to slow growth with expansionary policies, thus fuelling inflation. Andres and Hernando (1997), furthermore, find that there is a positive causation running from growth to inflation. We, therefore, treat inflation as an endogenous variable. In addition, investment could also be treated as endogenous. Namely, Levine and Renelt (1991) note in their extensive analysis, that the causal relationship between growth and investment is ambiguous. Blomström et al. (1996) observe that simultaneity bias will inevitably be a problem in growth-investment regressions. They even find more evidence that growth precedes investment than that investment precedes growth. Podrecca and Carmeci (2001) find that the causality between investment and growth runs in both directions.

Another question is how many lags of the dependent variable to use. In order to do this, we must test the validity of the instruments, which includes testing for autocorrelated error terms. Namely, the Generalised Method of Moments (GMM) used for estimation of dynamic panels, does not require distributional assumptions, like normality (Verbeek, 2000; Greene, 2002), but it does require that the error terms are not autocorrelated (Arellano and Bond, 1991).

In order to determine the number of lags of the dependent variable, we adopt a testing-down procedure, starting with 6 lags. The results of serial correlation tests for each lag length are given in Table 2.

Table 2 The serial correlation tests for different number of lags

Number of lags	Number of observations	*m1* *Equation 2*	*m2* *Equation 2*	*m1* *Equation 3*	*m2* *Equation 3*
6	48	0.0644[***]	0.1637	0.0567[**]	0.1166
5	56	0.0355[**]	0.3330	0.0285[**]	0.1080
4	64	0.0330[**]	0.5138	0.0230[**]	0.5701
3	72	0.0925[***]	0.2656	0.0533[**]	0.1396
2	80	0.0342[**]	0.0213[**]	0.0141[*]	0.1438
1	88	0.0229[**]	0.0647[***]	0.0390[**]	0.0227[**]

*, ** and *** denote 1, 5 and 10 percent level of significance, respectively. Robust standard errors were used.

In all cases in Table 2, except for 2 lags in Equation 2 and 1 lag in Equation 3, we get the preferred diagnostics, i.e. a rejection of the hypothesis that there is no first-order serial correlation, and acceptance of the hypothesis that there is no second-order serial correlation, at different levels of significance. The Sargan test (in each case) indicates (not reported) that we should not reject the over-identifying restrictions. However, *p*-value is 1, indicating that this test is probably weak because of the presence of a lot of instruments. As discussed in Statalist, the problem might be too large a number of degrees of freedom (http://www.stata.com/statalist/archive/2005-04/msg00436.html). This issue is, however, not discussed in the literature. Most authors just take the Sargan test (with *p*-value equal to 1) as indicating that the instruments are valid. Beugelsdijk and Eijffinger (2005), for example, note that this has no serious implications for the estimation result.

Mangan et al. (2005) note that it is commonly used procedure in the applied literature to select the largest possible number of lags of the dependent variable that can be used as instruments and that are valid according to the diagnostic tests. However, given that we have a relatively small sample this procedure would leave us with too small a number of

observations. Therefore, we proceed using two lags of the dependent variable in Equation 3 and three lags in Equation 2, since in these cases the diagnostics indicate that the instruments are valid, and we loose the least observations.

The dynamic panel results are presented in Table 3.

Table 3 Dynamic panel results

Dependent variable: GDP per capita growth — Independent variables	Endogenous	Equation 2	Equation 3	Equation 2 (reduced)	Equation 3 (reduced)
GDP growth (lag 1)	✓	-0.052 (0.354)	0.126 (0.230)	-0.067 (0.235)	0.186 ** (0.035)
GDP growth (lag 2)	✓	-0.242 *** (0.000)	-0.281 *** (0.000)	-0.195 *** (0.000)	-0.243 *** (0.000)
GDP growth (lag 3)	✓	-0.130 *** (0.000)		-0.099 * (0.063)	
GDP gap (USA)		-0.814 *** (0.009)	-0.486 (0.209)		
Investment/GDP	✓	0.317 *** (0.000)	0.373 *** (0.000)	0.437 *** (0.000)	0.390 *** (0.000)
Govt. expenditure/GDP		-0.036 (0.677)	-0.034 (0.765)		
Population growth		-1.225 *** (0.000)	-1.819 *** (0.000)	-1.388 *** (0.000)	-1.864 *** (0.000)
Life expectancy		-0.624 (0.268)	-1.101 *** (0.003)		
Secondary school enrolment		0.070 (0.115)	0.0298 (0.528)		
(Exports + imports)/GDP		0.054 ** (0.031)	0.029 * (0.109)	0.086 *** (0.000)	0.0359 *** (0.001)
Transition index		3.064 *** (0.005)	3.703 ** (0.059)		4.365 *** (0.001)
War dummy		0.314 (0.748)	0.126 (0.839)		
Inflation	✓	-0.065 *** (0.000)		-0.066 *** (0.000)	
Ln (inflation)	✓		-0.836 *** (0.000)		-0.657 *** (0.002)
Squared inflation	✓	0.00005 *** (0.000)		0.00005 *** (0.000)	
Wald statistic $\chi^2_{(7)}$		34.67 ***	192.17 ***	20.10 ***	72.54 ***

***, ** and * denote 1, 5 and 10 percent level of significance, respectively. Robust standard errors were used and year dummies included.

In addition to testing the assumption that the instruments are valid (*m1* and *m2* test and Sargan test), we use the Wald statistic in order to test the null hypothesis that the independent variables are jointly zero. The Wald statistic (Table 3, last row) indicates that in each case the null hypothesis is rejected for our model, i.e. that the independent variables are jointly non-zero.

In Table 3 the lags on the dependent variable are significant (except in some cases the first one), which suggests that there is on average a dynamic relationship. In other words, GDP growth is significantly affected by its past values. In both reduced equations (columns 5 and 6 in Table 3) the variables have the expected signs, except for inflation in (reduced) Equation 2, where we expected a positive sign on the level and a negative one on the squared term. Population growth, investment and the fraction of exports and imports in GDP as well as a variable(s) on inflation are significant in both Equations. In addition, the transition index is also highly significant (except in reduced Equation 2). In the full model (columns 3 and 4 in Table 3), the GDP gap and war dummy have the wrong signs, but are insignificant (except

GDP gap in Equation2). Secondary school enrolment, life expectancy (except in full Equation 3) and government expenditure are found to be insignificant.

Next we augment Equation 3 with a dummy that takes the value of 1 for all inflation rates above a certain threshold. We vary thresholds from 1 percent to 100 percent, but report only those 1 to 25. The results are presented in Table 4.

Table 4 The coefficient (γ_2) and p-value (in parenthesis) on the dummy variable $D_{threshold}$ [9] *in Equation 4* [10]

D1	3.276 (0.121)	*D6*	0.667 (0.374)	*D11*	1.146 (0.184)	*D16*	-0.2932 (0.741)	*D21*	-0.862 (0.340)
D2	2.639*** (0.010)	*D7*	0.427 (0.407)	*D12*	1.326 (0.158)	*D17*	-0.293 (0.741)	*D22*	-0.862 (0.340)
D3	2.368 ** (0.018)	*D8*	0.850 (0.156)	*D13*	1.188 (0.277)	*D18*	-0.293 (0.741)	*D23*	-0.921 (0.340)
D4	1.975 ** (0.045)	*D9*	0.528 (0.285)	*D14*	1.028 (0.431)	*D19*	-0.891 (0.295)	*D24*	0.184 (0.851)
D5	0.291 (0.722)	*D10*	1.029 * (0.066)	*D15*	1.119 (0.413)	*D20*	-1.385** (0.041)	*D25*	0.184 (0.851)

***, ** and * denote 1, 5 and 10 percent level of significance, respectively. Robust standard errors were used.

In Table 4 most dummies are insignificant. Their signs are relatively consistent, i.e. they are positive up to the threshold of 15 percent inflation, and mostly negative afterwards. The results indicate that there is a significantly positive impact on growth rates of inflation rates higher than two, three and four percent. The growth effects of inflation are attenuated as lower rates are removed. The dummies D5 and above are in effect zero, since they are insignificant. According to Table 4, the positive effect associated with D2 (inflation higher than 2 percent) is 2.639 percentage points; the positive effect associated with D3 (inflation higher than 3 percent) is 2.368 percentage points, and the positive effect associated with D4 (inflation higher than 4 percent) is 1.975 percentage points. By the time we reach D5, the positive effect has completely disappeared. The coefficient on *ln(inflation)* (not reported) is constantly negative and significant; i.e. the inclusion of the dummies does not significantly influence this. Overall, these results seem to be suggesting that low inflation rates (up to 5 percent) have positive effect on growth.

Finally, we run a regression based on Equation 5, i.e. we use spline technique. We estimate the kink in the inflation-growth relationship at that inflation rate that maximizes the Wald test. The results are given in Table 5.

[9] *D1* takes the value of 1 for all inflation rates higher than 1%, and 0 otherwise, *D2* takes the value of 1 for all inflation rates higher than 2%, and 0 otherwise, etc.

[10] The results presented in Table 4 are those on dummies when included in the full model (see Column 4 of Table 3). However, were we to use the reduced model (Column 6 in Table 3) the results on dummies would be very similar (in terms of significances and signs).

Table 5 Wald (chi2) of the model outlined in Equation 5 for different values of threshold inflation, full model

$\pi*$	Wald (chi2)	$\pi*$	Wald (chi2)	$\pi*$	Wald (chi2)	$\pi*$	Wald (chi2)
1	147.83	6	96.78	11	108.71	16	79.96
2	135.11	7	99.70	12	114.13	17	84.22
3	182.23	8	98.00	13	121.93	18	89.87
4	112.26	9	98.12	14	75.35	19	95.93
5	101.49	10	102.76	15	76.77	20	102.11

$\pi*$s are a part of the expression $D_{threshold}\left[\ln(\pi_{it}) - \ln(\pi*)\right]$ in Equation 5.

Table 5 indicates that the turning point now appears to be at a very low level of inflation, namely three percent. This is in line with our previous findings that positive growth effects are associated mainly with low rates of inflation. It is also in line with what mainstream theory predicts and what central bankers have been targeting in recent years. As before, we test whether the threshold effect is statistically significant. This means that we look at the relevant *t*-statistics in separate regressions for each level of the threshold. The results indicate that γ_2 (in Equation 5) for threshold inflation with the highest Wald test (i.e. 3 percent) is statistically significant, i.e. different from zero at the 10 percent level of significance. This means that the threshold is identified. In addition, the coefficient on the spline term is insignificant for inflation rates of 1 and 2 percent, but it becomes significant at 3 percent.

5. CONCLUDING REMARKS

Our evidence suggests that positive growth effects in transition countries are associated most strongly with low rates of inflation. With respect to the exact placement of the kink, visual inspection indicates that the kink occurs in the range of inflation between 3 and 7 percent. Econometric estimation supports this. Namely, the results with threshold dummies indicate positive growth effects of inflation rates of up to 5 percent. When we use the spline technique, it is strongly suggested that the threshold occurs at even lower inflation rates, of 3 percent or less. Furthermore, it is suggested that inflation rates above 20 percent are harmful for GDP growth. It is not possible to draw firm conclusions for inflation rates between these two levels. Overall, most of our evidence suggests that inflation rates needed to be as low as 3 to 5 percent during early and middle transition. This is in line with findings on developed economies and it also supports the view of central bankers who have opted for low inflation targeting in recent years. These results are in contrast with the results of other papers that investigate developing (Khan and Senhadji, 2000) or transition countries (Christoffersen and Doyle, 1998). Namely, it is suggested by these other papers that the inflation-growth threshold is higher in developing (7 to 11 percent) and transition countries (13 percent) than in developed economies; whereas our results suggest that the threshold is not higher than in developed economies.

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APPENDIX

Table 6 Definitions and sources of the variables

Variable	Source	Definition
GDP per capita growth (annual %)	World Development Indicators, World Bank (2005)[11]	*Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population.*
GDP gap	World Development Indicators, World Bank (2005)	*GDP gap is calculated as the ratio of USA's and country j's GDP per capita in constant US dollars in each year.*
Life expectancy at birth, total (years)	World Development Indicators, World Bank (2005)	*Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.*
Secondary school enrolment rate (%)	Unicef TransMONEE database available at: http://www.unicef-icdc.org/resources/	*Total upper secondary education enrolments (gross rates calculated as percent of population aged 15-18). Since the data on this variable is missing for years 1991 and 1992 for Slovenia, for these years we put the same value as in 1993.*
Gross capital formation (% of GDP)	World Development Indicators, World Bank (2005)	*Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.*
Population growth (annual %)	World Development Indicators, World Bank (2005)	*Annual population growth rate. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship - except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin.*
Exports + imports of goods and services (% of GDP)	World Development Indicators, World Bank (2005)	*Exports of goods and services represent the value of all goods and other market services provided to the rest of the world.* *Imports of goods and services represent the value of all goods and other market services received from the rest of the world.* *Variable is obtained as a sum of exports of goods and services (% of GDP) and imports of goods and services (% of GDP).*
General government expenditure (%GDP)	Unicef TransMONEE database available at: http://www.unicef-icdc.org/resources/	*General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defence and security, but excludes government military expenditures that are part of government capital formation.*
Transition index	EBRD Transition Report (various issues)	*Transition index is created as the un-weighted average of the following indices: Price Liberalisation, Foreign Exchange and Trade Liberalisation, Small-Scale Privatization, Large-Scale Privatization, Enterprise Reform, Competition Policy, Banking Sector Reform, Reform of Non-Banking Financial Institutions. Since the data on this variable is missing for years prior to 1994 we use the un-weighted average in 1994 and put this value in previous years. Namely, EBRD did not publish these indices before 1994, and given that they do not change drastically (but slowly increase over time), assuming that the index did not change much in the period 1991-1994 seems reasonable.*
War dummy		*Dummy variable that takes the value of 1 if a country was in war in certain year, and 0 otherwise. In our sample this variable takes the value of 1 for Croatia in years 1991-1995 and for Slovenia in 1991.*
Inflation rate, consumer prices (annual %)	World Development Indicators, World Bank (2005)	*Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly.*

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[11] Available online at http://www.esds.ac.uk/international

MECHANICS AND CAUSES OF TWIN CRISES: THE CASE OF RECENT CURRENCY – BANKING DISTURBANCES IN SERBIA

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1. INTRODUCTION

Recent financial crisis has had its reflections worldwide and also on Serbian economic system. From the local point of view it is a completely globally driven phenomenon. It began in the fall of 2008 when draining liquidity from banking sector endangered its stability together with some new pressure added on international reserves and exchange rate. Timing coincided merely with the incoming "savers week"; specially designed period of time when banks regularly give some concessions to depositors. Since it had been a practice for years, banks were especially fragile in that period of time. High amount of savings deposited in previous years were due at the period, and had to be repaid. Depositors have run on the local subsidiaries of foreign parent banking groups, because they were seen as liquidity pools of parent banking groups distressed with the bed loan portfolio of U.S. mortgage instruments. The developments in the financial sector of the Republic of Serbia were not consequence of any local shock. In the wake of crisis default rates were only slightly worse than it were previously, bank solvency ratio was twice the regulatory requirements. Therefore, we can freely conclude that it was a liquidity crisis not solvency one. At the same time, this local disturbance was characterized by drainage of international reserves and also bank run. This episode could be taken as a twin crisis episode, i.e. combined banking and currency crisis that occured jointly. Here we study traditional early warning signals of currency and banking crises and analyse to what extent they were present in the economic system of the Republic of Serbia.

The primary interest of the paper is to study what we named here „the twins episode", i.e. combine banking and currency disturbance from the fall of 2008. However, this short-lasting episode is far more important than it appears at first glance. It was only the first wave of incoming crisis-like mileue. Credit contraction that followed this incident was mostly a consequence of bank run. Sudden stop in credit activities is the first thing that deserves considering. That togather with an increase in deposit rates, loan rates and interest rate spread created incoming credit crunch. Bank credit to private sector growth (EUR) for the period 2003 – 2009 was in average 28.87 percent. In the last quarter of 2008 the Republic of Serbia faced for the first time reversal in growth of bank credit to private sector (-5.0 percent). By using methodology similar to that of Cottarelli *et al*. (2005), we calculated that net foreign liabilities contributed to the decline with 0.3 percent. Solely on the basis of deposit contraction the rate of decline will be 13.3 percent, and it was complitely offset by portfolio shift outwards of bank claims to the NBS (reserve requirements and high-yield securities) and public sector (13.6 percent). The regularity is similar in the first quarter of next year (*cf.*

Marinković, 2009, Tabela 2, p. 210). Thus we can conclude that bank run induced deposit contraction is almost solely responsible for the credit contraction that followed in the next two quarters.

There are other approaches that compete to the proposed one to explain recent developments in Serbia, and a possible explanation is "overborrowing hypothesis". There are some papers (Kraft and Jankov, 2005, Cottarelli *et al.* 2005) that bring some evidence on the importance of credit growth in region, with former being more alert to the danger. The rise of bank credit to private sector/GDP surely indicates rising of leverage, but we don't have data to appraise if it was excessive, or if the leverage of the private sector reached a certain precautionary threshold, in the case of Serbia. Moreover, apart from exchange rate policy (it is going to be discussed later), government has not imposed any other implicit scheme of guaranties for the private sector to encourage foreign creditors' behave in the moral hazard way. Thus, we have here victims but no clear culprit. Of course, it might be that Serbia in broader perspective fits into "overborrowing framework" but it cannot explain the timing and the trigger itself.

There is also an idea that the way NBS used to sterilize growth in money stock and credit aggregates created a kind of speculative bubble. NBS uses repo-operations in order to influence loan interest rates and it was the second most intensively used monetary instrument. However, the rationale of using it has to be considered in connection with already very stringent required reserve policy. Repo was introduced as a complement to reserve requirements in order to relax the pressure from this repressive instrument.

How much of NBS short-term securities were high yielded? The yield was just slighlty above cosumer price inflation, and a many times lower than rate banks regularily earn on consumer loans at the same time. Real exchange rate appreciation makes it rather high, when converting it into euro equivalent, as well as all domestic financial return. The share of banks' assets invested in NBS bills remains rather constant throughout the period preceding the crisis and it hasn't obstructed the growth of bank credit to private sector to GDP. Finally, one should bear in mind that the bills are the only usable assets to serve the role of secondary liquidity reserve.

2. LITERATURE REVIEW ON THEORY OF TWIN CRISIS

Every crisis episode has its trigger or an accident that starts the crises, i.e. the shock. Banking crisis starts with a bank or a group of banks declaring a legal (or having an economic) insolvency, that further drives depositors to rush (panic) into banks labeled as insolvent or incapable to redeem deposits. Currency crises usually starts with a) sharp, sudden and irregular drop of exchange rate, often, although not always, from the point previously determined as a peg or fixed rate, b) speculative attack on currency with the pressure to devalue the currency. Hence, the common feature of banking and currency crises is existing or potential depreciation in financial assets value. This leads bank to declare default on financial liabilities, or government to abandon peg or quasi peg regime, esentialy to abandon promise to redeem or convert financial claims at rate previously agreed upon. For banks and other private financial organizations, result is insolvency, reorganization, or liquidation. For governments, which regularily survive, this means different losses: increase of foreign debt burden, as well as costs of economic, political and social turmoil.

Pervasive currency turmoils during the last decades gave impetus to a flourishing literature on balance-of-payment, or currency crises. The so called first generation models (Krugman,

1979) interpretated speculative attack on exchange rate as an anticipated failure of inconsistant economic policy. Inconsistency between exchange rate peg commitment and expansionary fiscal and monetary policy (or inflation inertia) leads to the eventual collapse of the exchange rate regime. A sharp attack on the central bank's reserves occurs at some point on the economy path. The attack is inevitable, and represents an entirely rational market response to persistantly conflicting internal and external macroeconomic targets (goals). The main point of this models in respect to the cause of fragility is that the prime culprit is overvaluated exchange rate. This framework is wide enough to explain variety of current account types of crises. However, more recent currency crises were capital account type, so that a new generation of models arrived. Those models emphasize self-fulfilling expectatioins and herding behavior in international capital markets. Second generation models (Obstfeld, 1986) explain speculative attack in terms of fundamentals the same as in first generation models, but allowing that those fundamentals themselves are sensitive to shift in private (incomplete) expectations about future developments. Second generation models hold that a currency crises can hit even a fundamentally sound economy, because shift in expectations autonomously drive the economy to the „bad equilibrium". Otherwise, (Obstfeld, 1986, p. 72) „[s]uch crises are apparently unnecessary and collapse of exchange rate that would otherwise have been viable. They reflect not irrational private behavior, but an indeterminacy of equilibrium that may arise when agents expect a speculative attack to cause a sharp change in government macroeconomic policy." Those models shift the attention to the surges in international capital inflow, boom-bust circle in monetary and financial aggregates, asset prices, etc.

Since recently the economic theory has not paid attention to the interaction between banking and currency problems. However, in past ten years focus has been changed. Since then, a bulk of empirical studies have been pointing out the coincidence between banking crises and currency crises. Kaminsky and Reinhart's (1999) empirical study certainly is a reference point of highest importance. The authors found some regularities in a sample of 76 currency crises and 26 banking crises that happened globaly. Namely, problems in the banking sector typically precede a currency crisis, the currency crisis deepens the banking crisis, activating a vicious spiral; financial liberalization often precedes banking crises. The anatomy of these episodes suggests that crises occurs as the economy enters a recession, following a prolonged boom in economic activity that was fueled by credit, capital inflows, and accompanied by an overvalued currency. For extreme fragility of banking sector the following balance-sheet features are usually blamed (Benston and Kaufman, 1995, p. 212): a) low level of liquid assets relative to liabilities (fractional reserve banking); b) low level of equity relative to assets, so that rapid withdrowals of deposits (runs) that force equally rapid liquidation of assets or declines in the value of assets can render banks economically insolvent (more leveraged); c) assets are predominatly founded by short-term and demand debt (deposits). Currency crises literature is not that strightforward in respect of fragility indicators, but some indicators can be comparable to that of banking sector fragility, that is (Kaufman, 2000, Table 3, pp. 77-82): a) low level of reserves of internationally accepted assets relative to external debt, what is liquidity ratio; b) low level of foreign assets relative to foreign liabilities, what is solvency or convertibility indicator, and c) high amount of short-term to total external debt, what is analogous to banks because creates high potential of speculative attack on currency. Those fragility measures are, however, less precise than the bank fragility measures. If there is no exchange or capital control, foreign and domestic demand depositors, as well as the other short-term creditors are able to convert local to international currency claims. Under an exchange rate peg, a government *de facto* unconditionaly commits itself to exchange local to international currency and *vice versa* at predetermined rate, i.e. implicitly insuring the

other parties against currency risk. This is analogous to the promise of banks to redeem deposits at par. If depositors have reason to question the bankers' ability or probity they rush to make withdrawals, the same as investors do if question a government's ability to sustain on exchange rate. Similarly to bank run, claims on local currency is going to be converted to foreign currency at better rate when the local currency suffers less acute pressure. Latter transactions could be done with less attractive rate, i.e. with losses. Run like this will exhaust international reserves and raise the probability of currency depreciation. The run on the currency is possible even at floating exchange rate regime, but this case exchange rate will decrease gradually. This is why some academics (Kaufman, 2000) add all the short-term bank deposits, or money supply, to foreign debt in order to calculate those three measures of external fragility.

Goldstein and Turner (1996, pp. 10-11) stressed similar causes "[r]eal exchange rate volatility can cause difficulties for banks either directly (when there is a currency or maturity mismatch between bank liabilities and assets) or indirectly (when exchange rate volatility creates large losses for bank borrowers)". Fragile external position is quite often blamed for the twin crises. For instance Hawkins and Turner (2000, p. 6) indicated "large, short-term and unhedged external debt ... as a contributory factor to a number of twin crises". In an extensive analysis of twins, Radelet and Sachs (1998, pp. 43-49) found that higher ratio of short-term debt to reserves is strongly associated with the onset of a crisis, rapid buildup in the claims of the financial sector on the private sector is also associated with crises. Surprisingly, in this analysis larger current account deficit is only weakly associated, the same is true for ratio of total debt to reserves, and exchange rate overvaluation.

Some recent research on currency crises with a focus on transition economies (Liargovas and Dapontas, 2009) has found similar regularities. Variables associated with the first and second generation models: money supply, international reserves, as well as real exchange rate, appear to be significant. Some institutional features in countries in transition, such as short term maturity of debt, significant amount of debt denominated in foreign currency and lack of credibility or high uncertainty, play a significant role in turning economic environment toward full-fledge financial crisis. By focusing only on bank distress Männasoo and Mayes (2009) found that in transition economies liquidity variables, like poorly covered volatile and short-term liabilities with liquid assets provide relatively strong signal about approaching bank problems. Quite contrary level of capitalization is not strong indicator of bank distress, probably because regulatory capital requirements are often higher than in advanced countries.

The well accepted elaboration of causal linkage between currency and banking disturbances is the one by Mishkin (1999). By analyzing currency-banking turmoil in Mexico (1994) and Chile (1982) the author pointed out various institutional features of those markets proved to be very important in spreading out disturbances across national financial systems. Financial system with liberalized capital account, fixed exchange rate and inflationary expectations comes to equilibrium with local currency substitution, and "short termism". Long term credit market was closed for local currency. Real economy was threatened by an enormous currency exposure and maturity mismatch. In such an economy and banking system, despite of relatively controlled direct exposure to risk of depreciation of local currency, currency risk can not be avoided because borrowers exposed to currency and liquidity risks take over huge part of it and finally transfer credit risk to creditors. Any further disturbance on the foreign exchange market, i.e. significant depreciation or devaluation of local currency, starts readjustments on the financial sector with devastating impact on the macroeconomy. In an economy with those institutional features the weakness of banking sector is going to stay

under the surface until foreign capital flow gets reverting. When this happens the whole economy is taken by full-blown currency-banking crisis. Therefore, what makes economy prone to vicious circle of currency to banking turmoil is the fact that net international reserves support two economic goals: soundness of financial system and soundness of exchange regime. Attack (speculative or fundamentally driven) on one or another system got international reserves drained out, and regularly has implications on the other system. This is why is not often clear where the trigger event is and who makes and who takes contagion.

Our analysis confirm presence of many warning signals, strictly indicating fragile position of financial system of Serbia, so that the incidence of crisis was a matter of time. What was missing is trigger event.

3. THE LOCAL STORY – MECHANICS OF THE CRISIS

Drainage of liquidity was the main issue of domestic banking sector during the fall of 2008. Firstly, international banking groups started withdrowing liquidity from their local subsidiaries. It was the main reason why international reserves decreased from March to September in 2008. It was a trigger for depositors to rush. As known from the theory (Mishkin 1991, p. 125) „depositors rush to make withdrowals from solvent as well as insolvent banks since they cannot distinguish between them." However, in this case the pattern had not completely indicated irrational behaviour of depositors. The strongest pressure had been concentrated to foreign subsidiaries; right to those who had been indicated by international and domestic press to be harmed by losses in US mortgage market. Moreover, it was foreign currency denominated deposits that took strongest presure. This phase of crisis ended up with up to one fifth of previous amount of foreign currency savings that left the banking system (17 %). Total residents' foreign currency deposits that were withdrawn solely in last quarter of 2008 (Jelasic, 2009) amounted 977 mln. euro.

The figure below (1) shows that the time series of international reserves and M3 closely coincides, notably after September 2008. This is because foreign currency (forex) deposits take more than sixty percents of M3. Thus, any change (rise or fall) in forex component of M3 (e.g. forex deposits withdrawal) is going to have immediate effect on international reserves. The temporary increase of coverage ratio (September to December) comes from devaluation effect of RSD liabilities in M3 (RSD depreciated significantly in the wake of crises). Corellation is not that strong in previous period. Namely, in the eve of the crisis (the second quarter 2008) drop in international reserves left M3 stock unchanged because it came from foreign credit outflow causing decrease in coverage ratio (Reserves-to-M3).

National Bank of Serbia reacted on this issue in different ways: the policy of reserve requirements was relaxed, deposit insurance coverage was increased, some reforms of tax policy are undertaken, etc. An action was also readiness to discount NBS bills stock. The extent of liquidity crisis was that big that the banks had to adjust their asset portfolio to meet the suddenly increased liquidity needs. They reacted with significant reduction of theirs positions on NBS bills. This short-term debt instrument was the secondary liquidity reserve of commercial banks. During the last quarter of 2008 banks reduced their position almost to third of position they had immediately before the crisis strike (Figure 2).
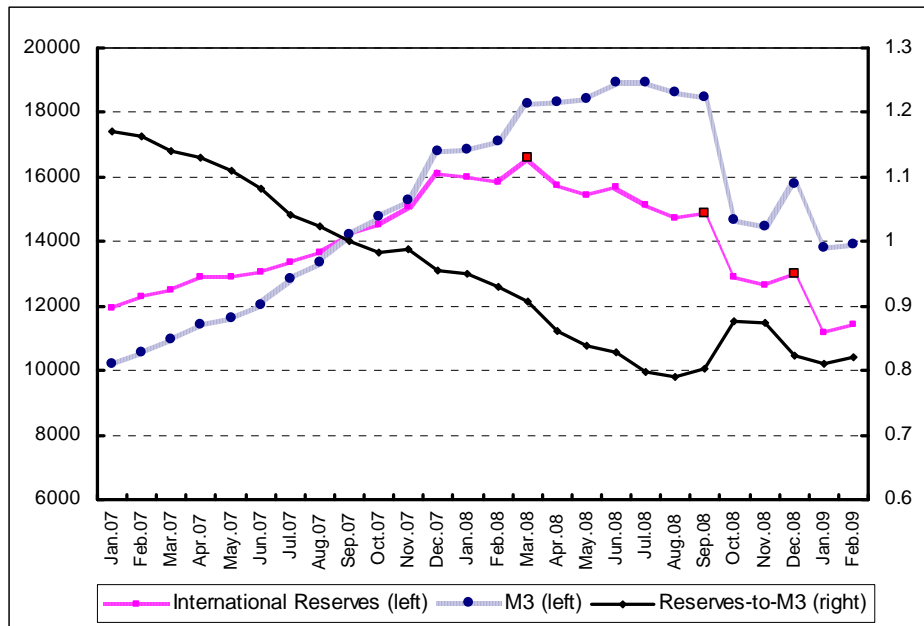
Figure 1: Financial Risk – Reserves-to-Money Stock (M3) ratio

In that time foreign parent banks stood up for their local subsidiaries and injected aditional liquidity. During the January 2009 this liquidity went back to parent banks continuing to hold the pressure on exchange rate. In the January of 2009 financial credit outflow reached approximately 0.8 bln. USD. NBS proceeded to protect exchange rate waisting precious international reserves. Despite the defence, local currency lost 20 % of its nominal value against the euro from 10th of October to the end of January. The authorities finally admitted that available international reserves cannot withstand all the posible pressure, and after initial precautionary arrangement (402.5 mln EUR) ask IMF for a new stand-bay.
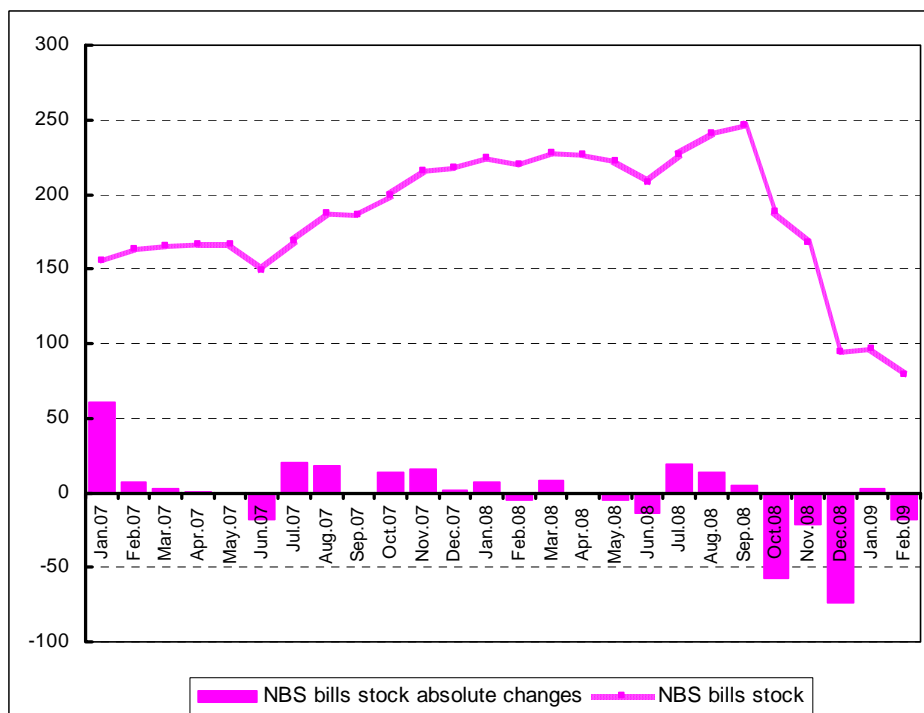
Figure 2: Change of secondary liquidity reserves in commercial banks

Therefore, the crisis episode started exogenously as a reflection of the global financial disturbance. There is no doubt that it was fully imported shock. However, the transmission revealed that the key players were aware of fragile bank liquidity position and fragile external liquidity position of Serbia.

In the next section we are going to discuss whether the shock originated outside of banking system, independently of the financial condition of banks, that cause depositors to change their liquidity preferences and cause reductions in bank reserves and international reserves.

4. CAUSES OF THE CRISIS

While the mechanics, i.e. the trigger and the transmission are straightforward, researching for the causes asks for profound analysis. Inheritance from the past deprived National bank of Serbia of a very important instrument – a good currency. Even after resolution of long-lasting period of monetary instability the local currency is perceived to be as bad as it was before political and economic regime switch. A decade of stabile foreign exchange rate was not enough to cover layers of mistrust widespread among market participants. The cornerstone of the mistrust was the fact that nothing meaningful was changed in very fundamentals of international position of the economy and its competitiveness. Export to import ratio at all times had hold below 0.5. On the eve of crisis export had been slowing down, with the same response of import, but at the faster pace.
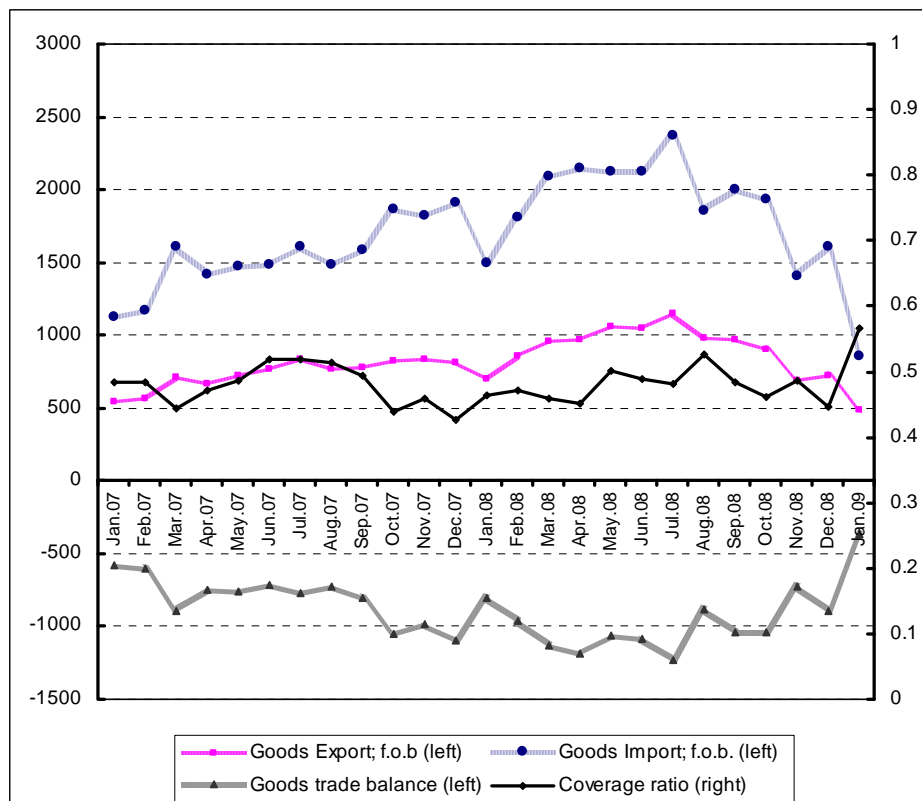
Figure 3: Foreign trade dynamics (mln. USD)

The dominant way of balancing balance-of-payment was the prime culprit. Since 2000 external position of the Republic of Serbia has been balanced with hevily reliance on foreign direct investments, workers' remittances and credit resources coming from parent banking

groups to their local units, as well as directly to local borowers. This „hot money" now, as many times before, proved to be „to hot" for the country that imports capital. Portfolio investments were also an important channel. Foreign institutional investors take part in bullish trend in Serbian equity market taking place previous years. In second half of 2008 this flaw of funds also started reverting.

The main advantage of the exchange rate regime that has been empowered in Serbia since October's political turnover is seen as the right combination of flexible and rigid elements. It seemed that for the first time Serbia would avoid the trap, so common in the past that is to make itself committed to something that goes beyond its abilities. However, ones again economic history proved that history will repeat itself when the people who create it are shortsighted. Some features of the pseudo-currency boards are implemented in the area of monetary management, while strong legally enacted exchange rate peg was avoided. Foreign exchange rate itself is floating but strongly managed. Namely, the authorities do not announce any objectives that would permit a judgment about where the exchange rate ought to be, and are prepared to act on those views. They intervene on the foreign exchange market, use monetary interventions on repo market, and reserve requirements, with a view to having an impact on the exchange rate and inflation. NBS voluntary abandoned part of its discretion in monetary management by binding itself unilaterally to the monetary prescriptions of a currency board. No credit to private and public sector were given from the NBS.

In the meantime the policy makers made another choice. Serbia started liberalizing capital account together with holding local currency overvalued. There is a bulk of research criticizing combination between inflexible exchange rate and liberalized capital account (Calvo and Mendoza 1996, Mishkin 1999, Tornell 1999, Frenkel 1996, etc.) Dornbusch made this point forcefully:

> "Exchange rate-based stabilization goes through three phases: The first one is very useful. ... [E]xchange rate stabilization helps bring under way stabilization. ... In the second phase increasing real appreciation becomes apparent, it is increasingly recognized, but it is inconvenient to do something. ... Finally, in the third phase, it is too late to do something. Real appreciation has come to a point where a major devaluation is necessary. But the politics will not allow that. Some more time is spent in denial, and then – sometime – enough bad news pile up to cause the crash" (quoted in Edwards, 2000, p. 150).

This inspiring tale is the best possible frame for explaining what happened to Serbia in the fall of 2008. The policy makers were locked in policy of real appreciation of local currency. Despite of foreign exchange regime being on the flexible side, i.e. managed floating rate, the authorities suffered from „fear of floating". Trade deficit could be easily neglegted when international reserves were rising in the aftermath of capital import. However, a textbook lesson from international economics tell us that sustainability of foreign exchange flow is more important that the actual balance of inflow and outflow at any point of time.

However, how much the local currency is overvalued, in the end? Despite ardent debate about this issue among academics, business comunity and policy makers, the right answer is possible only by considering all aspects of the whole story. Assessing whether a country's real exchange rate is out of line with its long-run equilibrium is not easy, however. The basic approach to misalignment is to use a simple version of puchasing power parity. This methodology, however, is subject to some shortcomings, including the fact that it does not consider the effects of changes in fundamentals over the equilibrium real exchange rate.

These fundamentals usually include the terms of trade, productivity differentials, the country's degree of openness to international trade, import tariffs, and government spending. Despite the shortcomings we took the simple approach. By taking value of national currency held on Jun 2005 as reference point, and allowing just for different monetary dynamics in both currency areas – local and eurozone, we arrive at the conclusion that since that time, other things being equal, till 10. October RSD appreciated for more than 60 percents (Figure 4). At least part of it can be explained in terms of trade that was in favor of Serbia during 2006, and 2007 (IMF, 2009, Table 3, p. 29). As regards to productivity differential (Balassa – Samuelson effect) it is worth stressing that non-tradable sector in Serbia is far more developed than tradable sector. According to the theory, economies with a higher level of productivity in tradables will be characterized by higher wages and hence by higher prices of nontradables, i.e. a more appreciated real exchange rate. However, for having the effect in place two preconditions are necessary: firstly, the price of tradables is pinned down by the law of one price through perfect competition, and production relies on internationally perfectly mobile capital and internationally perfectly immobile labor. Secondly, perfect intersectoral factor mobility ensures factor price equalization across the tradable and the nontradable sector, so that the productivity in the nontradable sector determines the price of nontradables (*cf*. De Gregorio and Wolf, 1994, p. 1). Thus, being more wage constrained tradable sector should determined the wages and prices in nontradable sector. In the very essence of its intuition productivity differential is able to explain real depreciation, not appreciation of a less developed economy's currency. Those theoretical underpinnings confront with tha real life facts: in Serbia, wages are constantly much higher in non-tradable sector, what with low level of economy openess (undeveloped tradable sector) could justify also a part of real appreciation. However, despite the inaccurateness of measuring that force us to accept the PPP approach being nothing more but a „rule of thumb", still holds strong concensus that the Serbia has currency appreciated most hevily than any other country in region (IMF, 2009a, p. 9).
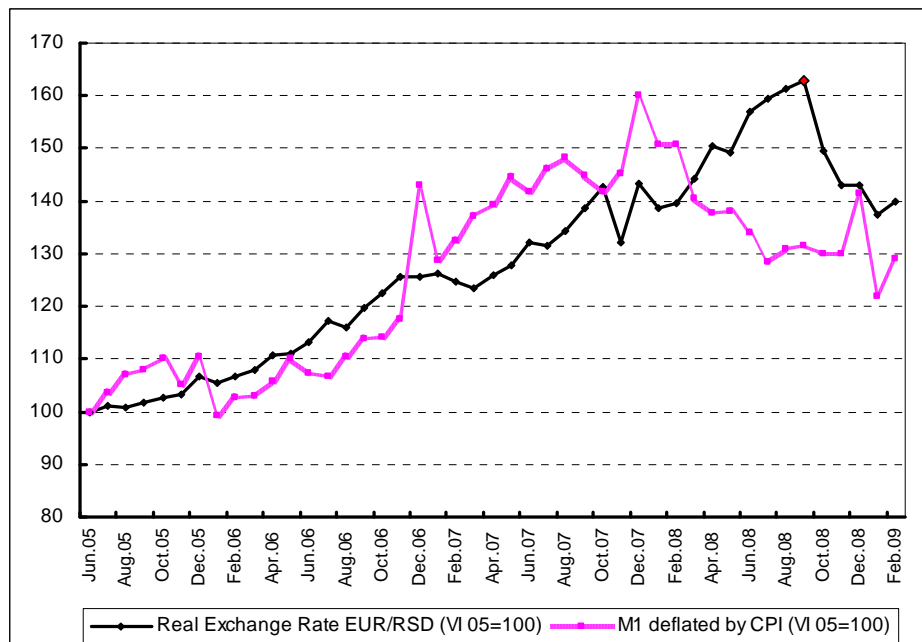
Figure 4: Real Exchange Rate dynamics

The real exchange rate appreciation was the reason why borowers benefited from taking foreign denominated debt. This further encouraged creditor to take more foreign currency denominated liabilities. Most of banking sector liabilities is currently foreign currency

denominated. Namely, financial euroization in Serbia reflects an asset substitution phenomenon (a shift to the euro as a store of value), and is accompanied by currency substition (a shift to the euro as a unit of account and means of payment) only to a minor degree. As we shall see in the next sections, the authorities managed to provoke reverse currency (in its means of payment role) substitution. The economy was remonetized, real money stock increased rapidly (Figure 4. or Table 4; last lines). However, in the second part of the task they failed. Only a minor part of retail deposits is currently RSD denominated (Table 3).

Holding aside for a moment monetary and financial consideration, this policy had immediate negative consequences. Export recovery has been slowing down in response to the overvalued currency what further expanded current account deficit (Table 4). It is well-known that autorities by controlling the exchange rate (by rule or discretion) in order to slow ongoing domestic inflation could potentially create a distortion in the capital market, besides trade implications. Namely, as long as the „peg" holds and domestic inflation continues, the effective rate of return, seen by domestic investors, falls below the real return garnered by foreign creditors. Thus, absent exchange controls, this differential encourages excess inflow of capital (see, McKinnon, 2000, p. 159). Seeing this time controlled nominal exchange rate as a kind of insurance against exchange rate risk makes it able to recognize threat that comes from over-borrowing. Foreign credit flows into the private and/or public sector with both creditors and debtors becoming indolent to insured exchange risk (moral hazard phenomena). However, the service of debt stays conditioned on the exchange rate. Steadily, contingent liabilities of ultimate insurer (often it is the government of a recipient economy) go above its risk-bearing capacity. When the real appreciation of domestic currency causes exchange rate to become usustainable, short-term capital flow reverses, leaving high-leveraged borrowers unable to service their foreign debt. No matter who the insurer is, public or private entity, the denger of foreign exchange risk to be turned into default risk is always there.

Disregarding exogenous determinants, there is still something that drives countries that are net foreign flow recipients to adopt this potentially dangerous mix of policies, i.e. controling the exchange rate toward real appreciation and oppening capital account. This is lengthening term structure of finance and equalizing relevant foreign and domestic currency interest rates. With a system of free capital account and freely floating rate capital inflow will be more slow and costly. Serbia adopted policy that depened financial intermediation, foreign and domestic interest rates failed to converge complitely, but even in field of financial deepness it failed to restore confidence in local currency as a store of value. But, having in mind recent experiences, a natural question arises: have those lower costs of financing domestic growth deserves such a catastrophic outcome. This policy mix proved to be good policy for the good times, and bad one for the bad times. It was the policy that gives you umbrella when sun is shining and takes it away from you when it starts raining.

3.1 A banking system exposed to currency and liquidity risk

High share of liquid to total assets[1] in Serbian banking sector was the main reason why regulatory authorities felt comfortable about liquidity of the banking sector. At the same time, equity to assets ratio was twice an already stringent regulatory requirement. Quite correct, banks' claims on National bank of Serbia served as a buffer from possible liquidity shock, but whether it was high enough to withstand all the pressure? However, under the surface banks' books hided huge gap in maturity compositions of assets and maturity compositions of liabilities.

Table 1: Currency and term structure of banking sector liabilities

	IX 08	XII 08	II 09
Currency risk indicators			
External debt (mln. RSD)	279,131	349,560	324,422
Foreign currency deposits (mln. RSD)	605,347	599,180	640,475
External debt/total liabilities + equity	15.18	18.24	16.95
Forex deposits/ total liabilities + equity	32.93	31.26	33.45
Total foreign liabilities/total liabilities	48.11	49.50	50.40
Forex deposits to total deposits	67.73	67.50	70.33
Forex savings/ total household savings	97.49	97.67	97.96
Liquidity risk indicators			
Short-term deposits (mln. RSD)	797,398	822,322	845,558
Short-term/total deposits	89.22	92.63	92.85
Short-term forex/total forex savings	81.34	85.72	86.74
Memoranda (mln. RSD)			
Total deposits	893,721	887,705	910,717
Total liabilities plus equity	1,838,138	1,916,650	1,914,456
Equity (not included loss allowances)	425,684	432.356	416.132

Source: NBS (2009): Statistical Bulletin, February 2009; Tables 6b-6c;

Short-term deposits are *circa* nine-tenths of total banking deposits and the share is increasing during the last quarter of 2008 and the first quarter next year. At the same time deposits were half of total liabilities plus equity, the rest of liabilities being merely bank foreign debt. What adds to fragility of banking sector liabilities is the fact that the biggest share of total deposits comes from the foreign currency denominated deposits. It is two-thirds on September 2008 and 70 percents early in 2009. Unfortunately, there are no available official data on term structure of other bank liabilities. Therefore, it is not possible to have a complete idea of maturity composition of bank liabilities.

The next step is to compare maturity composition of liabilities with those of bank assets. The next table (2) presents maturity composition of commercial banks claims on non-monetary sectors. The claims are approximately 40 percents short-term. It is quite clear that a comparison made upon those figures sends no warning signal.

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[1] The liquid assets are sum of claims on NBS (primary reserves and repo stock, etc.) and banking sector international reserves. On September the ratio of liquid assets was 34.6 and it decreased to 27.66 on January (end of period).

Table 2: Commercial banks maturity composition of claims on non-monetary sectors

Non-monetary sectors	IX 08		XII 08		II 09	
	Short-term claims	Long-term claims	Short-term claims	Long-term claims	Short-term claims	Long-term claims
Other financial org.	7,904	6,556	7,184	6,618	6,654	6,390
Other enterprises	348,266	283,466	358,931	329,609	399,599	332,497
State-owned enters.	9,937	7,572	17,684	7,781	25,958	8,975
local government	220	8,332	106	9,138	216	9,586
non-profit and other	1,252	2,187	1,780	1,569	1,635	1,595
households	48,223	285,567	50,589	331,276	51,841	344,521
Total	**415,802**	**593,680**	**436,274**	**685,991**	**475,903**	**703,564**
Maturity composit.	41.19	58.81	38.87	61.13	40.35	59.65

Source: NBS (2009): Statistical Bulletin, February 2009; Tables 6-6a.

However, simply comparing assets/liability maturity mismatch gives incomplete picture, because the figures that come from the official reports (tables 1 and 2) misrepresent reality. In fact the bulk of banks' liabilities were due on demand. Apart of demand deposits, a lot of saving deposits, being formally time deposits, contain provision to be witdrawn on demand. The same is with foreign credit lines. Thus, banks' liabilities are short maturing, or even due on demand, and foreign currency denominated. Due to above features of banks' liabilities, actual level of maturity transformation in the banking sector of Serbia stands a lot bigger that acctual methodology tells us to be. The regulatory body understimate level of liquidity risk just as a consequence of flaws in acctual methodology.

Table 3: Commercial banks transfer currency risk to other sectors

	IX 08		XII 08		II 09	
	Enterprises	Households	Enterprises	Households	Enterprises	Households
RSD claims	**572,105**	**333,434**	**633,460**	**381,496**	**676,226**	**395,900**
No risk hedging	208,084	78,480	221,162	80,171	235,549	81,282
CPI indexed	20,403	920	16,130	1,055	16,460	1,035
F/C indexed	285,325	250,280	335,349	296,021	361,100	309,413
EUR indexed	255,553	175,556	298,198	199,503	321,739	207,115
F/C unilaterally	56,577	2,218	59,803	2,232	62,091	2,211
Other risk hedging	1,716	1,536	1,016	2,017	1,026	1,959
Foreign currency claims	**78,996**	**356**	**75,422**	**434**	**82,679**	**462**
EUR denominated	51,024	332	55,728	402	60,012	429
A) TOTAL	**651,101**	**333,790**	**708,882**	**381,930**	**758,905**	**396,362**
B) CLAIMS TRANSFERING CURRENCY RISK	420,898	252,854	470,574	298,687	505,870	312,086
B/A (%)	64.67	75.72	66.38	78.20	66.66	78.74

Source: NBS (2009): Statistical Bulletin, February 2009; Tables 6b-6c.

While direct bank exposure to currency risk can not be harmful due to currency mismatch regulations, indirect exposure asks for special interest. Table (3) gives us impression of how much of currency risk banking sector transferred to borrowers. Two thirds of all the banking sector claims on enterprises, and three quarters of claims on households are foreign currency indexed or foreign currency denominated.

That leaves an economy with wide trade account deficit or low export-to-GDP ratio critically exposed to large exchange rate depreciations.

However, to what extent exchange rate policy should be blamed for the current stance of "dollarization"? Casual empiricism suggests that exchange rate movements can affect agents' choice of the currency composition of their portfolios. In particular, a strong depreciation would be expected to lead to substitution towards foreign currency, just as a strong appreciation would be expected to lead to substitution toward domestic currency. An analysis done by Šošić and Kraft (2006) shows that in case of Croatia agents responded on asymmetrical way to real exchange rate misalignments. The effect from the appreciation side would not be that strong to provoke meainful reverse currency substitution. This regularity proved to be relevant in case of Serbia too, and the case clearly supports some degree of dollarization persistance, despite many efforts to provoke trend reversal, among others persistant and statistically significant interest rate differential, reserve requirements and tax differences in treatmant of local and foreign currency deposits, and most important real exchange rate appreciation. Obviously, exchange rate appreciation as well other measures have been of no use in inducing de-dollarization. Nevertheless there was the downside of this approach.

Let us make the point. By controlling nominal (real) exchange rate in the milieu of liberalized capital account Serbia gained deepness of the banking sector, significantly increased credit to private sector, got out of short-term financing, but at the price of loosing exit strategy. If necessary, significant depreciation of the local currency was not an available option anymore, because it becomes (became) burdensome to some extent leveraged? local businesses and households. Let's summarize the above arguments! With one "hand tied up" all the pressure shifts to international reserves. The next section will show if the reserve position were already fragile.

3.2 Self-fulfilling or fundamentally driven disturbance?

In the following section we are going to discuss how sound was external position of the Republic of Serbia. For the convenience all the data are separated to different periods of time. The first period of several years from 2002 to 2007 is in the Table 4, and latest period 2007 – 2009 are presented in the Table 5. The soundness of external position is usually addressed with several indicators, grouped into external solvency, external liquidity and financial risk ratios.

3.2.1 Pre-crisis period 2002 – 2007

In the post-reform Serbia, the sustainability of foreign debt position has remained as one of the biggest issues. Serbia currently ranks among the high indebted countries according to the external debt/export and external debt/GNI criterion. However two other measures of indebtness: debt services/export and debt interest/export held the country rank inside the threshold of middle indebted countries[2]. Despite high absolute values of various ratios the overall picture does not look discouraging when the tendency gets into account. Thanks to debt relief, consolidation and restructuring, external solvency was improved. The same conclusion comes regarding majority of international liquidity measures and financial risk measures. Throughout the pre-crisis period most of indicators of international liquidity and financial risk for Serbia got better. Exceptions are some external liquidity indicators: debt services/export and debt interest/export that got worse, which is mainly because of the schedule of the debt service.

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[2] To be classified as a high indebted country an economy must have at least three out of four criteria above the threshold.

Table 4: Selected economic indicators – early warning signals

	2002	2003	2004	2005	2006	2007
External Solvency						
External debt/GNI	94.07	85.06	63.65	58.21	65.58	75.02
External debt/Export	541.16	492.52	363.44	315.76	304.99	297.28
Debt to private/total debt	36.32	36.16	34.74	43.49	57.96	66.19
International Liquidity						
Reserves/Import (month)	4.87	5.70	4.66	6.60	10.83	9.20
Reserves/Short-term debt	2.23	3.36	4.25	3.86	7.17	7.30
Reserves/GDP	0.14	0.17	0.17	0.22	0.37	0.34
Reserves/Curr. acc. bal.	1.31	1.87	1.27	2.29	3.06	2.15
Debt service/GDP (%)	1.33	1.95	3.70	4.51	9.93	10.49
Debt service/Export (%)	3.76	5.31	8.29	11.14	23.96	21.84
Debt interest/Export	6.50	7.44	7.63	8.61	9.16	10.49
Financial Risk						
Reserves/M0	1.93	2.68	2.98	4.21	4.97	4.52
Reserves/M1	1.43	1.95	2.21	2.91	3.56	3.07
Reserves/M3	0.70	0.79	0.92	1.12	0.84	0.82
***Memoranda* I** (mln. USD)						
GDP	15,831	20,339	24,518	26,231	31,779	41,581
GNI	11,937	15,958	22,149	26,567	29,896	34,969
International Reserves	2,280	3,550	4,245	5,843	11,887	14,218
Total external debt	11,229	13,574	14,098	15,466	19,605	26,235
Debt to private creditors	4,078	4,909	4,897	6,726	11,364	17,364
Short-term external debt	1,020	1,055	998	1,514	1,657	1,948
Debt services	211	397	907	1183	3156	4052
Export	2,075	2,756	3,879	4,898	6,428	8,825
Import	5,614	7,477	10,935	10,617	13,172	18,554
Trade account balance	-3,539	-4,721	-7,056	-5,719	-6,744	-9,729
Current account balance	-1,743	-1,896	-3,344	-2,553	-3,884	-6,612
Money base (M0)[1]	1,178	1,323	1,422	1,388	2,391	3,146
Money stock (M1)	1,590	1,817	1,919	2,006	3,335	4,635
Money stock (M3)	3,246	4,484	5,575	6,342	10,572	16,809

Source: NBS (2009): Statistical Bulletin, February 2009; Tables 6b-6c; The World Bank, The complete World
development report 1978-2009.
Notes: [1] Money base figures exclude liquid foreign exchange liabilities of NBS;

As obvious from the table (4), since 2001, international reserves have reported significant increases. At the same time, the ratios of international reserves to monetary aggregates rose, as well, which means that the dynamics of those elements which build the ratios, differ slightly. It makes a relative increase in international reserves even steeper than an absolute one.

During the time of net foreign capital inflow all the ratios indicated sound position of economic system in respect to international liquidity, financial risk and even external solvency (Marinković, 2006). The input common for most of those ratios is level of international reserves. The reserves of National bank of Serbia were high and continuously increasing. The later developments will show that high amount of foreign reserves reported earlier by National bank of Serbia proved inadequate to fight successfully against rapidly loosing confidence.

3.2.2 External position during the crisis

The external position of the Republic of Serbia got slightly worse after 2006. However, a dramatic decrease of international liquidity was postponed till the quarter that immediately preceded the escalation of the crisis (second quarter 2008). Then, reserves coverage of average monthly import, reserves/short-term external debt, reserves to RSD high powered money (M0) deteriorate. International reserves reverted after March 2008 (absolute pick). The drop was not dramatic until September. The run on reserves started primarily from foreign bank subsidiaries, and the pressure continued from forex deposits withdrawal. After several interventions NBS left exchange rate depreciating. Since 10. October RSD was continuously depreciating relative to euro.

Since liberalization of capital account traditional measures of exchange rate fragility becomes inadequate. Money stock (M1) indicates volume of rights to convert local to foreign currency, and hence potential pressure on the international reserves. However, in highly „dollarized" economies in counting claims on international reserves all the residents' liquid foreign liabilities have to be counted in. In stressed periods all the climants can run on reserves. The ratio of international reserves to narrow money aggregates (money base, or M1) remains almost unchanged during the crisis, and the level indicates prudent position (low financial risk). However, the picture is complitely different, i.e. more hostile when taking into account wider money stock aggregates.

Table 5: Indicators of liquidity and financial risk – quarterly data

	2007	2008				2009
	Q IV	Q I	Q II	Q III	Q IV	Q I[1]
International Liquidity						
Reserves/Import (months)	9.20	10.28	6.74	6.71	6.95	...
Reserves/Short-term debt	7.30	8.92	7.51	5.06	3.36	4.47
Debt services/Export (%)	21.84	32.79	26.38	19.66	34.92	...
Debt interest/Export (%)	10.49	17.15	22.60	13.76	27.73	...
Financial Risk						
Reserves/M0	4.52	5.54	3.95	4.55	2.26	2.58
Reserves/M1	3.07	3.46	3.19	3.34	3.00	3.40
Combined Ratios						
Reserves NBS/M3	0.84	0.82	0.76	0.75	0.73	0.75
Reserves total/M3	0.96	0.91	0.83	0.80	0.82	0.82
Reserves/Forex deposits	1.49	1.37	1.24	1.23	1.22	1.21
Memoranda (mln. USD)						
International Reserves	14218	15084	14382	13936	11494	10482
Short-term debt	1948	1691	1915	2755	3417	2343
Money stock (M3)	16809	18285	18936	18490	15771	13925
External debt to private credit	17364	18908	19950	20648	21672	19213
Forex banking deposits	9531	11013	11538	11264	9444	8618

Source: NBS (2009): Statistical Bulletin, February 2009; National Bank of Serbia
Notes: [1] the quarterly data stands for the end of February figures;

The coverage of M3 by international reserves (NBS plus commercial banks reserves) was continously decreasing since January 2007 to the middle of 2008 from the 1.17 to 0.80. This dynamics is not a surprise. The international reserves are partly built through the policy of reserve requirements. Forex bank debt as well as forex residents' deposits are subject to reserve requirements (45% – 40%, respectively). The only exception are cross-border credits, i.e. direct international borrowing of enterprises. Withdrowal of forex deposits as well as foreign credit outflow togather put the pressure on scarce international reserves. Though liquid assets of banking sector were able to withstand the pressure, its immediate conversion into foreign currency shift the pressure on international reserves, having the exchange rate depreciation to much costly. From the central bank

perspective, a run on the currency and a run on banks in a highly dollarized economy have similarly dangerous implications. International reserves had to stand all the pressure, being the only buffer to bank runs and reverting foreign capital flow. Refering to the issue of target level of international reserves in a dollarized economy Šošić and Kraft (2006) made it forcefully "[I]n case of serious run on banks or currency, even a very large "life-jacket" [reserves – *add.*] may prove to be insufficient". In case of Serbia, the dramatic drop of international reserves was a consequence of bank run; however, as obvious, some drainage of reserves that precipitate the run could be taken as a trigger event.

Therefore, it is easy to find a multitude of weak and deteriorating economic fundamentals in the onset of the crisis suggesting that it would be difficult to characterize this episode as a self-fulfilling crisis. Moreover, those economic fundamentals merely indicate fragile external liquidity and the banking sector exposed to liquidity risk and indirect currency risk. The turning point was the quarter that immediately precede the escalation of the crisis.

4. CONCLUSIONS

The key point for summarizing the above discussion is: High liquidity of Serbian banking sector: Where it went? The answer is obvious. Data from bank reports on liquidity do not describe the reality. Hence, liquidity went nowhere. It never had been here in the extent necessary to prevent liquidity crises. Therefore, despite of the high marks the banking system gets regarding its solvency, the same marks are not reality when discussing its liquidity. High level of currency substitution and economic system exposed to currency risk makes any liquidity shock imidiately transformed to the external illiquidity. This time banks' liquidity reserves were able to withstand that strong pressure. The pressure was shifted to fragile international reserve position. How fragile it was? In practice, it is difficult to establish any clear relationship between a country's reserve levels and its potential vulnerability to liquidity crises. This story tells us that the element of highest importance is not the absolute level of reserves but rather their sustainability, i.e. the ways the reserves have been created. There is important difference if the reserves are built up by cumulative current account surplus, or by "hot" money inflow. Therefore, potentialy dangerous transmission comes as a consequence of fragile currency structure of the banking sector balance sheet, i.e. the fact that official legal tender wasnot able to „takeover" meaningful share from foreign currencies in its role of means of savings. In other words, banking system of Serbia is still inherently burdened with liquidity risk, and country with such a banking system becomes inherently exposed to risk of international illiquidity. We can conclude that without any change of those two generators of banking crisis, the economic system is likely to be fertile soil for growing future twin crises-like disturbances.

Finally, this case study points out some wrong policy choices, but it doesn't necessary attribute the mistakes to some institutions resposible for only a part of overall economic transition. For, the scope of exchange rate or monetary policy to be effective in an ambience of slow progress in other fields of reform is surely limited.

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CORPORATE ENTREPRENEURSHIP – A WAY HOW BIG COMPANIES CAN DEAL WITH CHALLENGES OF GLOBAL ECONOMIC CRISIS

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1. INTRODUCTION

The end of the 20th and the start of the 21st century is characterized by changes of great intensity at the global level, which are increasing organizational pressures for finding new sources of sustainable competitive advantage. Global pressures, like opening of the Chinese economy, emergence of strong regional groups devoted to free trade, development of telecommunications, end of the „Cold War", have increased the level of insecurity and complexity in the environment, which, according to Gibb, provokes the application of entrepreneurial behavior at individual and organizational level, and the level of society as a whole (Gibb, 2000).

The need for entrepreneurial behavior at all levels of society dramatically increased at the end of 2008, when, as the consequence of „freeing" of the capital market at the international level there was a global increase in power of corporate finances, a general increase of international capital investments, i.e., the presumption that financial „shocks" from one country are transferred faster to other countries. In such conditions of globalization of the financial market, Croatia is also getting caught in the trends of financial crisis and recession, which had an influence on lowering of the general level of spending in the country as result of increasing unemployment, loss of savings and the omnipresent fear of uncertain future. In conditions of decreased volume of business, companies are faced with the challenge of early discovery and

reaction to opportunities in the environment, and maximization of utilization of human potential in finding new solutions to problems imposed by the globalized market.

Smaller businesses usually react faster on changes, but bigger businesses are usually more bureaucratic, what makes them slow in reacting on changes in its environment (Kanter, 2008). The concept of *corporate entrepreneurship* (Morris, Kuratko et Covin, 2008) is identified as a major organizational innovation which contributes to building capacity of large business systems for taking advantages of fast changes instead of being victims of them. Large business systems are characterized by bureaucratic organization, which discourages entrepreneurial behavior both at individual and organizational level, and without creative and innovative potential, large companies are becoming calcified, which disenables moving the organization from stalemate. The consequences manifest in choking of entrepreneurial initiatives of self-motivated employees and ultimately in loss of enthusiasm by enterprising individuals, who represent a true endemic species in such systems (Singer et al., 2009).

This paper will present the case of Allianz Zagreb d.d. who "trained" itself in good, normal times, for challenges in ever increasing complexities and changes in the business, technological and societal environment. Working on building its internal entrepreneurial capacity, determined by the innovativeness, pro-activeness and risk-taking, Allianz Zagreb d.d. started with the implementation of different activities and programs for establishing such working environment in which employees will be motivated for taking initiatives, to see connections between own performance and company's results, and to become accountable for the company's business sustainability. The case described confirms how important is to activate and build entrepreneurial capacity on all organizational levels, as the response on pressures and challenges coming from environment, especially in the times of globally disturbed economic environment.

2. KNOWLEDGE AS A SOURCE OF COMPETITIVE ADVANTAGE

The key to company success lies in establishing and maintaining the competitive advantage in the market. Unlike the neoclassical economy of 19th and 20th century whose authors emphasize the importance of natural resources and possibility of access to capital as crucial for establishment of competitive advantage, a whole range of factors has caused the reign of completely different rules of competing in contemporary business conditions. Many authors (Handy, 1994; Grant, 1996., Porter, 1998.) agree that the most important strategic aspect of a company today is its knowledge, i.e. capability for its collecting, developing, sharing and its implementation and that this knowledge is exactly what enables companies to provide superior value for their customers and develop sustainable competitive advantage, by combining of traditional resources of production that are disposable to all, in a new and unique way (Teece et al., 1997.).

One of the main causes of dominance of knowledge as a strategic resource in today's market conditions is the development of information technology and telecommunications and its influence on "internetization" of society and increasing of market transparency. Exploitation of information-intensive resources, porosity of a company as a system at all its levels and building of an active relationship with the environment have become an imperative and an essential part of doing business of all the companies, and not just an exclusive right of those that come from advanced technology industries.

Companies that develop efficient methods of environmental scanning at all levels and become scanning organizations and establish channels of internal processing and distribution of relevant information are thus building a system for identification of early signals form the environment which expands their maneuvering space for action and achieving advantage in relation to other players in the market (Aguilar, 1967). The most important component of the concept of scanning organization are employees at all levels who, each in the domain of their business activities, have the potential for gathering information and generating new ideas relevant for enhancing performance of the company they work at. This trend of activating innovative potential of employees at all levels, in the organizational context, is known as corporate entrepreneurship.

3. CORPORATE ENTREPRENEURSHIP AS A PRECONDITION FOR MAXIMIZING THE INNOVATIVE POTENTIAL OF EMPLOYEES AT ALL LEVELS

Corporate entrepreneurship, in the narrow sense, represents formal and informal activities whose aim is the creation of new ventures within existing organizations (Zahra, 1991), creation of new business entities in collaboration with the existing organization (Sharma and Chrisman, 1999), or transformation of the existing organization through strategic renewal (Guth and Ginsberg, 1990). Entrepreneurial organisational culture is the presumption for entrepreneurial activity of employees in corporations, characteristics of which stimulate and facilitate such behaviour.

Morris et al. (2008) gave an overview of characteristics of entrepreneurial organisational culture by several authors (Cornwall and Perlman, 1990.; Peters, 1997.; Timmons, 1999), and continued by synthesizing and citing the following elements of organisational culture: focus on people and empowerment; creation of value through innovation and change, emphasis on essence; hands-on management; effectiveness; freedom to develop and make mistakes; commitment and personal responsibility; emphasis on the future and the feeling of urgency.

The Entrepreneurial Culture Contrasting Metaphors	
Government/corporate	*Small business / Entrepreneurial?*
Order	Untidiness
Formal	Informal
Accountability	Trust
Information	Judgement
Demarcation	Overlap
Planning	Intuition
Corporate strategy	Strategic awareness
Control	Autonomy
Standards	Personal observation
Transparency	Ambiguity
Funktionalism	Holistic
Systems	Feel
Position	Ownership
Performance appraisal	Customer/network exposure

Figure 1.: "I want you to be like me!"
Source: Gibb, A.A.: «Entrepreneurial Society- Background Paper", Durham University Business School, 1998, p.11.

The importance of change of organizational culture of large corporations for the purpose of „catching up" with changes and challenges brought by the globalized environment is also discussed by Gibb who clearly alludes on setting small companies with their entrepreneurial characteristics as a benchmark for large companies, at the same time contrasting their organizational cultures in his paper «Corporate Restructuring and Entrepreneurship: What can large organisations learn from small?» (Figure 1).

4. LEARNING ORGANIZATION - CONTINUOUS ABILITY TO LEARN AT ALL ORGANIZATIONAL LEVELS

Development of entrepreneurial potential at all levels of corporation represents the path towards the creation of learning organization. Learning organization is a type of organizational culture in which attempts are made to maximize contribution of all employees and involve them with the aim of achieving organizational goals, through encouraging employees for individual development and learning.

Revans's "action learning" concept and systematic thinking have had a special impact on development of the idea on learning organizations. According to Revans, the basis for undertaking actions with the aim of organizational development by the management is their individual development, which makes individual and organizational learning mutually connected and inseparable (Leitch et al., 1984).

Concept of systematic thinking has been applied in practice in the 1950s. (e.g. Bertalanffy, 1952). Systematic approach perceives organizations as systems that are under direct influence of changes in the environment, and their survival ability is directly dependant on the ability to perceive and adapt to these changes. Besides the direct dependence of the system on its environment, this approach also notes and points out the connection of actions of the most distant parts within the system, and their mutual dependence. Concept of systematic thinking has had a significant influence on Peter Senge's thinking, who, identifies precisely systematic thinking as the integrating strength of remaining "disciplines" that enable creation of learning organizations, and these are: common vision, mental models, personal development and team learning. Senge believes that development of systematic thinking of every individual is the prerequisite for implementation of the concept of the learning organization, because systematic thinking allows individuals to understand the structures that operate "in the background" and influence people's behavior both between themselves and towards the organization in which they work. Systematic thinking also influences the transformation of „...perceiving people as helpless objects that only react according to whether that they are seen as active participants in shaping of their reality..." (Senge, 2001).

The most often quoted definitions among authors who analyze learning organizations are that of Senge and Pedler. Senge says that learning organizations are "…organizations where people continually expand their capacity to create the results they truly desire, where new expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together (Senge, 2001)." Pedler defines learning organization as one that "…facilitates the learning of all its members and continually transforms itself (Pedler, 1995)."

Below we will describe the case of creating entrepreneurial organisational culture in company Allianz Zagreb d.d.

5. SHOULD COMPANIES "WORK OUT" REGULARLY TO BE FIT FOR HARD TIMES? – THE CASE OF ALLIANZ ZAGREB D.D.

Allianz, one of the world's leading insurance companies with headquarters in Munich, started its significant international expansion in the 1970s by expanding to United Kingdom, Netherlands, Spain, Brazil, and the USA. At the turn of the 21st century, Allianz changed its global vision and strategy, and through entering the banking sector and assets management field, it transformed from a global provider of insurance services to a global player in the financial services market. Today Allianz represents the largest provider of financial services in Europe and is among the 5 leading providers in the world.

Allianz entered Croatian market in 1999, by founding Allianz Zagreb d.d., which, after several years of weak performance, in 2003 finally set a clear vision and strategy - to become the most successful insurance company in Croatia. The same year, a new management board was appointed, which devoted significant attention to creation of a quality team of people at the middle management level, which, within a period of three years, transformed Allianz in Croatia from a marginally profitable, inert and bureaucratic into a successful, flexible and profitable company. When defining development strategy in Croatia, Allianz uses similar experiences of branches from other countries, combining them with local knowledge and taking local particularities into account.

Growth of volume of work of Allianz in Croatia increased the need for employment and development of lower levels of management and professional associates who would be capable to assume part of the responsibility for performing more complex tasks, proactive and independent action in development and application of new business solutions, which would free space for middle management's stronger involvement in defining and implementing company's strategic development guidelines. Entrepreneurial characteristics of potential Allianz's employees needed to be recognized as well as further developed and stimulated entrepreneurial behaviour of existing ones. Since 2006 company intensively works on systematic education of its employees through the Allianz Development Center, and one of its programmes is Allianz Academy which represents a six-month education program for employees with the greatest development potential, who are going to assume positions that bring greater responsibility in the near future. Academy's goal is the exchange of knowledge between the members of management who actively participate as lecturer s in the programme, and a no less important side-effect of such organization of education are internal networking and more efficient communication within the company.

A new view of the role and development of the Department for Human Potential Development in Allianz is also a result of Daria Puhar's appointment as the head of this department in February 2004. Daria Puhar's previous experience of working at various positions within a small company and acquiring knowledge on the importance and application of entrepreneurial way of thinking at the Graduate Program in Entrepreneurship at the Faculty of Economics in Osijek certainly contributed to the systematic approach in observing the impact and importance of employee development for company's final results.

New system of education in Allianz required a systematic approach, as opposed to the sporadic approach that was present until then, emphasis on development of promising people in all segments of the company, not only employees that are part of the sales network, increase of the budget for internal education, employment of an expert person devoted

exclusively to employee development, foundation of Allianz Academy and an active role of management in the employee education process.

Defining Allianz's vision and basic values was identified as an important step in steering development and education of employees in the company. In 2005, Allianz Zagreb d.d. began redefining its basic business values, within the framework set by Allianz Group. All company's employees were involved in this process, through defining values that they consider the most important for Allianz and themselves personally, and by participating in the process of selection of best proposals. The selected values were: strength, excellence and partnership, and the results of this process were presented to employees in all branches of the company by Chairman of the Board of Allianz Zagreb d.d., Boris Galić in person. All employees were present at presentations and through direct communication they discussed the wider meaning of these values both for them personally and the work they perform. The greatest amount of "dust" in discussions about defined values was stirred up by the word "partnership", particularly the partnership and communication between employees and individual departments as a prerequisite for successful business.

At the end of 2006, Allianz Zagreb d.d. implemented an innovation in operational organization of the business. Instead of a functional organizational structure, a new structure was implemented, based on process way of thinking, which, besides the organizational restructuring also demanded a change in employees' way of thinking and attitudes. In the same year, Allianz in Croatia put greater emphasis on CRM, which demanded not only increased communication between the client and the department in charge of communication with clients, but steering the entire business towards the client. This kind of approach resulted in: sale of travel health insurance over the Internet, option to report damages by telephone to Allianz's call center, without the need to visit company's offices in person, sale of insurance through branches of a bank: Duo-Life (product created in cooperation with Zagrebačka Bank d.d.), and Allianz Best Invest (product that represents a combination of life insurance and investment of funds linked to the index of best European corporations).

Allianz is attempting to stimulate its employees to generate innovative ideas through the "i2s" project, which has been started at the level of Allianz Group, and it represents a continuation of a similar project that Allianz in Croatia organized in 2005 under title "My Idea". Within this project, employees were asked to come up with proposals for various improvements in business operations, which were then reviewed by a specially formed team, and forwarded to appropriate directors, and then the author of the proposal would receive feedback on idea's application within a previously agreed upon period. Some of the ideas that resulted from this project are: online reporting of damage for clients and introduction of a special incentive for employees who give a recommendation for employment of a new sales representative.

Employee motivation in Allianz in Croatia is based on two principal elements: defining and evaluating annual goals of each employee, which are arising from company's goals, and the result of annual evaluation is rewarded with an annual bonus; and defining and evaluating quarterly success indicators, which were based on quarterly plans jointly defined by manager and employee at quarterly meetings. Success indicators at the end of a specific quarter reflect on the salary in the next one, through defined fixed and variable part. This reward system was introduced in 2004, and each year it is modified and improved based on the feedback from participants. In accordance with this approach of more intensive communication between management and employees about goals, plans, and the achieved results at both individual and organizational levels, Allianz in Croatia has reformulated the role of regional directors,

who concentrate on people development, while branch directors are taking over the operational part of activities.

Beside the financial effect of the change in organizational culture in Allianz (double-digit growth of overall premium in 2007, move from the third to the second position in the rank of insurance companies in Croatia, increase in the number of employees), the key effects are those of immaterial nature – changing and creation of positive atmosphere in the company.

Through systematic and consistent implementation of activities described in this case at all levels of the company, Allianz has succeeded in creating entrepreneurial organizational culture in Croatia. Creating, i.e., changing organizational culture in a company is considered to be one of the most difficult management tasks, and the described measures show how demanding this process is in terms of time, but also in terms of level of leadership, enthusiasm, dedication and understanding of goals and benefits of this process, which must be present in the key group of people around the top management as the precondition for successful implementation of this process.

6. CONCLUSION

In conditions of general financial crisis and recession, which intensively affects the globalized world market at the start of the 21st century – companies in Croatia are faced with the challenge of finding new sources of sustainable competitive advantage. More than ever the pressure for maximum utilization of company's internal potential for the purpose of more efficient environmental scanning with the aim of timely identification of opportunities and threats in the environment is present. On the other hand, internal intellectual potential of the company in the sense of knowledge, creativity and entrepreneurial initiatives is becoming the main source of innovative solutions to problems and ideas for creation of new processes, products and services.

Creation of entrepreneurial organizational culture which, by its characteristics, encourages employees to act entrepreneurially in the sense of innovativeness, proactivity and undertaking risks is the precondition for maximization of company's internal potential. Change of organizational culture into entrepreneurial one represents one of the greatest challenges for modern managers, because it presumes creation of mutual trust between employees and management, as well as sharing a common vision.

The paper describes the case of creation of organizational culture in company Allianz Zagreb d.d., which was based on connecting management and employees at all levels of the company through projects: defining vision and key values of the company, developing innovative processes, products and services, internal education of promising employees, change of organizational processes, and developing a reward system. Through these activities, Allianz in Croatia managed to increase employee enthusiasm for accomplishment of organizational goals, efficiency of internal communication, and the level of financial performance.

Allianz in Croatia demonstrates a process of organizational learning at all levels of the company, as well as a tendency towards creation of a learning organization, which in the times that follow has a developed and trained internal potential for solving whatever problems uncertain future may bring.

As it was shown in the Allianz case, companies will be better off in times of uncertainty if they work on itself all the time, even in the more stable environment.

Economic crisis of such magnitude and intensity, as it is this one which started to spread globally in 2008, will affect everyone, from individuals to governments, from business sector to education, health and culture. Lower demand caused by lost jobs, savings, wealth, and fear of the uncertain future will pressure business sector to be more productive and innovative. There are two survival divides: first, the ability to use own and other's people knowledge in looking for new solutions and second, the speed at which businesses respond to those challenges. In "normal" times abilities of adaptation, creativity, flexibility, aggressiveness, speed and innovativeness are the needed characteristics of entrepreneurial capacity, which must be applied at the individual, organizational and societal level, as the response to the increasing level of uncertainty and complexity of the environment we live in (Gibb, 2000). But, in times of the global economic crisis entrepreneurial capacity is "to be or not to be" for any system, because the rising uncertainty will require new set of competences and new approaches in looking for solutions for new sources of sustainable business performance and competitiveness.

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FINANCING CONSTRAINTS AND CREDIT RATIONING: EVIDENCE FROM SOUTH-EAST EUROPE

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1. INTRODUCTION

The transformation of the banking sector in transition economies has been one of the most dynamic and challenging aspects of the transition process. Reforms in South East European countries were long delayed, especially in the first decade of transition. The banking sector was relatively inefficient, with a weak supervisory capacity, and old lending practices paved the way on many occasions for severe crisis and low levels of financial intermediation. In the second decade of transition, however, the banking sector in SEE underwent a fundamental restructuring and the consolidation. Reforms of the macroeconomic environment and institutions of a market economy were undertaken, which promoted stability and the prospect of financial deepening. Notwithstanding the progress, financial development in transition economies in general and SEE in particular has not achieved that of other countries with comparable levels of economic development (EBRD, 2006), with capital market imperfections as the main explanation.

Capital market imperfections stemming from information asymmetries and transaction costs, which lead to credit rationing and financing constraints on creditworthy borrowers, are well grounded in economic theory (Stiglitz and Weiss, 1981; Fazzari *et al*., 1988). In this paper, the availability of finance is examined by encompassing two strands of the literature into a single empirical framework: credit rationing and financing constraints. New evidence on credit rationing and the financing constraints experienced by firms in SEE is provided by addressing the important question of what, if any, is the impact of financial underdevelopment stemming from capital market imperfections on firms. The focus is on the distribution of such effects on specific groups of firms. Given that small firms are the most dynamic sector and critical to economic growth in SEE, the risk that market imperfections are especially pronounced for this group and limit their access to external finance is the principal issue addressed in the paper. Other firm characteristics such as ownership, past performance, financial disclosure, etc., that may influence the degree of financing constraints are also

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explored. Other working hypotheses, such as the persistence of soft budget constraints for state-owned enterprises, whether credit rationing is a supply- or demand-driven phenomenon, the ability of banks to distinguish between 'good' and 'bad' borrowers, are also tested. The latter reconciles largely debated the pooling equilibrium theory and bank screening hypothesis.

Using a large survey of firms in SEE countries (for 1999, 2002 and 2005) and extensive econometric modeling, different dimensions of credit rationing and financing constraints are explored. For example, the determinants of the proportion of investments financed through bank loans and internal funds are examined using a Tobit model; more direct tests of credit rationing such as the determinants of the likelihood of applying for a loan and being denied a loan are explored using the Heckman's incidental sample selection model. The findings confirm that capital market imperfections are prevalent in the SEE region, especially for the small business sector. However, during the period under review there has been a substantial decrease in financing constraints in all firm categories which is greater for small firms than for larger ones, implying a shift in the lending technology of banks towards the small business sector. Finally, a number of policy suggestions aiming at reducing financing constraints for the small business sector are derived.

2. THEORETICAL AND EMPIRICAL BACKGROUND

2.1. Credit rationing and financing constraints: the theory

There is a well established literature recognizing that imperfections in the credit market stem from information asymmetries, transaction costs and agency issues. Such imperfections have given rise to the credit rationing – a state in which information asymmetries between lenders and borrowers may result in the equilibrium interest rate not clearing the market. Instead, the demand for loans will exceed the supply and banks will deny credit to some borrowers who are observationally indistinguishable from those who receive loans, despite their willingness to pay the prevailing interest rate. Under the limited liability assumption a 'pooling equilibrium hypothesis' with adverse selection and moral hazard in the credit market is obtained. For example, if the borrower bears no cost when project returns are lower than the debt obligation, the moral hazard argument leads to credit rationing because the borrower may choose different projects with different degrees of risk *ex post* (Stiglitz and Weiss, 1981), engage in asset substitution (Schwartz, 1981), choose an inappropriate degree of effort in the project (Aghion and Bolton, 1997; Ghosh, *et al.*, 2001) or even falsely declare bankruptcy (Williamson, 1986); and because of information asymmetries banks cannot distinguish these borrowers from better quality ones, hence, the pooling equilibrium prevails.

The information asymmetry theories of credit rationing have often been criticized for assuming that banks are unable to distinguish between borrowers – given that banks are in the information processing business and have specialized expertise in analyzing credit risk (Riley, 1987; Inderst and Muller, 2007). For example, Riley (1987) criticizes the credit rationing theory of Stiglitz and Weiss by arguing that as long as high risk and high return are positively correlated, then the adverse effect of risk may be offset by a favourable effect of returns and, as the number of observationally distinct groups increases, credit rationing may not be an empirically important phenomenon. In this line of reasoning, Milde and Riley (1988) establish the 'bank screening hypothesis' in which separating equilibria with no rationing is attained where banks screen their borrowers by offering larger loans to safer borrowers and by sorting

out different risk classes. However, only if banks adopt different screening methods for every increment in loan size, then separating equilibria may be attained. But if the screening rules are adopted for classes of loan size (i.e., corresponding to borrower risk classes), then the pooling equilibrium is likely to be present in each class. As Stiglitz and Weiss (1987) contend, as long as an unobserved heterogeneity remains within each risk class it does not affect the magnitude of the problem and credit rationing occurs within each observationally distinct risk class. For example, banks can separate small firms from large ones, firms classified by different economic sectors, etc. But within each group some will receive loans while apparently identical firms may not.[1]

To the extent that information asymmetries are more problematic for a specific group such as for small firms, then it is a question of the magnitude within this group, as opposed to other groups, how much this problem is empirically important. If small firms have higher informational problems and are subject to credit rationing, it does not necessarily mean that they have 'bad' projects in hand. As Storey (1994) notes, if business proposals that are turned down for reasons not connected with the viability of the project itself, e.g., because firms lack track record and collateral or are small, then credit rationing may pose a problem in the credit market and may be subject to government intervention. As Cressy (1996) notes, although the theoretical underpinnings of credit rationing theory may be challenged, its implications seem to have been accepted since in many countries substantial sums of public money have been spent on alleviating this problem that is thought to affect small firms particularly. This is partly because the credit market imperfection may cause the flow of financial capital not to the most talented entrepreneurs but to those with sufficient collateral (Demirguc-Kunt and Levine, 2008), thus, impeding entrepreneurial activity and potentially economic growth.

Credit rationing may be thought of as an extreme state of imperfections in the credit market. It is important to recognize that if firms have access to external finance, they may still limit their investments to internally generated funds and underinvest since information and incentive problems introduce a wedge between the costs of internal and external finance – as the financing constraints literature argues. Financing constraints refer to the inability of firms to finance their desired level of investment that would have been attained in a perfect capital market case. When capital markets are perfect, firms are indifferent between what sources they use (internal or external) to finance their investment. Firms would not find it difficult to raise external finance when profitable investment opportunities arise and, in this framework, internal and external funds are perfect substitutes. However, given capital market imperfections, reliance on internal funds may be higher since raising external finance is either more costly or impossible. The 'pecking order theory' (Myers and Majluf, 1984) or the 'hierarchy of finance hypothesis' (Fazzari *et al.*, 1988) suggest that, due to market imperfections, external finance will be more costly than internal funds for financing investment and that firms will not turn to external funds until internal sources are exhausted. This is due to a number of reasons, including: the costly-state verification implying monitoring costs (Townsend, 1979; Williamson, 1987), asymmetrical information entailing moral hazard and adverse selection (Jensen and Meckling, 1976; Stiglitz and Weiss, 1981), tax reasons (Bond and Meghir, 1994), transaction costs in issuing bank debt, such as costs of application, screening costs, bankruptcy costs, etc.

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[1] Credit scoring models used by commercial banks are statistical models based on borrowers' observable characteristics. Notwithstanding various estimation biases in the credit scoring models (see for example Greene, 1998; Parnitzke, 2005), the rating is made based on some *average* pattern of observationally distinct risk classes. Despite this, within each risk class, due to information asymmetries and the inability to sort borrowers perfectly, credit rationing may still emerge.

2.2. Credit rationing and financing constraints: empirical literature

The empirical literature on credit rationing and financing constraints was developed in a two distinct frameworks. Regarding credit rationing, as Jaffee and Stiglitz (1990) note, the magnitude of this problem in the economy could be measured if the demand and supply for credit was known. However, what is observed is the quantity of credit that is transacted and not the excess demand for loans. Hence, credit rationing may be extremely difficult to identify and empirical tests are mainly indirect (Parker, 2002). One test for credit rationing is when the data allows the researcher to distinguish between firms that have applied for credit and those that have not (the demand effect) and it also distinguishes between the successful and the unsuccessful amongst the firms that applied for credit (the supply effect). Using enterprise survey data which allowed this distinction in Czech Republic, Hungary and Poland, Bratkowski, *et al.* (2000) tried to determine how banks allocate credit: do they lend to firms with higher profitability? Are they providing credit to firms with good prospects but weak track records? Or is it that collateral availability is the most important determinant of getting a loan? The authors found that banks were able to distinguish successful firms by lending to more profitable ones even without a track record but which were able to provide collateral. They also found that firms with less profit were less likely to apply for loans (e.g., no evidence of adverse selection). Based on these results, the authors conclude that credit rationing was not pervasive in the three countries in the early years of transition.

Studying the credit rationing problem in the housing loans market in the U.S., Jappelli (1990) explores the degree of rejection of applicants for bank loans as a measure of credit rationing. However, the author identified another group, those who did not apply for loans and perceive that, if they apply, they will be rejected by the bank. This group may be considered as credit rationed since all non-applicants cannot be treated as having had no demand for loans. Given that there are transaction costs of applying, they will not participate in the credit market. Omitting this group may lead to biased results, because the self-selection of applicants may induce banks to adapt screening rules that differ from those that would prevail if also the 'discouraged' borrowers were to apply.[2] Jappelli (1990) classifies this group as 'discouraged' borrowers and, together with the rejected group, considers them as 'credit constrained' borrowers to distinguish them from the strict definition of credit rationing. Similarly, Levenson and Willard (2000) adopt the definition of Jappelli (1990) for credit rationing and use survey data for investigating the small business sector in the U.S. The authors calculated that only 2.14 percent of firms did not obtain the funding which they sought. They also have taken into account the discouraged group which adds another 4.22 percent of borrowers who are discouraged from applying by the prospects of being denied. The rejected applicants and the estimate of the discouraged borrowers constituted the upper bound of credit rationing at 6.36 percent of the sample. Given that this proportion of firms accounted for only three percent of employment in the sample and that some of the constrained firms were not creditworthy, then the authors conclude that credit rationing was not a pervasive phenomenon in the U.S. economy. However, contrary to this, the bulk of the other empirical studies finds that credit rationing is indeed binding: for the U.S. economy (Perez, 1998), for developing economies (Angelini and Generale, 2005), for transition economy (Rizov, 2004), etc.

Financing constraints literature has accelerated after the original work of Fazzari, *et al.* (1988). They hypothesized that if firms can easily obtain external funds without paying a

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[2] Besanko and Thakor (1987) point out that in some cases the bank's credit policy discourages borrowers from applying for credit by using non-price mechanisms, e.g., collateral or application procedures, and that the bank need not explicitly reject borrowers to induce them to exit the market.

premium, their investment decisions may be less sensitive to internally generated funds. In contrast, when the premium is high, firms turn to internally generated funds for funding their investment first and external funds are not sought until their own resources are exhausted. The empirical question in this line of inquiry is to investigate whether a firm's investment decision is sensitive to changes in net worth, holding investment opportunities constant. In these models, investment is regressed on some proxies of net worth (e.g., cash flow or liquidity), controlling for investment opportunities (which are proxied by Tobin's Q, sales growth, employment growth, etc.) and other firm characteristics. If the coefficient of cash flow is positive and significant, then it is said that firms face financing constraints. In this framework firms are *a priori* classified as more or less likely to face financing constraints based on the researchers' beliefs about the systematic differences between firms regarding their information opacity, riskness, etc. For instance, if small firms are perceived to be more financially constrained than large ones, a common characteristic in almost all tests is that the sample is divided into sub-samples of small and large firms and then the investment model is estimated for the two sub-samples. If investments by small firms are more sensitive to internally generated funds, as measured by the absolute size of coefficient, it is suggested that these firms are more financially constrained than their larger counterparts.

There are many *a priori* distinctions of firms considered to be more or less financially constrained. For example, Gertler (1988) and Gilchrist and Zakrajsek (1995) use the size and age of firms as the criteria for financing constraints. As they point out, informational frictions that add to the financing costs, and hence financing constraints, apply mainly to younger firms with a short track record and with a high degree of idiosyncratic risk and firms that are likely to be not well collateralized. Small firms in general are more likely to share these attributes and may be perceived as more risky. Hence, they should be more financially constrained compared to larger and older firms.[3] Also the screening and monitoring of small firms may be proportionately costlier to the lender. From a bank's point of view, fixed lending costs related to loan appraisals and monitoring make costs per dollar lent relatively higher for small firms (Saito and Villanueva, 1981; Berger and Udell, 1998).[4] Also from the firm's perspective, transaction costs in the application process for small firms are relatively higher. All these attributes may lead small and young firms to face higher financing constraints. Often the ownership structure of firms is taken as an *a priori* criterion to distinguish between more and less financially constrained firms. In the transition context, due to the soft budget constraints (SBCs) and a variety of government subsidies, one may expect that state-owned enterprises (SOEs) face less financing constraints. However, in later years of transition subsidies to SOEs were cut, e.g., following the IMF recommendations. Or upon the entry of foreign banks, the budget constraints were hardened and access to finance for SOEs was reduced due to their lack of restructuring. For example, Perotti and Carare (1996) for the case of Romania, Konings, *et al.* (2002) for the case of Bulgaria and Romania showed that SOEs, although highly indebted and with negative cash flows, did not exhibit financing constraints due to the SBCs. While this finding in developed market economies would be a sign of perfect capital market, in the transition context it is claimed to show SBCs. On the other hand, foreign-owned firms, especially those originating from developed countries, may be expected to face lower financing constraints. This is because of their ability to access financial markets in their

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[3] Bulk of the empirical literature finds that collateral is related to a greater perceived *ex ante* risk (e.g., Leeth and Scott, 1989; Berger and Udell, 1990). If small firms fall within this group, then their lack of collateral makes them less able to qualify for bank loans and they may face higher financing constraints.

[4] Jovanovic (1982) points out that good credit risks among a pool of small/young firms can suffer from a type of structural discrimination since the relatively high costs of screening 'good' applicants from 'bad' leads external financers to decrease lending to this group as a whole. Instead, external financing is directed toward the pool of older/larger firms that have a higher probability of repayment as a whole.

home countries, obtain financial resources through foreign direct investments, etc. The possible lower financing constraints faced by foreign firms may be explained also due to the fact that these firms also bring know-how and new technology, have better governance and may be more transparent to their lenders, and thus, may face less financing constraints from financial markets in the host countries. For example, Perotti and Vesnaver (2004) employing an investment model for firms in Hungary, show that foreign-owned firms face less financing constraints.

Another approach to the study of financing constraints has been recently developed by Beck, *et al*. (2006). Using the survey data for 10,000 firms in 80 countries around the world in 1999, they test the severity of self-reported financial obstacles facing firms on the basis of firm and country characteristics. The survey provided information on the firms' perception of the degree to which they were financially constrained. Thus, unlike previous studies that inferred financial constraints from company financial statements, the authors claim that firms' financing obstacles can be identified directly from the survey data. As they point out, the aim was to assess how successful are factors such as age, size, and ownership in classifying firms *a priori* into financially constrained and unconstrained firms. The literature on financing constraints employs a rich data on balance sheet and income statements of firms and over time (e.g., financial accelerator models, dynamic models based on the Euler equation, Tobin's Q) which are not available in many transition economies. They are also limited to listed companies on which data are publicly available and are characterized by less informational problems. In the SEE countries stock markets are either in their infancy or non-existent. The SEE economies are dominated by small firms which, due to transaction costs, are in general not listed, are more informationally opaque and financial statements for these firms is either difficult or impossible to get. Hence, survey data may be more appropriate for the SME sector analysis in the context of financing constraints and the large-scale surveys recently conducted by the World Bank and EBRD, offer the possibility to follow this approach for the SEE countries.

3. EMPIRICAL EVIDENCE ON FINANCING CONSTRAINTS AND CREDIT RATIONING IN SEE

3.1. The empirical framework

Following Beck, *et al*. (2006), the empirical work in the remainder of the paper utilizes a survey-based approach to identify the determinants of firms' financing constraints. The use is made of a database derived from the World Bank/EBRD's Business Environment and Enterprise Performance Survey (BEEPS) 1999, 2002 and 2005 of the sub-set of firms in the SEE region. The determinants of various dimensions of firms' perceived financing constraints are assessed. Similar to Beck, *et al*. (2006), the question is whether age, size and ownership matter in determining different aspects of financing constraints. Nevertheless, the study differs from Beck, *et al*. (2006) and other literature studying credit rationing and financing constraints in many respects and extends it in a number of ways. First, the context of investigation is specific to transition countries in SEE. Second, the study uses more recent data from the 2002 and 2005 BEEPS. Third, using both logit and ordered logit models, several dimensions of firm perceptions regarding the financing issues are considered – for example, a general financing obstacle, firms' perceived obstacles to their operation and growth related to specific factors such as high interest rates, high collateral requirements, access to different types of finance (i.e., long-term and short-term loans). Fourth, more objective data on financing constraints that are more closely related to the Fazzari, *et al*.

(1988) methodology in assessing firms' financing constraints are also used. Namely, employing a Tobit model the determinants of financing patterns, such as the share of investment that firms finance through internal funds and through bank loans, are assessed. Fifth, additional control variables are introduced such as firm performance measures (profitability and sales growth) and whether or not firms use accounting standards. Importantly, this analysis is also supplemented to include the more direct evidence of credit rationing by explicitly modeling the firm's decision to participate in the credit market and a lender's decision to reject or provide finance to the firm. This is possible because the 2002 and 2005 BEEPS provide more detailed information on financing issues.

Bratkowski, *et al.*'s approach (2000) is followed to assess the determinants of the likelihood of firms applying for a loan and being denied credit. This was possible only with the 2005 data which identified firms that had applied for a loan as well as those which had not and those that were rejected. However, unlike Bratkowski, *et al.* (2000), the Heckman regression model is utilized, which is more appropriate method for samples with possible selection bias. The model of 'discouraged' borrowers is also tested by employing a logit estimation procedure, following Jappelli's (1990) and Levenson and Willard's (2000) methodology. However, the model here differs from Jappelli's (1990) approach in the sense that it considers discouraged borrowers in the loan market for firms rather than loan market for households. Whereas the difference of this method to the Levenson and Willard (2000) approach is that they calculate the estimates for discouraged borrowers indirectly based on the parameter estimates of the regression of firms that apply for loans and are denied credit.[5] In addition, using logit and ordered logit models, the firms' self-reported difficulties in accessing short-term and long-term loans are assessed. This method of measuring credit rationing is similar to Hersch, *et al.* (1997) who assess the difficulties of firms in accessing loans in Hungary in the early transition years. However, their study had a different context concentrating on whether the firm's owner had business experience in the socialist times, if they were members of nomenclatura (members of the Communist party or state bureaucracy), if firms owned or leased the plant, etc. One of the reasons for employing several dimensions of financing constraints is that the firm's self-reported financing constraints are subjective by nature and may not represent the real importance of the constraint accurately. Hence, the analysis of subjective responses is supplemented with the more objective indicators as explained above. The use of a diverse set of models is essential because of the nature of the survey data and the need for 'methodological cross-checking' advocated by Charnes, *et al.* (1988), albeit in a different context, which is important especially for issues entailing policy implications. The analysis is comprehensive in the sense that it encompasses the literature on financing constraints, credit rationing and recently developed empirical framework based on firms' self-reported financing obstacles. Furthermore, it reconciles two important theories in the credit rationing literature: pooling equilibrium models and bank screening hypothesis.

3.2. Models and the data

The BEEPS is a joint World Bank/EBRD project designed to collect firm-level information on the impact of business environment through detailed enterprise surveys at regular intervals. The surveys in almost all transition economies were conducted in 1999, 2002 and 2005 and covered about 4,000-9,000 firms. The BEEPS includes a broad range of questions aimed at evaluating the nature of obstacles faced by firms in important areas such as infrastructure,

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[5] This is because their survey did not provide direct information on whether non-applicants expect to be denied, while the BEEPS provides direct information on the reasons why some firms did not apply for a loan, including firms' expectation of denial.

judiciary, business regulation, crime, corruption, taxation and finance. The entrepreneurs were asked to assess and rank how problematic a particular area (e.g. finance) is for the operation and growth of their firms on a 1 to 4 scale (with 1 indicating no obstacle; 2 a minor obstacle; 3 a moderate obstacle; and 4, a major obstacle). The survey also covers other dimensions of, and more objective data on, financing constraints such as the difficulty obtaining credit, proportion of investments financed by loans, etc.

The general model employed in the empirical framework utilizing different specifications and models on financing constraints can be represented as follows:

$$Y_i = \alpha + \beta X_{1i} + \gamma X_{2i} + \varepsilon_i$$

where Y_i are different financing constraints measures, X_{1i} is the vector of variables representing different firm characteristics, X_{2i} denoting country dummies, α, β, γ are parameters to be estimated and ε_i is the random error. In section 3.3.1, the more objective data on firm financing constraints are utilized by employing two models. In the first model, the dependent variable is the proportion of investments that firms finance through internal funds (Internal Funds). In the second model, the dependent variable is the proportion of investments that firms finance through bank loans (Bank Loans). This approach is closely related to the Fazzari, *et al*. (1988) method where the evidence on financing constraints is based on the premise that firms that rely more on internal funds, as opposed to external funds, to finance their investment are more financially constrained. Given that both variables are censored at both ends (0%-100%) the Tobit model is used for estimation. In section 3.3.2, the models that are more closely related to the credit rationing literature are utilized. Namely, the determinants of the likelihood of applying for a loan and being denied, the model of discouraged borrowers and the determinants of firms' difficulties in accessing short-term and long-term loans are assessed. Finally, in section 3.3.3, the determinants of financing obstacles such as general financing obstacle, high interest rates, collateral requirements, etc., as an obstacle to the firm operation and growth are considered.

Firm characteristics include the firm age; then size of the firm measured by dummy variables indicating small and medium compared to the base category of large firms. It is expected that younger and smaller firms to be more financially constrained, e.g., to finance a higher (smaller) proportion of their investment through internal funds (bank loans) compared to their older and larger counterparts. An ownership effect is tested by introducing dummies for the majority state ownership and foreign-owned companies compared to the base category of private domestic companies. Other firm characteristics include firm performance measures – that may proxy for firm creditworthiness – such as sales change as a proxy for firm prospects. In the literature on financing constraints several proxies such as Tobin's Q, sales change, and employment change are used (Fazzari *et al.*, 1988; Giannetti, 2000; Bratkowski *et al.*, 2000). Firms with better prospects, i.e., investment opportunities, may be in need of more external finance in order to exploit those opportunities; hence, may be more likely to apply for external finance. To the extent that banks are able to identify this, they may be more willing to provide credit, thus, firms may be less constrained. However, if the demand is not met, then firms are expected to be more financially constrained.

A proxy for profitability is included in the models – a dummy taking the value of one if the firm was profitable in the past and zero otherwise.[6] One may expect that firms with low

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[6] Two profitability variables are used in the estimations. Profitability1 from the survey in 2002, a dummy variable taking the value of 1 if the firm had positive gross profit to total sales ratio in 2001 and 0 otherwise.

profitability may face liquidity problems and turn to banks for funds. This may be a sign of adverse selection where poorly performing firms are more likely to enter the market, worsening the pool of applicants which, in turn, may induce banks to limit credit availability. Profitability may also decrease the likelihood of a firm participating in the credit market given the stringent requirements by banks and high costs of external finance. Thus, profitable firms do not turn to banks for funding (the hierarchy of finance hypothesis). On the other hand, to the extent that firm profitability as an indicator of creditworthiness is observable to the bank, viable firms would find it easier to access external finance. Furthermore, a dummy variable is introduced taking a value of one if the firm uses some accounting standards, national or international, for its financial statements (Accounting Standards) which may indicate better information availability to lenders. This may ease access to external finance, e.g., making firms to finance a larger proportion of their investments through bank loans. Sector and country specific characteristics are controlled by introducing sector and country dummies.[7] Finally, for each specification on which all the data are available for variables in three rounds of BEEPS, the data are pooled and models controlling for year dummies are estimated. This aims at explaining whether the financing constraints have been relaxed over time, given the dynamic changes in the banking sector in the SEE countries.

3.3. Results

3.3.1. Financing constraints on firms in the SEE

Given the large number of censored observations, the Tobit model is used to assess the determinants of the proportion of firms' investments financed through internal funds and bank loans. The higher/lower proportion of investments financed through internal funds/bank loans, the particular firm characteristic is related to higher financing constraints.[8] The Tobit estimates are presented in Table 1 (specification 1 – 8). The estimated coefficient on age is positive but insignificant in all but one specification. The exception is specification 4 with internal funds as the dependent variable, indicating that older firms finance a larger proportion of their investment through internal funds, i.e., are more constrained, which is contrary to expectations and what is generally perceived in the literature.[9] However, age is insignificant in the regressions with bank loans as the dependent variable. The change in structures in the banking sectors in the region (i.e., the entry of foreign banks and the closure of domestic banks) may also be an explanation for this outcome, in the sense that all the firms were 'new' to foreign banks and the relationships had to be established from scratch.[10] The coefficients on SMEs (especially small firms) are in most specifications highly significant and have the

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And profitability2 from the survey in 2005, a dummy variable taking the value of 1 if the firm had reinvested profits in 2004 from profits in 2003 and 0 otherwise.

[7] To present more clearly the variables of interest, sector and country specific control variables are not reported, although they are included in all regressions.

[8] It is important to note that there is no misspecification in terms of heteroscedasticity and non-normality, by comparing the results with the probit model, where the dependent variable is a dummy taking the value of one if any percentage of investment is financed by internal funds (or bank loans) and zero otherwise. This is because the probit parameter estimates are broadly similar in magnitude to Tobit parameter estimates divided by the estimated standard error of the regression – though they cannot be the same due to sampling error (see Wooldridge, 2001). The results are available upon request.

[9] The specification replacing the age variable with a dummy variable taking value of one if the firm is less than five years old and zero otherwise is estimated (but not reported). This variable is statistically insignificant.

[10] Another explanation may be that the definition of this variable is not consistent across years: in the 1999 survey firms were asked about the year when they started their business, while in 2002 and 2005, when they started business in particular country. Furthermore, the later two rounds of BEEPS exclude firms younger than four years from the sample, i.e., new entrants, which presumably face the highest constraints.

expected sign, indicating that SMEs may have more/less reliance on internal funds/bank loans to finance their investment needs, compared to larger firms. The exceptions are the coefficients on small firms in specification 3 and medium-sized firms in specification 3, 5 and 7, which are insignificant at conventional levels. The estimated coefficient on SOEs is negative and significant in all the specifications for Bank Loans, indicating that the SOEs finance a smaller proportion of their investment through banks. This provides some evidence that hardening of budget constraints, or even credit rationing, has become binding for SOEs. However, as can be observed in the specifications with Internal Funds as the dependent variable, they do not seem to rely more on internal funds. This indicates that SOEs still may enjoy subsidies from the government, but not the 'soft' lending from the banks as in the early transition years or, alternatively, these firms are not investing.

The effect of being a foreign firm is unclear. The variable is significant at five percent level in one specification only with Bank Loans and the estimated coefficient is negative, giving some evidence that foreign firms rely less on bank funds to finance their investments. Given that the evidence suggests that these firms do not rely more on internal funds to finance their investment, this may to some extent support the previous assertion that foreign firms may turn to banks in their home countries for funds (presumably with better conditions) and/or their parent companies in the form of foreign direct investments. Regarding the firm performance variables, sales change is estimated to have a positive effect, but is significant in two specifications only, providing some indication that firms with good prospects use both internal funds and bank loans more than firms with weak prospects. Profitability has a positive sign and is statistically significant at the one percent level suggesting that more profitable firms finance a greater proportion of their investment through internal funds.[11] However, this variable is not significant in the specification with Bank Funds. This may support the 'hierarchy of finance hypothesis' suggesting that because of the premium with external funds, firms finance their investments internally and do not turn to banks for finance until internally generated funds are exhausted.

Whether the firm uses accounting standards has a statistically significant impact on the proportion of investment that firms finance through internal funds at ten percent level and in 1999 sample only, providing weak evidence that these firms relied less on internal funds to finance their investment. An estimated positive and significant effect in two specifications with Bank Loans suggests that these firms relied more on banks to finance their investment. In terms of the year effect, while the dummy for 1999 is insignificant, the dummy for 2002 is negative and statistically significant at five percent level indicating that firms in 2002 relied less on internal funds compared to 2005. On the other hand, in the specification with Bank Loans, the year dummy for 1999 is negative and statistically significant at the one percent level suggesting that banks increased their role in supporting firms to finance their investment over the period. Overall, the estimates suggest that smaller firms and SOEs face the highest financing constraints. Regarding foreign-owned firms, their financing of a lower proportion of their investment through banks and internal funds may be due to their reliance on parent companies or banks in their home countries as a source of external finance. Profitable firms finance a larger proportion of their investment through internal funds, but not bank financing which seem to be in line with the financial pecking order theory. Regarding financing patterns over time, it seems that access to bank loans has improved for firms in SEE.

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[11] Given that Profitability2 represents also the proportion of profits reinvested, it is dropped in specification 3.

Table 1. Financing constraints, credit rationing and financing obstacles of firms in SEE:

	Internal Funds [Tobit model]				Bank Loans [Tobit model]				Heckman MLE model		The model of discouraged borrowers	Access to short-term and long-term loans		Financing Obstacle [Logit Model]				High Interest Rates Obstacle [Logit Model]				High collateral requirements and access to long-term loans as an obstacle to firm operation and growth	
									The likelihood of applying for a loan 1=apply, 0=otherwise (Selection Model)	The likelihood of being rejected a loan, 1=rejected, 0=otherwise (Second Stage Model)	The likelihood being rejected and discouraged from applying for a loan=1; Otherwise=0 (Logit Model)	Accessing Short-Term loans Impossible/very difficult [Logit Model]	Accessing Long-Term loans Impossible/very difficult [Logit Model]									Collateral Obstacle [Logit Model]	Access to Long-Term Loans Obstacle [Logit Model]
	1999	2002	2005	Pooled	1999	2002	2005	Pooled						1999	2002	2005	Pooled	1999	2002	2005	Pooled		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
Age	11.77 (7.95)	4.76 (6.71)	1.45 (5.31)	7.43* (4.10)	0.06 (8.81)	10.10 (7.77)	2.82 (5.40)	4.64 (4.31)	0.150 (0.120)	-0.020 (0.028)	-0.162 (0.260)	0.258 (0.268)	-0.005 (0.245)	-0.161 (0.200)	0.264 (0.251)	0.230 (0.225)	0.199 (0.137)	0.147 (0.238)	0.082 (0.235)	0.403* (0.207)	0.41*** (0.134)	-0.066 (0.229)	-0.051 (0.217)
Small	37.78*** (10.46)	21.13*** (6.94)	7.25 (5.58)	19.98*** (4.52)	-52.04*** (11.66)	-40.17*** (7.91)	-18.18*** (5.61)	-32.33*** (4.61)	-0.708*** (0.131)	0.050** (0.022)	1.733*** (0.326)	1.056*** (0.295)	1.323*** (0.270)	0.651** (0.267)	0.584** (0.272)	0.650*** (0.256)	0.620*** (0.162)	0.635** (0.312)	0.360 (0.243)	0.637*** (0.233)	0.485*** (0.152)	1.191*** (0.311)	1.115*** (0.283)
Medium	21.67** (9.67)	13.91** (7.08)	4.55 (5.56)	9.82*** (4.54)	-9.14 (9.89)	-17.17** (7.69)	-3.76 (5.48)	-8.76** (4.48)	-0.213* (0.130)	0.014 (0.018)	0.714** (0.326)	0.043 (0.315)	0.313 (0.280)	0.461* (0.248)	0.015 (0.286)	0.296 (0.253)	0.371** (0.162)	0.336 (0.294)	-0.170 (0.259)	0.262 (0.232)	0.192 (0.154)	0.515* (0.287)	0.474* (0.258)
State	6.37 (9.60)	0.52 (6.73)	-7.45 (5.68)	-1.63 (4.53)	-19.62* (10.25)	-30.63*** (8.21)	-20.31*** (6.09)	-26.91*** (4.91)	-0.570*** (0.132)	0.016 (0.030)	0.670*** (0.289)	0.208 (0.262)	0.346 (0.242)	0.427* (0.244)	-0.032 (0.249)	0.045 (0.240)	0.118 (0.151)	-0.356 (0.287)	-0.126 (0.237)	-0.801*** (0.247)	-0.438*** (0.152)	0.333 (0.277)	0.214 (0.256)
Foreign	3.21 (12.72)	-3.51 (5.97)	7.59 (4.96)	1.80 (4.31)	-16.15 (14.91)	2.13 (6.93)	-12.26** (5.11)	-6.76 (4.49)	-0.264** (0.109)	-0.031* (0.016)	-0.180 (0.268)	-0.389 (0.254)	-0.485** (0.227)	-0.573* (0.341)	-0.222 (0.235)	-0.640*** (0.249)	-0.456*** (0.167)	-0.105 (0.393)	-0.198 (0.211)	-0.423** (0.203)	-0.212 (0.145)	-0.263 (0.407)	-0.144 (0.351)
Sales change	0.04 (0.05)	0.06 (0.04)	0.06 (0.04)	0.07*** (0.02)	-0.05 (0.07)	0.04 (0.04)	0.09** (0.039)	0.02 (0.02)	0.002*** (0.000)	-0.0002* (0.0001)	-0.004** (0.002)	-0.005*** (0.001)	-0.004** (0.002)	-0.002 (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004*** (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.002 (0.002)	0.001 (0.001)
Profitability1		31.31*** (6.92)				9.25 (8.44)																	
Profitability2									0.072 (0.094)	-0.054** (0.026)	-0.673*** (0.182)	-0.686** (0.269)	-0.455* (0.248)		-0.262 (0.253)	-0.540*** (0.163)			0.189 (0.241)	-0.509*** (0.153)			
Account Standards	-13.64* (7.62)	-0.94 (4.36)	-3.72 (3.08)	-0.25 (2.92)	2.32 (9.11)	8.53 (5.17)	7.90*** (3.04)	5.35* (3.04)	0.276*** (0.068)	-0.006 (0.011)	-0.452*** (0.147)	-0.008 (0.170)	0.074 (0.155)	-0.111 (0.191)	-0.007 (0.164)	0.144 (0.128)	-0.113 (0.103)	0.094 (0.228)	-0.167 (0.218)	0.106 (0.119)	-0.020 (0.098)	0.443* (0.228)	0.393* (0.211)
Financing Obstacle									0.148*** (0.030)	0.147* (0.075)													
Year 1999								-13.77*** (4.37)									1.708*** (0.141)				2.132*** (0.139)		
Year 2002				-9.49*** (3.72)				-5.00 (3.91)									0.505*** (0.137)				0.373*** (0.125)		
Constant	6.41 (32.62)	-37.25** (17.09)	58.46*** (13.32)	13.01 (11.52)	2.64 (35.47)	-6.65 (20.37)	-23.43 (14.50)	-11.43 (12.72)	-0.250 (0.323)		-1.103 (0.668)	-2.216*** (0.671)	-1.706*** (0.617)				-2.127*** (0.404)				-2.446*** (0.398)	-2.713** (1.175)	-1.177 (0.975)
Obs	674	1030	1845	2769	674	1030	1756	2769	1684		1265	963	947	696	988	1713	2722	687	1021	1728	2729	601	619
Left Censored obs	117	170	226	434	515	762	1135	1938															
Uncensored obs	306	536	1009	1436	143	249	596	778															
Right censored obs	251	324	610	899	16	19	25	53															
Log Likelihood	-2069.87	-3381.39	-6311.35	-9235.35	-1014.52	-1683.85	-3798.00	-5181.86	-930.84		-682.07	-493.81	-565.37	-457.17	-521.55	-835.77	-1454.78	-305.79	-595.17	-969.11	-1581.58	-357.27	-391.82
LR chi2	52.18***	201.44***	117.27***	182.99***	71.50***	143.52***	151.58***	279.94***			220.62***	147.47***	115.81***	50.52***	72.43***	116.11***	340.59***	130.61***	53.52***	147.93***	450.32***	65.71***	49.83***
Wald chi2									244.00***														
Mills lambda									-0.031***														
PseudoR²	0.02	0.03	0.02	0.02	0.04	0.05	0.02	0.03			0.139	0.13	0.10	0.05	0.07	0.065	0.1048	0.176	0.07	0.071	0.1246	0.09	0.07

Notes: ***, **, * denote significance at 1%, 5% and 10%, respectively; standard errors in parentheses.

3.3.2. Testing for credit rationing

The specifications 9 – 13 (Table 1) assess more directly whether firms in the SEE region experience credit rationing. First, the Heckman model is utilized to assess the determinants of the likelihood of applying for a loan and being refused (specification 9 and 10). Second, as discussed previously, it is inappropriate to consider that firms which do not apply for loans have no demand for credit. A model of credit rationed firms is employed by constructing a dummy variable taking a value of one if the firm was refused a loan and is classified as a 'discouraged' firm, and zero otherwise (specification 11). Third, the determinants of the likelihood of the firm reporting difficulties in accessing short-term and long-term loans on a scale ranging from 1 to 5 (with 1 being very easy and 5 impossible) using both the logit and ordered logit models are assessed (specification 12 and 13).

Determinants of the likelihood of applying for a loan and being refused

This model extends the methodology employed by Bratkowski, *et al*. (2000) who used a logit model to estimate two separate equations. In the first equation, they examined the determinants of the likelihood for applying for a loan and, in the second, the determinants of the likelihood being denied. It should be noted, however, that the second equation (a bank decision to deny a loan) is estimated on a sample of firms which are not randomly selected, i.e., the sample of applicants from the first equation, and for those that do not apply, the rejection rate is not observed. Those who apply may systematically differ from those who do not apply, and the latter group may be influenced by and reflect a response to credit denials. In other words, because applying may be systematically correlated with unobservables that affect the likelihood of being denied, using only those who apply may produce biased estimates in the equation of the likelihood of being denied. For example, non-applicants may anticipate the bank screening procedures and the acceptance criteria, thus, leading firms to self-select in applying based on their perception of success and conditions of a loan offer. Hence, it is likely that the sample is subject to selection bias. In an attempt to address this issue the Heckman model using partial maximum likelihood estimation is utilized.

The first-stage equation has the Financing Obstacle variable as the part of selection since it may have an impact on the firm's decision to participate in the credit market, given that finance is reported to be an obstacle for the firm's operation and growth.[12] Conversely, it is not expected that this variable has an impact on the bank decision to lend.[13] The coefficients in the first step equation show which factors influence the firm's decision to apply for a loan; while those in the second step show which factors influence the bank's decision to deny a loan, given that the firm has applied for a loan. The same explanatory variables are employed as in the previous models which may have influence on both the likelihood for applying for a loan and being denied. For example, younger firms may be in need of more external finance and more likely to be denied, given their higher risk. They may be excluded *ex ante* from the

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[12] Beck, *et al*. (2002) note that firms that report higher financing obstacles are expected to have a higher financing need and go to the market for external finance.

[13] To correct for the sample selection bias, there needs to be a variable that affects the selection equation without affecting the second. In the Heckman estimation, in the selection equation, inverse Mill's ratio (λ) is estimated for each observation. In all the cases with this type of data, the two-stage estimation procedure is necessary to calculate the Mill's λ in order to infer whether the sample is subject to selection bias (see Heckman, 1979; Wooldridge, 2001 for the methodology). At the outset it is worth emphasizing that the Mill's λ is statistically significant, which suggests that the sample is subject to selection bias. Therefore, the Heckman method is appropriate technique for estimating the second-stage equation of the likelihood of the bank decision to deny a loan.

credit market, e.g., many banks in SEE did not lend to firms with less than one year business experience. Small firms due to transaction costs in applying for a loan may be less likely to apply; at the same time, since the transaction costs of the screening process by banks may be higher for small firms, they may be more likely to be denied a loan. The regression results are presented in Table 1.

The selection variable (Financing Obstacle) is positive and highly significant, indicating that firms reporting higher financing obstacles to their operation and growth are more likely to turn to banks for loans. The estimates for the first equation show that small and medium-sized firms are significantly less likely to apply for bank loans compared to their larger counterparts. This could be interpreted as firms self-selecting in the market, e.g., those with little collateral available, high transaction costs of the application process, are less likely to enter the market. Regarding the ownership, both SOEs and foreign firms seem less likely to apply for bank loans compared to private domestic firms. An explanation may be that SOEs do not apply because of the prospects of being denied; while foreign-owned firms do not apply due to the possibilities of receiving funds from their home countries. Sales change is positive and statistically significant at the one percent level suggesting that firms with good prospects, i.e., those in need for more investment, seem to be more likely to apply for bank loans. This may indicate that adverse selection may not be a problem since firms with poor prospects are less likely to participate in the credit market and worsen the pool of applicants. This may be an additional evidence of self-selection in the credit market in SEE. However, the profitability proxy is positive but insignificant. The results also suggest that belonging to the group of firms that use some accounting standards increases the likelihood of applying for a loan.

In the equation estimating the likelihood of being denied credit, age is not significant. The dummy variable for small firms is statistically significant at the five percent level, but that of medium-sized firms is insignificant. The results indicate that it is small firms that face the highest likelihood of being denied credit in the SEE. The estimated coefficient on SOEs is positive but insignificant; while the dummy variable for foreign firms is negative and statistically significant (at ten percent level) indicating that foreign firms are less likely to be denied credit. The coefficients on sales change and profitability have an estimated negative effect and are statistically significant. Consistent with the bank screening hypothesis, this may be interpreted as banks seem to be able to distinguish 'good' from 'bad' firms and firms with good prospects are less likely to be denied credit. It seems that banks do screen their applicants' creditworthiness and viable firms are more likely to receive loans. These results are similar to Bratkowski, *et al*. (2000) who found that banks were able to distinguish successful firms suggesting that credit rationing was not pervasive in the CEE in early years of transition. However, this should be interpreted with a caveat since, *inter alia*, keeping profit, sales change and the use of some accounting standards constant, small firms are still less likely to participate in the credit market and more likely to be denied a loan. This may indicate that some credit rationing is present in the market from both the demand side (which seems more prevalent) and supply side, and that small firms face the highest constraints. Calculations from the BEEPS data reveal that 93.5% of firms that applied obtained the loans they sought. As a result, credit rationing seems to work more through self-selection of firms on the demand side.

Cressy (1996) in a study of the role of finance in business start-up survival in the U.K. point out that if firm does self-select (rather being selected by banks) then there is no credit rationing since the bank simply allows firms to decide whether they wish to accept its offers.

However, there are differences in the lending terms that banks offer. For example, in the more developed financial systems these terms are more favourable and firms may self-select and apply for a loan even with a lower net present value of their projects compared to their counterparts in less developed financial systems. In the transition context, Pissarides (1998) notes that mainly firms that are able to identify market niches of higher returns can afford expensive loans and the rest will rely on retained earnings for investment, or die. Hence, given the relatively more stringent conditions of borrowing in the SEE (e.g., high interest rates and high collateral requirements) then the credit rationing seems to be more prevailing on the demand-side, i.e., firms simply do not apply for loans. And it seems that small firms are the most constrained group of borrowers, despite controlling for a broad range of possibly observable distinct features such as age, ownership, performance, sector and country specific effects.

A model of discouraged borrowers

As already pointed out, the BEEPS 2005 provides information on firms that applied for credit and those that did not. Among the group of non-applicants, the survey provides information on the reasons why firms did not apply for a loan. The BEEPS data show that from the sample of applicants, 6.5 percent were denied credit while the remaining 93.5 percent received the loans they sought. For example, in a sample of small firms only, the corresponding figure for the U.S. economy in 1988 was 2.14 percent (Levenson and Willard, 2000) and for Italy it was 2.7 percent during the economic boom in 1988 and 12.8 percent during the recession in 1993 (Guiso, 1998). In a more conservative approach, using only a sample of start-up firms in the U.K., Cressy (1996) found that only six percent of business start-ups were denied a loan. However, in a developing country perspective, Bigsten, *et al.* (2000) find that more than half of the firms in the sample of six African countries had no demand for credit. Of those with a demand, only a quarter obtained a loan and small firms were constrained more.

In the SEE the rejection rate is higher for small firms – roughly, one in ten small firms are denied credit, while the ratio for medium and large firms is one in twenty. However, if the fact that some firms may not be creditworthy is taken into account, then the credit rationed firms must account for a smaller proportion. Two performance measures of firms that are denied credit were calculated, the proportion of firms that were profitable and with growing sales. Around 67 percent of rejected firms were profitable and 43 percent had a positive sales growth. Therefore, some creditworthy firms appear to be denied credit indicating that some credit rationing is likely to be present in the market. However, looking at the sample of applicants is only part of the story, since from the total number of firms in the SEE sample only 51.6 percent of firms applied for bank loans. The BEEPS data suggest that a smaller proportion of small and SOEs seek loans from banks. This may indicate that the factors on the demand side play a role. The BEEPS 2005 data set provides direct evidence regarding the reasons for the borrower non-application. Almost 60 percent of non-applicant firms did not apply because they had no need for loans, the rest either considered interest rates too high (11.3 percent), collateral requirements too high (2.8 percent), the procedures of application complicated (6.3 percent), informal payments required (0.2 percent), did not think the loan will be approved (1.9 percent), several from above (17.1 percent) and other (2.2 percent). Apart from the firms that did not need loans and considered interest rates to be high, the rest (30.6 percent of non-applicants) may be considered as 'discouraged' borrowers, which jointly with the group of rejected applicants compose the sample of credit rationed firms as defined by Jappelli (1990). In the total sample of firms in the SEE, rejected and discouraged firms constitute an upper bound of credit rationing at around 17 percent which is almost three times

more to the one calculated by Levenson and Willard (2000) for the U.S. economy.[14] Unfortunately, due to data unavailability, it was not possible to assess how much these firms participate in the total employment and sales volume in the sample. Table 1 (specification 11) presents the logit estimates of the likelihood of a firm being credit rationed.

As in most previous models, age is insignificant. The results show that SMEs are significantly more likely to be credit rationed than their larger counterparts. In this specification the coefficient on foreign firms is negative but not significant, while that for SOEs is positive and statistically significant at one percent level, indicating that SOEs are more likely to be credit rationed. Firms' good prospects, as proxied by the change in the firm's sales, have a negative and statistically significant effect on the likelihood of credit rationing. The effect of profitability is also statistically significant at one percent level, indicating that more profitable firms are less likely to be credit rationed. Using accounting standards enters with a negative sign and is statistically significant at one percent level suggesting that if firms are able to provide proper information to their lenders, this reduces their likelihood of being credit rationed. In all, the results broadly suggest that being large, performing well and using some accounting standards reduce the likelihood of being credit rationed.

Difficulties of accessing short-term and long-term loans

As in many survey questions where the opinions of respondents take the form of scales covering a range of alternatives, e.g., from 'easy' to 'difficult', these questions are examples of responses with ordered categories. Some studies, e.g., Hersch, *et al.* (1997) and Batra, *et al.* (2002) transform the ordered dependent variable, 'how difficult is it to get a long-term loan from a bank' ranking from 1, very easy, to 4, very difficult, into a dichotomous dummy variable (by amalgamating the top two rankings into 1 and bottom two rankings into 0) and employ the logit model. Using BEEPS data from 2002, in this section the group of firms facing the highest difficulties in accessing loans is modeled using logit estimation. A dummy dependent variable is utilized taking value of one if the firm reports that it is impossible or very difficult to access short-term and long-term loans, and zero otherwise (Table 1, specification 12 and 13).[15] As in most of previous specifications, age is insignificant. The reporting of greater difficulties in accessing either short- or long-term loans is statistically significant at one percent level for the group of small firms. However, the coefficient on medium-sized firms is insignificant. State-owned firms do not report significantly higher difficulties in accessing either long- or short-term loans, although the estimated coefficients have a positive sign. Being a foreign-owned firm decreases the likelihood of reporting difficulties in accessing long-term loans compared to private domestic firms and the estimated effect of sales change and profitability are negative and statistically significant in both specifications. This indicates that firms with good prospects are less likely to be credit rationed. The results also suggest that firms using some accounting standards have no

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[14] It should be noted that the approach taken here may result in underestimation in the sense that Levenson and Willard (2000) come up with this figure for the sample of small businesses only. However, it may also represent an overestimation since unlike Jappelli (1990) and Levenson and Willard (2000) that take into account only firms that expect to be turned down, here are taken into account all the reasons for non-application – apart from firms with no need for loans or consider interest rates to be high. The group of firms that consider interest rates to be high are excluded to approximate more closely the definition of credit rationing, i.e., the demand for loans will exceed the supply *at prevailing interest rates*. However, the results are basically the same if this group is included in the regression analysis.

[15] To pick all the variation in the data, an ordered logit model is also estimated for a dependent variable ranging from 1, very easy, to 5, impossible, indicating the difficulty of firms in accessing loans. The results for an ordered logit model are largely consistent with logit estimates and available upon request.

statistically significant effect on difficulties in accessing short- and long-term loans for the sample of firms in 2002. However, as shown previously, in later years (with 2005 data) these firms financed a greater proportion of their investment through bank funds and were less likely to be credit rationed, suggesting the financing environment for firms with better information availability has improved.

3.3.3. Finance as an obstacle to firm operation and growth

In this section the dependent variables indicate the firm's perceived severity of several financing obstacles for the operation and growth of their business on a 1 to 4 scale: general financing obstacle (Financing Obstacle), high interest rates (High Interest Rates Obstacle), high collateral requirements (Collateral Obstacle) and access to long-term loans (Long-term Loan Obstacle). To better discriminate firms that report various dimensions of finance as a major obstacle, a logit model is employed for the dependent variable taking one if firm reports finance as a major obstacle and zero otherwise.[16]

General financing obstacle

In this section the determinants of the general financing obstacle are assessed, using the three rounds of BEEPS and a pooled regression. Results are presented in Table 1 (specifications 14 – 17). The estimates indicate that age generally does not have explanatory power for firms reporting finance as a higher obstacle. The estimated coefficient on small firms is positive and highly significant in all specifications indicating that small firms face greater financing obstacles compared to larger firms. The estimated effect of being a medium-sized firm is positive and significant in 1999 and in the model with pooled data. This provides some evidence that the medium-sized firms too face greater financing obstacles than their larger counterparts. Regarding the firm ownership, the dummy variable for SOEs is not significant in any specification (except in specification 14 at ten percent level). This does not support the assertion that SOEs may have had access to 'soft' lending, hence may report lower financing obstacles. The dummy variable for foreign-owned firms is negative and statistically significant in all specifications except specification 15. This may support the previous claim that foreign firms may have lower financing constraints because they have better governance and banks are more willing to lend to this group, they may have access to finance from banks in their parent countries, or foreign direct investments from their parent companies.

Regarding other explanatory variables, sales change is estimated to have a negative and statistically significant effect in nearly all specifications. This supports the previous finding that firms with good prospects may face lower financing obstacles. Profitability has an estimated negative sign and is statistically significant at the one percent level in 2005, but in 2002 is insignificant. It is important to note here that profitable firms may report lower financing obstacles either because this implies creditworthiness which may be identified by the lenders and have lower difficulties in accessing external finance, or they may report lower obstacles because their profits suffice for the needed investments to be undertaken. As shown previously, profitable firms do not finance a higher proportion of investment through bank loans and are not more likely to apply for bank loans. However, the evidence suggests that if they turn to banks for finance, they are less likely to be denied. The variable indicating if the firm uses some accounting standards is not significant in any of the specifications. In terms of the year effect, in the regression with pooled data, the coefficients for 1999 and 2002 are

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[16] As previously, the ordered logit models are also employed so that all the variation in the data is picked up. The estimates are broadly consistent with the logit estimates and the results are available upon request.

statistically significant and positive. This suggests that the financing obstacles seem to have decreased over time for the firms in SEE (more so in the 1999-2002 period than in the 2002-2005 period), which is in line with the deepening of the financial markets in these countries.

High interest rates as an obstacle

Firms may have access to external finance, but this does not imply that they are not paying a risk premium associated with asymmetrical information and other credit market frictions. Using a similar approach, in this section the focus is on another dimension of the financing obstacle, namely the degree to which firms perceive the high interest rates as an obstacle to growth and operation of their businesses. Results are presented in Table 1 (specifications 18 – 21). As can be seen, age has an estimated positive sign and is statistically significant in two specifications.[17] The coefficient on small firms is statistically significant and positive in all the specifications, except in specification 19, and the coefficient on medium-sized firms is not significant. This indicates that, apart from the general financing obstacle, belonging to the group of small firms increases the likelihood of reporting higher obstacles for operation and growth due to high interest rates. Being state-owned firm has an estimated negative and statistically significant effect on perceiving high interest rates as an obstacle, except in two specifications. An explanation may be that either SOEs receive cheaper credit, or if they are credit rationed do not perceive high interest rates as an obstacle. As shown in the previous sections, the evidence suggests that SOEs are more likely to be credit rationed. The dummy variable for foreign firms is negative and statistically significant in the 2005 sample, giving some evidence that foreign firms may have access to cheaper loans than their domestic counterparts. The other explanatory variables, sales change and accounting standards are not significant. As in the previous model, the estimated coefficient on profitability is negative and statistically significant at the one percent level in 2005, but it is insignificant in 2002. In the pooled sample, the year dummies are positive and statistically significant, suggesting that in the earlier years firms perceived high interest rates as a greater obstacle for their operation and growth compared to 2005, broadly in line with the downward trend in lending rates in the SEE.

Collateral requirements and access to long-term loans as an obstacle

In this section the determinants of firms' self-reported obstacles for their operation and growth due to high collateral requirements and access to long-term loans are explored and the data is available for 1999 sample only. The estimates do not indicate a significant effect of age on firms perceiving collateral requirements and access to long-term loans as an impediment to their operation and growth (Table 1, specification 22 and 23). Small and medium-sized firms report significantly higher obstacles compared to the base group of large firms. Neither SOEs or foreign-owned firms are significantly different from private domestic firms in reporting these obstacles, although in all the specifications the state dummy is positive and foreign dummy is negative. The coefficient on sales growth is insignificant in all specifications. The estimated coefficient on accounting standards is positive and significant at the ten percent level only, suggesting that firms that use an accounting standard are more likely to perceive access to short- and long-term loans as a major obstacle compared to firms that do not use any standards, i.e., consider themselves as better quality borrowers.

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[17] As previously, the specification replacing age with dummy variable taking value of one if the firm is less than five years old and zero otherwise is estimated. The newly defined age variable is not significant in either specification.

To summarize, in terms of firms' self-reported financing obstacles, size appears to matter as a determinant of various dimensions of finance as an obstacle to firms' operation and growth. Small firms are more likely to face higher financing obstacles than large firms, while the evidence for medium-sized firms is weaker. The ownership effect also is an important determinant in various dimensions of financing obstacles. The regression results provide some evidence that foreign-owned firms are likely to face lower obstacles compared to their domestic counterparts. Evidence is not found that state-owned firms are likely to face lower financing obstacles compared to private companies, indicating that a hardening of budget constraints may have been put in place in the SEE. In general, firms with better prospects and good performance seem to face less financing obstacles. The firm's age and whether the company uses accounting standards do not seem to have an impact on firms reporting lower financing obstacles, being insignificant in most of the regressions.

3.3.4. Quantifying the effects: some examples

To quantify some of the findings, predicted probabilities are calculated for two of the models employed in this paper. First, to see the effect of size, ownership and time on the likelihood of the firm reporting finance as a major obstacle, the predicted probabilities are calculated from the model with pooled data (Table 1, specification 17). Similarly, the predicted probabilities of some important cases on the likelihood of being credit rationed from the model of discouraged borrowers are calculated (Table 1, specification 11). The results are presented in Table 2 for the two cases. As can be observed, over time, in all firm categories (by size and ownership) there is a substantial decrease in the probability of reporting finance as a major obstacle and that the decrease is more pronounced in the 1999-2002 period. For example, the estimated probability of a small firm reporting finance as a major obstacle in 1999 was 58.5 percent; while in 2005 the probability had fallen to 20.3 percent, keeping continuous variables such as age and sales change at their sample means. Another interesting feature is that small firms consistently have a higher probability of reporting finance as a major obstacle compared to the group of medium-sized firms (the probability is higher by 6.2 percent in 1999 and 3.7 percent in 2005) and large firms (the probability is higher by 15.4 percent in 1999 and 8.2 percent in 2005).

Table 2. Credit rationing of firms in SEE: quantifying the effects

	Predicted probabilities of reporting finance as a major obstacle			Predicted probabilities of credit rationing: the model of 'discouraged' borrowers			
	1999	2002	2005	Profitability=1; Accounting Standards=1	Profitability=0; Accounting Standards=1	Profitability=1; Accounting Standards=0	Profitability=0; Accounting Standards=0
Small	0.585	0.297	0.203	0.329	0.490	0.435	0.602
Medium	0.523	0.248	0.166	0.150	0.257	0.217	0.352
Large	0.431	0.185	0.121	0.080	0.145	0.120	0.210
State	0.460	0.204	0.134	0.145	0.249	0.210	0.343
Private Domestic	0.431	0.185	0.121	0.080	0.145	0.120	0.210
Foreign	0.324	0.126	0.080	0.067	0.124	0.102	0.182

Note: Continuous variables, age and sales change, are at their sample means; other dummies are zero; Profitability=1 is for profitable firms and 0 otherwise; Accounting Standards=1 is for firms that use national or international accounting standards and 0 otherwise;

Also the medium-sized firms have a higher probability of reporting finance as a major obstacle compared to large firms and the gap between medium-sized firms when compared to large firms is larger than when compared to small firms. The gap between the small and larger firms is decreasing over time suggesting that the financing constraints for small firms are reducing in the SEE. In the period 2002-2005 the probability of small firms reporting major financing obstacles decreased by almost ten percentage points, for medium-sized firms eight percentage points and large firms six percentage points. It seems that a shift towards lending to the small business sector has taken place. However, given the magnitude of the probabilities, finance remains problematic for growth and operation of a substantial proportion of firms in SEE, particularly small ones. In terms of the ownership effect and in line with predictions put forth in this paper, foreign-owned firms have consistently lower probability of reporting finance as a major obstacle compared to their domestic counterparts; while SOEs have the highest.

Table 2 presents the predicted probabilities of firms being credit rationed by size and ownership, by taking two additional features, i.e., if the firm is profitable and if the firm uses some accounting standards. As can be observed, profitability and the use of some accounting standards decrease noticeably the probability of credit rationing among all firm categories suggesting that banks screen their borrowers and increasingly are able to distinguish 'good' from 'bad' firms. However, as in the previous example, the probability of credit rationing is monotonically decreasing in the size of the firm where large firms consistently have a lower probability of being credit rationed compared to their smaller counterparts. For example, a small firm that is profitable and uses some accounting standards faces a similar probability of being credit rationed as a medium-sized firm which is not profitable and does not use any accounting standard (32.9 percent *vs.* 35.2 percent, respectively). This indicates that a substantial proportion of small firms with 'good' characteristics do not participate in the credit market either because they are rejected, or do not apply given onerous loan application requirements such as high collateral requirements or procedures of application set by banks. In terms of ownership, foreign-owned firms have the lowest probability of being credit rationed compared to their domestic counterparts, while SOEs have the highest.

4. CONCLUSIONS AND POLICY IMPLICATIONS

Credit markets may be characterized by credit rationing because of information asymmetries, transaction costs and other market imperfections. Given imperfect enforcement of collateral laws and other transaction costs, agency problems, and insufficient wealth endowments, collateral may not serve as a full security for the lenders. Therefore, banks adapt screening technologies to separate borrowers according to risk classes. However, in the presence of information asymmetries, costly screening and monitoring process, perfect sorting by the banks may prove to be difficult or impossible. This may necessitate banks sorting borrowers into risk classes through observable firm characteristics. However, given the heterogeneity of borrowers, credit rationing may still exist within each class. To assess the financing constraints and credit rationing of firms in the SEE region, data from the three rounds of BEEPS have been utilized. A broad spectrum of variables indicating financing constraints is employed by using five types of econometric techniques which are appropriate for particular financing constraint variables (Tobit, probit, logit, ordered logit and the Heckman model), thus pursuing a cross-checking which is important in cases involving policy discussions.

The empirical results suggest that the cohort of small firms is disproportionately constrained. Compared to the group of larger firms, small firms rely more on internal funds and less on bank loans to finance investment; are less likely to apply for a loan, are more likely to be refused a loan and are more likely to fall within the group of discouraged borrowers and face greater difficulties in accessing both short- and long-term loans. Furthermore, finance, high interest rates and high collateral requirements pose a greater obstacle to the operation and growth of small firms than larger firms. The impact is also economically significant since, for example, one in three small firms with good characteristics is discouraged from participating in the credit market. In terms of ownership, the evidence indicates that foreign-owned firms face lower financing constraints compared to their domestic counterparts. This may be explained by their ability to access financial sources from their parent companies, banks in their home countries and banking sector in which they operate. However, the estimates suggest that they do not rely much on the domestic banks – presumably because of better financing conditions in their home countries. On the other hand, state-owned firms seem to face credit constraints from the financial sector in the countries under investigation. This suggests that the hardening of budget constraints in the SEE region, at least in the bank-firm relationship.

In line with the 'bank screening hypothesis', it was found that more profitable firms, those with better prospects and firms that implement some accounting standards face fewer constraints, implying that banks perform their role in screening their applicants to reduce information asymmetries and to some extent are able to distinguish 'good' from 'bad' borrowers. However, the bank screening hypothesis is not the only explanation. To the extent that screening is limited to observable characteristics of firms that make up risk classes, then within each class the unobserved heterogeneity remains and credit rationing is still possible, consistent with the 'pooling equilibrium hypothesis'. In line with this, the evidence provided in this paper suggests that credit rationing is indeed an important phenomenon in the SEE countries for firms in all risk classes, including firms with 'good' characteristics. The evidence also points to the direction that self-selection in the credit market seems to play a role since firms with poor prospects do not enter the market (i.e., there is no adverse selection). However, credit rationing is more important on the demand side by discouraging borrowers from applying for a loan in the first place. This is due to the high collateral requirements set by banks, complicated application procedures, etc. In SEE region, the picture has changed gradually with the findings suggesting that there has been a substantial decrease in financing constraints in all firm categories. Importantly, the decrease of financing constraints is greater for small firms than for larger ones, implying a shift in the lending technology of banks towards small business sector. This may be a natural evolution, given the dominance of this sector in the countries under investigation. Notwithstanding this positive development, imperfections in the credit market seem to be substantial, especially for small firms, hampering their growth and overall economic performance.

Governments in both developing and developed countries introduce various explicit measures to alleviate the credit rationing problem. One of the most widespread government interventions in the credit markets has taken the form of loan guarantee schemes which are designed to support small firms as they constitute the most financially constrained group, as argued in the paper. However, several caveats need to be borne in mind when policymakers decide to introduce loan guarantee schemes or other forms of subsidy. Since the government bears the downside risk of a default, it may increase imprudent behaviour by borrowers (moral hazard), given the 'fresh memories' of soft lending from socialist times. More importantly, the banks' incentive to screen and monitor may decrease, thus, increasing the

overall default probability. Consequently, because banks are in the business of screening and information processing, government interference of this form may be counterproductive and the market would be characterized by duplication of effort, under-screening by the banks and inappropriate screening by loan guarantee schemes. To the extent loan guarantee schemes perform their intended role in correcting market failures, as is the case with any other institutions, then their establishment may be justified. However, as Vogel and Adams (1997, p. 35) put it "if the problem is that public transport is poor and small-scale borrowers do not own vehicles, a loan guarantee program is a roundabout and inefficient intervention, and it would clearly be more appropriate to deal directly with public transportation problems." Hence, given that the lack of collateral is one of the most important arguments for the existence of loan guarantee schemes, then the existing institutions such as protection of property rights and well functioning courts are indirect measures that increase the collateral availability.

The important channel through which the collateral availability increases is ensuring the property rights infrastructure. As DeSoto (2000) argues, weak property rights make substantial sums of ownership rights in developing and transition countries remain as 'dead' capital. The availability of collateral can be increased by facilitating property registration, such as pledge registers for movable collaterals and land registers for immovable collateral, land and other property titles that need to be integrated in a unified system of registration where the rights can be easily verified at low cost. In addition, political support for bringing properties without authorisation into formal ownership and simplifying the complicated, time consuming and costly processes of registering a property would facilitate further the collateral availability. While it is in the banks' business to screen and identify creditworthy projects, the state should enforce property rights, ensure a well functioning court system, systems of notice, etc., which contribute to financial development, new firm entry and growth. Therefore, ensuring appropriate functioning of existing institutions that facilitate financial development should be set as the top priority, rather than creation of new institutions, such as loan guarantee schemes.[18]

Regarding the information asymmetry problem, several implications for institutional bodies emerge. In order to improve information availability, the regulations on financial reporting and disclosure based on appropriate accounting and auditing standards need to be enforced and, accordingly, the accounting profession needs to be upgraded. Screening and monitoring by banks will be easier when firms become more transparent and the accounting information becomes more reliable, thus, enabling banks to adopt lending technologies based on 'hard' information. To the extent that weak transparency is an intrinsic feature of small firms, then establishing or enhancing information availability through credit registers and other systems of notice will improve general information availability and will decrease the costs of screening loan applications directly. This in turn will enhance the bank capacity for risk assessment, e.g., through the introduction of credit-scoring techniques within banks. However, given that the lending based on credit-scoring is applicable to existing borrowers only, it seems that increasing collateral availability and decreasing other transaction costs of the application process should be the priority for policymakers. This is because the evidence

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[18] It is costly to run loan guarantee schemes and given the limited budgets in the SEE countries, net benefits from these schemes may be low. For example, Parker (2002) provides evidence on the marginal net gains in terms of additional employment and costs to the government of a loan guarantee schemes in the U.K. Furthermore, the evidence does not validate other forms of directed credit programs to SMEs, such as interest subsidies (Levine, 2005).

provided in paper suggests that credit rationing is prevalent on the demand side with would-be borrowers not applying for loans in the first place.

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THE IMPACT OF THE GLOBAL FINANCIAL CRISIS ON EASTERN EUROPE

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1. INTRODUCTION

The global financial crisis is seriously affecting post-communist countries in eastern Europe (EE), though with more than a year delay. Many of the new EU member states and transition countries in southeast Europe and the Commonwealth of Independent States (CIS) risk the worst economic crisis since the early 1990s, when the transition to a market economy brought an unprecedented recession caused by economic and monetary disintegration, systemic vacuum and inappropriate policies (in particular over-shooting of macroeconomic stabilization). The EE countries appear to be among the most vulnerable groups, for a series of specific reasons.[1] The paper discusses four main factors – external imbalances, features of the banking system, trade integration, and specific constraints on economic policies – which render the EE countries particularly vulnerable to the current financial and economic crisis. Some general conclusions are drawn at the end.

2. EXTERNAL IMBALANCES

Most EE countries are heavily dependent on foreign resources for financing external imbalances. Except for Russia and a few other CIS countries, where exports of energy and natural resources have secured comfortable surpluses, all the other EE countries have had high, often increasing, current account deficits, frequently well above 10% of their respective GDPs (see Graph 1). In fact, in 2008, this was the case of 16 out of the 28 EE countries, where particularly high deficits were recorded by Estonia, Latvia, Lithuania, Bulgaria, Romania, Hungary, Ukraine, Serbia and Montenegro (see IMF, 2008 and EIU, 2008).

During the past decade, these high current account deficits have been covered by massive inflows of private capital, primarily foreign direct investment (FDI) thanks to unique privatization opportunities, but also portfolio investment and borrowing on international financial markets. A number of EE countries have accumulated very large external debts, rendering debt service excessively dependent on continuous inflows of foreign capital.

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[1] These arguments were first stressed at a conference at the University of Perugia in November 2008, but were elaborated further in a Policy Note prepared in early 2009 for the United Nations Committee for Development Policy (Uvalic, 2009).
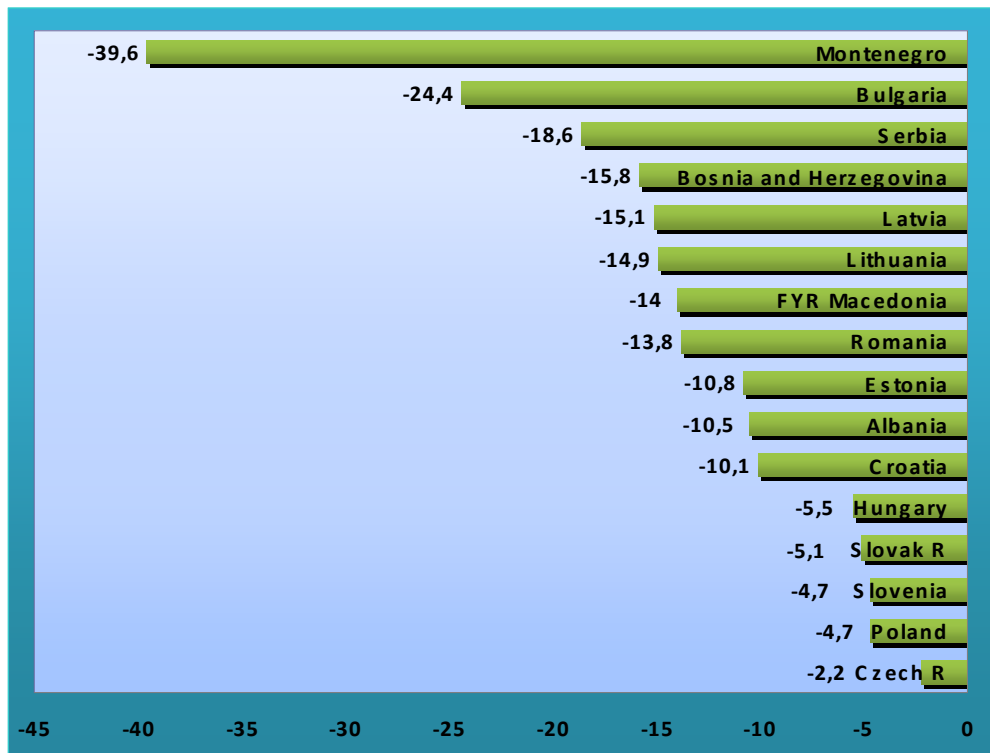
Graph 1. Current account deficits in Central and Southeastern Europe, October 2008
Source: IMF (2008)

The gross external debt of a number of countries is extremely high. Particularly Bulgaria, Croatia, Estonia, Hungary, Latvia and Slovenia have external debt levels that have already reached 80-130% of their respective GDPs (see Graph 2, IMF, 2008). Morgan Stanley estimates that EE has borrowed $1.7 trillion abroad, mainly on short term maturities, and must repay, or roll over, $400 billion this year, equal to a third of the region's GDP (see Evans-Pritchard, 2009). Though this is low with respect to the scale of USA and west European states, with the worsening of the financial crisis there have been increasing fears that one or more EE countries could default on its debt.
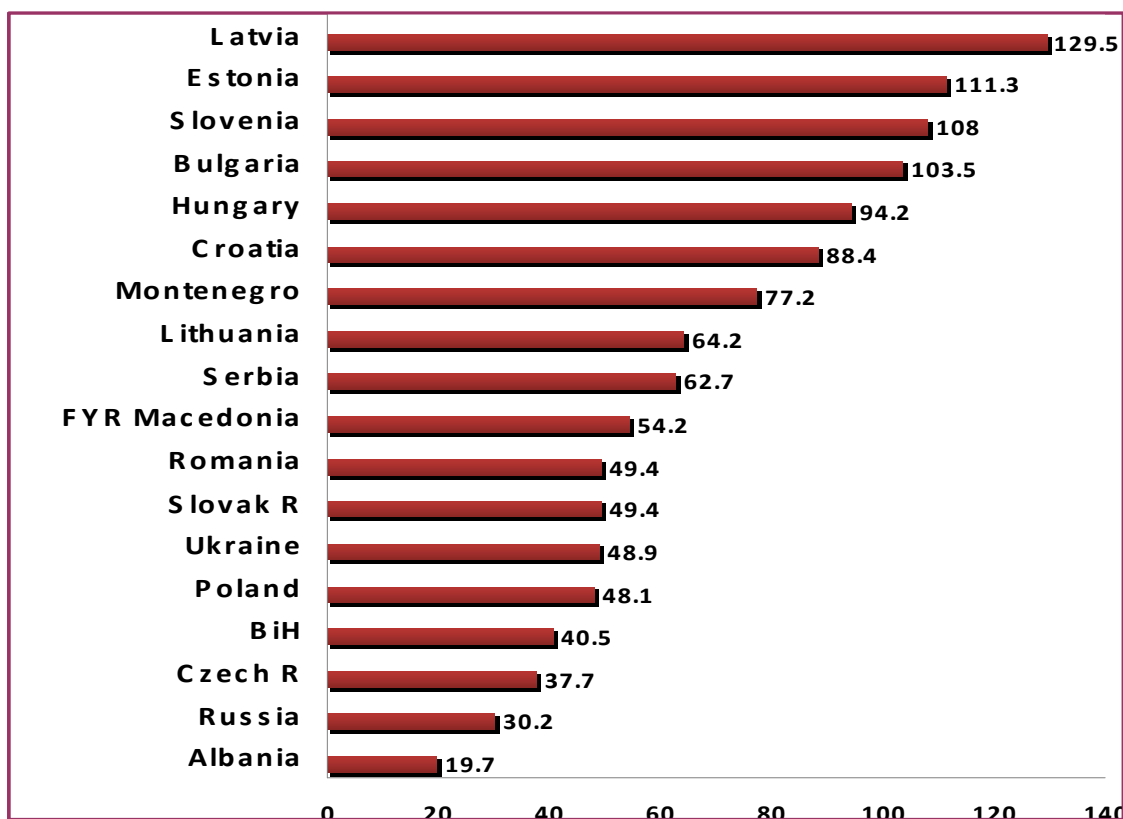
Graph 2. Gross external debt of EE countries (in % of GDP), 2008
Source: IMF (2008).

Because of their large external financial needs, the EE countries are among the most exposed to the global credit crunch. Forecasts for 2009 indicate a substantial reduction in all forms of private capital inflows to EE and more limited access to external finance. One of the major drivers of growth in EE, FDI inflows, for the EE region as a whole are expected to fall from a record US$ 155 billion in 2008 to US$ 98 billion in 2009 (EIU, 2008, p. 33). Medium-and long-term debt inflows are projected to fall by even more, from US$ 360 billion in 2008 to about US$ 200 billion in 2009. In those CIS countries and the Balkans where remittances have been important, this source of finance is also expected to decline by 10-20% (Kekic, 2008).

3. FEATURES OF THE BANKING SYSTEM

The privatization of the banking sector in EE over the last fifteen years has led to a massive sale of assets to foreign banks from EU countries, including Sweden, Denmark, Austria, Italy, Germany, Belgium, France, Greece. Except for Slovenia, in all the other new EU member states and the Balkans, presently 70-98% of banking assets are in foreign ownership (see Graph 3).
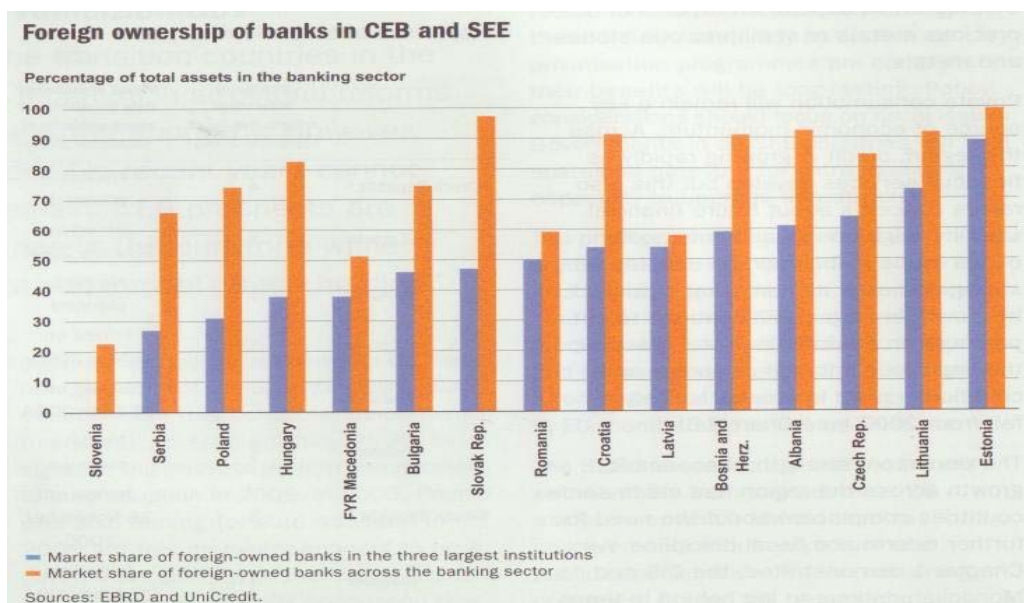
Graph 3. Foreign ownership of banks in EE
Source: EBRD (2006).

This was considered the best way to create a solid and efficient banking system, given the general lack of resources for a major recapitalization of state banks that were heavily burdened with non-performing loans, and to transfer technology and managerial know-how to EE, thus facilitating faster convergence to western banking standards. Relying on multinational banks from the EU as their primary source of capital, rather than on international financial markets, was also supposed to protect EE countries from financial crises.

Paradoxically, it is precisely this characteristic – strong foreign banking presence – that renders EE countries (except the CIS region) much more vulnerable to the present financial turmoil. These EE economies today depend excessively on capital funds provided by western parent banks to their eastern subsidiaries. During the last decade subsidiaries of western banks in EE have extended an enormous amount of loans to local clients, especially to households. With the present credit crunch in their countries of origin, not necessarily will these banks be able to continue extending capital to their local clients in EE. In countries like the Czech Republic, in early 2009 bank loans were totally backed by local deposits, but this is not the case in all EE countries, where capital withdrawals and decreased lending could easily occur. According to EIU forecasts, in 2009 bank loans in EE are expected to drop to 50% of their level in 2008 (Kekic, 2008).Moreover, the risk protection systems in many EE countries are still incomplete, with low ceilings for deposit insurance.

Though the risks of foreign ownership of banks in EE countries have initially been underestimated, based on arguments that withdrawals by foreign banks are unlikely given their high profitability in EE, more recently there have been increasing fears of a serious banking turmoil in eastern Europe and its just as dramatic consequences for western Europe. Given that the west and east European banking systems are so closely intertwined, in mid-February 2009 some main credit rating agencies have warned that west European banks with east European subsidiaries were at risk of being downgraded (see Graph 4).

EastEnders
% of total risk-weighted assets in eastern Europe*
2007
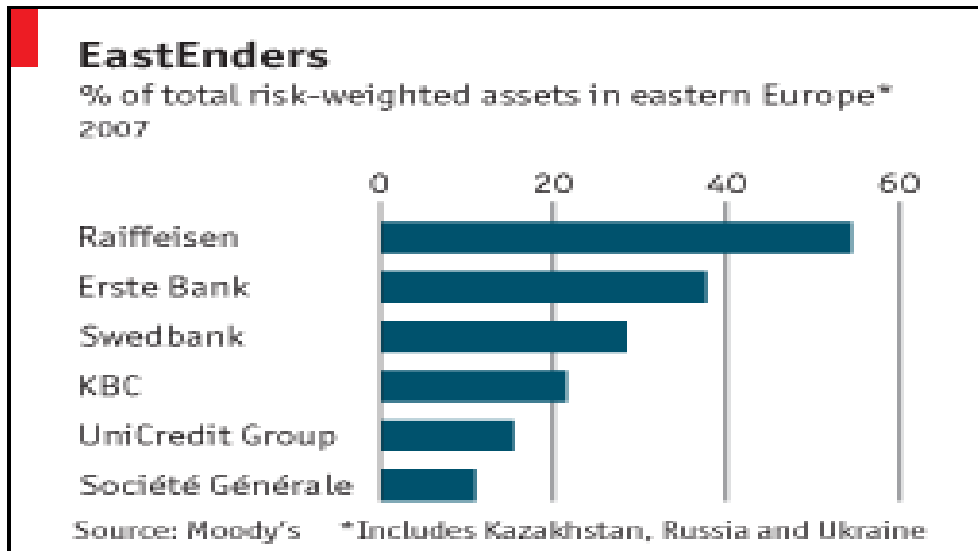
Graph 4. Share of risk-weighted assets in eastern Europe: Will west European banks abandon their eastern subsidiaries?
Source: The Economist, 19 Feb. 2009.

Several EE countries seem to have already been hit by the withdrawal of foreign capital, with severe consequences for exchange rates of their currencies. Some of the most exposed banks share prices have also rapidly declined, by some 60-80% during the May 2008 – February 2009 period .(see Graph 5 and Wagstyl, 2009). Depreciation of EE currencies raises the prospect of widespread defaults on foreign currency loans offered by foreign owned banks. Austria's banks seem the most exposed, with east European loans amounting to some 75% of its GDP, followed by Sweden (30%) and Greece (19%) (Wagstyl, 2009).

You lent how much?
Bank share prices, May 30th 2008=100
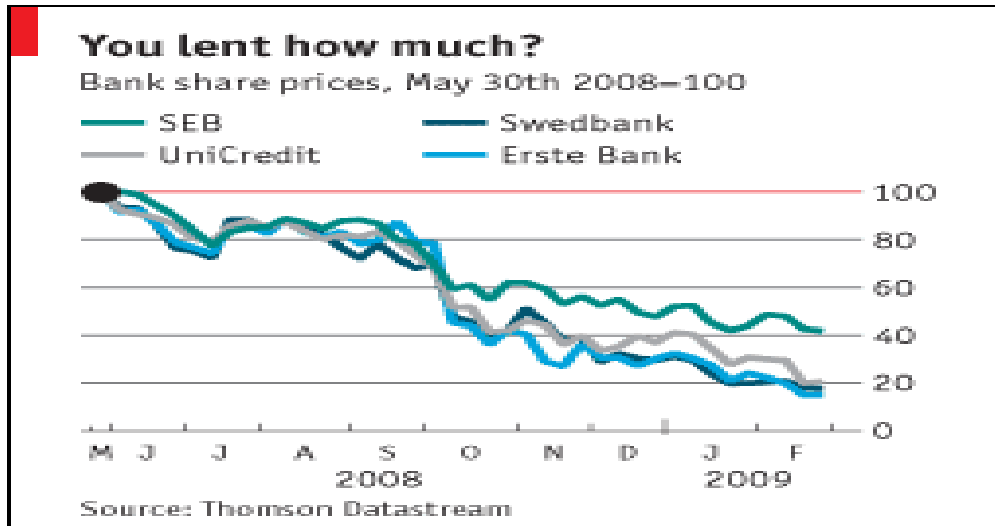
Graph 5. Banks share prices, May 2008 - February 2009
Source: The Economist, 26 February 2009.

4. TRADE INTEGRATION AND OPENNESS

Most of the new EU and Balkan countries are already highly integrated into the EU economy through trade flows, the EU representing their main trading partner with a share of around 60-90% of both exports and imports (this is much less so for the CIS countries). In addition, most EE countries (including Russia) are relatively open economies, which renders them highly vulnerable to deteriorating conditions on exports markets. The new EU members, on

average, have a higher degree of openness (measured by the exports/GDP ratio) than a number of old EU member states. With the exception of the largest economies - Poland and Romania - all the other new EU countries are much more open than most of the old EU member states - except Belgium, the Netherlands and Luxembourg (see Graph 6).

Graph 6. Trade openness of EU member states: Percentage of exports of goods and services to EU-25 (% of
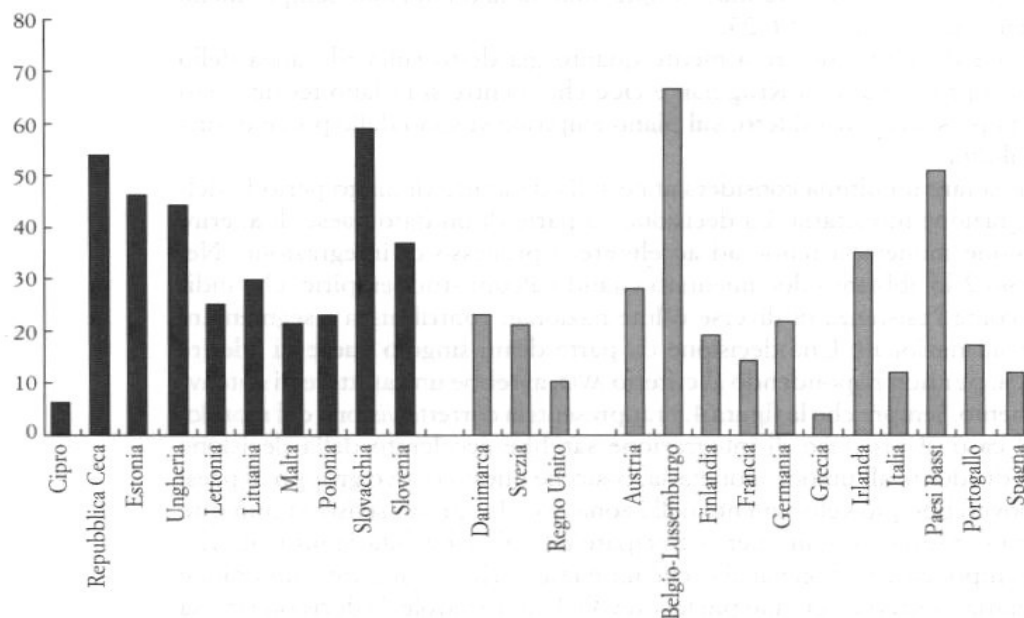
GDP), 2005
Source: De Grauwe (2008), p. 114, based on Eurostat data.

Given that the global financial crisis is having a significantly stronger impact on growth in western Europe than initially anticipated, the EE countries will clearly be badly hit by falling demand for their exports, particularly in view of the severity of the recession forecasted for 2009 in some of the EE countries' main trading partners – Germany, Italy, Austria. This will have serious implications for growth in the EE region. Since last November, all 2009 GDP growth forecasts for EE countries have been continuously and substantially adjusted downwards: the February 2009 forecast of the EIU gives the most dramatic estimate so far, of minus 2% for the whole EE region (see EIU, 2009).

5. CONSTRAINTS ON ECONOMIC POLICIES

What can the EE governments do in the case of a major banking crisis caused by withdrawals of capital by foreign owned banks? What economic policies can they implement to reduce the expected impact of the ongoing or forthcoming recession? Contrary to governments in the old EU member states, which have already provided for the coverage of bank losses also through nationalizations, or are ready to intervene with guarantees and emergency loans, governments and central banks in EE are not in a position to easily inject new liquidity into the economic system for a series of reasons.

The new EU member states, including those that are not yet members of the European Monetary Union (EMU), cannot implement large stimulus packages because of their obligations vis-à-vis the EU, as prescribed by the Stability and Growth Pact which imposes

strict fiscal discipline - the 3% GDP limit on the public deficit (0% in the course of the cycle), and the 60% GDP limit on public debt. Although most EE countries have a relatively low public debt, Hungary's has reached 65% of its GDP. Even those EE countries that could perhaps afford to run a counter-cyclical expansionary fiscal policy to offset the effects of the recession are constrained by aspirations to soon join the EMU (e.g. Poland).

Regarding monetary policies, in many EE countries these are in the hands of central banks that are even more independent than their inspiring model, the Bundesbank, therefore less sensitive to pressure from their governments. In some cases monetary policies cannot be effective in stimulating growth due to fixed exchange rate regimes, or cannot be used at all due to currency boards (in Estonia, Lithuania, Bulgaria, Bosnia and Herzegovina). Under rigid exchange rate regimes, central banks cannot be lenders of last resort in case of large withdrawals of capital from the banking system. In those EE countries that have flexible or managed float regimes, the global financial crisis has led to the rapid depreciation of their currencies throughout 2008 and increasing currency substitution. In Poland, Romania, Hungary, the Czech Republic, national currencies have steadily depreciated throughout 2008 reaching the lowest point in mid-February 2009 (see Wagstyl, 2009).

6. CONCLUSIONS

The discussed factors of vulnerability to the global financial and economic crisis apply primarily to the ten new EU member states and the six Balkan countries. The degrees of vulnerability differ substantially for the single countries, however. Still, Slovakia and Slovenia, the only EE countries that have adopted the euro, are the only among the 14 EE countries that have maintained a AAA credit rating (see Graph 7).

Fourteen ways to slowdown

In euro area
Pegged to euro

Country	GDP per person*	S&P credit rating†	Financing requirements % of GDP‡	Exports§	In a nutshell
Belarus	12,344	B+	7.3	62.1	Autocratic, isolated, gained surprise IMF bail-out
Bulgaria	12,372	A	29.4	61.0	Strong finances back currency peg, but sleaze rampant
Czech Rep.	25,757	AA	9.4	80.1	Thrifty and solid, but hit by export slowdown
Estonia	20,754	AA	20.0	72.0	Star reformer squeezes spending to stay afloat
Hungary	19,830	A	29.9	80.2	Currency crash could topple debt-heavy economy
Latvia	17,801	BBB	24.3	46.6	Clinging to currency peg amid turmoil and downturn
Lithuania	18,855	A+	27.1	59.0	Painful spending squeeze to avoid worse
Poland	17,560	A+	13.2	42.3	Regional heavyweight speeds up euro bid
Romania	12,698	BBB+	20.2	34.4	Spendthrift policies meet sober reality
Russia	16,161	BBB	2.2	31.7	Energy-based kleptocracy in denial about crisis
Serbia	10,911	BB–	23.5	22.2	Seeking more IMF help
Slovakia	22,242	AAA	12.5	90.5	Smugly in euro area but hit by car-factory slowdown
Slovenia	28,894	AAA	–	70.5	Self-satisfied, rich and still growing
Ukraine	7,634	CCC+	16.1	45.0	No end in sight to political and economic chaos

*PPP$, 2008 estimate †Standard & Poor's, latest ‡Current-account balance, principal due on public and private debts plus IMF debits, 2008 estimate §Goods and services, % of GDP, 2008 estimate

Sources: IMF; Moody's; Economist Intelligence Unit; *The Economist*

Graph 7.Variable impact of the global crisis on individual EE countries
Source: The Economist, February 2009

Despite the differentiated impact of the global crisis on EE, there are also some common grounds for concern. For most of these countries, the global crisis is an external shock of such dimensions that it will necessarily require substantial external finance for covering large current account deficits, repaying foreign debt, rescuing banks in crisis, sustaining growth and employment. External finance needs to be made more readily available, in substantially larger amounts, and possibly at better terms, not only by the international financial institutions (IFIs) but also by the EU and its institutions and possibly western governments. Whereas the international financial institutions, like the IMF, have recently taken bold steps in this direction (see IMF, 2009), there is an urgent need for a EU-led coordinated regional support for the EE economies, since financial turmoil in eastern Europe could have rather dramatic consequences for some of the most affected west European countries.

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FEMALE START-UPS IN THE LIGHT OF CRISIS: EMOTIONAL VERSUS TRADITIONAL SUPPORT

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1. INTRODUCTION

In the view of forthcoming economic crisis in which a large proportion of lost jobs will have to be replaced in new self-employed style ventures, women may be in position to utilize their so far unrealized entrepreneurial opportunities. From the viewpoint of entrepreneurship research, a challenge to question traditionally expressed problems of women entrepreneurship (traditional roles of women in a society, obstacles to financial resources etc.) and shift them to a new paradigm of family support seems to be on a grasp. There has been a lack of empirical evidence about the importance of family support regarding household obligations, child care and also emotional support of family members to women start-ups. The question raised at this point is: what are the factors that might have a positive influence to would-be entrepreneurs among female population?

The extensive research on involvement of men into household responsibilities, conflicts of job and family life, motivations of women to start their own business has been done. However, the implications suggested from the study on better reconciliation of work and family life in Slovenia were only from the viewpoint of the broader inclusion of women in labor market force in the last few decades. The economically desirable option of women starting their own ventures was neglected in the study. On the other side, evidence from other studies shows that the economic potential of would-be entrepreneurs both, men and female, is barely explored.

Flexibility in working hours is one of the most important factors for female entrepreneurs enabling them to combine both, business and personal life. In Greece 66.5 % of female entrepreneurs are married, have children and work more than 10 hours a day which leads to a

conclusion that they obviously developed skills of balancing business and family life (Sarri & Trihopoulou, 2005). More than 40 % of participants hold university degrees and established their companies after being 36 years old.

Forty-six per cent of women entrepreneurs in Cyprus are in the age range of 31-44. Eighty-two per cent are married, with a fertility rate (1.9) comparable to the national average (1.83). One of two possess only a high school leaving certificate, an 34 per cent have postsecondary education qualifications. However, the tendency among younger women is to further their education, where 54 per cent of young women entrepreneurs were performing above the average level of education.

Carr (1996) figures out that motivation for entrepreneurship are different for men and women. For men, important factors seem to be personal promotion and increased earnings while this appears not to be true with women. Self-employed women are generally higher educated than employee women, they are married and have children and more usually work for less hours than the normal daily work load. From this it has been derived that women decide for self-employment because of the easier balancing of family and job commitments. Budig (2006) agrees with the flexibility »theory«, however, she puts forward the proposition for another type of female entrepreneurs which is »career entrepreneurs«.

Because of this dual role of women, flexibility looks to be one of the most important influential factors for entrepreneurship. Flexibility of working time has been confirmed to be appreciated more than other values, promotion and control (McAtavey, 2002). Women do not wish to work less, they just prefer convenience of flexible working hours (Mattis, 2004; Orhan & Scott, 2001). Cabrera (2007, in Patterson, 2007) points out also the phenomenon of so called »sandwich generation« which were late with own children and are no in the position to take care for both: children and parents. Very similar findings were reported by Mattis (2004) and Wood (2001).

However, this idealistic picture of entrepreneurial career which would enable flexibility for better efficiency both in family and professional life often appears to be not that nice. The traditional social role as perceived from environment still impacts negatively on business career of women (Nearchou-Ellinas & Kountouris, 2004), or business has negative influence on family (Ufuk & Ozgen, 2001; Mitra, 2002). Unfortunately, after a couple of years of activity, women often admit that they forgot their primary motive (flexibility) for deciding for entrepreneurship (Patterson, 2007). Also, the problem of children-care often remains unresolved (Fielden & Dawe, 2004). The lack of time remains one of the major problems (Farooqi & Murray, 2007), being more exposed for women than for men (Domeisen, 2003).

There are other important influences for entrepreneurship career. Expectations and encouragement from parents from the early childhood seem to be very important (Rozier & Thompson, 1988) and higher educated parents show more preferences towards entrepreneurial career of their daughters (O'Gorman & Aylward, 2007). Parents' role to be mentors is also very often (Farooqi & Murray, 2007). Many female entrepreneurs are actually born to parents – entrepreneurs (Morris et al., 2006). Very similar to the role of parents looks to be the role of a husband (Mattis, 2004).

2. LITERATURE REVIEW AND PROPOSITIONS

Although women are pursuing entrepreneurial careers in increasing numbers, their career/achievement and personal life motivations remain similar to other professional women. Hence, although these motivations may be important to individuals, there may not be systematic differences between female entrepreneurs and similar female non-entrepreneurs - at least among high career potential white females. A comparison between women and men, however, did reveal important sex-based differences (DeMartino et al., 2006).

The impact of stereotyping which occurs largely without conscious awareness is shown in the study in three different cultures which reveals that entrepreneurs are perceived to have predominantly male characteristics. Respondents, males and females, who perceived themselves as more similar to males, had higher entrepreneurial intentions than those who saw themselves as less similar to males (Gupta et al, 2009). Those women who perceive higher congruence between feminine and entrepreneurs' characteristics have more entrepreneurial intentions (Diaz Garcia, 2007). This is close to findings of Gupta et al. (2009) that women see a significantly stronger relationship between feminine and entrepreneur characteristics than men.

Today there is no significant difference in the career/achievement and personal life orientations of women entrepreneurs and female non-entrepreneurs with similar backgrounds (De Martino et al., 2006). The new generation of female entrepreneurs was observed to possess relatively high educational levels, greater professional experience, and tended to lead more complex companies. The needs and motivations of those more career-oriented female entrepreneurs are more in line with male entrepreneurs. It was observed that more dynamic female entrepreneurs, owners of high-tech businesses were older at the time of launching the business, mostly single, their parents were highly educated, and they identify more with male characteristics (O'Gorman & Aylward, 2007). They are motivated by factors such as achievement, independence, and self-actualization. The female entrepreneurs with motivations closer to their male-peers can be put into categorization "intentional entrepreneurs" (Moore & Buttner, 1997). "Career climbers", on the other hand, are driven to entrepreneurship by either environment factors related to downsizing or systematic discrimination in the corporate world (Moore & Buttner, 1997). The number of women who chose entrepreneurship due to negative "push" experiences in their former positions was notable in the study where 44 percent of women business owners and 36 percent of men started businesses because they believed they had a winning idea, or because they came to realize that they would gain more from doing for themselves what they had been doing for an employer. Notably, "push" factors played a larger role in the newest generation of women entrepreneurs' decisions to start a business – those who had owned a business for less than ten years - than in the decisions of women who started businesses 20 or more years ago (Mattis, 2004).

The study of female entrepreneurs and female non-entrepreneurs with similar background showed no difference between the two groups towards family concerns, their career/achievement orientation, towards orientation to balancing their personal lives with work and career and family orientation (De Martino et al., 2006). In a study of gender differences regarding entrepreneurial intentions, Diaz Garcia (2007) concludes that women more than men depend on support of the family, friends and other important persons in their lives while deciding for entrepreneurship.

The findings from some studies (Moore & Buttner, 1997, Bruni et al., 2004) suggest that women who are necessity driven towards entrepreneurship were not pushed to the entrepreneurial path only because of the unemployment, but also because of the fact that their needs were not fulfilled in previous organizations. If they could fulfill those needs in the corporate world, they would rather stay employed than entrepreneurs. Women who started the business because of the positive or attraction factors, found the entrepreneurship as an opportunity to improve their life and household income, a way to obtain greater margins of flexibility, or as a solution for entering in an activity in which formal selection criteria seem less stringent (Bruni et al., 2004).

H1. *Women with (dependats) children choose entrepreneurship more because of the necessity than attraction.*

Women in certain life-stages prefer to choose family over career, but there is no difference between entrepreneurs and non-entrepreneurs (De Martino et al., 2006), which is close to the idea of Still and Timms (2000) which suggests that there is a positive link between the amount of time a woman spends on her business and her life stage and explains why some women do not want to grow their business. Still and Timms' (2000) work confirmed the "new" model of the female entrepreneur, which argues that the amount of time a woman spends on her business is linked to her life stage and explains why some women do not want to grow their business. The »new« model of female entrepreneur choose the entrepreneurship because of the family issues and does not want to grow the business as their existence does not depend on it.

Among the key findings in the report by a UK/Swedish Taskforce (M2 Presswire Coventry: Feb7, 2001) is also the statement that entrepreneurship in both countries tends to be a mid-life choice for women. Two thirds of female entrepreneurs in the UK are aged between 35 and 54. The typical Swedish female entrepreneur is over 30. Women in Greece and in Cyprus also start their entrepreneurial activity at an older age, when most of them have family and children (Sarri & Trihopoulou, 2005; Nearchou-Ellinas & Kountouris, 2004). The likelihood of self-employment of woman in United States is raised with age, children's presence, and husband's education, earnings, and health insurance coverage (Lombard, 2001). The similar was found in the study business owners and corporate businesswomen (Mattis, 2004), where the overwhelming majority of respondents were in their mid- to late-40s. Yet, women business owners were considerably more likely than the corporate businesswomen studied to have children – 82 percent compared to 64 percent. It seems that entrepreneurship is the decision for women with children in mid-career, therefore H2 is proposed:

H2. *Women with children most often decide for entrepreneurship career when they are between 35 and 45 years old.*

Most of the self-employed females do not earn enough to afford shorter working day therefore having a husband with employment arrangement that gives certain financial stability is very important, specially for female entrepreneurs with higher family responsibilities and thereafter higher need for flexibility (Carr, 1996; Taniguchi, 2002).

Having children and a husband as being the fact that increases the possibility that woman will decide for self-employment was suggested in several studies (Loscoco & Leicht, 1993; Carr, 1996; Taniguchi, 2002). Women often join their husbands in their business of become self-

employed in order to help and support the husband and not for their self-promotion (Greene 2000; Taniguchi 2002; Budig 2006; Nearchou-Ellinas & Kountouris, 2004).

Lombard (2001) proved, that a woman in United States is more likely to choose self-employment the greater her relative earnings potential as self-employed, the greater her demand for flexibility, the greater her demand for non-standard week, and if her husband has self insurance. The likelihood of self-employment is raised with age, children's presence, and husband's education, earnings, and health insurance coverage. Conversely, the likelihood declines with woman's own education and non-white racial status. Also, the probability of being self employed is higher if the husband is self-employed and lower if the husband is a wage-salary worker. The economic assistance provided by a working spouse was cited as an important support in a study of Mattis (2004): 51 percent said a second income was "critical" or "somewhat important", while 30 percent said that they did not have a second income to rely on (Mattis, 2004). Hypothesis H3 and H4 are derived from the surveyed literature above.

H3. *Women with children decide for entrepreneurship if their partners have stabile revenues which on short-run enable financial security and preferred life-style for their families.*

H4. *Women decide for entrepreneurship more often if their spouses are entrepreneurs themselves.*

However, the societal pressure upon women to take on domestic roles breaks their ties with previous networks and impacts upon their capability to develop and expand their networking activities. This can leave female entrepreneurs at a clear disadvantage when it comes to gaining knowledge, and other resources, which could have a determinental impact on the development of their firms (Hampton et al., 2007).

It seems that the education of the husbands also has an impact to female entrepreneurs. The study of female entrepreneurs in Turkey showed that 28 per cent of female entrepreneurs have a self-employed husband, 14 per cent of husbands are tradesmen or artisan (Ufuk in Ozgen, 2001). Most of the husbands of Turkish entrepreneurs are university or college graduates (36%), the high school graduates with a close percentage of 34.5% (Ufuk in Ozgen, 2001). According to this H5 can be postulated.

H5. *Higher level of partner's education may increase the probability of the decision for entrepreneurship by their wives.*

Women's perceptions of support appeared to have a greater effect on their success in entrepreneurial ventures than actual support, regardless of whether traditional measures or women's own perceptions of success were applied (Farrington Pollard, 2006). It has been determined that the rate of the female entrepreneurs stating that they did and did not have disagreements with their husbands due to their business are the same (Ufuk & Ozgen, 2001). Emotional support from partner is one of the highest valued factors among female entrepreneurs when they decide for entrepreneurship. Moreover, in Singapure, partner also highly value and support entrepreneurial activities by their spouses because these contribute to families' budgets and decreases their responsibilities as only family providers (Kim & Ling, 2001). Several women in the study of Fielden & Dawe (2004) found that their partners were unsupportive of them entering into self-employment. That family support was perceived as an influencing factor after they become business owners was also stated by some participants in the study of Rozier & Thompson (1988). Emotional support seems to be even more important

than responsibilities relief (Vadnjal & Vadnjal, 2007). Most of the respondents in the study of Indian female entrepreneurs (over 79%) said that their spouse was either happy of very happy that they owned their own business. Over 43% said that their spouse was happy with the level of commitment that they had to their business, and over 70% said that their spouse offered them emotional support. The women were overall happy with the level of support they received from their marital partners. This is also reflected in the fact that some women rated spousal support as a key reason for success (Das, 1999). Thus, H6 can be constructed.

H6. *Partner's support is more important for women who decide for entrepreneurship because of opportunity and less important for those who decide because of necessity.*

Women entrepreneurs expressed that there has not been any change in their responsibilities in terms of housework after starting entrepreneurial activities. In other words, a new role was added to their roles of being a wife, mother and housewife with their entrepreneurship. This case brought and additional task to them while underlining that they are trying to conduct the roles expected from them (Ufuk & Ozgen, 2001). The study of French entrepreneurs reveals that a female-specific feature is the push factor of a flexible schedule, reflective of the family caring role that is still expected from women. Because of their mothering role, women experience truncated or stopped careers more often than men (Orhan & Scott, 2001). This finding, that majority of entrepreneurs participating the study in Greece belong to the category "married with children", together with the fact that women entrepreneurs spend many hours per day in their businesses (more than ten), serves as proof that they have managed to develop abilities, skills and competences that help them combine their business activities with their family life (though either at the risk or expense of their quality of life (Sarri & Trihopoulou, 2005).

Studies (Loscocco & Leicht, 1993; Rednak, 2006; Stropnik & Černič Istenič, 2001; Noor, 2004; Health et al., 1998; Arai, 2000) showed that although women and men had similar commitments to business, women devoted much more time to domestic work and child care than men. Juggling jobs and families can result in a work-family conflict that can decrease psychological well being. It is not that women want to be actively caring for children while doing their work at home. Rather, it is a way of reducing the distance (and resulting worry and anxiety) between themselves and their children, whether they are in school or cared for at a day care facility or at home (Mattis, 2004).

Turkish female entrepreneurs stated to receive help from other members of the family with regards to housework (34.55%) and 15.45% stated to receive charged assistance. The arrangements of the female entrepreneurs with respect to the care of their children have been as follows: children of 67.35% of women are old enough to stay at home alone. 14.8% of women with children who are not old enough to stay at home alone stated that they were looking after them and 5.6% expressed that a charged babysitter was looking after their children (Ufuk & Ozgen, 2001).

The women entrepreneurs in India did not feel that having their own business affected their roles a spouse, parent, or homemaker very much. They indicated that their business responsibilities made it a little difficult for them to do household chores. Interestingly, the respondents felt that being an entrepreneur helped them improve their relationship with their spouse as they had something interesting to share with the partner. Work-family conflict in India does not seem to be as high as that found in the studies based on samples form the developed world. The high amount of spousal and extended family support, combined with

the availability of cheap household help ma account for the lower level of work-family conflict found in the study. this, combined with their overall satisfaction with their life in general, marriages and the progression of their business ventures may have further reduced the extent of work-family conflicts faced by this women. (Das, 1999). About half the women in the sample of Cypriotic entrepreneurs (55 per cent) claim to be content with the support system they enjoy. This is usually broken down to support by the family (parents, spouse, older children) and by hiring domestic help. Absence of such a support system is likely to influence the degree of their ability to continue their entrepreneurial activity. However, one in three feel their relationship with significant others are burdened because of their enterprising activity (Nearchou-Ellinas & Kountouris, 2004).

It was suggested that family members could respond to the changing environments by changing both their role expectations and role performance. Due to this fact, effective distribution of the responsibilities among the members and execution of various arrangements regarding home and child care are significant in terms of encouraging and supporting women entrepreneurship (Ufuk & Ozgen, 2001; Kim & Ling, 2001).

H7. *Help from the primary family is for female entrepreneurs of greater importance in the first years of entrepreneurial activity that any form of paid outside assistance.*

3. METHODOLOGY

The hypotheses were tested through a questionnaire mailed to a sample of 500 female start-ups included in government supported program for start-up entrepreneurs in the period of 2004-2006. The access to the database was enabled through a small business development agency which was one of the providers of the support program. Although this was a nation-wide program, it was delivered locally/regionally which led to one of the possible pitfalls of the study which is that no geographical spread was enabled thus, limiting the study to more urban rather rural areas. This particular issue may in the future cause problems to replicate the study in some other environment.

The questionnaire was printed on three double-sided sheets of paper and supplemented with a stamped envelope with pre-printed return address which probably increased response rate. The anonymity was ensured in the cover letter, in which the purposes of the research were explained. The participants were also offered to leave their contact address to receive a copy of the final report later on, if interested in the results and findings of the study. The mail was sent out in April 2008 allowing possible respondents a period of 14 days for sending back completed questionnaires. Because of the anonymity, no follow-up activities to increase response rates were possible.

The 24.2 % response rate is comparable to similar studies in other economies. On the other hand, this response rate can be evaluated as rather high, which can be mostly explained with a very good targeting of the sample (start-ups in the recent years). The majority of questions was designed in the manner of the five point Likert scale which increase response rate and made several parametrical tools of statistical analysis Standardized tools of statistical analysis (t-test, F-test, Cronbach alpha, linear correlation coefficients, χ^2-test) were used.

4. FINDINGS & ANALYSIS

Results show that majority of women who started their own business feel that the emotional support of a spouse was more important in the first year of operation than the household help. The majority felt that family was quite reluctant to the idea of female entrepreneurship. However, they would not change their mind even if the partner was not positive about their entrepreneurial activities. Children are not recognized as a barrier. As flexibility and independence rang the highest among factors of motivation, we suggest that the pull factors are as important among female as among male population. Women's life cycle stage was recognized as an important factor influencing the decision for entrepreneurship. Women were asked to choose three main motivational factors for starting their own business.

Table 1. Motivation for starting own business

	All (%)	R	Has children (%)	R	Doesn't have children (%)	R	χ^2	P
Need for achievement	28.1	4	28.0	4	27.5	4	0.00	0.95
Independency - to be on »my own«	72.7	1	73.2	1	70.0	1	0.13	0.71
Control, power, resposnibility	3.3	9	2.4	9	5.0	9	0.56	0.45
Economic emergency	25.6	5	25.6	5	25.0	5	0.05	0.94
Better carrer oportunity in own business	9.1	8	9.8	8	7.5	8	1.67	0.68
Progress on societal level	0.8	10	0.0	10	2.5	10	2.07	0.15
No personal development at previous job	14.9	7	15.9	7	12.5	7	0.24	0.62
Flexibility	44.6	2	42.7	3	47.5	2	1.89	0.39
Need to develop own ideas	42.1	3	43.9	2	40.0	3	0.17	0.68
Money	19.0	6	20.7	6	15.0	6	0.05	0.94

Source: own research, 2008

We can see from the table 1 that the main motivation for most of the female entrepreneurs (72.7%) was independency and to work »on their own«. Flexibility ranked second amongst motivation factors (44.6%), the third factor was the need to develop own ideas, which was chosen by 42.1% of sample.

The first factor, which most of the females have chosen, is the need to be independent, which is also one of the characteristics which shows high entrepreneurial intention (Solymossy, 1998). Women see entrepreneurship attractive as it gives them the possibility for work and time flexibility (44.6%) and it enables them to realize their own ideas (42.1%). Those answers support the findings from other studies, that women become entrepreneurs because of attraction and certain intention and also, that the motivation factors from woman entrepreneurship are mixed (Budig, 2006, Patterson, 2007; Orhan & Scott, 2001; Sarri & Tripoulou, 2005; Morris et al., 2006; Farooqi & Murray, 2007).

There are no statistical differences between the answers of entrepreneurs with dependant and entrepreneurs without dependats.

Entrepreneurs marked the statement »I choose the entrepreneurship because circumstances forced me to decide so« with the mean grade 3.2 (1=strongly disagree, 5=strongly agree). There are no statistical differences between the answers of entrepreneurs with dependants

(3.3) and entrepreneurs without dependats (3.2). »I always wanted to be independent« was marked 4.3. There are no statistical differences between the answers of entrepreneurs with dependants (4.2) v and entrepreneurs without dependats (4.4).

The highly ranked motivational factor among female entrepreneurs is the need for independence, which was suggested to be necessity factor (Moore & Buttner, 1997, Bruni et al., 2004), as women would rather stayed employed in previous organization if they could fulfill the unfulfilled needs in the corporate world. However, the need for independence is the factor which shows high entrepreneurial intention (Solymossy, 1998). The females in the sample decided for the entrepreneurship because of attraction with no regard to their motherhood. Hypothesis H1 was not supported.

As seen in the table 2, women became entrepreneur before the age of (63.3%). However, the majority of women who had children (52.9%) were in the age between 35 and 45 when they became entrepreneurs. There is the statistical difference between the entrepreneurs with and without children (χ^2 = 22.48, df = 3, p = 0.00). Hypothesis H2 was fully supported. Women do become entrepreneurs in their mid-career stage or in the pragmatic endurance phase (O'Neil & Billimoria, 2005).

Table 2. The Age of Female Entrepreneurs at the time establishing the business

Age at the beginning of entrepreneurial career	Did not have children at the time of establishing the business (%)	Did have children at the time of establishing the business (%)	Total (%)	χ^2	p
Less than 30 yrs.	52	18.60	32.50	22.48	0.00
30 yrs. to 34 yrs.	34	28.60	30.80		
35 yrs. to 39 yrs.	8	24.30	17.50		
40 yrs. and more	6	28.60	19.20		
	100	100	100		

Source: Own research, 2008

From the table 2 it is evident that women without children in more than half of the cases start their businesses younger than 30 years old and in one third of the cases when they are between 30 and 34 years old. From the data in table 3 it can be figured out that women without children in the start-up phase are generally younger than their counterparts with children. Thus, hypothesis H2 can be entirely confirmed.

Table 3. Maternity in the start-up phase

Age at the beginning of entrepreneurship	Did not have children at the time of establishing the business (%)	Did have children at the time of establishing the business (%)	Total (%)	χ^2	P
Less than kot 30 yrs.	66.7	33.3	100	22.48	0.00
30 yrs. to 34 yrs.	45.9	54.1	100		
35 yrs. to 39 yrs.	19.0	81.0	100		
40 yrs. and more	13.0	87.0	100		
	41.7	58.3	100		

Source: own research, 2008

Female entrepreneurs do not agree very much with the statement »the employment of my spouse was of a key importance when I was deciding for entrepreneurship«, as they gave it the mean grade 2.3 (1=strongly disagree, 5=strongly agree). Entrepreneurs without children less agree with the statement (mean mark 1.9) than entrepreneurs with children, who marked

the statement with 2.5 (F=3.6, p=0.06). Table 4 shows the employment of entrepreneurs' spouses at the time of starting the business.

Table 4. Employment of husband at the time of establishing the business

	All (%)	Rank	With children (%)	Rank	Without children (%)	Rank
Sole Proprietorship	17.0	3-4	14.7	3-4	20.0	2-3
Employed in my company	12.6	5	8.8	5	0.0	7
Owner of his own business	17.0	3-4	14.7	3-4	5.0	6
Unemployed	10.5	6	5.9	6	15.0	4
Employed in private sector	31.3	1	33.8	1	30.0	1
Employed in Public Administration	19.2	2	17.6	2	20.0	2-3
Other	9.4	7	4.4	7	10.0	5

Source: own research, 2008

At the time of starting the business there were only 5.9% of women with children who had unemployed spouse, compared to 15% of women without children. No entrepreneurs without children employed their husband of living partner at the beginning of the entrepreneurship, while 8.8% of the entrepreneurs with children did so. In the partnership with the spouse were established 21% of the businesses of women with children and 7.5% of the businesses of women without children.

Although entrepreneurs less agree with the statement that the spouses employment was important for their decision to become entrepreneurs, the mean mark of entrepreneurs without children (1.9) shows stronger disagreement than the mean rank of entrepreneurs with children (2.5). The data of spouses' employment at the time for launching the business also support the hypothesis H2, that the female entrepreneurs with children find employment of their partner as important while deciding for starting the business.

Table 5. Correlation matrix of the support factors – participants without children

	Motivation-attraction	Motivation-necessity	Partner–Domestic help	Partner–emotional support	Partner-business support
Motivation- attraction	1.000	-0.367**	-0.172	-0.043	0.112
Motivation- necessity		1.000	0.225	0.256	0.110
Partner–Domestic help			1.000	0.438**	0.172
Partner– emotional support				1.000	0.227
Partner- business support					1.000

Note: (**) statistical significance at p<0.01
Source: authors' calculations, 2008

Attraction factors and necessity factors were negatively correlated in the sample of entrepreneurs with and without children. The opportunity factors on one side and necessity factors on the other side are in both samples (women with and without children) negatively correlated but with coefficients which are statistically significant. It can be confirmed

(p<0.01) that there is a prevailing dichotomy groups of motives (opportunity : necessity and that the influence of the other group is negatively correlated. According to this hypotheses H6 can be neither confirmed nor rejected.

Table 6. Correlation matrix of the support factors – participants with children

	Motivation-attraction	Motivation-necessity	Partner–Domestic help	Partner–emotional support	Partner-business support
Motivation- attraction	1.000	-0.452**	0.107	-0.025	0.029
Motivation- necessity		1,000	-0.141	0.008	0.006
Partner–Domestic help			1.000	0.542**	0.493**
Partner– emotional support				1.000	0.769**
Partner- business support					1.000

Note: (**) statistical significance at p<0.01
Source: authors' calculations, 2008

Table 7. Statement on spousal support (1=strongly disagree, 5= strongly agree)

	All	**With children**	**Without children**	**F**	**P**
In the first year of my entrepreneurship my husband helped me with household work.	2.8	3.0	2.5	2.3	0.13
Partner's Emotional Support was the most important for me in the first year of entrepreneurship.	3.4	3.5	3.2	1.1	0.31
The majority of the help with child care comes from my husband.	3.2	3.4	2.6	0.9	0.33
My husband agreed with my decision to become entrepreneur.	4.1	4.2	4.0	0.6	0.42
The decision for entrepreneurship had a positive effect on my partnership.	3.2	3.3	3.0	2.4	0.12
My husband firstly didn't agree with my decision for entrepreneurship, later on he supported me.	1.9	1.9	1.8	0.0	0.83
Before deciding for entrepreneurship I asked my husband for advice.	3.5	3.7	3.0	5.6*	0.02
If my husband didn't completely agree with my decision, I would not become entrepreneur.	2.5	2.6	2.1	4.6*	0.03
For the first advice in my business I ask my husband.	2.8	2.9	2.5	2.0	0.16

Note: (*) statistical significance at p<0.05
Source: authors' calculations, 2008

For the confirmation of the hypothesis H6 the correlation matrices are used for women without children (table 5) and women who had children in their start-up phase (table 6). There is a statistically significant positive correlation between partners' emotional support and readiness to help with household obligations while partners' business support appears to be not relevant for entrepreneurs without children. From table 6 it can be figured out that all three factors are statistically significant and positively correlated. From mentioned above it can be argued that general support of a partner is crucial for entrepreneurs who have children

in their business start-up phase and less important for those without children. The general support of the partner can be defined as an appropriate combination of family and business support or combination of "hard" (business advice, assistance when making decisions) and "soft" (emotional support) factors.

Generally, it can be stated that the supportive role of partner is much more important for female entrepreneurs with children since the average level of agreement is higher in all categories. This can be interpreted as that role of partner is even more evident in the context of a family, which is easy to understand because family type of community is much more complex from the viewpoint of relationships, planning and development than a partnership of a couple. The highest grade (4.1) earned the statement that "partner agreed with my decision for entrepreneurship". In this case, there were no statistically significant differences revealed between the two groups, with and without children. Statistically significant differences occur (F=5.6, p=0.02) in the grading of the statement "before the decision was taken I counseled my husband" which respondents with children graded in average with 3.7 and those without children with 3.0, which points out that partner's advice may be more important for entrepreneurs with children. There is a lower level of agreement with the statement "I would not decide to start my own business if my partner did not agree". There is even statistical significance between the two groups (F=4.6, p=0.03), having entrepreneurs with children in more neutral position (2.6), while entrepreneurs without children tend to agree less. There is quite a high level of agreement (3.4) regarding the importance of partner's emotional support without any significant difference between the two groups. From all what was argued above it can be stated that partner's support is highly appreciated for all female entrepreneurs, even more for those with children thus, hypothesis H6 can be entirely confirmed.

In the table 8 the attitudes of partners regarding the entrepreneurial career of their spouses is presented. The statement was formulated as "partner did not agree in the beginning but he supported the idea in the later stage" and the level of agreement was lower with higher formal level of education of a partner. The difference is regarding the level of education are even statistically significant (F=3.2, p=0.02). Thus, hypothesis H5 can be entirely confirmed.

Table 8: Partners' support dependency on level of formal education

Partner's level of education	Partner did not agree with my entrepreneurial career in the beginning but he supported it in the later stage
Vocational	2,6
High-school	2,1
College	1,8
University	1,7
Post-graduate	0,6
F	3,2
P	0,02**

Source: authors' calculation, 2008

From the table 4 it can be observed that 16.1% of entrepreneurs had a partner who was also an entrepreneur and another 12.6% of entrepreneurs who had a partner who was owner in a small company. Thus, it can be stated that 28.7% of female entrepreneurs actually had partner who was entrepreneur himself. Therefore, hypothesis H4 can be entirely confirmed.

Table 9. Assistance with household obligations and children

	All	Has children	No children	F	P
In the first year of my entrepreneurship I had assistance from my spouse in household work.	2.8	3.0	2.5	2.3	0.13
In the first year of my entrepreneurship I had assistance from my parents/spouse's parents in household work.	2.5	2.5	2.6	0.1	0.73
In my beginnings I had assistance from a house-maid.	1.6	1.6	1.5	0.7	0.40
My spouse takes a lot of responsibilities in child-care.	3.2	3.4	2.6	7.2	0.01*
My parents help me with child-care.	2.8	2.9	2.6	0.9	0.33
Nany helps me with child-care.	1.7	1.5	2.3	11.5	0.00*
I am happy with child-care in the kinder-garten.	3.2	3.2	2.8	3.8	0.05
I am happy with child-care in the school.	3.1	3.3	3.6	1.8	0.18
Kindregartnes should be open till & PM.	3.4	3.3	3.6	0.8	0.37

Source: Own research, 2008

From the table 9 it is evident that entrepreneurs generally agree less that they had assistance with household activities by own our partner's parents in the first year of running their business (average grade 2.5). Even less women used house-maids in the first year of operations. Similarly as emotional support of partner is very important (table 7), it can be realized that support from parents is crucial for entrepreneurs who do not have partners at their start-up phase because they valued parents' support higher and the difference is even statistically significant (F=8.4, p=0.01). It can be also concluded that support of the family is much more important for entrepreneurs than outside assistance. Thus, hypothesis H7 can be entirely confirmed.

5. CONSLUSIONS AND IMPLICATIONS

Seven hypotheses were postulated as a literature review process outcome. Out of them only H1 was by no means rejected thus not confirming that women with children start their businesses more because of the necessity rather than opportunity. All other propositions were entirely or at least partly confirmed meaning that it can be generally confirmed that family support, both in hard and soft means is very important and even more important than outside paid assistance (i.e. for household work, child care etc.). Furthermore, female entrepreneurs even value this support of both partners and parents even higher than different means of support programs, networking etc.

The implications of the study are on two levels. The design of start-up support and promotion programs from women should be influenced by the results implying that women's abilities to start their ventures rely pretty much on extend of the family support and their life cycle stage. The other way of implications is expected to arouse in the field of business training and education as well as small business consulting. Thus, training and consulting programs should consider including also spouses of would-be entrepreneurial persons, the self-esteem of female students should be promoted on all levels of education, and entrepreneurship should be recognized as an honorable way of career choice.

The value of the study would to the greatest extend be another contribution to broader understanding of the complexity of the women entrepreneurial process. This will be shifted away from often misleading explanations of the paradigms of women entrepreneurship. The new research paradigm of women entrepreneurship should therefore go more in to exploration

of different aspects of broader family support rather than checking the presumed inequalities in start-up processes between men and women.

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MODELLING EXTREME EVENTS: APPLICATION TO ZAGREB STOCK EXCHANGE

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1. INTRODUCTION[1]

Statistical distributions have been used for a long time to describe the behaviour of financial returns; it is often assumed that these financial returns are normally distributed. However, empirical research provides evidence that empirical distributions of financial returns often have fatter tails than implied by the normality assumption; thus, large financial returns are more likely than the normal distribution implies. Such extremes can have a devastating impact upon economic wealth and the stability of financial system. Naturally, financial managers and regulators are increasingly interested in assessing probabilities of such events. Investigating the empirical distributions of financial returns and in particular those characteristics related to the magnitude and frequency of extreme returns is therefore of vital importance. Just as the normal distribution proves to be the important limiting distribution for sample sums or averages, as is made explicit in the central limit theorem, another family of distributions proves important in the study of the limiting behaviour of sample extrema. This is the family of extreme value distributions. From a practical point of view, the distribution of financial returns forms an important input to risk measurement models such as Value-at-Risk (VaR). VaR is usually defined as the maximum potential loss that a portfolio of assets can suffer within a fixed confidence level during a holding period. However, evidence suggests that current VaR estimates are inadequate since they do not model the tails of a portfolio's return distribution realistically and incorrectly assess the probability of extreme events. Traditional VaR models tend to ignore extreme events and instead focus on modelling the entire empirical distribution of returns. The danger is that such risk models are prone to fail just when they are needed the most – in large market moves, when largest losses occur. Estimation of risk associated with rare events with limited data is inevitably problematic, and these difficulties increase as the events concerned become rarer. Inference about the extreme tails is

always uncertain, because of low number of observations and sensitivity to the values of individual extreme observations. The key to estimating the distribution of extreme events is the extreme value theorem (EVT), which governs the distribution of extreme values, and shows how this distribution looks like in the limit, as the sample size increases. By definition, extreme events are rare, meaning that their estimates are often required for levels of a process that are greater that those in the available data set. This implies an extrapolation from observed levels to unobserved levels and extreme value theory provides a class of models to enable such extrapolation. In lieu of an empirical basis, asymptotic argument is used to generate EVT models. It is important to be aware of the limitations implied by the adoption of the extreme value paradigm. EVT models are developed using asymptotic arguments, which should be kept in mind when applying them to finite samples. EVT models are derived under idealized circumstances, which need not be true for a process being modelled. EVT models were primarily used in the field of civil engineering; engineers are required to design their structures to withstand the forces that might be reasonable to expect but are rarely experienced. Another standard field of application of EVT is hydrology, where engineers have long struggled with the question of how high dams, sea-walls and dikes should be to contain the probabilities of floods within reasonable limits. They have to do their calculations with even fewer observations than financial risk practitioners, and their quantile estimates are typically well out of the range of their sample data. Today EVT is also used in traffic predictions in the telecommunications, alloy strength predictions, ocean wave modelling, thermodynamics of earthquakes, memory cell failure and many other fields. Even though extreme value theory has previously found large applicability in climatology and hydrology, there have also been a number of extreme value studies in the finance literature in recent years. de Haan, Jansen, Koedijk, and de Vries (1994) study the quantile estimation using extreme value theory. McNeil (1998) studies the estimation of the tails of loss severity distributions and the estimation of the quantile risk measures for financial time series using extreme value theory. Embrechts et. al. (1998) overview the extreme value theory as a risk management tool. Embrechts (2000) studies the potentials and limitations of the extreme value theory. McNeil and Frey (2000) study the estimation of tail-related risk measures for heteroskedastic financial time series. Gencay et. al. (2003) compare the performance of unconditional EVT to those of other methods like GARCH, VCV and Historical simulation. They find that GARCH and GPD models are preferable for most quantiles. Gencay and Selcuk (2004) use VCV, Historical simulation and unconditional EVT model to calculate and compare VaR estimates in emerging markets. While having mixed results at the usual 99% level EVT model is found to be more accurate at higher quantiles. Maghyereh, Al-Zoubi (2006) investigate performance of a range of models, including EVT, to estimate VaR in seven Middle East and North Africa countries. Unconditional EVT model was again among top ranking models but skewed-t APARCH model was found to perform better in some cases.

Measuring of market risk on Croatian Zagreb Stock Exchange (ZSE) has not been as extensively studied. Žiković (2006) analyses the benefits of using time weighted (BRW) simulation and obtains much better results than by using plain historical simulation. Jurun et. al. (2007) conclude that using assumption of heavy tailed distribution, such as Student's t-distribution in GARCH model, it is possible to forecast market risk much more precisely than under normality assumption. Žiković (2007a, b) tests a wide range of VaR models on transitional markets of 2004 and 2007 EU new member states as well as Croatia and concludes that traditional VaR models are incapable of providing adequate risk coverage specified under Basel 2 rules.

The aim of this paper is, firstly, to identify the asymptotic distribution of extreme positive and negative daily returns for the Zagreb Stock Exchange (ZSE) index (CROBEX) over the period 2000 to 2009 by employing extreme value theory. Secondly, the aim is to investigate the relative performance of a wide array of VaR models on CROBEX index during the period of increased market stress, for both long and short trading positions. All of the above mentioned studies as well as the great majority of risk related studies in general measure VaR only for long trading positions. To the best of our knowledge this is the first paper that measures the risk for an emerging country taking into account both long and short trading positions. This is also the first study of asymptotic distribution of tails for the emerging country stock index. We also introduce extreme value theory to VaR calculation on Croatian financial market. Besides testing the performance of unconditional extreme value model on an emerging market which is not a novelty we introduce a conditional extreme value model and test its performance. The rest of the paper is organised as follows: Section 2 presents a theoretical background on extreme value theory and extreme value VaR estimation. Section 3 presents a description of the data and tail fitting results. In section 4 VaR backtesting results are presented and their implications discussed. Finally, section 5 summarizes our main findings.

2. EXTREME VALUE THEORY

Presuming n observations of P&L time series, if X is IID drawn from some unknown distribution $F(x) = P(X \leq x)$, estimating extreme value (EV) VaR posses a significant problem because the distribution $F(x)$ is unknown. Help comes from Fisher-Tippett theorem (1928), which can be considered to have the same status in EVT as the central limit theorem has in the study of sums. The theorem describes the limiting behaviour of appropriately normalised sample maxima. We denote the maximum of the first n observations by $M_n = max(X_1, ..., X_n)$. Assuming that we can find sequences of real numbers $a_n > 0$ and b_n such that $(M_n - b_n)/a_n$ the sequence of normalized maxima, converges in distribution:

$$P\{(M_n - b_n)/a_n \leq x\} = F^n(a_n x + b_n) \xrightarrow[n \to \infty]{} H(x) \tag{1}$$

for some non-degenerate distribution function $H(x)$. If this condition holds we say that F is in the maximum domain of attraction of H: $F \in MDA(H)$. It was shown by Fisher & Tippett (1928) that:

$$F \in MDA(H) \Rightarrow H \text{ is of the type } H_\xi \text{ for some } \xi.$$

Thus, if we know that suitably normalized maxima converge in distribution, then the limit distribution must be an extreme value distribution. It shows that as n gets large the distribution of tail of X converges to the generalized extreme value distribution (GEV):

$$H_{\mu,\sigma,\xi}(x) = \begin{vmatrix} \exp\left(-[1 + \xi(x-\mu)/\sigma]^{-1/\xi}\right) \\ \exp\left(-e^{-(x-\mu)/\sigma}\right) \end{vmatrix} \quad if \quad \begin{matrix} \xi \neq 0 \\ \xi = 0 \end{matrix} \tag{2}$$

where x satisfies the condition $1 + \xi(x-\mu)/\sigma > 0$. GEV distribution has three parameters: location parameter (μ), which is a measure of central tendency, scale parameter (σ), which is a measure of dispersion and tail index (ξ), which is a measure of the shape of the tail. GEV distribution has three special cases:

- If $\xi > 0$, GEV distribution becomes a Fréchet distribution, meaning that *F(x)* is leptokurtotic.

- If $\xi = 0$, GEV distribution becomes a Gumbel distribution, meaning that *F(x)* has normal kurtosis.

- If $\xi < 0$, GEV distribution becomes a Weibull distribution, meaning that *F(x)* is platokurtotic, which is usually not the case with financial data.

Mean and variance are related to location and scale parameters of GEV distribution as follows:

$$Mean = \mu + \left[\frac{\Gamma(1-\xi)-1}{\xi}\right]\sigma \quad \xrightarrow{\xi \to 0} \quad \mu + 0{,}577216\sigma \tag{3}$$

$$Variance = \left[\frac{\Gamma(1-2\xi)-\Gamma^2(1-\xi)}{\xi^2}\right]\sigma^2 \quad \xrightarrow{\xi \to 0} \quad \frac{\pi^2}{6}\sigma^2 \tag{4}$$

It is easy to obtain mean and variance from μ and σ, but one must be careful not to confuse the two since they differ significantly. Quantiles of GEV distribution can be obtained by taking log of equation (2):

$$\log(cl) = \begin{cases} -\left(1+\xi(x-\mu)/\sigma\right)^{-1/\xi} & if \quad \xi \neq 0 \\ -\exp(-(x-\mu)/\sigma) & \xi = 0 \end{cases} \tag{5}$$

Value of *x* is than calculated to get the quantiles or VaRs associated with a desired confidence level (*cl*). EV VaR is calculated as:

$$VaR_{cl} = \mu - \frac{\sigma}{\xi}\left[1-(-\log(cl))^{-\xi}\right] \qquad \text{(Fréchet VaR, } \xi > 0\text{)} \tag{6}$$

$$VaR_{cl} = \mu - \sigma \log\left[\log(1/cl)\right] \qquad \text{(Gumbel VaR, } \xi = 0\text{)} \tag{7}$$

The Fisher-Tippett theorem tells us that fitting of the GEV distribution should be done on data on sample maxima. Although this is not a problem when dealing with hydrology or meteorology it might present a serious problem when dealing with financial data. Using only sample maxima would lead to serious waste of information. Since there is only one maxima in any sample period we are disregarding all other extreme events and thus limiting our data set. For this reason the most widely accepted method of using EVT in finance is based on modelling the behaviour of extreme values above a high threshold. This method is usually named peaks over threshold approach (POT). POT approach extracts extremes from a sample by taking the exceedances over a predetermined threshold *u*. An exceedance of the threshold *u* occurs when a realization is higher than the threshold, $X_t > u$ for any *t* in *t* = 1, 2,..., *n*. An excess over *u* is defined by $y = X_i - u$. Provided a high threshold *u*, the probability distribution of excess values of *X* over threshold *u* can be defined as:

$$F_u(y) = P(X - u \leq y \mid X > u) \tag{8}$$

which represents the probability that the value of X exceeds the threshold u by at most an amount y given that X exceeds the threshold u. The excess distribution above the threshold u as the conditional probability can be defined as:

$$F_u(y) = \frac{P(X - u \leq y \mid X > u)}{P(X > u)} = \frac{F(y+u) - F(u)}{1 - F(u)}, \quad y > 0 \tag{9}$$

Balkema, de Haan (1974) show that under MDA conditions given in equation (1) the generalised Pareto distribution (GPD) is the limiting distribution for the distribution of the excesses, as the threshold tends to the right endpoint. A positive measurable function $\sigma(u)$ can be found such that:

$$\lim_{u \uparrow \infty} \sup_{0 \leq x \leq \infty} \left| F_u(x) - G_{\xi,\sigma(u)}(x) \right| = 0 \quad \text{iff} \quad F \in MDA(H_\xi)$$

This theorem suggests that for sufficiently high threshold u, the distribution function of the excess observations may be approximated by the GPD. Since $x = y + u$ for all excedances, the following representation holds provided that $X > u$:

$$F(x) = [1 - F(u)]F_u(y) + F(u) \tag{10}$$

As the threshold u gets larger, the excess distribution $F_u(y)$ converges in limit to the GPD, which is defined as:

$$G_{\xi,\sigma,\mu}(x) = \begin{cases} 1 - \left(1 + \xi\dfrac{x-\mu}{\sigma}\right)^{-\frac{1}{\xi}} & if \quad \xi \neq 0 \\ 1 - e^{-(x-\mu)/\sigma} & if \quad \xi = 0 \end{cases} \tag{11}$$

$$x \in \begin{cases} [\mu, \infty] & if \quad \xi \geq 0 \\ [\mu, \mu - \sigma/\xi] & if \quad \xi < 0 \end{cases}$$

where ξ is the shape parameter, σ is the scale parameter, and μ is the location parameter. The relationship between the standard GDP $G_\xi(x)$ and GEV $H_\xi(x)$ is simple, such that:

$$G_\xi(x) = 1 + log\, H_\xi(x) \quad if \quad log\, H_\xi(x) > -1$$

When $\mu = 0$ and $\sigma = 1$, the representation is known as the standard GPD. The GPD embeds a number of other distributions. When $\xi > 0$, F is in the Fréchet family and $H_{\xi,\beta(u)}$ is ordinary Pareto distribution. This representation is the most relevant for financial time series analysis since they are usually characterized by heavy tails. For $\xi > 0$, $E[X^k]$ is infinite for $k > 1/\xi$. The number of finite moments is ascertained by the value of ξ: if $0.25 \leq \xi \leq 0.5$ the second and higher moments are infinite; if $\xi \leq 0.25$, the fourth and higher moments are infinite, and so forth. When $\xi = 0$, the F is in the Gumbel family and $H_{\xi,\beta(u)}$ is an exponential distribution and, if $\xi < 0$, F is in the Weibull family and $H_{\xi,\beta(u)}$ is a Pareto type II distribution.

In order to estimate the tails of the loss distribution, the result that, for a sufficiently high threshold u, $F_u(y) \approx G_{\xi,\beta(u)}(y)$ is used. An approximation of $F(x)$, for $X > u$, can be obtained from equation (10):

$$F(x) = [1 - F(u)]G_{\xi,\sigma,u}(x-u) + F(u) \tag{12}$$

An estimate of *F(u)* can be obtained non-parametrically by means of the empirical cdf:

$$\hat{F}(u) = (n-k)/n \tag{13}$$

where *k* represents the number of exceedences over the threshold *u* and *n* number of observations. By substituting equation (12) into equation (13), the following estimate for *F(x)* is obtained:

$$\hat{F}(x) = 1 - \frac{k}{n}\left(1 + \hat{\xi}\frac{x-u}{\hat{\sigma}}\right)^{-\frac{1}{\xi}} \quad \text{provided that } G_{\xi,\sigma,u}(x) = 1 - \left(1 + \xi\frac{x-u}{\sigma}\right)^{-\frac{1}{\xi}} \tag{14}$$

Where $\hat{\xi}$ and $\hat{\sigma}$ are the maximum likelihood estimators of ξ and σ. This equation can be inverted to obtain a quantile of the underlying distribution, which is actually VaR. For *cl* ≥ *F(u)* VaR is calculated as:

$$VaR_{cl} = q_{cl}(F) = u + \frac{\sigma}{\xi}\left(\left(\frac{1-cl}{\overline{F}(u)}\right)^{-\xi} - 1\right) = u + \frac{\sigma}{\xi}\left(\left(\frac{1-cl}{k/n}\right)^{-\xi} - 1\right) \tag{15}$$

To remedy the problems of unconditional estimation that is traditional in EVT McNeil and Frey (2000) developed a conditional quantile EVT approach under the assumption that the tail of the conditional distribution of the GARCH is approximated by a heavy-tailed distribution. They underline the conditional quantile problem and apply EVT to the conditional return distribution by using a two-stage method, which combines GARCH model with EVT in applying the residuals from the GARCH process. McNeil, Frey (2000) conditional extreme value (EVT-GARCH) VaR can be written as:

$$VaR_{(cl)} = \mu_{t+1} + \sigma_{t+1}VaR(Z)_{cl} \tag{16}$$

$$r_t = \mu_t + \sigma_t Z_t$$

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{q}\alpha_i\varepsilon_{t-i}^2 + \sum_{i=1}^{p}\beta_i\sigma_{t-i}^2$$

$$Z = \left(\frac{x_{t-n+1} - \mu_{t-n+1}}{\sigma_{t-n+1}}, ..., \frac{x_t - \mu_t}{\sigma_t}\right)$$

$$VaR(Z)_{cl} = u_Z + \frac{\sigma_Z}{\xi_Z}\left(\left(\frac{1-cl}{\overline{F}(u_Z)}\right)^{-\xi_Z} - 1\right)$$

3. DATA ANALYSIS AND BEHAVIOUR OF THE TAILS

CROBEX index data set is composed of 2,183 daily returns, which are collected for the period of nine years, 04.01.2000 - 05.01.2009, including the latest financial crisis and its' effects on global stock markets. To secure an adequate out-of-the-sample VaR backtesting period the out-of-the-sample data is formed by taking out 1,000 of the latest observations

from the series. The rest of the observations are used as presample observations needed for VaR starting values and volatility calibration. The calculated VaR figures are for a 1-day ahead horizon at 99, 99.5 and 99.9 percent confidence levels. VaR models that are tested in this paper are: Normal simple moving average (VCV) VaR, RiskMetrics, Historical simulation with rolling windows of 100, 250 and 500 days, BRW (time weighted) simulation with decay factors of 0.97 and 0.99, GARCH parametric model, unconditional EVT approach using GPD and McNeil, Frey (2000) conditional EVT approach.

Table 1 gives a summary of descriptive statistics and normality test for the entire sample and out-of-the-sample daily log returns.

Table 1 - Summary descriptive statistics for CROBEX returns in the period 04.01.2000 – 05.01.2009 and subperiod 24.11.2004 - 05.01.2009

CROBEX	04.01.2000 - 05.01.2009	25.11.2004 - 05.01.2009
Descriptive statistics		
Mean	0,00039	0,00015
Median	0,00037	0,00067
Minimum	-0,10764	-0,10764
Maximum	0,14979	0,14779
St.Dev.	0,01565	0,01596
Skewness	0,34783	-0,04143
Kurtosis	17,61	16,89
Normality tests		
Lilliefors	19.462,05	8.047,14
(p value)	0,00	0,00
Shapiro Wilk/Francia	0,108	0,126
(p value)	0,00	0,00
Jarque-Bera	0,846	0,839
(p value)	0,00	0,00
Unit Root tests		
ADF (AR + drift)	-33,53	-21,76
P-P (AR + drift)	-45,62	-28,23

Source: Authors' calculation

Skewness and excess kurtosis of the series for both periods are significantly different from zero. The distribution of CROBEX returns is skewed and has far fatter tails than assumed under normality. In the sub-period of the latest 1,000 days up to the beginning of 2009 a difference from the entire period is visible in the value of skewness which switched from positive to negative. This significant change can be attributed to the global financial crisis and severe market crashes during 2008. In line with the characteristics of the moments of the series normality tests confirm that the daily CROBEX returns are far from being normally distributed. Ljung-Box, ACF, PACF and Engle's ARCH test show that there is significant autocorrelation and ARCH effects present in CROBEX daily returns i.e. volatility tends to cluster together (periods of low volatility are followed by further periods of low volatility and vice versa), meaning that the CROBEX returns are not IID. These findings are troubling for VaR models based on normality assumption, as well as for the nonparametric and semi-parametric approaches that are based on IID assumption, such as historical simulation and BRW approach. Since elementary assumptions of such VaR models are not satisfied, VaR figures obtained for such models cannot be trusted. By modelling the series as an ARMA(1,1)-GARCH(1,1)-t process we managed to remove autocorrelation and heteroskedasticity from the data making the innovations of the process IID.

To find which distribution provides the best fit to tails of CROBEX returns we fit fat tailed, positively skewed distributions: lognormal, gamma, inverse Gaussian (IG) and generalized Pareto (GPD), along with exponential distribution as a benchmark, to the empirical tails. As stated earlier EVT methods are applicable over a high threshold with the most problematic element being the choice of the suitable threshold. By setting the threshold too high we are left with only a few data points and increase parameter uncertainty. By setting the threshold too low we are losing the theoretical justification for the application of extreme value theory. We fit the selected fat tailed distributions to 2.5% left and right tail of the return distribution. Distributions are fitted using maximum likelihood estimation. The results of parameter estimation with standard errors given in parenthesis are presented in Table 2.

Table 2 – Maximum likelihood parameter estimates and standard errors for the tested distributions

Negative returns					
Distribution	Lognormal	Exponential	Gamma	IG	GPD
Parameters	$\mu = -3.09$	$\mu = 0.0489$	$a = 7.115$	$\mu = 0.0488$	$\xi = -0.044$
	(0.049)	(0.0064)	(1.303)	(0.0025)	(0.207)
	$\sigma = 0.373$		$b = 0.0069$	$\lambda = 0.337$	$\sigma = 0.021$
	(0.035)		(0.0013)	(0.063)	(0.005)
					$k = -0.029$
Log likelihood	151,96	115,03	149,84	152,35	166,02
Positive returns					
Distribution	Lognormal	Exponential	Gamma	IG	GPD
Parameters	$\mu = -3.138$	$\mu = 0.0476$	$a = 5.570$	$\mu = 0.0476$	$\xi = 0.288$
	(0.052)	(0.0062)	(1.005)	(0.0026)	(0.180)
	$\sigma = 0.397$		$b = 0.0085$	$\lambda = 0.278$	$\sigma = 0.014$
	(0.037)		(0.0016)	(0.052)	(0.003)
					$k = 0.0285$
Log likelihood	153,73	118,64	147,78	153,56	172,24

Source: Authors' calculation

For both left and right tail (long and short trading positions), GPD provides the best fit in the tail followed by the lognormal and inverse Gaussian distribution. The exponential distribution that was used as a benchmark does not provide a close fit to the tail regions of the distribution. Right tail of the distribution belongs to Fréchet domain of attraction and it does not even have a finite fourth moment since the estimated tail index is greater than 0.25. The left tail is not significantly different from zero implying that it has a medium tail belonging to Gumbel domain of attraction. The two distributions providing the best fit to the empirical left and right tails, along with the worst fit - exponential distribution are plotted in figures 1 and 2. We use the three parameter form of the GPD with the location parameter set to the threshold value.
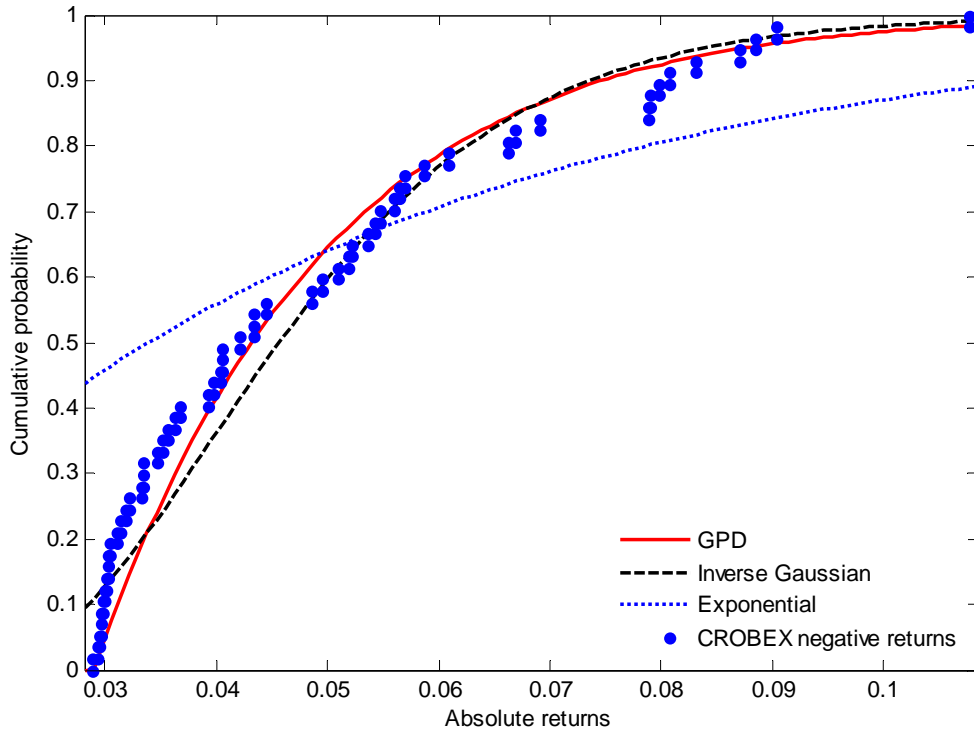
Figure 1 - Performance of GPD, inverse Gaussian and exponential distribution compared to empirical 2.5% left tail of CROBEX returns
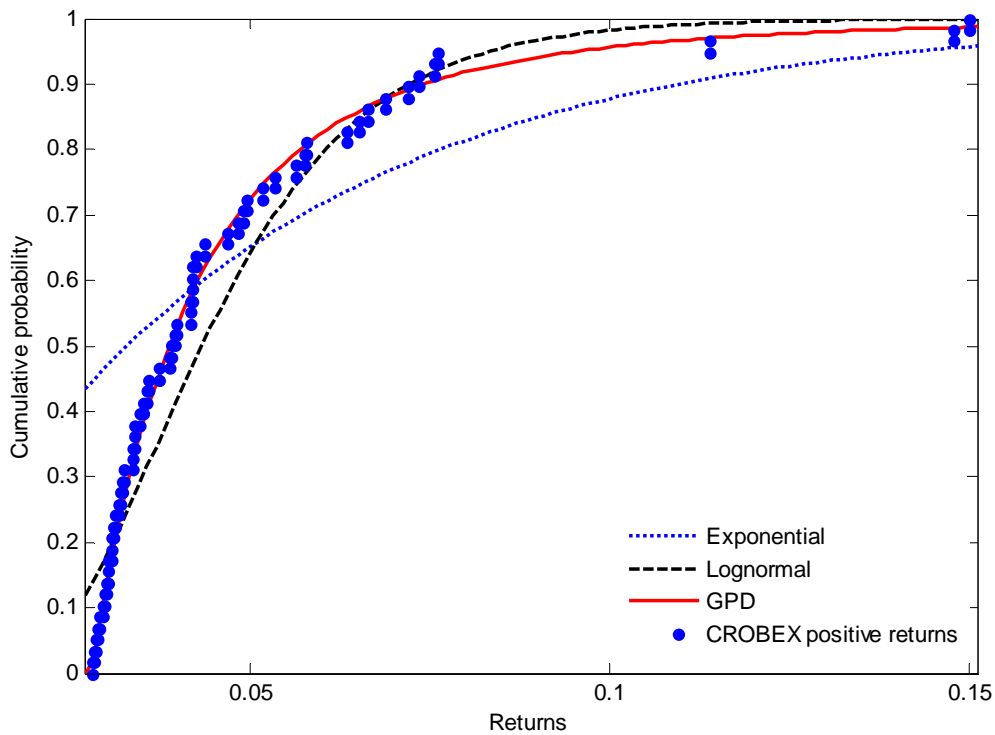Source: Authors' calculation

Figure 2 - Performance of GPD, lognormal and exponential distribution compared to empirical 2.5% right tail of CROBEX returns
Source: Authors' calculation

Besides providing the best fit to the empirical 2.5% tails GPD has solid foundations in the mathematical theory of the behaviour of extremes and as such does not simply represent ad hoc curve fitting. It is possible that by trial and error, some other distribution can be found which fits the analysed tail data even better. Such a case can be found in Burneckia, Kukla, Weron (2000), where they find that for property claim services (PCS) indices lognormal distribution is superior to GPD in the tail region. One should keep in mind that such a distribution is an arbitrary choice, without any mathematical justification, and extrapolating beyond the available data set would be highly questionable.

To estimate EVT risk measures it is necessary to estimate EVT parameters – μ, σ, and in the case of Fréchet distribution the tail index (ξ). Estimation of the tail index is the most problematic element of EVT estimation. As a first step before model fitting is undertaken, a number of exploratory graphical methods can be used to obtain preliminary information about the tails of the data. In statistics, a quantile-quantile (QQ) plot is a convenient visual tool to examine whether a sample comes from a specific distribution. Specifically, the quantiles of an empirical distribution are plotted against the quantiles of a hypothesized distribution. If the sample comes from the hypothesized distribution or a linear transformation of the hypothesized distribution, the QQ plot is linear. The QQ-plot against the exponential distribution (distribution with a medium-sized tail) is a very useful instrument in identifying heavy tails. If the analysed data is from an exponential distribution, the points on the graph would lie along a straight line. If there is a concave presence, this would indicate a fat tailed distribution, whereas a convex departure is an indication of short tailed distribution. There are also other purely graphical techniques, such as mean excess function plot that can be used in identifying the shape of the tail (see McNeil (1998) for more details).
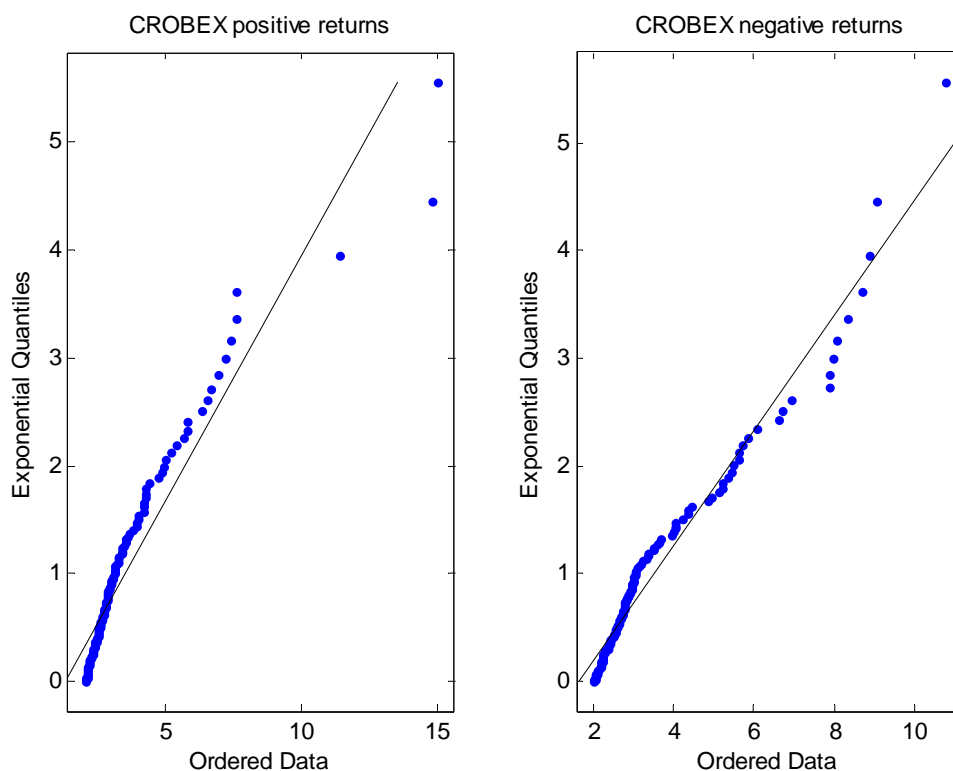
Figure 3 – QQ plot of CROBEX positive and negative returns against exponential distribution
Source: Authors' calculation

In case of positive returns there is clear evidence of concave shape for observations above the 3% threshold. For negative returns the results are more ambiguous and it would be hard to come to any confident conclusion.

Embrechts et al. (1997) suggests determining the tail index of the distribution via Hill estimator:

$$\hat{\xi}_{n,k}^{(H)} = k^{-1} \sum_{j=1}^{k} \ln X_{j,n} - \ln X_{k+1,n} \tag{17}$$

where k, the tail threshold used in the Hill estimation has to be chosen arbitrarily, which is a major source of problems in practice. The Hill estimator is the average of the k most extreme observations, minus $(k+1)$th observation, which is next to the tail.
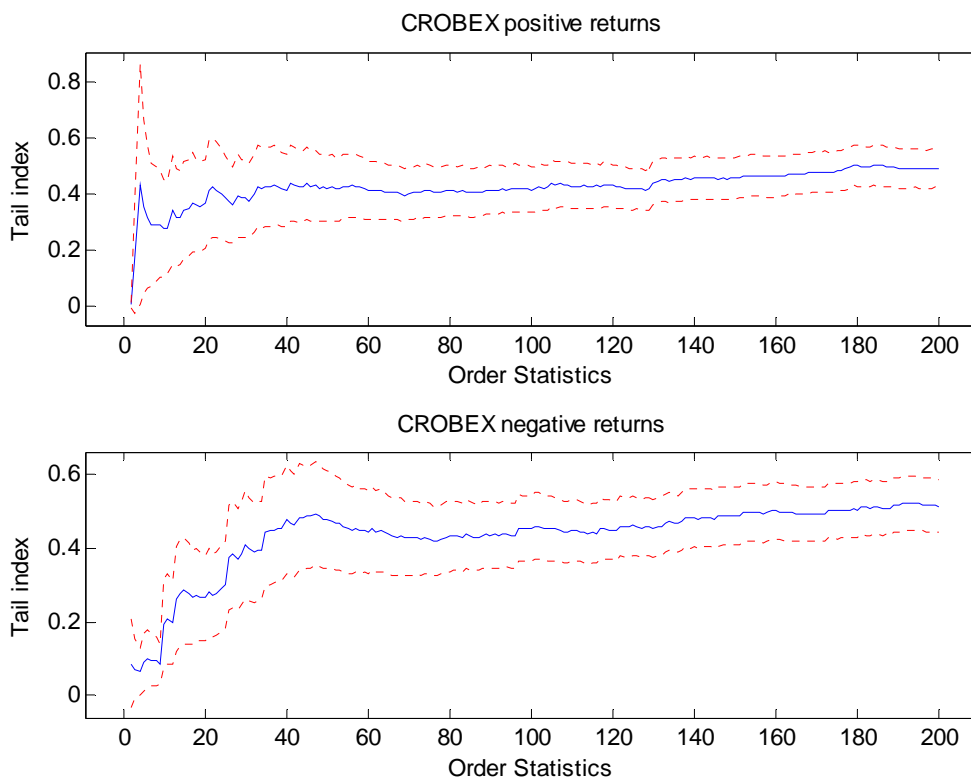
Figure 4 – Hill estimates of tail index against the k upper order statistics (number of exceedances) with 95% confidence intervals
Source: Authors' calculation

In Figure 4 we fitted GPD models with different thresholds to obtain maximum likelihood estimates of tail index, as well as asymptotic confidence intervals for the parameter estimates. In choosing an optimal threshold we are confronted with a bias-variance trade off. A threshold is selected from the plot where the tail index is fairly stable. In this paper we opted for a purely statistical approach to threshold estimation where the value of threshold has been chosen as the value which minimizes Anderson-Darling statistic as proposed by Coronel-Brizio and Hernandez-Montoya (2005). The use of Anderson-Darling statistic is due to the fact that the corresponding weighting function puts more weight in the tails of the distribution. Under the assumption that a tail of the distribution follows a Pareto law, the asymptotic distribution of Anderson-Darling statistic is known and we can use this distribution as a reference to determine an estimate of the cut off using a statistical approach.

Although we use maximum likelihood method for fitting the generalized Pareto distribution to excesses data over a high threshold other methods such as the method of probability weighted moments can be used. In plotting the Hill estimator as well as Anderson-Darling maximum likelihood estimation of GPD parameters we choose to end the plot at the third order statistic, thus omitting two most extreme observations since they significantly differ from the rest of the sample and may be treated as erratic.

Table 3 - Maximum likelihood estimates of GPD tail index and scale parameter, threshold based on Anderson-Darling statistic

	Positive returns			Negative returns		
	estimate	se	threshold value	estimate	se	threshold value
Tail index	0,1209	0,1488	2,3441	0,2179	0,1665	2,3656
Sigma	1,1215	0,2040		1,1629	0,2276	

Source: Authors' calculation

The exclusion of the two most extreme positive and negative observations along with the use of Anderson-Darling statistic made a huge difference to parameter estimation compared to full sample ad hoc 2.5 and 97.5 quantile estimation. Truncated series of extreme losses with Anderson-Darling threshold has a higher tail index i.e. is more extreme than a series of positive extremes. Both positive and negative truncated extremes are significantly different from zero i.e. fat tailed, putting them both in Fréchet domain of attraction. Modelling of high quantiles for such a distribution with light or middle tail distributions such as: normal, exponential, gamma or lognormal, would result in serious underprediction of risk. High value of the estimated tail index for both tails makes CROBEX index a good candidate for EVT VaR models as it indicates that Croatian stock market experienced extreme gains and crashes over the recent period.

4. BACKTESTING RESULTS

In this section the backtesting results for eleven VaR models are presented and their performance is analysed according to different criteria. Performance of each VaR model is evaluated separately for long and short position in the CROBEX index, based on several performance tests. Overall summary results are very useful to see how tested VaR model fare with standard backtesting framework based on the complete testing sample. Kupiec test and Christoffersen independence test are used to identifying VaR models that are acceptable to regulators, and actually provide the desired level of safety both to individual investors and regulators. It often happens that more than one VaR model is deemed adequate and the problem of ranking the models arises. To overcome this shortcoming of the backtesting measures forecast evaluation can be used, such as Lopez size-adjusted loss function. A loss function can allow for the sizes of tail losses to influence the final rating of VaR model. VaR model that generates higher tail losses would generate higher values under this size adjusted loss function than a VaR model that generates lower tail losses, ceteris paribus.

Kupiec and Christoffersen independence (IND) test backtesting results, at 5% significance level, for tested VaR models at 95, 99, 99.5 and 99.9% confidence levels are presented in tables 4 and 5.

Table 4 - Kupiec test backtesting results at 99, 99.5 and 99.9% confidence levels, period 24.11.2004 - 05.01.2009

VaR models	Positive returns			Negative returns		
	99%	99,5%	99,9%	99%	99,5%	99,9%
HS 100						
HS 250						
HS 500						
BRW λ=0,97						
BRW λ=0,99						
Normal VCV						
RiskMetrics						
GARCH						
EVT GARCH	+	+	+	+	+	+
GPD	+	+	+	+	+	+

Grey areas mark the VaR models that satisfy Kupiec test for positive/negative CROBEX returns and selected confidence level, at 5% significance level.
Source: Authors' calculation

Table 5 - Christoffersen independence (IND) test backtesting results at 99, 99.5 and 99.9% confidence levels, period 24.11.2004 - 05.01.2009

VaR models	Positive returns			Negative returns		
	99%	99,5%	99,9%	99%	99,5%	99,9%
HS 100						
HS 250		+	+			+
HS 500	+	+	+			
BRW λ=0,97						+
BRW λ=0,99		+	+			
Normal VCV			+		+	
RiskMetrics						+
GARCH	+	+	+	+	+	+
EVT GARCH	+	+	+	+	+	+
GPD	+	+	+	+	+	+

Grey areas mark the VaR models that satisfy Christoffersen IND test for positive/negative CROBEX returns and selected confidence level, at 5% significance level.
Source: Authors' calculation

Backtesting results for both long and short trading position in CROBEX index are equally disappointing. With the exception of EVT models none of the tested VaR models provides adequate risk coverage for any of the tested high quantiles. Besides satisfying the basic Basel criteria – the Kupiec test, EVT models also satisfy the independence criteria i.e. EVT VaR errors do not bunch together making them IID. Although independence of VaR errors is not required under Basel rules, in practice it is of vital importance. Dependence of VaR errors i.e. their bunching is crucial for the stability of an institutional investor since bunched VaR errors can erase capital reserves much faster than slight underestimation of risk. Out of the widely used VaR models, GARCH is the only model that, although providing falsely optimistic risk estimates, yields independent VaR forecasts for both long and short positions at all of the tested quantiles. Historical simulation model with observation period of 500 days (HS 500) satisfied Christoffersen independence test only for short position while completely failing the test for long trading position. All other models besides failing the basic Kupiec test also failed the independence test. These characteristics make non EVT VaR models extremely dangerous if relied upon by investors and risk managers since they pose a dual treat – they are providing overly optimistic risk forecasts and at the same time their VaR forecast errors are dependent. Taking into account the length of the backtesting period and consistency of results we can confidently conclude that when including into the backtesting period the global financial crisis, only conditional and unconditional EVT models perform satisfactory, while other, widespread VaR models tend to seriously underpredict the true level of risk in Croatian market.

Besides providing adequate risk coverage a good VaR model has to yield forecasts as close as possible to the true level of risk. An ideal model would neither under or overstates the true level of risk. A risk measure that would satisfy the Kupiec test but yield excessively high risk forecasts is unacceptable by any investor since it would require unnecessary high reserves. By employing Lopez test and calculating average VaR values we identify which VaR model gives the closest fit to the true level of risk and as such is the most acceptable by investors. The results are presented in table 6.

Table 6 - Lopez test ranking and average VaR values of competing VaR models, period 24.11.2004 - 05.01.2009

Lopez test	Positive returns			Negative returns		
	99%	99,5%	99,9%	99%	99,5%	99,9%
HS 100	12,33	11,27	15,22	20,27	15,20	17,17
HS 250	14,32	10,23	8,16	15,28	13,18	10,10
HS 500	10,38	8,26	4,14	16,38	11,23	9,10
BRW λ=0,97	10,26	11,20	10,15	12,18	12,13	9,07
BRW λ=0,99	7,23	5,16	6,13	11,17	6,08	4,04
Normal VCV	23,39	20,31	10,20	21,37	15,29	12,18
RiskMetrics	12,27	14,22	12,14	11,25	12,19	9,09
GARCH	10,16	8,11	4,06	5,13**	6,09	3,03
EVT GARCH	-4,95	-1,97**	1,02	-5,96	-2,98**	0,00**
GPD	-4,92**	-2,97	-1,00**	-8,98	-5,00	-1,00
Average VaR (%)	99%	99,5%	99,9%	99%	99,5%	99,9%
EVT GARCH	4,03	4,42	5,19	4,15	4,81	6,39
GPD	6,83	8,24	12,01	9,11	11,47	18,55

** marks VaR model with the lowest Lopez value i.e. smallest deviation from expected number of failures
Source: Authors' calculation

For short trading position EVT models yield the lowest Lopez size adjusted score, making them, by this criterion, the best VaR models since they minimises the deviation between recorded and expected VaR failure rate. Although Lopez test favours the unconditional GPD EVT model average VaR values show that conditional EVT GARCH model yields similar results to GPD model but giving approximately 50% lower VaR forecasts.

For long trading position at 99% confidence level GARCH-t model yielded the lowest Lopez test value but failed to satisfy the Kupiec test. Absolute deviation of EVT models from the expected value is higher but they err on the conservative side making them acceptable. For higher quantiles conditional EVT GARCH model yielded the lowest Lopez test values. Similarly to shot trading position the average VaR difference between the only two models that passed the Kupiec and independence test is very high. EVT GARCH VaR forecasts are again over 50% lower than for the unconditional version.

5. CONCLUSION

We find that both theoretically and empirically generalised Pareto distribution fits the extreme tails of CROBEX index return distribution better than any other tested fat or medium tailed tested distribution. It could happen that by trial and error, some other distribution can be found which fits the analysed tail data even better. One should keep in mind that such a distribution is an arbitrary choice, without any mathematical justification, and extrapolating beyond the available data set would be highly questionable.

Our VaR backtesting results for long positions are similar to Gencay et. al. (2003), Gencay and Selcuk (2004) and Žiković (2007a, b) for emerging markets but are even more disappointing for the widely used VaR models. Such results can naturally be attributed to the ongoing global financial crisis which is included in the backtesting period. Both simpler and more sophisticated VaR models consistently fail their task, for both long and short trading positions, with none of the models giving adequate risk coverage at any of the tested quantile. We can safely conclude that widespread VaR model should not be used for risk measurement purposes at high quantiles in case of the CROBEX index. Usually employed models provide

investors and risk managers in the Croatian market with falsely optimistic information about the true levels of risk they are exposed to. Taking into account the length of the backtesting period and consistency of results we can confidently conclude that when including into the backtesting period the global financial crisis, only conditional and unconditional EVT models perform satisfactory. The performance of the two EVT models with regards to minimising the deviation from the expected number of VaR exceedances is similar but the real difference can be seen in the average VaR values they yield. Conditional EVT GARCH models yields approximately 50% lower VaR forecasts than the unconditional GPD, making it a preferable model for any investor.

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APPENDIX

Table A1 - Backtesting results for VaR forecasts (CROBEX index, cl = 0.99, period 1,000 days: 24.11.2004 - 05.01.2009)

Negative returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	30	25	26	22	21	31	21	15	4	1
Frequency of failures	0,03	0,025	0,026	0,022	0,021	0,031	0,021	0,015	0,004	0,001
Kupiec test (p value)	0,000	0,000	0,000	0,000	0,001	0,000	0,001	0,048	0,971	1,000
Christoffersen UC test (p)	0,000	0,000	0,000	0,001	0,002	0,000	0,002	0,139	0,030	0,000
Christoffersen IND test (p)	0,011	0,003	0,004	0,011	0,008	0,002	0,008	0,499	0,858	0,964
Christoffersen CC test (p)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,266	0,094	0,001
Lopez test	20,274	15,276	16,375	12,181	11,173	21,372	11,249	5,125	-5,959	-8,983
Blanco-Ihle test	9,781	8,415	11,573	7,078	5,253	11,449	8,583	4,353	1,058	0,181
RMSE	0,031	0,030	0,028	0,037	0,035	0,026	0,033	0,035	0,001	0,003
MAPE	1,817	1,805	2,009	1,219	1,485	2,208	1,432	0,987	0,733	0,936
Average VaR (%)	2,76	2,83	2,82	3,33	3,22	2,58	2,89	3,16	4,15	9,11

Positive returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	22	24	20	20	17	33	22	20	5	5
Frequency of failures	0,022	0,024	0,02	0,02	0,017	0,033	0,022	0,02	0,005	0,005
Kupiec test (p value)	0,000	0,000	0,001	0,001	0,014	0,000	0,000	0,001	0,934	0,934
Christoffersen UC test (p)	0,001	0,000	0,005	0,005	0,043	0,000	0,001	0,005	0,079	0,079
Christoffersen IND test (p)	0,011	0,018	0,413	0,006	0,031	0,023	0,001	0,366	0,823	0,016
Christoffersen CC test (p)	0,000	0,000	0,014	0,000	0,012	0,000	0,000	0,013	0,208	0,012
Lopez test	12,327	14,321	10,376	10,261	7,233	23,391	12,274	10,162	-4,953	-4,924
Blanco-Ihle test	12,837	9,549	11,822	8,526	5,988	12,580	9,758	6,293	1,237	1,111
RMSE	0,031	0,032	0,030	0,038	0,042	0,027	0,035	0,035	0,001	0,002
MAPE	1,332	1,382	1,272	1,218	1,060	2,189	1,335	1,068	0,804	1,145
Average VaR (%)	3,01	3,17	3,10	3,51	3,79	2,78	3,13	3,17	4,03	6,83

Source: Authors' calculation

Table A2 - Backtesting results for VaR forecasts (CROBEX index, cl = 0.995, period 1,000 days: 24.11.2004 - 05.01.2009)

Negative returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	20	18	16	17	11	20	17	11	2	0
Frequency of failures	0,02	0,018	0,016	0,017	0,011	0,02	0,017	0,011	0,002	0
Kupiec test (p value)	0,000	0,000	0,000	0,000	0,005	0,000	0,000	0,005	0,876	0,993
Christoffersen UC test (p)	0,000	0,000	0,000	0,000	0,020	0,000	0,000	0,020	0,126	0,002
Christoffersen IND test (p)	0,000	0,039	0,023	0,002	0,004	0,061	0,002	0,621	0,929	NaN
Christoffersen CC test (p)	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,060	0,309	NaN
Lopez test	15,205	13,179	11,233	12,127	6,082	15,287	12,187	6,085	-2,976	-5,000
Blanco-Ihle test	6,648	4,843	6,043	4,590	2,208	7,804	5,702	2,680	0,521	0,000
RMSE	0,035	0,034	0,040	0,043	0,042	0,029	0,037	0,039	0,001	0,004
MAPE	1,417	1,443	1,498	1,189	0,907	1,591	1,454	1,048	0,500	0,500
Average VaR (%)	3,15	3,18	3,82	3,85	3,98	2,87	3,22	3,50	4,81	11,47

Positive returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	16	15	13	16	10	25	19	13	3	2
Frequency of failures	0,016	0,015	0,013	0,016	0,01	0,025	0,019	0,013	0,003	0,002
Kupiec test (p value)	0,000	0,000	0,001	0,000	0,013	0,000	0,000	0,001	0,736	0,876
Christoffersen UC test (p)	0,000	0,000	0,003	0,000	0,049	0,000	0,000	0,003	0,333	0,126
Christoffersen IND test (p)	0,001	0,218	0,157	0,001	0,653	0,023	0,004	0,558	0,893	0,929
Christoffersen CC test (p)	0,000	0,001	0,004	0,000	0,129	0,000	0,000	0,010	0,620	0,309
Lopez test	11,266	10,233	8,264	11,203	5,161	20,309	14,224	8,110	-1,967	-2,974
Blanco-Ihle test	8,403	5,953	6,975	5,622	3,204	8,651	6,985	4,111	0,801	0,314
RMSE	0,041	0,036	0,042	0,039	0,043	0,030	0,039	0,039	0,001	0,002
MAPE	1,240	1,094	1,128	1,240	0,781	1,880	1,507	1,028	0,500	0,561
Average VaR (%)	3,71	3,55	4,11	3,79	4,22	3,07	3,45	3,51	4,42	8,24

Source: Authors' calculation

Table A3 - Backtesting results for VaR forecasts (CROBEX index, cl = 0.999, period 1,000 days: 24.11.2004 - 05.01.2009)

Negative returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	18	11	10	10	5	13	10	4	1	0
Frequency of failures	0,018	0,011	0,01	0,01	0,005	0,013	0,01	0,004	0,001	0
Kupiec test (p value)	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,004	0,264	0,632
Christoffersen UC test (p)	0,000	0,000	0,000	0,000	0,004	0,000	0,000	0,024	1,000	0,157
Christoffersen IND test (p)	0,003	0,106	0,003	0,085	0,016	0,009	0,085	0,858	0,964	NaN
Christoffersen CC test (p)	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,077	0,999	NaN
Lopez test	17,166	10,105	9,103	9,072	4,044	12,179	9,089	3,035	0,000	-1,000
Blanco-Ihle test	5,315	2,412	2,063	2,018	0,943	3,921	2,309	0,977	0,002	0,000
RMSE	0,039	0,040	0,055	0,052	0,059	0,035	0,045	0,048	0,002	0,006
MAPE	1,609	1,001	0,980	0,828	0,455	1,175	1,013	0,439	0,189	0,100
Average VaR (%)	3,47	3,72	5,14	4,70	5,61	3,46	3,88	4,20	6,39	18,55

Positive returns	HS 100	HS 250	HS 500	BRW λ=0,97	BRW λ=0,99	VCV	Risk Metrics	GARCH	EVT GARCH	GPD
Number of failures	16	9	5	11	7	11	13	5	2	0
Frequency of failures	0,016	0,009	0,005	0,011	0,007	0,011	0,013	0,005	0,002	0
Kupiec test (p value)	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,001	0,080	0,632
Christoffersen UC test (p)	0,000	0,000	0,004	0,000	0,000	0,000	0,000	0,004	0,379	0,157
Christoffersen IND test (p)	0,001	0,686	0,823	0,004	0,753	0,106	0,000	0,823	0,929	NaN
Christoffersen CC test (p)	0,000	0,000	0,017	0,000	0,000	0,000	0,000	0,017	0,677	NaN
Lopez test	15,222	8,156	4,135	10,148	6,129	10,199	12,139	4,061	1,016	-1,000
Blanco-Ihle test	6,229	2,974	2,603	2,856	2,176	4,344	3,398	2,018	0,337	0,000
RMSE	0,049	0,053	0,072	0,045	0,051	0,036	0,047	0,048	0,001	0,004
MAPE	1,482	0,835	0,507	1,044	0,627	0,865	1,175	0,510	0,243	0,100
Average VaR (%)	4,27	4,89	6,60	4,39	5,06	3,66	4,12	4,21	5,19	12,01

Source: Authors' calculation

II

CLIMATE CHANGES

WATER GOVERNANCE AS A KEY ELEMENT OF SOUND WATER MANAGEMENT SYSTEM

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1. INTRODUCTION

Managing water effectively is fundamental for human society. Yet evidence of the problems of water management is found throughout history. Over the past 50 years, a series of institutional arrangements has been presented as panaceas to improve water management: strong government agencies, user organizations, and water markets. Seemingly successful cases of state, user, or market governance of water were compared with problematic performances in other cases governed by other institutions, with the implication that if the institutions from the successful cases, whether a strong bureaucracy, a water users' association, or transferable water rights, were only replicated, they would solve the problems. Each of these approaches has failed to live up to expectations, largely because the variability of local situations and the difficulty of transplanting institutions from one context to another were not taken into account.

The perceptions of what is required for sustainable water resource management and sustainability science in general have undergone major changes over the past decade. Initially, water resource management followed an instrumental "prediction and control" approach, dominated by technical end-of-pipe solutions. Pollution control, for example, relied primarily on waste water treatment instead of source control, and flood management was based on dykes and reservoirs rather than non-structural measures such as land-use zoning. This approach has yielded important results, but it came at a price. In many places, the natural dynamics of the river environment have been destroyed. Moreover, this approach no longer works very well. It cannot adequately deal with the growing uncertainties, increasing rates of change, different stakeholder perspectives, and growing interdependence that are characteristics for today's resource management issues. What we need then is a new understanding of sustainable water resource management as a societal search and learning process (e.g., Pahl-Wostl 2002, Wals 2007).

The emphasis is now moving from the need to simply 'know more' and deploying even more information to policy and expert circles to developing adaptive cross-industry capacities and new types of knowledge to respond adequately to the changing dynamics of social–ecological systems in concrete contexts of action.

The problem that we face when we deal with sustainability lie not so much in our lack of understanding of the functioning of ecological systems, but in our lack of understanding of the governance and cultural systems, how they are structured and managed, how they interact with ecological systems, and how we produce science and knowledge for policy.

This article examines the fundamentals for efficient and effective water management system. New institutional arrangements are needed to structure more sustainable relationships, based on new framings of the issues at stake and the agents involved. Therefore, the problem lies in developing new identities, as well as institutions and individual capacities, that are more socially and ecologically robust with the common goal of sustainability. The most important framework which affects the water governance procedure is the stability and independence of the water management institutions on one hand and efficient control over those institutions on the other hand.

Another perspective which will be analyzed in the article is the time dimension of the water governance and water management. It is quite obvious, that the results of the measures foreseen by the adopted river basin management plans is set into a time dimension of 20, 50 and even more years. By this the decision making process and water governance is positioned into a time framework which goes beyond the objectives of regular democratic procedures and addresses even cross-generational issues.

2.   CHALLENGES OF WATER GOVERNANCE

Governance is about effectively implementing socially acceptable allocation and regulation and is thus intensely political. It embraces the relationship between a society and its government. Governance generally involves mediating behaviour via values, norms, and, where possible, through laws. The concept of governance of course encompasses laws, regulations, and institutions but it also relates to government policies and actions, to domestic activities, and to networks of influence, including international market forces, the private sector and civil society. These in turn are affected by the political systems within which they function. (United Nations Development Programmes, 2001)

National sovereignty, social values or political ideology may have a strong impact on attempts to change governance arrangements related to the water sector, as is the case for example, with land and water rights or corruption.

The water governance framework in European Union could be structured according to the framework set by the Water Framework Directive and related Flood Directive. At this point it is necessary to stress that Water Framework Directive as being framework directive integrates several other directives or provides operational links to them. There are about 28 directives that implicitly tackle water governance system in Europe, listed in appendix 1.

Listed directives provide a broad framework within which the EU directed water governance should be performed. The institutions that manage the requirements expressed by those directives varies from country to country and their common identificators are difficult to observe and structure. Nevertheless archetype concept of the structures that govern listed directives could be broken down by following categories:

Public institutions by level:

- Central state
- Mid level – regional
- Local level.

Additional levels might be implemented according to the size of the EU country.

By role:

- Legislation authority
- Planning authority
- Certified monitoring laboratories
- Permitting authority
- User (pressures)
- Public infrastructure managers
- Investors (owners)
- Supervising authority (inspections)
- Public (organized) in the planning and participation process
- Market regulators.

Role definition is very important as it is the capacity building

By position in the system

- Water quality authorities
- Water quantity authorities
- Health and public health authorities
- Marine area authorities
- Nature protection authorites
- Spatial planning authority
- National security and emergency authority (extreme events management – natural and man-made disasters)
- Economic and financial management authorities
- Other.

Resource management system

- Water (groundwater, surface water, sea),
- Human resources,
- IT resources,
- Archive data resources,
- Time as a resources,
- Financial resources,
- Constructed resources (i.e. hydraulic structures, water supply, systems, waste water collection and treatment system),
- Other.

Listed resources are an important component in the description of the water management system as basic concept of water management as any management lies in the optimization of a limited resource.

All listed levels, roles, positions and resources are encompassing the water governance process which defines the goal of water management, prepare programmes of measures, provide resources, implement and follow-up the implementation of measures. It could be observed already from this short description of directives and composition of related structures and resources that the water governance is not an easy task.

The Global Water Partnership defines water governance as follows:

Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society.

The notion of governance for water includes the ability to design public policies and institutional frameworks that are socially accepted and mobilise social resources in support of them. Water policy *and the process for its formulation* must have as its goal the sustainable development of water resources, and to make its implementation effective, the key actors/stakeholders must be involved in the process. Governance aspects overlap with technical and economic aspects of water, but governance points us to the political and administrative elements of solving a problem or exploiting an opportunity. Governance of water is a subset of the more general issue of the creation of a nation's physical and institutional infrastructure and of the still more general issue of social cooperation.

When speaking about water resources we should be aware of clarifying and maintaining a system of property rights, and, through the principle of participatory management, asserts the relevance of meaningful decentralisation at the lowest appropriate level. There is increasing pressure to recognise and formalise water rights and this is happening in many countries. Formalising rights raises complex questions about the plurality of claims and the balancing of the distribution of benefits among the social groups. It also imposes responsibilities including in particular that of pollution prevention and financial sustainability. The process of formalisation is often biased in favour of the rich and powerful who may abuse the system and capture rights. The capacity to defend rights against competing claimants is essential for the rights to be meaningful, whether they are formal or informal. An important matter to clarify is to what extent the processes of devolving water rights serve segments of a population, or its entirety.

In the last few years the concept of integrated water resources management (IWRM) has been accepted as a means to ensure equitable, economically sound and environmentally sustainable management of water resources and provision of water services. This approach is defined as a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems (GWP, 2000). This concept demands a new framework within which there may be a need for significant changes in existing interactions between politics, laws, regulations, institutions, civil society, and the consumer-voter. The capacity to make these changes depends therefore on changes in governance.

3. WATER MANAGEMENT IN EUROPEAN UNION

The European Commission invested heavily in water-related research. A major impetus for this was the **European Water Framework Directive (WFD),** which entered into force in 2000. As already mentioned in the previous section Water Framework Directive integrates several other directives or provides operational links to them. There are about 28 directives that implicitly tackle water governance system in Europe, listed in appendix 1.

The WFD introduces the following innovative elements into European Water Policy:

- An integrated approach expanding the scope of water protection to all waters, surface waters, and groundwater;

- The hydrological principle where water management is based on river basins;

- The obligation to achieve a "good water status" by 2015;

- A "combined approach" of emission limit values and quality standards;

- Getting the prices right by introducing the principle of cost recovery;

- Getting citizens involved more closely by prescribing public participation in the development and implementation of the WFD.

However, integrated and adaptive water management approaches cannot be implemented without profound structural changes.

While the implementation procedure of Water Framework Directive and Flood Directive, which uses similar procedures is well under way from the technical point of view is the decision making process, which includes public participation lagging behind.

Some very profound reasons could be identified. One is of course lack of historical experience in the field of public participation stipulated by the directives. In industrialized countries however with a strong prediction-and-control tradition of water management, a complete system redesign comprising technologies, organizational structure, regulations, and thus a major transition is needed. But in many other countries, the base for efficient governance has yet to be developed. The changes needed are no less profound, but these countries face entirely different problems. Many countries suffer from a lack of political stability and the absence of any reliable governance procedures.

The knowledge base and monitoring capacity for implementing water management are often missing. Building the capacity to manage water has to be seen in a larger context of socioeconomic development. Given these uncertainties, an adaptive and flexible management approach seems to be mandatory. These countries need to develop and implement management strategies tailored to their needs and the political and environmental context rather than trying to adopt blueprints for institutions or technologies that may be entirely unsuitable for their situation.

4. EFFICIENT AND EFFECTIVE WATER GOVERNANCE

Governance represents a great deal for economic, social and environmental outcomes. Some necessary conditions for good governance are inclusiveness, accountability, participation, transparency, predictability and responsiveness. When the governing system does not fulfil these conditions we talk in terms of *poor governance*. Poor governance leads to increased political and social risk, institutional failure and rigidity and a deterioration in the capacity to cope with shared problems. Of course, governance systems should facilitate action and not create an obstacle to development. Getting the right balance is a source of constant debate and an ongoing process that will be continually changing over time.[1]

When speaking about water governance we should be extremely cautious. At the 2000 World Water Forum in The Hague, the GWP Framework for Action (GWP, 2000) stated that *the water crisis is often a crisis of governance*, and identified making water governance effective as one of the highest priorities for action. At the Bonn 2001 Freshwater Conference the ministers recommended action in three areas, with water governance as the most important. They proposed that *each country should have in place applicable arrangements for the governance of water affairs at all levels and, where appropriate, accelerate water sector reforms*. (Rogers, Hall, 2003)

Water governance should be accountable, efficient, responsive and sustainable. **Accountability** refers to roles in the legislative and executive processes that need to be clear. Each institution must explain and take responsibility for what it does. Rules of game should be clear.

By definition the **efficiency** is related to the use of the resources, while the **effectiveness** is related to the achievement of the defined objectives. It is quite clear that the benchmark for the use of the resources is quite difficult to define and the same occurs on the side of the achievement of the defined objectives.

In the standard textbook model of neoclassical firms and markets the issue of efficiency is usually discussed in line with profitability. It is predicted that differences in firm profitability cannot persist in the long run but are eliminated over time through competitive entry. In reality however, profitability differences seem to exist for very long periods of time (see Mueller 1986). Recent theories of the firm suggest that, due to asymmetric information and incomplete contracting, internal factors, such as the organization of firms and their governance structures, are important drivers of firm efficiency and profitability. Agency problems, transaction costs and relationship-specific investments can all be invoked to make a case for why internal organization and governance structures may matter for corporate performance. However, there are also concepts of political, social, and environmental efficiency which need to be balanced against simple economic efficiency. It is also essential that governance systems do not impede action, for example, minimising transaction costs will go a long way toward political and economic efficiency.

Responsive and sustainable water management should incorporate policies that deliver what is needed on the basis of demand, clear objectives, an evaluation of future impact and, where available, of past experience.

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[1] Empirical evidences have shown that there is a strong causal relationship between better governance and better development outcomes such as higher per capita incomes, lower infant mortality and higher literacy (Kaufmann et al., 1999).

The presence of large externalities and other sources of market failure in the water sector have limited the reliance on market institutions in water sector. But continued inefficiencies of water use, combined with liberal reforms in many donor agencies, led to greater interest in market institutions to improve the performance of the water sector. In an influential article, Rosegrant and Binswanger (1994) laid out the case for tradable water rights to create incentives for water-use efficiency. Their article notes that water markets depend on several factors:

- infrastructure to allow transfer of water from one user to another;
- effective government organizations, especially to regulate impacts on third parties; and
- effective user groups to provide information.

They point out that the costs and benefits of alternative institutional arrangements are likely to vary, depending on climate, water scarcity, agricultural intensification, and water use by diverse users, especially from different sectors. Examples of water transfers from agriculture to municipal and industrial uses in the western United States indicated that markets for water were feasible, but Chile's example generated the strongest policy narrative in support of water markets.[2]

Australia's water reforms stimulated further interest in water markets as over-allocation of water and increasing salinity and ecological externalities prompted the adoption of tradable water rights.

The question remains whether market allocation can be applied to water systems in developing countries, particularly where infrastructure is not as well developed to transfer water and government organizations have less regulatory capacity. Active groundwater markets exist in South Asia at the local level, but they are informal and not recognized by the state (Easter and Rosegrant, 1998). Attempts to introduce formalized water markets are often met with objections to the privatization and commercialization ofwater, because of norms that water is a free good.

Nevertheless all these approaches should serve as a basic structure for the benchmark of the national water governance approaches in order to provide some insight in their functioning.

Use of the resources could not be obtained by any existing collecting method, and even estimates are almost completely unfeasible. The effectiveness of the water governance could be first seen with the publishing and submission of the first river basin management plans by the end of 2009. For now only phased reporting on the implementation of the water framework directive could be followed-up on the EU water information system (WISE) and European Environmental Agency homepage (http://cdr.eionet.europa.eu/, http://water.europa.eu/). But those pages cover little or almost nothing regarding the water governance dimensions. Water governance institutions should be built with an eye toward long-term sustainability. Water governance must serve future as well as present users of water services.

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[2] The country had a long history of private irrigation systems, water rights allotted by shares, and fairly flexible infrastructure to transfer water. National policies allowed private transferable property rights for water use, and both the government organization regulating water and the user groups were relatively strong. The documentation of substantial gains from trade as high-value grape farmers bought water from farmers producing lower-value crops in the Elqui Valley (Hearne and Easter, 1997) generated considerable interest.

5. CONCLUSIONS

Water governance is an extremely complex task as it governs very heterogeneous domain, with governing processes from the nature as well as artificial (man-made) processes. Both are subject to area specific systematic uncertainties and complex objective oriented management. A specifics of this domain is almost complete absence of market mechanisms, which should be instead replaced by different mechanisms.

The approach listed in the article is identifying an important core of the water management – water governance which is by now only poorly recognized to be a key element for efficient and effective water management.

In the water governance some specific issues could also be recognized. One of them is long term orientation of the water management, which provides for the measures with a life span which goes for more than 50 or even 100 year, and are even of trans-generational dimension. This specific should also mirror in the water governance structure which should be enough independent from short-term political turbulences with shorter decisional time-horizon of 4 to 8 years.

This turns our attention in the historical continuity, tradition and robustness of the water governance structures. This could also be recognized in different approaches towards the implementation of the EU directive requirements which could be preformed in two main ways and plethora of possibilities between them:

- adaptation to the existing (stable) water governance framework

- build-up a new water governance framework based on the EU requirements.

Having in mind the necessary long – term horizon of the governance structure one should probably opt for the first approach.

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Appendix 1

Directives related with water governance system in European Union (listed by the publishing date):

1) Dangerous Substances Directive (67/548)
2) Bathing directive 76/160/EEC, 7/2006/ES)
3) Council Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of Community.
4) Directive 75/440/EC on Drinking-water-treatment-classes,
5) Fish directive 78/659/EEC
6) Council Directive 79/869/EEC of 9 October 1979 concerning the methods of measurement and frequencies of sampling and analysis of surface water intended for the abstraction of drinking waters in the Member States
7) Birds directive 79/409/EEC
8) Shellfish directive 79/923/EEC.
9) Drinking water directive 80/778/EEC of 15 July 1980
10) Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances
11) The Environmental Impact Assessment Directive (85/337/EEC)
12) Sewage Sludge Directive (86/278/EEC)(4)
13) Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources
14) Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment
15) Council Directive 91/692/EEC standardizing and rationalizing reports on the implementation of certain Directives relating to the environment
16) Council directive of 15 July 1991 concerning the placing of plant protection products on the market 91/414/EEC;
17) Natura 2000 Directive 92/43/EEC (Habitats Directive)
18) The Major Accidents (Seveso) Directive (96/82/EC);
19) Integrated Pollution Prevention Control Directive (96/61/EC).
20) Directive 98/8/EC of the European Parliament and of the Council on the placing on the market of biocidal products
21) Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control
22) Flood directive (60/2007)
23) Council Directive 2008/114/EC on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.
24) Reach directive (93/67) repealed by: (2006/121)
25) Groundwater directive (2006/118/ES)
26) Inspire directive (2007/2/EC)
27) Directive on Priority Substances (Directive 2008/105/EC)
28) Marine strategy directive (2008/56/ES)

THE ROLE OF SUSTAINABILITY IN SERVICE SECTORS

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1. INTRODUCTION

Ensuring full employment, a balance of trade, the stability of prices or a steady growth path are common characteristics of a successful economic development. Thus, indicators describing these goals such as employment rates, the value added or the GDP reflect the economic progress or the quantity of resources as well as of products available in an economy. But such indicators are limited in describing further goals concerning qualitative changes and the quality of life that have become more and more important: protecting biodiversity, a safe environment as an answer on climate changes or the question of social inclusion affecting the distribution of income among social groups. The latest strategy can be summed up under the generic term of "sustainable development" following the balance between economic, social and environmental goals.

Parallel to this process of rethinking about economic development, the sectoral composition of an economy has changed in terms of employment during the last century. Today, the share of total employment in services relative to other sectors has been risen and reaches today more than 70 % in industrialized countries. In contrast to these developments, the shift to the service sector in terms of value added is discussed controversially. In literature, there is a disagreement whether the output share is measured in terms of constant or current prices (see e.g. Feinstein (1999)). Nevertheless, different occupations in the service sector dominate the economies at present and will do so in the future following and promoting a tertiarization process as per capita income rises. Furthermore, the ECB describes empirically a main cyclical advantage of the service sector: the growth rate of such activities during recession phases slows down and declines only exceptionally. In general, the industrial sector was decisive for cyclical variations of the GDP during the former recession phases 1974/75, 1980 till 1982 and 1992/93 (ECB (2009), 53).

In contrast to these developments, theoretical approaches and models as well as the willingness to implement the ideas of the concept of sustainability are discussed mainly for the sectors industry and agriculture. Analyses concerning services are limited. Furthermore, services are considered to be a part of cross sectoral topics concerning energy, natural resource management or other issues (OECD (2001)). The main question of this paper is to examine the approach of sustainability and therefore, it will be tempted to answer the question how far sustainable development could be realized in these sectors. Precisely, existing

theoretical approaches concerning the service sectors have to be extended by social and environmental objectives.

The paper consists of five sections including some empirical findings concerning selected (Eastern) European Countries. Section two illustrates a general discussion of the concept of sustainability and its components as well as their implementations into the framework of the European Union (EU). Section three and four continue to give further insights into the theoretical considerations describing the development process to a service economy. Using the theory of Baumol (1967) who describes services suffering from a so-called "cost-disease" as a basis, further determinants of structural change are analysed with particular reference to characteristics that are specific to services and are implemented into the strategy of sustainable development as well. Finally, the biased conclusions undergo a relativization and the disease wears off. Section five ends the paper with the main results.

2. THE CONCEPT OF SUSTAINABILITY IN THE EU FRAMEWORK

Today, governments who take action against the consequences of the financial and economic crises pack up their programs and call them strategies for promoting a sustainable development path. Furthermore, international organizations like the OECD in its Environmental Strategy or the United Nations in the Millennium Declaration highlighted the importance of following a strategy promoting sustainability in several connections. This concept is also implemented into the framework of the European Union and is used by the European Commission and the member states in various policies and programs strengthening European cohesion by vertical integration.[1] Today the sixth Environment Action Program (2001 – 2010) does not specify targets or instruments, but formulates general principles linking different sectors and environmental impacts. The need for consolidation of existing legislation of the countries including new member and candidate states is emphasized as well. The latest EU policy follows a so-called (Renewed) EU Sustainable Development Strategy (EU SDS) of 2006. The main topic of the EU SDS is to accept the challenge by promoting the quality of life in terms of nature and humankind as well as the inter- and intra-generational equity within the EU – specified along the famous definition of sustainable development of the Brundtland Commission in 1987. To achieve these goals key challenges with operational objectives and actions[2] as well as cross cutting priority areas[3] were specified on national and

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[1] The promotion of ideas on "Sustainable Development" in the EU started in 1973 after the first United Nations Conference on the Environment (1972) with the first Environment Action Program which had the aim to introduce minimum standards with no legally binding character. Environmental protection received at the first time an independent policy character in the Single European Act (1987) as well as a field of action in the Maastricht Treaty (1993). In line with the UN Earth Summit in Rio 1992 and the Agenda 21, the commitment to consider "sustainable" growth and cohesion in all policy areas was mentioned in the preamble of the Amsterdam Treaty (1999). Furthermore, it was discussed at the Council meeting in Cardiff in 1998 ("Cardiff Integration Process"). The first EU Strategy for Sustainable Development was introduced in 2001 in preparation for the World Summit in Johannesburg in 2002 dealing with various fields as well as mentioning concrete sector-based policies. After the Brussels 2003 spring summit, several member and accession countries started to implement the ideas of sustainable development with different focuses into the national strategies. For a more detailed historical analysis see e.g. Berger (2008), Caratti, Lo Cascio (2006), Hey (2005) as well as the official documents of the EU dealing with this topic.

[2] 1. Climate change and clean energy, 2. Sustainable transport, 3. Sustainable consumption and production, 4. Conversation and management of natural resources, 5. Public health, 6. Social inclusion, demography, migration, 7. Global poverty and sustainable challenges.

[3] 1. Education and training, 2. Research and development, 3. Financing and Economic Instruments, 4. Communication, mobilising actors and multiplying success, 5. Implementation, monitoring and follow-up.

European level (ECORYS (2008), 17f.). Furthermore, these targets were implemented into the Treaty of Lisbon in 2007 and completed the re-launched Lisbon Strategy of 2005. Thus, following the second article, section two, the major objectives of the Lisbon Treaty are indicated, while the internal market

> "[…] shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance. It shall combat social exclusion and discrimination, and shall promote social justice and protection, equality between women and men, solidarity between generations and protection of the rights of the child." (Official Journal of the European Union (2007), 11)

In this context, the Lisbon Strategy[4] defines the strategic development trajectory of the EU by the "Integrated Guidelines for Growth and Jobs (2008 – 2010)" while the guidelines are divided into employment, macro- and microeconomic ones. Thus, all forms of sustainability are mentioned. In the first macroeconomic guideline, a sustainable growth is needed to secure economic stability. The second one extends this aim by a sustainable fiscal policy in line with demographic challenges[5] and defines therefore, the role of the Stability and Growth Pact ensuring the medium-term budgetary objectives as well as containing fiscal risk inter alia in form of difficulties in financing the pension, social insurance and health care systems. Otherwise, these systems are mentioned in the Employment Guidelines promoting institutional features. The modernisation of social protection systems by promoting active labour market policies and a review of the tax as well as of the benefit systems tackle the problem of low employment and participation rates of young and older people, unskilled, migrants and women. To improve the adaptability of workers along market needs, an increase investment in human capital is needed. Furthermore, an efficient allocation of resources is mentioned in connection with microeconomic guidelines concerning a sustainable consumption and production by using resources along the aims of energy efficiency improvements and environmental protection as well as emphasizing the importance of biodiversity (guideline 11). The promotion of R&D and innovation (guideline 7 and 8) is highlighted by increasing the capacity of information and communication technologies (ICTs) and environment-friendly technologies emphasizing the role of small and medium enterprises (guideline 9) (European Commission (2007a)).

Summing up and simplify these propositions, sustainability on the macroeconomic level has to be understood as an interplay between overall labour productivity growth, (high-skilled) employment expansion and an output respectively demand growth meeting the environmental, inter- as well as intra-generational justice. In addition, the UNESCO extended this approach in the "Universal Declaration on Cultural Diversity" of 2001 with a fourth pillar or in addition to social goals namely cultural diversity of humankind (UNESCO (2002)).

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[4] For a critical analysis of the Lisbon Strategy goals see e.g. Kohler (2006).

[5] Lindbeck defines fiscal sustainability as an inter-temporal budget constraint of the public sector ensuring a stable debt-to-GDP ratio over some future time periods (Lindbeck (2006), 303). In general, the concept of fiscal sustainability was created by Blanchard (1990) dealing with budget indicators like the primary gap, the medium term and long-run tax gap. Furthermore, the role of fiscal sustainability was discussed in transition countries emphasizing the support of international organizations. Acting under the pressure of the EU-criterion of stable public finance, the countries have to fight against large deficits by building up social and physical infrastructure and offering extended tax incentive encouraging investment (see e.g. Aristovnik, Berčić (2007)).

These examples show the basic intentions of the concept of sustainability causing two opposing views. Whereas one group of researchers consider the concept as a new paradigm in thinking about economic development, the others criticised it to be more or less a cross-section, eclectic or holistic one, choosing, putting and comparing - also overlapping - several components together. Furthermore, the components are based on preferences without a clear distinction if it includes the individual, national or group level. Dovers (1997) argues that it is an umbrella concept with many unsolved interrelated issues of environment and human development. Thus, the diversity and over-complexity of interpretations make it difficult to define a clear methodology and generally accepted set of indicators for evaluating sustainable development[6] and thus, comparing the achievements in an international context. Even the European Commission itself concludes, that the concept offers rather a "vision of progress" becoming an "empty box" and changing very little. Furthermore, there is a lack in understanding what is actually meant in practice discussing about the "right" mix of objectives and causing trade-offs as well as spill-overs on the sectoral level (European Commission (2004), 5f.). Even in the report of 2007, examining policies and indicators on national level, the results of the European Commission are twofold: they confess that in many areas progress implementing sustainability is rather modest, but at the best in climate change and clean energy (European Commission (2007b), 15). Finally, it is necessary to connect the three pillars of sustainability to "win"-scenarios with the aim of overcoming the possible short-term trade-offs in-between.

Despite the critics, the main goal of these discussions is indeed to promote an open debate about the coordination of national political as well as sectoral and therefore technological priorities by realizing the problems along the pillars of sustainability. Today, the supporters of this concept consider the financial and economic crises as a chance to incorporate their ideas into the activities and sectors strongly affected by the crises. The restraints to grow have to be reduced and a strategy of saving resources could prevent further crises. By the promotion of renewable energy sources and new eco-technologies implemented into the industry sectors as automotive or machinery, climate change will be affected in a positive way. First, a cleaner production by the use of these technologies is possible along the aims of a "green" growth avoiding the exploitation of nature, the improvement of the usage of resources and to restrict pollution. This means that through a consistency of renewable instead of fossil or nuclear energy, the efficiency of production processes improves by less energy used and therefore increases the sufficiency promoting the quality of life. Thus, sustainable consumption and production patterns as well as a so-called Corporate Social Responsibility of enterprises have to be promoted. Furthermore, by the implementation of public "Leitplanken"[7], the creation of new markets, ecological modernisations as well as an internalisation of external effects into prices[8] support a more "green" growth. The latest argument could be illustrated in a figure,

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[6] There are propositions of sets of indicators of the OECD, the UN Commission on Sustainable Development, the Laeken indicators and indicators used during the Cardiff integration process or of the 6th EAP. The European Environment Agency proposes a selection of tools, frameworks, typologies and finally indicators for EU progress reports with the aim of getting information about the current and foreseeable state of the environment (Bosch (2002)). Today, indicators of Eurostat are divided along ten basic themes and several sub-themes linked to the EU policy priorities and the goals of the Sustainable Development Strategy.

[7] The concept of „crash barriers" which was introduced by the German WBGU (Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen) specifies quantitative damage frontiers with the aim to secure sustainable development. This advisory committee as well as the renewed EU SDS emphasizes e.g. the Kyoto goals of reducing greenhouse gas emissions aiming for a global surface average temperature not to rise by more than 2ºC compared to the pre-industrial level.

[8] In general, common environmental policy principles of the EU are based on the polluter-pays principle, the precautionary principle and preventive action and the principle of rectification of pollution at source.

whereby e.g. the use of environmental taxes to mitigate and internalise the negative externalities and costs as shown in a price (P)- output (Y)-diagram with a price elastic demand curve D. The effects of a uniform eco-tax (τ) are twofold: first, output decrease to Y_3 through the shift of the supply curve (S $\rightarrow$ S'). At the end, the height of Y depends on how these receipts are invested in eco-innovations or to improve environmental quality. These efforts lead to a rise of the level of demand for eco-products. Otherwise, if the price elasticity of demand tends to zero, the consumers pay less attention to the tax, considered to be a marginal part of the expenditures.
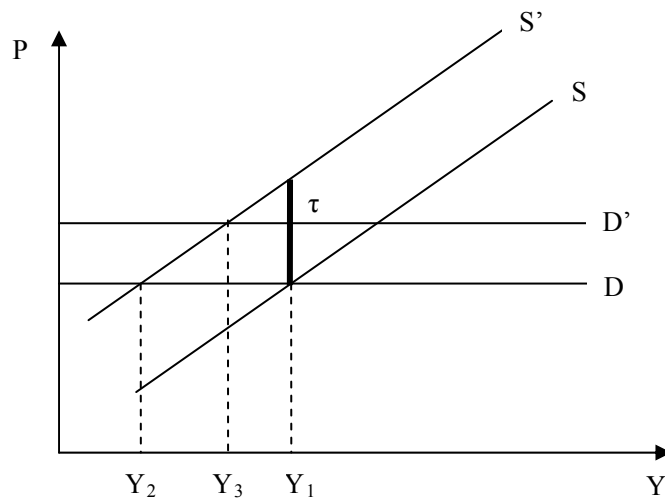

Figure 1. *The internalisation of negative externalities with taxes*
Source: own illustration

Analysing at least the environmental aspect of the concept of sustainability, it is remarkable that during the transition process of the Eastern European countries, environmental protection was considered to be of less importance in comparison to the economic restructuring phase. After joining the EU, the new member states formulated and implemented gradually the main objectives of the concept into national strategies. But a consistent prosecution is still lacking. For example, the resource productivity measured as the relationship between the GDP and the domestic consumption of materials is under the EU average: the lowest productivity is measured in these countries and the highest in the UK (Figure 2).
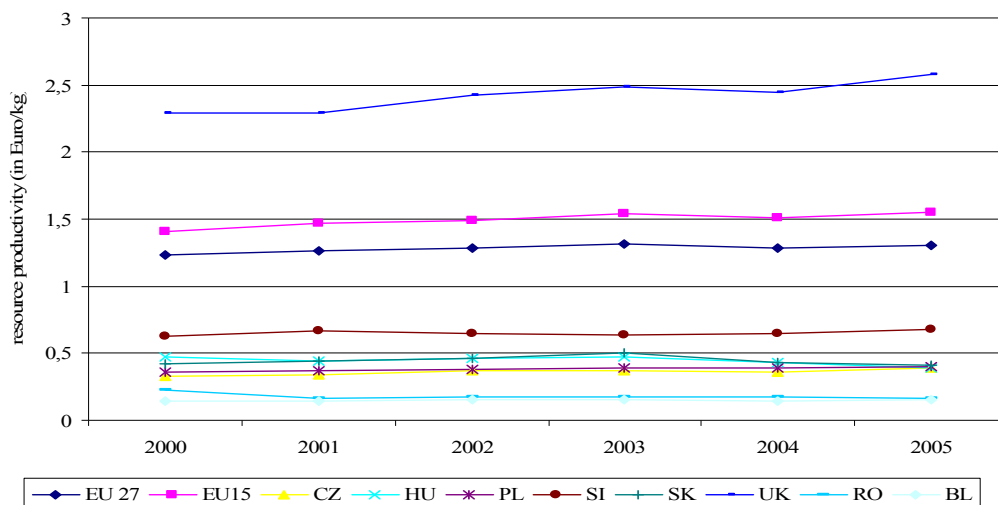

Figure 2. *Resource productivity in selected European countries*
Source: own illustration, based on Eurostat data

Today, Croatia as a candidate country since 2004, accession to the EU assumes to adopt the acquis communautaire consisting of different chapters proofing the ability to join the EU. Concerning the environmental area, over 200 legal documents are classified in nine different groups promoting to establish a framework and guidelines for institutional harmonization into the EU of the national legislation. The main goals are to implement the integration of environmental protection in all sectors of the economy as well as the commitment of reporting and ensuring access to information (Kordej-De Villa (2004)). In 2008, the European Commission confirms in the progress report an overall good progress especially in the areas of air quality, chemicals and genetically modified organisms. However, further efforts are needed in water, industrial pollution control and risk management as well as climate change and horizontal sectors. According to Eurostat (2007), national sustainable development strategies as well as an indicator based monitoring system were not implemented as in other EU-countries. The publication of a National Environmental Action Plan of the Ministry of Environment and Physical Planning was a first step, and in fact, the Plan only deals with the environmental dimension of the concept. The latest step was the implementation of a Sustainable Development Strategy in March 2009.

Finally, the problems which are becoming evident in the current economic circumstances denied the assumptions of the Environmental Kuznets Curve (see e.g. Panayotou (1993)) in which the local devastation decreases along the time path accompanied by an increasing welfare and by structural changes. Furthermore, considering due to Fourastié (1949) that service sector activities act as a "shelter" for employees loosing their jobs in the two other sectors during an economic crises, further shifts of employment shares to services are estimated. In recent years, the characteristic of "intangibility" of services and therefore, the possibility for quantifying their contribution to economic development, has changed: next to the "traditional" ones like health, education or government services, "new" ones are getting central for a transition to a knowledge economy namely business services or "green" technologies promoted by the evolution of modern ICT. The common feature of the "new" services is on the one hand, that they are using fewer natural resources than other sectors. For example, energetic consumption in the EU-27 and Croatia is rather much lower in the service than in the industry sector (133 274 000 vs. 327 850 000 tons crude oil in 2005, Eurostat data). On the other hand, more educated workers are needed whereby a substitution of tangible goods by intangible services is limited. But how far it is possible to assume that the potentialities of a transition process to service sectors could "cure" the environmental disease? Which sectors could meet these claims? In the next sections, the service sector will be discussed by answering these questions. Thus, it has to be shown that the service sector has to be diversified in different categories along the characteristics of employment and productivity contributing to sustainable development. Just as the consumption patterns change in terms of quality and quantity, the products of the service sector have to change and adapt to prevailing conditions as well as social needs.

Thus, the division of the next section follows the concept of sustainability: concerning economic aspects the possibility of productivity increases will be analysed in detail, as well as the role of human capital and the welfare state describing the social dimension. Finally, the ecological pole has to be discussed as well.

3. SOME DETERMINANTS OF THE SERVICE SECTORS

In literature, services are considered to be "a residual" in comparison to the other activities in the economy, "invisible" and "non-tradable", thus, proving the inherent character of services being "intangible". Services are regarded as the sum of their input factors or in the words of Baumol as "an end in itself" (Baumol (1967), 416). Consequently, they are only a part of vertically integrated production activities in the two other sectors (Baumol et al. (1985), Fixler and Siegel (1999), Oulton (2001)). Furthermore, while the service sector consists mainly of small firms, it is not possible to exploit economies of scale and therefore, the sector has little potentialities to expand. Thus, the question of services being "un-productive" or not and therefore innovative is the key point of discussion in literature and is far to be solved. But efforts to reclassifying and specifying the service sector indicate that this sector is far away from being homogenous and a diversification was proposed by different economists.

Following the three-sector-hypothesis, economic development has to be described by shifts in sectoral allocation of resources in an economy. Although different causes and factors are mentioned, the contributions have the same result: the patterns of phases are much more a natural phenomenon. The major factor accelerating economic growth is the height of productivity but also the *kind* of productivity. In an agrarian or mainly rural-based economy, the nature's productivity is measured in terms of climate conditions or soil fertility. In an economy going through an industrialization process, capital goods and therefore material goods are produced while labour productivity and unit labour costs are important references. Finally, in a post-industrial, knowledge-based economy, the productivity of human capital and therefore a sort of intellectual productivity decides about innovation potentialities of an economy. The latest is dominated by service sector activities whose contributions to productivity and growth have to be examined.

One of the first and the most famous articles dealing with potentialities of productivity increases in the service sector is the one of Baumol (1967) [9] who describes in a neoclassical, supply-side growth model a process with negative consequences at the end. Within his model two sectors are compared with each other indicating different usage of their productive resources. First, a "progressive" sector, i.e. manufacturing, is described where, along the vintage approach, current capital goods incorporate new knowledge and techniques. Exogenous technical progress promotes standardization and EOS, so that an increase in labour productivity leads to an increase in real income due to output per man hour. Hence, wage costs per unit could be held constant, while wages in the economy grow at the same extent as labour productivity in this sector. The reason for the last conclusion lies in the characteristics of the secondary sector. The services sector is called "stagnant", because of inherent low or zero technological progress potentials, and physical capital cannot be employed. Consequently, the explanation of services being "cost diseased" is based on two main results of the model depending on the height of price elasticity of demand. A stagnant sector is characterised by high price elasticity. Thus, craftsmanship or fine restaurants will disappear or be retreated to luxury niches because customers will react with non-tolerance to price increases during the transformation process. Thus, the first effect of different productivity growth rates leads to an increase of relative prices of services. In other words, because of the feature that jobs in services (in comparison to agricultural or industrial goods) cannot be replaced by machines, labour productivity does not grow and services are getting more expensive relative to other goods. Otherwise, if low price elasticities of demand are

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[9] This approach was used for formulating an extension to Wagner's Law of 1876.

assumed like in health care or education both supported by government subsidies, a reallocation process of the labour force to the non-progressive sector takes place as long as the amount of labour in the first sector will tend to approach zero. Thus, the share of employment in the service sector will be higher in high-income countries because of 'technological stagnancy' and the labour-intensive nature of services. This reallocation process caused by productivity differentials (biased technological progress) using less labour for producing one unit in the manufacturing sector (displacement effect) has furthermore a negative effect on overall productivity growth and thus, could slow up aggregate growth. In addition, the relative unit costs and analogously the relative price of services rise in the long run (in nominal terms). This process is possible as long as the real output or final demand relation of the stagnant to the progressive sector remains unchanged. Summing up the main conclusions of Baumol, it has to be mentioned that the resistance to rationalisation in the service sector is not the solution for the employment crises as described by Fourastié (1949) but much more the cause of wage and price increase as well as of a productivity slowdown.

From the publication of the article until today, the model of Baumol has been criticized in different ways modifying the main assumptions and adding new determinants. First, thinking about the possibilities increasing productivity in the service sector, "new" services which are central for a country following the transition to a knowledge and modern communication and information economy are investigated in literature. These developments lead to a new point of view showing potentials for increasing returns to scale whereas at the beginning, production costs are high but decrease by customers use. One answer to this problem is stated by Baumol himself in an essay with Blackman and Wolff (1985) while "asymptotically stagnant services" are indicated in the computer industry, the health sector or in retail trade. These findings illustrates that the stagnant sectors could undergo a technological change supported mainly by innovation processes and at the end, a cost reduction is possible only as long as total costs are dominated by technological components respectively by progressive inputs with falling prices. Indeed, empirically a productivity gap between the two sectors is evident and could not be denied, but there are potentials for productivity growth in services in the end. In addition, measuring productivity growth in this sector is difficult (van Ark (2002)). The European Commission (2003) argues that the price, the quality and the technology characteristics of services and their effects on productivity are not implemented into standard productivity measures. Furthermore, the diffusion and implementation process of ICTs causes declining communication and transaction costs by direct and indirect network externalities as well as spill-over effects contributing to productivity increases in other sectors. New services sectors and products like IT investments and the contributions of IT to product quality, variety, and customer service influence the productivity and therefore the growth level of an economy in the long run. This was the argumentation of Triplett and Bosworth (2003) who proved in their essay that "[…] Baumol's Disease has been cured" by measuring an increasing and accelerating growth rate of labour productivity in services sectors in the United States after 1995. Concerning the EU, the implementation of the IC technology lags behind the developments in the United States. Therefore, this innovation weakness is responsible for lower productivity and growth rates per capita in European countries in the last decade (van Ark (2005)).

Thus, implementing the finding of possibilities of accelerating productivity into the one factor model of Baumol (1967), the production functions gives us the information that the labour productivity (Y_{it}/N_{it}) grows at time t at the constant instantaneous rate of growth r which is higher in the progressive sector (r1) than in the stagnant sector (r2). Furthermore, the

exogenous given constant a is higher than b, i.e. labour productivity b for final services is constant and lower than in manufacturing (called "biased technical progress").

$$Y_{1t} = aN_{1t}e^{r1t}$$ (Production function of the progressive sector) (1)

$$Y_{2t} = bN_{2t}e^{r2t}$$ (Production function of stagnant sector) (2)

If prices are indicated by a constant mark-up on unit-labour costs with the assumption to tend to zero over time, the price of services relative to manufacturing grows along the difference of the productivity growth rates of both sectors in contrast to the results of Baumol (1967).

$$\frac{w_t}{p_{2t}} = \frac{\partial Y_{2t}}{\partial N_{2t}} = be^{r2t}$$ (3)

$$\frac{w_t}{p_{1t}} = \frac{\partial Y_{1t}}{\partial N_{1t}} = ae^{r1t}$$ (4)

$$\Rightarrow \frac{p_{2t}}{p_{1t}} = \frac{ae^{r1t}}{be^{r2t}} \Rightarrow \frac{d\ln\left(\frac{p_{2t}}{p_{1t}}\right)}{dt} = \frac{d\left(\frac{p_{2t}}{p_{1t}}\right)}{\left(\frac{p_{2t}}{p_{1t}}\right)} = \hat{p} = r1 - r2 > 0$$ (5)

Furthermore, if homothetic preferences and therefore a linear Engel curve with unit income elasticities of demand for services and manufacturing are assumed. Due to Quibria und Harrigan (1996), the demand side is modelled as a CES utility function indicating a special case of the Cobb-Douglas utility function (6) and is enlarged by a budget constraint (7).

$$U_t = [\alpha k_{1t}^\rho + (1-\alpha)k_{2t}^\rho]^{\frac{1}{\rho}}$$ (6)

$$w_t N_t - p_{1t}k_{1t} - p_{2t}k_{2t} \geq 0$$ (7)

where α and ρ are constant parameters of the consumption per capita k combined with a constant elasticity of substitution σ formulated as $\sigma = 1/(1-\rho)$ and indicating values between zero and one. Solving the utility maximization problem and implementing the Keynesian principle of Effective Demand, the output structure of an economy as well as the proportionate change in the economy is determined by

$$\frac{Y_{2t}}{Y_{1t}} = \frac{N_t k_{2t}}{N_t k_{1t}} = \left(\frac{\alpha p_{2t}}{(1-\alpha)p_{1t}}\right)^{-\sigma} \Rightarrow \frac{d\ln\left(\frac{Y_{2t}}{Y_{1t}}\right)}{dt} = -\sigma\frac{\left[d\ln\left(\frac{p_{2t}}{p_{1t}}\right)\right]}{dt} = -\sigma(r1-r2) < 0$$ (8)

If the elasticity of substitution tends to zero (Leontief demands), output shares remain constant. Otherwise, if Cobb-Douglas preferences are assumed and therefore σ tends to one, the output share of services will decline - in contrast to the empirical findings. Thus, if

relative prices of services increase, the relative output share decrease. On the contrary, the model implies a reallocation of the production factor labour towards the services sector if σ is lower than one. Otherwise, if σ is one, the share stays constant and Baumol's cost disease does not lead to a rise of jobs in services.

$$
\frac{N_{2t}}{N_{1t}} = \left(\frac{a}{b}\right)\frac{Y_{2t}e^{r1t}}{Y_{1t}e^{r2t}} \Rightarrow \frac{d\ln\left(\dfrac{N_{2t}}{N_{1t}}\right)}{dt} = (1-\sigma)(r1-r2) > 0 \tag{9}
$$

Determining the growth rate of real output I, the production functions have to be differentiated. While full employment is assumed, the value share of services in total income is specified by $\theta = (p_{2t}Y_{2t})/Y_t$ and the price of manufacturing is considered to be a numéraire as well as p_{2t} is indicated as p. Insert these assumptions into the growth rate of income, it is indicated that it rises along r1. Thus, in contrast to Baumol (1967), overall economic growth increases towards a positive rate and is not zero.

Furthermore, if the "hypothesis of constancy of services" is proved empirically, no "sustainable" improvements following the transition process to a service economy are possible. Empirically, the hypothesis is discussed controversially, arguing whether the output is measured in terms of constant or current prices (see e.g. Feinstein (1999), Echevarria (1997), Gordon (1996)). Appelbaum and Schettkat (1999)) argue that the hypothesis only holds if the price elasticity of demand for services is zero, or if the negative effects of price elasticity are exactly offset by the positive demand effects of rising income. But these cases will be the exception rather than the rule. Assuming an ongoing development process, income rises and preferences of the consumers change as well. Paradoxically, if prices in the stagnant sector rise, demand will not be discouraged. Thus, the heights of income elasticities of demand have to be implemented into the description along a diversification of the service sector products.

Before Appelbaum and Schettkat, economists like Fisher (1935), Clark (1940) or Pasinetti (1981) have emphasized the demand side explanation of structural change. Furthermore, the changing age structure of the population as well as the high rate of female participation in the labour market modify the preferences in consumption and therefore, raise the demand for services (Esping-Andersen (1999)). Today, these points of view are discussed on the European level in the so-called Flexicurity model with reference to the life-course perspective and along the ideas of sustainability. Furthermore, demographic changes and changing life-courses indicate together an impact on the financial sustainability of social security systems along the different European welfare state regimes (Klammer et al. (2008), Aiginger, Guger (2005)). Due to the European Commission, not the already mentioned argument of the minor implementation of ICTs alone, but also inflexible labour market conditions[10] as well as the lack of competition are responsible for the low productivity growth (European Commission (2007c), 103). Paradoxically, countries belonging to the Continental regime following its corporatist tradition with an employment-related social insurance and strong job protection

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[10] The basic theoretical as well as empirical contribution to this topic is the book of Layard et al. (1991). Before the essay of Siebert (1997), solutions for solving the structural problems during de-industrialisation were discussed in the "Job Study" of the OECD (1994a, 1994b). Apart from deficits in the education system, the competition and innovation policies, it was argued that a more flexible labour market due to working hours, wage costs and systems of unemployment benefits as well as of protection against dismissals is necessary. In the "Employment Outlook" of 2006, the OECD toned down and changed the recommendations.

with the primary goal of minimizing labour market turmoil, show positive results in time of the current crises. In general, a renaissance of demand-oriented policies could be observed including the question of a coordinated European fiscal, wage and monetary policy to react on external shocks. Thus, long-term investment projects and stable working conditions contribute to stabilize the consumption level. These considerations will play a decisive role when a relaunch of the Lisbon Strategy is needed after 2010.

These arguments are related to the approach of sustainable development: the strengthening of the material income leads to an enhancement of consumer choice. Thus, due to Fourastié (1949), despite the low potentiality of rationalisation in the service sector, the reallocation process leads to the solution of employment problems. In contrast to the productivity-bias hypothesis and the prediction that output will decline proportionally to the rest of the economy, the demand-bias hypothesis explains the paradox of rising employment and (real) output shares in services in reality along the Engel's Law and the hierarchy of needs hypothesis describing the distinction between inferior goods and superior services. Furthermore, a complementation in consumption is recognized: people tend to add various uses to products and services as their income grows. Thus, de-industrialization is not a substitution process per se, but all three sectors will coexist in the future. According to the empirical observation that income demand elasticities increase and are greater than one respectively if the demand elasticity of substitution is less than one, the expenditures and relative prices for services would increase more than proportionally. In other words, with rising income, the demand for inferior goods will fall, while the demand for superior services will grow. The final demand for services is, therefore, mainly income elastic respectively non-homothetic preferences are assumed, so that finally, service activities will not vanish[11]. These findings are implemented into a model of Gundlach (1994), while only the main results have to be described in this context.[12] Gundlach proposes two demand functions (10 and 11) depending on p_{it}, N_t and y_t and consisting of two parameters c and d. The development of demand depends on the interaction of two elasticities: price (ε_{ii}) and income elasticities of demand (η_i).

$$Y_{1t}^D = cp_{1t}^{\varepsilon_{11}} p_{2t}^{\varepsilon_{12}} y_t^{\eta_1} N_t \tag{10}$$

$$Y_{2t}^D = dp_{2t}^{\varepsilon_{22}} p_{1t}^{\varepsilon_{21}} y_t^{\eta_2} N_t \tag{11}$$

The change of the relative output and employment share between services and manufacturing shows a different picture. This is possible if a biased technical progress is assumed (r1 > r2), the income elasticity of services is higher than the one of the manufacturing sector ($\eta_2 > \eta_1$) as well as the price elasticity of services (ε_{22}) is lower than zero in contrast to the positive cross price elasticity ε_{12}.

$$\left(\frac{\hat{Y}_{2t}^D}{Y_{1t}^D}\right) = (r1 - r2)(\varepsilon_{22} - \varepsilon_{12}) + r1(\eta_2 - \eta_1) \tag{12}$$

$$\left(\frac{\hat{N}_{2t}}{N_{1t}}\right) = (r1 - r2)(1 + \varepsilon_{22} - \varepsilon_{12}) + r1(\eta_2 - \eta_1) \tag{13}$$

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[11] The empirical tests of Möller (2001) approved that the income elasticity of services is higher than one. Furthermore, in Wagner's Law (governmental) services are treated as luxury goods whereas the budget share of services rises over time in line with rising income.

[12] It is also possible to incorporate one or two constant subsistence levels of the consumption goods and services into the utility function.

While the first and the last brackets indicate positive values, the difference of the two price elasticities decides about the reallocation process.[13] In general, if the productivity bias hypothesis is renounced the net result is clear: the demand bias hypothesis shows the reallocation process of employment and output towards services.

Nevertheless, the negative effect on aggregate growth through changes in sectoral composition cannot be ignored. However, in literature this fact is studied in contrast to the positive effects through human capital. In this context, still assuming that household preferences shift to services with rising income, Pugno (2006) connects demand and supply-side factors into one model, while he adds in his endogenous dynamic model, the variable "h" in the two production functions of Baumol. The variable "h" indicates the generic skills of labour in producing as well as the upgrading of the skill index by consumption as a demand side explanation (Lucas (1988), Pasinetti (1981)). Thus, services like education, health and cultural services contribute to human capital formation and enable people to gain higher incomes through learning. Furthermore, the quality of services is highlighted in the article of Pugno. In this context, it is discussed, that the relevance of the quality of educational systems to economic development is essential as well as the importance of government interventions raising the level of employability to avoid mismatch, but also the danger of de-qualification through long-term unemployment (see e.g. Gundlach (2006), Hanushek et al. (2008)). Indeed, the qualification profiles have changed today: services need more skilled workers, so that the previous assumption of a perfect mobility across sectors is not right. It is rather difficult to transfer workers from one sector to another because of sectoral specific knowledge. Thus, to ensure an easy adjustment to inter-related changes in demand as well as to structural changes caused by innovation or international competition it depends on (a highly) skilled labour force. Thus, life-long-learning programmes have to be a part during life-courses of employees. In this context, figure 3 shows the negative relationship between life-long-learning activities and the long-term unemployment rate in the EU-27, Croatia and Turkey. Employees from the Nordic countries participate much more (Sweden 32,4 %, Denmark 29,2 %, Finland 23,4 %) than the ones living in Eastern European countries e.g. Slovakia (3,9 %), Croatia (2,4 %) or in the latest new member states Bulgaria (1,3 %) and Romania (1,3 %) accompanied by the highest rates of long-term unemployment.
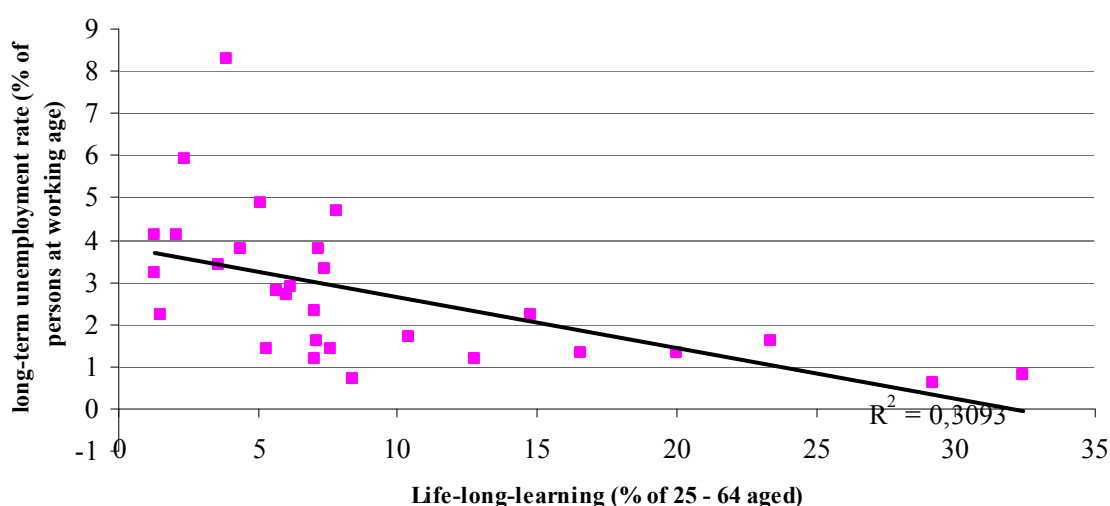

Figure 3.   The relationship between life-long-learning and long-term unemployment, 2007
Source: own illustration, based on Eurostat data

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[13] For a more detailed analysis of the different cases see Gundlach (1994).

These findings show specific labour market characteristics of the mentioned welfare state regimes. Furthermore, Nordic countries are relatively flexible concerning the EPL indicator, but ensuring strong social guarantees to the individual employee including large state expenditures (Scandinavia) or a high share of employee contribution (the Netherlands). Especially the Scandinavian countries implied the double earner or dual-career family model to enhance gender egalitarianism and women's integration in the labour market. In general, Eastern European countries, shows different combinations of flexibility and security patterns. In most countries the institutional framework follows that of the Continental model at the beginnings. But in general, the welfare system reflects more and more the influence of the neo-liberal concept of the IMF and the World Bank for reasons of budgetary discipline. Following Cazes (2002), only Slovenia indicates the highest EPL indicator with the highest expenditures for active labour market policy and thus, a high concentration on sustainability in this segment, while Hungary shows the lowest degree of EPL with highest expenditures for passive labour market policies. In contrast to other transition countries, the Croatian labour market showed a pervasive worker protection with low levels of active and passive labour market protection, with a low replacement rate and a relatively short duration of benefit (Biondić et al., 2003). The revision strengthened new flexible arrangements like atypical employment relationships (part-time and temporary) or the slight liberalization of dismissals among full-time and regular employees in order to solve the labour market problems. According to Eurostat data, the share of temporary employment relationships increased in Eastern European countries reaching double-digit values in Croatia (12,9 % of total employment), Poland (27,3 %) and Slovenia (17,3 %) in 2006. But negative consequences of these policies are evident: unpaid overtime and undeclared wages as well as a lack of enhancing social dialogue and corporate social responsibility, not achieving sustainable production and therefore, consumption patterns.

4. CATEGORIZATION OF THE SERVICE SECTOR

Incorporating these findings as well as quality measures, it is necessary to introduce a breakdown of services. Several contributions are made by Katouzian (1970), Singelmann (1978), Elfring (1989) and Castells (1996). In general, four sub-sectors are highlighted, namely business, distributive, personal and social services, while demand elasticities vary across service categories including heterogeneous levels of productivity growth. In literature, due to institutional characteristics, the business and distributive services are also defined as intermediate services and inputs for the production of goods and services belonging to other (sub)sectors. Personal and social services are mainly final or consumer-oriented services. Furthermore, a functional division of services along the skill structure reflects an internal diversity of activities whereas different qualification profiles are needed (knowledge-intensive services). At the end, the potentialities for promoting a sustainable development are added, too.

Producer services define financial, insurance and real estate services, R&D, advertising as well as renting of machinery and equipment. They provide externalities and symbiotic, network-like connections between producers as well as between producers and consumers like companies, other production organizations and government agencies. They influence the production process of the manufacturing sector, could enhance productivity gains as intermediate goods and they need mainly knowledge-intensive high-skilled workers functioning as an exploitation of EOS for human capital. The latest characteristics could be applied to *distributive* services as well, being a part of network services as energy and water

supply. Productivity gains in retail and wholesale trade, transport and storage services as well as communications are primarily interpreted as a result of the efficiency, size and incorporation of the ICT capital stock. Furthermore, living in a service economy, personal transportation increases. Thus, social conditions influence the environment through consumption patterns with increasing use of car and air transport. Hence, the question of reducing environmental damages in terms of energy use and decreasing pollution as well as the internalisation of negative externalities in prices are discussed in connection with distributive services. According to ECORYS (2008), the increasing volumes of transports exceeded growth in energy use in all other sectors reaching a 98 % share of total oil demand. Greenhouse gas emissions are increasing in line with the increase in road freight, air freight or passenger car transport. Thus, research, support and regulation leading to improvements and innovations in vehicle, aircraft and fuel efficient technology by requiring cuts in CO_2 emissions as well as traffic management including better use of public transport due to demographic changes are necessary – and support to overcome the current economic crises. But looking at the national SDS strategies of Eastern European Countries, it is shown that the aim of a "sustainable transport" in not the objective in countries like the Czech Republic, Poland or Slovenia. Nevertheless and despite the decrease of international trade in the course of the financial crises, great growth potentials are expected in these services sectors in the future through outsourcing, fragmentation and offshoring. In general, the characteristic of "non-tradability" of services is no longer maintainable.

On the contrary, personal and social services indicate weak or even negative potentials for productivity growth because of their consumption-oriented nature and difficulties in their measurement. *Social services* consist of government services proper, health, educational and other social services are mainly regarded as public goods.[14] These services are affected by problems of market-failure and thus, showing characteristics of merit goods in a social welfare perspective as well as of poor substitutes for manufactured goods.[15] Government interventions and the promotion of sustainable development are needed, because households do not realize the positive externalities, the qualities and long-run consequences investing in these kinds of services. The topic of a sustainability of the welfare state and the question of providing such "technologically driven cost-disease" services by the market have been discussed before the financial crises and certainly will also be discussed afterwards. In a growing income economy with a "greying" of the population, the demand for public services rises (Lindbeck (2005), van der Ploeg (2006), Official Journal of the European Union (2007)).

At least, *personal services* consist of repair and domestic services but also hotels and restaurants and therefore recreational and cultural services. These sectors as well, are not acting mainly on domestic markets at local or regional levels but are opened to international competition. Connecting these sectors with the considerations of sustainability, the main discussions are dealing with tourism related activities. The tourism sector is regarded on the one hand, as a multiplier through its linkages and spill-over effects to other sectors as well as being a composite product with a collection of interrelated industries (Sinclair (1998), 14)[16]. But this sector depends on basic innovations of other sectors mainly transport and the development of ICTs covering the whole tourism value chain and enforcing global

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[14] In literature, the distinction between market and public services is used along the institutional characteristics reflecting differences between countries and therefore, the different welfare state models. For a more detailed analysis see e.g. Esping-Andersen (1990), Aiginger and Guger (2005), Blanke and Hoffmann (2008).

[15] For a more detailed analysis see Blank (2000).

[16] Statistically, the positions consists of four categories along the NACE, Rev. 1 categorization: H (hotels and restaurants) and parts of I (transport), K (real estate) and O (other social and personal services)

competition by pressures on quality. On the other hand, it is considered to be a clean and renewable sector. However numerous studies show that there are significant environmental impacts on tourist destinations in terms of air pollution, climate change, congestion, resource use and the production of waste as well the quality of jobs and the impacts on cultural heritage.

Summing up the main findings, the shares of all categories will increase due to income increases in the future. The social services benefits from a "greying" economy but depending on the intensity of the welfare state, the quality of personal services has to adjust to the "new customer", and business as well as distributive services depend on the developments in the manufacturing sector, the developments of ICT and the deepening of the globalisation processes. Concerning the tradability of services, liberalisation in the EU is still lagging behind the efforts in the other sectors. Despite the intention of a common market, the national segmentation is determined by country specific regulations. Furthermore, the Lisbon goals enforce impulses for the development of services, accelerating productivity and social cohesion with the aim of a common market for services in 2010 due to the EU Services Directive. Concerning the current financial and economic crises, services which show a high dependence on tradability are much more affected than domestic-oriented services dealing as refugee sectors for unemployed people. In comparison to other recession phases, today distributive and business services suffer of high negative growth rates while the rate of social services increases (ECB (2009), 56).

Following all these implementations, transition countries which are low- to middle-income countries, need to evolve a "typical" structure of economies at a similar stage of development. The over-industrialisation in these former planned economies led to structural distortions promoting agricultural and industrial conglomerates. Due to the definition of the Gross National Product of the former Eastern European countries, services like education, health or services of the state are considered to be un-productive, while business-related services like transport or trade as well as the returns of the tourism sector which are covered in the material product system are more productive because they contribute to the production or distribution of goods. While the over-consumption of natural resources which are needed for future generations took place, the relative equality of income was ensured. But paying similar wages without differentiating between lower or higher education and skills, negative consequences on the incentives for entrepreneurship and among workers affecting innovation potentialities, quality and varieties of goods and services had been occurred. During the de-industrialisation phase, demand adjustments, reflecting consumer preferences and efficiency gains in industry took place. Thus, figure 4 gives an overview of the distribution of employment in European countries.
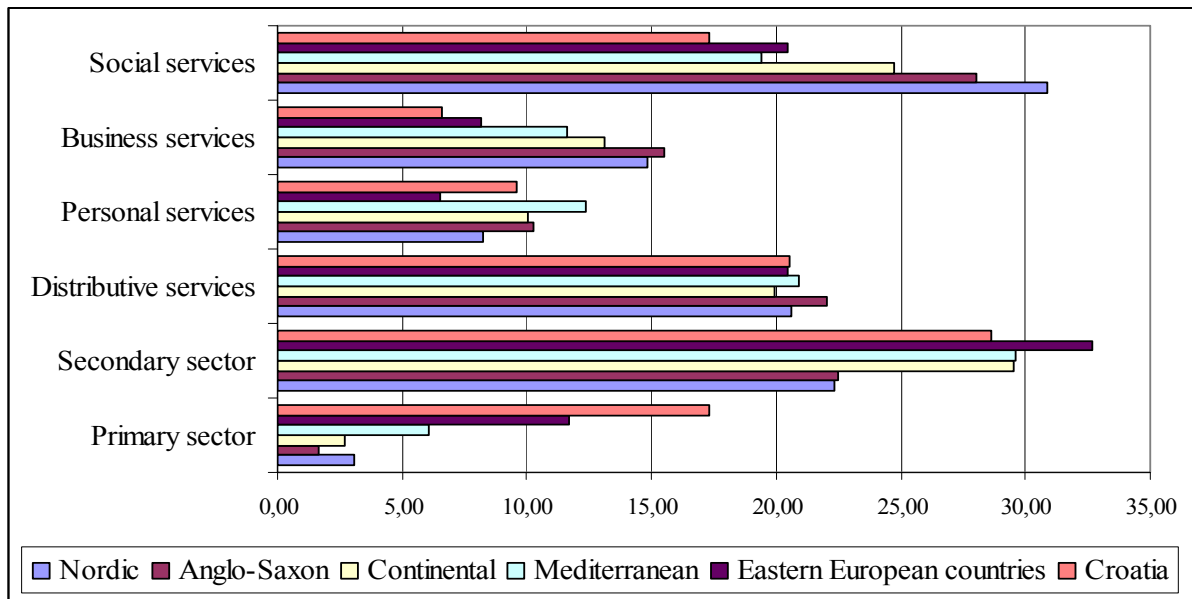
Figure 4. *The distribution of employment shares in European countries selected along welfare state regimes, 2005*

Source: own illustration, based on Laborstat, Eastern European Countries without the Baltic States

Apart from the relatively high employment shares in the secondary and primary sectors, Eastern European Countries and Croatia show a lower share in personal, business as well as social services influencing further productivity catching-up processes. The highest values in social services are found in the Nordic group which reflects the already mentioned intentions of a more expansive welfare state regime, while in the Continental, as a traditional male breadwinner model, and the Mediterranean countries, with passive family policies, the gaps are closer. The Nordic, the Anglo-Saxon, France and the Eastern European countries have also a more than twice or even three time's higher ratio of female employees. Also Croatia shows the overall highest female/male ratio in this sector which will play a more important role in the future because of population ageing.

Finally, figure 5 shows another possible distinction: the one between high- and middle-technology products and knowledge-intensive services.
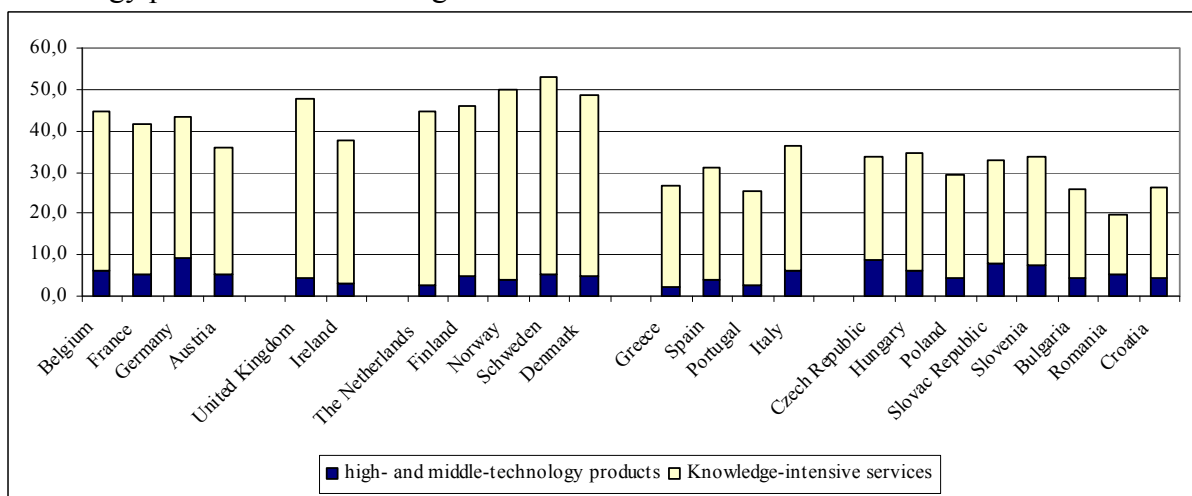

Figure 5. *Share of employees working in the production of high- and middle-technology products and knowledge-intensive services, in % of total employment, 2006 (source: own illustration, based on Eurostat data).*

Thus, the share of employees working in the production of the first mentioned products are higher in the Czech Republic, Hungary, Slovakia or Slovenia than in other European countries of the Nordic and Anglo-Saxon regime. This observation underlined the conclusion of the BMBF (2007), whereby the scientific specialisation has remained nearly unchanged concentrated in chemistry, pharmaceutics, transport and machinery. In Poland, there is a trend towards R&D in the primary sector, whereby the Czech Republic and Slovakia promote life sciences. The production as well as the employment in knowledge-intensive products connecting the processes in manufacturing is still under-represented. Thus, the ongoing modularisation of "tradable" and knowledge-intensive ICTs and services, encourage the promotion of these services in the future.

5. CONCLUSIONS

Examining the approach of sustainability, it was highlighted that the concept is a cross-section topic mainly used by politicians and is implemented inter alia into the framework of the European Union. The main goals of sustainable development are to protect, maintain and improve present lifestyles and preserve them for future generations. These goals have to be implemented into the production processes of all sectors of an economy as well as in services affecting mainly the quality of service sector activities. Therefore in this paper, determinants of structural change are analysed with particular reference to characteristics that are specific to services taking into account the growing role of this sector in terms of employment and income. In this context, this paper represents some theoretical insights into the structural change theory. It was indicated, that the supply-side explanations have to be extended by demand-side elements as well as by the role of ICT use and human capital. The categorization as well as the possibilities and effects resulting from the tradability of services show that these activities considered as "green" sectors offend against the pillars of "sustainability".

Applying these considerations for Eastern European countries, the point of view changes: economic development and a catching-up process is not only economic growth in terms of productivity, GDP or GNP and therefore a convergence process to other industrialized countries. Moreover, a post-industrialisation, innovation and "sustainable" process is accompanied by changes in the socio-economic structure as well as environmental degradation, climate change, EU integration processes and (quality) improvements needed in labour conditions, education and health. This ensures lower production costs, by using resources in a more efficient way through the necessity of employing fewer raw materials, less energy, less water or recycling. In this context, ECORYS (2008) analyses that a convergence of national SDS towards the EU SDS is established in all key challenges in the Czech Republic as well as in Slovakia and Poland with the exception of the topic of global poverty. The Slovenian Sustainable Development Strategies covers only sustainable consumption and production, public health and social inclusion. But remarkable efforts are made in the field of eco-innovation, new environmental technologies as well as the establishment of further excellence centres. In Hungary, the NSDS is currently in the legislative process, while Croatia has the most work to be done and to promote further structural changes.

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CAN SLOVENIAN FIRMS EXPLOIT THE POTENTIAL OF LEAD MARKETS AND ECO-TECHNOLOGIES?
A PRELIMINARY EMPIRICAL INVESTIGATION

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1. INTRODUCTION

The lead markets initiative first appeared as a tool of promoting technological development in the *Aho Report* (2006, entitled *Creating an Innovative Europe*). The initiative focuses on the fast growing markets for products based on technologically demanding and innovative activities that could become globally competitive if given the necessary support in their development phases. As planned in the initiative, the support would be provided in the framework of the public procurement procedures (First 'Lead-Markets' Initiatives to be Launched Early 2008, 2007).

Aho Report (2006) also identified several areas that potentially qualify as lead markets: e-Health, pharmaceuticals, transport and logistics, environmental technologies, digital contents, energy and security. In 2008, the following six areas were selected for the first implementation of the lead markets initiative: e-health, protective textiles, sustainable construction, recycling, bio-based products and renewable energy (Six areas selected for lead market initiative, 2008).

The development of environmentally friendly technologies, which (among other goals) are aimed at reducing the use of energy, recycling of materials and creating energy as a by-product, is in Slovenia led by the company called *Esotech* with the help of *Ekološki grozd*, an interest group of companies. Although the field is new, it has been growing fast, with several companies developing different environmentally friendly products and cooperating both at the national as well as the international level.

The primary research objective of this article is to examine the potential benefits of the lead markets initiative in the field of eco-innovation in Slovenia at the microeconomic level. The assessment of the current situation in Slovenia is provided by the four most important companies in the field. We examined their views of the initiative, general and specific problems in the eco-markets, strategic orientation, etc. in a qualitative study which serves as the platform for development of an action plan presented in the concluding section of this paper.

2. LEAD MARKETS AND TECHNOLOGICAL DEVELOPMENT

2.1. Lead markets initiative: the historical background

After the Second World War, from 1950s to 1970s, European economic performance was remarkable; both high economic growth and productivity improvements led to a successful catching up with the USA. At some point, however, the gap between the European economies and the USA measured in per capita GDP stopped diminishing, although the productvity was still on the rise. From that point onwards, the GDP per capita gap has been relatively stable, with Europe (the EU) reaching about 70% of the US GDP per capita. It was caused by the slowdown in job creation, which also resulted in higher unemployment accompanied by the decrease in the working hours per capita (Key Figures, 2005, p. 1-2).

Given the gap the EU focused on examination of possible approaches to turn the unfavourable trends around. It was soon acknowledged that technological development, the transfer and application of knowledge and research from institutes into the business sphere, active creation of new knowledge and technologies at the company level, stimulation of innovation and the creation of high value-added jobs could significantly alter the economic dynamics and help creating a competitive edge for the EU in the global economy.

Consequently, the lead markets initiative is aimed at stimulating technological development in selected highly propulsive industries with a large competitive potential by creating a market for new technologies with the help of public procurement. As we continue, we briefly present the importance of technological development for economic growth, followed by a discussion on the lead markets initiative in relation to technological development with a special focus on eco-innovation and its role for the future development of the planet.

2.2. Lead markets initiative: the promotion of technological development

Helpman (1991) discusses the rise and decline of nations. Research and development, along with the creation of new technologies and knowledge, have been emphasised countless times as the key component of economic success, especially in the developed economies. In economic theory, two models of growth are discussed: (1) growth by imitation and (2) growth by innovation (the latter of crucial importance for developed economies). Barro and Sala-i-martin (1997, p. 279) claim that capital accumulation and technological transfer can be an efficient way of promoting growth and development in less developed countries (basically due to cost considerations). History has recorded several breakthroughs from a 'follower' to a 'leader' group of economies (the US and Germany overtook Great Britain in the 18th century; see Brezis, Krugman and Tsiddon, 1993). It is therefore very important for the developed countries to mobilize their resources, especially technological and human capital, to develop new technologies in order to maintain their competitive edge and boost their economic performance.

'Becoming the most competitive and dynamic world economy, based on knowledge and the idea of sustainable development with a special focus on creating and economy capable of sustainable development and social cohesion' was proclaimed as a development goal by the EU in March 2000 (Lisbon Agenda, 2007). The 1990s were a succesfull decade for the EU with the creation of the internal market, implementation of Euro, successful monetary and fiscal policies across economies, which stimulated real and nominal convergence.

The new technologically oriented development paradigm and a comparative analysis of technological achievements in the EU shows that additional stimulus is required. The *Lisbon Agenda* was the first important step towards achieving development goals. Its main goals are the following (The Lisbon European Council – An Agenda of Economic and Social Renewal for Europe, 2000, p. 11): (1) the establishment of a dynamic and knowledge based economy, (2) accelerated growth aiming towards a sustainable development, (3) increased employment, and (4) modernization of social protection systems.

The *Lisbon Agenda* also suggests increasing the R&D expenditure to the level of 3% of GDP. But with EU-27 average of 1.83% and EU-15 average of 1.91% in 2007 the goal is unachievable without a significant increase in R&D investments by the business sector. One of the key obstacles for companies when deciding about investing in R&D is the perceived lack of new innovative products' possibilities for commercial exploitation. Another problem, typical for the EU, is also the presence of the 'borders' in the form of regulation and technological demands despite the implementation of internal market. Big national markets (the US, China) therefore posess an important competitive advantage over the EU (Creating an Innovative Europe, 2006, str. 5).

The lead markets initiative was developed as a supporting platform for technological development. 'Lead markets' were defined as high-growth potential markets for research and innovation-rich products, those which represent a potential for becoming a global competitive leader provided they get the necessary support from the public sector either in the role of a regulator, customer or facilitator (First »Lead-Markets« Initiatives to be Launched Early 2008, 2007). As already mentioned, the concept was first introduced in the *Aho Report*, also known under the title *Creating an innovative Europe* (2006), as one of the possible mechanisms for promoting technological development.

Gavigan (2006) defined lead markets as: (1) markets for R&D and innovation intensive goods, services or solutions, (2) markets with high growth potential in both the EU markets and globally, (3) products and markets that have the potential of obtaining competitive advantage in both the EU and global markets, (4) markets that require action by the public sphere (regulation, customer, facilitization).

The same author also emphasised that the lead markets initiative is not about 'picking winners', but that the idea is based on a search for those markets, products, services, and technologies, that can add greater value to the European economy. The aim of the initiative is not the artificial creation of markets for research advancements, but the creation of such a business environment that will stimulate and allow the business sector to develop and market innovative products on competitive basis. *Aho Report* (2006, p.5) emphasises that unless the EU is capable of developing markets for innovative products, the industries and branches offering such products will either move to a different location or disappear.

According to the *Aho Report* (2006, p.5), lead markets are important due to the following reasons:

- Lead users (customers) are the 'early birds' among the customers; consequently they are prepared to take higher risks and accept higher costs. Their role is indispensable as they provide valuable feedback to the producers. In return, they develop better abilities to use and reap the benefits from the innovation; the probability that the innovative product will be custom-tailored to their specific needs is also quite high.

- The existence of a large enough market offers the investors potential for earning a return on their investment and thereby reduces risk.

- Local product characteristics requirements and the proximity of markets are often very important when launching an innovative product. Therefore the existence of lead markets can influence the decision of investors about the R&D and business location.

The fact that markets ususally do not reward the lead customers increases the importance of the EU and its institutions. The most important steps in creation of lead markets are the following ones (Creating an Innovative Europe, 2006, p. 6):

- Harmonized regulation across the EU that is favourable to innovation and 'based on early anticipation of needs'.

- The power of the EU to set standards could be used to demand high technical performance; new standards should be set quickly and efficiently.

- Public procurement could be used as a driving force of the demand for innovative products.

- The creation and stimulation of an environment that 'celebrates innovation' and welcomes new innovative products and services would make the EU attractive to investors.

The lead markets initiative was developed in several stages. Following the *Aho Report* (2006) which identified the lead markets priorities as e-health, pharmaceuticals, transport and

logistics, environment, digital content, energy, and security, the European Commission announced a slightly modified set of priority areas in December 2007, focusing specifically on sustainable development and ecology. These areas are (A lead market initiative for Europe, 2007):

- **e-health** representing ICT solutions for patients, medical services and payment institutions;
- **sustainable construction** necessary because currently buildings have the largest share (42%) of the total EU final energy consumption and also produce about 35% of greenhouse gas emissions;
- **technical textiles** for intelligent personal protective clothing and equipment (the EU market has a growth potential of 50% in the next few years and major spillovers to other segments of the textile sector are possible);
- **bio-based products** with the goal of lowering uncertainty about product properties and increasing market transparency that 'hinder the fast take-up of products';
- **recycling** as the key element of moving towards sustainable consumption and production;
- **renewable energy** given that the development of renewable resources is held back by high costs, low demand, market fragmentation as well as administrative and market barriers.

In the remaining part of this section we focus on the lead markets initiative as applied to environmental technologies.

2.3. Environmental technologies and lead markets

The environmental concern has been gaining a widespread support across the globe. The importance of limiting greenhouse gas emissions has been especially aknowledged within the EU, which has started its own environmental programme and was also the first to launch an emissions trading market (Emmissions trading scheme, 2009).

The support for the environmental initiative is also evident from the choice of the lead markets, because 4 of the chosen 6 fields are directly linked to the environmental problems. Also, the EU has taken the leading global initiative in the environmental fields by trying to reach the greenhouse gases emissions target. It would seem that the understanding for the importance of environmental issues is so high that the EU believes that these fields could also become a source of global competitive advantage.
According to the EU, 'the renewable energy as the development of renewable resources is held back by high costs, low demand, market fragmentation as well as administrative and market barriers' (Six areas selected for lead market initiative, 2008). But the concept of sustainable development, studies in environmental economics, resource economics as well as the European strategies warn that the share of renewables, both energy as well as resources, will have to significantly increase in order to avoid high costs of climate change (see Stern Report, 2006).

The field of eco-innovation was chosen among the priorities in the 2006 *Aho Report*. Although in the final decision and choice of the lead markets the environment field was broken down into several lead markets and eco-innovation was not specifically mentioned,

the field of eco-innovation is closely related to many products and services from recycling, sustainable construction, renewable energies, and bio-based products.

The field of eco-innovation focuses on the innovations within the eco-industries. These are defined according to the OECD/Eurostat (1999) as activities producing goods and services, that measure, limit, diminish, stop or undo environmental damages, whereby the environment is defined as water, air and land. The field also focuses on the problems of waste, noise and eco-systems as well as clean technologies, goods and services that diminish environmental risk, pollution and use of resources. The field of eco-industries is further divided into several sub-fields, presented in Table 1 (Analysis of the EU Eco-Industries, their Employment and Export Potential, 2006, p. 4):

Table 1: Eco-industries groups and environmental domains

Eco-Industry Group	Environmental Domain (Sub-Sector)
Pollution Management	Air pollution Control (APC)
	Waste Water Treatment (WWT)
	Waste Management (WM)
	Remediation and Clean up of Soil & Groundwater
	Noise and Vibration Control
	Environmental Monitoring & Instrumentation
	Environmental Research & Development
	Public Environmental Administration
	Private Environmental Management
Resources Management	Water Supply
	Recycled Materials
	Nature Protection

Source: Analysis of the EU Eco-Industries, their Employment and Export Potential, 2006, p. 4.

Eco-innovations, both planned or circumstantial, within the fields of eco-industries denotes the production, adaptation or use of a product, production process, service, management or business process. For the company they are a novelty which positively contributes to reduced environmental risks, pollution and other negative impacts of resource use (including the use of energy; see Kemp and Pearson, 2007).

Unfortunately, at the moment eco-innovations are of less interest from the marketing perspective. The business community is generally still unable to fully recognize the potential cost advantages of implementing new technologies resulting from eco-innovations that would reduce either the use of materials or energy. According to Bartolomeo et al. (2003) the current three most common arguments for the increased use of eco-innovation in companies are the following: improvement of company image, compliance with legislation and cost reduction. But despite the potential cost savings, the costs of eco-innovation are the greatest obstacle to their implementation, especially for companies that are dependant on purchasing new technology (Del Rio Gonzales, 2005).

2.4. The position of eco-innovation industries in Europe and globally

The European eco-innovation market is the second largest in the world after North America. In 1998 the market size in EU-15 was estimated at 104 billion € and in the US at 132 billion €. The forecasted growth rates are low, only about 1% per year. Higher growth is expected only in the Eastern markets (8-14%), which are at the moment still small (Table 2).

Table 2: Eco-inndustries markets in the world

Region / Country	1998 Market size (billion €)	2010 est. Market size (billion €)	Est. growth rate (in %)
North America	132	149	1
EU-15	104	118	1
Japan	62	69	1
China	4	17	12
India	1	2	6
SE Asia	9	43	14
S America	4	13	9
CEE	4	12	10
Australia/NZ	4	5	1
Middle East	2	6	8
Africa	2	5	6
Total	330	439	2

Source: The EU Eco-Industry's Export Potential, 1998.

Eco-industries represent about 2% of GDP in EU-25. In 2004 the total revenues of eco-industries in EU-25 was 227 billion €, 214 billion in EU-15. The revenues in EU-15 were growing steadily by an average of 7% during 1999-2004. 64% of the revenues in 2004 were earned in industries and activities dealing with pollution management and the remaining 36% in resources management. The biggest national eco-markets are France and Germany, which toghether represent 49% of total eco-industries revenue in the EU. The 10 new memebers only contribute 5.7% of total revenues.

The industry directly or indirectly provides jobs for 3.4 million people (2.3 million in pollution management, solid waste management and water management; solid waste management has the highest share of 77%). The trade in the industry is not strong. In 2004 the exports of eco-industries in EU-25 was estimated to be 31 billion € and imports 11,1 billion €. 57% of all trade takes place on the internal EU market. The largest three markets (Germany, France, Great Britain) are all net exporters, and represent 55% of the total eco-industry trade (Analysis of the EU Eco-Industries, their Employment and Export Potential, 2006).

The growth of eco-industry markets has been strong in the past few years, but there is a significant difference between the traditional mature markets (water supply, waste management) and those markets, whose emergence and growth were initiated by legislative changes (renewable energy, eco-construction). In most cases, the forecasts are good, especially in the new EU members, which will have to implement the EU environmental regulations.

Growth of the eco-industries has been primarily motivated by the following factors (Eco-industry, its size, employment, perspective and barriers to growth in an enlarged EU, 2006):

- compliance with national and EU regulation (e.g. about water quality);

- development of new technology or new market segments (removal of old factory plants from city centres);

- policy assistance (in some cases it is necessary to allow a more competitive position of new industries compared to the more traditional ones);

- public financing;

- growing consumer awareness about the availability and benefits of new environmental technologies and products.

According to the EU eco-industries analysis the following measures could be used to stimulate future development (Analysis of the EU Eco-Industries, Their Employment and Export Potential, 2006):

- The increase of environmental standards and demands. The existing standards have been shown to play a crucial role in the development of eco-industries and the legislative and regulatory demands are expected to sustain EU's leading global position in the eco-field.

- The harmonistation of eco-standards is also very important for future development of the industries, because it promotes the quality of eco-industries and has a positive impact on consumer awareness.

- The transparency of prices and the share of environmentally related costs in the cost structure should be stimulated. The stimulation of demand with tax incentives is also desirable.

- It is important to provide as much information about eco-industries, the costs and benefits of eco-products and services to the consumers as possible. The examples of such instruments are eco-brands.

- Financial mechanisms to support the growth of eco-industries should be developed, especially in new EU members. The mechanisms should be adapted to the needs of the new and still risky industries, demanding high inputs, long return periods etc.

- The development should also be stimulated with knowledge transfer, information transfer etc.

- Export should be given assistance, especially in mature industries.

- Technological development and technology transfer should be stimulated and given assistance as well.

With growing consumer awareness the potential of eco-industries in Europe has been increasing fast. Following its environmetal orientation, Europe has thus taken a leading role globally and should aim at retaining and developing this competitive advantage. But to do that, it is also important that national economies develop their own eco-industries and focus on specific comparative advantages within EU, which could in time gain a more global character.

3. ECO-INDUSTRIES IN SLOVENIA

3.1. Background and methodology

The development of Slovenian eco-industries has been stimulated by the development of European standards and regulations, although all the relevant ones still haven't been adopted at the national level yet. Nonetheless, as the subsequent analysis shows, the development of eco-indutries in Slovenia has a significant potential.

In this section we present the main characteristics of eco-industries in Slovenia based on our qualitative research project. In-depth interviews with 3 members of management teams of 2 most important Slovenian eco-companies (Esotech and Elpa) were used as our primary tool of data collection, supplemented with a thorough review of available secondary data sources and relevant bibliographical information to complete each case study.

The focus of our research was on details of hands-on experience each of our respondents has in the field of eco-industries. The summary of our most important findings is presented after a short introduction of four most innovative Slovenian eco-companies which are successfully competing in a global market.

3.2. Short company introduction

As already mentioned, the most important firm in the field of eco-industries in Slovenia is **Esotech** from Velenje, which is the key company in *Slovenian Environmental Cluster* and mainly focuses on large environmental projects in the air pollution control, waste water treatment, waste management etc. They are active in the reconstruction and rennovation of power plants, hydro plants, power transmission and distribution and are involved 'in all segments assuring reliable, safe and environmental friendly solutions' (Esotech, 2009).

The majority of *Esotech*'s commercial projects are tailored to the needs of their individual clients; therefore many products actually cannot be patent-protected because the required repetition of the technology use cannot be demonstrated. But nonetheless, many of these individual solutions are innovative and the patent protection can, in some cases, be applied to the area of marketing.

Eco-industries in Slovenia are also represented by two small but innovative firms. **Elpa, d.o.o.** (also from Velenje) develops system for noise, vibration reduction, 'wear out of rails, wheel flanges and rail brakes; GCC (gauge corner cracking); RCF (rolling contact fatique); sinus-line (corrugation); etc, by using special environmentally friendly composite materials, applied on sources of noise, and for that reducing maintenance costs on rail infrastructure as on railways, tramways, metros, hump yards, shunting stations, classification yards, marshalling yards under Rail Interoperability and Directive on Environmental Noise, as being also awarded by European Commission for the Environment' (Elpa, 2009).

The **W**ear **O**ut and **N**oise **R**eduction **O**n **S**ource (WONROS) technology is *Elpa*'s key product. It is economically efficient, reduces cost, but it is also environmentally friendly and reduces helath hazards related to noise. The entire (patent-proteced) technology is built around patented multi-active rail preserving systems; special heavy duty appliances designed with rail maintenance, vandalism and energy independence in mind, by using special long lasting, temperature proof and environmentally friendly composite materials, applied on the

noise sources. For example, the innovative anti-noise package for rails BREMEX-ANNSYS – currently the most efficient in the market - reduces noise by 99.9% (measurement provided by the *Zavod za varstvo pri delu, d.d. Ljubljana*).

Gea-SOL, do.o. from Kranj is a small developer of the solar tile. The company received several awards for their product, including the 2003 European Business Award for the Environment. The patent-protected tile transforms solar energy into heat; as such it is an alternative to classic solar collectors. Thus channelled the solar energy can be used either for water or room heating (Gea-Sol Commended for European Environment Award, 2002)

Karbon Čiste tehnologije, d.o.o[1] (2009) is one of the smallest companies within the Velenje mines system. It was established in 2003 and focuses on development of clean technologies for the coal extraction and use. They are also involved in waste management (car disposal etc.) and plan to enter the water distribution industry. The goal of the company is to become one of the leading companies in the SE Europe in the field of environmentally friendly coal extraction and use.

3.3 Analysis of companies in eco-industries in Slovenia

3.3.1. Slovenian Environmental Cluster

In order to understand the environment in which the companies active in Slovenian eco-industries operate, we first need to discuss the role of the *Slovenian Environmental Cluster*. Formally the *Economic Interest Association - Slovenian Environmental Cluster* (SEC) was set up in 2003.[2] It comprises of 15 members, all of them organizations from academia and business capable of developing, building and/or marketing the eco-technologies in domestic and foreign markets.

The cluster represents a strong developmental core and provides a critical mass of engeneering, R&D, technical and technological, economic and other knowledge and skills for developing large environmental projects in Slovenia and abroad. The projects which were developed and successfully implemented at home represent excellent references in the global setting.

The key cluster objective is to internationalise technologies and to transfer knowledge from theory into practice. Following are two most successful stories so far:

- *Esotech* and *Kemijski inštitut (Institute for Chemistry)* developed waste water treatment plants for the company Niko and Javor;

- *Esotech* and *Jozef Štefan Institute* cooperated on the project of developing a device for flue gas desulphurisation and a pilot project for the use of termic energy produced at the waste processing plant in Podgorica near Ljubljana.

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[1] See www.karbon.si.

[2] Information was obtained from the assosciation's website (www.giz-eg.si) as well as from the leading enterprise of the association Esotech, d.o.o.

Within the SEC another network of companies was formed joined in the Slovenian *Water Supply and Sanitation Technology Platform* (WSSTP) with over 20 members, many of them with relevant knowledge and experience in its practical implementation. Several important and leading institutes and companies operate within the platform with the purpose of facilitating sustainable development. The development of WSSTP is based on cooperation between scientific institutes and companies and also on cooperation within the EU's *Water Supply and Sanitation Technology Platform* (EU WSSTP).

The strategic goals of the platform is creating a pool of planning and implementation capabilities in order to raise the innovative abilities of Slovenian economy; the development of communication and information platform; and the exchange of expertise among partners of WSSTP and similar platforms in the international arena. The developmental unit of the cluster and joint infrastructure stimulates the development and operation of the cluster and therby also enhances the competitiveness of its members based on higher R&D investments, specialization and core capabilities development, the development of suitable skills and knowledge in the labour market and a more vigourous development in the international environment.

The environmentally friendly projects that are developed and stimulated by the cluster and its members also stimulate environmental awareness and rational use of energy. The implementation of environmental technologies includes the choice of cost efficient technologies, the use of energy efficient and modern equipment, continuous education, use of modern management techniques and suitable communication. All these also contribute to a decrease in cost (including environmental tax), creation of new market niches, higher quality and a higher level of innovativness.

Developmental projects of SEC include hot flue gass filtration in the case of waste incineration, low cost device for flue gas desulphurisations, technology for flue gas desulphurisations with additivies, thermophilous anaerobic – aerobic stabilisation of mud from waste water treatment plant and SBR technology for waste water treatment.

The *Slovenian Environmental Cluster* also acknowledges the importance of cooperation with scienticic institutes and academic institutions. Environmental technologies are highly demanding regarding the R&D inputs. Lack of cooperation with the scientific and academic sphere would significantly reduce the success of these projects. Also, the combination of basic and applicative research enables strengthening of the competitive advantages. Additionally, SEC emphasises the importance of marketing knowledge, project management and other non-technical skills that are necessary for successful implementation of larger projects. And, since the company size often does not allow the development of own R&D departments, the cooperation with institutes and universities gains additional importance.

3.3.2. The challenges in Slovenian eco-industries

In our in-depth interviews with managers of two of the four most important Slovenian companies active in the field of eco-industries we addressed several vital issues. The summarized discussions are presented below.

The Slovenian eco-industries build on development of technologies, goods and services that promote environmental friendliness or are themselves environmentally friendly final products for consumers. The **development of environmentally friendly technological solutions** (the

main goal of the SEC which was introduced in the previous segment) is related to achieving the following three goals:

- Reduced use of resources (energy, materials, water use savings, reduced use of land and a more prominent use of recycling).

- Diminished negative impacts on nature, especially in case of emissions and reduced water pollution (sustainable use of resources – especially land - is encouraged instead).

- Increased value of product or service by increasing its functionality, flexibility and quality.

The main opportunities for future development of eco-industries are hidden in the motivation of companies to increase or stimulate their growth and development by increasing their market share. The main factors to consider when discussing factors affecting future development and opportunities of eco-industries are:

- Profitability, which is most often the most important stimulus for investing in environemental technologies as these usually cause a decrease in cost by reducing material and energy use, increased recycling, eco-tax savings, etc.

- Improved quality, which is a result of several factors, but most importantly it results from decreased damages to the environment, increased safety and reduction of health hazards; an important consequence is also the increased social responsibility of companies.

- Environmental regulation and other instruments of the state, which include legislation and regulation, a policy that stimulates the development of eco-industries, including the creation of markets via the idea of the lead markets.

- Flexiblility in adjustments to the changing market demands.

As we see, the role of the government in creating a favourable financial environment for eco-investments is not to be overlooked.

According to our respondents, another key factor in the future development of eco-industries in Slovenia are the **environmental standards and their implementation**. Not only do they stimulate the development of eco-industries but also the development and competitiveness of other companies that implement the technologies produced by eco-industries later on. Eco-orientation is becoming an important element of competitiveness in the European markets and will become increasingly important in the global market as well. As an EU member state, Slovenia implemented EU environmental regulation and must incorporate the environmental dimension in its development strategies in order to fulfill the demands of the *Lisbon Agenda* and Kyoto. And this will, in turn, also stimulate the development of eco-industries as it will strengthen the existing and open new markets for environmental technologies.

The Slovenian companies in eco-indutries which were included in our qualitative study listed several **problems and obstacles** to their more efficient development.

The first major problem is the slow and insufficient transfer of knowledge gained in scientific (either basic or applied) research projects into the business sector. Partially, the lack of motivation on the academic side could be caused by their lack of cooperation with the companies. But as it turns out, the business sector is also sometimes to blame: it is often not capable of absorbing the new knowledge and technology and/or lacks the necessary skills either due to the lack of human capital or more often due to the fear of investing relatively large funds necessary for implementing new technologies and developing new or improved products. On the other hand all our respondents emphasise the fact that environmental technologies and environmental efficiency represent a huge opportunity for Slovenia, because eco-efficiency could become a competitive advantage for Slovenian firms in the future.

A significant contribution to the relative failure of the cooperation between academia and business can be attributed to Slovenian government because it no longer stimulates the investment into clusters. Moreover, all remaining investment incentives are generally very low. The companies emphasise the fact that the business sector in many cases does not use the cutting-edge technology. The investment incentives should therefore include subsidized loans for environmental projects and significant tax deductions for investment into new technologies.

Another important obstacle for the development of eco-industries is the lack of international references and also references in general (lack of formal academic credentials often results in the most innovative companies not qualifying at national project tenders). A more successful international presence of Slovenian companies could be established through better cooperation, more focus on marketing activities and different financing schemes.

Furthermore, small and medium-sized companies often cannot find the means of financing development projects. The government should develop system mechanisms to help in such cases. But so far, public funds have rarely been used to stimulate the competitiveness of domestic businesses. This contributes to the lack of references and disables companies from being more present in the international markets.

Finally, the EU funds are generally recognized as an important source of financing. However, both at the national and the EU level, the success in obtaining these funds is lowered substantially by very complicated and time-consuming procedures which can use up to a quarter of total funds allocated to the project in its lifetime.

4. CONCLUSIONS: AN ACTION PLAN PROPOSAL

Future economic development and growth in the European Union will depend on its internal technological progress. As research and data show, the EU has so far not been able to create a suitable environment that would stimulate innovation which is a precondition for further successful development. Therefore, the lead markets initiative with its emphasis on the role of public procurement represents an important step forward.

The lead markets initiative has been developed in several stages. A siginificant number of areas were suggested; 4 out of the chosen 6 are closely related to environmental issues. Environmental changes pose a serious challenge both to policy makers and the wider population; it is good to note that the European Commission seems to understand the

importance of the issue and works on policy measures for diminishing the environmental changes.

The development of eco-industries has so far not really been a consequence of systematic government efforts although several small and medium-sized companies did successfully define and enter their chosen market niches (some even penetrated larger foreign markets with significant success). Nevertheless, many obstacles to quicker developments in the field of eco-innovation are still firmly in place. We therefore propose a short government action plan which, if implemented, would assist further innovations and help Slovenian companies penetrating larger foreign markets.

Following from the results of our in-depth interviews it would seem that the first and foremost measure the Slovenian government needs to implement is to provide the small and medium-sized companies active in the field of eco-industries with the necessary system support for the utilization of the available EU funding (especially in the application process but also in subsequent project management procedures).

In the second step, the government should review the national tender requirements and get read of anomalies such as the demand for presentation of formal academic credentials (many great innovators not just in Slovenia but worldwide are university programmes dropouts).

Finally, a revised package of tax-related incentives should be introduced on one, and a formal plan to promote more socially (and in this framework more ecologically) desirable behaviour of both companies and consumers should be put in place. This might prove difficult in the current global economic environment, but is the only way of sustaining life on our planet in a long term.

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DOES BETTER ENVIRONMENTAL PERFORMANCE AFFECT REVENUES, COSTS, OR BOTH? EVIDENCE FROM A TRANSITION ECONOMY[*]

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1. INTRODUCTION

Much recent economic analysis, including empirical studies, examines the effect of corporate environmental performance on financial performance (e.g., Konar and Cohen, 2001; Khanna and Damon, 1999). Theoretical insight on this topic posits either a positive relationship or a negative relationship. The traditional perspective views environmental expenditures, whether on end-of-pipe treatment or pollution prevention efforts, as a drain on firms' resources (Palmer et al., 1995; Filbeck and Gorman, 2004). Certainly, firms spend billions of dollars annually when applying for environmental permits, installing mandatory technologies or at least technologies necessary to achieve compliance with pollution limits, and reporting their environmental impacts (Portney and Stavins, 2000). For example, in 1994, U.S. firms spent more than $ 120 billion to comply with environmental laws, in addition to several more billions spent on associated research and development (Konar and Cohen, 2001).

On the other hand, more recent theoretical insight posits that pollution prevention and the associated re-evaluation of firms' production processes engenders opportunities for firms to innovate by modifying their production "strategically", such as recycling by-products that would otherwise be discharged into the natural environment (Filbeck and Gorman, 2004). Moreover, this innovation may translate into a competitive advantage for a firm (Porter and van der Linde, 1995). Consistent with this perspective, some firms are moving beyond compliance by voluntarily reducing their pollution to levels below legal limits (Konar and Cohen, 2001). In some cases, this overcompliance is associated with a government-sponsored voluntary program. For example, more than 1,200 firms participated in the EPA's 33/50 program, agreeing to reduce voluntarily their emissions of certain chemicals by 33 % by 1988 and by 50 % by 1995 (Arora and Cason, 1995). Similar to voluntary overcompliance or as

part of these efforts to overcomply, some firms are adopting riskier proactive environmental management practices that attempt to modify production processes in order to prevent pollution rather than treat it. While riskier, these pollution prevention programs may effectively reduce pollution, while also lowering costs. For example, by implementing a rigorous pollution prevention program, 3M reported reducing its air pollutant emissions by 125,000 tons between 1975- 1990, while saving more than $ 1 billion in costs (McCloskey, 1993).

Several studies analyze empirically the effect of corporate environmental performance on financial performance (e.g., Khanna and Damon, 1999). To the authors' best knowledge, no previous study examines this relationship outside of the US and Canada, with only two studies of Canada (Laplante and Lanoie, 1994; Lanoie et al., 1998). Thus, previous empirical studies examine only mature market economies. In contrast, our study examines the effect of environmental performance, as measured by air pollutant emissions, on financial performance in the transition economy of the Czech Republic during the years 1996 and 1998.

The context of a transition economy is highly interesting for an assessment of financial performance for obvious reasons. Firms in transition economies are struggling to restructure themselves within a new market-based system. De novo private firms struggle to establish themselves as the economic system evolves. State-owned firms struggle to compete against potentially more nimble private competitors. Privatized firms (i.e., previously state-owned firms) face the extra challenge of reformulating their corporate management practices to fit an entirely new economic paradigm. The importance of corporate restructuring and financial management is even greater in most of the transition economies in Central and Eastern Europe, including the Czech Republic, given the desire to enter the European Union (EU). [While the Czech Republic entered the EU in 2004, the accession process began in the mid-1990s.]

As with other countries in Central and Eastern Europe, the context of the Czech transition economy is also highly interesting for an assessment of environmental performance. During and following the collapse of communism in the Czech Republic, environmental protection issues were prominent. The Czech Republic had a substantially degraded environment in the 1990s; in particular, poor ambient air quality and air pollution were large environmental problems of public concern (World Bank, 1992). In addition to this domestic public concern, the Czech government needed to reduce industrial air pollutant emissions in order to qualify for membership in the EU. (For both of these reasons, our focus on air-related environmental performance seems quite valid.) In response to public concern and in anticipation of the Czech Republic's entrance into the EU, between 1991 and 1998, the country's government was tightening air protection with a new Clean Air Act and its subsequent clarifying decrees. The Czech government was requiring new stationary emission sources to meet stringent emission limits based on the installation of state-of-the-art treatment technologies and forcing existing stationary emission sources initially to meet "currently attainable" emission limits and eventually to meet new source limits (by the end of 1998), all while steadily increasing emission charge rates on all stationary emission sources. In addition to more stringent air protection policies, Czech firms moved into export markets that may have offered new, albeit limited, opportunities to market "green" goods. Consistent with the escalating protection policies and new marketing opportunities, investment in environmental protection as a percent of gross domestic product (GDP) rose dramatically after 1991, peaking in 1996, and declined substantially after 1998, returning to pre-transition levels by 2000. In keeping with this increased investment, throughout this same period, aggregate air pollutant emissions declined

dramatically. Thus, Czech firms substantially increased their investment into environmental protection and produced dramatic pollution reductions.[1]

Consequently, Czech firms simultaneously struggled to control their air pollutant emissions and re-organize their financial matters. In this context of major changes, we anticipate that our study is well-positioned to capture any meaningful relationship that might exist between environmental and financial performance. This context contrasts with a mature market economy, where most firms may only marginally modify their environmental management practices with only limited effects on their financial performance. Of course, many prominent cases of substantial change to environmental management do exist in mature market economies; however, these cases need not represent a substantial portion of the overall economy.[2]

For this reason, the results from this study of a transition economy need not generalize to economies that are neither in transition or developing in general. Nevertheless, the results should generalize to other similar transition economies. The Czech experience with poor ambient air quality, initially high air pollutant emission levels, tightened air protection laws, substantial emission reductions, and pending entry into the EU is highly similar to other countries in Central and Eastern Europe, such as Hungary and Poland.[3] Thus, our study of the Czech Republic may be viewed as representative of other countries in the Central and Eastern European region during its transition period towards EU accession. In sum, this study cannot serve as the definitive study on the link from environmental performance to financial performance and may not generalize beyond transition economies; still, it represents a useful contribution to a literature packed with studies of mature market economies

Within the context of a transition economy, our study focuses on a particular research question. It assesses whether good environmental performance affects revenues, costs, or both, and if so, in which directions. As environmental performance improves, do revenues rise or fall? Do costs rise or fall? Do revenues rise and costs fall so that profits unambiguously increase? Or do revenues fall and costs rise so that profits unambiguously decrease? If both revenues and costs rise (or fall), does better environmental performance improve or undermine profitability? To answer these questions, this study analyzes the links from environmental performance to revenues, costs, and profits using a panel of Czech firms. The analytical results indicate strongly and robustly that better environmental performance improves profitability by driving down costs more than revenues.

This paper explores the effect of environmental performance within the following format. The next section summarizes the related literature. Section 3 describes the database on corporate financial performance and air pollutant emissions. Section 4 estimates and interprets the effect of corporate environmental performance on financial performance. The final section concludes.

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[1] During this period, the Czech government offered limited financial assistance from the State Environmental Fund for environmental investment. For example, this source represented only 4 % and 9 % of overall financing into air-related investment in 1996 and 1997, respectively (Czech Ministry of the Environment, 1997, 1998).
[2] While greater variation in the financial and environmental performance factors help to facilitate our analysis, this greater variation may stem (at least partially) from a stronger prevalence of "noise", which reduces our analytical ability to identify a meaningful "signal".
[3] Details on this comparison are available upon request.

2. RELATED LITERATURE AND THEORETICAL INSIGHT

2.1. Literature of the Link from Environmental Performance to Financial Success

Recent economic analysis explores the link from corporate environmental performance to financial performance. All of these studies analyze firms in mature market economies. Four studies employ regression analysis to examine a sample of firms from the Standard & Poor 500 using environmental data from the Investor Responsibility Research Center (IRRC) Corporate Environmental Profiles Directory. First, Konar and Cohen (2001) find a significantly positive effect of good environmental performance, as measured by toxic emissions, on firms' intangible asset values. Similarly, Austin et al. (1999) demonstrate that good environmental performance, as captured by certain measures (e.g., toxic emissions and hazardous waste corrective actions), positively affect financial rates of return. Consistent with the two noted studies, Hart and Ahuja (1996) show that emission reductions prompt better financial performance, based on accounting-based measures, within a two-year window. Filbeck and Gorman (2004) also find a positive relationship between financial and environmental performance; to demonstrate this point, they regress three-year holding period returns against environmental penalty magnitudes.

Three additional studies generate similar conclusions in general by also employing regression analysis to examine financial performance. Russo and Fouts (1997) demonstrate that good environmental ratings, as assigned by the Franklin Research and Development Corporation, positively impact a firm's return on assets (ROA). Khanna and Damon (1999) generate a similar conclusion by examining participants in the EPA's 33/50 program and revealing that better environmental performance, at least measured by the number of Superfund sites, improves return on investment and sales-adjusted excess market value.[4] In addition, the authors show that participation in the 33/50 program improves sales-adjusted excess market value. Similar to Khanna and Damon (1999), Arora and Cason (1996) demonstrate that participation in the EPA's 33/50 program slightly increases profits.

In addition to regression analysis, which our study employs, three studies use sample means tests to examine the effect of environmental performance on financial performance. First, Cohen et al. (1995) examine both accounting-based measures of financial performance (e.g., return on assets) and market-based measures of financial performance (e.g., risk-adjusted shareholder total return). Their study divides a sample of US firms into two "portfolios" according to whether each firm is above or below its industry median for one of nine environmental performance measures. Then they test the differences in financial performance mean values across the two sub-samples. Similarly, Austin et al. (1999) divide firms into "green" and "brown" categories according to their lagged environmental performance. Consistent with these two studies, Gottsman and Kessler (1998) compare the financial returns to the S&P 500 against three sub-samples based on four measures of environmental performance. In particular, they divide firms into the top 75%, top 50%, and top 25% of environmental performers across all industries.[5]

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[4] Sales-adjusted excess market value equals actual market value less the book value of assets.

[5] Additional studies use event-study analysis to examine the effect of environmental events on stock value. Laplante and Lanoie (1994) use the CAPM version of event-study analysis. Bosch et al. (1998) use Dodd and Warner's (1983) version of event-study analysis to explore the effect of federal environmental enforcement on stockholder wealth. They show that the stock market reacts negatively upon learning that a given firm has been targeted for enforcement. Muoghalu et al. (1990) also use Dodd and Warner's (1983) version of event-study analysis. Lanoie et al. (1998) use a method akin to event-study analysis to analyze how investors react to the release of public information regarding the environmental performance of specific facilities, including the

Our study draws upon this empirical literature to guide our analysis. Since all of the noted studies examine mature market economies, our study contributes to the literature by examining the link from corporate environmental performance to financial performance in a transition economy.

As a second contribution, our study examines a panel of firms over a multi-year period using an econometric estimator that relies upon intra-firm variation rather than cross-sectional variation. Use of this estimator avoids the concern that more financially successful firms are the same ones who effectively control their pollution levels. Several of the previous studies fail to address this concern (e.g., Russo and Fouts, 1997; Hart and Ahuja, 1996; Arora and Cason, 1996). Consequently, these studies may be incorrectly attributing influence to environmental performance that is based on correlation rather than causation. In other words, these cross-sectional analyses are unable to identify properly the important heterogeneity across firms, while our panel data analysis controls for individual firm characteristics in more detail.

Beyond the empirical guidance displayed above, the cited studies, along with additional studies, provide insight into the theoretical effect of environmental performance on financial performance. Collectively, this insight suggests that good environmental performance may improve or degrade financial success and that this improvement or degradation may stem from an alteration to revenues, costs, or both.

First, environmental performance may affect revenues. Customers may be willing to pay more for or buy more of environmentally friendly products ("green" products). Thus, a firm is able to increase its revenues by reducing its environmental impact in order to sell "green" products (Klassen and McLaughlin, 1996). Conversely, firms may experience lower revenues when their products are deemed "brown" because the firms' environmental record is poor. Within the realm of "green" marketing, a firm may sell green products to customers who would otherwise be indifferent to the firm's environmentally responsible efforts (Konar and Cohen, 2001). In addition, environmentally responsible behavior may improve a firm's overall reputation among customers (McGuire et al., 1988). Lastly, a firm may be able to increase its revenues by using an environmentally friendly technology to establish an industry standard; this establishment provides the firm with an "early-mover advantage" and status as an "industry leader" (Hart and Ahuja, 1996; Klassen and McLaughlin, 1996; Porter and van der Linde, 1995). All of these noted effects are causal, in that better environmental performance directly leads to higher revenues, given a sufficient lag. For example, customers need time to assess the "green" nature of a product before modifying their willingness to pay for it.

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deliberate release by regulators, as measured by fluctuations on the stock market. Klassen and McLaughlin (1996) use the Efficient Market Theory version of event-study analysis to show that signals of strong environmental management, as measured by environmental performance awards, increase firms' equity returns, and signals of weak environmental management, as measured by environmental "crises", lower equity returns. Hamilton (1995) uses Dodd and Warner's (1983) version of event-study analysis to examine firms listed in the Environmental Protection Agency (EPA)'s Toxic Release Inventory (TRI) database to determine the effect of that data's release on stock returns for those firms. His results indicate that stockholders in firms reporting TRI pollution figures experienced negatively abnormal returns upon the first release of the information. In addition to their event-study analysis, both Klassen and McLaughlin (1996) and Hamilton (1995) perform regression analysis. In particular, Hamilton (1995) performs cross-section analysis of the abnormal returns, measured in dollars, on the day of TRI data release. Konar and Cohen (1997) also use event-study analysis to examine investors' reactions to the release of TRI data. Then they expand on Hamilton (1995) by showing that the abnormal returns generated by the TRI dana release were important enough to affect future corporate environmental performance.

Second, environmental performance may affect costs. When firms invest in more efficient production processes, frequently these new technologies are also environmentally friendly: the new production processes require less energy, generate less waste, demand fewer toxic inputs, etc. In addition, better environmental performance may lower the costs of regulatory scrutiny, such as lost productivity due to inspections. Similarly, it may lower the costs associated with regulatory sanctions and third-party lawsuits (Klassen and McLaughlin, 1996). Similar to regulatory scrutiny, better environmental performance may lower the costs imposed by local community pressure, e.g., increased zoning restrictions (Earnhart, 2004; Konar and Cohen, 2001). Related to regulatory sanctions and third-party lawsuits, better environmental performance may reduce financing costs because lenders associate lower financial risk with better environmental management (McGuire et al., 1988). These environmental effects on costs are causal: better environmental performance directly leads to less regulatory scrutiny, fewer sanctions, less community pressure, etc, given a sufficient lag.[6] For example, regulators needs time to respond to poor environmental performance with inspections and sanctions; consistent with this separation in time, improved environmental performance will lower a firm's future regulatory costs.

Better environmental performance may also reduce labor costs. Pollution-reduction investments may lower three types of emissions: (1) "external emissions", which are directly discharged from the factory into the external environment, (2) "internal emissions", which are created and remain within a factory's working environment, and (3) "internal/external emissions", which are created within a factory's working environmental but are eventually discharged into the external environment. (These internal/external emissions are important when a facility's primary emission sources are diffuse within the factory; wood chip dust represents a good example of these so called "fugitive emissions".) Often, if a factory wishes to lower its overall discharges into the external environment, it must reduce internal/external emissions. Reductions in internal/external emissions improve working conditions, which increases labor productivity (lowering labor costs) and decreases worker's compensation claims and litigation costs (Porter and van der Linde, 1995). Thus, efforts to improve environmental performance – lower discharges into the external environment – directly lead to lower costs, due to better working conditions. Still, this causal link exists with a lag since the human body does not respond immediately to improved indoor ambient air quality and the compensation claims process is time-consuming.

In contrast to these enhancements to cost minimization, complex pollution-reducing devices and processes may reduce overall productive efficiency, thus, raising production costs (Bosch et al., 1998). This effect is causal and consistent with the traditional perspective on pollution control, which views efforts to reduce emissions, whether with end-of-pipe treatment or pollution prevention methods, as a real drain on firm resources (Palmer et al., 1995; Filbeck and Gorman, 2004).

Third, environmental performance may affect both revenues and costs. From a more general perspective, investments in environmentally responsible behavior may drag down financial performance because resources are being committed to an ostensibly non-productive use

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[6] The installation of a newly efficient process may be a notable exception since installation generates two outcomes: (1) lower costs, and (2) better environmental performance. In this case, better environmental performance need not cause lower costs. Instead, a link may simply exist between the two elements because they stem from the same underlying cause. However, the effect of environmental performance on lower costs may be viewed as causal when a firm chooses to improve its environmental performance by installing a newly efficient production process. In this case, the choice to improve environmental performance leads to lower costs.

(Cohen et al., 1995). More specifically, environmentally responsible business decisions may limit a firm's strategic alternatives, thus, driving down revenues and driving up costs. For example, a firm may decide not to pursue certain product lines or avoid plant relocations and investment opportunities in certain locations (McGuire et al., 1988).

Consistent with this classification, several studies in the literature take great pains to distinguish conceptually the two relevant pathways from environmental performance to financial performance: (1) the pathway of revenues and (2) the pathway of costs. For example, Figure 2 of Klassen and McLaughlin (1996, p. 1202) represents an excellent schematic for distinguishing between "market gains" and "cost savings". Despite these efforts, no previous empirical study evaluates the two pathways, to the authors' best knowledge. Instead, the previous empirical studies examine either market-based financial performance measures, which cannot discern revenues from costs, or profit-based accounting measures, which evaluate only the difference between revenues and costs. Thus, the present study contributes to the literature by evaluating both profit and its constituent components in order to assess effectively the two noted pathways.

Lastly, we draw upon the noted theoretical insight to interpret our empirical results.

2.2. Literature of Financial Performance in Central and Eastern Europe

We also draw upon recent economic studies of corporate financial and operational performance in the transition economies of Central and Eastern Europe. None of these studies consider environmental performance as an explanatory variable. Moreover, the prominent economic studies use a surprisingly narrow set of measures to capture corporate financial performance. In particular, they consider only accounting-based measures of financial performance. In contrast to studies of financial performance in the US and Canada, few studies of the Central and Eastern European region consider market-based measures for examining corporate-level financial performance across a variety of firms; this limited use is not surprising given the weakly developed state of most of the stock markets in this region during the 1990s.

We describe the use of financial and operating performance measures by a few of the more prominent studies. Frydman et al. (1999) use revenues and the ratio of labor and material costs to revenues. Both Kocenda and Svejnar (2002) and Pohl et al. (1997) use profitability. Similarly, Claessens and Djankov (1999) use profitability defined as operating profits relative to the sum of fixed assets and inventory. Weiss and Nikitin (2002) use operating profit and value added on either a per worker basis or a per capital unit basis. We utilize these studies to identify meaningful measures of corporate financial performance in the context of a transition economy.

We also utilize these studies to identify control factors in the context of a transition economy. All of these cited studies include only three types of control factors: ownership structure, year indicators, and industrial sector indicators. Claessens and Djankov (1999) include a dummy variable for the first phase of privatization in the Czech Republic, which does not relate to air pollution controls. Multi-country studies also include country-specific indicators (e.g., Frydman et al., 1999). We include the same relevant control factors as these cited studies, in addition to other factors.

3. DATA ON FINANCIAL AND ENVIRONMENTAL PERFORMANCE

3.1. Czech Republic as Study Site

To examine the effect of corporate environmental performance on financial performance, we exploit data on firms in the Czech Republic between 1996 and 1998, which is an excellent site and time period for our study. First, poor ambient air quality was a prominent environmental problem. In response to public concern, Czech government authorities took substantial and effective steps to decrease air emissions dramatically during the period 1991 to 1998 (Czech Ministry of Environment, 1998). Figure 1 displays the trend of economy-wide air emissions over this period. Perhaps, the post-communist decline in economic activity partially explains the drop in the early 1990s. This output decline notwithstanding, firms' pollution control efforts, such as the installation of electrostatic precipitators ("scrubbers") and fuel switching may also explain much of the reduction in air pollutant emissions (World Bank, 1999). Second, consistent with this focus on pollution control efforts, investment in environmental protection was most important during the period between 1992 and 1998, as shown in Figure 2. As a percentage of Czech gross domestic product (GDP), investment rose dramatically after 1991 from a level of 1.3 % to a peak of 2.5 % in 1997 and tailed off after 1998 back to a pre-transition level of 1.1 % by 2000; in 1990, investment was 1.1. % of GDP. Third, the Czech Republic was attempting to enter the EU during this period and was required to reduce its industrial emissions in order to qualify for membership.[7]

3.2. Panel Data from Financial Statements, Ownership Files, and Emissions Register

To examine accounting-based financial performance at Czech enterprises, we gather data from three segments of a database provided by the private data vendor Aspekt. Two segments provide information drawn from firms' balance sheets, such as assets, and information taken from firms' income statements, such as profits.[8] The third segment provides information on ownership structure, which we use as a control variable in our multivariate regression analysis. We gather balance sheet and income statement data and ownership data for the years 1996 to 1998. The Aspekt database includes all firms traded on the primary market – Prague Stock Exchange – or secondary market [e.g., "*Registra…ní místo system*" (RMS)] and a majority of the remaining large Czech firms (plus their key trading partners). This comprehensive database has been used by previous studies of financial and operational performance in the Czech Republic (e.g., Claessens and Djankov, 1999; Weiss and Nikitin, 2002; Kocenda and Svejnar, 2002; Djankov, 1999).

As an indicator of corporate environmental performance, we choose air pollutants emitted by facilities located in the Czech Republic during the years 1995 and 1998. The included pollutants are carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter, and nitrous oxides (NO_x), which represent the main and most heavily regulated pollutants in the Czech Republic, similar to other industrialized nations. The Czech Hydrometeorological Institute maintains the REZZO-1 database, which records emissions for large, stationary sources. While the REZZO-1 database records emissions at individual units of individual facilities, the Czech Hydrometeorological Institute aggregates the air emissions to the level of each facility before public release of the data. We further aggregate air emissions across all facilities

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[7] Further details on country-wide emissions, Czech air regulations, and environmental issues related to EU accession are available upon request.

[8] These financial data are not adjusted for inflation. Instead, our analysis includes year indicators as regressors in the regression analysis.

associated with a single firm, especially since no other facility-level data are available to us.[9] Thus, the analysis links emissions data aggregated to the firm level with other firm-level data, consistent with previous studies of firm-level environmental performance (Konar and Cohen, 1997; Konar and Cohen, 2001; Earnhart and Lizal, 2006; Khanna and Damon, 1999; Khanna et al., 1998; Arora and Cason, 1995). Finally, we add the four pollutants into one composite measure of air emissions, similar to previous studies of environmental performance (Konar and Cohen, 1997; Konar and Cohen, 2001; Khanna and Damon, 1999; Khanna et al., 1998; Arora and Cason, 1995; Arora and Cason, 1996).

To examine the effect of environmental performance on financial performance, while controlling for ownership structure, we merge the financial, emission, and ownership data sets. In order to generate the largest sample possible and to avoid a sample selection bias due to attrition, we create an unbalanced panel of firm-year observations for the time period 1996 to 1998. In this merger and creation, we screen for meaningful financial data by applying the following criteria: positive production, positive total assets, and positive fixed assets. (Other important financial measures, such as profits, are difficult to screen because they can truthfully take zero or negative values.) We also restrict our sample to those observations with non-missing data for the financial, ownership, and emission variables used in our analysis.[10] We consider three financial performance measures; each retained observation must possess non-missing data for all three measures. (We choose not to examine a variety of samples based on the availability of data for each financial performance measure; by considering a single sample, we avoid sample compositional biases when comparing results across the various financial performance measures. The same concern applies to our use of various measures of firm size; again, we avoid compositional biases by considering a single sample.) This merger, screening, and set of restrictions generates a combined unbalanced panel of 429 firms with 1,044 observations for the years 1996 to 1998. (In this process, missing values, not inconsistent values, cause most of the reduction in sample size.)[11]

3.3. Descriptive Statistics

Table 1 presents a statistical summary of the relevant firm data. As shown in Table 1.a, our data are sufficiently spread across the three years of our time frame. Table 1.b. summarizes our data on air emissions. Our data set contains much variation for emissions, which facilitates our analysis. Table 1.b also summarizes the ownership shares held by certain types

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[9] While the Czech Hydrometeorological Institute gathers additional information on some facilities, these data are not systematically recorded.

[10] In the case of emissions, non-missing data are available for either all four pollutants or none.

[11] Two features of this merger deserve elaboration. First, the overlap between the financial data set and the air emissions data set is limited. Yet, the limited overlap does not indicate a problem with the data. Instead, it may simply indicate that firms included in the Aspekt database do not own large stationary air emission sources. In this way, the Aspekt database need not completely represent large stationary air polluters. Therefore, our results may not generalize to all or most large stationary air polluters. The opposite concern is not relevant. The REZZO-1 database is fully comprehensive of all large polluters. Second, the restriction of non-missing data binds strongly for ownership data because we lack these data for many firm-year observations. (Ownership data for years prior to 1996 are especially scarce, which explains our focus on the period 1996 to 1998. In addition, data on ownership prior to 1996 mostly exist for firms that were privatized under the Czech citizen voucher program; thus, use of these data most likely would introduce sample selection bias.) The incomplete recording of ownership data during the chosen sample period raises a concern about selection bias. We address this concern by implementing a Heckman two-step sample selection procedure (Heckman, 1979). Based on the first stage of this procedure, we generate an inverse Mills ratio for each firm in each time period. By including this variable as a regressor in the estimation of financial performance, we control for any potential sample selection bias. (Complete details are available upon request.)

of investors: (1) state, (2) investment funds, (3) citizens, (4) portfolio companies, (5) bank: direct ownership, (6) strategic investors (e.g., other companies), (7) foreign investors, and (8) dispersed private investors, which are not included in the table.[12] We also incorporate a variable to capture the concentration of ownership as measured by the stockholding share of the single largest shareholder (Kocenda and Svejnar, 2002).

Table 1.d indicates the distribution of firms by industrial classification, while Table 1.c summarizes the key financial variables used in our study: profits, operating profits, sales (or revenues), costs, total assets, and equity. As demonstrated by the standard deviation measures, our data set contains much variation in these financial measures.

Profits, operating profits, sales, and costs represent measures of accounting-based financial performance. In particular, profits and operating profits represent two measures of profitability. Operating profits equal the difference between sales and the combination of costs of goods sold and operating expenses, such as depreciation. Profits equal the difference between operating profits and other income and expenses, such as interest payments, extraordinary gains, and taxes. Interestingly, profits and operating profits are not extremely correlated given a correlation coefficient (ρ) equal to 0.709, which is statistically significant (p=0.0001). Since the two profitability measures are similar but sufficiently different, as a robustness check, we examine both profits and operating profits. For the purposes of this study, costs represent the difference between sales and profits. Consequently, they do not capture full costs but full costs net of other income; i.e., [cost of goods sold + operating costs + other costs] - other income.

Total assets and equity represent measures of firm size. While total assets and equity capture distinctively different aspects of a firm's financial structure, the two measures are strongly correlated ($\rho = 0.939$) and significantly correlated (p=0.0001). Thus, both measures are most likely capturing similar information about a firm's size. Yet, as a check for robustness, we consider both measures.

4. STATISTICAL ANALYSIS OF FINANCIAL PERFORMANCE

4.1. Econometric Framework

In this section, we use the described data to explore the link from environmental to financial performance at Czech firms in 1996 to 1998. We estimate the relationship between environmental performance, as measured by the absolute level of air pollutant emissions, and financial performance, as measured by sales, costs, and profits. Consistent with several previous studies (Konar and Cohen, 2001; Filbeck and Gorman, 2004; Cohen et al., 1995; Austin et al., 1999; Hart and Ahuja, 1996), we use lagged environmental performance as the proper regressor. The lagging of environmental performance is appropriate since economic agents need to time to translate any reduction in emissions into an alteration of revenues

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[12] Two of these ownership forms deserve elaboration. First, portfolio companies are similar to strategic investors in that another company invests in the identified company; however, the rationale for the investment ranges widely. Second, the category of dispersed investors includes investors who hold less than 10% of a given company and never publicly announced their holdings. Since data on these shares are not available, we cannot measure the presence of dispersed investors directly. Instead, we establish it as the omitted category in our regression analysis. As a benchmark, these investors clearly represent less interested, non-strategic investors since they hold such a small share of the particular company.

and/or costs, as noted in sub-section 2.1. For example, consumers need time to view a product as "green"; as another example, lenders need time to adjust their calculations of environmental risk. Thus, environmental performance and financial performance are separated in time. Given this separation, lagged environmental performance is clearly predetermined with respect to current financial performance. In essence, the analysis estimates the effect of environmental performance on future financial performance.

To estimate the influence of environmental performance on financial performance, we regress each type of financial performance on lagged air pollutant emissions plus other control factors. To construct the econometric models associated with financial performance, we define the following notation. We consider three dependent variables. As the first dependent variable, s_{it} denotes the sales generated by firm i in time period t. As the second dependent variable, c_{it} denotes the costs born by firm i in time period t. Finally, π_{it} denotes the profits generated by firm i in time period t. Unless otherwise indicated, π_{it} denotes overall profits as opposed to operating profits.

The analysis seeks to decompose the effect of each explanatory factor on profits into the factor's separate effect on revenues and separate effect on costs. Estimation of profits unto itself does not provide this decomposition. Estimating revenues and costs separately, along with estimation of profits, would generate this decomposition. Fortunately, we do not need to estimate all three dependent variables. By definition, profits equal the difference between revenues and costs. Thus, we only need to estimate two of the three dependent variables in order to generate the desired decomposition. Each coefficient that could be generated by estimation of the omitted dependent variable is recoverable as a simple linear combination of the coefficients generated for the two estimated dependent variables. Arbitrarily, we choose to estimate costs and profits. Based on the coefficients generated by the estimation of costs and profits, we recover the estimated coefficients for revenues. For each regressor, the sales-related coefficient equals the difference between the profit-related coefficient and the cost-related coefficient; we elaborate below.

We incorporate various explanatory variables into our estimation of costs and profits. As the primary explanatory variable, $p_{i,t-1}$ denotes the amount of pollution emitted by firm i in the preceding time period $t-1$ (i.e., lagged emissions). We also include financially-related factors as explanatory variables. Costs and profits most likely depend on the level of production, which is denoted as y_{it}. As production rises, one would expect costs to rise. Since production is clearly expected to affect costs, by extension, production is expected to affect profits.[13] Costs and profits may also depend on firm size, denoted as a_{it}. Unless otherwise indicated, firm size is captured by total assets. This set of financially-related regressors may seem limited relative to the regressor sets used by comparable studies of environmental and

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[13] Two aspects surrounding production deserve elaboration. First, production is measured in value terms, which allows the analysis to compare across firms and across time within a given firm. As noted below, our analysis incorporates both industry-specific indicators (or firm-specific indicators in the fixed effects model) and year indicators. This incorporation sufficiently controls for any variation in prices across firms and/or time that may otherwise complicate the use of production value as a regressor. Second, for our analysis, we assume that production is pre-determined with respect to costs and profits. Consistent with this general assumption, we specifically assume that the firm is a price-taker, even in those cases when it markets a product of higher environmental quality. Similarly, we assume that the firm is demand-constrained in each separate product, with a clear distinction between a product of higher environmental quality and one of lower environmental quality. Fortunately, identifying the relationship between production and costs and profits does not prove critical for the task at hand. The reported results regarding the effect of environmental performance on financial performance are fully robust to the exclusion of the production factor and a oneyear lagging of the production factor.

financial performance in mature market economies. These studies include additional regressors, such as advertising expenditures and research and development expenditures. We do not include these types of factors as regressors for two reasons. First, as noted in Section 2, previous studies of corporate financial performance in transition economies do not include these types of factors. Second, data on these factors are not recorded systematically, if at all, in our database.

Our analysis incorporates additional regressors. Specifically, we include various regressors that capture ownership structure. First, we include a regressor for each ownership type except "dispersed investors". Collectively, we denote these ownership variables as W_{it}. Second, we include a measure of concentration, as captured by the ownership share held by the single largest shareholder and denoted as L_t. By including these ownership-related regressors, we control for ownership structure, consistent with most studies of transition economies. However, we neither report nor interpret the associated estimation results since ownership is not the focus of our study and the coefficients prove insignificant. To control for variation over time with respect to economy-wide trends and the legal framework controlling air emissions, we also include individual year indicators, collectively denoted as vector T_t. To control for sector-specific variation, we also include industry indicator variables, collectively denoted as vector X_i. (The omitted industrial category includes "manufacturing: other" and "other: overall" sectors, which are both listed in Table 1.d.) The fixed effects model, described below, subsumes these sectoral effects into its firm-specific fixed effects since sector does not vary over time for a specific firm. Given this notation, we formulate the following regression system:

$$c_{it} = \alpha^c + \beta^c p_{i,t-1} + \gamma^c y_{it} + \kappa^c a_{it} + \omega^c W_{it} + \eta^c L_{it} + \Psi^c T_{it} + \zeta^c X_{it} + v_{it} ,$$
$$(1)$$

$$\pi_{it} = \alpha^\pi + \beta^\pi p_{i,t-1} + \gamma^\pi y_{it} + \kappa^\pi a_{it} + \omega^\pi W_{it} + \eta^\pi L_{it} + \Psi^\pi T_{it} + \zeta^\pi X_{it} + \upsilon_{it},$$
$$(2)$$

where v_{it} and υ_{it} denote the error terms associated with costs and profits, respectively.[14] Please note the use of superscripts to distinguish the coefficients shown in the two equations: "c" denotes costs and "π" denotes profits. We estimate each equation separately; joint estimation of the two equations within a seemingly unrelated regresssion framework generates identical results since the two regressor sets are the same.

To control properly for firm-specific effects, we estimate equations (1) and (2) using standard panel methods: pooled OLS, fixed effects method, and random effects method. We use standard tests to assess these methods. When the F-test indicates significant firm-specific effects, the fixed effects estimator dominates pooled OLS. Since this dominance always holds, we do not report the pooled OLS estimates; instead, we only report the F-test statistics, as shown in Tables 2 and 3. We use the Hausman test of random effects to evaluate whether the random effects estimates are consistent. Since the random effects estimates are always inconsistent based on the Hausman test statistics, we do not report these estimates.[15] The fixed effects estimates are consistent by assumption of the model.

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[14] We consider neither a semilog nor log-linear specification because profits (and operating profits) cannot be log-transformed since they take zero values.

[15] Hausman test statistics are available upon request.

Use of a fixed effects estimator has an additional advantage. By including firm-specific intercept terms, the fixed effects estimator controls comprehensively for time-invariant factors associated with specific firms. Thus, the estimator controls for the possibility that companies who are better in terms of both environmental and financial matters due to some common (time-invariant) factor, such as a highly effective corporate governance structure. Rather than using cross-sectional variation, which is vulnerable to this concern, the fixed effects estimator utilizes intra-firm variation.

4.2. Estimation Results

Table 2.a presents the regression results. First, production strongly and positively affects costs and profits. Firm size does not significantly affect either costs or profits. Second, we examine the estimated coefficients for lagged environmental performance. To recover the sales-related coefficient for environmental performance (i.e., effect of lagged environmental performance on sales), we subtract the cost-related coefficient for environmental performance (β^c) from the profit-related coefficient for environmental performance (β^π):

$$\beta^s = \beta^\pi - \beta^c ,\tag{3}$$

where "s" denotes sales. The resulting coefficient is shown in Table 2.b.

In this sub-section, we report and interpret briefly the estimation results relating to environmental performance, while interpreting them more deeply in the subsequent sub-section. As shown in Table 2.b, higher lagged air pollutant emissions significantly raise sales (p=0.062). Thus, better environmental performance appears to reduce revenues. Perhaps, environmentally responsible business decisions limit firms' strategic alternatives, forcing firms to forego revenue-boosting products. In contrast, better environmental performance appears linked with reduced costs. As shown in the first column of Table 2.a, higher lagged air pollutant emissions significantly raise costs. Many reasons potentially explain this outcome, such as diminished regulatory scrutiny. In the next sub-section, we assess which of these reasons seems the most plausible. Both reported conclusions are fully robust to the use of equity as the firm size measure in lieu of total assets and to the inclusion of a squared production term.[16]

If better environmental performance lowers revenues and costs, one question remains: does better environmental performance raise or lower the difference between revenues and costs, i.e., profits? As shown in the second column of Table 2.a, higher lagged air pollutant emissions significantly lower profits. Thus, better environmental performance appears linked with improved profitability. While more responsible environmental management may limit firms' abilities to exploit revenue-enhancing projects, apparently better environmental management more than compensates for these missed opportunities by driving down costs via reduced regulatory scrutiny, dampened community pressure, etc. The next sub-section interprets the full set of results; this interpretation helps to assess which reason (or reasons) most likely drives (or drive) these results.

We demonstrate the robustness of this last conclusion by examining the effect of environmental performance on profitability using alternative econometric specifications. We focus on profitability because it is the most comprehensive financial performance measure

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[16] Details on these results are available upon request.

from the set of three: sales, costs, and profits. In all cases, the estimated effect of environmental performance on profitability is highly robust to the alternative specifications and does not differ qualitatively across the alternative specifications. While we estimate several alternative specifications, which are described below, for the sake of space and the reader's burden, we report the full regression results for only three alternative specifications, which are shown in Table 3. For the remaining specifications, we merely report the p-value of the coefficient associated with environmental performance. First, we modify the effect of firm size on financial performance. To capture any nonlinearities associated with firm size, we add a squared term of firm size (a_{it}^2). As shown in the first column of Table 3, this alternative specification generates an environmental performance coefficient that is very similar in terms of sign, magnitude, and significance as the coefficient reported in Table 2. Inclusion of the squared firm size measure causes both the linear and the squared firm size coefficients to become statistically significant. Specifically, profits rise with firm size but at a declining rate. As an additional specification, we replace total assets with equity, as the measure of firm size. This change in firm size measure does not meaningfully alter the sign, magnitude ($\beta^\pi = -13.32$), and significance (p=0.0001) of the estimated environmental performance coefficient. The addition of squared equity as a regressor does not change this preceding conclusion.[17] Two previous studies of financial performance in Central and Eastern Europe use alternative measures of firm size. Claessens and Djankov (1999) use the sum of fixed assets and inventory as a replacement for total assets. Similarly, Weiss and Nikitin (2002) replace total assets with depreciation, which serves as a proxy for units of capital. Use of these alternative firm size measures again generate highly similar coefficient estimates in terms of sign, magnitude, and significance (p=0.0001 in both cases).

Second, we assess the robustness of the profits-related result by modifying the production regressor. In one alternative specification, we simply drop this regressor; in a second specification, we lag the regressor; in a third specification, we add a squared term of production (y_{it}^2). Regardless, the estimated effect of environmental performance remains strongly and significantly negative (p=0.0001 in all cases). Results for the third specification are displayed in the second column of Table 3. As shown, profits rise in production but at a declining rate since the coefficient on the squared production term is significantly negative.

Third, we modify the measure of profitability by replacing overall profits with operating profits. This replacement generates a highly significant negative coefficient for lagged environmental performance: $\beta^\pi = -10.92$ and p = 0.0001. Thus, better environmental performance improves operating profitability, as well as overall profitability. This conclusion is strongly robust to the particular measure of firm size included as a regressor. As shown in the third column of Table 3, use of equity as the firm size measure also generates a highly significant negative effect (p=0.0001) for lagged environmental performance on operating profits. (We report the full regression results for this particular specification since the use of equity as a firm size measure generates a significant coefficient for firm size as opposed to the use of total assets, which generates an insignificant coefficient for firm size.) Use of the sum of fixed assets and inventory or depreciation as the firm size measure generates highly similar coefficient estimates in terms of sign, magnitude, and significance (p=0.0001 in both cases).

4.3. Interpretation of Results and Implications

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[17] Estimation of the environmental performance coefficient is also robust to the inclusion of a debt to equity regressor, which does not prove to be statistically significant.

Lastly, we interpret these results in light of the preceding literature, while attempting to identify important implications. First, the results of our study indicate that better environmental performance appears to lower revenues. This finding provides support for the conjecture that the implementations of better environmental management practices limit firms' abilities to pursue revenue-enhancing projects. More specifically, tighter air emission limits and/or higher emission charge rates may have possibly constrained Czech firms' abilities to produce higher quality products. Conversely, the noted finding rejects the conjectures that better environmental management (1) allows firms to sell "green" goods at a higher price or in greater quantity, (2) prompts customers who are otherwise indifferent to environmentally responsible efforts to buy "green" goods, (3) improves a firm's overall reputation among customers, and (4) provides the firm with an "early-mover" advantage and status as an "industry leader" (given that the better management practice establishes an industry standard). This apparent rejection need not surprise us given that Czech firms were probably not well situated during the sample period to deliver "green" products or establish themselves as "industry leaders".[18]

Overall, this finding implies that Czech firms should cautiously improve environmental management practices if corporate management keys on any decline in revenues, independent of any change in profits (which seem to benefit from better environmental management), as an indicator of the need to cut costs. In other words, management may observe weakened revenues in the preceding period and attempt to address this issue by cutting costs in the current period. In this case, management would be over-reacting because the diminished revenues are associated with an even stronger reduction in costs so that profits actually rise.

Second, the results of our study indicate that better environmental performance appears to lower costs. This finding is consistent with several conjectures, which are described in sub-section 2.1. First, this finding supports the conjecture that implementation of a more efficient production technology, which reduces air pollutant emissions, also lowers production costs.[19] Alternatively, this finding supports the conjecture that reduced air emissions lead to lower regulatory scrutiny, which reduces the costs stemming from the distraction of inspectors and lawyers. Yet again, this finding supports the conjecture that better environmental performance lowers the costs associated with regulatory sanctions, third-party suits, and community pressure.

All of these interpretations are plausible for the Czech transition economy and consistent with other available evidence. Certainly, Czech firms invested into new production technologies over this period (Lizal and Svejnar, 2002b). However, pollution prevention stemming from the installation of better and cleaner production processes was not prevalent during the sample period. Instead, most Czech facilities reportedly reduced emissions in the old-fashioned way:

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[18] According to Czech Ministry of Environment (2004), while the Czech Ministry of the Environment established the National Eco-Labeling Program in 1994, this program operated at a low level prior to 2000. Starting in 2000, the Czech government began to support the sale of eco-labeled products by granting them preference in the purchasing orders from the state administration. In the same year, the national program entered the Global Eco-Labeling Network. By 2004, the program had awarded the ecolabel to 310 products, involving 169 licenses for 82 companies; moreover, the Czech government had integrated its national program into the multinational programs of the OECD and EU.

[19] Use of the fixed effects estimator clarifies our interpretation of the estimated effect of environmental performance on costs. Given the examination of intra-firm variation, the estimated coefficient captures the connection between a change in a firm's emissions relative to the firm's average emission level and a change in the firm's costs relative to the firm's average cost level. This connection helps the analysis to focus on the installation of new technologies.

they installed end-of-pipe treatment technologies. Thus, the role of new production technologies appears limited. In contrast, the role of regulatory scrutiny seems larger. Unlike in Communist times, the Czech Inspection, which is responsible for monitoring for and enforcing against non-compliance with air protection laws, performed many inspections and imposed many fines during the sample period. For example, in 1997, the Czech Inspection performed 13,455 inspections and imposed 1,952 fines, in addition to closing 36 facilities due to noncompliance, as reported in the agency's annual yearbook. Similar to the cost of regulatory scrutiny and regulatory sanctions, local community pressure was tangible in this period, as expressed through numerous citizen complaints, which are filed with the Czech Inspection (Earnhart, 2000). For example, in 1997, the Czech Inspection received over 700 citizen complaints. Unlike regulatory and commmunity pressure, the threat of third-party lawsuits was trivial in the Czech Republic during this period (Earnhart, 1998).

As yet another interpretation of the negative effect on costs, the noted finding supports the conjecture that better environmental performance lowers financing costs. While possible, this interpretation is not plausible for the Czech Republic during the sample period given the lack of any corroborating evidence. Lastly, the noted finding supports the conjecture that better environmental performance lowers labor costs by improving work conditions with reductions in internal/external or fugitive emissions. As explained in sub-section 2.1, improved work conditions increase labor productivity and/or decrease workers' compensation claims and litigation costs. Given the rather filthy conditions in some Czech firms during the sample period, a meaningful increase in labor productivity seems quite plausible. Consistent with this claim, labor productivity improved dramatically over the sample period (Kocenda and Svejnar, 2002). However, we are aware of no study that connects reductions in fugitive emissions to improved labor productivity in the Czech Republic. Thus, this claimed connection remains unsubstantiated. Unlike the potential importance of labor productivity increases, any reduction in workers' compensation claims and litigation costs was most likely mitigated by the government's comprehensive coverage of medical services and the general absence of litigation over "environmental" matters (Earnhart, 1998).

Based on this discussion, of the supported conjectures (i.e., interpretations), the most plausible is the combination of regulatory and community pressure: reductions in air emissions lowered Czech firms' costs by removing regulatory scrutiny and community pressure and eliminating the imposition of regulatory sanctions.

In contrast, the noted finding rejects the conjecture that complex pollution-reducing devices and processes reduce overall productive efficiency, which implies an increase in costs.

Third, the results of our study indicate that better environmental performance appears to improve profitability by driving costs down more than revenues. Profits represent the simple difference between revenues and costs. Above we interpret the findings for revenues and costs separately. Thus, the remaining issue concerns the relative magnitudes of the effects on these two profit components. The decline in costs exceeds the decline in revenues. A greater decrease in costs is consistent with the meaningful benefits of reducing the otherwise substantial regulatory scrutiny or at least reducing the uncertainty associated with possible regulatory scrutiny. As evidence of this substantial regulatory scrutiny, several facilities were actually shut down in the Czech Republic due to noncompliance. The benefits of reduced community pressure further substantiate the greater decrease in costs, relative to the decline in revenues.

On the other side of the ledger, a lesser decrease in revenues is consistent with the traditional end-of-pipe approach to pollution control taken by most Czech firms. Use of these end-of-pipe treatment technologies most likely did not constrain the production of revenue-enhancing production to a great extent. This point notwithstanding, better environmental management, in some form, not necessarily end-of-pipe treatment, apparently constrained revenue enhancement to a significant extent.

In sum, better environmental management appears linked to improved profitability and the most likely cause is reduced regulatory and community pressure.

5. SUMMARY

This paper examines the link from corporate environmental performance to financial performance. In particular, we assess whether better environmental performance alters sales, revenues, or both. Based on our analysis of Czech firms in the years 1996 to 1998, we conclude that good environmental performance, in the form of lower air pollutant emissions, appears to undermine future revenues, while lowering costs to a greater extent, thus, improving profitability. This conclusion is highly robust to many alternative specifications.

As noted in the introduction, given the transitional nature of the Czech economy, the results of this study need not generalize to other economies, especially mature market economies. To assess this point, as ongoing research, we are examining the latter period of the Czech transition, specifically, the period between 1999 and 2004, when the country entered the EU. By examining the expanded period from 1996 to 2004 and comparing the two sub-periods, we will be able to assess whether the evolution towards a market-based economy alters the relationship between environmental and financial performance.

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APENDIX

Descriptive Statistics

Table 1.a. Year Distribution

Year	Frequency	Percent
1996	372	35.63
1997	357	34.20
1998	315	30.17
Total	1,044	100.00

Table 1.b. Means and Standard Deviations of Production, Ownership, and Emission Variables

Variable	Mean	Std. Deviation
Production Value (000s CZK)	1,201,078	2,646,672
Emissions Total (tons)	866	3,728
State Ownership share (%)	5.69	15.73
Strategic Investor Ownership share (%)	28.40	30.33
Individual Citizens Ownership share (%)	4.92	15.22
Bank Ownership share (%)	1.00	5.62
Portfolio Company Ownership share (%)	1.97	8.44
Investment Funds Ownership share (%)	13.51	20.51
Foreign Ownership share (%)	7.16	19.84
Concentration: Single Largest Shareholder (%)	44.76	21.62

Note: CZK = Czech Crowns

1.c. Means and Standard Deviations: Financial Performance and Firm Size

Variable	Mean	Std. Deviation
Profits (000s CZK)	- 6,914	194,909
Operating Profits (000s CZK)	60,751	249,785
Costs (000s CZK)	1,238,092	2,717,239
Sales (000s CZK)	1,231,178	2,553,454
Total Assets (000s CZK)	1,546,258	3,183,106
Equity (000s CZK)	776,521	1,659,270

Note: CZK = Czech Crowns

Table 1.d. Distribution According To Industrial Classification

Industry	Obs.	Percent
Agriculture, Hunting, Forestry, Fisheries	8	0.79
Mining and Quarrying	13	1.23
Manufacturing of Food Products, Beverages, and Tobacco	165	15.76
Manufacturing of Textiles, Textile Products, Leather, and Leather Products	85	8.10
Manufacturing of Wood, Wood Products, Pulp, Paper, and Paper Products and Publishing and Printing	36	3.43
Manufacturing of Coke and Refined Petroleum	4	0.35
Manufacturing of Chemicals, Chemical Products, and Synthetic Fibers	46	4.40
Manufacturing of Rubber and Plastic Products	18	1.76
Manufacturing of Other Non-Metallic Mineral Products	80	7.66
Manufacturing of Basic Metals and Fabricated Metal Products	135	12.94
Manufacturing of Machinery and Equipment n.e.c.	141	13.53
Manufacturing of Electrical and Optical Equipment	41	3.96
Manufacturing of Transport Equipment	73	7.04
Manufacturing: Other	32	3.08
Electricity, Gas, and Water Supply	53	5.11
Construction	49	4.67
Wholesale and Retail Trade and Repair of Motor Vehicles	3	0.26
Hotels and Restaurants	8	0.79
Transport, Postal Service, Storage, and Telecommunications	1	0.09
Finance, Real Estate, Rentals, Business, Research, Public Administration	30	2.90
Education, Health, and Veterinary Services	11	1.06
Other Public and Social Services	5	0.44
Other: Overall	7	0.65
Total	1,044	100.00

Fixed Effects Estimation of Financial Performance Measures

Table 2.a. Estimation of Costs and Profits

Variable [a]	Costs		Profits	
Lagged Pollutant Emissions	23.609	***	- 15.146	***
	(6.008)		(3.713)	
Production Value (000 CZK)	0.8381	***	0.0717	***
	(0.0286)		(0.0177)	
Total Assets (000 CZK)	0.0439		0.0048	
	(0.0273)		(0.0169)	
1997	- 4,383,064	***	1,620,403	***
	(1,050,596)		(649,367)	
1998	- 4,182,951	***	1,547,097	***
	(1,007,084)		(622,473)	
No. of Firms / No. of Obs	429 / 1044		429 / 1044	
F-Test for Fixed Effects [significance level]	21.47 [0.0001]		3.90 [0.0001]	
Adjusted R^2	0.9957		0.7170	

Standard errors are noted inside parentheses; p-values are noted inside square brackets.
*, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.
[a] Each regression also includes 429 firm-specific indicators, seven ownership share factors, an ownership concentration factor, and an inverse Mills ratio for ownership data reporting.

Table 2.b. Effect of Lagged Pollutant Emissions on Sales: Coefficient Recovered from Estimation Results for Costs and Profits

Variable	Sales
Lagged Pollutant Emissions	8.463 * (4.532)

Standard errors are noted inside parentheses.

*, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Fixed Effects Estimation of Profitability: Alternative Specifications

Table 3. Fixed Effects Estimation of Profitability: Alternative Specifications

Variable [a]	Add Firm Size^2		Add Production^2		Dependent = Operating Profits, Firm Size = Equity	
Lagged Pollutant Emissions	- 14.630 (3.593)	***	- 15.122 (3.653)	***	- 9.735 (2.643)	***
Production (000 CZK)	0.1185 (0.0185)	***	0.1571 (0.0254)	***	0.1105 (0.0106)	***
Production^2 (000,000 CZK)	N/A		- 3.42 E-9 (0.74 E-9)	***	N/A	
Total Assets (000 CZK)	0.0914 (0.0209)	***	0.0307 (0.0175)	*	N/A	
Total Assets^2 (000,000 CZK)	- 3.73 E-9 (0.56 E-9)	***	N/A		N/A	
Equity (000 CZK)	N/A		N/A		0.2105 (0.0228)	***
No. of Firms / No. of Obs	429 / 1044		429 / 1044		429 / 1044	
F-Test for Fixed Effects [significance level]	4.18 [0.0001]		4.06 [0.0001]		10.63 [0.0001]	
Adjusted R^2	0.7365		0.7267		0.9134	

Standard errors are noted inside parentheses; p-values are noted inside square brackets.

*, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

[a] Each regression also includes 429 firm-specific indicators, two year-specific indicators, seven ownership share factors, an ownership concentration factor, and an inverse Mills ratio for ownership data reporting.
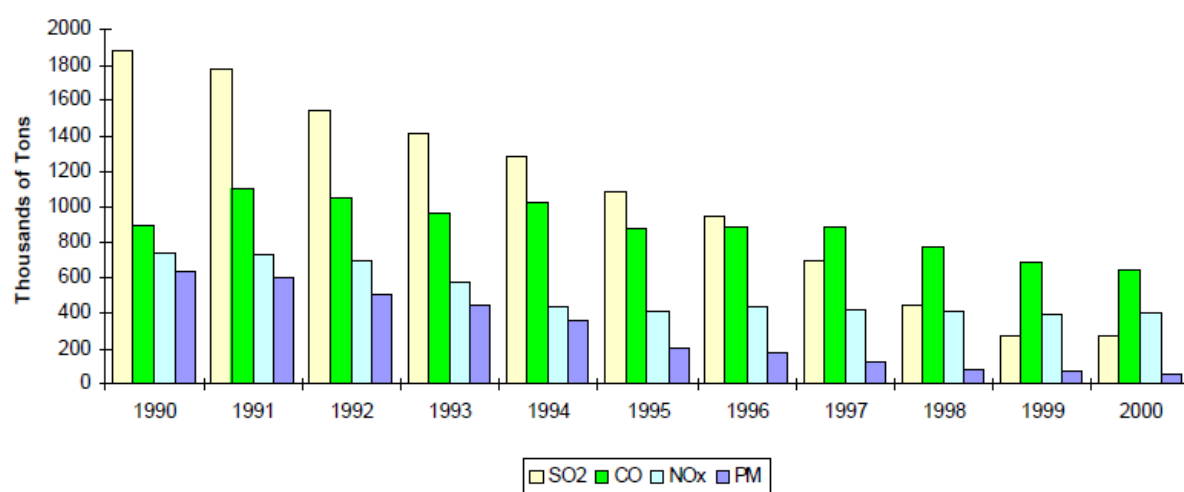

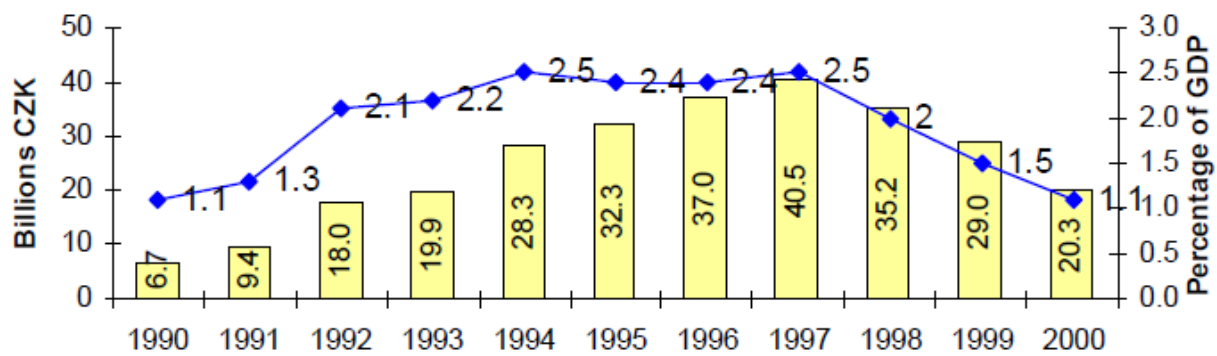*Figure 1: Air Pollutant Emissions in Czech Republi0*

Figure 2: Investment in Environmental Protection
Source: Czech Statistical Office, Czech Ministry of Environment

THE IMPACT OF PERSONALITY TRAITS ON ENVIRONMENTALISM: EVIDENCE FROM CROATIA

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Key words: *environmentalism, the "Big Five"personality traits, Croatia*

1. INTRODUCTION

Nowadays it is difficult to ignore the fact that man has significantly changed his environment and adapted it to his own needs to the level that he endangered its normal functioning. Inadequate models of production and consumption are becoming a potential threat to the survival and the future generations' quality of life. The task of a firm is to encourage, with right decisions, the use of resources that will not have negative effects on the environment. The mentioned can be accomplished by implementing acceptable production procedures, by developing products which will not damage the environment during their life cycle and by promoting the culture of living which can be characterized as "environment friendly". All mentioned demands a higher level of social responsibility in doing business.

Environmentalism arose in the middle of the last century as a response to the threats to survival and endangered quality of life. This was a movement aimed at warning about the harmful actions of man on the environment. Individuals become more and more aware that the environment which they live in is being destroyed and that they, being its integral part, are endangered. That is why the state of the environment influences more and more opinions, beliefs and finally behaviour of individual people. For consumers to behave responsibly, the assumption is that they are aware of the situation in the environment and of the consequences of their actions. The belief that consumers can contribute to environment protection with their behaviour should result in concrete activities, such as using products of organic origin, producing less garbage, avoiding inappropriate disposal of harmful substances etc. Yet, the following question is raised: which are the key factors that define the consumers' behaviour which is in harmony with sustainable development? In other words, what makes the

individuals who take more or less care of their environment and are capable to regulate their behaviour to treat nature responsibly, different.

Previous research (Hirsh, Dolderman, 2007) point the possibility that personality traits are one of the important guidelines of environmentalism. In order to explore in detail the relationship between personality traits and the belief about environmental endangerment, concern about it, and concrete activities regarding the reduction of negative impact on the environment in the following part of this paper we explain the basic characteristics of environmentalism and personality traits structured in the model called The Big Five. The hypotheses set by desk research were tested through the research on the sample of students in two Croatian counties, on the basis of which adequate conclusions were made. Because of the objectivity of this research, limitations and suggestions for future research are also mentioned.

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Disturbance of harmony in human environment elicited the appearance of a philosophical direction and movement called environmentalism in the second half of the 20th century. According to O'Riordan (1981), the central philosophical idea of environmentalism is to understand the purpose of human beings on Earth, one's duties to all living and non-living creatures and the proper way to behave when one should choose among different directions. The idea of environmentalism started to develop in the middle of the 19th century when the transcendentalists described the ideal community of individuals, a utopian picture stemming from a careful observation of nature.

The modern form of the environmentalist movement matured in the 1950's and 60's, ensuing huge scandals discovering carcinogenic elements in the air, water, soil, as well as in food and tobacco. The experts started to point to the limitation of the population growth because of the "baby boom" in the West, and the Vietnam War reminded people of the destructive power of modern technology. Gibson (2002) holds that the bases of environmentalism were laid already in the period after the World War II and that the modern movement itself was formed in the period from 1964 to 1970. However, the first Earth Day in 1970 is generally considered to be the dawning of environmentalism. On this day messages about peace, the need for legal protection of nature and an appeal for reducing pollution and use of technology were sent to people. Over time movements dealing with global ecology, appropriate amount of technology, eco-feminism, sustainable development and a simple life style developed (Mirvis, 1994).

According to Milton (1994), environmentalism is a field of communication through which responsibilities of people to the environment are established. Pepper (1996) claims that the basic idea of environmentalism is the need of people to live in harmony with nature, which is the reason why they should respect the laws of nature. One should stop behaving according to the theses of materialism and consumerism and accept the control of the population number and the use of technology on the basis of renewable energy. The entire future development must be sustainable and it should be able to ensure enough of economic as well as ecologic resources for the future generations.

The values which the environmentalists fight for are eco-centric and come from the concern for the human environment and the entire eco system. Environmentalism is connected to the belief that nature has an intrinsic value, therefore represents a value by itself, and not only the value to people. That is why people have the moral obligation to respect and preserve plants,

animals and the entire nature which has a right to exist and have a fair treatment. Such a way of thinking can be connected to the notion of Gea, the belief that the entire Earth is actually a living organism which sustains itself. This logic leads to the conclusion that nature would survive, even grow luxuriantly, if there were no human beings, whereas vice versa does not apply. People have caused a crisis of the environment with their presence and actions, whereby they disturbed not only the natural environment but also the survival of the human kind itself. Because of this fact people should be humble towards the Earth and not exploit it. This philosophy leads to viewing the man's position as a part of the eco system. So, everything one does has an impact on all other parts of that system, which in the end will reflect back on itself. The greenhouse effect is the best example of the process described (Pepper, 1996).

Environmentalism pleads for a change on the level of individual consciousness and for the need to change attitudes, values and lifestyle of each individual person with the aim of respect and coexistence with nature. When a sufficient number of people achieve this change, then the entire society will change (Pepper, 1996). The importance of knowledge about the environment and the connection to the beliefs of individuals about the environment's importance manifested through the change in behaviour. The importance of the existence of knowledge about the environment and the connection to the beliefs of individuals about the importance of the environment manifested through the change in behaviour and the rise of sensitivity to the problems in the environment is emphasized (Kaiser, Woelfing, Fuhrer, 1999) That is why under the notion of environmentalism on the individual level we understand values and beliefs which inspire attempts to conserve the environment; in the first place values based on egocentric, altruistic and biospheric attitudes. Under egocentric values we understand the environmental concern which is the result of the concern about the influence of pollution on ourselves. Altruistic values show how much an individual cares about others, and biospheric attitudes come from the individual's concern about the integrity of the nature itself. Except the belief, under the notion of environmentalism we understand the concern for the state of environment and finally the behaviour directed at the protection of environment from negative influences of human actions (Hirsh, Dolderman, 2007). There is evidence that consumers concerned enough about the environment are ready to consider paying higher prices for products that are nature friendly (Shrum, McCarthy, Lowrey, 1995). Those consumers are willing to pay up to 10% more for ecological products, and investors prefer the companies which are known for taking care of the environment (Clancy, 1991). This trend will, of course, except for the influence on the behaviour of the consumers themselves, inevitably influence the behaviour of producers as well. If the consumer is aware that the company is trying to take care of the environment, the success of a company in this segment will be guaranteed. Companies that are neither informed nor interested in protecting the environment are an exception and not the usual business practice (Mirvis, 1994).

The question about the factors that influence the consumers' behaviour based on the philosophy of environmentalism is raised. Fraj and Martinez (2006) proved the connection between the personal values of consumers and the level of environmentalism. They came to the conclusion that certain values and lifestyle determined the level of environmental concern. It was also established that the number of consumers who are aware of the problem in the environment and are trying to do something about it is constantly growing.

Stern (1999) states three domains which comprise the environmentalist influence on the consumers' behaviour. He calls them personal, behavioural and contextual domains. The personal domain consists of the persons' basic values, his/her beliefs about the functioning of

the biophysical environment and the way it reacts to the behaviour of man, the environmental consequences of their behaviour, and the attitudes towards the environment. The behavioural domain refers to activism, whereby one considers the working in organizations fighting for the protection of the environment, taking part in protests; realizing civil rights, such as voting for the green party, writing to chosen representatives; supporting the policy of environment protection and behaviour in the private sphere such as shopping behaviour, buying products which are nature friendly and using services which do not pollute the environment. The contextual domain which determines consumers' behaviour refers to the characteristics which individuals gain from birth, such as cultural heritage, religion, economic state in the family, social status; the acquired capabilities of individuals such as education, skills, the individual's current situation, such as the place of living, accommodation; and a lot of other factors.

Consumer behaviour, generally speaking as well as when environmental issues are concerned, is under influence of different factors. We can divide them into external, which are grouped under consumers' social profile, and internal factors, grouped under consumers' psychological profile (Grbac, B., 2007). Among internal factors that influence consumer behaviour are personality traits. Different models for understanding personality traits exist. Among the best known is a model that groups them into five categories which is known as "Big five" personality traits.

The Big Five structure captures, at a broad level of abstraction, the commonalities among most of the existing systems of personality description, and provides an integrative descriptive model for personality research (John, Svaristava, 1999). So it can be said that all personality measures can be reduced or categorized under the umbrella of a five factor model of personality (Judge et al., 1999). The Big Five structure refers to the five domains consisting of personality characteristics that are important for understanding human functioning and are related to important life outcomes (Schutte et al., 2003). Five personality traits are stable through different cultures; they are relatively stable during time and show evidence of heritage. The same five dimensions tend to be found in the same order with impressive consistency across different samples of subjects, different selections of personality adjectives and languages (Saucier, Goldberg, 1998, Judge et al., 1999, Paunonen, Jackson, 2000, Schutte et al., 2003, De Hoogh, Den Hartog, Koopman, 2005, Schmitt et al., 2007). The five big domains of personality are extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. Within each of the mentioned domains there is a group of characteristics (John, Svaristava, 1999, Roesch, Wee, Vaughn, 2006).

In the domain of extraversion there are characteristics such as openness, eloquence, vigour, tendency to be assertive, active, and generally gregarious; these individuals like excitement and stimulation and tend to be cheerful in disposition. Within the domain of agreeableness there are characteristics of compassion, empathy, consideration for others and reflects interpersonal tendencies. Under the domain of neuroticism there are characteristics of nervousness, emotional instability, experience negative affective states, but also includes a propensity to generate irrational ideas and engage in impulsive acts. In the domain of conscientiousness the following characteristics are pointed out: responsibility, self-discipline and tidiness, tendency to be purposeful in cognition and behaviour as well as determined. If the domain of openness to experience is taken into consideration, the characteristics of fancifulness, creativity and openness to ideas, tendency to develop unconventional values and to engage in divergent thinking are included.

The assumption of action in terms of environmental protection is the conviction that nature is being jeopardized and that it is necessary to carry out activities with the aim to protect it. Individuals that appreciate others are friendly, generous, empathize with other people, will behave in the same way towards nature, plants and animals. This is the reason why people who achieve a higher level on the scale of agreeableness have a higher level of belief in the existence of environment problems and the environmental concern as well. Individuals who are more open to experience, curious, creative and willing to accept new ideas also show a tendency to develop unconventional values, accept more information from the environment and show a higher level of interest for the environment and thereby notice numerous problems in the environment. That is why such persons should express a higher level of belief about the environmental endangerment. Individuals who are responsible and conscientious as well as focused towards a certain goal will represent their beliefs about the need and necessity of the protection of nature decisively and energetically. If we observe individuals who are open, active and energetic in their behaviour, one can notice that they will transfer their beliefs about the harmful influence of people on the environment and necessity of reducing the negative influence to other individuals in their environment more easily and quickly and in that way influence the spreading of the idea of environmentalism. On the other hand, we have individuals who are nervous, form negative attitudes and change their mood quickly, so that their beliefs in the necessity of the protection of the environment will be negative and changeable. Hirsh and Dolderman (2007) prove similarly; they stated by researching the influence of personality traits on the consumerism and environmentalism that agreeableness and openness are important predictors of environmentalism. On the basis of this mentioned the following hypothesis can be set:

H1: Environmental beliefs are influenced by personality traits. Thereby persons who achieve higher values on the scale of agreeableness, extraversion, conscientiousness, awareness and openness to experience also show higher values on the scale of environmental beliefs, whereas persons achieving higher values on the scale of neuroticism, achieve lower values on the scale of environmental beliefs.

Kilbourne and Pickett (2008) determined the connection among values, beliefs, environmental concern and behaviour. They came to the conclusion that by accepting the materialistic values the belief in the existence of a problem in the environment is decreasing and thereby the concern for the environment is decreasing as well. Yet, with the existence of the conviction about the problems in the environment the environmental concern grows as well, which increases the behaviour by which one tries to abate the negative impact of man on the environment. On the basis of that the hypothesis can be set:

H2: Individuals who achieve higher values on the scale of environmental beliefs show higher environmental concern.

In Croatia, the behaviour connected to the protection of the environment is rarely practiced. Namely, although individuals express beliefs about the need and the necessity of protecting the environment as well as acting according to the long-term sustainable development and taking the nature into consideration, it is often all just mere words. Only individuals who are strongly convinced in the harmful impact of man's actions towards nature and show a high level of concern about the destruction of environment they live in and manifest all the mentioned through their environmental behaviour. Such individuals who are highly concerned about the environment are trying to abate the negative impact on it, that is, they feel the need to act directly or indirectly in order to protect the environment. The connection between the environmental concern and direct and indirect environmental behaviour was established by

Killbourne and Pickett (2008), whereas Kaiser et al. (1999) established environmental attitude as a powerful predictor of ecological behaviour. According to the mentioned, the following hypothesis is set:

H3: Individuals who achieve higher results on the scale of environmental concern largely support the protection of the environment directly and indirectly.

The hypotheses set were tested by the field research and the results are presented in following section.

3. RESEARCH METHODOLOGY

3.1. Sample

The testing of the hypothesis set was conducted by field research on the sample of 254 students at three faculties in two Croatian counties. Among the respondents were 66.45% of women and 33.6% of men of the average age of 23. The family's incomes of 83.5% respondents are at the Croatian average income level, 8.5% of the respondents have incomes above the average income level, whereas the family incomes of other respondents are under the average income level. Of the total number of respondents 45% live in small towns with the population of less than 5,000, 20% in small towns with the population from 5,000 to 10,000, 22.5% in towns with the population of up to 25,000, and 12% of the respondents live in towns with the population of more than 75,000.

3.2. Research instrument

The survey method was implemented. Alongside the questions referring to demographic characteristics of the respondents, the research instrument included 82 statements referring to environmental beliefs, concern and behaviour. Personality characteristics of individuals were also included in the questionnaire and classified according to the model of the "Big Five" personality traits.

The scales from the known bibliography were incorporated in the research instrument with certain modifications. The scale the Big Five Inventory (BFI) by the authors John and Srivastava (1999) was used for measuring the "Big Five" personality traits. The BFI consists of 44 items referring to five dimensions which reflect personality traits: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. Respondents marked their agreeing with the statements on a 5-point scale, whereby 1 indicates strongly disagree, and 5 indicates strongly agree. Among the stated items 16 of them were reversely coded. Before the data processing, recoding of the reverse coded variables was done. Taking into consideration that the questionnaire was translated from the English language into Croatian, a factor analysis was carried out in order to check the dimensionality of the scale and to reduce a larger number of manifested variables to a smaller number of factors. The principal axis factoring method of extraction with varimax rotation of the factor axis with Kaiser normalization was implemented. It was necessary to exclude certain statements from the analysis because they disturbed the scale reliability and loaded on a larger number of factors. Finally, 33 statements, manifested by 5 factors, were kept. The coefficient of reliability Cronbach alfa was calculated for each factor. The following values of coefficients were gained: .703 for extraversion, .603 for agreeableness, .654 for conscientiousness, .742 for neuroticism and .812 for openness to experience.

Environmental beliefs, environmental concern and environmental behaviour were measured by scales used in the paper by Kilbourne and Pickett (2008), as well as the revised New Ecological Paradigm (NEP) scale (Dunlap et al., 2000).

Environmental belief scale is taken from the authors Kilbourne and Pickett (2008) who constructed a scale of 6 items taken from Kilbourne et al. (2002) and Cotgrove (1982). The statements refer to the convictions that there is an environmental problem, such as global warming or a high level of pollution. Environmental concern scale includes 6 items referring to the concern of people about the state in the environment. Environmental behaviour scale consists of 8 items that reflect the respondents' behaviour which has the goal to reduce the harmful impact on the environment.

Environmental beliefs, concern and behaviour are measured on a 5-point scale although they were originally measured on a 7-point scale. The reason why we implemented the scale with only 5 points was the conviction that the respondents understand the 5-point scale more clearly and that they can express themselves more precisely on a scale of five, and not seven levels. Apart from that, the big five personality traits were measured by a 5-point scale, so the assumption was made that introducing a new criterion of grading would have confused the respondents. The contents of the items were not changed, except for the fact that the items were translated into the Croatian language. Because of the modifications that were carried out, a checking of the scale dimensionality by implementing explorative factor analysis was done. The principal factor analysis with varimax rotation of factor axis was carried out. After that, the checking of the scale reliability was carried out by applying the coefficient Cronbach alpha. The results of the analysis are shown in table 1.

Table 1. The results of factor analysis and scales reliability analysis

Items	Factor loading	Cronbach alpha
Environmental beliefs		.806
Many types of pollution are rising to dangerous levels.	.733	
Some living things are being threatened with extinction.	.685	
Continued use of chemicals in agriculture will damage the environment.	.737	
Shortages of some important resources will occur in the near future.	.770	
Global warming is becoming a problem.	.748	
Ozone depletion is an environmental problem.	.630	
Environmental concern		.856
I am very concerned about the environment.	.777	
Human are severely abusing the environment.	.803	
I would be willing to reduce my consumption to help protect the environment.	.705	
Major political change is necessary to protect the natural environment.	.727	
Major social changes are necessary to protect the natural environment.	.848	
Anti-pollution laws should be enforced more strongly.	.754	
Direct environmental behaviour		.814
I buy environmentally friendly products whenever possible.	.856	
I reduce household waste whenever possible.	.825	
I use product made from recycled material whenever possible.	.816	
I buy organic food whenever possible.	.647	
Indirect environmental behaviour		.668
I am member of an environmental organization.	.796	
I contribute money to an environmental organization.	.767	
I subscribe to an environmental magazine.	.640	
I would contact my political representative about an environmental issue.	.602	

Source: research results

As one can see from the table, satisfying results of the conducted analysis were achieved. 51.7% of variance of the results was explained by the environmental beliefs scale, whereas 59.36% of variance was explained by the environmental concern scale. Environmental behaviour scale consists of 8 items grouped into two factors: direct environmental behaviour and indirect environmental behaviour. The first factor implies direct behaviour and refers to buying organic food and other products that do not pollute the environment, to using products made from recycled materials and the tendency to produce the least amount garbage as possible. The second factor refers to indirect behaviour, such as supporting environmental protection organizations, donations, reading magazines about the nature protection or contacting the local representative in case of noticing environmental problems. 58% of the variance of the results in total was explained by the scale. The stated results prove that substituting the 7-point scale with the 5-point scale did not influence the quality of the measurement instrument.

Except for the mentioned environmental beliefs scale which refers to the so called specific beliefs, the well-known The revised New Ecological Paradigm scale (NEP) was implemented. General beliefs are measured by The Revised NEP scale. That scale measures the level to which the respondents show concern about environmental issues (Dunlap et al., 2000). The scale consists of 15 items which represent statements on the situation in the environment. Just as with the previous measurement scales, a 5-point scale was implemented. The checking of the metrical characteristics of the scale was carried out by implementing principal component analysis and coefficient of reliability Cronbach alpha.

By the principal component analysis with varimax rotation two factors were extracted which together explain 45.4% of variance. Four items were excluded because they disturbed the inner consistence and largely loaded on both factors. The results of the principal component analysis are shown in table 2.

Table 2. Rotated Component Matrix for New Ecological Paradigm scale

	Component	
	1	2
Plants and animals have as much rights as humans to exist.	,758	
The earth has plenty of natural resources if we just learn how to develop them.	,740	
Humans are severely abusing the environment.	,720	
If things continue on their present course, we will soon experience a major ecological catastrophe.	,556	
When humans interfere with nature it often produces disastrous consequences.	,508	
The so-called „ecological crisis" facing humankind has been greatly exaggerated.		,711
Humans will eventually learn enough about how nature works to be able to control it.		,680
The balance of nature is strong enough to cope with the impacts of modern industrial nations.		,618
Humans were meant to rule over the rest of nature.		,598
Humans have the right to modify the natural environment to suit their needs.		,542
Human ingenuity will insure that we do not make the earth unliveable.		,470

Source: research results

After the principal component analysis had been carried out, two variables were formed. The first variable reflects the belief that the nature is seriously endangered, so that this variable was named "Ecological endangerment". The second variable reflects the belief that ecological crisis is exaggerated and that human ingenuity will find a solution to the problems in the environment. This variable was named "Human domination". The coefficient of reliability Cronbach alpha is .696 for the first factor, and .685 for the second factor, which represent relatively poor values, but considering the fact that the scale was manifold evaluated and accepted in science, there was no reason not to use it in further analysis. These results are somewhat different than the results by Dunlap et al. (2000), who extracted four factors by the component analysis, but yet decided for a one-dimensional solution, considering the fact that a high value of the coefficient alpha (.83) for 15 items was achieved. Taking the fact into consideration that by implementing the scale on our sample resulted with only 22% of explained variance with the low value of the coefficient alpha (.49) in the case of one-factor structure, we consider it justified to choose the two-factor structure despite the relatively poor value of the coefficient alpha for both components.

4. RESEARCH RESULTS

It was assumed by hypothesis H1 that persons, who show a higher level on the environmental beliefs scale, achieve higher results on the scale of agreeableness, openness to experience, extraversion and conscientiousness, and a lower level on the neuroticism scale. In order to test the hypothesis mentioned we used the multivariate regression analysis. Environmental beliefs are chosen as a dependent variable and predictors are five variables referring to the personality traits. By this regression analysis it was established that there is a significant relationship between the Big five personality traits and specific environmental beliefs (R = .349; $F_{(5, 223)}$ = 6,177, p < .001). Significant positive values of beta coefficient for the variables agreeableness (β = .315, t = 3.888, p < .001) and openness to experience (β = .123, t = 2.339, p < .001) were achieved. Significant relationship among the other variables was not established.

An additional multivariate regression analysis was carried out in order to explore the connection between the personality traits and general environmental beliefs measured by the NEP scale. The environmental endangerment was chosen as the dependent variable. Statistically important relationship between the variables analyzed (R = .348; $F_{(5, 221)}$ = 6,078, p < .001) was established. Agreeableness (β = .235, t = 3,635, p < .001) and extraversion (β = .145, t = 3,635, p < .001) are in a positive correlation with environmental endangerment, whereas the relationship among other variables was not established. Although the relationship of neuroticism and conscientiousness with environmental beliefs was not established, we can conclude that the hypothesis H1 was generally confirmed, considering the fact that there is a statistically significant relationship among agreeableness, openness to experience, extraversion and environmental beliefs.

It was assumed by hypothesis H2 that persons, who achieve a higher level of conviction that the state in the environment is critical, also show a greater concern about the state in the environment. The coefficient of correlation between the variables environmental beliefs and environmental concern is r = .684, p = .000, so that the hypothesis H2 can be confirmed and we can conclude that there is a high level of connection between environmental beliefs and environmental concern.

Hypothesis H3 refers to the relationship between the environmental concern and concrete behaviour which contributes to the preservation of the environment. Two latent variables extracted by factor analysis were included in this analysis: direct and indirect behaviour. A statistically significant relationship between the variables environmental concern and direct behaviour (r = .388, p = .000) was established, as well as between the variables environmental concern and indirect behaviour (r = .334, p = .000). This represents the verification of the hypothesis H3, so we can conclude that persons who are more concerned for the environment show tendency to behave in the way that is not harmful for the environment.

The questionnaire consisted, except for the scales mentioned, also of two additional questions referring to the readiness to buy more expensive products which are not harmful for the environment. The first question was actually a statement: "I would pay more for products which are not harmful to the environment." The respondents were supposed to express their agreeing with the mentioned statement on a 5-point scale. The second question referred to the amount the respondents would be ready to pay for a product whose producers take care of the ecological standards. By the correlation analysis carried out it was established that there is a statistically significant relationship between environmental concern and readiness to pay a higher price for products which are not harmful to the environment (r = .379, P = .000). This additionally confirms hypothesis H3.

When we mention the concrete amount the respondents would be ready to pay for a product whose producers take care of the ecological standards the following values were gained: 4.3% is not ready to pay a higher price, 40.9% would pay 1-5% more, 37.5% is ready to pay 6-10% more, 12.1% would pay 11-20% more, and 5.2% of the respondents are ready to pay more than 20% for buying such products.

Except for testing the hypotheses set, there was also a checking of the influence of demographic variables on environmental beliefs, environmental concern and environmental behaviour carried out, as well as readiness of consumers to pay a higher price for ecologically acceptable products. Namely, except for the personality traits there is an assumption that demographic variables also influence environmentalism. Younger persons are more open to the changes and information receiving from the environment. They are not burdened by the traditional view of the world and are ready to accept the changes in considering the environmental issues. Since environmentalism represents a new way of considering this problem and a new way of thinking about the consequences, young people are more ready to accept this point of view. People with a higher level of education also have more information about the problems in the environment and understand the ecological perspective of preserving the environment. That is why their beliefs, concern and behaviour will be directed to reducing the negative impact of man on the environment we live in. Except that, it is regarded that women are more sensitive to the changes in the environment and that they see more negative consequences which the destruction of the environment has on the human species because of their mother role and more expressed empathy. Stern and Dietz, (1994) prove similarly as Dunlap et al. (2000). By implementing factorial ANOVA on the sample of students we examined influence of sex, age and family income on the previously mentioned variables. Statistically significant influence of demographic variables on environmental beliefs ($F_{(3,212)}$ = 2.062, p = .106), environmental concern ($F_{(3,212)}$ = 2.321, p = .076) or environmental direct ($F_{(3,212)}$ = 2.219, p = .087) and indirect ($F_{(3,212)}$ = 1.939, p = .124) behaviour was not established. The influence of education could not be analysed considering the sample homogeneity. From all that was mentioned we can conclude that demographic variables in the sample do not influence environmentalism.

5. CONCLUSION

The research had the goal of establishing the relationship between personality traits and behaviour according to the philosophy of environmentalism. The starting point of the research was the assumption that the behaviour of consumers who are inclined to take care of the consequences of their actions is based on their beliefs that the environment is seriously endangered and that it is necessary to start certain activities regarding its protection. The factors related to the beliefs can be different and in this paper we focused on the personality traits as environmental beliefs predictors and indirectly on environmental concern and behaviour.

On the basis of the results, we can draw a few conclusions which generally prove the hypotheses set. The hypothesis that the belief about the environmental endangerment is under the influence of personality traits structured in the Big Five model was confirmed, whereby the positive influence of openness to experience, agreeableness and extraversion on the environmental beliefs was established. Hirsh and Dolderman (2007) claimed something similar; they established a positive correlation among agreeableness and openness to experience and environmental beliefs. From the mentioned we can conclude that persons who show greater interest for the state of environment have the following characteristics: creative, open to new ideas, assertive, active, energetic, unselfish, curious, ingenious, inventive, considerate, sociable, like cooperating with others and show a high level of empathy.

The conviction that the ecological balance is endangered results in a higher concern about the state in the environment. Consequently, it influences positively the consumers' behaviour manifested in the activities that influence the environment directly or indirectly, which is in accordance to the results of Kilbourne et al. (2002) and Kilbourne and Pickett (2008). Direct behaviour refers to buying products that do not pollute the environment, using products made of recycled material, buying organic food whenever possible and producing the least amount garbage as possible. Indirect behaviour presumes supporting the work of the environment protection organizations, donating money to the environment protection organizations, reading magazines about the environment protection and contacting persons in the local community who are in charge for the environmental issues. So, persons who are more concerned about the environment buy organic food or products made of recycled material, take care that they do not make too much garbage, and are ready to pay more for the products which are not harmful for the environment. They also show the tendency of supporting the work of organizations that protect the environment or deal with the environment protection.

Different than in the previous researches (Raudsepp, M., 2001, Bjerke, T., Thrane, C., Kleiven, J., 2006), in this research the influence of sex, age or the family income on the environmentalism was not established. The reason for this is probably the fact that the sample was relatively small and homogenous, so these conclusions should not be taken for granted and further researches should be conducted in order to examine the existence of this influence. The results of this research have a certain applicative value. Namely, recently firms recognize the importance of acting according to the laws of nature more and more. In relation to that they offer products and services that take the environment into consideration and do not endanger it (for example, using the packing made of recycled material, reducing the CO^2 emission, implementing the ecologically sustainable technologies and similar). The research shows that there are consumers who are aware of the need of the sustainable development and that by the growth of their environmental concern the readiness to start activities with the aim of protecting the environment also grows. Those activities refer also to the readiness to pay

more for a nature friendly product, so that investing into cleaner production is worthwhile. While companies deliver a greater value to the consumers who are responsible to the environment, the consumers are ready to reward additionally. Yet, far more important is that firms' environmental friendly behaviour has positive effects on the nature and the quality of life of people who coexist with it.

6. LIMITATIONS AND FUTURE RESEARCH

In order to present the research results objectively it is necessary to state the limitations of the research which undoubtedly influenced the results and conclusions. The biggest limitation is the sample which is not representative. The respondents were chosen into the sample on the basis of accessibility, so that the results can be considered to be preliminary and a landmark for further research. The homogeneity of the sample regarding the aspect of age, education and life experience is the cause why we could not analyze the influence of demographic variables on environmental beliefs, concern and behaviour in more detail. Future research should be done on a greater and, if possible, a representative sample. Then possible socio-demographic differences among the respondents could be revealed.

The next disadvantage of the research is the measurement scales implemented in the research. Those are known and accepted measurement instruments of good metric characteristics. The scales had to be translated into the Croatian language which might have caused a change in the meaning of certain statements. Except that, certain notions mentioned in the BFI scale were unclear to the respondents, so that explanations were added in the questionnaire, such as for the notion of assertiveness or inventiveness and similar. Future research could be based on the use of other personality traits measurement instruments or the research could be carried out by personal interview.

Furthermore, the hypotheses about relationship among environmental beliefs, environmental concern and environmental behaviour were checked by the research. Environmental behaviour was analyzed through direct and indirect supporting activities that tend to reduce the negative influence onto the environment. In future research one could, by introducing additional variables, analyze in more detail concrete activities done by respondents regarding the issue of environment protection, such as recycling. It would also be necessary to explore how much personality traits influence the decision to buy "green" products. As far as attitudes and beliefs are considered, it would be necessary to explore how stable they are, how they affect the behaviour and how much they are the result of adjusting to the global trends of environmental concern. As far as Croatia is considered, it would be interesting to research and compare results in different counties and areas because life in a more or less polluted area can affect the beliefs and attitudes differently, especially the behaviour connected to environment.

When we talk about activities done for protecting the environment a similar research should also be done on the sample of managers because managers are responsible for making business decisions which result in interventions in the environment and support more or less a socially responsible behaviour. It could be examined if their belief about the state of the environment, their concern and concrete measures taken are influenced by personality traits, other personal variables or factors of the situation.

Since the field of environmentalism has not been researched enough yet in Croatia, new research may occur.

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CROATIAN HOTELIERS' ATTITUDES TOWARDS ENVIRONMENTAL MANAGEMENT

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1. INTRODUCTION

Contemporary society increasingly wields moral, ethical, social, and political pressures at ensuring environmental protection and sustainable development. Yet, the most recent developments in the global arena suggest even greater changes are underway. Namely, in the wake of global financial crisis and surging costs of fossil fuels, energy conservation and environmental management have almost instantaneously become critical issues internationally. Consequently, trends such as the green hotel movement and ecotourism are likely to be accelerated in the near future.

In the lodging sector, the hoteliers' adoption of ecological standards is typically motivated by the perceived costs and benefits of such action. Moreover, there is a greater awareness among hotel managers that safeguarding natural resources directly influences firm's operational success, competitiveness, and ultimately its survival. For these reasons, an increasing number of hotels are embracing formal and/or informal environmental management policies, systems, and procedures.

The Croatian lodging industry, despite its long-standing tradition, is still hampered with numerous viability issues – e.g., incomplete and/or poorly executed hotel privatization process, unresolved land ownership disputes, and pronouncedly high seasonality. Consequently, the operational efficiency of many hotels is questionable, while the overall lodging industry struggles to attract sound foreign investment. Under these circumstances, one may expect that the adoption and implementation of environmental standards by Croatian hoteliers is still at an early stage.

In Croatia, however, no research has been conducted to determine the state of environmental management in Croatian hotels. Thus, the purpose of the present investigation was to

determine and measure the Croatian hoteliers' attitudes towards environmental management. Specifically, this research sought to accomplish these goals:

- Theoretically explore the role and the importance of the environmental standards adoption in hotels amid growing international ecological concerns;

- Empirically investigate the attitudes of Croatian hoteliers towards potential benefits arising from environmentally-oriented hotel management, including increased profitability, increased employee and guest satisfaction, improved relations with the local community, improved public relations, and development of a competitive advantage;

- Examine the relationships among hoteliers' attitudes, hotel characteristics (lodging type, size, quality rating, location, guest type, seasonality, the number of years in business, and ownership type), and the presence of a formal/written environmental management policy.

2. DISCUSSION

2.1. Environmental Management and the Hospitality Industry

It was not until the 1990's that tourism - and in particular, the hospitality industry – have started to respond to the need of the environmental management. Namely, in 1992, the International Hotels Environment Initative was developed when a number of the leading international hotel companies realised that they had a lot to gain from working together. The IHEI had developed a manual for managers (IHEI, 1993; as cited in Kirk, 1998), a journal, "Green Hotelier," and a number of training aids for hotel companies. IHEI has now evolved into the International Tourism Partnership, the tourism programme of the International Business Leaders Forum (ITP, 2009), whose aim is to assist the industry to make a valuable contribution to the countries and cultures in which they operate, to their customers, their shareholders and future generations. They had published the third edition of a mannual "Environmental Management for Hotels" providing hotels and other related businesses with the knowledge and means to develop practical solutions to 'green' their operations.

As part of wider environmental management, many (typically larger and/or franchised) tourism establishments now use the ISO 14001 environmental management standard. ISO 14000 series of eco-standards has been developed and issued by the International Organization for Standardization (ISO) in 1996. They are meant to be complementary to national regulatory regimes and are not intended to replace or duplicate a country' regulatory regime (Quazi, 1999). ISO 14001 was recognised as a step toward achieving EMAS, the Eco-Management and Audit Scheme. EMAS has become operative in the EU since April 1995 (EU/Environment, 2009). It is a voluntary scheme aiming to promote continuous evaluation and improvements in the environmental performance of participating organisations. EMAS goes beyond EN ISO 14001 in a number of ways, requiring the undertaking of an initial environmental review, the active involvement of employees in the implementation of EMAS, and the publication of relevant information to the public and other interested parties.

Green Globe 21 is also an environmental management standard, developed specifically for the travel and tourism industry, but it has not managed to reach the market. There are also a

substantial number of ecolabels, codes of conduct, sustainability reporting schemes, awards, and benchmarking programs in the tourism industry. Font (2002, as cited in WTO & UNEP, 2008; 164) identified over 100 ecolabels of tourism, hospitality and ecotourism worldwide (such as Blue Flag, Green Globe, Pan Parks, Le Clef Verte…). Environmental management, certification and ecolabelling can be a useful basis for managing a businesses' supply chain and developing strategic partnerships.

From the available literature (Kirk, 1998; Chan, 2008) it is obvious that the pioneers in introduction of ecological operation standards, i.e. environmental management, were mainly hotels belonging to the big hotel chains. This is due to the fact that, except the simplest rationalization measures, most activities require a significant starting investment the return on which is admittedly relatively fast but which cannot be afforded by the hotels that operate without safe and stable financial and managerial support. Moreover, in most countries environmental policy is mainly designed to penalize noncompliance with certain standards and regulations rather than to reward autonomous environmental initiative. Nevertheless, there are increasingly frequent government initiatives aimed at subsidizing hotels in their efforts to introduce ecological standards into their operation. An outstanding example is the federal government of Canada that since the mid nineties has been supporting with an annual subsidy of 4% per hotel income the members of the Canadian Hotel Association in their effort to develop an environmentally friendly offer. This cooperation is carried out through the government Agency for Environment Preservation that, among other things, helps the Hotel Association develop ecological operation criteria by ensuring 50% of the funds needed for implementation of the program (IHRA, UNEP, 1995, 46).

Although ecological initiatives can be taken in any hotel, it is certainly much easier with financial, organizational and consultative support. Even though a certain number of countries are directly engaged in such programs, such as the above mentioned case of Canada, then for example Tanzania, Togo, South Africa, etc. where issues related to environment and tourist industry are dealt with in the common ministry, ecological programs in the tourist industry and particularly in the hotel industry, are mainly carried out through various professional alliances, primarily through the national hotel associations. They are then associated into the International Hotel Association (IHRA, 2008) and other green organizations (professional and non-professional) and ecological initiatives. The most renowned are GEMI - Global Environment Management Initiative (1999), center for promotion of ecological standards and environmental management in companies all over the world, and WEC - World Environment Center (2009) serving as a bridge for information and expertise exchange between the industry and the governments, as well as numerous organizations and associations dealing with these issues.

As for the EU initiatives regarding the issue, the EU Eco-label award scheme has been set up to identify products with a reduced environmental impact. It is a voluntary scheme and manufacturers can choose whether or not to apply for the Eco-label. The scheme is based on Council Regulation EEC Nº 880/92 of 23 March 1992, which has been updated and revised by Council Regulation Nº 1980/2000 of 17 July 2000. The European Eco-label for tourist accommodation service was created to reward accommodation services that respect the environment. It signals good environmental performance and is an added quality value when tourists are choosing their accommodation. Hotels and guesthouses displaying the Eco-label flower logo have been distinguished as being amongst the most environmentally friendly in their area (2009).

2.2. Application of ecological standards in hotel operation

There are numerous activities and measures that can be undertaken by hotels to protect the environment and reduce operating costs without any harm to the achievement of optimal comfort standards for their guests. However, these activities as well as the way and scope of their implementation will differ from one hotel to another due to differences in:

- Mode of operation and sort of guests (depending on whether it is a city hotel specialised for business guests, seasonal hotel, or hotel specialized for specific guests in terms of age, education, interests, etc.),

- Country legislation and regulations,

- Local and regional priorities in environment protection,

- Starting position (whether hotels have been taking some of the measures and activities of environmental management since the beginning of operation or are just introducing them).

On the other hand, it is certain that most measures refer to 6 basic areas: energy, solid waste, water, effluents and emissions (fluid and gaseous waste), choice of contractual partners (suppliers, service providers, etc.), operation (IHA, IHEI, UNEP, 1995: 9; UNEP, 1992; 5).

Ad 1)   Hotels consume vast quantities of energy in different places and different departments for heating, cooling, lighting, cooking, laundering, maintenance, etc. Most of them are not rational in this consumption, i.e. they consume much more energy than it is necessary. In that way, due to indirect or direct unnecessary fuel consumption, they do not only increase their costs and reduce operation efficiency but also contribute to global warming, acid rains and other environmental threats.

Ad 2) Solid waste disposal is one of the greatest environmental problems, especially if it includes non-biodegradable or hard degradable materials. Most hotels produce large quantities of solid waste, bottles, tins, kitchen waste, scrapped furniture, equipment, and potentially dangerous materials such as asbestos, paints, etc. Saving measures in this domain primarily involve more rational use. In these terms numerous hotels run the so called 3R campaign - **Re-**use, **Re**cycle, **Re**duce
.

Ad 3) The water benchmark values suggested by International Hotels Environment Initiative (IHEI) at the beginning of the 1990s were in the range of 120–280 m^3 per guest staying overnight per year (average daily guests) for fairly efficient hotels and below 120–220 m^3 for facilities with good water efficiency, depending on the type and size of the hotel. A more recent benchmark value from IHEI states the quantity of water below 540 l/guest-night as satisfactory, and below 480 l/guest-night as excellent in the case of luxury hotels (Bohdanowicz, 2006).

In order to rationalise the water consumption, it is necessary to build in special devices aimed at lowering water pressure in showers and pipes (so called aerators) and water saving toilets, to install water gages etc.

Ad 4) The main polluting factors in fluid and gaseous waste are: air conditioners and refrigerators (containing chlorofluorocarbon - CFC, dangerous for ozone layer), boilers using

fossil fuels, vehicle exhausts, chemical effluents caused by cleaning and washing, pesticides and herbicides, unprocessed excrement, kitchen and washroom odors, etc. In most countries disposal of such wastes is strictly regulated by law and any breach incurs penalty and also loss of reputation among guests. On the other hand, if a country lacks strict legal regulations in this area the hotels themselves can take various measures to protect their reputation as hotels respecting the health of their clients and of their wider environment.

Ad 5) A less emphasized but not less important set of measures directed at the eco-hotel status refers to its dealing with contractors and suppliers. Namely, in order to gain and retain the "green" epithet the hotel has to choose contractors and suppliers of the same orientation. In other words, it will purchase biodegradable washing powders, cleaning fluids and cosmetics, organic fertilizers for its gardens and plants, fresh and preferably organic grown food, reusable packaging, energy efficient appliances, etc. Consequently, the choice of suppliers able to offer such goods has to be one of the basic tasks of environmental management in any hotel. Moreover, an environmentally inclined hotel can include in its ecological mission a large number of previously passive partners.

All the above mentioned activities and measures directed at introduction of ecological standards into hotel operation should in due time lead to concrete business results expressed primarily by higher savings, i.e. reduced operation costs and thus also higher profits. They should also result in increased customer loyalty, especially if the hotel is located in beautiful scenery admired and visited by nature lovers. Finally, they should create new business opportunities, primarily cooperation with agents and tour operators whose business policy is also environmentally inclined. To benefit from this policy, the hotel has to inform its business partners about it, primarily agencies and through them the prospective guests. This can be easily done by using various promotional tools (written materials, personal selling, fairs, etc.) and also by direct involvement in various environmental actions and programs to gain a recognizable "green" image. Here we have to point out the initiative that can be taken by the eco-hotel in the ecological training of the hotel personnel to enable them to implement its ecological policy and also to raise environmental awareness in the wider community.

2.3. Environmental Management in Croatia's Hotel Industry

Croatian hotel industry is still operating in an unfavorable business environment. This is primarily due to the incomplete privatization process and unresolved problem of land ownership. Besides, Croatian tourism is still mostly of seasonal character which is caused by a number of problems such as poor direct air links between its destinations and emission markets and an inadequate and insufficiently attractive offer of destinations in the off-season period. Under these circumstances most Croatian hotel companies are coping with mere survival in the market and that is why most of them are unwilling to implement formal systems of environmental management justifying their reasoning by high initial costs. The exceptions are the hotels operating within international chains whose ecologically oriented operation is the basic element of their competitive strategy. Nevertheless, the national hotel chains are increasingly introducing systems such as ISO 14 001 (e.g. Maistra Inc. operating as the hotel brand within the Adris Group).

In May 2008, Maistra certified the Environmental Protection Management System according to ISO 14001:2004 norm which, together with the Quality Management System implemented according to ISO 9001:2000 norm, makes a part of the Integrated Quality Management

System implemented throughout the entire organization. The systems have been implemented in all hotels, tourist resorts, camps and Maistra's business functions (Maistra, 2008).

Some hotels in Croatia implement informal measures of environmental management directed primarily to rationalization of energy and water consumption. For example, the Croatian Association of Small and Family Hotels provides training for its members in implementation of these measures and environmental management in general and strives to establish environmental quality mark to be awarded to its members. It also collaborates with Croatian Center for Clean Production that in 2006 started a pilot project on possibilities of savings in Croatian hotels by implementation of environmental measures (CRO-CPC, 2006).

In accordance with the Food Law NN 46/07 and Regulations on Food Hygiene NN 99/07, from January 1, 2009 Croatian hotels will have to start the implementation of a special system in food production, preparation and serving, the so HACCP, Hazard Analysis Critical Control Point. This system is actually one of the formal systems based on environmental principles.

The HACCP concept, pioneered in USA, was first introduced in 1958 by the NASA (National Aeronautics and Space Administration). The European hygiene rule defined in the paper 94/356/EG demands for an HACCP-concept which can be integrated in a quality management system (OurFood, 2008). Introduction of HACCP into hotels is carried out by the Public Health Institute and consulting firms, while certification is provided by authorized agencies.

It is to be noted that no Croatian law, regardless of their number and variety, deals with the issue of resource usage in the hotel industry. The issue is defined in a number of environmental and industry laws. Environment laws deal with the usage of environment factors such as water, soil, sea, etc. Industry laws, unlike the environment laws directed to the general issues, regulate the treatment of concrete natural resources in particular industries (such as agriculture, fishing, etc.). It is obvious that the operation of the tourist industry (and thus also of the hotel industry) is based on various natural and cultural resources and that it has to comply with the basic principles of environment protection declared by these laws, and particularly by the Environment Protection Law (NN no. 82/1994, 110/2007). According to this law (art. 150-158) all legal entities (including hotels), are liable for the damage incurred by pollution if caused by their operation or negligence. In a hotel this can be for instance emission of oil, mazut, or excrements into water, emission of gas into atmosphere, dispersion of asbestos dust, etc. In such cases the hotel not only settles its own damage but also covers all the costs caused by measures taken to eliminate pollution.

As for the measures stimulating implementation of ecological initiatives and general environmental policy in companies (including hotels), the Law provides the possibility of regulating benefits, tax incentives, and exemption of tariffs for those entities that use less detrimental production procedures (for example use of alternative energy resources, use of environment friendly equipment and appliances) and those that organize disposal of used appliances or their parts, used products and their packaging or use other ways to reduce negative effects on the environment (Law on Environment Protection, NN no. 82/1994, 110/2007). It is certain that without systematic implementation of environmental policy and stimulation of companies and hotels adhering to its principles sustainable development will be but an empty phrase.

2.4. Factors Affecting the Adoption of Environmental Standards by Hotels

Why do hoteliers join the environmental efforts and initiatives at all? Is it simply for the sake of environment or...? We believe that their environmental behaviour is largely driven by the improvements to the bottom line, while less so by altruism.

Many studies have been taken so far to describe motivations for the introduction of the environmental initiatives as well barriers to its implementation. Summarizing results of different studies, it can be concluded that hoteliers' adoption of ecological standards is typically motivated by both costs, i.e., poor image, loss of market share, higher long-term expenses, greater employee turnover, etc., and benefits i.e., lower operating expenses, improved relationships with a local community, safer working environment, enhanced image, and the development of competitive advantage, as perceived by the firm (Chan, 2008; Chan & Wong, 2006; Kirk, 1998; Lorente et al., 2003; Quazi, 1999; Quazi et al., 1999; Quazi et al., 2001). Morover, there is a greater awareness among hotel managers that safeguarding natural resources directly influences firm's operational success, competitiveness, and ultimately its survival (Garrod & Chadwick, 1996).

In particular, with the proliferation of "green" consumerism, environmental management is increasingly viewed as a marketing advantage (Cairncross, 1995). In fact, hotel rating schemes in some countries and regions are based on environmental factors (Goodno, 1993). In terms of customers' reactions to the "greening" of products and services, findings appear inconclusive. Thus, while some customers consider environmental issues when making decisions about a choice of hotel (Gustin & Weaver, 1996), others subscribe to environmental management as a concept, but are not prepared to pay more for an eco-friendly hotel room or dining experience (Jaffe et al., 1993; Watkins, 1994).

In addition to marketing benefits, environmental management is believed to have a positive influence on public opinion and public relations (Worcester, 1994). For instance, a company which is sensitive to local concerns will likely face less resistance by the local community in any proposed new development (Elkington & Knight, 1992). Similarly, since some employees wish to work for a socially responsible company, environmental management can result in the heightened morale of the workforce (Hopfenbeck, 1993).

For these reasons, an increasing number of hotels are embracing formal and/or informal environmental measures and procedures. Indeed, the formal adoption of a written environmental policy statement is commonly recognised as the first and most important step towards environmental action in an organization (Gilbert, 1993). Thus, some hotels employ a number of environmental best practices to curb energy, water and other expenses, albeit they do not have a formal environmental management system (EMS) in place. On the other hand, hotels with a formal EMS, such as ISO, adopt a structured, comprehensive and formal organizational approach designed to achieve environmental care in all aspects of operations. It typically involves the development of an environmental policy for the tourism business, monitoring of impacts (such as emissions), environmental reporting (e.g. in the form of 'triple bottom line' reporting) and certification.

Both the presence of a formal written policy – as well as the hoteliers' attitudes toward marketing and other benefits – may be a function of various characteristics of the lodging facility, such as its type, size, quality rating, location, trip motive, seasonality, years in business, and ownership type. In terms of size, since smaller hotels generally face greater

constraints (i.e., low environmental awareness, economic barriers, inadequate institutional support, etc.) they may be less prone to protect the environment (Tilley, 1999). Given the usually strong association between the size of the hotel and its quality rating (Kirk, 1998), hotels with superior quality (e.g., 4-5 stars) should exhibit more environmentally conscious operations.

Furthermore, there is some evidence supporting the notion that small town/rural hotels are more in favor of general environmental policies than their urban counterparts (Deng et al., 1992). With respect to guest type, a hotel catering mostly to business travelers (as opposed to leisure travelers) may perhaps display less concern for the environment. Similarly, seasonal hotels may be less worried about the environment than hotels operating all year round. Also, longer established hotels could be more sensitive to environmental protection as a way to protect their long-term interests (i.e., to retain that which attracts tourists). Finally, one may also expect a difference in environmental attitudes between the independent and chain-owned hotels (Bohdanowicz, 2005; Green Flag for Greener Hotels, 2001).

3. RESEARCH HYPOTHESES

In line with our study's goals, and based on the previous discussion, this study's two main research hypotheses and a number of sub-hypotheses are as follows:

H1: There is a relationship between the presence of a formal/written environmental management policy and characteristics of the hotel;

H1a: There is a relationship between the presence of a formal/written environmental management policy and lodging type;

H1b: There is a relationship between the presence of a formal/written environmental management policy and hotel size;

H1c: There is a relationship between the presence of a formal/written environmental management policy and hotel quality;

H1d: There is a relationship between the presence of a formal/written environmental management policy and hotel location;

H1e: There is a relationship between the presence of a formal/written environmental management policy and guest type;

H1f: There is a relationship between the presence of a formal/written environmental management policy and seasonality of operations;

H1g: There is a relationship between the presence of a formal/written environmental management policy and the length of time that a hotel is in business;

H1h: There is a relationship between the presence of a formal/written environmental management policy and ownership type;

H2: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and characteristics of the hotel;

H2a: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and lodging type;

H2b: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and hotel size;

H2c: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and hotel quality;

H2d: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and hotel location;

H2e: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and guest type;

H2f: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and seasonality of operations;

H2g: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and the length of time that a hotel is in business;

H2h: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and ownership type;

H2i: There is a relationship between hoteliers' attitudes towards potential benefits from environmental hotel management and the presence of a formal/written environmental management policy;

4. METHODOLOGY

The Croatia's Ministry of Tourism (MINT) list of 671 officially licenced and categorized facilites under the group HOTELS (hotels [562], aparthotels [11], tourist resorts [46] and tourist apartments [52]) in Croatia for January 2009 served as the sampling frame for this study. The actual study sample consisted of 310 facilities (46% of the sampling frame) belonging to the group HOTELS (210 hotels, 11 aparthotels, 46 tourist resorts and 52 tourist apartments). The 210 hotels in the sample were randomly selected among 562 hotels using Research Randomizer (2009). The study was carried out during February and March of 2009.

Overall, this study featured a primary data collection, whereby a 2-page self-administered questionnaire written in Croatian was mailed to the General Managers of hotels that make up the sample. The questionnaire comprised 8 multiple-choice questions, a fill-in-the-blank question, and a Likert-type question - developed through a review of related literature and evaluated by two social science research experts. The subsequent pre-test of the survey on two hotels (one small and one large) revealed only a few typos that were easily corrected. Questionnaire design followed the established guidelines for mail and Internet surveys (Dillman, 2000). Thus, prior to mailing out the final version of the survey, an email informing

the respondents about source, scope, nature, and date of the approaching survey was sent in an attempt to improve the survey response rate. The email correspondence was conducted using the Mail Merge Wizard, so as to assure respondent privacy and to avoid appearance of mass emailing.

The first part of the surey aimed to identify some of the characteristics of the hotels by using 7 multiple-choice questions. This included lodging type (hotel, aparthotel, tourist resort or tourist apartment) size (small [≤ 50 rooms/units], medium [51-100] or large [> 100]), quality rating (2-5 stars), location (coastal, city, rural, highway, airport or other), guest type (leisure, business or other), seasonality of operations (seasonal or all year round), and ownership type (independent or chain-operated). This section of the survey also included a fill-in-the-blank question about the length of time that a hotel has been in business.

The second section of the questionnaire related to the presence of a formal written policy on the environment, and if there was one, how long the policy had been in place and what type of policy (i.e., ISO, HACCP, national or international hotel eco label, or other). Although HACCP is primarily a food safety policy (as opposed to an environmental policy), it also comprises some elements of environmental management, such as proper disposal of potentially harmful food wastes. However, the main idea behind food waste disposal in HACCP is prevention and control of food cross-contamination, not environmental protection. Yet, this difference between a formal HACCP system and a formal/written policy on the environment may not appear as clear to some respondents. Therefore, while included as one of the optional response categories, HACCP was not considered an environmental policy in the subsequent analysis.

The third section of the questionnaire contained a 6-item measure of the hotelier's attitude toward possible impacts of environmental management on their business. This 6-item measure was adopted from previous research (Kirk, 1998), albeit no scale reliability and validity were reported in the original study. Specifically, respondents rated six statements reading the following: A program of environmental management will: (1) increase profitability, (2) increase customer satisfaction, (3) increase employee satisfaction, (4) improve relationships with the local community, (5) help with our public relations, and (6) give a marketing advantage over our competitors. All statements were rated on a 5-point Likert scale, ranging from 5 (*strongly agree*) to 1 (*strongly disagree*).

5. RESULTS

Of the 310 questionnaires mailed, 81 usable surveys were returned, representing an overall response rate of 26%.

5.1. A Profile of Surveyed Hotels

Of the 81 lodging units that returned the survey, the majority were hotels (81.5%), as shown in Table 1. Because of the small number of aparthotels (4.9%), tourist resorts (6.2%), and tourist apartments (7.4%), these were merged together in the later analysis. This gave two groups, HOTELS (81.5%) and OTHER LODGING FACILITIES (18.5%). In terms of size, due to the small number of medium-sized (51-100 rooms/units) lodging facilities (8.6%), these were combined with large hotels (> 100 units) in the subsequent analysis. Thus, two groups were formed, 37 hotels (45.7%) with ≤ 50 units, referred to as SMALL HOTELS, and

Table 1. Characteristics of surveyed hotels

Variable	#	%	Valid %
Lodging type (N=81)			
Hotel	66	81,5	81,5
Aparthotel	4	4,9	4,9
Tourist resort	5	6,2	6,2
Tourist apartment	6	7,4	7,4
Hotel size (# of rooms/units; N=81)			
≤ 50	37	45,7	45,7
51 to 100	7	8,6	8,6
> 100	37	45,7	45,7
Quality rating (N=80)			
2*	15	18,5	18,8
3*	46	56,8	57,4
4*	14	17,3	17,5
5*	5	6,2	6,3
Location (N=79)			
Coastal	40	49,4	50,6
City/urban	34	42,0	43,0
Highway	1	1,2	1,4
Airport	2	2,5	2,5
Other	2	2,5	2,5
Guest type (N=78)			
Leisure	50	61,7	64,1
Business	23	28,4	29,5
City break	4	4,9	5,1
Other	1	1,2	1,3
Seasonality (N=81)			
Seasonal	35	43,2	43,2
All year round	46	56,8	56,8
Ownership type (N=81)			
Independent	58	71,6	71,6
Chain-affiliated	23	28,4	28,4
Years hotel in business (N=77)			
≤ 25	40	49,3	51,9
> 25	37	45,8	48,1
Formal written eco-policy (N=81)			
YES	27	33,3	33,3
NO	54	66,7	66,7
Years eco-policy in place (N=41)			
1	19	23,5	46,3
2-4	17	21,0	41,4
7-10	5	6,1	12,1

44 hotels (54.3%) with > 50 units, referred to as LARGE HOTELS. In relation to quality rating, hotels were divided into two groups for further analysis, 2-3 STAR HOTELS (76.2%) and 4-5 STAR HOTELS (23.8%).

In regards to location, because of the small number of hotels at highway (1.3%), airport (2.5%) or other locations (2.5%), these were combined with city/urban hotels, thus forming two groups – COASTAL HOTELS (50.6%) and CITY/URBAN/OTHER HOTELS (49.4%). As far as the type of guests mainly served by a particular hotel, two groups emerged, LEISURE GUESTS (64.1%) and BUSINESS/OTHER GUESTS (35.9%). The analysis further revealed that majority of hotels (56.8%) were opened all year round, while 43.1% were seasonal. In terms of ownership, 71.6% were INDEPENDENT and 28.4% were CHAIN-AFFILIATED hotels.

The analysis of the length that a hotel has been in business showed that there was a skewed distribution with a large number of 'younger' (≤ 50 years in business) hotels (83%), and then a broad distribution of hotel ages up to a maximum of 123 years in business. Based on the median value of the years that a hotel has been in business, 25, hotels were divided into two groups for further analysis, 40 hotels (51.9%) with ≤ 25 years in business, referred to as YOUNG HOTELS, and 37 hotels (48.1%) with > 25 years in business, referred to as OLD HOTELS.

Moreover, only 27% of hotels in the sample have some sort of a formal/written environmental policy in place. As noted in the methodology section, HACCP was not considered an eco-policy because it is essentially a food safety policy. In relation to the length of time that an eco-policy has been in place, roughly half the total number of hotels in the sample (41) indicated their answers to this question. Of the 41 responses, over 46% have a formal environmental policy in place for 1 year or less. While an additional 41% and 12% have a formal eco-policy for 2-4 and 7-10 years, respectively, no hotel has a written policy on the environment in place for more than 10 years.

5.2. Formal Eco-Policy and Hotel Characteristics

To test if there was any relationship between the presence of a formal/written eco-policy and the characteristics of the hotel, Chi-square tests were employed because the data collected were recorded on a nominal scale. Chi-square tests (χ^2) demonstrated significant association between the presence of a written environmental policy and characteristics of the hotel, such as size, quality rating, location, seasonality, and ownership type (Table 2). Managers of large, 4-5 star, coastal, seasonal, and chain-affiliated hotels are more likely to have a formal/written policy on the environment, as compared to small, 2-3 star, city/urban, and independent hotels that operate all year round. No relationship was detected between the presence of a written eco-policy and lodging type, guest type, and the years that a hotel has been in business.

Whereas Chi-square informs us about the existence of significant difference between variables, it does not tell us much about the strength (i.e., effect size) of any significant relationships. Phi correlation (ф) provides this additional information (Hinkle et al., 2003). ф varies between 0 and 1, with values close to 0 indicating a very weak relationship, and values approaching 1 indicating a very strong relationship. By convention, ф's of .10, .30, and .50 represent small, moderate, and large effect sizes, respectively. Thus, in this study, hotel size had a moderate effect on the presence of a written environmental policy. In comparison, quality rating, location, seasonality, and ownership type had a small effect on the presence of

a written eco-policy. Overall, however, results in Table 2 suggest that H1 is mostly supported. Specifically, H1b, H1c, H1d, H1f, and H1g are supported. Conversely, there is no support for H1a, H1e, and H1h.

5.3. Attitude to Eco-Management and Hotel Characteristics

Mean scores and percentages for each of the six attitude questions are shown in Table 3. While all six questions received positive attitude ratings, the questions related to increased customer satisfaction, providing marketing advantage, and helping with PR were rated higher than other attitude questions.

To test if there was any relationship between the characteristics of the hotel and the responses to the individual attitude questions, Chi-square tests were employed as in the previous analysis. The hotel characteristics chosen were lodging type, size, quality rating, location, guest type, seasonality, ownership type, the length of time that a hotel has been in business, and a presence of a formal/written eco-policy. In order to satisfy the requirement of the Chi-square test that there are at least five counts in each cell, it was necessary to reduce each set of attitude responses to two categories. Therefore, for each attitude question, the sample was divided into two groups – NEGATIVE ATTITUDE (those with a score ≤ 3) and POSITIVE ATTITUDE (those with a score > 3).

Table 2. Association between written policy and hotel characteristics

| | Presence of written eco-policy | | | |
	χ^2	p	Phi (ϕ)	N
Lodging type	0,368	.544	.067	81
Hotel size	8,981	.003*	.333	81
Quality rating	4,603	.032*	.240	80
Location	6,393	.011*	.284	79
Guest type	1,249	.264	.127	78
Seasonality	6,440	.011*	.282	81
Ownership type	5,131	.024*	.252	81
Years in business	2,916	.088	.195	77

*Significant at p = .05 or less

Item	Strongly disagree 1	2	3	4	Strongly agree 5	Mean[2]	Rank	N
Increase customer satisfaction	1.2[1]	1,2	13,6	29,6	54,3	4,35	1	81
Provide marketing advantage	2,5	3,8	13,8	25,0	55,0	4,26	2	80
Help with PR	1,3	6,3	17,7	20,3	54,4	4,20	3	79
Improve community relations	3,8	8,8	25,0	22,5	40,0	3,86	4	80
Increase employee satisfaction	3,7	6,2	29,6	27,2	33,3	3,80	5	81
Increase profitability	3,7	12,3	28,4	22,2	33,3	3,69	6	81

[1]Valid %

[2]Mean ranging from 1 = *strongly disagree* to 5 = *strongly agree*

A matrix of results based on this analysis (Table 4) shows some interesting associations between characteristics of the hotels in the sample and attitudes to environmental management. As indicated by the statistically significant χ^2 values, managers of large hotels are more likely to view environmental management as means to improve community relations, help with PR, and provide marketing advantage, as compared to small hotels. However, hotel size had a small effect on these significant relationships, as denoted by the associated ϕ values. Thus, H2b is partially supported. Managers of 4-5 star hotels are more likely to perceive improved community and public relations as benefits from eco-management, albeit low ϕ value signifies that these relationships are weak. Hence, H2c is marginally supported.

Table 4. Association between environmental attitudes and hotel characteristics

	Increase profitability		Increase customer satisfaction		Increase employee satisfaction		Improve community relations		Help with PR		Provide marketing advantage	
	χ^2	Phi (ϕ)	χ^2	Phi (ϕ)	χ^2	Phi (ϕ)	χ^2	Phi (ϕ)	χ^2	Phi (ϕ)	χ^2	Phi (ϕ)
Lodging type	2,356	.171	1,203	.122	0,294	.060	2,412	.120	1,919	.194	1,154	.160
Hotel size	2,547	.177	1,570	.139	2,382	.171	5.635*	.265	4.076*	.227	4.073*	.226
Quality rating	1,813	.151	3,396	.246	1,944	.156	5.227*	.257	4.149*	.265	0,780	.136
Location	4.575*	.241	2,456	.176	6.892*	.295	8.838*	.337	14.776*	.438	8.527*	.331
Guest type	2,218	.169	0,000	.013	3.834*	.222	2,942	.195	6.006*	.281	0,196	.085
Seasonality	6.289*	.279	2,558	.178	4.905*	.246	4.924*	.248	8.587*	.330	2,506	.177
Ownership type	6.706*	.288	2,164	.201	6.573*	.285	10.449*	.361	4.246*	.232	3,295	.238
Years in business	0,024	.018	0,023	.017	0,002	.006	0,675	.094	0,098	.036	2,432	.179
Presence of written eco-policy	3,600	.211	1,386	.166	1,653	.143	2,329	.171	1,003	.113	4.039*	.225

*Significant at p = .05 or less

Next, managers of coastal properties are more likely to see benefits from environmental management in terms of increased profitability, increased employee satisfaction, improved community/public relations, and marketing advantage. The associated φ values suggest weak association between location and the perceptions of increased profitability and improved employee satisfaction. On the other hand, there is a moderate effect of location on the perceptions of improved community/public relations and marketing advantage. Overall, H2d appears mostly supported. Hotels catering mostly to leisure guests are more likely to view increased employee satisfaction and improved PR as benefits from environmental management, though these associations are weak. Therefore, H2e is marginally supported. Managers of seasonal hotels are more likely to view eco-management as a way to increase profitability (weak relationship), increase employee satisfaction (weak relationship), improve community relations (weak relationship), and help with PR (moderate relationship). Thus, H2f is mostly supported.

Moreover, managers of chain-affiliated properties are more likely to perceive increased profitability (weak relationship), increased employee satisfaction (weak relationship), improved community relations (moderate relationship), and help with PR (weak relationship) as benefits from environmental management. Hence, H2g seems mostly supported. Additionally, hotels with formal/written eco-policy are more likely to see marketing advantage as a benefit from environmental management (weak association), therefore providing only marginal support for H2i. Yet, there is no significant effect of lodging type and the length of time that a hotel has been in business on any of the six attitudes to environmental management. Thus, H2a and H2h appear unsupported. Similarly, there is no statistically significant relationship between characteristics of the hotel and the perception of increased customer satisfaction. Ultimately, the results in Table 4 suggest partial support for H2.

6. CONCLUSIONS AND IMPLICATIONS

It is noteworthy that, at the time this survey was completed (February and March of 2009), only a third (33.3%) of the hotels in the sample had a written environmental policy, despite environment (i.e., Adriatic sea) being Croatia's first and foremost tourism 'attraction'. Moreover, given the implied underlying role of environmental protection in Croatia's official tourism slogan (i.e., "Croatia – The Mediterranean As It Once Was"), it is interesting that the reported figure in this research is so low. While interesting, this finding does not come as a surprise. Namely, despite its long-standing tradition, the Croatian lodging sector is still hampered with numerous viability issues – e.g., incomplete and/or poorly executed hotel privatization process, unresolved land ownership disputes, and pronouncedly high seasonality. Under these circumstances, it appears reasonable that the adoption and implementation of environmental standards by Croatian hoteliers is still at an early stage.

Perhaps the most interesting finding in this study is that there was association between the presence of a written eco-policy and characteristics of the hotel, such as size, quality rating, and ownership type. This is in contrast to survey findings of hotels in Canada (Deng et al., 1992) and Edinburgh (Scotland; Kirk, 1998). Equally notable is the finding that managers of seasonal hotels are more likely to have a formal/written policy on the environment, as compared to hotels that operate all year round. Having a formal eco-policy in place suggests that seasonal hotels (as opposed to those that operate all year round) expect greater savings to their bottom line amid shorter time (i.e., fewer days) available for revenue generation. Such

view is further supported by this study's findings whereby managers of seasonal hotels are more likely to view eco-management as a way to increase profitability, increase employee satisfaction, improve community relations, and help with PR.

Clearly, the findings in this study could be useful in the development of environmental awareness which could be disseminated to all hotels in Croatia. Further research would be useful in order to investigate in more detail the actual realized benefits of Croatian hotels that have formal/written eco-policies in place. Equally important would be to look into the actual hindrances to implementation of environmentally best practices. Findings from such proposed research could provide evidence of good practices and offer advice on overcoming common obstacles, which could then be spread to other hotels.

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ECONOMIC AND INSTITUTIONAL ASPECTS OF THE WATER SECTOR MANAGEMENT IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

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1. INTRODUCTION: INSTITUTIONAL CONTEXT

Bosnia and Herzegovina is established as a complex state, consisted of two entities: the Federation of Bosnia and Herzegovina (FBH) and the Republic of Srpska (RS). Within the Federation of Bosnia and Herzegovina there are ten cantons. According to the constitutional decisions, responsibility over natural resources is given to the entity authorities, with a remark that in the FBH this responsibility is still "divided" between the Federation and the cantons. The entity authorities have the obligation to "help" the local authorities (municipalities and cities) in ensuring needed quantities of water of a certain quality for public use, as well as to help them partially in solving problems in purification of urban wastewater. The responsibility for water supply, collection and drainage of wastewater lies with the local authorities (municipalities and cities). Some of responsibilities regarding water management were transfer from entities level to state level. Globally, responsibilities are divided between further institutions:

1. State level: Ministry for Foreign Trade and Economic Relations,

2. Entities level:

FBH:

- Ministry for Agriculture, Water Management and Forestry of FBH,

- Agency for Sava River Basin District (RBD),

- Agency for Adriatic Sea RBD,

- Cantonal ministries responsible for water management,

RS:

- Ministry for Agriculture, Water Management and Forestry of RS

- Directorate for water of RS,

3. Brčko District: Department for Agriculture, Forestry and water management

4. Local level: municipalities (more than 140) responsible for water supply and sanitation services (through public companies).

In 2007 and 2008, USAID financed implementation of the project to provide assistance to water utilities in Bosnia and Herzegovina aiming at the establishment of autonomous, institutionally and financially sustainable companies through the development of three critical requirements:

- Autonomy – the ability to operate with minimal control by any governmental body, while allowing for necessary oversight and regulation;

- Leadership - the presence of utility managers who practice good management skills, have the respect of employees and society, and know every facet of the utility;

- Business-like approach – operation of the utility, a public entity, as though it were private in terms of financial self-sustainability, planning and treatment of users as a real customers.

2. FINANCING OF THE WATER MANAGEMENT IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

Financing of water management in FBH is based on the following principles:

- resources for financing of water management are provided from general water billing, special water management compensations, compensations achieved by concessions and funds provided by special law, as well as from the other resources defined by the Law on water;

- resources achieved by general water billing; particular water management compensations and compensations on concessions are to be used in accordance with solidarity principles of all beneficiaries from the territory of the Federation and/or main watershed areas, except if it is otherwise defined by the Law on water;

- resources for water management financing can be used only for purpose defined by the Law on water;

- lacking funds, for reconstruction and construction of waterworks facilities, that are provided from the budget of the Federation and canton, as well as from funds collected from legal entities and citizens, are allocated, as a rule, as credit instruments or as participation in investments on whose base a distributor of funds acquires property-rights (shares, stocks).

The FBH Law on Waters defines the modes of raising funds for funding water management activities. The Agency for Sava river basin district and the Agency for Adriatic sea river basin district (i.e. Public companies for river basins, until 1. January of 2008.) are basic institutions in the water sector in FBH, created by the new Law on water. Basic source of financing of

these agencies are particular/specific water compensations (bos. posebne vodne naknade - PVN). Specific water compensations are collected on the basis of the Law on water and different bylaws regulating the question of the amount or level or charges, charge payers, forms and conditions of payment etc. Specific water charges represent public revenues and primary revenues of the Agencies. According to the Article 171. of the Law on water (Official Gazette of the FBiH, No. 70/06), on the proposal of the Federal Ministry of agriculture, water management and forestry and the Federal Ministry of environment and tourism, as well as the prior consent of the Federal ministry of the finance, the Government of the Federation of Bosnia and Herzegovina adopted the *Decision on the level of specific water compensations*. This Decision, that came into force on 1. July 2007, determines the amount of the special water compensations for:

- water utilization,

- water protection,

- dug out material from water streams,

- water regime changes.

- flood protection.

All mentioned compensations are collected presently in the FBH, except the special water compensation for flood protection which has not been introduced in practice because some additional conditions and parameters for its payment were not insured.

These funds are used for the management of the water sector, monitoring of waters, maintenance of flood control facilities owned by FBH, strategic studies for the domain of water, expenses of the Agencies for RBD, and for participation in funding of construction of infrastructural buildings for water management, drainage and waste water treatment. Construction and maintenance of infrastructure is financed by the water utilities and local communities through subsidies, grants, borrowing etc., and partially by participation of the two Agencies for RBD.

Basis for the collection of water compensations is to be found in the principles "polluters pay" and "user pay". These principles mean that the polluter of water should pay the costs of treatment of discharged polluted water and that the user of water services should pay the rent for usage of water as public good. These principles are to be found also in the EU Framework directive on water, which determine the features of water management in the EU countries. The solutions envisaged by the EU framework directive have been incorporated into the new Law on water of FBH. Implementation of the solutions from the EU framework directive and the new Law on water requests, beside the qualified staff, large funds in order to achieve desired goals concerning the status of water resources. The new Law on water has introduced significant changes in previously existed system of the financing of water sector, primarily with regard to distribution and usage of the resources. According to the estimates of the Federal ministry of agriculture, water management and forestry, and based on information obtained through the questioners concerning the harmonization of the BH legislation with EU directives, as well as taking into account present situation and the dynamics of collection of resources aimed for the financing of the projects in water sector, FBH will achieve requested standards in 2030. In June of 2008, new estimates of the level of harmonization with EU directives were done, and slow progress was determined.

Some important changes in the institutional and economic sense were introduced. One of the most important is the different system of the collection and distribution of the primary water sector revenues. According to the previous Law collected revenues were distributed to the Public companies for river basins (70%), budget of the Federation of Bosnia and Herzegovina (10%) and the budgets of cantons (20%). According to the new law collected revenues are supposed to be distributed as follows: the Agencies for river basins districts (40%), budgets of cantons (45%) and recently established Fund for the environmental protection of the FBH (15%). We shall give some estimates of the annual collected revenues and discuss some present problems in the process of their collection. The following table contains basic data on financial effects of the Decision on special water compensations; estimated revenues (collected compensations) across the cantons, river basin districts and for the FBH as a whole, as well as their distribution on the main users.

Table 1: Estimated financial effects of the collection of special water compensations in the Federation of Bosnia and Herzegovina

Number	Canton	Total amount of PVN	Budgets of cantons 45%	Agencies for RBD 40%	Environmental fund 15%
1.	**Sava RBD**				
1.1.	UNSKO-SANSKI	1.688.094,00	749.642,30	675.237,60	253.214,10
1.2.	POSAVSKI	751.977,05	338.389,67	300.790,82	112.796,56
1.3.	TUZLANSKI	8.094.430,71	3.642.493,82	3.237.772,28	1.214.164,61
1.4.	ZENIČKO-DOBOJSKI	7.606.691,00	3.423.010,95	3.042.676,40	1.141.003,65
1.5.	BOSANSKO-PODRI.	168.280,97	75.726,43	67.312,39	25.242,15
1.6.	SREDNJOBOSANSKI	1.717.933,13	773.069,91	687.173,25	257.689,97
1.7.	SARAJEVSKI	4.792.785,62	2.156.753,53	1.971.114,25	718.917,84
	Total 1:	**24.820.192,48**	**11.169.086,61**	**9.928.076,99**	**3.723.028,87**
2.	**Adriatic see RBD**				
2.1.	ZAPADNOHERCEGOV.	1.031.374,72	464.118,62	412.549,89	154.706,21
2.2.	HERCEGOV.NERETVAN.	5.121.175,47	2.304.528,96	2.048.470,19	768.176,32
2.3.	HERCEGBOSANSKI	731.615,47	329.226,96	292.646,19	109.742,32
	Total 2:	**6.960.567,42**	**3.132.255,34**	**2.784.226,97**	**1.044.085,11**
	FBH (1+2):	**31.780.759,90**	**14.301.341,96**	**12.712.303,96**	**4.767.113,99**

Source: Ministry for agriculture, water management and forestry of FBH, 2008

It is visible from the table that the envisaged annual financial effect of the collection in accordance with the Decision on payment of special water charges (PVN) is about 32 million KM (16 million Euros), provided 100% collection. However, based on the experience from the previous years regarding the collection of PVNs one can say with certainty that the real rate of collection will be significantly lower than the envisaged one. The level of collection of PVN from the Water supply and water sanitation companies was very low in 2007. The Agency for Adriatic sea RBD managed to collect only 17% of its total PVN claims on the water companies. The situation was somewhat better for the Agency for Sava RBD where the rate of collection of PVN is about 45%. According to the information of the Agency for the Adriatic sea RBD debts in the form of uncollected PVN to a significant amount represent a burden for the functioning of the Agency and represent the ballast in financial reports, being transferred from one year to another simply as a bad debts item. According to data provided by the very tributaries, i.e. water companies, in 2007, their total unpaid obligations were more than 500.000 KM (250.000 Euros). Total unpaid obligations of the water companies regarding the PVN for the period 2003-2006, amounts to about 3,5 million KM (1,25 mill. Euros).

The significant part of problem with regard to collection of special water compensations lies in the fact that new Law on water is not completely harmonized with the stipulations of some other relevant laws in FBH. Concretely, according to the Law on water, the Tax administration is explicitly stated as an institution responsible for and in charge of controlling of the collection of special water compensations from water companies. However, that obligation does not exist in the Law on tax administration (by which the tasks and the scope of work of the Tax administration is legally determined). Hence, from the legal point of view, these two laws are practically in collision. Taking into account that the Agencies for RBD are not in a position to enforce in any way the collection of special water compensations from water companies, presently their payment practically depends only on the good will of water companies. The Agencies for RBD have initiated a procedure with the relevant legal authorities to adopt needed changes in respective laws. These changes should enable that Tax administration formally takes over the responsibilities concerning the payment and collection of special water compensations. Consequently, this should lead to improvement of the whole system of payment and collection of water compensations, and to better financial position of the Agencies for RBD.

3. WATER SUPPLY AND WATER SANITATION SECTOR SECTOR IN HTE FEDERATION OF BOSNIA AND HERZEGOVINA

Local authorities (municipalities or cantons) are in charge of local water services. They are allowed to establish water company, public institution, or they can award a concession to legal and physical entities. Service provider is responsible for management and the operatiin of the water infrastructure. Revenues from the services delivered are realized through the price paid by the final users. Componets in the structure of the price are as follows:

- price for the service of water supply,

- compensation for the financing and maintaing of infrastucture,

- compensation for the wells protection,

- compensations for the water usage,

- VTA on the price of water services, and probably in the future,

- compensation from the concession for water catchment.

Water companies (mainly known as Vodovod i kanalizacija), insure their revenues through the following sources:

- Provision of basic services of water supply and drainage of urban waste water,

- Provision of other services in this area (as collection and transport of garbage)

- Subsidies from the cantonal budget.

Water companies are organized on the level of municipakities without connection into the cross-municipality or regional (with rear exceptions, as Tuzla region, inter-municipality water

companies Zenica-Vitez and Neum-Čapljina, and city water company of six municipalities in Sarajevo). Hence the operational and mainenance costs are very high. Water management companies are not in a position to fulfill their tasks fully. There are numerous reasons, but one of the most important is the low level of revenue collection accompanied with the unit prices not adjusted to the realistic economic parametars.

In the existing situation the managers in water supply companies are in a very difficult position. Namely, having in mind the particular features of the services they provide and the importance of water as a scarce public good, they are forced to satisfy simultaneously at least three different and often mutually opposing strategic goals: economic, social and environmental. These companies are expected to operate on the market and to deliver their services and insure their revenues respecting market rules and principles. They are expected to earn enough money for the financing of maintenance of existing infrastructure as well as their future growth. But the price of the water has been used as an instrument of the social policy and is deliberately determined by municipalities at the level far below the realistic economic price, which would insure coverage of all justified organizational, economical and technical costs (values of which should be determined through the benchmarking procedure with the similar water companies in the region). Starting from the basic formula for the total revenue (quantity of goods or services multiplied with the price), in order to satisfy economic goals and realize needed profit managers are tempted to increase the prices as one element in the formula. But the goals of the social policy applied by the local authorities do not allow such increase – the prices for water services are kept artificially low with the justification of the living standard protection. However, if managers, on the other hand, want to increase the quantity of water supplied by their companies, in that case the environmental issues emerge. Different environmental organizations usually raise their voice - the water is scarce resource to be preserved for the future and its consumption should not be encouraged but to the contrary- discouraged.

The existing model of linear pricing differentiates only between two groups of customers (households and companies) and, although it might be attractive for its simplicity, it is inadequate and contributes to the mentioned problem. According to that linear pricing system consumer pays the same rate or the unit price (per cubic meter) regardless of the quantity of the water consumed. The existing system does not contribute or stimulate more rational usage of water. The existing system leads to a very difficult financial situation of water companies in the form of huge losses, usually covered by the cantonal budgets. In the existing situation, without these subsidies, amounting to 30% of revenues of water companies, these companies would not be able to cover even their operational costs.

But there is a model of the price determination that can reconcile these opposing goals. This model is known as the increasing block system with the first block subsidized, meaning that all the customers, regardless of their income will paid subsidized (artificially low) price for the first block (e.g. first 10 cubic meters). After that limit all the consumers (regardless of their income) would have to pay higher price for the next block. As the consumption rise so would the price. Several blocks could be determined. All three goals can be achieved simultaneously using such model. The first economic goal, will be achieved because the prices are higher for higher consumption. The second social policy goal, will be achieved through the subsidized first block and the consumption of the quantities determined as basic needs. The poorest would be protected that way. And the third environmental goal will be achieved since the water consumption would be discouraged through the existence of higher prices for larger quantities consumed. Having in mind that introduction of such price

determination model into practice requires certain administrative, organizational, financial and technical prerequisites, and having in mind their present situation with that regard, we are convinced that it is not realistic to expect it to be introduced very soon in water companies in FBH. Preliminary analysis should be done. We consider that three years is realistic period for the design of the system and its introduction into daily practice.

Low level of the revenue collection is another serious problem for water companies. Bed debts for the water company in Sarajevo amount to 28 million EURO, for the company in Bihać – 3 million EURO, for the compayny in Tuzla – about 12 million EURO, and for the water company in Zenica – about 1 million EURO.

The price of the water is determined on the basis of input costs and it is still insufficient for the coverage of the depreciation costs. Comparing to the previous situtation (before 1. January, 2008) when the price of the water for households in the canton Sarajevo, for example, was 1,26 KM/m3 (0,63 euro/m3), presently this price is somewhat lower – 1,22 KM/m3 (0,61 EURO/m3). The difference is the result of dicrease of special water compensation for water usage. Price of the water for legal entities, depending on the level of the pollution of their waste water is 3,09 KM, 3,15 KM or 3,25 KM per cubic meter. In all cantons and water companies situation is the same. In Mostar, the price for households is 0,92 KM/m3 and for the legal entities 1,90 KM /m3 in average. In Zenica, the price for households is 0,60 KM/m3 and for tle legal entities 1,5 KM /m3. In Tuzla, the price for households is 1,31 KM/m3 and for tle legal entities 1,69 KM /m3 or 2,5 KM/m3. For the sake of comparison with the neighbouring countries we are giving the short list of the prices in Zagreb and Belgrade. As it is visible, the price in Zagreb is significantly higher, comparing to Sarajevo, because in Croatia the proces of achieving economic price for water has already begun, while in Serbia relevant authorities still debate about the need to introduce economic price of water. According to available data the price of the cubic meter of water in Belgrade is 0,3 euros, while for the full coverage of the production costswould require teh price of 0,5 euros. In the following table we give the list of the prices in some other European cities as well.

Table 2: Prices of the water per cubic meter in some European cities

Sarajevo	0,61 EUR
Zagreb	1,16 EUR
Vienna	2,88 EUR
Berlin	6,15 EUR
Munich	3,37 EUR
London	2,28 EUR
Bucharest, Sofia, Budapest,	3,00 EUR

Directives of EU regarding the price determination request on the determination of so called economic price of water in order to destimulate consumption, preserve the quality of water supplied, and to insure enough resources for the future growth of water companies. Although there are significant problems in FBH regarding the income of the majority of citizens, determination of prices at the level below the total average costs only add to the problem of the „normal" functioning of water companies. But we have to stress that water companies should accept the fact that economic price of water does not mean the coverage of any kind and amount of costs, but only costs that are justified economicaly, organizationaly and technologicaly. Analizing available data and the situation in water companies, we are fully

convinced that there is significant but unused space for improvement of the internal economy in the sense of insrease of:

- effectivenes and efficacy of operations,

- more efficient usage of energy in accordance with technical norms and standards which exist for the similar systems of water supply using intensively pumping system,

- improvement of infrastructure through the fixing and retroffiting of the worn out and demaged parts, that would result in the less lekage and waste of water.

One of the possibilities for domestic water companies to assess if the level of their existing costs is justified, is a comparison with other similar companies in the world, using the method known as benchmarking. For that purpose water companies might use a data base known as IBNET (The International Benchmarking Network for Water and Sanitation Utilities) which contains relevant information for more than 2000 water companies from 85 countries. (www.ib-net.org).

As an illustration that there is a space and possibilities for the waste reduction we are giving the chart representing the average water loss in some of the European countries.
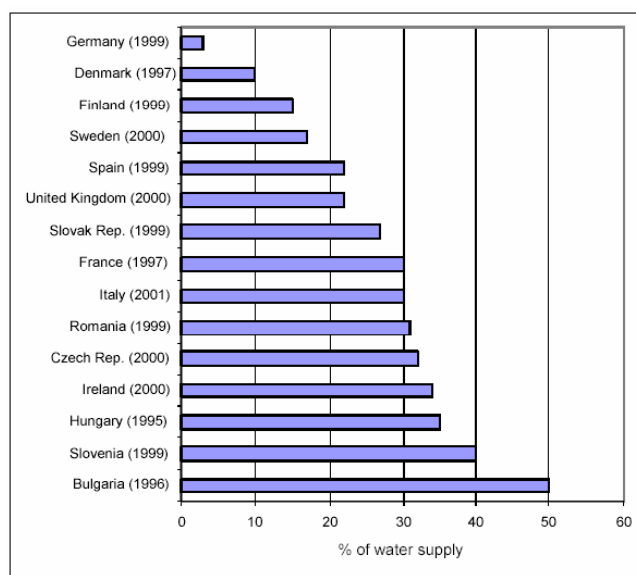
Figure 1: Average water losses in some European countries
Source: DG Environment, European Commission (2007):"Water Scarcity and Droughts Second Interim report",
p.18.

In that sense we are convinced that domestic water companies in FBH are not motivated sufficiently to use the scarce resource entrusted. We are using the example of the compensation which water companies are obliged to pay based on the exclusive right to use water resources. According to the previous Law on water, water companies were obliged to pay water compensation for water usage in the amount of 0,05 KM/m3 based on *delivered* water quantities. According to the new Law on water that obligation has been reduced to 0,01 KM/m3 on the base of *trapped* water quantities. We think that the final result is negative, because of the simple reason. Namely, having in mind the level of he losses these companies have (60 -70%), water companies are now brought into better financial position, because their

total expenditures for these compensations are now lower. The basis for the calculation of the compensation has been increase three times, but the rate of compensation has been reduced five times. We urge that such situation should be changed as soon as possible (to increase the rate of compensation for water usage) because it is completely counterproductive in the sense of the absence of any incentive for more effective use of water. Having in mind the importance of these companies and their monopolistic right to use this scarce resource, as well as quantities of water they use, we consider that the existing solution is not in accordance with the basic request stipulated in the Law on water, which stress that water management must be organized on the principles of sustainable development and preservation of scarce water resources. For the sake of comparison, the compensation for water usage calculated on the basis of delivered and billed quantities of water in Croatia is 0,80 kuna/m3, which is 0,20 KM/m3 (the exchange rate of 4,1 kuna for 1 KM, on 06. June, 2008). The compensation for the protection of water is 0,90 kuna/m3 or 0,22 KM/m3. (Source: http://www.voda.hr/Default.aspx?sec=182). In the following table the rates compensation for water usage in some European countries are given.

Table 3: Rate of compensation for water usage in some European countries

Country	Compensation for water usage	The rate of compensation
Bulgaria	Not in use	Not in use
Czech Republic	-surface waters -underground waters	-The rate of compensation determined by the company for the river basin management -0.05 EUR/m^3
Estonia	All sources	-between 0.0019 EUR/m^3 and 0.96 EUR/m^3 depending on the way of usage of water
Hungary	All sources	-between 0.006 EUR/m^3 and 0.04 EUR/m^3 depending on the way of usage of water
Latvia	-surface waters -underground waters	-0.003 EUR/m^3 -0.016 EUR/m^3 The rate of compensation for mineral water is between 0.08 EUR/m^3 and 0.161 EUR/m^3
Lithuania	-surface waters -underground waters	- the level of rate depends on the way of usage of water -0.009 EUR/m^3 (households); 0.02 EUR/m^3 (industry) and 1.22 EUR/m^3 (mineral water)
Poland	-surface waters -underground waters	-0.027 EUR/m^3 -0.08 EUR/m^3
Romania	-surface waters -underground waters	-0.005 EUR/m^3 – 0.0006 EUR/m^3 -0.006 EUR/m^3
Slovak Republic	-surface waters -underground waters	-0.5 EUR/m^3 -0.02 EUR/m^3 for public system of water supply and 0.5 EUR/m^3 other purposes
Slovenia	Not in use	Not in use

*Source: REC 2000, in Agnieszka Laskowska and Frank Scrimgeour:"**Environmental Taxation: The European Experience",** http://wms-soros.mngt.waikato.ac.nz/*

4. REGULATION IN THE WATER SECTOR OF THE FEDERATION OF BOSNIA AND HERZEGOVINA: REASONS FOR ESTABLISHING AND POSSIBLE INSTITUTIONAL SOLLUTIONS

Presently, in the Federation Bosnia and Herzegovina telecomunication and electricity sectors are regulated through appropriate regulatory agencies (RAK and FERK). We are convinced, and we advocate that a simillar independent regulatory in the water sector should be institutionalized in the form of a Regulatory body commision/agency for water services tariffs determination. Basic role of such commission would be insuring adequate local component in the structure of the economic price of water. That component, i.e. price of services deliverd by companies for water supply and collection and treatment of waste waters, is intended to cover the costs of the system management. During the period in which public companies are still dominant providers of the services of public water supply, collection and treatment of waste waters, the Commission would be a mediator and arbitrator in the process of negotiation between water supply companies seeking coverage of their costs through the prices of their services and local authorities insisting on lower prices justified by their concern about living standard protection. After privatization of the part of operational functions in the water sector, the role of the Commision would be to prevent high extraprofits on the monopolized water market. That way an expert assessment and evaluation of the requests for price increase in each case would be insured. According to the present legislation, local authorities-municipalities and in particular cases cantons in the FBH, are responsible for the management of public water companies. Municipalities and cantons would nominate the members of managing boards and directors of water companies. Managing boards of water companies in most cases would consider and approve (or do not approve) tariff changes, proposed by the water company.

4.1 A proposal for a new administrative control of water tariff determination

At the level of entities, recently (during 2007 and 2008) finished projects concerning reforms in water sector reccomand adoption of a new law on water companies. Such a law would enable, among other things, that water companies are fully administratively and financialy autonomus in relation to municipalities as their founders. This autonomy would be insured by appropriate contract between municipality and water company – Contract on management. Acording to the proposed new law on water companies and this contract of management, a water company would be fully responsible for the financial aspects of its own functioning. Managing board would be responsible for monitoring and oversight of the water company functioning and for the consideration of proposed increase of water tariffs. The proposal of a new administrative control of the water tariffs determination envisages that:

- water companies propose tariffs in accordance with or based on their costs,

- managing boards of water companies approve these tariffs and submit them to municipality for their consideration,

- if municipalities accept them, tariffs would enter into force,

- if municipalities reject them, proposed tariffs would be submited to the Commission for the final decision making.

The Regulatory commisions/agencies would be independent bodies consisted of experts, regulating tariffs and making final decisions on requested rate of increase of water tariffs. Administrativelly these regulatory commissions/agencies would operate within new „Bodies for water sheds", which will be established in six water sheds in Bosnia and Herzegovina. Bodies for water basins were proposed as a part of the state level reform of the water sector. A Commission for the tariff determination would consists of 5 to 7 members, out of which one member would be a representative of water company and one representative of municipality, while the others (representing majority) would be independent experts, nominated by the Federal government. Administrative procedure for the proposal preparation will be administred by the office of Director of the relevant Body of the water basin. Members of the Commission would perform these activities through part time arrangement, during the period of two years.

4.2 Functions of the Commission for the tariff determination

The most important function of Commision for the tariff determination would be consideration and approvement of tariffs proposed by the water companies, with the primary goal of enabling water companies to become financialy self-sustainable, operationaly efficient and capable of delivering services of requested quality to customers. A Commision is requested to establish indicators and components/elements of successfull functioning of water companies in the FBiH. These indicators would be used as a basis for analysis and assessment of the business performance of water companies. These elements would, among other things, include following:

- unit prices as a function of technical and economic conditions of delivering services of water supply and water sanitation;

- total revenue and purchasing power (ability to pay) of service users (customers);

- prevailing or allowed rate of return on invested capital or used asets, as well as the basis for profit calculation-determination;

- elements of an optimal organizational structure of a water company, including number of managers and operational staff per connection;

- educational/qualificational structure and types and levels of skills of employees;

- level of salaries and fringe benefits, as well as all other payments to employees;

- form of servicing/payment of debts and the level of financial leverage (ratio of debts to water company own capital);

- methods of depreciation of fixed assets;

- level of bad debts of a water company;

- level of lickages/wastes in the system and nonpaid quantities of water;

- customer complaints, etc.

Effective regulation of the water sector through proposed Commisions will also have significant impact on financing of new capital investments. Water companies are expected to invest much more in future, in order to:

- replace worn out and written off or significantly damaged facilities and equipment;

- enhance areas and number of citizens to be served; and

- improve overall efficiency of service delivering.

While for certain investments needed funds will be insured in the form of donations (domestically or from other countries), water companies will much more have to rely on credits, in order to be able to finance needed capital investments. These credits could be provided by international financial institutions like World Bank or European Bank for Reconstruction and Development, as well as by different private creditors, mainly from abroad. In any case, it should be stressed that financial stability of water companies and their capabilities of repaying debts will be one of the most decisive factors for obtaining new funds for capital investments envisaged by water companies.

5. INSTEAD OF CONCLUSION

Some important changes in institutional and economic sense were introduced by the new Law on water . One of the most important is the different system of the collection and distribution of the primary water sector revenues.

With the implementation of the overall ongoing reforms in the FBH, the water sector in general should resolve the problems of sustainable, efficient and transparent funding of the water management, as well as of construction and maintenance of water management and utilities infrastructure.

As of the water pricing we can conclude that the existing system does not contribute or stimulate more rational usage of water. The existing system leads to a very difficult financial situation of water companies in the form of huge losses, usually covered by cantonal budgets.

We proposed a model of the price determination that can reconcile mutually opposing goals. This model is known as the increasing block system with the first block subsidized, meaning that all the customers, regardless of their income will paid subsidized (artificially low) price for the first block. But we conclude that such price determination model into practice requires certain administrative, organizational, financial and technical prerequisites, and that the present situation with that regard in water companies in the FBH is very bad, we concluded that it is not realistic to expect it to be introduced very soon in water companies in FBH. Preliminary analysis should be done first. We consider that three years is realistic period for the design of the system and its introduction into daily practice.

We concluded that domestic water companies in FBH are not motivated sufficiently to use the scarce resource entrusted, and we suggested certain changes in the area of rates of compensation for water usage.

We also concluded and we advocate that an independent regulatory in the water sector should be institutionalized in the form of a Regulatory body commision/agency for water services tariffs determination. Basic role of such commission would be insuring adequate local component in the structure of the economic price of water. We proposed and elaborated a proposal for a new administrative control of water tariff determination. We also elaborated in detail what the possible functions of the Commission for the tariff determination would be.

And finaly, we concluded that a rational, transparent and effective mechanism for tariff determination will not only contribute to and finally insure greater financial stability of water companies, but also provide higher security to potential creditors, when they consider capabilities of water companies for repaying credits. This should result in a better postion of water companies in the process of envisaged credit negotiations.

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IMPACTS OF CLIMATE CHANGE IN ATLANTIC CANADA ON REGIONAL ECONOMY

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1. ABSTRACT

The Government of Canada projects that over the next fifty years average temperatures in Atlantic Canada will increase by 3 to 4^oC. Moreover, these climate changes are expected to be the largest and most rapid of the last 10,000 years. Atlantic Canada may not experience as much warming as central, western, and northern Canada, however, the region may be particularly hard hit by the following climate change impacts: (i) rising sea level, (ii) drier summers, and (iii) wetter winters which will cause coastal erosion, extreme weather events, reduced freshwater resources and drought on farms, increased forest fires and others.

In this paper we test these stylized facts on the basis of a comprehensive time series analysis using data set for the period of 1940-2006. Particularly, we are looking at dynamics of such series as annual mean temperature, annual total precipitation, annual total precipitation during winters and summers, annual snowfall, annual rainfall and annual sea level.

We find that at large there were two major regime changes with respect to the dynamics of the climate variables: the first one occurred in the late 1950s - early 1960 while the second one occurred in the mid 1990s. Our statistical tests support some of the stylized facts but not all of them. There was definitely a regime change in temperature series in the 1990s with the mean temperature being about 0.8^0C higher over this decade. The dynamics of the sea level rise is also obvious: there was a significant increase in the sea level rise in the mid 1990 of about 3.2 cm on average compared to the previous period which eventually translated into 6.4 cm sea level rise over a period of 10 years.

Less can be concluded regarding "wetter winters – drier summer" argument. It looks like in the 1990s, less snowfall was observed with higher rainfall which is consistent with the climate change: warmer temperatures caused conversion of snow into rain. However, total precipitations in the 1990s have decreased. With regard to "wetter winters – drier summers", we find that in fact total precipitations during summer months have decreased in the 1990s on average by 46 mm/year. However, total precipitation during winter months in the 1990s have also decreased on average by 65 mm/year. On the other hand, both springs and falls are currently getting wetter.

The economy of Atlantic Canada is mainly a resource based economy. Since resource based economies are likely to be harder hit than industrial economies, the Atlantic Canada may suffer proportionately more economic hardship than central Canada. In terms of economic loss to the Atlantic Canada's economy, gross domestic product (GDP) is estimated to be about 0.26-0.41 percent less by 2010 than it could have been by following the current

development scenario. In a longer term, the impact of climate change on regional economy is stronger. Our computer simulations showed an expected 2.5 percent decrease in Atlantic Canada GDP by the year of 2050 due to climate change impacts.

2. IS THERE A CLIMATE CHANGE IN ATLANTIC CANADA?

There have been a lot of speculations on the issue of global climate change. Scientists have not reached a unanimous agreement on whether or not human activities are the primary reason for the increasing atmospheric concentration of greenhouse gases (GHG). Literature on climate change is vast. However, recently the increasing body of observations has suggested that the problem of global climate change does exist. The Intergovernmental Panel on Climate Change established in 1988 by the World Meteorological Organization and the United Nations Environment Programme concluded that globally the 1990s were the warmest decade since recording of the climate began in 1861. However, change in temperature, as the main indicator of the climate change, has not been uniform, and has varied over regions.

There have been a number of publications dedicated to the climate change impacts in Atlantic Canada as well. The Government of Canada projects that over the next fifty years average temperatures in Atlantic Canada will increase by 3 to 4°C. Moreover, these changes in temperature are expected to be the largest and most rapid of the last 10,000 years (Government of Canada, 2000).

Due to recent warming in the Atlantic region, the number of mild days in winter has been increasing, and large peak flows into the rivers in early spring are becoming more common (Government of New Brunswick, 2003).

The entire Atlantic region is influenced by seawater. Forecasts show that the level of the sea will rise from 50 cm to about a meter above its normal level in the Maritime Provinces. Strong winds combined with the increased water level will flood the areas that have been never exposed to water before. Low-lying coastal areas will be the most vulnerable. Sinking of coastal land could compound the problem as much of the New Brunswick, Nova Scotia and Prince Edward Island coast is low-lying and sensitive to erosion and flooding (Government of Canada).

In general, the existing literature suggests that Atlantic Canada may not experience as much warming as central, western, and northern Canada, however, the region may be particularly hard hit by secondary effects such as:

- rising sea level
- extreme weather events
- coastal erosion
- wetter winters
- drier summers
- reduced freshwater resources
- drought on farms
- exotic pests bringing new diseases and threats to our farms and forests with infestation
- increased forest fires
- plant and animal communities may not be able to adapt fast enough.

Based on the existing literature and expert opinion, it was hypothesized in this study that climate change in Atlantic Canada came about sometime in the period between 1940 and 2006. In this regard, time series data was collected on climate related variables over this period to primarily test the following stylized facts:

    (i)   An increase in mean annual temperature
    (ii)   An increase in sea level rise
    (iii)   Wetter winters
    (iv)   Drier summers.

The data was obtained from the National Climate Archive of the Environment Canada. The main idea behind the below presented tests is to statistically detect regime changes in the following time series:

- annual mean temperature;
- sea level;
- annual total precipitations;
- annual snowfall;
- annual rainfall.

Based on the results of a comprehensive time series analysis, later conclusions regarding validity of the discussed stylized facts were made.

The following methodology was employed to test our hypotheses. Each time series of climate related variables was tested for a break point (regime change) on the basis of the Andrews-Quandt structural stability test. The test was introduced by Quandt (1960) and then later refined by Andrews (1993, 1994). This test is designed for an endogenous break point. However, the test shows only a single, dominating break point while over the period of 1940-2006 there could be more than one regime change.

That is why next Chow test was applied to detect other possible break points. The Chow test allows for several break points, however, they should be introduced exogenously. Therefore, after the Andrews-Quandt test provided us with major break points for each time series of climate related variables, we tried other years in addition to the major break points as candidates for multiple break points. Multiple break points were accepted only if they improved dynamic properties of an econometric model compared to the model with only one break point.

Below the results of these tests are presented graphically. Dotted (blue) lines in all graphs show the real time series while solid (red) lines show estimated data generating processes behind each time series on the basis of the EVIEWS 6.0 econometrics package.

First, the annual mean temperature series was tested. Andrews-Quandt test produced 1996 as the dominant break point. Additional tests on the basis of Chow test did not reveal other break points. The following Figure 1 depicts this situation:
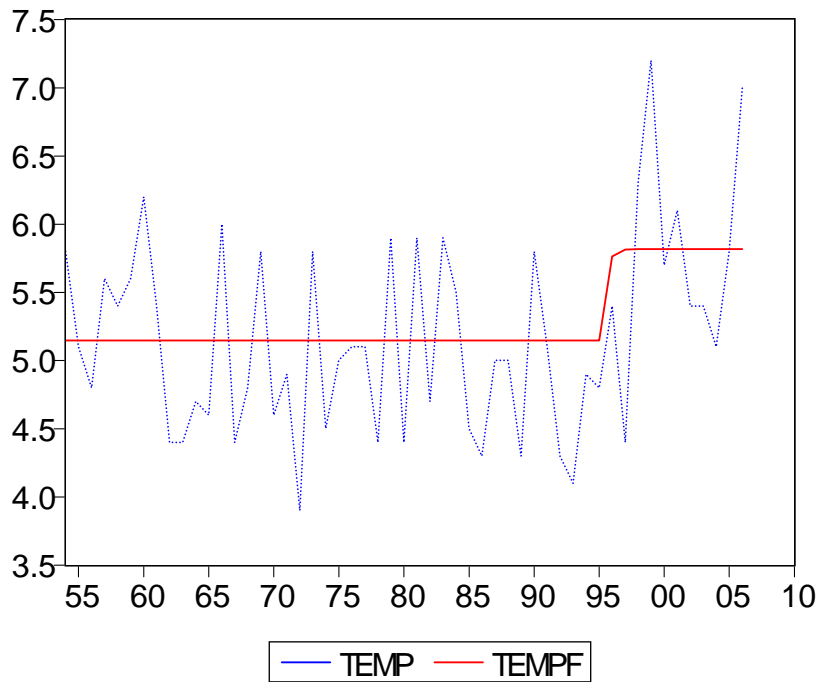
Figure 1. Temperature Dynamics, degrees Centigrade

According to the obtained results, in the 1990s on average mean annual temperature has been 0.8C higher.

Next the sea level series was tested, and Figure 2 summarizes the results of the tests:
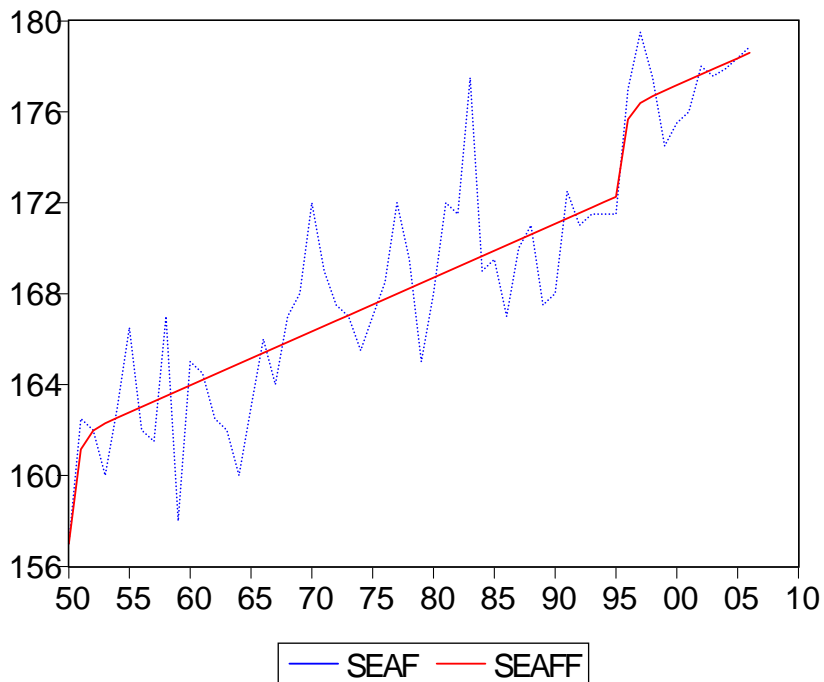
Figure 2. Sea Level Rise Dynamics, cm

Again, like in the mean temperature series the Andrews-Quandt test produced 1996 as the major break point, and no other breaks were detected on the basis of a series of Chow tests. As can be seen from the above graph, there was a 3.2 cm jump in the trend with average sea level rise of 0.2 cm per year in the 1990s.

Econometric analysis of the total precipitations series revealed two break points – 1961 and 1985 – with 1961 being a dominant one. However, the break year of 1985 is statistically significant as well. Figure 3 depicts this situation.
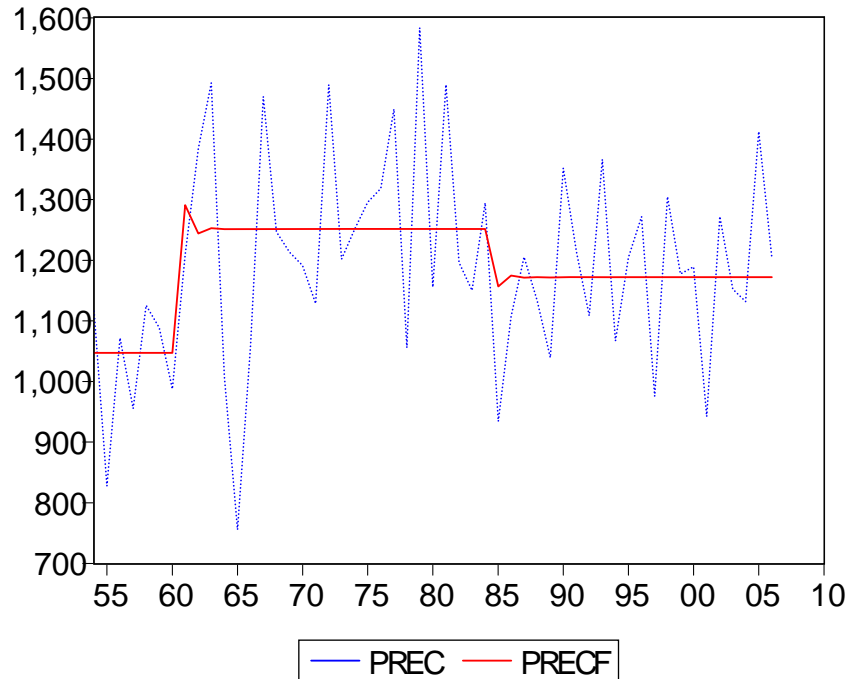
Figure 3. Dynamics of Total Precipitations, mm/year

As seen from the graph, there was an increase in annual level of precipitations by 243 mm per year during 1961-1984 with a decrease by 95 mm afterwards. In order to better understand this change, two series that compose total precipitations namely snowfall and rainfall were tested separately, and the following Figures 4 and 5 present the obtained results.
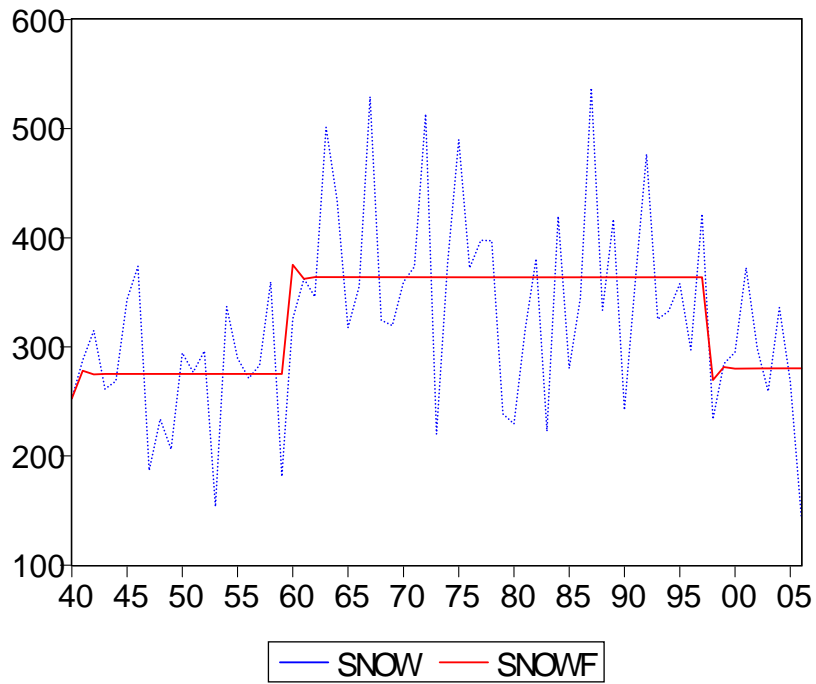
Figure 4. Dynamics of snowfall, cm/year
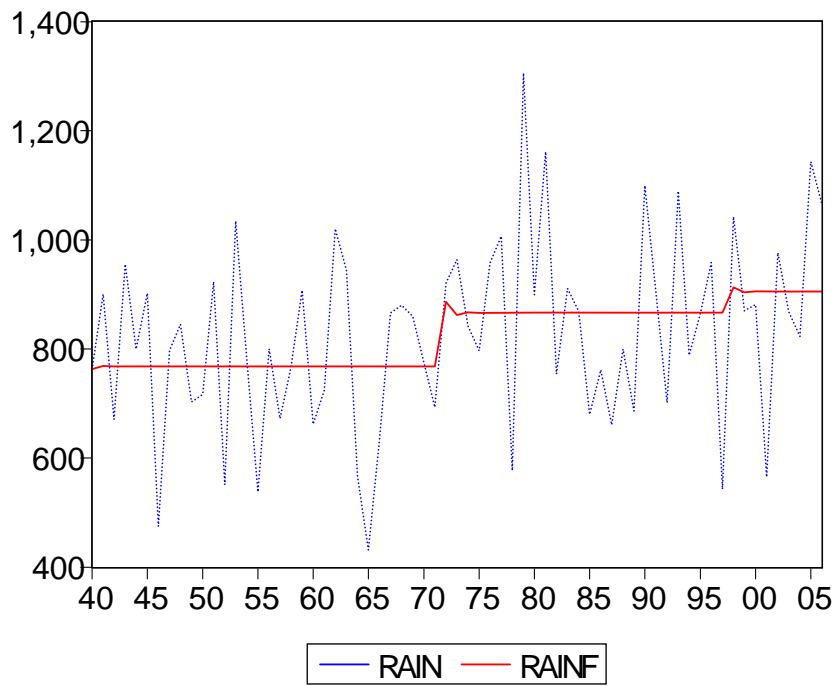
Figure 5. Dynamics of rainfall, mm/year

Both series exhibit two break points each:

- snowfall: 1960 and 1998
- rainfall: 1972 and 1998

In general, snowfall has decreased by 94 cm per year during the 1990s while rainfall has increased by 30 mm/year over the same period. Dynamics presented by Figures 3, 4 and 5 allow us to make the following intermediate conclusion: due to an increase in average temperature in the 1990s by 0.8C, some snowfall was converted into rainfall; however, the decrease in snowfall exceeded the increase in rainfall, and that is why total precipitations decreased.

Finally we tested the "drier summers-wetter winters" argument. The following figures 6 and 7 show the results of our tests:
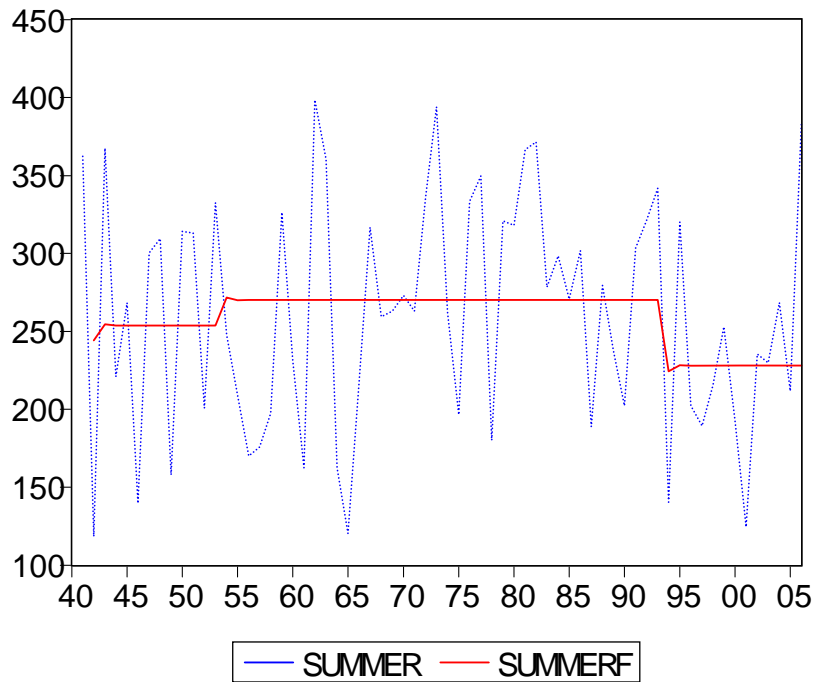
Figure 6. Dynamics of total precipitations during summers, mm/year
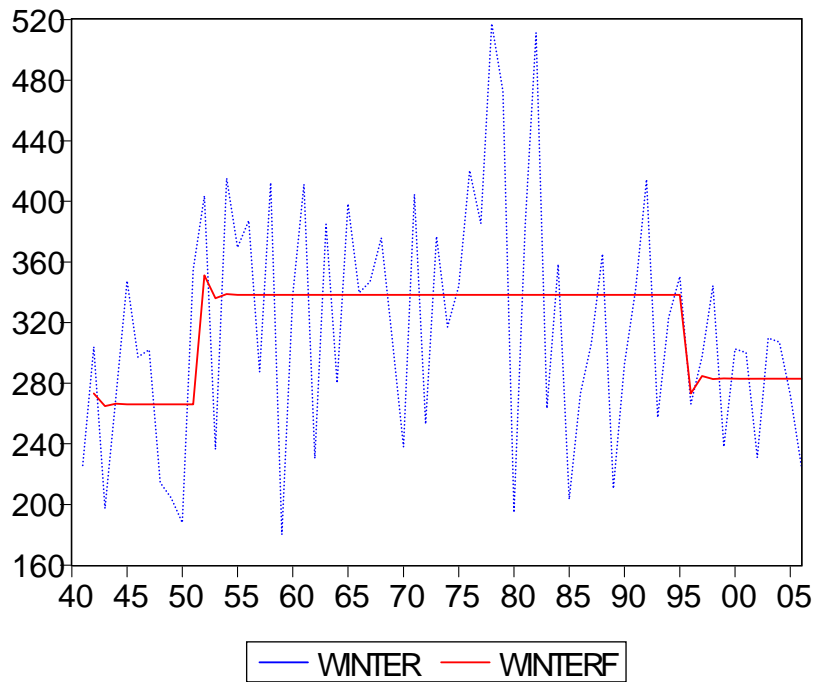
Figure 7. Dynamics of total precipitations during winters, mm/year

It appears to be that our tests produce two break points for each of these time series:

- summer months: 1954 and 1994

- winter months: 1952 and 1996.

During the 1990s, summers were indeed drier by 46 mm/year on average. However, winters were also drier by 65 mm/year. We tried different combinations of months for summers and winters, however, the results were similar.

Therefore, based on the above tests the following conclusions can be made:

- There was definitely climate change in the 1990s in Atlantic Canada. Two series – mean temperature and sea level rise – unambiguously point to a regime change in the mid 1990s.

- Regime change with respect to precipitation is not so obvious. Break points associated with the 1990s are not dominant but statistically significant.

- There was a regime change in the 1950-1960s with respect to precipitations

- Statistical evidence supports the drier summers stylized fact while rejecting the wetter winters fact.

3. ESTIMATING CLIMATE CHANGE IMPACTS AS PRODUCTIVITY SHOCKS

In this section, we incorporate dynamics of the climate related variables into dynamics of the Atlantic Canada Gross Domestic Product (GDP) to derive the so-called marginal economic impacts of various climate variables on the Atlantic Canada GDP. According to modern approach, a typical macroeconomic time series is a result of some data generating process (DGP) plus some shocks that are a driving force behind the DGP. Consequently, it is assumed in modern econometric time-series analysis that error terms in a stochastic difference equation for GDP data generating process reflect productivity shocks at a macroeconomic level (Enders, 2004). Therefore, if we are able to pinpoint the DGP process for the Atlantic Canada GDP time series, we will be also able to retrieve productivity shocks from residuals of the estimated DGP including climate related shocks.

Similar to methodology, introduced and described by Blanchard and Quah (1989) on decomposition of productivity shocks, in this study the aggregate productivity shock was decomposed into (i) aggregate, climate-unrelated productivity shock, (ii) climate-related productivity shock, and (iii) other influences. In addition, the following assumptions were made in order to capture the climate-related productivity shock. They are:

- Aggregate, climate-unrelated productivity shock is constant over time and reflects technological progress.

- Climate-related productivity shock depends on climate variables such as temperature, sea level and total precipitations expressed by vector of climate variables C_t.

- Other influences are totally random events. Statistically, they can be specified as a white-noise process with zero mean and constant variance.

Therefore, it is possible to decompose residuals from the GDP data generating process as follows:

$$\Delta e_t = a_0 + A_1 \Delta C_t + \varepsilon_t \qquad (1)$$

In this specification, Δe_t is the change in residuals of the GDP series, and ΔC_t is the change in the vector of climate variables. In (1) aggregate climate-unrelated productivity shock is captured by the parameter a_0. White noise series ε_t captures all other random shocks. Therefore, estimation of this equation produces vector of parameter estimates A_1 which reflects marginal impacts of various climate variables included in vector C_t on regional GDP.

Since there was a regime change in dynamics of climate variables in the late 1980-mid 1990s as discussed in the previous section, the time series of Atlantic Canada GDP was formed from 1985 – the year of the earliest recent break in climate variables – until 2006. It was done to bring the dynamics of climate changes into accord with the dynamics of regional GDP. Different specifications of the DGP for the Atlantic Canada GDP were tested, and the following one was eventually chosen:

$$\Delta GDP_t = 1035 - 0.048 D_t \times GDP_{t-1} + 344.7t \qquad (2)$$

where *GDP* is Atlantic Canada GDP, *t* is year (1990-2006), and *D* is the dummy variable (*D = 1*, if *t > 1989*, and *D = 0* otherwise). All coefficients in (2) are statistically significant at

95% confidence interval, and R^2-adjusted is 0.78 which shows that the equation captures the dynamics of Atlantic GDP very well. Residuals from this equation were saved, and then were run against a vector of climate related variables C_t according to (1). As a result of econometric estimation of equation (1), the following model was obtained:

$$\Delta e_t = 114 + 142.2 \times \Delta TEMP_t - 155.8 \times \Delta SEAL_t + 0.791 \times \Delta PREC_t \quad (3)$$

in which $\Delta TEMP_t$ is the change in annual mean temperature in degrees of Centigrade, $\Delta SEAL_t$ is the change in the sea level in centimeters and $\Delta PREC_t$ is the change in total annual precipitations in millimeters. Coefficients of these variables show marginal impacts of the chosen climate variables on Atlantic Canada GDP:

- a one-degree increase in annual temperature increases GDP by $142.2 million
- a one-centimeter increase in the sea level decreases GDP by $155.8 million
- an increase in total precipitation by 100 millimeters increases GDP by $79.1 million
- a decrease in total precipitation by 100 millimeters decreases GDP by $79.1 million

Therefore, using the dynamics of Atlantic Canada GDP presented by (2), the marginal impacts in (3) and expected changes in the climate variables in the future, it is possible to trace the consequences of these changes for the regional economy at aggregate level which is discussed in the next section.

4. CONSEQUENCES OF THE CLIMATE CHANGE IMPACTS FOR THE ATLANTIC CANADA ECONOMY

Since resource based economies are likely to be harder hit than industrial economies by climate change, the Atlantic Canada may suffer proportionately more economic hardship than central Canada. If the warming trend continues in Atlantic Canada, ice break-up and flooding on the rivers will become more severe and less predictable. This can cause increasing damage to public and private property, highways, and bridges.

According to the Government of Canada (2004), the Atlantic Canada can also anticipate an increased risk of trees blowing down as storms become more frequent and intense as a result of climate change. For example, a massive blow-down in 1994 caused 30 million trees to be felled which cost $100 million in damages.

Agricultural sector of the regional economy will be the primary beneficiary of climate change. Due to warming, the growing season for such crops as corn and other cereals will be prolonged producing larger yields. However, the probability of droughts is going to increase, thus raising the issue of supplementary irrigation. In addition, warmer winters will boost insect reproduction, forcing local farmers to apply bigger amounts of pesticides. Some other natural phenomena such as floods and hail can substantially damage crops as well as livestock.

Climate change may increase the risk to forests in Atlantic Canada as well. According to the Government of Canada report *"warmer winter temperatures may allow invasive insects, such as the gypsy moth, to become more pervasive, while warmer, drier summers would increase the threat of forest fires in the Atlantic Provinces"* (Government of Canada, 2004).

Analysis of the cost structure of the major industrial producers in Atlantic Canada shows that adjustment to the global climate change will result in the following (Government of Canada, 2004):

- The price of pulp and paper will rise by 0.06 percent or by about 59 cents per ton;
- The price of electricity (coal) will rise by 1.94 percent or by 0.14 cents per KWH;
- The price of electricity (gas) will rise by 0.60 percent or by 0.04 cents per KWH;
- The price of steel (conventional) will rise by 0.29 percent or by $2.10 per ton;
- The price of aluminum will rise by 0.23 percent or by $4.73 per ton.
- The price of natural gas will rise by 0.14 percent or by 0.5 cents/million cubic feet.

All these changes will inevitably affect the allocation of production, consumption and trade flows in the regional economy. In order to address this issue at aggregate level, the following three scenarios were assumed in order to trace consequences of the climate change impacts on regional economy:

Table 1. Scenarios of climate changes in Atlantic Canada

	Expected	**Best**	**Worst**
Sea level rise	0.5 cm/year	0.2 cm/year	1.0cm/year
Temperature	0.03/year	0.01/year	0.05/year
Precipitations	0	0	-50 mm/year

These scenarios were formed on the basis of the forecasts made by the Government of Canada (2004) for Atlantic Canada. Each of them was incorporated into DGP of the Atlantic Canada GDP through error terms using the marginal impacts obtained in the previous section. For each scenario, two time paths of regional GDP were generated: (i) without climate-related shocks, and (ii) with climate related shocks. The following Figure 8 is an example of the results of this simulation for the worst case scenario:
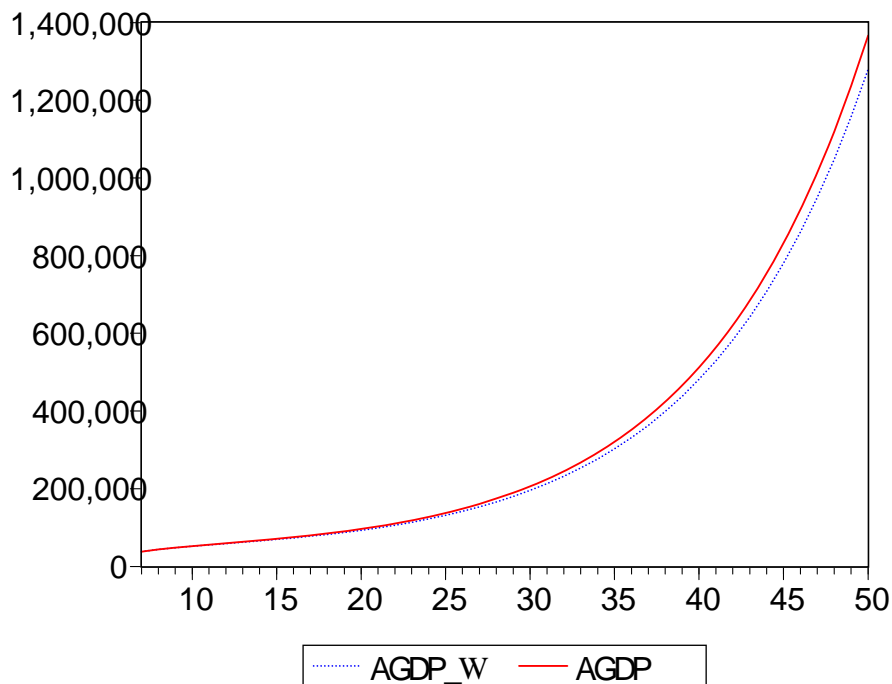
Figure 8. Simulated time paths of Atlantic Canada GDP (AGDP), billion dollars

Overall results of the computer simulations on the basis of MATHCAD 8.0 are summarized in the following table

Table 2. Change in Atlantic Canada GDP

Year	Best Case Scenario	Expected Scenario	Worst Case Scenario
2010	-0.26%	-0.41%	-1.65%
2050	-1.02%	-2.51%	- 6.42%

The results are consistent with the Government of Canada forecasts. Government of Canada (2010) predicted a 0.3% decrease in Atlantic Canada GDP by the year of 2010. According to our simulation, except for the worst case scenario, a decrease in Atlantic Canada GDP is expected to be in the range of 0.26-0.41%. Therefore, it is possible to argue that a longer forecast until 2050 is also valid as a first approximation.

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TRANSPORT AND THE CLIMATE CHANGES

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climate changes, traffic flows management

1. INTRODUCTION

Ever since the beginning of the life on the planet Earth, the climate was changing due to natural reasons, but as time passes by, the climate changes are more affected by human operations. Combustion of the fossil fuels from industry, transport and households is the main cause of climate changes. Other causes are for example deforestation and waste. Climate is something that cannot be programmed, at least for the time being, but the negative impacts of human activities could be restrained by prudent, more indulgent behaviour.

Nowadays it is impossible to imagine a modern life without a developed transport sector. It plays an important role in people's everyday life, but also in the development of national and global economy. Yet, each transport mode causes negative effects to people (users and non-users) and the environment. The common judgment is that among all transport modes, the road transport is producing the majority of negative impacts, which are manifested as congestions, accidents, noise, intrusions to the natural land areas (fragmentation of landscape, ecological separation-effect on biodiversity, social separation), air pollution and finally climate changes. The latest is considered to be one of our greatest environmental, social and economic threats.

In our time, mobility of people and goods is understood as something given, but the question is until when. Passengers and cargo flows are getting bigger and less sustainable by each passing year, making infrastructure struggling to accommodate the rising demand, resulting in bottle necks in transport system followed by big money loses and environmental damage. These problems should challenge transport policy makers, as the only answer to these problems is not the construction of new, high capacity infrastructure.

The paper focuses on the impact of transport activities on the climate changes, dealing with other negative impacts of transport more marginally. The paper consist of three main parts; first one is giving the overview of transport sector in EU and in Slovenia, the second discusses the external costs of transportation and the third one analysis the possibilities of different parties to contribute to the reduction of negative transportation impacts.

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2. OVERVIEW OF TRANSPORT SECTOR IN EU AND SLOVENIA

2.1. Overview of transport sector in EU

Ever since the first civilizations, the role of transport was clearly visible, as the need to move things and people was always present. Besides positive effects on society and community, transport develops many negative impacts, that are more and more recognized, but still too little is done to reduce those impacts. The main problem seems to be disproportionate growth of transport demand, which is not handled in the right way (not environmentally and not logistically). One of the important goals of White paper – Transport policy for 2010: time to decide was to decouple economic growth from the transport growth [1, p. 72]. Unfortunately, there has not been much success until now. The need of cargo and passenger flows and thus the demand for transportation is derived from many macro-economic parameters, as for example number and density of population, gross domestic product (GDP), purchasing power, allocation of industrial zones and dispersion of settlements, international trade, size and position of the market, motorization level etc.

As it can be seen in Figure 1, the modal split of European (EU-27) inland freight transport is very unsustainable. And the future is not bright at all, as the road freight transport grows with the highest pace among all inland transport modes, that is, with average annual growth of over 3,3% since 2000 (entire freight transport grows with the yearly rate of 2,2%).
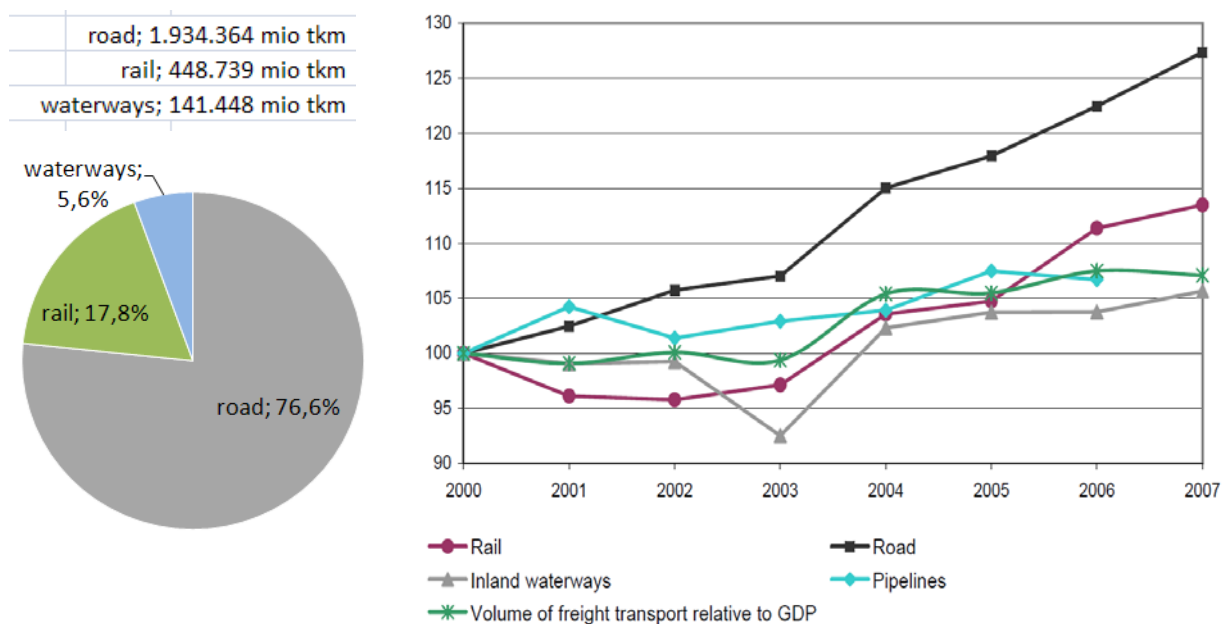
Figure 1: Modal split of EU inland freight transport; Source: Author, based on [2, p. 1, 2]

In the EU freight transport the important role belongs to short sea shipping, which carries on around 1.300.000 million tonne-kilometres (tkm) of intra EU trade. Short sea shipping is the transport modality which is very stimulated in EU (Marco Polo programme), but the recent studies show that maritime transport has huge impact on health of people living in coastal zones. That is because of high amount of sulphur in marine fuel. Analogically for the same reason, maritime transport should have more impact on the environment as well, causing acid rain and the linked consequences.

Passengers transport is growing a little slower, with the annual rate of 1,8% (estimation excludes air transport). Majority of the growth is contributed by the usage of personal cars. The imbalances modal split of EU-27 inland passenger transport is presented in the Figure 2.

Air traffic is growing very intensively in the last decade, more precisely, over the last decade, it has grown by more than 50%. Europe now has close to 8,5 million flights per year and up to 28.000 flights on busiest days. EuroControl expects that today's traffic will have doubled by 2020 [3].
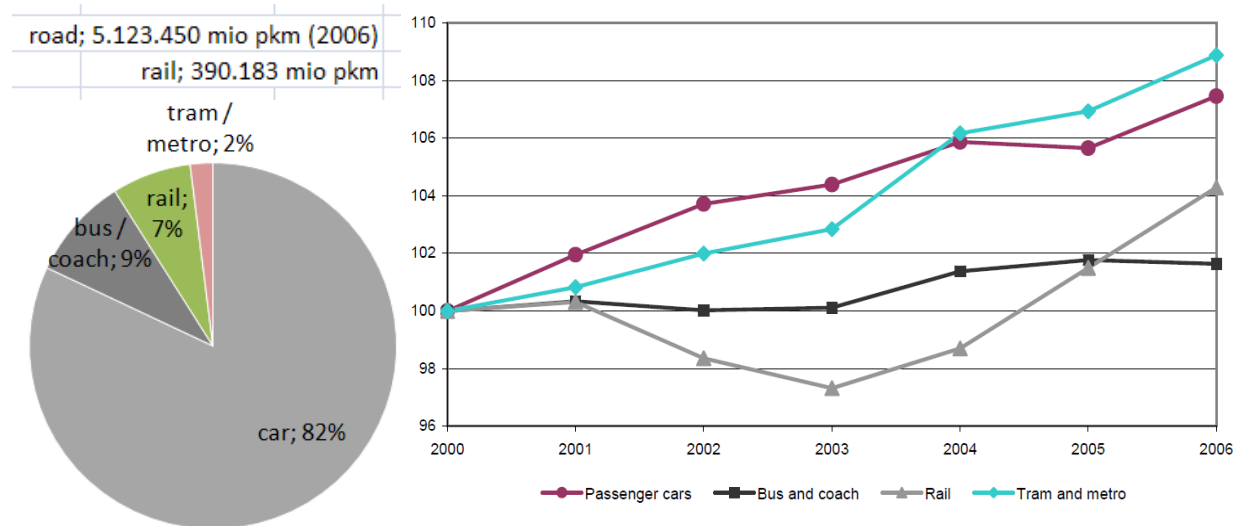
Figure 2: Modal split of EU inland passengers transport; Source: Author, based on [2, p. 4, 5]

The excessive growth of road transport produces bottlenecks measured in thousands kilometres every day on main European directions. These bottlenecks produce a chain of reactions, starting with congestions, time and energy consumption, emissions and finally climate changes. The missing links are being built intensively (in the last three decades the length of motorways in EU-27 more than tripled), but the construction of the infrastructure is not the only solution to the transportation problems causing environmental damage.

2.2. Overview of transport sector in Slovenia

Slovenia follows the EU pattern when it comes to modal split of freight and passenger transport. The modal split is similarly unsustainable in Slovenia, like it is in EU. National freight transport modal split records 20% of all tonne-kilometres done by rail transport, while the remaining 80% of all ton-kilometres are done by road.

The situation is even more challenging in the passenger transport sector. In the years of independence Slovenia has registered obvious improvement of living standard, which, along with other reasons such, as the way of living or dispersed settlements, led to the motorization level of 459 cars per 1.000 inhabitants, which is now comparable to EU-27 level. The number of personal cars was growing fast, with the 15 year average of 3,3% and is now reaching over 910.000 units. In these years the car share in passenger transport grew from barely reaching 50% in the beginning of the nineties to the almost 84% in the year 2004 which caused bus share to drop from 42% to less than 14% in the same period and number of buses in use to drop for approximately 30% [4, p. 3].

3. TRANSPORT AND THE ENVIRONMENT IN EU AND SLOVENIA

The transport sector continues to damage the environment in many views. Transport infrastructure intrudes into the nature, while traffic on it causes harm to the people and to the environment.

3.1. External costs of transport in EU

Transport sector uses approximately one third of all used energy, which is still by rule from a non-renewable sources.

Table 1: Energy consumption by transport sector in EU-25in 2006 (in tonnes of oil equivalent - ktoe)

		Share
Road	289.688	72,50%
Rail	8.591	2,10%
Inland navigation	4.994	1,20%
Air	46.966	11,70%
Sea	48.404	12,10%
Pipelines	1.188	0,30%
Total	399.831	

Source: Author, based on [5, p. 8]

The external costs of transport, that is the uncovered costs of accidents (29%), air pollution (25%), climate changes (23%) and noise (7%) being the most important categories, in the EU amount around 8% of GDP[2]. Motorized road transport accounts for more than 90% of these costs. Passenger transport is estimated to be responsible for 65% of total external costs [6]. Some of transport's negative impacts are manifested on local level and some on global level, some are manifested immediately and some after certain period, thus making the total estimation of their influences very hard. Currently there is no unique commonly accepted methodology for estimating external costs. Figure 3 shows the estimation of external costs as projected by INFRAS/IWW study.

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[2] Pure congestion costs are excluded from this list. They alone amount for aproximately 2% of EU's GDP. The contribution of congestions to the costs of air emissions and climate changes is accounted into these two categories.
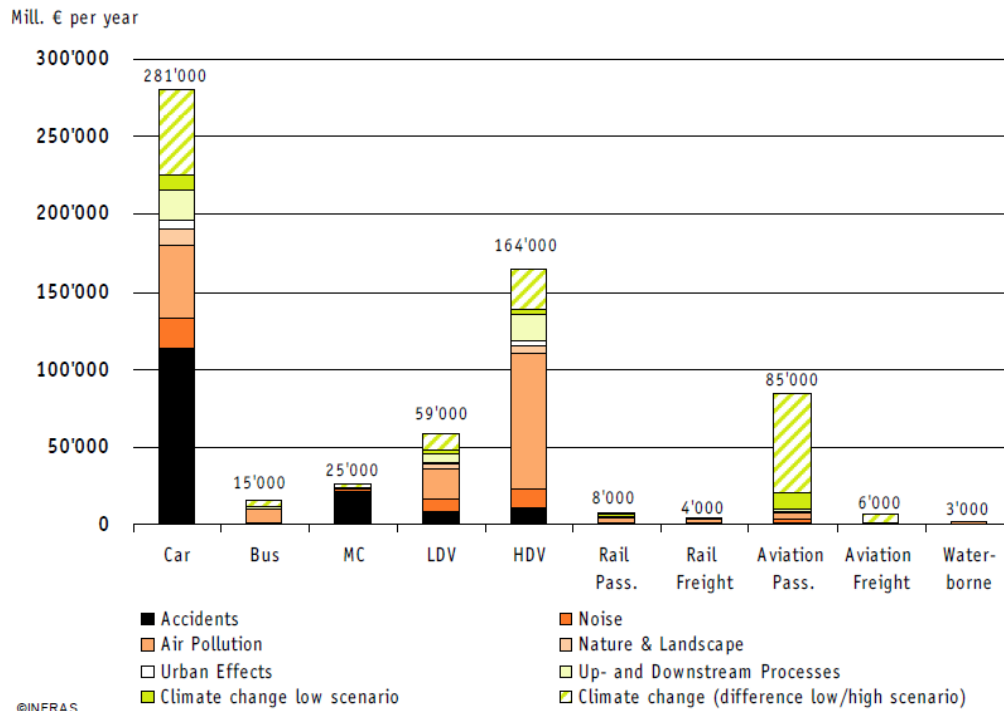
Figure 3: Total external costs 2000 (EU-17) by transport modes and cost category (excluded congestion costs); Source: [7, p. 73]

Transport is responsible for 21% of green house gas (GHG) emissions in EU -15 (excluded the emissions from maritime transport and international air transport, which contributes around 3% of total EU CO_2 emissions [8] and impacts global warming by other substances that at high altitudes react harmfully, like water vapour, sulphate, soot aerosols and nitrous oxides [9, p. 71]). Majority of these emissions is produced by road transport, precisely 93%, but the fastest growing are the emissions from international air transport, registering the growth of 86% in the period from 1990 until 2004 [10].

The contribution to the change of GHG emissions from each transport mode any by pollutant can be seen in Figure 4. Emissions from transport depend on mixture of factors, such as transport mode, vehicle type, weight and volume of goods or logistic efficiency. Average carbon di-oxide (CO_2) emissions in grams per tonne-kilometre ($^g/_{tkm}$) are significantly lower for rail (18–35 $^g/_{tkm}$), sea transport (2–7 $^g/_{tkm}$) and inland water ways (30–49 $^g/_{tkm}$) than they are for road (62–110 $^g/_{tkm}$) and air transport (665 + $^g/_{tkm}$) [11, p. 12]. GHG emissions cause climate changes, which are demonstrated as global temperature increase, ice melting, sea level raise, devastating weather disasters etc.
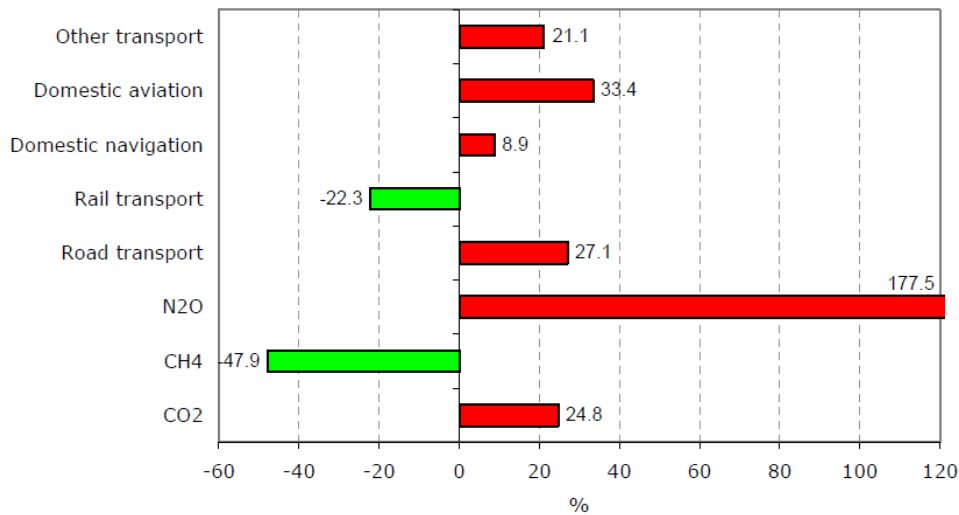
Figure 4: Contribution to change in total EU-15 GHG transport emissions by mode and pollutant, 1990 – 2004
Source: [12, p. 4]

The number of vehicle-kilometres in EU is quickly growing because increasing motorization level in majority of EU member states, accompanied by low vehicle occupancy. Frequent problem is also the unattractiveness of public passenger transport, and consequently low usage level of it. The number of vehicle-kilometres is thus growing faster than the number of passenger kilometres, making the limited road infrastructure even more saturated. Similar situation is in the freight sector, where delivery times and competitive advantages force the usage of weakly exploited vehicles (concerning net weight). Therefore, more vehicles are needed to move the same amount of goods. Figure 5 shows positive and negative impacts of road transport development on CO_2 emissions. CO_2 emissions trap the heat and are therefore the most significant cause of climate changes. Anyhow, total GHG emissions, without LULUCF[3], in the EU-27 decreased by 7,7% between 1990 and 2006 (430 million tonnes CO_2 equivalents) [13, p. 7], but the emissions from transport sector continue to raise.
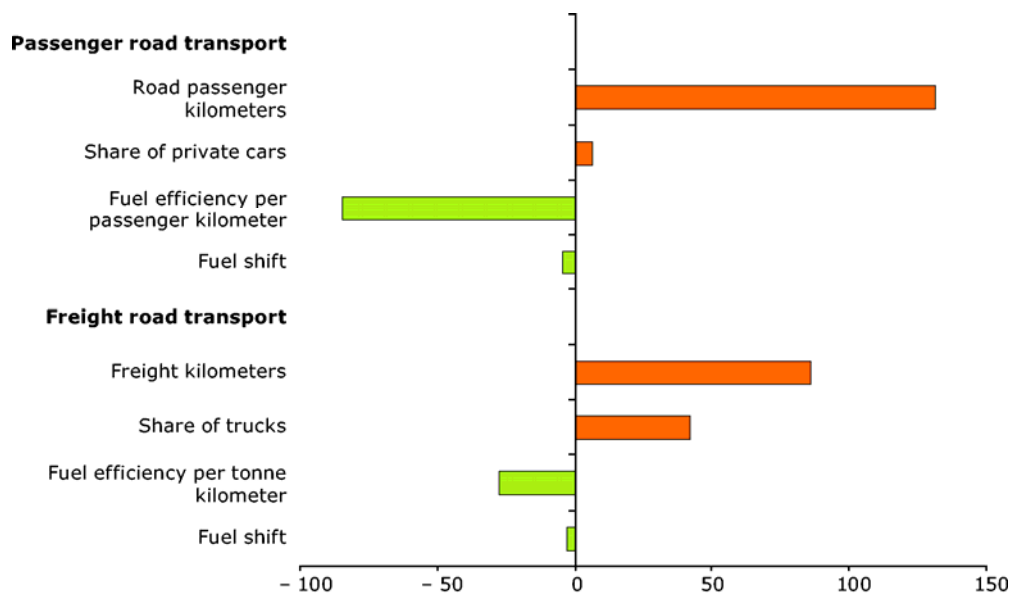
Figure 5: Change in CO_2 emissions, 1990 – 2006 (million tonnes CO_2 equivalent); Source: [14, p. 49]

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[3] Land Use, Land-Use Change and Forestry

Emissions are influenced also by the age of the transportation means; the older the transportation unit is, the elder technology is used and more emissions are produced. However, frequent changes of the fleet and personal cars make a threat to the environment as more energy and materials are used to construct new transport units as well as to recycle and eliminate old ones.

3.2. External costs of transport in Slovenia

The only estimation of external costs of transport in Slovenia was done in 2004 within the project "Analiza esketrnih stroškov prometa" of the program "The competitiveness of Slovenia 2001-2006". The estimations are based on the methodology used in INFARS/IWW study.

As it can be seen from Table 2, GHG emissions from transport in Slovenia are increasing with high rate, while emissions from other sectors are dropping. However, total emissions increased, therefore reaching the goals set by Kyoto protocol will be difficult for Slovenia. Accordingly, to the agreement on 8% reduction of emissions, the average emissions in Slovenia for the period 2008-2012 should not exceed 18.725.719 tonnes of CO_2 equivalents [15].

Table 2: GHG emissions in Slovenia by sector (in 1000 t CO$_2$ equivalent)

	1986 base year	1990	1994	1998	2002	2004	2005	2006	Growth index	Growth rate
Transport	2.033	2.744	3.422	3.855	3.988	4.285	4.569	4.797	236,0	4,4%
Energy production	6.729	6.266	5.255	5.946	6.432	6.315	6.386	6.379	94,8	-0,3%
Industrial processes	1.288	1.282	1.082	983	1.031	1.148	1.209	1.246	96,7	-0,2%
Fuel in industry	4.406	3.449	2.678	2.286	2.244	2.289	2.488	2.589	58,8	-2,6%
Fuel in households	2.366	2.093	2.274	3.160	2.977	2.828	2.585	2.344	99,1	0,0%
Agriculture	2.334	2.249	2.133	2.087	2.188	1.999	2.006	2.029	86,9	-0,7%
Waste	566	597	572	632	697	726	729	702	124,0	1,1%
Other	618	571	446	464	480	502	495	508	82,2	-1,0%
Total	20.340	19.251	17.862	19.413	20.037	20.092	20.467	20.594	101,2	0,1%

Source: Author based on [15]

The estimation of external costs of transport in Slovenia for the year 2002 ranges from 6,6 in 9,4% GDP; majority, more than 90%, of external costs, is produced by the road transport as can be seen from Table 3. In the same year, 1,2 million tonnes of fuel were sold, producing almost 3,8 million tonnes of CO_2 emissions on 17,1 billion driven kilometres [16, p. 179]. Barely 7% of these were produced by foreign vehicles, but Slovenia has a very good geo-strategic location, and a well-developed international seaport that attracts a lot of cargo flows, so it is estimated that after May the 1st 2004, the road transit transport increased by more than 70%.

Table 3: External costs of transport in Slovenia in 2002 and the share of road transport

		Emissions	Urban areas	Accidents*	Noise	Congestion	Nature & landscape	Up & downstream processes[4] – min**	Up & downstream processes – max***	Climate changes – min**	Climate changes – max***	Total - min	Total - max
External costs	% GDP	2,7	0,0	1,9	0,7	0,5	0,0	0,7	1,3	0,2	2,3	6,6	9,4
Mio €		629,1	24,0	440,6	153,6	123,5	88,4	157,2	307,3	56,0	541,0	1.672,4	2.307,5
Road		570,8	24,0	440,6	139,7	123,5	82,6	115,6	261,7	54,7	527,9	1.551,5	2.170,9
Share [%]		90,7	100,0	100,0	91,0	100,0	93,4	73,5	85,2	97,7	97,6	92,8	94,1

Source: Author, based on [16], Tabela A, Tabela C (p. X, XI)
Note:
The analysis includes only road, rail and air transport
* Only state roads are considered
** Climate changes are valued by 14 € per tonne of emitted CO_2
*** Climate changes are valued by 135 € per tonne of emitted CO_2

4. ACTIVE PARTICIPANTS' ROLE IN REDUCING NEGATIVE IMPACTS OF TRANSPORT

4.1. EU transport policy makers

EU had its first environmental programme back in the 70s of the previous century, but for many years, environmental issues remained separated from other sectarian policies. Nevertheless, some important measures were taken in order to reduce negative impacts of the transport sector.

EU has an ambitious plan on transport network development consisting of construction of new infrastructure, and upgrading of existing infrastructure. It is planned that by 2020, Trans European Transport Network (TEN-T) should include 89.500 km of high-level roads and 94.000 km of railways, including around 20.000 km of high speed rail lines suitable for speeds of at least 200 $^{km}/_h$, that should increase the competition level of railways comparing to air and road passenger transport. The inland waterway system should become 11.250 km long with 210 inland ports, whilst there should be a further 294 seaports and around 366 airports. Significant time savings would be gained through the completion of the 30priority TEN-T projects, which form the 'backbone' of TEN-T, as a 14% reduction in road congestion and improved rail performance is expected. Parallel to this, the slow down of the CO_2 emissions by about 4% is anticipated, representing a reduction of these emissions by 6,3 million tonnes per year [17, p. 7]. If all projects of common interest, not on the priority list projects (30 priority projects, 20 of which are railway projects), are included, the total cost of completing TEN-T will exceed € 600 billion [17, p. 8].

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[4] Processes in energy production, processes in production, maintenance and decomposition of vehicles and processes in construction and maintenance of transport infrastructure

Majority of subsides and investments is still directed towards road sector, probably with the idea of reduction of its negative impacts. This is shown in Figure 6. However, the interoperability of current rail network remains a huge problem for the European transport system, and thus European competitive position in the global market as well as the obstacle in achieving more sustainable modal shift. Although there are no longer the state borders within the EU, there are still differences in national rail systems, such as different width of the rails, different power sources, different signal systems, different axes load capacities etc. Besides that, railway system is often characterized as inflexible, slow and unreliable.
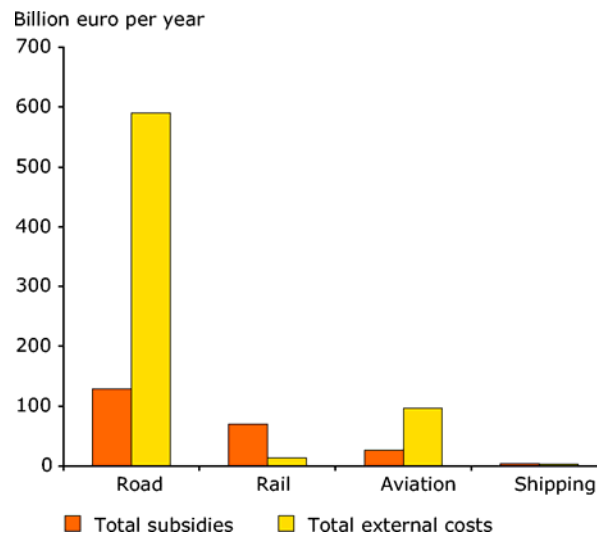
Figure 6: Total external costs and transport subsidies found for EU-15; Source: [18]

Transport infrastructure might be fundamental for the mobility of people and goods, but although establishing an trans-European transport network is a considered to be a key element in achieving the competitiveness and employment in Europe, the bare construction of infrastructure is not enough to have an efficient transport system. The construction of infrastructure is expensive and lengthy, and harmful to the environment. The new infrastructure often causes more traffic flows (additional environmental damage, especially in the case of road transport), and at the end the total infrastructure permeability capacity might even be reduced (this is known as Braess paradox [19]). Instead, it is necessary to optimize the current cargo and passenger flows (management of traffic flows) in order improve the utilization of existing infrastructure and transport means. This process is also lengthy, but the results would protect our environment. Examples on good practice (like car sharing stimulation, public transport stimulation, green vehicles stimulation etc.) can be found throughout Europe, but can not be just copy pasted into local environment.

Something that is applicable throughout Europe are the standards on fuel quality and emissions. The adoption of a number of Directives since 1970 relating to emissions from motor vehicles, both light vehicles (cars, light commercial vehicles) and heavy vehicles (lorries, buses) has had the effect of gradually reducing emissions of gases and particles. The reductions in atmospheric emissions defined by EURO I to VI concern four main pollutants: carbon monoxide (CO), oxides of nitrogen (NO_x), particles and hydrocarbons. Within the same regulations the useful vehicle life was defined in order to have clean cars on the EU roads. In addition, fuel quality regulations were adopted. These regulations define minimum diesel cetane number, maximum diesel sulphur content, and maximum petrol (gasoline) sulphur content. According to these regulations, "sulphur-free" diesel and gasoline fuels (≤ 10

ppm S) needed to be available from 2005, and become mandatory from 2009 [20]. The EU has recently agreed that 10% of its transport fuel must come from a mixture of renewable sources, including bio fuels, and green electricity. EU Member States are planning to increase the share of bio fuels in transport fuel to 5,75% in 2010 and 10% in 2020 (including other renewable sources) [11, p. 21].

The EU has not set the date until when the railways in the Member states must be electrified. Electrified railways are environmentally friendlier, especially if the energy source comes from renewable sources (hydro, wind, waves, solar, geothermal and tides). Furthermore, electric locomotives can deliver as much as 2,5 times the tractive power output of an equivalent diesel, and a slowing-down train can use its electric motors as generators to recycle energy back into the system for other electric trains to use [21]. Motivated by the rail transport ecological aspect recognized in the 20 TEN-T priority projects, the EU is stimulating studies on intermodal transportation feasibility.

Maritime transport is important mode of transportation for EU's internal and external trade. It is considered to be an environmentally friendly way of transportation, but the recent studies emphasize the negative impacts of maritime sulphur emissions, therefore the EU has adopted a strategy to reduce the atmospheric emissions of seagoing ships [22]. For the sake of lowering negative impacts of maritime transport, the Baltic and North Sea region are declared a Sulphur Emissions Controlled Area (SECA). It is planned to declare a SECA over entire Europe until 2015 [23]. EU has also defined measures on maritime safety in order to prevent more ecological disasters like the Erika or Prestige. These measures concern among other things the prevention of pollution caused by ships.

Air transport is excluded from majority of analyses on transport impacts on the environment, furthermore it is excluded also from Kyoto protocol, but its development is not left to a chance. The EU's CO_2 emission reduction goal is presently set at 80 per cent of 1990 emission levels – a figure it aims to have achieved by 2020 [8]. By 2013 some 100 European airports will allow planes to descend all the way from cruising altitude to the runway in one smooth glide, saving up to 450 kilograms of CO_2 per landing. Fuel-efficiency measures will cut emissions by a further 1,8% [24].

4.2. Slovenian transport policy makers

Slovenian parliament discussed two resolutions on transport policy recently; first one in 2004 and the second one in 2006. Currently valid document is titled "Inter-modality: Time for synergy", an ambitious title for not so ambitious contents. The resolution provides a sketchy snap-shot of current situation in Slovenian transport sector and its SWOT analysis, it also sets out some goals, but it does not provide any concrete measures on how to achieve these goals. Transport policy should aim to achieve sustainable transport system by all points of views, namely economical, social and environmental, but current Slovenian transport policy does not do that. The transport system is not understood as a system, and transport branches are not developing equally. As in majority of transit economies, also Slovenia allocates majority of investments to the road transport, mainly to the construction of motorways system, while some regions continue to be poorly connected and railways remain "neglected", making the competition among different modes even more unbalanced. Furthermore, not much is done to revitalise the public transportation, making the mobility of many citizens questionable, and indirectly encouraging the use of energetically inefficient and filthy personal cars.

4.3. Transportation means manufacturers

Transportation means manufactures have no other selection that to follow the standards set by transport policy and environmental policy makers. This of course means the necessity for additional knowledge and extra costs of developing new technologies, but produces environmentally friendlier transportation means. Not all innovative technologies reach the final market due to various reasons, one of which is lobbying of fuel production companies. Anyhow, the production of greener vehicles is present in all transport modes, from passenger cars, through heavy goods vehicles to the passenger and cargo ships. Today's vehicles are more efficient as they consume less fuel and produce less emission than decades ago. Furthermore, vehicles powered by the alternative fuels are getting more efficient and the mass production and use is closer than ever.

4.4. The citizens

The citizens are gradually getting familiar to the negative impacts of transport, but it seems that only a little is done to change the transportation and living habits. Maybe this is because the national or regional transport policies do not cover the issue in the right way. Transport policy makers are entitled to take measures concerning companies and individuals involved in the transportation in order to change their transportation habits. These measures can be external impacts like traffic bans in urban neighbourhoods, or pricing mechanisms such as taxes, charges or subsidies that give incentives to change users' behaviour towards cleaner transport, but it seems that this kind of measures are not often taken. This is probably because these measures require assurance of alternative transportation methods (e.g. banning personal cars from urban neighbourhoods demand establishment of well-organized public transportation), which require considerable amount of money and organizational skills.

5. CONCLUSION

Transport system needs to be treated as a system. Unfortunately, in many occasions it is not. EU tends to optimize transport system even beyond the borders of the Member states in order to become the most competitive economy worldwide, but this will not be achieved by only constructing the infrastructure. Many measures taken so far have limited success because the transport flows are not optimized.

It seems that environmental impacts of transport are too often described only in money terms, especially as the damage costs, although it is impossible to detect all the environmental and social impacts of global warming. Still, it is frequently forgotten, that environmental damages cannot be fixed by money, at least not all, and not in a reasonable period. Furthermore, climate changes might be more intensive and develop faster than it is now expected. The fact is that we cannot avoid climate changes as they are already occurring, but it is maybe possible to reduce them by reducing the emissions of GHG. This also costs money (mitigation costs), but usually the costs of preventing something are smaller in comparison to the costs of fixing the damage. In addition, it is important to have in mind that only timely activities and adaptations to new proficiencies about the environment, might efficiently reduce climate changes.

Transport sector produces huge negative impacts to the environment and contributes a lot to the climate changes, but it is important to admit that situation would have been much worse if

environmental consciousness was not in the minds of transport policy makers and in the minds of European politicians for decades. However, it is not only up to the policy makers to assure less devastating climate changes. It is up to all of us, at least when it comes to transportation. A little of sacrifice today, might bring better future for us and for the following generations.

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III

GOVERNANCE, COMPETITIVENESS AND INNOVATION

RESEARCHING INNOVATION STRATEGIES OF FOREIGN INVESTMENT ENTERPRISES:
THE CASE OF CROATIA

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1. INTRODUCTION

Foreign investment enterprises, characterised by MNE ownership are differentiated by the desired strategic goals, executed through their business activities. In general, these enterprises can be seeking to access the international (global) market, increase efficiency and production flexibility of its business group, exploit low acquisition price of state-owned companies in comparison to the investment risk (Bitzenis and Marangos, 2008), delocate/relocate the production activities towards low-wage countries as well as tapping into localised tacit knowledge (cf. Costa and Filippov, 2008). In business practice, strategic goals have been achieved simultaneously with the existence of a goals hierarchy, hence one goal (e.g. increase efficiency within MNE group) presents a priority in comparison to other goals. In the context of achieving strategic goals innovation activities within firm's strategy frequently presents a crucial activity.

Innovation strategy refers to the introduction of new products or processes within enterprises and may depend on technology acquisition, innovation strategy of their owner, level of competitiveness (cf. Aghion, Carlin, Schaffer, 2002) as well as ownership type (e.g. MNE). In developing markets such as Croatia, foreign owned enterprises show more inclination towards performing innovation activities in comparison to enterprises with domestic owners. So, knowledge primarily within MNE (a majority of foreign investors within manufacturing sector) enhances the opportunity to perform innovative strategy within local subsidiaries. Moreover, MNEs are trying to increase their potential for competitive advantage on the local market by enabling local subsidiaries to perform business activities, enhancing

competitiveness and value of the firm in a more long-term horizon. Thus local subsidiaries are a vehicle for enhancing MNE resources and capabilities, and by so doing add value to their foreign investor enterprises as a whole (cf. Birkinshaw, Hooda and Jonsson 1998). However their innovation strategies could be observed as dependent on the strategy of their owner. Moreover, innovation strategy to an extent depends on the institutional framework (e.g. characteristics of the financial system) (cf. Tylecote and Visintin 2008). Innovation capacity of local subsidiaries i.e. the ability to perform innovative activities presents an important stimulus aimed at innovation strategy development. Johanson and Vahlne, (1977) stated that technological capabilities in the local subsidiaries are closely associated with accumulating international experience of MNEs and increasing commitments to foreign markets. It seems that over time foreign investor enterprises stimulate increase of technological activities (e.g. R&D and innovation activities) within their units where foreign investor enterprises (primarily MNEs) exploit local opportunities (cf. Luo and Peng, 1999; cf. Holm and Deo Sharma, 2006). This explanation could be described as systemic (broader) approach in innovation strategy research where this approach implies viewing innovation strategy in the context of institutional characteristics of entrepreneurs, firms and their environments. This approach appears in innovation performance analyses where researchers tackled the effects of industrialization specialization, corporate governance (and/or institutional framework) on innovation performance (Visintin 2001). Similarly, in case of United Kingdom, Tylecote and Ramirez (2005) have explained the influence of country's corporate governance and financial system and its influence on innovation.

The main focus of the paper is to explain differences between local subsidiaries in terms of innovation strategy. Differences could appear in the manner of use of various types of innovation as well as in firm's innovation activities intensity (radical/incremental) in comparison to industrial average where a local subsidiary belongs. Since local subsidiaries are foreign owned enterprises these differences could be explained primarily by the distribution of business function between foreign investor enterprises and local subsidiaries on the local market. Hereby, differences in types of ownership could be a crucial factor of explanation. Moreover, these differences could be explained by other characteristics like local subsidiary market orientation (domestic and/or international) as well as type of customers e.g. selling to MNE headquarters and/or other independent firm on the local and/or international market. The data used in this analysis was generated by a survey of knowledge transfers and innovation activities in manufacturing enterprises recipients of foreign direct investments in the period 2004-2006.

The aim of this paper is to explore the behaviour of local subsidiaries (foreign owned entities) in terms of their innovation strategies upon entry into the host country (Croatia) and at present. Since foreign owned enterprises achieves competitive advantages on the domestic markets through performance of local subsidiaries, innovative performance of local subsidiaries present an important tool of achieving competitive advantage for foreign investor enterprises in the local market such as Croatia. In this paper, we try to confirm the hypothesis there is statistical significant difference measured by regression modelling between local subsidiaries regarding their innovation strategy.

The contribution of this exploratory paper is twofold. Firstly the paper contributes to the discussion about innovation strategy within local subsidiaries. Secondly, it explains innovation strategy primarily through relationship between local subsidiaries and foreign investor enterprises as well as researching business framework influences on local subsidiaries innovative performance. In addition, the paper has clear policy implications since

it implies the significance of external, in this case foreign, knowledge sources in Croatia. We have structured the paper on the way that after introduction literature review on strategic motives and outcomes in terms of foreign direct investment (FDI) behaviour and relating to innovation activities follows. In the next section, the methodology and data survey analysis will be introduced. In fifth section the results of the research are presented. Finally, concluding remarks are presented in the last section.

2. LITERATURE REVIEW

The literature on the determinants of FDI has been influenced by theories of international business and by international economics (Bellak et al., 2008). Through internationalization as a method to open up different strategic options (Saarenketo et al., 2008), MNEs are looking for building/sustaining different types of advantages in front of their competitors. Through FDI processes MNEs are exploiting the advantages of global operations. Doing business in many markets for MNEs can become a base for comparative advantages determined by the differences in the natural resources, availability of land, capital, labour force, etc. But with the globalization of the market, both domestic and international levels of competition have increased together with the increase in pricing competitiveness and the non-price competitiveness. Comparative advantages are not enough anymore for global competition; MNEs must build up sustainable competitive advantages. In conditions of global, rapidly changing competition, investments into dynamic, know-how based competitive advantages are becoming more important. The ability to develop new technologies more rapidly than other firms as well as the ability to promote and facilitate technological innovations is determining competitive advantages in the global market (Guan and Ma, 2003). Because, MNEs require rapid growth of overseas research and development capacity (Chung et al., 2003) so improvement of for example innovation capability has become crucial element in building and sustaining international/global competitive advantage.

The capability not only to create, but also to apply (Castro et al., 2008) a new knowledge, where it has been considered as one of the main sources of the competitive advantage, implies two-direction process going on between the investor (MNE) as well as the investment recipient (local subsidiary). Therefore an innovation capacity of local subsidiaries is strongly affected by quality of innovation and R&D activities within firms and at the same time it means firm's ability to exploit external knowledge (Cohen and Levinthal 1990: 138). The primary issue within firm regard with innovation capacity is the choice between investments into own R&D and innovation activities and acquisition of external technology. The choice between these options depends on the available technological knowledge, expected outputs, as well as on the accompanying risks and costs of conducting R&D and innovation activities.

In that context, Nassimbeni (2001: 248) argues that innovation capacity is tightly connected with product adaptation, in time when firms begin to internationalize its business activities. In this matter competence of firm's management in recognition of specific market demand is crucial since innovative product and/or processes cost is not standardized. Major challenge for MNEs is to find an organizational system capable of transferring know-how across units and locations, allowing locally generated know how to be used throughout the multinational organization (Sanna-Randaccio and Veugelers, 2003). In many studies show that parent companies have a positive influence on local subsidiaries and their innovation activities through knowledge transfer (Sourafel, Greenaway and Wakelin, 2001; Damijan et al., 2003) .

It seems that in researching innovation strategy is core relationship between innovation activities and firm's competencies where mutual dependence between firm's competence and innovation activities exists. According to Danneeels (2002: 1096) there are three approaches which describe this relation. The first conceptual framework is based an integration of the scholarly literature regarding product innovation, organizational resources and competencies which incorporates organizational learning and path dependency; the second approach examines product innovation from resource-based perspective where core capabilities may stimulate and/or impede product innovation; the third dynamic capabilities approach in which product innovation is treated as dynamic capabilities of the firm where innovation could alter the resource configuration of the firm (see for example Eisenhardt and Martin 2000).

The results of inward FDI in the local market depend on the role of the local subsidiary where their efficiency varies in their interactions with the parent, with other business units of the parent's network, and with local businesses (Meyer, 2004). Developing effective local subsidiaries is of particular concern to MNEs in the developing countries (cf. Uhlenbruck, 2004) like Croatia, where creating of revenue-generating potential as well as their added value to the MNE are a basis for further development.

Since, innovation and R&D are risky activities which design and implementation and commercialization frequently require a large amount of financial resources, R&D cooperation as an operational mode become popular where participants from public and the business sector appear as partner. In that context, R&D cooperation between MNEs and its local subsidiaries is frequent and present a result of requirement for downsizing firm's business activities risk associated with the market introduction of product and/or process and (Von Hippel, 1988). In terms of organisational modes this cooperation could varies from wholly-owned subsidiaries with full internalisation of transaction, across various types of equity and non-equity agreements (which include team collaboration) to interpersonal collaboration more informal cooperation (Lundin, Frinking and Wagner, 2005). The type of R&D cooperation and type of partners involved into R&D (e.g. MNE) definitely influence innovation strategy of local subsidiaries. Whereby, a partner from the public and the business sector such as foreign investor enterprise has a twofold role; the first role as a participant of R&D cooperation and the second role as a knowledge source for local subsidiary's R&D and innovation activities. Furthermore, participation on the different markets (domestic and international) could presents a source of knowledge for local subsidiaries R&D and innovation activities and finally successful application of external knowledge definitely depends on firm's innovation capacity (cf. Knell, Rojec 2007).

It is obvious that MNEs need to cope with different markets in many different ways, as well as the government of country that receives foreign investments needs to cope with different types of FDIs in different ways. Generally, together with the rapidly changing global market, changes in corporate strategies of multinationals could have important implications to subsidiaries located overseas (Costa and Filippov, 2008). Possible changes of MNE's corporate strategies and goals should be observed more closely by host governments due to their different possible spill over effects on host country economy. As MNEs are recently seen as the firms playing a crucial role in the development of many emerging economies, they became the focus of researches conducted by economists and policy analysts. Most of conducted studies have emphasised their strategic behaviour, with the implications on their performance as the global players on the global market. Being the global player, it is obvious that MNEs pursue global strategic objectives that can motivate FDI. Accordingly, FDI can be classified into resource seeking, strategic asset seeking, market seeking or efficiency seeking

(Dunning, 1993, 2000). These objectives are directed by MNE's headquarters and fulfilled by it's subsidiaries that play various roles within MNEs. Consequently, the objectives vary in their interactions with the parent, with other business units of the parent's network, and with local businesses (Meyer, 2004). Seeking for optimal locations for raw materials, intermediate goods, services 'brain arbitrage' or assembly plants (Murtha et al., 2001) MNEs are creating different types of spill over – either positive or negative ones.

Furthermore, Keller (2002) argues that for most countries foreign sources of technology are of dominant importance – ninety per cent – for productivity growth. Foreign sources of technology are more important for small and developing countries like Croatia in comparison to bigger countries, and the relative importance of international technology diffusion appears to be increasing along with higher levels of economic integration (cf. Keller, 2004) where FDI and international trade present important driver of Croatia's economic integration into the EU.

The ability of the host country to benefit from the inward FDI is often a great challenge, as they may play either a positive or a negative role in economic development (Tiits, 2007). FDI can promote the exports of the host country, facilitate access to new and large foreign markets, and provide training for the local workforce, upgrading technical and management skills, (Zhang, 2007). As well it can influence other domestic firms by having demonstration/imitation effects, increasing competitive pressure by spurring local firms to operate more efficiently (Flores et al., 2007), etc. On the other hand it may lower or replace domestic savings and investment, not transfer advanced technologies, target primarily the host country's domestic market and thus not increase exports, inhibit the expansion of indigenous firms that might become exporters and not help in developing the host country's dynamic comparative advantages by focusing solely on local cheap labour and raw materials (Zhang, 2007), attract the best workers from domestic firms by offering higher wages, cause an increase in prices which penalises domestic firms' costs through production quality upgrade induced by the presence of MNEs (Flores et al., 2007), keep their knowledge-intensive activities in their country of origin, especially in sectors in which knowledge capital is most important (Siotis, 1999), etc. Lately, the pure quantitative approach in considering FDI by host country has been increasingly replaced by a more qualitative one as evaluations in terms of their impacts on host countries' innovation dynamics, have come to the fore (Costa and Filippov, 2008).

The expected benefits for host countries would be an increase of employment rate, survival of local firms in crisis through foreign acquisitions or joint-ventures, acceleration of the rate of technological transfer for both- subsidiaries as well as other domestically owned firms through imitation, R&D expenditure increase, innovation (new product development), increase of consumer welfare by overall price level fall, pushing exporting activities etc. In such economies it is expected that the firms with foreign participation will have access to more sophisticated marketing capabilities enabling them to outperform their domestic counterparts (Fahy et al., 2000). The potentially negative effects of growing levels of foreign investment on domestic market structures and national sovereignty have long been the focus of attention as have the harmful affects of foreign investment in less developed countries (Hooley et al., 1996). Still, we have fairly little knowledge about resource and capability creation in foreign subsidiaries (Rugman and Verbeke, 2001) as there has been little contribution to a debate of long-term negative effects of FDI in host transition countries on acquired firms as well as on the overall national economy.

3. METHODOLOGY

Available data provided a representative sample of key foreign companies, namely Croatian foreign owned manufacturing companies, active in the Croatian market. Consequently, the firms were analysed via a postal survey throughout April and May 2007. It was completed by a poll-taker who subsequently contacted every firm from the population of foreign-owned enterprises. The database was created according to available data from Institute for Business Intelligence in Croatia and captured the main companies in foreign ownership, which amounted to 220 companies, following the exclusion of dormant, extremely small or non representative companies[1]. The analysis includes enterprises in the manufacturing sector only. The questionnaire was created on the basis of a panel session (twenty two questions), addressing the basic information about the firm, the relationship between the foreign investor (or a number of investors) and the firm, and R&D and innovation activities, both on the point of entry into the Croatian market and from the viewpoint at the time of the questionnaire.

Using regression modelling (binomial logistic regression analysis and likelihood ratios), the differences in firm behavioural patterns were identified on the basis of the processed data from the questionnaire. Ownership type in the questionnaire was separated into six main groups (question 5) – MNE, foreign SME, foreign financial company, public sector company, domestic financial company or company owned by workers or managers. The classification for each question was binary, Yes or No, hence the use of the binomial logistic regression model. MNE as a type of ownership is therefore a binary dependant variable in the model. The analysis focused on three main areas (as independent variables) on the basis of the data generated through the survey. The results draw on the groups where statistically significant differences have been found between groups.

The first area analysed was the overview of the strategic motives, embedded in the decision making process of foreign firms before and after their entry into the Croatian market. The implicit assumption is that overwhelmingly, foreign companies seek to expand their markets, but as the literature suggests, this is not always the case (Dunning, 1993, 2000). Accordingly, the questions attempt to capture the initial strategic motives for the entry into the Croatian market, but also to define and establish the changing strategic attitudes with the passage of time. It is important to note that behavioral changes were analysed for two main ownership categories, namely foreign owned firms and firms which are part of a multinational entreprise (MNE). The motives may have changed due to internal and external factors, and certainly in the context of establishing the links between intentions and results required a dynamic insight into the evolution of the strategic motives.

Second aspect of this analysis examined the strategic decisions of the foreign owned companies in Croatia. Importantly, the questionnaire layout allowed for the clear distinction between MNE units and companies which are not a part of a MNE which could present an important knowledge source for local subsidiary's innovation and R&D activities (for more, see Knell, Rojec 2007: 41). Using logistic regression analysis, the aim was to determine the links between innovation activities of MNE subsidiaries in terms of the impacts on innovation in marketing, product and process development. Here, development implies improvements to processes and products resulting from innovative local solutions and ideas which have been incorporated into the business practice where existing knowledge of foreign investor

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[1] The survey sample size was 220, with 66.0% response rate.

enterprises presents a knowledge source and can therefore be identified and linked with the innovation activities themselves.

Finally, in the third part the link between product development and exports was examined, namely exports oriented towards the MNE headquarters situated abroad. Previous empirical research about Italian small business entities confirmed link between ability to innovate product and develop inters organizational relations on the one hand and propensity to exports on others (Nassimbeni, 2001). Since a majority of local subsidiaries in manufacturing in Croatia are small and medium enterprises more than eighty percent (82.8 percent) similar approach had been used here. The distinction had to be made to capture the goods and services simply processed in the local market and then exported to the headquarters but which had nevertheless been impacted by the work and R&D in the local market, i.e. through the use of local knowledge and resources.

4. RESULTS

The results produced interesting outcomes, warranting the interest in this topic as well as further research in this area. The analysis has show that various types of ownership are the determinant factor between local subsidiaries in terms of innovation strategies.

Results in terms of the dominant strategic motives for FDI investment into the Croatian market, as shown in figure 1., show that there were no substantial changes in the strategic logic of MNE investors. Namely, the motive was simply access to new markets as well as creating efficiency gains both at the point of entry and after a time lapse. On the other hand, it is interesting to note the increase in the importance allocated to the access to local knowledge, skills and technologies, which increased in the period analysed. Interestingly, most active, in terms of orientation towards sales in the local market, are slow growth companies, not part of MNEs. They generated 49.49% of income from sales in the local market in comparison to 27.19% *of MNE members*.
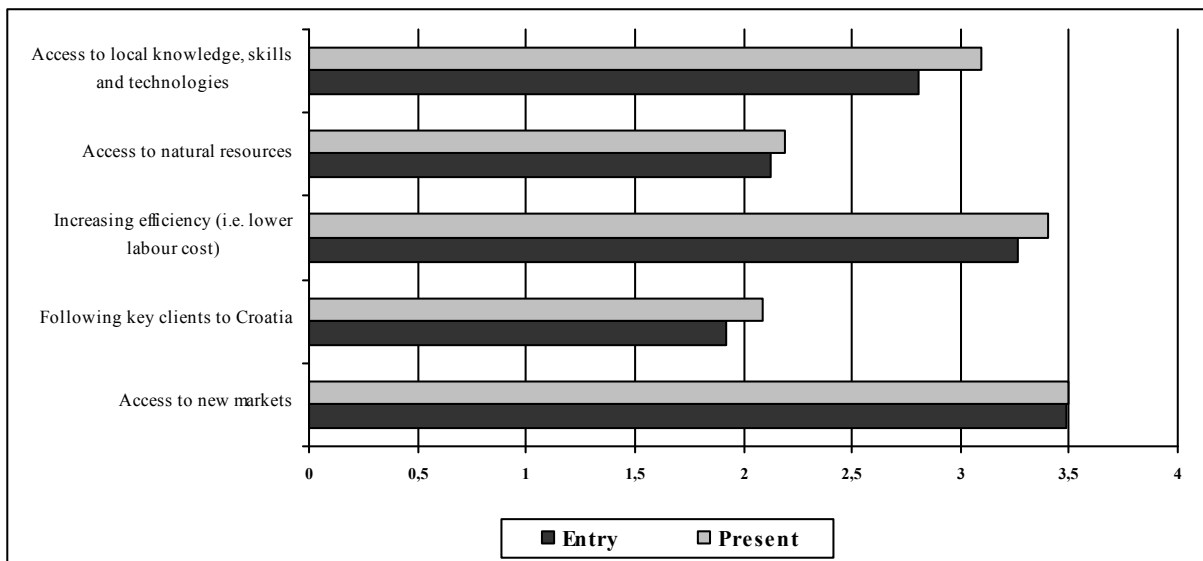
Figure 1.   EIZ (2007: 6) Strategic motives of the foreign investors on entry into the Croatian market and at present (2007), mean value on the 1-5 scale (1-not important, 5-indespensible)

Further analysis (binomial logistic regression analysis and likelihood ratios), the summary of which is provided in table 1., show that local subsidiaries, owned by MNE, show more inclination towards product innovation. Local subsidiaries in Croatia (not a part of MNE, a methodological category explained in the methodology section) in comparison to their counterparts (i.e. local subsidiaries, parts of MNE) have a likelihood ratio of 2.247 of not developing their products.

MNE subsidiaries therefore innovate semi finished products or use existing knowledge of their owner companies and place these in the local markets. While this is not necessarily an indication of inefficiency, but on the contrary is a reflection of the efficiency efforts by the MNEs themselves, the clear absence of local innovation emphasis generates further questions relating to the long term strategy by foreign subsidiaries in local markets such as Croatia.

Table 1. Product innovations difference between groups

Variable	Exp B	Standard error	t-value
Non MNE unit product innovations	2,247	0,366	0,027

Source: Author's calculations

MNE units are more likely to possess innovative products. More than half 60.2% of foreign investor enterprises have innovative products (EIZ 2007: 12). Certainly, a contributing factor is the knowledge available within the overall MNE group, as a reliable source of knowledge for local subsidiary's research and development and innovation activities.

Similar results appear in case of marketing innovation (see table 2). Local subsidiaries owned by Multinational Enterprises show more inclination towards marketing innovation in comparison to local subsidiaries not owned by MNE. Foreign owned non MNE companies, in comparison to local MNE subsidiaries, have a 2.437 likelihood ratio that they do not innovate in marketing.

Table 2. Marketing innovations difference between groups

Variable	Exp B	Standard error	t-value
Non MNE unit marketing innovations	2,437	0,377	0,018

Source: Author's calculations

This implies that MNE subsidiaries are more active in marketing development, but also that knowledge transfer in terms of marketing is particularly relevant in MNE structures. In addition, there is a clear danger of perception bias, since new developments in marketing can be perceived as an innovation by MNE subsidiaries purely on the basis of the trend for local tailoring of marketing needs. This means that the majority of the research and development has already been undertaken by the MNE Head office, but the implementation and potential adjustments of the products are made locally, which is perceived as local innovation by local subsidiaries operating in strict organisational structures such as many MNEs. Researching similar population of small and medium enterprises (SMEs) in Croatia, Račić, Aralica, Redžepagić (2008: 296) found that high growth SMEs (measured by above average increase of total revenues and number of employees in the analysed period) is more active in marketing innovation than other SMEs. Whereby this results was explained by the fact that SMEs compensate low level of innovativeness. It seems that results about marketing innovation are still inconclusive and further researches are required.

Using forward stepwise method in the analysis of the product development likelihood ratios yielded statistically significant results for the variable of income from sales to HQ company. Likelihood ratio that a company does engage in product development increases by 7% if exports to MNE headquarters increase by 1% (t-value 0.004, standard error 0.023). This suggests that companies exporting to MNE headquarters are not primarily marked oriented, implying a lack of emphasis on developing technical capabilities in line with the perceived requirements of the local market. Another implication of this is that foreign owners use local subsidiaries as vehicles for the exploitation of cheaper labour and potentially for the production of semi products, i.e. unfinished products requiring less technological knowhow and more labour intensive.

In addition, these companies can be grouped by a higher tendency for exports and export activities, in particular to their MNE group, or other members of their MNE group. Hence, a positive correlation was found between the level of "in house" trading and the level of innovation within a MNE group, highlighting the value added of local subsidiaries and the impacts of local resources. Finally, non MNE subsidiary has a likelihood ratio of 2.006 of not innovating their processes which implies that local MNE subsidiaries show more inclination towards process innovation[2].

Table 3. Process innovations and sales to domestic companies

Variable	Exp B	Standard error	t-value
Non MNE unit process innovations	2,006	0,363	0,055
Non MNE unit sales to domestic companies	1,012	0,005	0,028

Source: Author's calculations.

It seems that MNEs in Croatia are more active than domestic companies in terms of fostering innovation for domestic market. Given the relatively small size of the Croatian market and the seemingly long term commitment by the national policy on fostering innovation growth, these results indicate that there is progress to be made still.

It should be noted that research was conducted in field of market orientation and the distribution of business function. However, there is no any statistical significant result which may confirm distinction between local subsidiaries with regard to these variables. So, we may conclude that innovation strategy does not depend on the market orientation type, i.e. the links are implicit. In addition, the distribution of business functions between foreign investment enterprises and local subsidiaries does not influence the innovation strategy.

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[2] ROC curve value 0,585.

5. CONCLUNDING REMARKS

Relationship between innovation activities and firm's competencies is the basis for the research of innovation strategy of local subsidiaries and the research into mutual dependencies. The characteristics of innovation strategy differ among local subsidiaries in terms of use various type of innovation activities (product innovation, process innovation, marketing innovation and organizational innovation) as well as in terms of intensity of the firm's innovation activities (radical/incremental). Participation of multinational enterprises in ownership structure definitely presents a crucial factor which influences innovation strategy of local subsidiaries allowing for more frequent product innovation. Local subsidiaries, not part of MNEs, in Croatia; in comparison to local subsidiaries part of MNE have a likelihood ratio of 2.247 of not developing their products. So, local MNE subsidiaries show more inclination towards product innovation, explained by the level of existing knowledge within MNEs. The local subsidiary role is crucial, because these business entities needs to develop own absorptive capacities which is strongly affected by quality of own innovation and R&D activities and at the same this capacity needs to be capable to exploit available external knowledge.

Similar results appear in case of marketing innovation, where local subsidiaries owned by Multinational Enterprises show more inclination towards marketing innovation in comparison to local subsidiaries not owned by MNE. This could be explained by the fact that local subsidiaries are responsible for potential product selling strategy on the local market, while simultaneously more knowledge intensive business functions (e.g. product development) are the responsibility of foreign investor enterprises. However, since marketing innovation presents a differentiating factor between SME groups in Croatia (Račić, Aralica, Redžepagić, 2008: 296) with high growth SMEs more intensive in the use of marketing innovation in comparison to other SMEs, additional research in marketing innovation is required. So, further research should be enhanced in the field of market concentration and investments in marketing innovation.

The presence of multinational enterprises in ownership of domestic business enterprises presents improvements regarding product development and their sales on the international markets. Likelihood that a company does engage in product development increases by 7% if exports to MNE headquarters increase by 1% i.e. likelihood ratios yielded statistically significant results for the variable of income from sales to headquarters (HQ) company. Thus, multinational enterprises present a driver of knowledge demand for their companies (i.e. local subsidiaries), and source of export activities increase, as analysed on macro level. At the same time, local subsidiaries parts of MNEs in Croatia are more active than domestic companies in terms of fostering innovation for domestic market. Given the relatively small size of the Croatian market and the seemingly long term commitment by the national policy on fostering innovation growth, these results indicate that there is progress to be made still.

Regarding with market orientation and distribution of business function there is no statistical significant different result between local subsidiaries in Croatia. Similar results appear in terms of strategic motives for FDI investment into the Croatian market. There were no substantial changes in the strategic logic of MNE investors. Namely, the motive was simply access to new markets as well as creating efficiency gains both at the point of entry and after a time lapse. On the other hand, it is interesting to note the increase in the importance allocated to the access to local knowledge, skills and technologies, which increased in the analysed period.

In conclusion, the survey results yielded interesting findings which contribute to the study of innovation strategies of local subsidiaries in Croatia. Moreover, the survey results contribute to research on links between various types of innovation activities (product innovation and/or marketing innovation) and existing knowledge within MNE which participate in their ownership structure. Ownership by a multinational company enhances the potential for local subsidiaries to sell innovative products on the domestic market and the international markets (to the market where the headquarters or other MNE companies are located).

These findings provide additional insight into the importance of foreign direct investments and the importance of foreign sources of knowledge, with the significance of stimulating innovation activities in developing countries such as Croatia, where low level of innovation performance in comparison to other countries is observed (see more EIS, 2008: 7). Furthermore, the results create an opportunity for the innovation policy implementation where stronger policy efforts should be made in the field of promoting foreign sources of knowledge through innovation and R&D programmes schemes in Croatia, as the results would imply.

Finally, the methodology could be further improved through additional econometric modeling i.e. multivariate analysis such as factor analysis and multiple regressions. In addition, since the level of innovative activities depends on the institutional framework further researches should make more emphasis on research taking into account the knowledge sources and its influence on local subsidiaries R&D and innovation activities. Furthermore, research about SME sector which includes majority of local subsidiaries and its innovation capacity should be advanced. The existence of innovation capacity is a prerequisite of developing and implementing innovation and R&D activities within these enterprises as well as increase opportunity to exploit external knowledge sources.

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INTERNET ACCESS AS THE CRUCIAL MICRO-LEVEL DETERMINANT OF THE HIGHER EDUCATION PARTICIPATION IN SLOVENIA

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1. PAST STUDIES OF MICRO-LEVEL DETERMINANTS OF HIGHER EDUCATION

Demand for higher education is usually investigated either at a country level or at a level of an individual. The first approach is a so called macro-level and the second micro-level approach. In this study we investigate the micro-level determinants of the higher education participation in Slovenia. These micro level determinants are characteristics of the observed individual and especially his belonging family or household.

The previous investigation of micro-level determinants of higher education participation has focused on household income as an important determinant of educational achievement over the entire educational investment cycle of a child (Heckman 2000). We might expect that *household wealth and income* have a positive effect on participation in higher education (Acemoglu and Pischke 2001; Lopez-Valcarcel and Quintana 1998). Becker and Tomes (1979, 1986) argue that *short-run financial constraints* are also important for the participation in the higher education. Similarly Laitner (1992), Benabou (2000) and Aiyagari et al. (2002) believe that credit constraints play an important role in the higher education participation.

However, some other researchers suggest that family or household characteristics are more important than the financial constraints that they face (Chevalier and Lanot 2002). Aakvik, et al. (2005) find that short-term credit constraints only have a small effect on educational attainment. Long-term factors such as permanent family income and parental education should be relatively more important. *Parental environments* might be one of the first such factors which are significant for higher education participation over the long-run (Heckman 2000). Among another long-term factors, there are *cognitive and non-cognitive abilities* that are more important than short-term financial constraints in the determination of higher education participation (Carneiro and Heckman 2002). Heckman et al. (2006) provide further

evidence that cognitive and non-cognitive skills are critical in the determination of educational outcomes.

A study by Lehrer (2005) offers evidence that *religious affiliation* is an important factor for the completed years of schooling by an individual. This is most probably because religious attendance increases the number of social interactions, because the attendance of religious schools may be an advantage and because religious institutions provide financial and emotional help to students when problems occur. The believers may also be less stressed out by the every day problems (Gruber 2005).

Cultural capital or a familiarity with the conceptual codes that underlie a specific culture with its major artistic and normative manifestations is another factor of higher education participation (De Graaf et al. 2000). Parents with a greater quantity of cultural resources can help their children at their study obligations. Therefore the effect of cultural capital has a positive effect on the higher education attainment. Some researchers believe that cultural capital is even more important than economic capital (Jaeger and Holm 2006). *Social class of parents* has a positive effect on higher education participation (Lauer 2002a; Lauer 2002b; Burnhill et al. 1990). Higher levels of *parents' education* positively and strongly affect the participation in the higher education (Lauer 2002a; Beneito et al. 2001; Albert 2000; Lopez-Valcarcel and Quintana 1998).

Rural location of a household has a negative effect on the participation in the higher education (Le and Miller 2005). However, the lower participation in the higher education for people from the rural areas should be a consequence of specific socioeconomic circumstances that prevails in the rural areas and less a consequence of a greater distance from universities (James 2001).

A number of children in a family or a *number of household members* is found to have a negative affect on the higher education attainment in some studies (Hartog and Diaz-Serrano 2004). However, some other studies show that the greater number of children in a family does not necessarily lead to a lower higher education participation in such families (Gonzales et al. 2002).

Another interesting study proves that the pupils in the secondary schools who have the unrestricted *access to the internet* are more likely to participate in the higher education than those with no access (Collins et al. 2006). The presence of a personal computer and access to the internet proves to be an important factor of the higher education participation.

2. RESEARCH QUESTIONS, DATA AND METHODOLOGY

In this paper we empirically test the importance and the direction of the undergraduate higher education participation determinants of the Slovenian higher education participation. A special focus is paid to the determinants that are related to the household member characteristics and household characteristics. The research questions are the following. First, which are the most important and statistically significant the undergraduate higher education participation determinants in Slovenia? Second, what is the direction of their impact on the undergraduate higher education participation? And third, which determinant, out of all the statistically significant undergraduate higher education participation determinants, is the most important?

The data used in this research are collected from the Household Budget Surveys (HBS) for the reference years from 1998 to 2005 which are continuous surveys of the Statistical Office of the Republic of Slovenia (SORS). The HBS *covers* private households in Slovenia. The HBS does not cover collective households such as boarding schools, nursing homes for children, old people's homes, hospitals, homes for pupils, student hostels, and foreigners temporarily living in Slovenia as well as the homeless. The *sample design* is a random probability sample. For large towns with more than 10,000 inhabitants, the one-stage simple random sample is used. For the other areas, the two-stage sample is used, which means that clusters of 4 households are selected. The ultimate *sampling unit* is an adult person. The enumeration unit is household and its members. A household is a community of persons who live together and share their income for covering the basic costs of living such as food and accommodation. A member of a household can, however, temporarily lives apart because of work, school, and similar. The HBS contains the basic socio and demographic data for the household members observed within the surveys, data on household member and household income and assets as well as data on final household member and household consumption. Some data used in this research are directly taken from the HBS and some are inferred from it by further calculation and transformation of the raw data.

The *dependant variable* in our research is a dummy or a binary response nominal variable: this is the participation in the undergraduate higher education of a household member (*PH*). It is a binary response nominal variable since it only takes the values 0 and 1. *PH* = 0 if a household member is currently not participating in higher education, and *PH* = 1 if a household member is currently participating in the higher education. The independent or explanatory variables, which are used to explain why some household members are not and why some household members are participating in higher education, are divided into the two groups. In the first group of the explanatory variables are the observed *household member characteristics* such as household member sex (*SEX*) (if female *SEX* = 0, and if male *SEX* = 1), a household member age (*AGE*), a household member marital status (*MS*) (if single, divorced or widowed *MS* = 0, and if married or living in a non-marital cohabitation *MS* = 1), and a household member net personal annual income (*PI*). In the second group of the explanatory variables are *the household characteristics* of the observed household member. The first household characteristic is a number of cars (*NCAR*) in a household measuring the mobility of a household and the living standard. The second household characteristic is a household expenditures for non-formal education activities (*NFEDUC*) (such as language courses, music school, driving course, sport courses, cooking courses, handcraft courses, computer courses or any other courses), measuring the living culture of a household and openes of a household members for a broader range of interests in the sense of their (free time) activities. The next household characteristic is the presence of the internet access in a household (*INTER*) (if not present *INTER* = 0, and if present *INTER* = 1), measuring the computerisation and informatisation of a household. The value of own household production (*OP*) is another household characteristic for measuring opportunity costs of higher education participation in terms of the rurality (and agrarianess) of a household and physical access to the higher education institutions. The household net annual total assets and income together excluding the net annual personal income of the observed household member (*HAI*) measures the financial ability of a household apart from the financial conditions of the observed household member. The number of household members (*NHM*) is the household characteristic, which measures the impact of a household size on higher education participation, through its wealth and social effects. The last household characteristic is the presence of at least one household member with a higher education in addition to the observed household member. This is the higher education of the others household members

(*HEO*) (if nobody from a household has a higher education *HEO* = 0, and if there is at least one household member with a higher education in addition to the observed household member *HEO* = 1), measuring the impact of the parents or any other household members education on the higher education participation of the observed household member. In our research we want to use these different household member characteristics of the observed individual and the household characteristics of the observed individual in order to explain why some individuals are and why some individuals are not participating in the higher education. More specifically, we aim to explain the participation probability of a particular individual. Since the dependant variable has only two possible values or outcomes (0 or 1), the methodology used in our research is a binary response probit model.

In the econometric analysis, a probit model is a popular specification of a generalised linear model. In particular, it is used for a binomial regression using the probit link function (Harnett 1982; Jobson 1992a; Jobson 1992b). A probit regression is the application of this model to a given dataset in our case to the HBS data on participation in the higher education and its determinants. The response is a series of binomial results (0 if a household member is currently not participating in the undergraduate higher education, and 1 if a household member is currently participating in the undergraduate higher education). The expected value of the dependant variable can be written as:

$$E(y_i) = 0 \cdot P\,(y_i = 0) + 1 \cdot P\,(y_i = 1) = P\,(y_i = 1)$$

The likelihood is assumed to follow the binominal distribution. Let y_i be a binary outcome variable, and let x_i be a vector of regressors. The probit model assumes that

$$P(y_i = 1 \mid x_i) = \Phi(x'_i\beta) = \int_{-\infty}^{x'_i\beta} \phi(z)dz$$

where $\Phi(.)$ is the cumulative distribution function of the standard normal distribution and $\int_{-\infty}^{x'_i\beta} \phi(.)$ probability density function. The parameters β are typically estimated by maximum likelihood method.

Probit model can also be generated by a simple latent variable model. Suppose that:

$$y_i^* = x'_i\beta + \varepsilon_i$$

where $\varepsilon_i \sim N(0,1)$, and suppose that y_i is an indicator for whether the latent variable y_i^* is positive. Then y_i can be written as:

$$y_i = \begin{cases} 1, y_i^* > 0 \\ 0, y_i^* \leq 0 \end{cases}.$$

A household member is currently not participating in the higher education ($y_i = 0$) if y_i^* is negative and a household member is currently participating in the higher education ($y_i = 1$) if y_i^* is positive.

When conducting a research we normally measure values for y_i only. Therefore, a probability that a household member is currently participating in the higher education can be presented as (Dillon and Goldstein 1984):

$$
\begin{aligned}
P(y_i = 1 \mid x_i) &= P(y_i^* > 0 \mid x_i) \\
&= P(x'_i\beta + \varepsilon_i > 0 \mid x_i) \\
&= P(\varepsilon_i > -x'_i\beta \mid x_i) \\
&= 1 - \Phi(-x'_i\beta / \sigma) = \Phi(-x'_i\beta / \sigma)
\end{aligned}
$$

Not like in a linear regression model, in the case of the probit model, the parameters β_i can not be directly interpreted as the marginal effects of x_{ik} on the dependant variable y_i. To define the marginal effect of an explanatory variable x_{ik} (a determinant of the higher education participation) on the expected value of the dependant variable (participation in the higher education) in general the following expression is used (Maddala 1977; Verbeek 2002):

$$
\frac{\partial E(y_i \mid x_i)}{\partial x_{ik}} = \frac{\partial P(y_i = 1 \mid x_i)}{\partial x_{ik}} = \phi(x'_i\beta)\beta_k
$$

It is a typical to choose a reference person, which is defined by a chosen set of values for the explanatory variables (determinants of the higher education participation) since the marginal effects are different for a different observation unit i (observed household member). The interpretation of the marginal effects then refers to a chosen reference person. The marginal effect of a chosen explanatory variable tells for how many percentage points will change the probability that a reference person is participating in the higher education if a value of that explanatory variable has increased by one.

3. PROBIT MODEL EMPIRICAL RESULTS

3.1. The probit model

In this section we present the results of the probit model analysis. In the probit analysis we focus on the determinants of the undergraduate (but not postgraduate) higher education participation separately for the persons who are from 19 to 25 years old, the persons who are from 26 to 34 years old, and the persons who are from 19 to 34 years old. In the younger group there are 84% of all undergraduate higher education students and in the older group there are 10% of all undergraduate higher education students. Both age groups cover around 95% of all undergraduate higher education students as reason not to widen the age groups substantially to include the remaining 5% of the undergraduate higher education students. We expect that some undergraduate higher education determinants would be different for the younger and for the older age groups of the observed persons.

In the probit model analysis, the statistical software package STATA 9.2 was used. In the analysis, the importance sampling weight for different observations units from the HBS sample were taken into account. The initial specification of the probit model were included all in the previous section presented variables. In the process of getting the best probit model we were step by step excluding some of the initially included variables. It turned out that some variables were endogenous, like the household member marital status (*MS*), and the

household member net personal annual income (*PI*), meaning that they do not explain the undergraduate higher education participation, but that they are explained by the undergraduate higher education participation. Some variables were statistically not significant or some were to strongly correlated with each other (multicolinearity). The final best fitting probit models for the undergraduate higher education participation, described as:

$$P(PH=1)=\Phi(\alpha + \beta_1 \cdot x_1 + \beta_2 \cdot x_2 + \beta_3 \cdot x_3 + \ldots + \beta_i \cdot x_i + \ldots + \beta_n \cdot x_n)$$

for both age sub groups and for the age group from 19 to 34 years old are presented in Table 1.

Table 1. Results for the probit models of the undergraduate higher education participation determinants.

Higher education participation determinants x_i	Marginal effects for undergraduate higher education participation		
	From 19 to 25 years old[*]	From 26 to 34 years old[*]	From 19 to 34 years old[*]
SEX	-0.1328 (0.000)	/	-0.1059 (0.000)
AGE	-0.0164 (0.000)	-0.0109 (0.000)	-0.0541 (0.000)
INTER	0.2957 (0.000)	0.0503 (0.000)	0.2768 (0.000)
OP	/	$-0.0446*10^{-6}$ (0.002)	$-0.0402*10^{-6}$ (0.020)
HAI	$0.0563*10^{-6}$ (0.000)	$0.0133*10^{-6}$ (0.000)	$0.0582*10^{-6}$ (0.000)
NHM	-0.0418 (0.000)	-0.0137 (0.000)	-0.0469 (0.000)
HEO	0.1811 (0.000)	0.0352 (0.000)	0.1775 (0.000)
Constant (β_0)	$\beta_0 = 0.4626$ (0.010)	$\beta_0 = 1{,}6858$ (0.000)	$\beta_0 = 2.5800$ (0.000)
Model	Younger	Older	All together
CDF	0.3077	0.0451	0.3642
N	10,376	10,007	20,383
Sign. of Wald χ^2	0.0000	0.0000	0.0000
Pseudo R^2	0.1641	0.1527	0.2852

Source: own calculations based on the HBS data collected from SORS using statistical software package STATA

Notes: *SEX*-household member gender; *AGE*-household member age; *INTER*-presence of the internet access in a household; *OP*- value of own production of a household (in SIT); *HAI*-household net annual total assets and income together excluding net annual personal income of the observed household member (in SIT); *NHM*-number of household members; *HEO*-higher education of others-presence of at least one household member with a higher education beside the observed household member; *CDF*-cumulative distribution function (probability that a reference person is participating in undergraduate higher education); N-number of observations; [*]significances of regression coefficients (β_i) are in the brackets

In the each row of Table 1, there is a value for the marginal effect and in the brackets is the p-value for the significance of the regression coefficient (β_i) of the corresponding determinant for all three age groups. The marginal effects are calculated for the reference person who is female (*SEX* = 0) and her age equals the lower margin of the corresponding age group (*AGE* = 19 or 26). The reference person household has no internet access (*INTER* = 0), has an average value of its own production (*OP* = aver.) and has an average net annual total assets and income together excluding net annual personal income of the observed household member (*HAI* = aver.). The reference person household has four members (*NHM* = 4) and it has in addition to the observed household member no other household member with higher education (*HEO* = 0). The averages always refer to the households of the observed household members in the corresponding age group.

The cumulative distribution function (*CDF*) tells the probability that a reference person is participating in the undergraduate higher education. N is the number of the observed

individuals. All the regression coefficients (β_i) of the corresponding determinants included in the three final probit models, are statistically significant, and they have the expected signs and the determinants are not endogenous or to strongly correlated with each other. Considering Wald χ^2 test, which is significant at 0.000 and considering pseudo R^2 in all the three models, these probit models proved to be the most appropriate. All the models also include a regression constant β_0.

The marginal effects in Table 1 explain the direction (the sign of the marginal effect) and the strength (the absolute value of the marginal effect) of the each determinant effect on the undergraduate higher education participation probability. They could be interpreted as elasticity or sensibility of the undergraduate higher education participation probability to a particular determinant unit change.

3.2. Marginal effects of the undergraduate higher education participation probability

Probit model for the age group 19-34 years

The results of the final probit models (Table 1) show that the most important determinants of the undergraduate higher education participation probability of the persons who are from 19 to 34 years old are *SEX, AGE, INTER, OP, HAI, NHM,* and *HEO.* In this analysis, 20,383 persons aged from 19 do 34 were observed. The probability that a reference person (a female who is 19 years old, whose household has no internet access, whose household has an average value of its own production, whose household has an average net annual total assets and income together excluding net annual personal income of this female, whose household has four members, and whose household has not have in addition any other household member with the higher education) is participating in the undergraduate higher education is 36.42%. However, this probability would decrease by 10.6 percentage points if the reference person were male. That probability would decrease by 5.4 percentage points if the reference person were one year older. If the reference person household had the internet access, that probability would increase by 27.7 percentage points. If the reference person household had its annual own production for 1 million SIT greater than the average annual own production of households whose members are from 19 to 34 years old, that probability would decrease by 4 percentage points. If the reference person household had its net annual total assets and income together excluding net annual personal income of the reference person for 1 million SIT greater than the average in that age group, that probability would increase by 5.8 percentage points. If the number of the reference person household members increased from 4 to 5, that probability would decrease by 4.7 percentage points. If the reference person household had beside the reference person at least one more household member with higher education, that probability would increase by 17.8 percentage points.

Probit model for the age sub group 19-25 years

When analysing separately two subgroups within the age group from 19 to 34 years, we found out that there are slight differences in the determinants of the undergraduate higher education participation determinants between these two sub groups.

The probit model for the sub group of younger individuals (who are from 19 to 25 years old) unlike the probit model for the whole age group (those aged from 19 to 34 years) does not include the value of own production of a household (*OP*). This determinant is obviously not significant in that model.

In this analysis, 10,376 persons aged from 19 to 25 years were observed. The probability that a reference person (a female who is 19 years old, whose household has no the internet access, whose household has an average net annual total assets and income together excluding net annual personal income of this female, whose household has four members and whose household has not have in addition any other household member with the higher education) is participating in the undergraduate higher education is 30.77%. However, this probability would decrease by 13.3 percentage points if the reference person were male. That probability would decrease by 1.6 percentage points if the reference person were one year older. If the reference person household had the internet access, that probability would increase by 29.6 percentage points. If the reference person household had its net annual total assets and income together excluding net annual personal income of the reference person for 1 million SIT greater than the average of households whose members are from 19 to 25 years old in that age group, that probability would increase by 5.6 percentage points. If the number of the reference person household members increased from 4 to 5, that probability would decrease by 4.2 percentage points. If the reference person household had in addition to the reference person at least one more household member with the higher education, that probability would increase by 18.1 percentage points.

Probit model for the age sub group 26-34 years

The probit model for the sub group of older individuals (who are from 26 to 34 years old) unlike the probit model for the whole age group (those aged from 19 to 34 years) and unlike the probit model for the sub group of younger individuals does not include a statistically insignificant determinant gender of an individuals (*SEX*). On another hand the probit model for the sub group of older individuals unlike the probit model for the sub group of younger individuals does include the value of own production of a household (*OP*). That means that this probit model is specified in a similar way as the probit model for the whole age group.

In this analysis, 10.007 persons aged from 26 to 34 were observed. The probability that a reference person (a person who is 26 years old, whose household has no the internet access, whose household has an average value of its own production, whose household has an average net annual total assets and income together excluding net annual personal income of this person, whose household has four members and whose household has in addition to the observed household member no any other household member with the higher education) is participating in the undergraduate higher education is 4.51%. However, that probability would decrease by 1.1 percentage points if the reference person were one year older. If the reference person household had the internet access, that probability would increase by 5 percentage points. If the reference person household had its annual own production for 1 million SIT greater than the average annual own production of households whose members are from 19 to 34 years old, that probability would decrease by 4.5 percentage points. If the reference person household had its net annual total assets and income together excluding net annual personal income of the reference person for 1 million SIT greater than the average in that age group, that probability would increase by 1.3 percentage points. If the number of the reference person household members increased from 4 to 5, that probability would decrease by 1.4 percentage points. If the reference person household had in addition to the reference person at least one more household member with the higher education, that probability would increase by 3.5 percentage points.

4. CONCLUSION AND POLICY IMPLICATION

Based on the results of the three probit models we find that the most important determinants, which are included in the probit model for the whole age group (from 19 to 34 years) are the internet access in a household (*INTER*), the higher education degree by at least one household member in addition to the observed household member (*HEO*), household member sex (*SEX*), household net annual total assets and income together excluding net annual personal income of the observed household member (*HAI*), household member age (*AGE*), number of household members (*NHM*), and value of own production of a household (*OP*). Both sub models for narrower age groups include the same specified determinants except one. The probit model for the younger group (from 19 to 25 years of age) does not include *OP* (value of own production of a household), and the probit model for the older group (from 26 to 34 years of age) does not include *SEX* (person's sex).

Obviously *value of own production* is not that important for the probability of participation in the undergraduate higher education of younger persons (who are from 19 to 25 years old), but it is a quite important in the age group of older persons (who are from 26 to 34 years old) as well as in the age group which embeds both sub age groups (from 19 to 34 years of age). In the last two mentioned age groups, the value of own production negatively affects the undergraduate higher education participation probability. The higher the value of own production, the lower is the undergraduate higher education participation probability. Higher value of own production might mean that a household is more agrarian and rural with more traditional style of living and more away from the university cities. Consequently it faces greater cost of accommodation and transportation when a household member from such a household wants to participate in the undergraduate higher education. Regardless whether the reason for a greater value of household own production is a result of own food production or own home craft, the higher value of own production means higher opportunity costs of participation in the undergraduate higher education and lower relative expected benefits. Household members living in such households are giving up their contribution to the own production of its household, when going to participate in the undergraduate higher education. On another hand, the benefits of higher education might be lower for them due to the nature of their environment, their way of living especially in terms of their own production. Therefore, higher education might play a much less important role for a household with own home craft or own farm, than for other households, thus it is much less beneficial. However, when analysing younger persons, the value of own production is not a significant determinant, probably because, younger persons are usually relatively much less involved in own production of their household, compared to their older household members, regardless the level of household own production.

Persons's sex seems not to play any special role in the probability of participation in the undergraduate higher education of persons, who are from 26 to 34 years old. But it plays an important role in the sub age group of those who are from 19 to 25 years old as well as in the age group which embeds both sub age groups (from 19 to 34 years of age). In the last two age groups female are obviously more prone to participate in the undergraduate higher education. This might be due to the differences in a female and male nature of employment and also due to the socio-economic changes in the last decades, resulting also in a changing personal and social value-scale.

The greater the *age of the observed household participant*, the lower the undergraduate higher education participation probability. Obviously is the probability of participation the highest

when a person is around 19 years old (when he leaves the secondary education) and is decreasing when the person is getting older.

When the *number of household members* is greater than four, then decreases the undergraduate higher education participation probability of the observed household member. This might mean that increasing the number of household members over four could result in worsening the financial capability of a household and its living standard. On another hand the decreasing undergraduate higher education participation probability might be a result of a fact that in bigger families it is more plausible that at least one of the observed children is a bit older. Obviously the probability of participation in the undergraduate higher education for older people is lower than for younger people.

The household net annual total assets and income, excluding the net annual personal income of the observed household member, measures a household financial capability and socio-economic standard. The higher the value of this variable, the higher the undergraduate higher education participation probability. While participating in the undergraduate higher education, a household member must cover different kinds of study costs, which are much easily covered if the household assets and income are higher. The net annual personal income of the observed household member is excluded from all the household assets and income, since it is an endogenous variable, which depends on the participation states in the undergraduate higher education. Especially for the observed age group of the individuals who are from 19 to 34 year old.

The higher education of the other household members or *the presence of at least one household member with a higher education in addition to the observed household member* is a variable, which divides the households into the two groups. Into those, whose members do not have a higher education, and into those with at least one household member that has a higher education, not taking into account the observed individual. If there is at least on more household member (in addition to the observed individual) who has a completed higher education, the undergraduate higher education participation probability of that individual increases substantially. So that variable has a strong positive impact on the undergraduate higher education participation. Apparently a general atmosphere, a household value-scale, a way of thinking, and an attitude to the higher education in a household where there is at least one household member who already possesses any kind of the higher education, is such that it stimulates the undergraduate higher education participation of the observed household member.

Based on the results of all the three probit models, *the presence of the internet access in a household* has the most significant and positive association with the undergraduate higher education, regardless the age group. This is a result of at least three different consequences of the internet access in a household. First, this implies better, faster, more up to date and more accurate information, and especially about the higher education study programs, their location, duration, quality, requirements, and specific benefits resulting from the acquired undergraduate higher education in terms of competitiveness on the labour market. Second, this also implies better communication possibilities. The internet access offers numerous possibilities of fast, quality, and cheap two-way or conference communication globally through e-mail, different kinds of internet forums and blogs, chat rooms, free phones, on-line conference rooms, and video communication. Third, the internet users are also better skilled in use of several computer programs compared to the non internet users or without computer at home. Many of those, who do not have the internet access, also do not have the computer.

All the three mentioned factors for the presence of the internet access at home help at getting the best possible information when deciding for the higher education and offer a tool as well as stimulate abilities which are an advantage while studying at the university level.

The results provide important policy implication to help make the information technology and internet possibility even more accessible for every household. However, the responsibility for that policy lies not only on a government, but also the private sector, which takes most of the higher education benefits. The positive effects of the internet access, computerisation and informatisation of households are found important for the undergraduate higher education participation.

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TRANSITION, TRANSITION PROGRESS AND GROWTH

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1. INTRODUCTION

From the very beginning of the transition process there was a puzzled question how and when transition economies may be regarded suitable to join the world of the developed market economies. For the European transition economies the question was particularly interesting since the majority of them have been counting on the accession to the European Union. Nonetheless the question was important for the economies that were acting aside of European continent since their aim was to catch up the level of developed economies of the world with an idea to perform at a higher level and to provide their population with a higher and desired standard of living.

The architects of the transition process were persuasive and were confident that the process would not take much time while the results would be satisfactory on a broad scale and in a relatively short run. They had introduced a certain set of measures and policies that if carried out accurately would lead those economies into the system of good and effective performance in a relatively short period. Recalling these opinions we have to point out the seminal analytical papers on the issue like the two presented by de Melo *et al.* (1996, 1997) which had to confirm that countries faster in reforms perform better in terms of their GDP *per capita* level and that proper policies can overpass some deficiency in starting positions of those countries, particularly if there was a strong commitment regarding new policies and if there was a decisive policy in their persistent implementation (which in turn and non-surprisingly happened just among those countries that were faster in reform promotion). These papers together with some other findings (Sachs, 1996) seemed to provide important arguments in favour of the idea that the speed of transition matters and that the reforms should be implemented as fast as possible which would be awarded by higher growth rates and faster recovery from transition recession.

However, further studies showed that the issue of velocity in carrying out reforms is not that straightforward. A number of authors including some who have agreed with de Melo[1] and others who expressed some doubts about the conclusions presented[2] found that the speed of transition and the quality of new institutions cannot be separated from the inherited conditions. Moreover, the speed of reforms, transition progress as well as performance of a transition economy appeared to be largely dependent on initial conditions of a country in question as well as on institution building. The finding cannot be taken as a brand new idea: it

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[1] Like: Krueger and Ciolko (1998), Heybey and Murrell (1999), Havrylyshyn and Rooden (2000)
[2] Like: Popov (2000), Stiglitz (2001), Ellerman (2003); an author of this paper also took part *v.* Cerovic (2000).

is mostly known that on a spoiled peace of land the harvest won't be very abundant – unless a certain amount of investment in cultivation is spent.

The debate on whether the speed of transition progress – depending on the willingness of policy makers to follow projected policies – is crucial for economic performance or the speed of reforms should be seen as an endogenous variable depending on inherited, pre-reform initial conditions has attracted attention of the authors of this paper. Moreover, some analytical results that have been pointing out how transition economies perform in an unexpected way concerning traditional growth models were also provoking. In this paper we try to examine some of these findings and to examine the questions on what determines transition progress, what transition progress could add to growth of a certain transition economy and how transition economies behave regarding established growth models. The last question seems particularly interesting because it gives the field where one should find the answer on catching up problems of transition economies.

The plan of the paper is the following. In the first two parts we shall try to examine the present state of art regarding transition progress. The analysis will show why transition is not that easy and that speedy process as it has been predicted on the eve of transition. We shall also examine what forces command the process and what is the influence of the initial conditions and to what extent we may look at the transition process as an endogenous phenomenon. In these two sections we shall largely rely upon our previous paper (Cerovic & Nojokovic, 2008) in order to make our further arguments more clear. In the following parts of the paper we shall try to examine what influence and/or determines growth of a transition economy. The two topics will dominate the remaining two sections of our study: firstly, how much faster implementation of transition reforms can affect growth and is it a general rule or is it just valid for the initiating period of transition process (having in mind what part of transition reforms can be conducted according to the initial conditions and institutional heritage of a country), and secondly, what are the specificities of transition growth when assessed by the established growth models. For that reason we shall try to examine what transition progress can add to the country's growth (and how long it has some effect) and how growth in transition economies deviates from the route predicted by known growth models or is it a long term deviation.

2. MEASURING TRANSITION PROGRESS

There are several well developed criteria for measuring transition progress – starting from World Bank's Composite Liberalisation Index to European Bank's (EBRD) nine indicators that became particularly popular in past years thanks to their systematic publication and presentation. Referring to the latter ones we can observe that the range of the EBRD indicators goes from 1 for no change to 4+ (or 4.33) for 'as if' a developed market economy. Thus, the path that has to be passed by a transition economy in terms of a sum of all the nine indicators[3] range actually from 9 to 38.97 (4.33 x 9, or 39). In other words, a country has to earn on its transition route some 29.97 (or 30) points as measured in compliance with the EBRD methodology[4]. Starting from this conclusion and according to the EBRD

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[3] The nine EBRD indicators are: small scale privatisation, large scale privatisation, enterprise reform (governance and restructuring), price liberalisation, trade and foreign exchange system, competition policy, banking reform and interest rate liberalisation, securities markets and non-bank financial institutions and infrastructure reform.

[4] This new and convincing way of reasoning we took from Nuti (2008). It should be mentioned that percentages in calculating transition progress have been used previously by Gabrisch and Hoelscher (2006, see: p. 9) but it seems that they did not subtract initial nine points from their calculations.

assessments for all transition countries in 2007 (EBRD 2007) in our previous paper (Cerovic & Nojkovic, 2008) we have defined another measure that shows how far transition economies are from the aimed market model after around 18 years of transition. We have calculated position of each economy on the transition path in terms of percentage points provided 0% represents their starting position (no reforms) and 100% depicts a fully developed market economy[5]. The obtained assessments are in the following table (Table 1):

It can easily be remarked that only eight countries (28% from 29 observed), according to the EBRD methodology, have accomplished reforms by 75% (or more) of the intended developed market economy structure. Among them only two countries are close to the 90% threshold (Estonia and Hungary) and one of them has just overstepped the 75% line (Croatia). Further on, 13 countries enter the range 55%-75% in accomplishing reforms, ten of which are in the range 55%-65%. Below 55% there are eight countries[6].

However, the most important result is that the presented figures portray the present outcome of transition process after nearly two decades since recommended transition policies have been claimed. One can remember how the time horizon for a full reform was explained to be close at that time ('jump over a chasm in one leap') including some apparently cautious forecasts of not more than approximately ten years.[7] After 18 years (what a leap which lasts that long!) it appears that transition process is much more demanding, that it depends on many various and not yet fully recognised factors and definitely is not merely a matter of strong or weak willingness and commitment among policy makers within transition countries.

Table 1. Transition Progress in % (authors' calculation based on the EBRD indicators)

Country	EBRD 2007	Progress (%)
Albania	26.66	58.92
Armenia	27.99	63.36
Azerbaijan	23.67	48.95
Belarus	16.66	25.56
Bosnia and Herzegovina	24.34	51.18
Bulgaria	31.34	74.54
Croatia	31.66	75.61
Czech Republic	34.32	84.48
Estonia	35.33	87.85
Georgia	27.66	62.26
Hungary	35.33	87.85
Kazakhstan	27.01	60.09
Kyrgyz Republic	26.33	57.82
Latvia	32.66	78.95
Lithuania	33.32	81.15
Macedonia, FYR	28.32	64.46
Moldova	26.66	58.93
Mongolia	26.99	60.03

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[5] The calculus is very simple: we divide the sum of the EBRD indicators (minus nine) for each country with 29.97 multiplying the result by 100 to get percentage points.

[6] The relative progress of the countries is not that transparent if we calculate it directly from the EBRD indicators since the EBRD indicators present a more beautiful picture on reform success: an example of a country with, say, 20 EBRD points, seems to show that this country have passed already a half of its way to a market economy; in reality it has left behind just a bit more than a third of that route (this difference is due to the fact that the EBRD indicators donate nine points before any change was taken).

[7] Fischer and Gelb (1991); one may also recall Dornbusch's allegoric 'seven days' (1991).

Country	EBRD 2007	Progress (%)
Montenegro	24.67	52.29
Poland	33.99	83.38
Romania	30.67	72.31
Russia	27.33	61.16
Serbia	25.01	53.42
Slovak Republic	33.66	82.28
Slovenia	30.33	71.17
Tajikistan	21.33	41.14
Turkmenistan	11.67	8.91
Ukraine	27.00	60.06
Uzbekistan	19.35	34.53

Source: EBRD 2008

It is obvious that expectations about the speed of reforms have not been confirmed; it is more plausible that some other forces – neglected at the beginning of transition – play an important role. This brings us again to the issue of endogeneity of transition progress and to the role of initial conditions, inherited level of development and of institutional capacity in conducting reforms.

3. TRANSITION PROGRESS AS AN ENDOGENOUS VARIABLE

The endogenous character of transition progress basically refers to inherited initial conditions within a country. There are several groups of these pre-transition conditions among which the two groups dominate: (a) level of development in terms of the GDP *per capita* together with macroeconomic conditions, or rather distortions and (b) the inherited level of institution capacity including experience in governance of a market oriented economy or at least in some deeper reforms within the preceding economic system. Since the data are usually lacking it is relatively difficult to fully assess initial conditions although some attempts have been made[8].

Having this in mind, we have examined the impact of the following variables on transition progress (TPROG, in terms of percentage points as explained above): (i) value (in US$) of the GDP *per capita* in 1989 expressed by purchasing power parity (GDP1989), (ii) dummy variable stating whether a country had deeper market oriented reforms during communism or not (MREF), (iii) number of years of communist rule in an economy (INST1), (iv) black market premium in exchange rate compared with the official one in 1990, that is on the eve of transition (INST5), which is used as a proxy for various macroeconomic distortions.[9]

In the paper we refer to, we have tested a set of regression equations in order to estimate how long and how much initial conditions influence reforms. We made several models for the

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[8] As to initial conditions already in seminal papers of de Melo *et al.* one can meet a set of indicators for macroeconomic inherited surroundings and even for some institutional variables. Further on, there were attempts in collecting additional data (e.g. Campos (1999), Moers (1999), Fischer and Sahay (2004), Roland (2007)).
[9] In a chronic lack of data for transition economies we used for variables (i), (iii) and (iv) the results published in de Melo *et al.* (1997) and for variable (ii) we put a dummy stating that former Yugoslav countries, Hungary and Poland had some experience with market oriented reforms (represented by the value 1 and 0 for the others).

years 1998, 2001, 2004 and 2007[10]. Here we shall reproduce the results for the 2004 and 2007 only[11]. The results obtained are presented in table 2.

The most impressive result obtained was that initial conditions, whatever their composition might be in different specifications, permanently and significantly influenced transition progress. Moreover, the explanatory power of the models in terms of adjusted R^2 does not diminish over time necessarily (contrary to the expectations of de Melo *et al.*). For instance, equation 2 with the initial GDP and INST1 increases the impact of initial conditions over time until the period beyond 2004. This is not surprising: the countries that were longer under a planned economy like the countries from the former USSR (that stayed longer under this regime in comparison with the other countries) did not have any remarkable experience with market economy neither under communist rule nor in the preceding history.

Table 2. Independent variable: TPROG (2004, 2007)

Variable	TPROG 2004			TPROG 2007		
	Equ. 1	Equ.2	Equ. 3	Equ. 1	Equ. 2	Equ. 3
constant	42.6856	93.6131	56.2956	46.3134	98.5921	59.5460
	[7.6858]*	[11.7324]*	[7.2607]*	[7.9727]*	[12.2304]*	[7.6300]*
GDP1989	0.0034	0.0028	0.0034	0.0032	0.0026	0.0033
	[0.0014]**	[0.0009]*	[0.0012]*	[0.0014]**	[0.0010]*	[0.0013]**
MREF	11.8103			11.1888		
	[5.5193]**			[0.2838]***		
INST1		-0.8068			-0.8298	
		[0.1841]*			[0.1917]*	
INST5			-0.0973			-0.0948
			[0.0307]*			[0.0325]*
R^2 (%)	32.0	65.5	46.4	28.4	64.2	42.1
Adj. R^2 (%)	25.2	62.1	41.0	21.2	60.6	36.3
DW statistics	1.92	1.77	1.76	1.93	1.85	1.81
N	23	23	23	23	23	23

Robust standard errors are given in parentheses; * denotes statistically significant at 1% level, ** denotes statistically significant at 5% level, *** denotes statistically significant at 10% level.

According to the results obtained we may conclude that the hypothesis on the impact of initial conditions on transition progress of a country has been confirmed and that this influence of economic and institutional heritage lasts much longer than it was predicted at the beginning of transition and in the first transition advancement analyses.

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[10] We may add here that we have estimated a set of additional equations for the same period that includes some other variables describing various initial conditions as publicised in both papers of de Melo *et al*. In doing so we have discovered that many of them influence transition progress for a long period. For example in an equation that takes TPROG as a dependent variable on 15 indicators for initial conditions, eight of them (three structural indicators on industry, agriculture and services share in GDP, location, foreign trade dependence, number of years under communist rule, the status of a country – centralised or relaxed federation or a single country – and share of exports in GDP) proved to be significant for 1998 and 2001 (all at 5%), whereas for 2004 and 2007 the structural indicators are just below of the confidence interval at 10% (around 10.5) and only one – trade dependence – was fully rejected (the remained variables stayed significant at 5%) . In all estimated models the adjusted R^2 was between 61-66%. However, represent the models from Table 2 since the variables used in the equations better represent something of the institutional heritage than the others.

[11] Other results have been presented in our paper already quoted (Cerovic & Nojkovic, 2008)

4. TRANSITION PROGRESS AND GROWTH

The next step in our analysis will be directed towards the relationship between transition progress and growth. As stated in the papers of de Melo *et al*. (1996; 1997) the performance of a transition economy should depend on the implementation speed and/or completion of reforms. Indeed, the same result we have got in a series of our papers that were dealing with the earlier stages of transition. Recently, in assessing the current transition progress of Serbia (a typical late transition economy) we have tested again a set of growth models that were depending on transition progress as well as on some inherited conditions and macroeconomic indicators, for a group of 23 transition economies (Cerovic & Nojkovic, 2008a, pp. 34, 35).

Thus, for example in a regression equation[12] for 1998 and 2001 taking *per capita* GDP for performance to be dependent on (a) GDP *per capita* from 1989, (b) transition progress measured by squared sum (squared in order to capture *U* shaped transition growth) of the EBRD indicators, (c) a dummy − whether a country had deeper market oriented reforms or not, (d) average rate of inflation from 1994 (to avoid the first unstable years of transition), (e) a dummy for budget deficit − 1 for under 5% of the GDP and 0 otherwise, we obtained the results which have confirmed that transition progress matters (significant at 5%), as well as all other variables (except for budget deficit in 2001)[13] with a high explanatory power (adjusted R^2) at around 79.5% level.

The most interesting result, however, was the one concerning the initial, pre-transition performance level i.e. GDP from 1998. The sign of this variable was positive suggesting that more developed countries performed better in terms of their GDP growth. There are two intriguing problems relating to this finding. Firstly, this is in sharp contrast with accustomed growth models which suggest the poorer countries should growth faster and in doing so can catch up developed economies. This has already been remarked (see: Campos, 2001; we shall comeback to this question later on). The second intriguing point is that we know from above presented analyses how initial conditions affect transition progress: better developed transition economies have higher potential for faster reforms. Now, if faster reforms push up performance and if better developed transition economies perform better under transition we can come to an idea that only these economies can successfully pass transition process or at least at lower costs in terms of growth losses. Accordingly, we may put a question what should be understood as a successful transition in terms of growth if we have remarked that initial conditions influence the length of transition path i.e. reforms implementation.

For that reason we shall try to compare real achievements of transition economies in reforms conducted with their real GDP indices for 2006 (according to EBRD, 2007, p. 35). In table 3 we put together these figures as well as figures of fitted values for transition progress based upon our findings presented in table 2 of this paper. This can ease our assessment whether a country, in reforming its economic structure, did as much as it could since transition progress appeared as an endogenous variable.

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[12] Actually we have tested more equations with or without some of the variables used in this specification and the results were similar to those that we quote here.
[13] In the 1998 equation inflation rate and budget deficit were significant at 10%.

Table 3. Transition progress in 2007 - real and fitted values (in %) and GDP index 2006[14]

	Real values	Equation 1: Fitted values	Equation 2: Fitted values	Equation 3: Fitted values	GDP index 1989=100
Albania	58.92	50.85	63.29	60.01	143
Armenia	63.36	64.23	54.29	60.30	126
Azerbaijan	48.95	61.28	52.71	57.32	136
Belarus	25.56	69.03	57.37	65.14	135
Bulgaria	74.54	62.52	76.12	67.17	101
Croatia	75.61	77.50	76.72	79.47	105
Czech R.	84.48	74.18	86.46	85.92	130
Estonia	87.85	75.15	79.78	71.32	145
Georgia	62.26	64.43	55.27	60.49	53
Hungary	87.85	79.57	81.73	81.38	134
Kazakhstan	60.09	62.94	53.23	58.99	125
Kyrgyz R.	57.82	56.62	48.08	52.61	87
Latvia	78.95	74.15	78.97	70.31	113
Lithuania	81.15	67.15	73.26	63.24	108
Macedonia FYR	64.46	68.50	68.56	70.39	91
Moldova	58.93	61.45	68.61	57.50	49
Poland	83.38	74.19	78.18	73.76	158
Romania	72.31	57.56	72.91	63.99	113
Russia	61.16	71.33	57.58	67.46	93
Slovak R.	82.28	70.94	83.82	82.65	137
Slovenia	71.17	87.31	84.73	89.38	141
Ukraine	60.06	64.72	52.19	60.79	63
Uzbekistan	34.53	55.19	46.92	51.17	137

Looking at the table we can easily realise that, a big majority of the countries behave in accordance with expected i.e. fitted values while only few countries distinctly deviate from their fitted route. Actually, there are only two countries, which are considerably away from the fitted percentage – Belarus and Uzbekistan. Although Belarus has never claimed that it was following the common transition path, it is remarkable that both countries, despite their poorly assessed transition progress, achieved the GDP index which is comparable or even higher than in some countries usually quoted as champions of transition reforms – like Hungary[15]. Although we cannot claim the two countries have chosen the best available ways of their development we may conclude that, for the time being at least, they found a certain trade off between GDP growth and (non-pursued) transition agenda.

The second remarkable point that appears from the data in table 3 is that some countries seem to perform better in terms of their transition progress than their fitted values would suggest. According to the data presented there are countries that almost systematically show a noticeably higher transition progress than the calculated (fitted) one, like Estonia, Hungary, Lithuania and Poland in the first place. These countries have high EBRD assessments for achievements in transition and these assessments go together with high GDP indices in

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[14] The table is firstly published in our previously mentioned paper (Cerovic & Nojkovic, 2008).
[15] Another example of this kind is Turkmenistan, which is not taken into our sample due to an unrecoverable lack of data, with the GDP *per capita* index at the level of 177 – the highest one among all countries surveyed in the EBRD reports (see: EBRD, 2007).

Poland, Estonia and Hungary[16] which however, is true for Lithuania to a much lesser extent. On the other hand there are countries – like Slovenia known for its gradual and partially original approach to transition policies – that are systematically below the fitted values but nevertheless very convincing by the GDP index. What might be the reason for this divergence?

Traditionally and following de Melo *et al.* one might state that the policy set up in a country could be an explanation for some of these discrepancies. If the actual transition progress of a country is above the corresponding fitted value, we may think of this policy as a particularly good one and the contrary if the result of a country stays below the related fitted value. However, we may also assume that in some cases and for the countries that are above the fitted values, the EBRD assessments – that stay behind our percentage figures – have been possibly overestimated while underestimated in the case of countries that stay below their fitted values for transition progress. Moreover, we can doubt whether the value of the EBRD indicators is particularly high for those countries that more strictly follow recommended transition policies and too low for those that exhibit a certain degree of originality, but this could be left for another discussion.

On the other hand we may conclude that according to the figures presented and – as already stated – transition process is still in progress and is not close to its end. Although at the beginning there was an idea of a close horizon which designates the accomplishment of reforms we have seen that after almost two decades many countries remain very much behind of the projected goal. The point is that this misjudged period has direct consequences on performance: if transition process had to be fast the corresponding transition recession and the corresponding *U* shaped GDP growth curve should be short and shallow. Since this is not true transition recession including the subsequent recovery might last much longer and induce considerably higher costs than expected.

Indeed, looking at the countries' performance we may easily remark that only ten countries after 18 years of transition efforts have passed the limit of 130 in their GDP indices (base year: 1989), or that their real GDP has been augmented 30% or more over the observed period. Surprisingly enough, among those countries there are only three that have been assessed as frontrunners in transition progress (Poland, Estonia and Hungary) and are above the fitted values for transition progress. The other three countries (Albania, Czech Republic and Slovakia) are – more or less – at their fitted levels of transition progress. The remaining four countries are those that are lagging behind the fitted values but are not of the same kind – here we find Slovenia, the EU member and the third successful transition economy according the GDP index, although with a lower assessments for transition progress in comparison with the fitted values, but we find also the three former USSR republics – Azerbaijan, Belarus and Uzbekistan that are on the low level of transition progress as well as below their fitted achievements (the reason of which differs across those countries). All the other countries are below the 130 line and among them six are still under the 100 level or, after 18 years, still under impact of transition recession. Among those remaining countries there are two only that

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[16] Ironically enough, the two countries from this group – Estonia and Hungary – experience significant troubles in recent period: Estonia is in recession from 2008 with a double digit inflation and with an external debt of around 115% of the GDP (*v.* Eesti Pank, 2008) whereas Hungary was recently subject to a $25 billion rescue package delivered by the IMF, EU and World Bank and is still in a critical condition.

could be assessed as the ones which are lagging behind their fitted transition progress and whose poor performance could be ascribed to ineffective policies of their governments[17].

Motivated by these facts we came back to our previously defined relationship between transition progress and performance. Using together the figures for real achievements in transition progress in 2007 (as assessed by the EBRD and re-calculated into percentage points – as presented in Table 1) and performance measured by the real GDP indices for 2007 (EBRD, 2008a, p. 13, Table A.1.1.1.) we have obtained a striking and fully unexpected result: correlation coefficient between the two series appeared insignificant and yet negative or precisely $r = -0.0335$ ($p = 0.8629$)!

As one can remark this result is in sharp contrast with expectations of de Melo *et al.* (1996, 1997, as well as those of Sachs, 1996 and Fischer *et al.* 1996) suggesting that transition progress does not influence performance of a transition economy in a longer run (or in turn, if it did the effect would be unfavourable in terms of growth!). At its best we may conclude that transition progress has to do something with growth and can support growth in the first years of transition process but becomes irrelevant after a while or – according to our results presented in the first part of this section – it is becoming irrelevant after approximately ten years since transition reforms have started.

5. TRANSITION PECULIARITIES ABOUT GROWTH

Summarising our previous results we may conclude that in the first period of transition there are some regularities in relationship between transition progress and growth: transition progress stimulate growth but is itself an endogenous variable that depends on initial conditions including the achieved level of GDP in the pre-transition period. For that reason transition economies exhibit peculiar behaviour when compared with traditional long run growth models: it seems that more developed economies perform better and grow faster. Since transition progress does not influence performance in the same way in later years of transition – whereas transition process is still ongoing and is not approaching its end in majority of the countries, at least not in the way it was designed – it could be interesting to analyse whether transition economies demonstrate observed peculiarities in current phase that is, at the end of the second decade of transition.

As it is well known the growth literature has generated several models that should explain and/or identify robust empirical relation for economic growth. The one frequently quoted is Levin and Renelt (1992) specification which suggests that initial level of *per capita* income, rate of population growth, the level of human capital and share of investments in GDP are key determinants of growth of an economy. Specifically, investments and human capital are expected to be positively related to growth, while initial income and population growth are expected to be negatively related to growth.

As mentioned in a previous section Campos (2001) tried to employ some of these models in analysing transition economies. Among them he used Levine and Renelt model to examine growth pattern in 24 transition economies covering the period from 1989 to 1998. Surprisingly, among these variables that have been identified as the long-run determinants of

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[17] Among this group of countries we find Russia, a country that has somewhat deteriorated according to the EBRD indicators for transition progress after the year of 2000, but was performing better afterwards in terms of its GDP.

growth, in the sample of transition economies only few were statistically significant. The signs for initial income per capita, population growth and secondary education were opposite to what we should expect. The coefficient on investments became statistically significant at the 10% level only when baseline model was augmented by including CIS dummy variable for the countries from the former USSR, which had a negative sign, as expected and was

Table 4. Levine and Renelt specification – estimation results: Dependent variable: average annual GDP growth rate[18]

	Transition 1999 – 2007	(Campos, 2001) Transition 1990 – 1998	(Campos, 2001) Non-transition 1990 – 1998
Constant	-3.62 (8.400)	-7.02** (3.150)	1.32 (1.03)
Initial income *per capita*	-0.001** (0.000)	0.0005 (0.000)	-0.0016 (0.007)
Secondary education	0.015 (0.091)	-0.007 (0.074)	0.003 (0.012)
Population growth	0.451 (0.676)	1.570 (1.160)	-1.09* (0.264)
Investments	0.374* (0.099)	0.163*** (0.092)	0.102* -0.023
CIS dummy	2.021** (0.723)	-5.54* (1.640)	
Adjusted R-squared	0.429506	0.4405	0.309
N	25	24	115

Robust standard errors are given in parentheses; * denotes statistically significant at 1% level, ** denotes statistically significant at 5% level, *** denotes statistically significant at 10% level.

statistically significant. Compared with the result obtained by traditional growth accounting, it is found that Levine and Renelt approach performs poorly in transition context. According to Campos (2001), econometric and data problems seem much less sever than the structural difference remaining after almost a decade of transition.

Following Campos (2001) we re-estimated specification from Levine and Renelt with cross-sectional data of 25 transition economies for the subsequent period from 1999 to 2007. In table 4 we report estimation results obtained together with the results obtained by Campos (2001) both for transition and non-transition economies.

As stated above the re-estimated Levine and Renelt coefficients are mainly insignificant for transition economies and for the period 1989-1998 as presented in Campos (2001). However, in the subsequent period 1999-2007, according to our calculations presented in the first column of Table 4 there are some new evidence. Basically our findings indicate the following:

- – Initial income per capita has an expected sign and is statistically significant (contrary to the preceding period);

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[18] Data definitions and sources:

Variables	Definition	Period	Sources
Dependent variable	GDP growth, annual, %	1999-2007	EBRD (various years)
Initial income per capita	GDP per capita, current dolars	1998	EBRD
Secondary education	Gross secondary school enrolment, %	2000-2006	UNICEF
Population growth	Popiulation annual growth rates, %	2000-2006	UNICEF, WDI
Investment	Investment/GDP, %	1999-2007	EBRD (various years)

- Investments have an expected sign and became more significant in comparison with the preceding decade;

- Secondary education remains statistically insignificant but with an expected sign (contrary to the preceding period);

- The sign for population growth coefficient remains opposite to what we should expect and is not significant[19];

- The CIS dummy remains significant, but – surprisingly – with a positive sign (meaning that CIS countries experienced larger output increase than the ones in Central European economies in the second decade of transition despite their lower assessments for transition progress).

We may conclude that transition economies still remain structurally different from other market economies at comparable levels of *per capita* income after almost two decade of transition. This gives new evidence regarding the transition path that every transition economy has to pass which appears much longer than predicted and this is in accordance with the data presented in our Table 1. On the other hand we may conclude that over time and in comparison with the results obtained in non-transition countries, the Levin and Renelt approach start to perform better in later years of transition process or at least in the years when transition economies have managed somehow to adjust to the new economic environment and new economic settings.

Finally, comparing the results obtained by Campos in the first decade of transition with the results we have obtained for the second one we may conclude that the peculiar growth pattern under transition has blocked a good number of poorer economies that followed transition in their attempts to catch up more developed countries at least for a decade. Since the initial conditions of these economies did not support fast and radical change toward a model of a developed market economy they could perform better under less aggressive institutional adjustments and with persistent but slower institution building, which is necessary for an effective market economy.

6. CONCLUSIONS

Re-calculating the EBRD assessments for transition progress into percentage points we have shown that transition process is still an ongoing process in a vast majority of transition economies and is far from its projected end. This is in sharp contrast with predictions and expectations at the beginning of the process.

Moreover, this prolonged course of action is perfectly explainable when transition progress is seen as an endogenous variable that depends on initial conditions of a transition economy. According to the analysis conducted the former hypothesis concerning the impact of initial conditions on transition progress has been confirmed. The obtained results show that the

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[19] This unusual result probably is connected with the general climate of a transition economy: if there is some growth and better performance the standard of living is better and population growth is higher. However, in many transition economies population growth was stopped due to deterioration of living conditions and even a high mortality rate was sometimes related to certain transition policies like mass privatisation (see: Stuckler *et al.* 2009).

influence of economic and institutional heritage of a country lasts much longer than it was predicted at the beginning of transition and in the first transition advancement analyses.

A prolonged transition produces direct effects on growth: if transition process had to be fast the corresponding transition recession and the corresponding *U* shaped GDP growth curve should be short and shallow; since this is not the case transition recession including subsequent recovery should last much longer and induce higher costs than it was expected.

We have shown that in the first years of transition the progress achieved in reforming the economic structure of a country may add to country's performance. In the longer run this effect fades out and currently there is no connection between performance and transition progress (even if it could influence growth it would be an unfavourable impact regarding the negative sign of correlation coefficient between the two series).

The initial impact of transition progress in the first phase of transition appears as an unexpected outcome from the standpoint of traditional long term growth models. Since faster transition progress depends on higher initial level of development and other favourable initial conditions of a country this will favour better developed countries to attain higher GDP growth rates.

Analysing the Levine and Renelt model we have shown that in a later phase of transition that is, in the second decade of reform implementation the model performs better and does not exhibit some of the peculiarities observed during an earlier transition phase: more specifically, higher rates of growth are not anymore associated with high initial GDP level. However, this peculiar sequence of events could be a new argument that forced and quick transition – above all in the countries that do not have necessary prerequisites for fast reforms concerning their initial conditions – may harm growth abilities of these countries and divert them from catching up route making their growth slower and weaker than necessary at least for a decade.

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ECONOMIC GOVERNANCE AND COMPETITIVENESS: SOME EVIDENCE FROM CROATIA AND THE NEW EU MEMBER STATES

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1. INTRODUCTION

This paper examines to what extent the economic governance mechanisms and the quality of institutions determines the level of the country's economic competitiveness at both macro and micro levels. We start from the assumption that EU institutional arrangements and policy orientations define the regime and framework of economic governance, We focus on comparative experiences of selected EU new member states from Central and Eastern Europe (Czech Republic, Hungary, Slovakia and Slovenia) and Croatia which is a candidate country in accession process to the EU.

As for the methodology used to measure and benchmark the competitiveness and the quality of institutions and economic governance mechanisms, we rely on data and findings of the Executive Opinion Survey conducted for the World Economic Forum, which is published in the Global Competitiveness Report from 2004-2008. The analyses of economic governance and its impact on the level of country competitiveness and enterprise sector will especially lean on analyzing the WEF Survey findings and composite indicators on some institutional issues such as government efficiency in delivery of policy goals; property rights protection; corruption and corporate ethics.

2. THE EU ECONOMIC GOVERNANCE MECHANISMS AND UNDERPINNING INSTITUTIONS AND POLICIES - BRIEF SNAPSHOT ON CONCEPTUAL AND POLICY FRAMEWORK

The quality of economic governance mechanisms in different EU member states vary significantly in accordance to their current orientations in national policy-making as well as to what extent the coordination, convergence and "Europeanization" of national and sub-national governance systems towards commonly agreed and supranational ones (Economic and Monetary Union) was implemented. The number and type of EU economic governance mechanisms vary accordingly across the member states (Scharpf, 2001, Marcussen, 2006; Marcussen 2008; Umbach and Wessels, 2008; Linsenmann et al, 2007) and the accomplished

convergence and policy "Europeanization" levels so far are rather uneven. This refers especially in the case of the new EU members from CEE but also to candidate countries under "pressure of Europeanization" and policy transfer prior to accession (Lippert, Umbach and Wessels, 2001; Lippert and Umbach, 2005).

The current EU economic governance regime and practice as well as underpinning institutional framework reflects to a great extent the prevailing "soft" coordination methods as apart from the monetary policy, most economic policies remain in the competence of national policy-making. For that reason, the current economic governance mechanisms have leaned more towards the regime of soft intergovernmental coordination than implementing efficient and harmonised EU-wide mix of economic and social policies. The current economic governance also reflects divisions among member countries regarding functions of state and markets that is also present in economic theory and policy practice (Begg, 2008; Marcussen, 2006; Dyson, 2002; Umbach and Wessles, 2008; Dahausse, 2008).

In this paper we focus on how all these affects the country competitiveness. The issues of economic governance and competitiveness are very much interrelated notions as they reflect well the general level of efficiency of an economy as a whole and especially of the business sector. In the EU context, two levels of economic governance do affect the level of country competitiveness: domestic economic governance mechanisms (policies and institutions) and the EU economic governance mechanisms for both member states and acceding countries such as Croatia. Additionally, at the country level, macroeconomic and microeconomic policy mix and governance mechanisms have a direct impact on their domestic and international economic competitiveness.

Apart from the institutional framework that determines the general rules and code of conduct of market actors, the EU economic governance framework and its mechanisms are also dominantly reflected on conducting the following policy mix:

 a) macroeconomic policy (especially monetary, fiscal, competitiveness and state aid)

 b) social cohesion, employment and regional policy

 c) microeconomic policy.

As for the current EU economic policy context which defines the general umbrella framework for economic governance mechanisms, they are laid down by common economic reform and competitiveness strategy - *Lisbon Strategy* (2000)[1] and **revised Lisbon Strategy** known as *Growth and Jobs Strategy* (2005)[2] which put competitiveness, economic growth and employment as core policy objectives.

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[1] Council of the European Union (2000) *Conclusions of the Lisbon European Council,* SN 100/00, 23-24 March 2000. The Lisbon Strategy for the first time integrated the different policy coordination areas and objectives into one comprehensive strategy aiming to put the EU on the top of most competitive economies in the world, while at the same time achieving economic growth, more jobs and greater social cohesion. The adoption of this ambitious Agenda was motivated by the inadequate pace of economic growth and job creation especially when compared to the main global competitors such as the US. The document stressed the gap in productivity growth and technology progress & innovation as main causes behind sluggish growth.

[2] *F*or which a report of an expert group was prepared under the guidance of Wim Kok, former Prime Minister of the Netherlands: *Facing the challenge: The Lisbon strategy for growth and employment,* European Commission, Luxembureg, Nov 2004, available at: http://europa.eu.int/comm/lisbon_strategy/index_en.html

In short, putting the focus on structural economic reforms, the Lisbon Strategy encompassed orientation towards four main reform targets: a) creating a dynamic knowledge-based economy driven by R&D and innovation that foster structural economic reforms; b) facilitation of higher investment by completing the internal market with the market for services; c) social cohesion and modernizing the European social model which will mitigate social exclusion and ensure full employment and d) ensuring an appropriate macroeconomic policy mix which will be conducive to sustaining favourable economic growth taking care of environment constraints (Collignon (2003): 223-224). Additionally, the substantial reduction of administrative burden for business is also one of the important policy objectives that should reduce business costs and boost micro competitiveness.

Originally, it was envisaged that these policy targets would be reached by 2010, but even nine years after its first launch, the Lisbon process still lies somewhat "between the revolution and illusion" (EC, 2008b, p.7), in neither failure nor success limbo or, as some authors put it, between ambitions and reality (Becker and Hishow, 2005). Given the fact that the most policies in question fall almost exclusively within the sphere of competence of the Member States, an open method of coordination (OMC) entailing the development of national action plans has been introduced as a main governance instrument. "Besides the broad economic policy guidelines, (BEPG), the Lisbon Strategy provides for the adaptation and strengthening of existing coordination mechanisms: the Luxembourg process for employment, the Cardiff process for the functioning of markets (goods, services and capital) and the Cologne process on macroeconomic dialogue".[3]

However, the mid-term review of the results held in 2005 showed that the indicators used in the OMC and policies implemented were not sufficient to attain the stated goals as they caused the objectives to become largely turbid and results generally unconvincing.

For this reason, the Council re-launched and revised the Lisbon Strategy (under renewed name- Growth and Job Strategy and backed by redefined Stability and Growth Pact) with an objective to better focus policy efforts and commitments on the achievement of stronger and sustainable growth and the creation of higher quality jobs. In order to accomplish "*Europe of excellence*" based on socially and ecologically sustainable economic growth, what was needed apart from efficient coordination of policies were structural reforms underpinned by quick and smart growth-oriented measures which could deliver the desired outcome (Randzio-Plath, 2006: 51).

As far as the implementation of the **renewed Lisbon Strategy**, the coordination process has been simplified. The renewed Program introduced novelties such as new three years cycle of economic governance mechanisms (starting with the 2005-2008) and Integrated Guidelines for Growth and Employment (IGGEs) which mainly combine the former Broad Economic Policy Guidelines (BEPGs) and the Employment Guidelines (EGs) and include orientation towards the following policy areas:

- Macroeconomic priorities and policy responses to identified challenges in order to underpin the economic stability and convergence of national economies;

- Microeconomic priorities and policy responses to challenges identified by member states;

- Employment priorities and policy responses identified by member states.

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[3] Glossary of Europe, available at: http://europa.eu/scadplus/glossary/lisbon_strategy_en.htm

Based on these guidelines National Reform Programs (NRPs) were drawn up as a kind of three-years' national strategy for delivering growth and jobs' objectives in their economies. Renewed Lisbon Governance instruments within the OMC rely heavily on voluntary arrangements, leaving the individual member states to support the EU economic reform by own policies, taking more responsibility for it, and at the same time learning from other experiences (benchmarking), while viewing the Commission's role more as a facilitator rather than the manager or controller of what is being done (EC, 2008b, p. 13)

The actual progress is being assessed by the European Commission on the basis of the single Annual Progress Report with specific country recommendations on the sectors and policies where the progress was inadequate, but without the ability to sanction inadequate progress in economic reforms that underpin the Lisbon objectives or failures in meeting the policy targets. In short, the implementation of national reform programs lacks effective control mechanisms as existent "blaming and shaming" mechanisms seem to be rather ineffective (Begg, 2008),

The implementation of the Lisbon Strategy underlined the problem of economic policy coordination in the context of having rather divergent and complex policy objectives which guided economic government mechanisms. The efficiency of economic governance mechanisms and their consistency have been questioned and challenged many times by a number of analysts (Begg, Hudson, Maher, 2003, Collignon, 2003; Dyson, 2006, Best, 2008 etc.). They determine to a large extent the inadequate accomplishment of the general competitiveness objectives of the EU internal market laid down by the Growth and Job Strategy (2005). The main question behind many critics is if the "soft" coordination policy implemented by the Open Method of Coordination, based on voluntary arrangements and dialogue, is actually sustainable and conducive to efficient economic governance and growth. The other important question examined is how to move from "Lisabonisation" of national policies and multi-level governance towards the EU economic government with full legitimacy which will provide more efficient mechanisms for obtaining EU-wide policy goals (Umbach and Wessels, 2008; Linsenmann; Meyer and Wessels, 2007; Meyer and Umbach; 2007). The critics also emphasize the inability of the policy system to deliver a coherent policy mix in such an overloaded agenda (Begg, Hodson and Maher, 2003: Becker and Hishow, 2005).[4]

The shortcomings of the current multi-level economic governance mechanisms are even more visible in the present economic and financial crisis which reveals a lot about economic and social governance in the EU. The arsenal of crisis management tools at disposal to the ECB is rather narrow as they are not backed by an equivalent EU fiscal authority (Di Noia and Micossi, 2009).

The adopted "EU Economic Recovery Plan" (November 2008) gives only tentative and initial directions for economic and financial crisis management. Policy responses are left almost entirely to the individual member states, while the common and coherent EU-wide management of crisis' effects is missing.

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[4] For further and elaborate discussions on systemic "fault lines" of the Lisbon Strategy as an umbrella framework for economic governance see for instance Wyplosz, 2002; Alssop, C. and Artis, M.J. 2003; Begg and Larsson, 2007; Begg and Schelkle, 2004; Dyson 2008.

3. SELECTED EMPIRICAL EVIDENCE FROM THE NEW EU MEMBERS AND CROATIA IN ADJUSTING TO ECONOMIC GOVERNANCE AND COMPETITIVENESS BENCHMARKS

The post-socialist countries which joined the EU in 2004 have been in the continuous process of adjusting their political and economic governance systems, policies and institutions (legislative framework and soft rules) in order to converge to the existing EU practice, ever since they started their accession process as candidate countries. The pressure of Europeanization has "worked as a factor and incentive to shape and develop structures and institutions capable of meeting the obligations and needs of a future EU member state" (Lippert and Umbach, 2005). The EU membership negotiations also proved to be an important trigger and a shaping power of national policies, institutions and governance structures (Lippert, Umbach and Wessels, 2001). The process could be characterized as the attempt to adjust to a "*moving targe*t" as the EU itself is undergoing the process of substantive changes as well[5].

So how well did they do so far? Complying with the convergence criteria of new member states in fulfilling their obligations towards the Economic and Monetary Union (price stability, avoiding excessive budget deficits and exchange rate fluctuating) would not be in the focus of our detailed analyses.[6]

In this chapter we rather examine elements of coordination and macro and microeconomic policy coherence as well as underpinning institutions (rules and regulations) when analyzing the achieved levels of competitiveness of selected countries.

The starting assumption of our analyses of economic competitiveness of the selected four new EU member states (Czech Republic, Hungary, Slovakia and Slovenia) and Croatia is that by getting closer to the benchmarks set out by the policy coordination process they improve and increase their competitive advantages. Competition rules (both formal and informal); market structures; solid finance institutions and government policy efficiency are key elements of the business environment. The level of convergence towards the average EU levels of the new EU members is usually also reflected in the country's global competitiveness rank (Marcussen, 2008).

The analysis that follows is based on the data from the Executive Opinion Survey, published by the World Economic Forum in the Global Competitiveness Report 2004-2008. Survey indicators measure „sentiment" of business community towards certain institutional aspects that can not be measured by the hard data. It measures perceptions of the quality of institutions and policies i.e., on the level of achieved results as perceived by business community. The survey is conducted every year in almost all countries in the world at the same time, with identical set of questions and with controlled sample, providing for a sound base for analysis of general competitiveness as well as selected specific issues.

The existing standard „pillars" of the GCR were not suitable for the purpose of this paper which aimed at getting into specific aspects of the **quality** of government and public policies

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[5] Slovak commissioner Jan Figel in an interview:"The EU is a moving targe**t"**, Friday 27 February 2004. available at: http://www.euractiv.com/en/future-eu/interview-news-eu-moving-target-slovak-commissioner/article-116248

[6] The EU Convergence Report is published regularly every year or two by ECB. For latest See the EU Convergence Report, European Economy 3/08, DG Economic and Financial Affairs, EC, Brussels

that create environment for the private business. We have selected 24 survey indicators to construct 3 „pillars", which denote quality of government policies at the macro level (1), micro level (2) and in building institutions (3). For the purpose of this analysis we have constructed these pillars as composite indexes, comprised of 8 indicators each. The analysis is focused on benchmarking the values of these indexes for the selected transition countries (Croatia, Czech Republic, Hungary, Slovakia and Slovenia) against the average score for EU15, or "old" EU members. The purpose of such analysis was to try to identify if the selected countries were successful in recent reforms. Therefore, we analyzed data for the last 5 years. Although often criticized as a methodological tool, we feel that benchmarking of the survey indicators within this framework is worth as an explanatory tool, since the countries under review are catching up and aligning their policies with the EU *acquis.* Apart from that, these countries are rather close, historically and culturally and there should be no major differences in the factors creating the framework for analyses.

3.1. Institutional Framework

The institutional framework is very important for the business community and ultimately for all citizens; their living standards and general quality of life. The link between quality of institutions and economic growth had been repeatedly studied and empirically tested (North, 1997; Rodrik, 2004; Pedersen 2008). At the business sector level, the link is most evident in investment decisions whereby investors take into account the quality of institutions as a very important factor for the ease of doing business and when assessing overall risk of future business conduct in one country.

Firms are generally keen to invest in countries with high respect and protection of property rights; developed legal framework and enforced rules of law; well developed public services without burdensome bureaucracy, redundant regulation and corruption. It is important that government policies are transparent, judiciary does not hinder business and there is a strong protection against crime and fraud. Apart from that some rules of conduct and institutional aspects within the "ethical behavior" were also included, with indicators of business ethics and public trust in (financial) honesty of politicians, i.e. those created by the private sector subjects themselves are also very important.

These are precisely the elements we have taken into account when measuring the quality of the current institutional framework that affects the decisions of enterprises and market actors. The findings of the analysis for the "Institutions" pillar, as well as for the 8 underlying indicators follow in Table 1.

Table 1: „Institutions" pillar (% of the EU15 average), 2008/2009

	Slovenia	Hungary	Croatia	Czech R.	Slovak R.	average
Organized crime	97.9	93.7	85.2	98.4	89.1	92.8
Property rights protection	81.1	87.4	70.0	78.3	81.8	79.7
Ethical behavior of firms	80.5	67.9	72.0	68.0	70.0	71.7
Judicial independence	73.9	76.6	56.8	73.7	64.5	69.1
Diversion of public funds	79.3	61.0	66.7	55.4	62.2	64.9
Irregular payments in public contracts	89.5	58.5	67.0	51.0	56.1	64.4
Favoritism in decisions of government officials	69.5	52.7	61.6	53.3	48.9	57.2
Public trust of politicians	74.7	47.8	54.6	42.5	43.5	52.6
INSTITUTIONS	80.8	68.2	66.7	65.1	64.5	69.1

Organized crime - Organized crime (mafia-oriented racketeering, extortion) in your country: (1 = Imposes significant costs on businesses ; 7 = Does not impose significant costs on businesses); Property rights - Property rights in your country, including over financial assets, are: (1 = Poorly defined and not protected by law ; 7 = Clearly defined and well protected by law); Ethical behavior of firms - The corporate ethics (ethical behaviour in interactions with public officials, politicians and other enterprises) of firms in your country are: (1 = Among the worst in the world ; 7 = Among the best in the world); Judicial independence - Is the judiciary in your country independent from influences of members of government, citizens or firms? (1 = No – heavily influenced ; 7 = yes – entirely independent); Diversion of public funds - In your country, diversion of public funds to companies, individuals or groups due to corruption: (1 = Is common ; 7 = Never occurs); Irregular payments in public contracts - In your country, how frequently would you estimate that firms make undocumented extra payments or bribes connected with the following: d. Awarding of public contracts and licences: (1 = Common ; 7 = Never occurs); Favoritism in decisions of government officials - When deciding upon policies and contracts, government officials in your country: (1 = Usually favour well-connected firms and individuals ; 7 = Are neutral);   Public trust of politicians - Public trust in the financial honesty of politicians in your country is: (1 = Very low ; 7 = Very high)
Source: Authors' calculations from WEF survey database

The perception is by far worst regarding trust in financial honesty of politicians and neutrality of government officials when deciding upon public policies and public procurement contracts. According to the knowledge of the surveyed executives, there is as much irregular payments in public contracts and public funds as commonly diverted due to corruption. It is interesting to note that organized crime is perceived not to impose very significant costs on business in these countries, as compared to the EU15 average. A possible explanation may be that corruptive and criminal conduct is focused more on influencing public funds and politicians, while private sector is relatively less exposed to organized crime.

Slovenia stood apart from the group of countries under review, with more favorable indicators, however, still below the EU15 average. The other 4 countries show very similar patterns of corruptive behavior of politicians and public officials.

The analysis of dynamics of the "Institutions" pillars is conducted for the most recent 5-years period (Figure 1).

Institutions quality index (% EU15)

Figure 1:   Dynamic comparisons of the Institution quality index for the selected new EU members and Croatia, 2004-2008
Source: Source: Authors' calculations from WEF survey database

The dynamics of the perception of the quality of institutions proved to be rather interesting. Slovenia stood alone at a relative high level above 80% of the EU15 average, without clear trend component. However, three countries that were meant to be very successful reformers, i.e. Hungary, Czech Republic and Slovakia clearly and significantly lost their comparative positions from 75% of the EU15 average towards rather low 65% level. Croatia recorded a significant improvement in 2006, joining the three other countries and it is rather remarkable how the 4 countries came close together, indicating how much they still have to work to improve their institutional framework.

3.2. Macroeconomic Framework

Although the *World Economic Forum* uses the composite "Macroeconomic stability" pillar, composed completely of the hard data indicators, we undertook a somewhat different approach. By using the selected survey indicators we have tried to identify and measure certain underlying factors of the macroeconomic stability as well as to tackle certain policies connected with the quality and impact of budget spending (quality of education and infrastructure). Furthermore, we included also the indicator of general macroeconomic framework using the survey question of the extent and effect of taxation and the question of how successful are government policies (and macroeconomic framework) in attracting foreign investment that bring new technologies and not only to exploit opportunities of market access and low labor costs. We have also included the indicator of soundness of banks, which recently proved to be very important for the macroeconomic stability. There are also other indicators of general regulation i.e. quality of antitrust policy and burden of government regulation.

The findings of the analysis for the "Macroeconomic policies" pillar, as well as for the 8 underlying indicators are shown in Table 2.

Table 2: „Macro policies" pillar (% of the EU15 average), 2008/2009

	Slovak R.	Czech R.	Slovenia	Croatia	Hungary	average
Extent and effect of taxation	154.2	110.9	94.0	93.7	59.7	102.5
FDI and technology transfer	115.3	106.8	73.7	78.3	106.1	96.0
Soundness of banks	100.3	91.0	88.2	91.1	85.0	91.1
Burden of government regulation	87.7	80.8	112.6	87.0	71.1	87.8
Quality of the educational system	70.9	97.3	91.0	76.0	66.6	80.4
Effectiveness of antitrust policy	86.2	87.0	79.4	65.9	80.6	79.8
Overall infrastructure quality	66.9	75.6	86.5	73.6	71.9	74.9
Government spending wastefulness	70.2	69.8	81.9	78.2	56.0	71.2
MACROECONOMIC POLICIES	94.0	89.9	88.4	80.5	74.6	85.5

Extent and effect of taxation - The level of taxes in your country: (1 = Significantly limits incentives to work or invest ; 7 = Has little impact on incentives to work or invest); FDI and technology transfer - Foreign direct investment in your country: (1 = Brings little new technology ; 7 = Is an important source of new technology); Soundness of banks - Banks in your country are: (1 = Insolvent and may require a government bailout ; 7 = Generally healthy with sound balance sheets); Burden of government regulation - Complying with administrative requirements for businesses (permits, regulations, reporting) issued by the government in your country is: (1 = Burdensome ; 7 = Not burdensome); Quality of the educational system - The educational system in your country: (1 = Does not meet the needs of a competitive economy ; 7 = Meets the needs of a competitive economy); Effectiveness of antitrust policy - Anti-monopoly policy in your country is: (1 = Lax and not effective at promoting competition ; 7 = Effective and promotes competition); Overall infrastructure quality - General infrastructure in your country is: (1 = Underdeveloped ; 7 = Extensive and efficient by international standards); Government spending - The composition of public spending in your country: (1 = Is wasteful ; 7 = Efficiently provides necessary goods and services not provided by the market).
Source: Authors' calculations from WEF survey database

Rather good performance of the countries under review as compared to the EU15 countries for the macroeconomic policies could be attributed to a favorable perception of taxation (even better than in the EU). Regarding that, an exception is Hungary, with very low value of the indicator (59.7%) on the extent and effect of taxation, indicating that business community in this country finds taxes a very heavy burden. On the other hand, thoroughly reformed taxation policy in Slovakia and to a certain extent even in Croatia (with decreased share of profit and income taxes in the budget revenues), proved to be well accepted by the business sector. The role of FDI for transfer of technology is perceived to be very favorable, with clear exceptions of Slovenia and Croatia, countries that were not successful in attracting new "greenfield" investment, especially not in medium and high-tech industries. It may come as a surprise that soundness of banks was perceived to be rather good in 2008, however it indicates that the business community believed that these banks (mostly foreign owned) are well managed and controlled. Recently, the banks in these countries came under significant pressure in the financial crises, although seemingly not due to their inherent low quality, but as a consequence of international turmoil and (in some countries) currency depreciation.

The worst outcome is measured for the indicator of wastefulness of government spending, meaning that executives feel that much of the budget is spent for instance for state-aid without positive impact for the economy. Also, situation is not good regarding the scope and impact of public spending, and the overall quality of infrastructure, as well as quality of education, are perceived to be significantly worse than the EU average.

The analysis of dynamics of the "Institutions" pillar is presented in the Figure 2.

Macro policies index (% EU15)

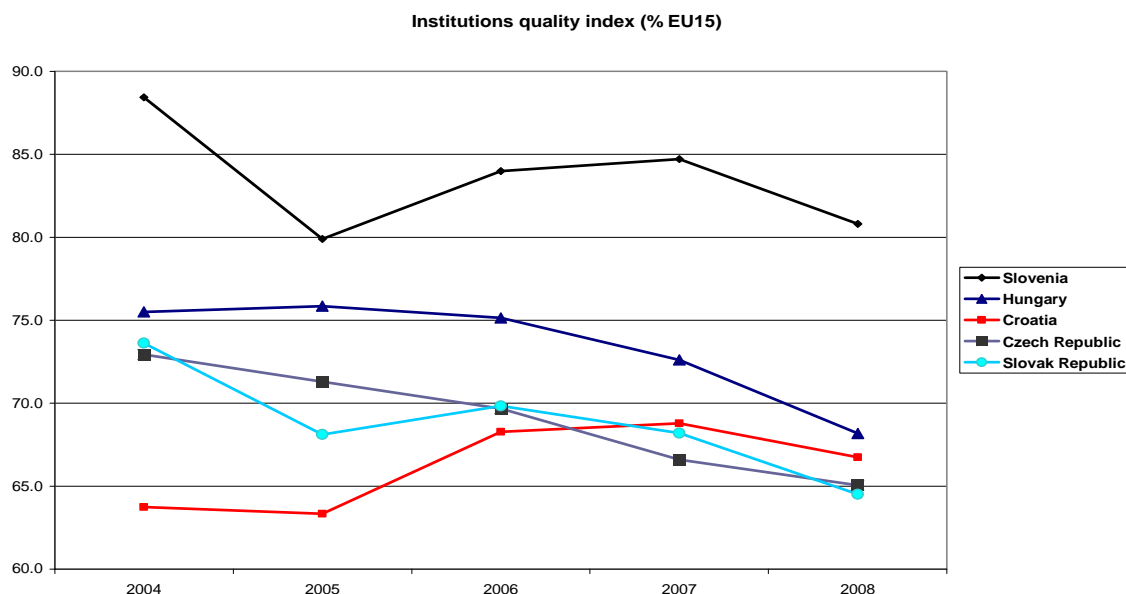*Figure 2: Dynamic comparisons of the Macro policies index for the selected new EU members and Croatia, 2004-2008*
Source: Authors' calculations from WEF survey database

The countries under review performed rather differently in the last 5 years. The leader in this particular pillar is Slovakia, although losing ground in the last two years (with worsened satisfaction with the educational system, taxation and soundness of banks). Czech Republic and Slovenia show the "U" curve dynamics, with a significant upturn in the last year under review. Croatia has improved since 2006 and the reforms seem to have lost momentum since. Hungary recorded a significant downturn of the survey indicators showing that the business community became aware of some bad macroeconomic statistics and the reasons behind it, especially that the heavy tax burden is to a large extent wasted, not providing for high quality services of the public sector and administration.

3.3. Microeconomic Framework

Within this pillar, we included the survey indicators which create a direct impact on performance and opportunities of business environment, i.e. those set of rules and policies that directly affect the decisions of business sector.

This includes quality of auditing and management control by boards and small investors, as well as protection of the interests of minority shareholders, which recently and again proved to be a cornerstone of the transparency of business sector operation. The indicator on the rules governing the FDI is included as it shows perceptions of general quality of investment climate. Ease of access to loans should cover the quality of banking services and availability of finance to the business sector and not their soundness (included in the macro pillar), which is element of the overall stability and control. The pillar includes also certain specific government policies, reflected in labor-employer relations, protection of intellectual property and strategy for development of information and communication infrastructure (ICT).
The findings of the analysis for the "Microeconomic policies" pillar, as well as for the 8 underlying indicators is shown in Table 3.

Table 3: „Microeconomic policies" pillar (% of the EU15 average), 2008/2009

	Slovak R.	Slovenia	Czech R.	Hungary	Croatia	average
Impact of rules on FDI	111.9	77.6	102.7	98.8	76.8	93.6
Cooperation in labor-employer relations	99.8	93.1	96.0	91.1	77.6	91.5
Efficacy of corporate boards	100.6	93.4	97.8	84.4	81.3	91.5
Ease of access to loans	102.6	96.8	85.2	75.4	75.6	87.1
Strength of auditing and accounting standards	85.2	89.5	88.9	89.0	81.5	86.8
Government strategy for ICT	80.2	99.7	81.1	84.4	87.3	86.5
Protection of minority shareholders' interests	77.3	74.8	77.9	84.4	75.4	77.9
Intellectual property protection	66.4	79.2	71.3	74.2	66.6	71.5
MICROECONOMIC POLICIES	90.5	88.0	87.6	85.2	77.7	85.8

Impact of rules on FDI - In your country, rules governing foreign direct investment: (1 = Discourage foreign direct investment ; 7 = Encourage foreign direct investment); Cooperation in labour-employer relations - Labour-employer relations in your country are: (1 = Generally confrontational ; 7 = Generally cooperative); Efficacy of corporate boards - Corporate governance by investors and boards of directors in your country is characterized by: (1 = Management has little accountability ; 7 = Investors and boards exert strong supervision of management decisions); Government strategy for ICT - The government has a clear implementation plan for utilizing information and communication technologies for improving the country's overall competitiveness: (1 = Strongly disagree ; 7 = Strongly agree); Ease of access to loans - How easy is it to obtain a bank loan in your country with only a good business plan and no collateral? (1 = Impossible ; 7 = Very easy); Strength of auditing and accounting standards - Financial auditing and reporting standards regarding company financial performance in your country are: (1 = Extremely weak ; 7 = Extremely strong – the best in the world); Protection of minority shareholders' interests - Interests of minority shareholders in your country are: (1 = Not protected by law ; 7 = Protected by law and actively enforced); Intellectual property protection - Intellectual property protection and anti-counterfeiting measures in your country are: (1 = Weak and not enforced ; 7 = Strong and enforced)
Source: Authors' calculations from WEF survey database

Again, FDI policies are ranked high in the list of microeconomic pillar indicators. The surveyed managers feel that the rules governing FDI generally encourage investment. However, this is not true for Croatia and Slovenia, which do not stimulate foreign investment successfully. It comes as a surprise that in all countries (apart from Croatia) labor-employer cooperation is ranked high, however this may be a consequence of less than perfect situation in the EU15. The situation is similar regarding efficacy of corporate boards.

The worst position is on the protection of intellectual property rights, meaning that piracy and counterfeiting is not successfully combated. Also, minority shareholders' interests are not well protected in the countries under review, which is somewhat better in Hungary and Slovak Republic. In Croatia this has been repeatedly reported in many surveys and studies of applied corporate governance standards and codes.[7]

The analysis of dynamics of the "Micro policies" pillar is also conducted for the last 5-years period (Figure 3).

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[7] Cf. World Bank: "*Corporate governance country assessment Croatia*", 2008.

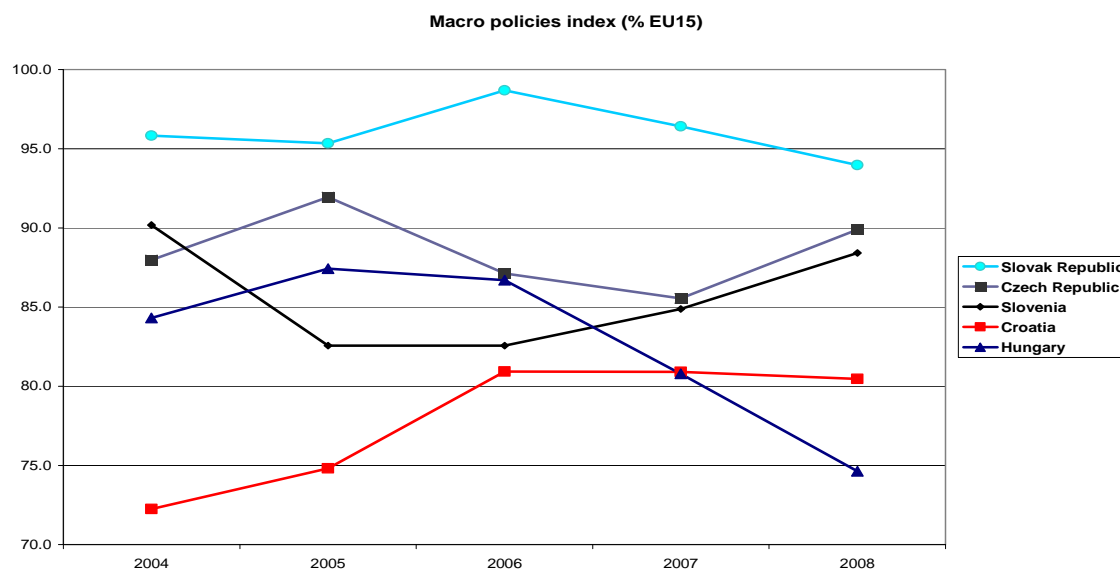**Micro policies index (% EU15)**
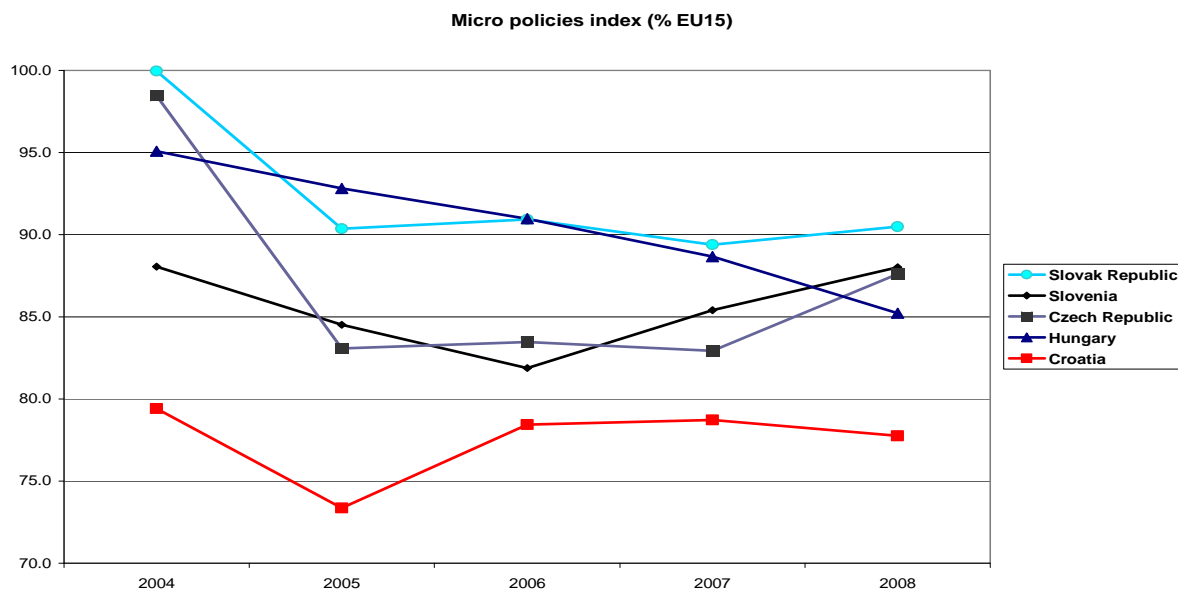
Figure 3: Dynamic comparisons of the Micro policies index for the selected new EU members and Croatia, 2004-2008

Source: Authors' calculations from WEF survey database

In this case we have no clear "winner", with Slovakia and Slovenia changing on the top. Only Croatia is significantly lagging behind the other countries under review, however showing some improvements in 2005-2007. Hungary is visibly deteriorating its microeconomic policy environment, while the other three countries have somewhat recovered in 2008, after a significant downturn recorded in 2005.

4. ASSESSMENT OF ALL THREE PILLARS IN 2008/2009

The presented analysis indicated that, against a widespread opinion, the new EU member countries after the formal date of accession and candidate country Croatia, were not conducting straightforward reforms of institutions that affect directly the business environment. There are significant differences in dynamics of change, both in the level of the 3 pillars, benchmarked against the EU15 and between the countries under review.

However, the differences between countries in the level of each of the indicators in the last year (2008) are not large. This may be evident from the Figure 4.
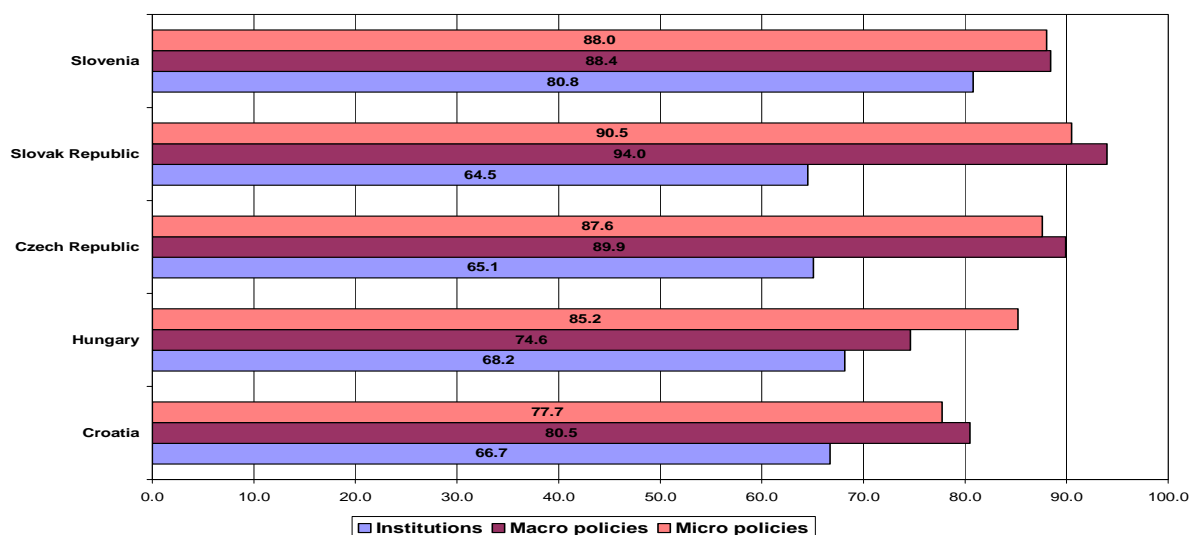
Figure 4:   Three „pillars" for the synergic assessment of the quality of governance and its impact on competitiveness in 2008/2009Source:
Source: Authors' calculations from WEF survey database

The presented data show that the government policies at the macro and micro level generally were at a similar level within each country. For Slovenia, Slovakia and Czech Republic, the level of indicators stood at a rather high level of 90% of the EU15 average. These two pillars stood for Croatia also close to each other, however at a level somewhat lower than 80% of the EU15 average.

On the other hand, the „Institutions" pillar stood significantly worse that the other two pillars, for all countries under review. Apart from Slovenia, that stood out at a 80% of the EU15 level, the other 4 countries show strikingly similar performance, with the „Institutions" pillar in a narrow range from 64.5% to 68.2% of the EU15 average. What follows is the conclusion that quality institutions in the countries under review are lagging significantly behind in the overall success in the alignment of the government policies and public sector performance to the standards of the European Union.

A detailed insight in the basic indicators that we used to construct these pillars show that nominal convergence towards formal institutional rules would not necessarily mean that enforcement and respect of these rules on the ground would be smooth and imbedded. The Croatian case demonstrates this quite visibly where the gap between the adopted and enforced rules and norms is rather high according to the Doing Business study (World Bank, 2008).

5. CROATIA AND ADJUSTMENT TO EU INSTITUTIONS, ECONOMIC GOVERNANCE AND COMPETITIVENESS: HOW MUCH DOES IT MATTER?

Croatia's convergence results were rather profound in the last 5 years according to the recent World Bank Convergence Report (2009). Croatia's main development objective is to reach 75 percent of the EU's average per capita income by 2013, but it remains to be seen if the goal is overoptimistic, especially in the context of recent economic recession. Currently, at about

US$ 11,500 per capita, it stands at around 56 percent of the EU average in purchasing power standards.[8]

Croatia started its accession process to the EU in 2004 after the EU approved her candidate country status. The membership negotiations with the EU started in 2005 with an aim of intensification of the catching-up process, convergence and integration in the single European market. The adjustment process to the *acquis communautaire* should bring a substantial improvement in the policy and institutional (legislation and soft rules) framework for the Croatian economy and consequently also improved competitiveness rankings. For some areas of adjustment, different benchmarks were set in order to assess relative performance of a country towards meeting various EU standards in alignment with the EU *acquis*.

The selected WEF indicators, analyzed in the previous chapter, focused more on the effects of advancing the institutional setting and macro and microeconomic policy mix towards improving the institutional environment for business, with special focus on those institutions which seem not to function properly or fail to meet the expectations of the business sector, such as efficiency of government policies, corruption, corporate ethics, protection of property and intellectual rights etc. In this chapter, we analyzed structural aspects of the position of Croatia's competitiveness towards the selected four new EU member states, to assess progress in adjustments in selected areas of institutional, macroeconomic and microeconomic competitiveness.

From 2005 to 2008, measured by WEF Global Competitiveness Index, Croatia has started to close the competitiveness gap against the group of four European new member countries - Slovenia, Slovakia, Czech Republic and Hungary. However, this is attributable more to the worsening of the position of the four benchmark countries, especially Hungary, with a significant drop of rank by 14 places. Croatia improved its position by 7 positions (in real terms) in 2006 and remained rather stable since, around the rank 60. (WEF, 2008). The ***poor effectiveness of public administration*** and ***corruption*** are the main identified problems in the perceptions of Croatian entrepreneurs. ***Inadequate levels of education and skills*** of labor are also high among the identified obstacles for higher competitiveness of Croatian business sector.

Institutions proved to be a significant problem also as measured by methodology used in this paper. In this section we compared the outcome for the 8 survey indicators for the years 2004 and 2008 in order to identify the areas with the largest improvement, as well as those with more reform effort still to come (Figure 5).

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[8] Croatia Country Brief 2008, World Bank, available at;
http://www.worldbank.hr/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/CROATIAEXTN/0,,menuPK:301254
~pagePK:141132~piPK:141107~theSitePK:301245,00.html

Figure 5: CROATIA – "Institution" Indicators, 2004 and 2008 (EU15=100)
Source: Source: Authors' calculations from WEF survey database

The most notable improvements are recorded in the business impact of organized crime, with a move from 70% of the EU15 average in 2004 to a rather high level of 90%. Improvement is strong also for the business ethics and corruption for public contracts, indicating improved control of public procurement. However, the perception of corruption for general diversion of public funds has worsened, together with influence on the decision of government officials. However, situation is perceived to be much worse in judicial independence, without any significant improvement.

Surprisingly, against the common perception and other surveys (Cuckovic and Bartlett), protection of property rights is ranked rather high at 80% of the EU average, with some improvement as compared to 2004.. The reality is however not that rosy according to the recent data of World Bank study.[9] The lack of secure property rights has been one of the major obstacles reported by the entrepreneurs in Croatia. This is especially the case with registering the property of land or business buildings. The registering the property in Croatia is much more inefficient and procedure is lengthier than in EU-15 and even if compared to the other countries in the Western Balkans. For instance it takes 5 procedures and 174 days on average in Croatia to transfer the property title on land and buildings from one firm to another, while in the core EU-15 countries it takes only 39 days.

It may be true that the business community gives some credit to the reforms that brought to a certain improvements in this particular area. For instance, property registration took as long as 956 days in 2005. Also, a significant improvement is recorded in cutting the number of unsolved court cases by half in 2005-2008, which affects also enforcing contracts.

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[9] Doing Business in 2009, World Bank and IFC.
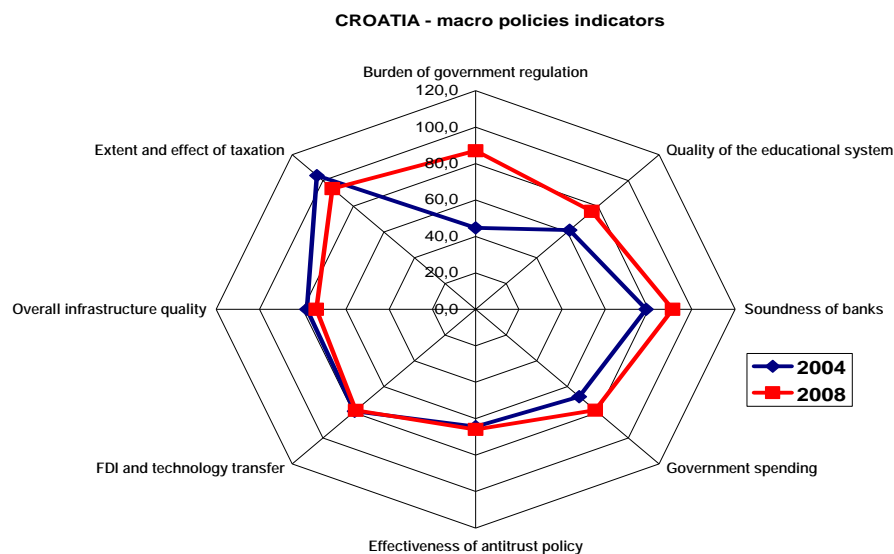
Figure 7: CROATIA – "Macro policies" indicators, 2004 and 2008
Source: Source: Authors' calculations from WEF survey database

The improvement of the indicator on burden of government regulation was immense. It seems that complying with administrative requirements for businesses (permits, regulations, reporting) became somewhat less burdensome, presumably due to an increase in the use of online services for getting permits and tax-filing, as well as initial cut of redundant regulation. Improvements are also visible in the quality of an educational system, soundness of banks and (wastefulness of) the government spending.

Soundness of banks also improved. This proved to be grounded even after the recent international financial turmoil. In Croatia, the currency remained (relatively) stable and there was a proper policy response from the national bank by measures aiming to improve the liquidity of banks. Therefore, the trust in soundness of banks remained almost intact, with only a temporary and insignificant withdrawal of deposits.

The effectiveness of antitrust policy remained at worst position and without improvement in the perception of the business community. Complying with the EU competition rules is a precondition for Croatia to assume the abilities of full EU membership. In its annual assessment of the adjustments to the competition policy *acquis*, the European Commission Progress Report (2008c) also stressed the remaining open issues in the Croatian anti-trust and state-aid policy. Although aligning the antitrust and state aid legislation has considerably progressed, dealing with abuses of the rules is still inefficient due to low administrative capacity of the agency responsible for competition and state aid policies. In addition, although progress has been achieved as regards state aid in some subsidized sectors such as the steel sector, significant efforts are required in particular as regards restructuring aid to the shipyards, which must be addressed in the context of their foreseen privatization.
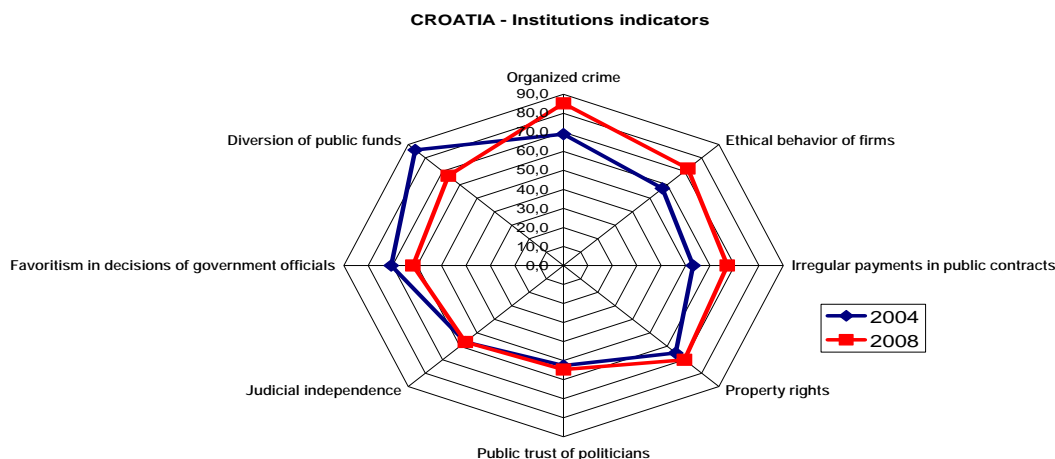
CROATIA - Micro-policies indicators
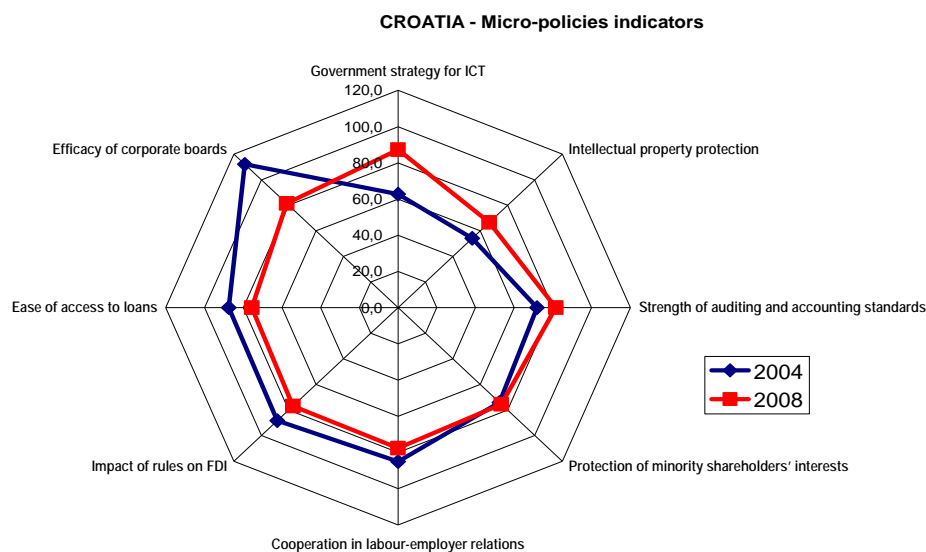
Figure 8: CROATIA – "Micro policies" indicators, 2004 and 2008 (EU15=100)
Source: Source: Authors' calculations from WEF survey database

The indicator with the strongest improvement in the period under review is the government strategy for ICT, which is surprisingly well perceived. A possible explanation may lie in visibility of policies providing for more competition in telecom services.

A notable improvement is recorded for the protection of intellectual property; however, this remained the worst ranked indicator. It is interesting to note that the perception of the efficacy of corporate boards worsened significantly, indicating that the business community became more aware of the problem of corporate governance. A significant improvement is still to come also for the protection of minority shareholder interests.

These problems were also identified by the World Bank (2009), whereby Croatia was ranked as low as 126th position according to the "Investors protection" indicator, measuring control mechanisms within corporate governance.

It seems that the success among of the many policies for improving national competitiveness of Croatia has been a rather variable. Therefore, further reforms are needed not only in formally complying with the requirements of the EU membership, but in order to constantly improve the business environment. The need to improve competitiveness in various fields is already recognized and supported by Croatian government policy makers and the Lisbon Strategy goals are already built in several government strategic documents.[10]

Striving to achieve the policy targets connected with the EU membership would provide additional long-term impetus for economic growth, while also net costs might be significant. The cost-benefit analysis of the future EU membership effects on Croatia (Economic Institute, 2007) has shown that the first years of membership will produce significant burden to the annual national budget. Total yearly net budget contribution is estimated from €501 million in 2009 to €578 million in 2011, while that burden in percents makes for some 1% of the GDP

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[10] Strategic Development Framework, 2006-2010, Central Office for Development Strategy and Coordination of EU Funds, http://www.strategija.hr/Default.aspx?sec=122

per annum.[11] However, the cited study shows that long-term benefits would be significantly larger than the costs.

Apart from that, recent studies demonstrated that achieving Lisbon targets also in the EU countries does matter significantly for the Croatian economy, given the intensive economic links with the EU market. In estimating the potential economic gains for Croatia that stem from achieving targets of the Lisbon Agenda, the recent results obtained by econometric simulation (Lejour, 2008), showed the effects on income, consumption, exports and real wages of reaching five selected Lisbon targets by 2015. These five targets are completion of internal market for services; reduction of administrative burden; increasing human capital; advancing R&D and increasing employment. Increasing the R&D expenditures, from 1.2 to 3.0 of GDP will have a strong impact on economic growth, which is estimated to be higher by 6% of GDP in 2025. In addition to that, increased EU employment itself should have the strongest effect on Croatian GDP growth, as much as 17.7% in 2025. Other EU polices should also have a significantly positive influence on the Croatian economy. If backed with implementation of the Lisbon policies within Croatia, targeting the most problematic issues of theinstitutional framework coupled with those policies that would yield the most significant impact on growth, including innovation and R&D, the overall long-term impact on economic growth and advancing competitiveness after joining EU would be even more substantial (Economic Institute, 2007).

6. CONCLUSIONS

Over the past decade a number of quantitative empirical studies[12] analyzed the issue of convergence between the "old" and "new" EU members. Regardless of the in-built inefficiency of the current Lisbon Strategy and Stability for Growth Pact frameworks for economic governance and competitiveness, they have proved to be powerful engines of convergence and structural reforms both in the new EU member states and in Croatia as a future member.

Since 2004 the countries under review have substantially decreased the income discrepancy with the EU-15 average, as a result of high growth rates and yields of structural economic reforms driven to a large extent by pressure of Europeanization of national policies and governance structures to get in line with the Maastricht, Copenhagen and Madrid Criteria for EMU. This proved to be the case especially for the two new members of the euro zone Slovenia and Slovakia where the institutional and monetary policy alignments to the EMU institutions, policies, norms and standards were most advanced. However, in Hungary which is not participating in the euro zone, structural reforms were less successful. A similar situation also emerged for a number of other new EU members within the recent financial crisis what was reflected in the decrease of their competitiveness rank in 2008.

This paper also came out with findings that there are significant inequalities both between the general reform outcome among the new member countries and also among different factors of competitiveness. Although there is a general process of convergence to the EU level, as measured by the WEF Global Competitiveness Index, looking into more detailed indicators

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[11] "Accession to the EU: Expected Economic Effects", Institute of Economics Zagreb, August 2007, p. 32.

[12] Cf, Iraj Hashi; Paul J. J. Welfens and Anna Wziatek-Kubiak (2007); Dogan, Nukhet and Saracoglu, Bedrye (2007).

we have shown that the new members (as well as Croatia) still have much to reform, especially in the field of the quality of institutions.

A closer examination of specific issues of institutional framework and some components of macroeconomic and microeconomic policy environment for business transactions show that nominal convergence and transposition of EU norms does not necessarily optimize the business environment and that there is still a lot to be done in these areas. The issue of policy transfer as a main vehicle of Europeanization and convergence to single market is another area of controversy which surpasses the scope of this paper, but seems very important to explore when assessing the competitiveness levels of the new EU member states.

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THE SELF-EMPLOYMENT TWIST. EVIDENCE FROM KOSOVO

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1. INTRODUCTION

Does more self-employment also mean more entrepreneurship? While entrepreneurship is often equated with self-employment, on the grounds that the self-employed fulfill the entrepreneurial function of being risk-bearing residual claimants, it could be also argued that this definition is too broad. Let us consider entrepreneurship as the creation of goods and services not currently existing within the market place (Kruger, 2004) and self-employment as individuals who earn no wage or salary but who derive their income by conducting a profession or business on their own account and at their own risk (Parker, 2004). If the latter only imitate and replicate, they are not performing basic entrepreneurial functions. As shown by Solymossy (2005), this is the situation in Kosovo.

In this paper we further develop this argument by investigating the characteristics of Kosovo entrepreneurs and non-entrepreneurs. We divide entrepreneurs in a broader sense into two groups: entrepreneurs in a narrower sense who have two or more employees, and self-employed persons who have one employee or who do not employ other workers. This distinction is suitable for Kosovo. If the enterprise has two or more employees, it is already more active, and has been in business for a longer time. Therefore, the entrepreneur is actively engaged in the coordination function of factors of production and performs an entrepreneurial function. If the enterprise has one or no employees, its activities are more limited and it is less clear in which direction the business is headed.

We compare entrepreneurs in a broader sense with non-entrepreneurs as well as entrepreneurs in a narrower sense with self-employees and with non-entrepreneurs. The results show significant differences in characteristics among groups. The highest potential for the economic growth of Kosovo lies in entrepreneurs who have at least two employees

(entrepreneurs in a narrower sense). Self-employees are more constrained in their capabilities and possibilities, while non-entrepreneurs have a very naive view of the business. There are not substantial differences between the three subgroups of non-entrepreneurs: those who already have been entrepreneurs, those who are thinking of becoming entrepreneurs and those who have never thought about becoming entrepreneurs.

These findings are important, since with the formation of its own state and the institutions it is also expected that economic and political conditions will improve in Kosovo. Great opportunities for economic growth exist in foreign direct investments, especially in the coal industry and in the production of energy and minerals. Those industries are going to help on the one hand revive the production of goods and services for export as well as for domestic consumption, and on the other hand they will lead to new jobs and hence to greater employment. Entrepreneurship should serve as a bounty to these industries.

2. DESCRIPTION OF THE KOSOVO ECONOMY

After open conflicts in Kosovo and the NATO intervention in 1999, the Kosovo economy was almost completely destroyed. With help from the international society and donors it managed to achieve positive economic growth, however economic activity in Kosovo is very unstable and crucially depends on foreign aid, i.e. donations from the international society (BPK, 2008) and remittances (IMF, 2008).

One of the most problematic macroeconomic issues in Kosovo is the extremely high rate of unemployment (40%; MEF, 2008). The regional differences in the unemployment rate are extremely high. The problem also lies in the structure of the unemployed, since 86% of the unemployed are either long-term unemployed, unqualified or are young. Also, the dynamics of employment is not the cause of optimism (MEF, 2008).

Although Kosovo has one of the most friendly business environments to establish new enterprises, 15 years after transition new private businesses are still small, with unexpressive comparative advantages. Around 98% of enterprises employ less than 10 workers, 94% of them are self-employed, half of them operate in the trade sector and more than 60% of them are managed by the owner (IPAK, 2005).

The sector structure of the Kosovo economy shows that the war caused major damage in manufacturing. The manufacturing sector needs thorough renovation, investment in new equipment and in new technology. Agriculture is the second largest sector. The tertiary sector is based mainly on trade.

Privatization is one of the key areas of the transition process that started in Kosovo very late, i.e. in the period when other middle and east European transitional countries had already finished. Although the goal was that the privatization process in Kosovo would be finished by the middle of 2005, only 10% of the plan was achieved. One of the reasons for such a delay was the cautiousness of foreign investors. In the years 2006 and 2007 the process of privatization accelerated since foreign investors also showed substantial interest in Kosovo firms.

The revival of the Kosovo economy will be based on the active promotion of key sectors that have comparative advantages on the global scale. The development of entrepreneurship is,

however, crucial in playing a key role in the creative destruction of goods and services that at the moment still do not exist in the Kosovo market (Domadenik and others, 2006). The important question for the Kosovo economy is therefore: What is the current potential of entrepreneurship and how to increase it in the near future?

3. THE DATA

Our goal was to collect information about the state of entrepreneurship in Kosovo. In order to achieve this goal we interviewed individuals, entrepreneurs and non-entrepreneurs from different regions of Kosovo. When designing the questionnaire we looked to the questionnaire that Djankov and others (2005, 2006a, and 2006b) used when they investigated entrepreneurship in China and Russia. However, due to the different characteristics of entrepreneurship in Kosovo we modified some questions and added some new ones.

As already mentioned, a group of entrepreneurs is divided into entrepreneurs in the narrow sense (having at least two employees) and self-employed persons (without employees or with one employee). The group of non-entrepreneurs consists of people who are not engaged in an organized business activity. In order to gain more information about this group we have divided it into three subgroups: 1) non-entrepreneurs who have already been entrepreneurs; 2) non-entrepreneurs who are (were) thinking of becoming entrepreneurs and 3) non-entrepreneurs who never thought about becoming entrepreneurs.

We conducted the interviews between March and November 2007. 300 entrepreneurs in the narrow sense, 300 self-employed persons and 500 non-entrepreneurs were interviewed. For each group we formed a stratified sample based on the number of companies registered in seven Kosovo regions. The self-employees were also selected randomly from the Business Registries of Kosovo in the same manner. As in Djankov and others (2005, 2006a, 2006b), 80% of respondents in the non-entrepreneurs sample were chosen randomly yet conditional on matching the age, gender, and educational attainment of entrepreneurs from the respective entrepreneur surveys, and 20% were chosen completely at random. In order to provide valid statistical estimates professional interviewers from Integra Consulting were employed and interviewers were trained in advance.

4. THE RESEARCH STRATEGY AND EMPIRICAL RESULTS

4.1. The model and the key variables

The traditional views of entrepreneurship concentrate on conceptually identifying one dominant characteristic that makes entrepreneurs unique individuals vis-à-vis other economic agents, namely employees and capitalists. For Say (1845), coordination or managing ability is what makes the entrepreneur different from the employee. For Cantillon (1931) and Knight (1921), it is the ability for taking risks that differentiates the entrepreneur from the employee but there is no difference between the entrepreneur and the capitalist. For Kirzner (1979) the entrepreneur diagnoses the error and engages in market transactions that increase market efficiency while she profits by exploiting the error. On the other side, neoclassical economists inspired by conceptual differences rekindled the idea of a specific entrepreneurial activity, and started looking for an indicator of individual characteristics that one needs to posses in order to become an entrepreneur. Lucas' (1978) model assumes that individuals differ in managerial

or entrepreneurial talent and that there is a cut-off point of talent above which sufficiently talented individuals are better off converting into managers (entrepreneurs) than remaining as employees. Calvo (1980) introduces technological change, which affects the age and human capital expected from an entrepreneur. Kihlstrom and Laffont (1979) obviate differences in human capital and concentrate only on the individual's relative risk aversion. According to them, the entrepreneurs are the relatively more risk tolerant individuals in the population. Based on these models an individual would become an entrepreneur if he or she possessed above a certain level of entrepreneurial talent, which could be either human capital or the inclination towards risk.

In our work we lean on the modern studies of Djankov and others (2005, 2006a, 2006b) and Demirgüc – Kunt et.al. (2007). Djankov and others divide the factors that influence entrepreneurial activity into three main groups: 1) individual characteristics such as skills, education and intellectual and personality traits. Thanks to psychological studies, we know that motivation, risk sharing and individual self-confidence are also important in this group; 2) sociological variables such as family background, social origins, social networks, values and beliefs; 3) perceptions of the institutional, social and economic environment that the business faces, including the role of finance for small businesses and institutions securing property rights. In addition, we include in our research 4) wealth and access to finance and 5) labor market experience, elaborated in other studies, such as Demirgüc- Kunt et al. (2007).

In table 1 we present the descriptive statistics of variables grouped in five groups, which together form the basis of our model and empirical research. We also present the differences in means between the group of entrepreneurs in the broader sense, and non-entrepreneurs and their statistical significance.

Table 1:Comparison of characteristics between Kosovo entrepreneurs in a broader sense and non-entrepreneurs

Variables	*entrepreneurs & self-employees*	*non-entrepreneurs*	*p-value test for difference in means*	*significance of difference*
Number of observations	600	500		
Individual characteristics				
Number of age (mean)	41	36	0.000	***
Male (%)	93.6	61.4	0.000	***
Urban (%: if from Pristina=1 , otherwise=0)	34.2	33.6	0.110	
Married (%)	92	70.5	0.000	***
Number of children (mean)	3.36	2.82	0.000	***
Education (number of years of education)	9.2	11.4	0.850	
Health (%: good or very good health=1, otherwise=0)	74.8	71.8	0.000	***
Risk taking (%: if win 50 with probability ½ and lose 50 with probability 50 = 1, otherwise=0)	15.5	14.3	0.031	
Motivation (%: retire if wins a lottery of €800,000 =1, continue working=0)	10.2	17	0.016	
Greed (%: continue working because want more money=1, otherwise=0)	46	45.4	0.352	

Variables	*entrepreneurs & self-employees*	*non-entrepreneurs*	*p-value test for difference in means*	*significance of difference*
Happiness (%: very happy and quite happy in life=1, otherwise=0)	83.6	56	0.000	***
Sociological characteristics				
Father has higher education (%: qualified and more=1, otherwise=0)	13.7	13	0.405	
Father was a boss or director (%)	7.6	2,8	n/a	
Mother has higher education (%: qualified and more=1, otherwise=0)	8.8	9	0.900	
Mother was a boss or director (%)	0.9	0.2	0.000	***
Members of the family were/are running businesses (mean)	15.42	3.35	0.000	***
Friends were/are running businesses (mean)	1.05	4.24	0.000	***
Institutional environment				
Population has favorable view towards entrepreneurs (%: if favorable and somewhat favorable=1, otherwise=0)	52.4	27.3	0.000	***
Government has favorable view towards entrepreneurs (%: if favorable and somewhat favorable=1, otherwise = 0)	42.1	52.7	0.525	
Private entrepreneurs pay a bribe to change rules (%: if very often and often=1, otherwise=0)	14	44.2	0.000	***
Private entrepreneurs are subject to theft of property (%: if very often and often=1, otherwise=0)	87.3	82.6	0.015	
Labor market				
Number of localities (mean)	1.1	1,17	0.071	
Employed in a formal sector (%: if respondent pays pension contributions=1 , otherwise=0	61.2	33.6	0.000	***
Prior status (%: if employed=1, otherwise=0)	39	n/a	n/a	
Working as manager (%: if yes=1, if no=0)	1.8	n/a	n/a	
Wealth and financial constraints				
Average wealth at 16 (%: if above average=1, otherwise=0	9.2	10.6	0.153	
Remittances (%: if respondent receives money from abroad=1, otherwise=0)	30. 5	n/a	n/a	
Relatively easy to find a money (%: if very easy or relatively easy=1, otherwise=0)	6.1	15.6	0.000	***

Source: questionnaire and own calculations.
Asterisks denote: ***: significant at 1%
n/a: not available

Looking at the variables from the first group in table 1, it is evident that Kosovo entrepreneurs (in a broader sense) are in the majority men, more then forty years old, married and with several children. They have, on average, almost 10 years of education and are in relatively good health. From the psychological point of view, it seems that they are not heavy risk takers. Only about 15% report taking the risk of investing EUR 50, if the probability to win was 50%. Motivation seems to be relatively high. If they won a lottery of EUR 800,000, only 10% would retire and about 45% would continue to work due to the desire to have more money (greediness). 84% of entrepreneurs were very happy or quite happy compared to 56%

non-entrepreneurs. If happiness is taken as a sign of optimism, Kosovo entrepreneurs are more optimistic than non-entrepreneurs, but less than Russian or Chinese entrepreneurs, where this indicator is higher than 90%.

The second group of variables describes the social environment. The parents of many Kosovo entrepreneurs are not highly educated. Only 14% of fathers had a higher level of education than qualified workers. This holds for 9% of mothers. Entrepreneurs have been in the position of a boss or manager more frequently than non-entrepreneurs. However, the overall numbers are small. A very interesting observation relates to the proposition of entrepreneurs in one's family and among one's friends. Entrepreneurs are much more likely to have entrepreneurs in their family (39.5%) than non-entrepreneurs (26.4%). The average number of family members acting as entrepreneurs is much higher (15.4 on average) for entrepreneurs than for non-entrepreneurs (3.35). Namely, in Kosovo enterprises are very often organized as a network of enterprises inside the extended family with "arms" not only in Kosovo, but also outside of it (diaspora). From table 4.1, another striking trend emerges: while 95.5% entrepreneurs report that they have friends engaged in business activities, this number is much smaller for non-entrepreneurs (68.3%). When asked how many such friends they have, the average number for entrepreneurs (1.05) was much smaller than for non-entrepreneurs (4.24). This is closely related to trust. We will return to this issue later in the paper.

With the third group of variables we compare the individual perceptions of entrepreneurs and non-entrepreneurs on the institutional environment for the development of the entrepreneurship sector in Kosovo. Only 27.3% of non-entrepreneurs and 52% of entrepreneurs think that the population is at least partly favorable toward entrepreneurship. This is substantially lower than in the studies of Chinese and Russian entrepreneurs. Also, regarding the attitude of the government toward entrepreneurs, the perceptions of Kosovo entrepreneurs and non-entrepreneurs are harsher than in Russia and in China. Kosovo entrepreneurs are among the most critical about the role of the government towards entrepreneurship. It is interesting that a very small percent of entrepreneurs think that the change in rules are connected with paying a bribe (14% of entrepreneurs stated that this happens often or very often). This result is much smaller compared to Kosovo non-entrepreneurs (44%) and even smaller if we compare it to Chinese entrepreneurs and non-entrepreneurs and especially to Russian entrepreneurs and non-entrepreneurs. When asking Kosovo entrepreneurs and non-entrepreneurs if the private entrepreneurs are subject to property theft, the results are similar to those in China and Russia.

The fourth group of variables explored the labor market issues that were investigated in the transitional context by Earle and Sakova (2000) and Demirgüc-Kunt et al. (2007). The results for Kosovo reveal that entrepreneurs in Kosovo did not have many labor experiences before they started with the business activity. 39% of entrepreneurs were employed before they started their own business and only 1.8% had been managers before.

The final group of variables reflects the difficulty of getting access to the finances that are needed in order to start a new business. The entrepreneurs from our sample rarely came from families that would have experienced above-average wealth in their youth (only 10%). Around one third of entrepreneurs stated that they were receiving remittances. Only 6.1% of entrepreneurs stated that it is easy or relatively easy to gain access in order to finance business activities. For non-entrepreneurs this number is slightly larger (15.6%).

As seen in other studies (Koman and others, 2009) regarding the perceptions of Kosovo entrepreneurs and non-entrepreneurs about values, both groups put family in first place, followed by work and financial stability. These confirm that in Kosovo the extended family is still important. Regarding the trust individuals in Kosovo have a very low degree of trust. Trust in colleagues, businessmen and government officials is even lower for the group of self-employees than for the group of entrepreneurs in the narrower sense (Koman and others, 2009)

4.2. The results of probit and multinomial logit analysis

In tables 2 to 6 we show the probit and multinomial probit results of different models that should, when taken together, reveal a coherent picture of entrepreneurship activity in Kosovo.

In table 2 we continue the discussion on the group of entrepreneurs in the broader sense and non-entrepreneurs that we started with in the previous chapter. Marginal effects and robust standard errors of probit analysis are reported. Robust standard errors were clustered at the city level to correct the intra-city correlations. Table 2 introduces the main specifications. We start with individual characteristics (column 1), to which we first add sociological factors (column 2), followed by perceptions on institutional development (column 3), labor markets experience (column 4) and wealth and financial constraints at the time of entry (column 5). These results confirm our previous findings. The entrepreneurs from Kosovo have a higher probability of being married men and are more optimistic (happy) than non-entrepreneurs. They have less trust in business friends than in non-entrepreneurs. They also believe, compared to non-entrepreneurs, that paying bribes in order to change the rules is not so common in Kosovo. They move less often (change locations less frequently) than non-entrepreneurs and operate mainly in the formal sector (paying social contributions). They believe more that is difficult to get money for starting a business than do the non-entrepreneurs. Hence, our results show that non-entrepreneurs do not have a very good idea about how business functions in Kosovo. They naively believe that running a business is nothing special, mainly because they have quite a lot of friends who have a business. According to the non-entrepreneurs' view, in order to start a business one first needs to collect some money, which in Kosovo is not such a difficult task. After that one needs to bribe some officials in order to change the rules. The next belief is that one needs to change locations quite frequently. The question remains why non-entrepreneurs have not done this already, since they would substantially increase their happiness.

Table 2. Probit analysis of Kosovo entrepreneurs in a broader sense versus non-entrepreneurs

Variables	*Probit 1*	*Probit 2*	*Probit 3*	*Probit 4*	*Probit 5*
Number of observations	1100	1100	1100	1100	1100
Individual characteristics					
Age	0.317 (0.155)	0.284 (0.147)	0.214 (0.150)	0.196 (0.158)	0.151 (0.213)
Male	0.374 (0.052)***	0.305 (0.049)***	0.331 (0.041)***	0.33 (0.046)***	0.356 (0.020)***
Urban	0.031 (0.022)	0.004 (0.019)	0.078 (0.017)***	0.099 (0.021)***	-0.008 (0.037)
Married	0.241 (0.063)***	0.248 (0.047)***	0.24 (0.064)***	0.223 (0.065)***	0.358 (0.092)***
Number of children (mean)	0.065 (0.118)	0.052 (0.110)	0.052 (0.109)	0.071 (0.113)	-0.042 (0.094)

Variables	*Probit 1*	*Probit 2*	*Probit 3*	*Probit 4*	*Probit 5*
Education	0.005 (0.070)	-0.053 (0.093)	-0.056 (0.077)	-0.07 (0.086)	0.035 (0.087)
Good health	0.037 (0.066)	0.027 (0.053)	0.020 (0.056)	0.022 (0.056)	-0.005 (0.044)
Risk taking	-0.044 (0.062)	-0.072 (0.062)	-0.065 (0.078)	-0.064 (0.078)	-0.102 (0.119)
Retire if won €800,000	0.218 (0.096)	0.203 (0.076)*	0.155 (0.080)	0.151 (0.079)	0.143 (0.118)
Not retire - I want more money	-0.003 (0.062)	-0.006 (0.063)	-0.006 (0.058)	-0.009 (0.063)	0.006 (0.074)
Happy and very happy	0.309 (0.010)***	0.407 (0.099)***	0.377 (0.094)***	0.362 (0.103)***	1.049 (0.089)***
Sociological factors					
Father has higher education		-0.038 (0.059)***	-0.013 (0.045)	-0.012 (0.043)	0.080 (0.062)
Father was a boss		0.189 (0.086)	0.207 (0.096)	0.197 (0.099)	0.175 (0.101)
Mother has higher education		0.09 (0.168)	0.110 (0.185)	0.113 (0.188)	0.122 (0.127)
Mother was a boss		-0.083 (0.225)	0.087 (0.172)	0.08 (0.160)	0.187 (0.124)
Family members in business		0.063 (0.020)**	0.049 (0.025)	0.044 (0.024)	0.047 (0.041)
Friends were in business		-1.152 (0.276)***	-1.163 (0.281)***	-1.127 (0.279)***	-0.929 (0.236)***
Institutional environment					
Favorable attitude of the population			0.213 (0.030)***	0.195 (0.032)***	0.175 (0.03)***
Favorable attitude of the government			-0.062 (0.090)	-0.058 (0.091)	-0.029 (0.067)
Pay bribes			-0.329 (0.054)***	-0.320 (0.051)***	-0.170 (0.076)
Labor market					
Number of localities				-0.283 (0.118)	-0.456 (0.143)**
Employed in the formal sector				0.132 (0.043)**	0.163 (0.062)*
Prior status				n/a	n/a
Working as a manager				n/a	n/a
Wealth and financial constraints					
Average wealth at 16					0.041 (0.096)
Remittances					n/a
Relatively easy to find money					-0.911 (0.024)***

Source: questionnaire and own calculations.

Models: Probit 1 - independent variables are only individual characteristics; Probit 2 - independent variables are individual characteristics and sociological factors; Probit 3 - independent variables are individual characteristics, sociological factors and institutional development variables; Probit 4 - independent variables are individual characteristics, sociological factors, institutional development variables and labor market variables; Probit 5 - independent variables are individual characteristics, sociological factors, institutional development variables, labor market variables and wealth and finacial constrain variables.

Coefficients are marginal effects.

Robust standard errors corrected for clusters at the city level are reported in parenthesis.

Asterisks denote: *= significant 10% ,**=significant at 5% and ***= significant at 1%.

n/a: not available

In table 3 we made a comparison of three groups: entrepreneurs in the narrower sense, self-employees and non-entrepreneurs. In column 1 we report the results of a probit analysis between entrepreneurs and self-employees. Compared to entrepreneurs, the self-employees are less likely to be men and are less healthy. The father and mother of self-employees are more likely bosses, and self-employees have more family members that are running the business. Remittances play a smaller role in running a business among self-employees than among entrepreneurs. Column 2 shows probit results between self-employees and non-entrepreneurs. Self-employees are more likely to be older, men and married than non-entrepreneurs. They also have more family members that run the business and have fewer friends in business. Self-employees, compared to non-entrepreneurs, stress a more positive attitude of the population toward entrepreneurship and believe less that bribes are important when one needs to change rules. Self-employees are also less likely to change locations than non-entrepreneurs. In column 3 we report probit analysis results between entrepreneurs in the narrower sense and non-entrepreneurs. Entrepreneurs are more likely to be men and are happier than non-entrepreneurs. The entrepreneurs' mothers are more likely to be bosses, their families have fewer members that are running a business and they are less likely to have friends in business than non-entrepreneurs. The entrepreneurs put a more favorable attitude of the population toward entrepreneurship than non-entrepreneurs. They also believe that bribes are used less often in order to change rules. The results of the multinomial analysis in columns 4 – 6 confirm the probit results.

Table 3. Probit analysis of Kosovo entrepreneurs versus self-employees, self-employees versus non-entrepreneurs and entrepreneurs versus non-entrepreneurs and multinomial logit analysis of entrepreneurs, self-employees and non-entrepreneurs

Variables	entrepreneurs versus self-employees	self-employees versus non-entrepreneurs	entrepreneurs versus non-entrepreneurs	entrepreneurs	self-employees	non-entrepreneurs
	Probit 1	Probit 2	Probit 3	Multinomial logit		
				4	5	6
Number of observations	600	600	800	1100	1100	1100
Individual characteristics						
Age	-0.079 (0.152)	0.396 (0.094)***	0.187 (0.189)	0.112 (0.168)	0.223 (0.072)**	-0.355 (0.090)***
Male	0.246 (0.062)***	0.233 (0.062)***	0.341 (0.014)***	0.244 (0.018)***	0.140 (0.057)*	-0.385 (0.041)***
Urban	0.023 (0.036)	0.016 (0.023)	0.039 (0.027)	0.025 (0.021)	0.004 (0.025)	-0.03 (0.037)
Married	-0.076 (0.127)	0.206 (0.034)***	0.184 (0.078)	0.1 (0.074)	0.154 (0.033)***	-0.255 (0.050)***
Number of children (mean)	0.069 (0.104)	0.014 (0.135)	0.108 (0.112)	0.075 (0.074)	-0.011 (0.104)	-0.064 (0.061)
Education	0.071 (0.091)	-0.053 (0.089)	0.051 (0.090)	0.058 (0.091)	-0.046 (0.052)	-0.012 (0.064)
Good health	0.245 (0.075)**	-0.034 (0.055)	0.135 (0.086)	0.154 (0.071)	-0.106 (0.038)*	-0.047 (0.042)
Risk taking	-0.071 (0.108)	-0.017 (0.06)	-0.063 (0.069)	-0.055 (0.057)	0.009 (0.060)	0.046 (0.050)
Retire if won €800,000	-0.061 (0.074)	0.218 (0.087)	0.139 (0.058)	0.064 (0.041)	0.162 (0.063)	-0.022 (0.046)***

Variables	entrepreneurs versus self-employees	self-employees versus non-entrepreneurs	entrepreneurs versus non-entrepreneurs	entrepreneurs	self-employees	non-entrepreneurs
Not retire - I want more money	0.015 (0.086)	-0.006 (0.089)	0.005 (0.032)	0.009 (0.026)	-0.009 (0.078)	0.003 (0.035)
Happy and very happy	0.017 (0.096)	0.332 (0.073)	0.322 (0.081)***	0.213 (0.104)	0.191 (0.043)***	-0.404 (0.040)***
Sociological factors						
Father has higher education	0.072 (0.062)	-0.042 (0.069)	0.001 (0.045)	0.015 (0.029)	-0.057 (0.052)	0.041 (0.056)
Father was a boss	-0.122 (0.038)**	0.155 (0.080)	0.083 (0.062)	0.021 (0.036)	0.157 (0.054)**	-0.178 (0.077)
Mother has higher education	0.124 (0.072)	0.005 (0.109)	0.085 (0.128)	0.082 (0.098)	-0.031 (0.069)	-0.051 (0.076)
Mother was a boss	-0.345 (0.106)**	-0.077 (0.215)	-0.224 (0.019)***	-0.132 (0.034)***	0.085 (0.199)	0.047 (0.210)
Family members in business	-0.485 (0.090)***	0.166 (0.021)***	-0.417 (0.058)***	-0.265 (0.043)***	0.225 (0.023)***	0.039 (0.035)
Friends were in business	-0.208 (0.211)	-0.648 (0.109)	-0.596 (0.107)***	-0.412 (0.138)*	-0.714 (0.141)***	1.127 (0.142)***
Institutional environment						
Favorable attitude of the population	0.031 (0.075)	0.160 (0.049)**	0.214 (0.035)***	0.115 (0.040)**	0.114 (0.049)	-0.212 (0.041)***
Favorable attitude of the government	0.151 (0.065)	-0.111 (0.087)	0.034 (0.073)	0.039 (0.033)	-0.119 (0.077)	0.075 (0.041)
Pay bribes	0.162 (0.082)	-0.372 (0.030)***	-0.195 (0.041)***	-0.078 (0.041)*	-0.291 (0.032)***	0.362 (0.044)***
Labor market						
Number of localities	0.420 (0.190)	-0.420 (0.088)***	-0.104 (0.108)	0.011 (0.086)	-0.421 (0.079)	0.410** (0.142)
Employed in the formal sector	0.111 (0.102)	0.058 (0.051)	0.110 (0.046)	0.101 (0.046)	0.019 (0.047)	-0.120 (0.040)**
Prior status	0.055 (0.094)	n/a	n/a	n/a	n/a	n/a
Working as a manager	-0.008 (0.149)	n/a	n/a	n/a	n/a	n/a
Wealth and financial constraints						
Average wealth at 16	0.148 (0.057)*	-0.116 (0.053)	0.019 (0.085)	0.107 (0.064)	-0.078 (0.032)	-0.020 (0.094)
Remittances	0.605 (0.071)***	n/a	n/a	n/a	n/a	n/a
Relatively easy to find money	0.120 (0.147)	-0.152 (0.054)	-0.106 (0.059)	-0.360 (0.063)***	-0.57 (0.072)***	0.93 (0.026)***

Source: questionnaire and own calculations.

Coefficients are marginal effects.

Robust standard errors corrected for clusters at the city level are reported in parenthesis.

Asterisks denote: *= significant 10% ,**=significant at 5% and ***= significant at 1%.

n/a: not available

Our results thus far have shown that there are substantial differences among the characteristics of entrepreneurs in the narrower sense, self-employees and non-entrepreneurs. Let us for a moment focus on self-employees. They are on average older, more likely married and less healthy than the other two groups of entrepreneurs. Compared to them, their fathers are more likely bosses. They come from an extended family of entrepreneurs. However, they are less likely to have friends among businessmen. Due to the limited resources that they posses, they compete on the same dimension, i.e. they open a small kiosk in which they sell imported merchandise or they run a business that requires simple operations and hardly allows them to survive. They do not put much emphasis on the attitude of the population towards entrepreneurship and on bribes. For them, business is cruel per se, since the lack of possibilities and capabilities does not give them much chance of succeeding. We also need to stress that for self-employees remittances play a much smaller role in starting a new business than for entrepreneurs in the narrower sense.

Let us turn now to the group of entrepreneurs in the narrower sense. The analysis till now has shown that they are firmly settled in entrepreneurship activity. With a high probability we can state that they are happier as people than in the other two groups. Their mothers are more likely to be bosses. However, their family members are less likely to deal with business activities and they also have fewer friends among entrepreneurs than the other two groups. These results support our earlier discussion that in Kosovo the extended family is probably disintegrating. Although remittances played an important role during the establishment of their companies, over time entrepreneurs realized that less dependence on their families and friends is probably beneficial to their businesses. In column 1 of table 4 we show which factors distinguish entrepreneurs in the narrower sense by necessity and by opportunity. These two groups differ mainly in two dimensions: entrepreneurs by opportunity are more educated and have a lower probability of being employed in the formal sector than entrepreneurs by necessity. They might feel more liberal and therefore do not need or want to pay contributions. In column 2 we compared the entrepreneurs in the narrower sense by necessity with self-employees. There is no statistically significant difference for both groups in individual and sociological characteristics. However, there is a substantial difference in their perceptions about institutional development. The entrepreneurs by necessity have, compared to self-employees, a more favorable opinion about the attitude of the population and government toward entrepreneurship, and they also believe that paying bribes is important if one wants to change rules. They also are more likely to pay social contributions as self-employees. Remittances also have an important role when starting a business. Despite entering into business activity by necessity they probably achieved a higher stability in business operations than the self-employed persons. Hence, it is not so important whether one starts a business due to necessity or opportunity. However, it is of prime importance that the one who provides the initial financing achieves results that ensure more stable business operations in the future. In column 3 we show probit results between entrepreneurs (broadly defined) by necessity and entrepreneurs (broadly defined) by opportunity. The results reveal that those two groups only differ in the status of both parents. Entrepreneurs by necessity were more likely to have fathers and mothers that were bosses (managers). This shows that parents of extended families may no longer be willing to support their family members (who are thus forced to establish their own companies).

Table 4. Probit analysis of Kosovo entrepreneurs (broader sense, narrower sense and self-employees) by necessity versus entrepreneurs (broader sense, narrower sense and self-employees) by opportunity

Variables	entrepreneurs by necessity versus entrepreneurs by opportunity	entrepreneurs by necessity versus self-employees	entrepreneurs and self-employees by necessity versus entrepreneurs and self-employees by opportunity
	Probit 1	**Probit 2**	**Probit 3**
Number of observations	170	350	380
Individual characteristics			
Age	0.173 (0.074)	-0.048 (0.170)	0.103 (0.056)
Male	n/a	0.184 (0.082)	0.05 (0.048)
Urban	-0.034 (0.033)	0.037 (0.060)	-0.027 (0.018)
Married	0.033 (0.032)	0.069 (0.108)	-0.017 (0.012)
Number of children (mean)	0.039 (0.020)	0.108 (0.086)	-0.026 (0.019)
Education	-0.349 (0.091)***	-0.0005 (0.105)	0.012 (0.022)
Good health	0.033 (0.047)	0.183 (0.070)	0.017 (0.012)
Risk taking	0.017 (0.034)	0.011 (0.117)	-0.001 (0.000)
Retire if won €800,000	0.110 (0.054)	0.065 (0.107)	0.006 (0.013)
Not retire - I want more money	-0.004 (0.039)	0.034 (0.044)	0.065 (0.018)
Happy and very happy	0.147 (0.026)	-0.014 (0.090)	0.043 (0.022)
Sociological factors			
Father has higher education	-0.114 (0.061)	0.005 (0.028)	-0.022 (0.033)
Father was a boss	-0.012 (0.118)	-0.14 (0.051)	-0.203 (0.051)***
Mother has higher education	-0.002 (0.020)	0.103 (0.064)	n/a
Mother was a boss	n/a	n/a	-0.257 (0.094)*
Family members in business	0.09 (0.052)	-0.309 (0.086)	-0.026 (0.043)
Friends were in business	n/a	-0.157 (0.171)	-0.008 (0.009)
Institutional environment			
Favorable attitude of the population	0.151 (0.033)	0.121 (0.046)*	0.032 (0.020)
Favorable attitude of the government	-0.028 (0.027)	0.146 (0.053)*	0.015 (0.015)

Variables	entrepreneurs by necessity versus entrepreneurs by opportunity	entrepreneurs by necessity versus self-employees	entrepreneurs and self-employees by necessity versus entrepreneurs and self-employees by opportunity
Pay bribes	0.025 (0.022)	0.287 (0.085)**	-0.001 (0.001)
Labor market			
Number of localities	-0.107 (0.072)	0.455 (0.184)	0.016 (0.031)
Employed in the formal sector	0.112 (0.031)***	0.138 (0.062)***	0.024 (0.026)
Prior status	-0.031 (0.019)	0.047 (0.088)	0.008 (0.014)
Working as a manager	-0.086 (0.212)	0.013 (0.080)	-0.338 (0.140)
Wealth and financial constraints			
Average wealth at 16	-0.023 (0.023)	0.098 (0.064)	-0.022 (0.014)
Remittances	-0.082 (0.051)	0.543 (0.057)*	n/a
Relatively easy to find money	0.018 (0.007)	0.336 (0.155)	-0.053 (0.024)

Source and notes: same as in table 3

In table 5 we present the results of the probit analysis between entrepreneurs in production and trade and between entrepreneurs from Pristina and other cities. As can be seen from columns 1 and 2 there are few differences in characteristics between entrepreneurs in production and trade. In column 1 we present the results for entrepreneurs in the narrower sense. The entrepreneurs in trade are more likely to pay social contributions than entrepreneurs in production. In column 2 we compare entrepreneurs in the broader sense in production and in trade. The results reveal that they differ in two characteristics: motivation and greed. The entrepreneurs in production would be less likely to continue with their activities if they won a lottery than the entrepreneurs in trade. Furthermore, they are less likely to retire, because they desire more money. This indicates that the entrepreneurs in production are less motivated than the entrepreneurs in trade. These results are reflected in the Kosovo economy. There are fewer entrepreneurs in production than in trade. The production sector is at a low level of development. Many industrial plants have closed their doors, including those in the textile industry. Entrepreneurship in the production sector is mainly focused on craft and construction, which is very cyclical.

In column 3 we compare entrepreneurship characteristics between entrepreneurs in the narrower sense in Pristina and entrepreneurs from other cities in Kosovo. In column 4 we extend this comparison to include self-employees. Entrepreneurs in the narrower sense from Pristina are younger and more educated than entrepreneurs from other cities in Kosovo. Their mothers are probably also more educated. They believe that it is more likely that one needs to pay bribes in order to change rules. The last two conclusions also hold when we deal with

entrepreneurs in the broader sense. The results from column 4 also reveal that is more likely that entrepreneurs in the broader sense from Pristina come from wealthier families than entrepreneurs from other cities.[1]

Table 5. Probit analysis of Kosovo entrepreneurs in trade versus entrepreneurs in production and entrepreneursin Pristina versus entrepreneurs in other cities

Variables	*entrepreneurs in production versus entrepreneurs in trade*	*entrepreneurs and self-employees in production versus entrepreneurs and self-employees in trade*	*entrepreneurs in Pristna versus entrepreneurs in other cities*	*entrepreneurs and self-employees in Pristina versus entrepreneurs and self-employees in other cities*
	Probit 1	**Probit 2**	**Probit 3**	**Probit 4**
Number of observations	180	345	300	600
Individual characteristics				
Age	-0.039 (0.094)	0.059 (0.050)	0.196 (0.112)	0.047 (0.084)
Male	-0.035 (0.044)	n/a	0.084 (0.097)	0.046 (0.079)
Urban	n/a	-0.019 (0.030)	n/a	n/a
Married	n/a	0.027 (0.046)	-0.259 (0.072)***	-0.112 (0.044)
Number of children (mean)	0.267 (0.149)	0.04 (0.048)	-0.255 (0.131)	-0.110 (0.095)
Education	-0.006 (0.059)	-0.02 (0.038)	0.189 (0.057)**	0.162 (0.065)
Good health	0.073 (0.041)	0.051 (0.043)	-0.01 (0.103)	-0.124 (0.105)
Risk taking	-0.079 (0.069)	-0.045 (0.073)	-0.133 (0.093)	-0.016 (0.059)
Retire if won €800,000	0.048 (0.042)	0.082 (0.026)**	-0.086 (0.094)	-0.005 (0.083)
Not retire - I want more money	0.009 (0.031)	-0.017 (0.006)*	0.009 (0.059)	-0.089 (0.063)
Happy and very happy	-0.161 (0.086)	-0.067 (0.052)	0.261 (0.163)	0.152 (0.085)
Sociological factors				
Father has higher education	-0.019 (0.078)	-0.054 (0.036)	-0.114 (0.053)	-0.096 (0.040)
Father was a boss	0.066 (0.149)	0.014 (0.085)	0.005 (0.122)	0.003 (0.083)
Mother has higher education	-0.051 (0.087)	-0.018 (0.041)	0.426 (0.101)***	0.335 (0.083)***
Mother was a boss		n/a	n/a	n/a

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[1] Different regions suffer from low levels of demand, poorly educated workers and effective barriers to entry (Robson, 1998). In Kosovo these differences are much higher due to the centralization of main activities in Pristina.

Variables	*entrepreneurs in production versus entrepreneurs in trade*	*entrepreneurs and self-employees in production versus entrepreneurs and self-employees in trade*	*entrepreneurs in Pristna versus entrepreneurs in other cities*	*entrepreneurs and self-employees in Pristina versus entrepreneurs and self-employees in other cities*
	n/a			
Family members in business	0.109 (0.095)	0.016 (0.014)	-0.23 (0.208)	-0.041 (0.022)
Friends were in business	n/a	0.004 (0.316)	-0.122 (0.297)	-0.399 (0.232)
Institutional environment				
Favorable attitude of the population	-0.001 (0.097)	-0.003 (0.045)	-0.021 (0.096)	-0.117 (0.064)
Favorable attitude of the government	-0.021 (0.548)	-0.003 (0.048)	0.036 (0.048)	-0.085 (0.063)
Pay bribes	0.190 (0.101)	0.142 (0.085)	0.369 (0.109)***	0.265 (0.085)**
Labor market				
Number of localities	-0.24 (0.140)	-0.118 (0.095)	-0.206 (0.193)	0.024 (0.129)
Employed in the formal sector	-0.121 (0.027)***	0.002 (0.037)	-0.288 (0.129)	-0.218 (0.091)
Prior status	-0.058 (0.045)	-0.034 (0.026)	-0.099 (0.082)	-0.016 (0.042)
Working as a manager	0.210 (0.164)	0.013 (0.163)	0.045 (0.057)	-0.016 (0.039)
Wealth and financial constraints				
Average wealth at 16	0.291 (0.269)	0.022 (0.077)	0.298 (0.117)	0.316 (0.110)**
Remittances	0.031 (0.059)	0.041 (0.040)	0.010 (0.008)	0.062 (0.038)
Relatively easy to find money	n/a	-0.057 (0.064)	-0.195 (0.129)	-0.107 (0.109)

Source and notes: same as in table 3

Lastly, let us focus on non-entrepreneurs. Entrepreneurship literature puts a special emphasis on non-entrepreneurs since they can serve as a pool for future entrepreneurs.[2] We have divided non-entrepreneurs into three subgroups: 1) those who have already been entrepreneurs but who did not succeed; 2) those who were thinking of becoming

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[2] Starting a business is by neoclassical economists simply a rational choice faced by an individual who chooses between uncertain self-employment, having certainty as an employee and possible unemployment, based on the expected utility in each state. If there is increased unemployment, start-up activities will increase due to the low opportunity cots of not starting a business (see for example Lucas, 1978, Evans and Leighton, 1989a and 1989b, Meager, 1992, Parker 2004).

entrepreneurs; and 3) those who had never thought about becoming entrepreneurs. The results of the probit and multinomial probit analysis for those three groups are presented in table 6. In column 1 we compare non-entrepreneurs who had never thought about becoming entrepreneurs with non-entrepreneurs who were thinking of becoming entrepreneurs. Non-entrepreneurs who had never thought about becoming entrepreneurs were more likely to be women, healthier, less inclined toward risk and put less emphasis on the role of the government in the development of entrepreneurship. They were also more likely to be employed in the formal sector and believe that it is not so difficult to get money for operating a business than non-entrepreneurs who were thinking of becoming entrepreneurs. In column 2 we compare non-entrepreneurs who were thinking of becoming entrepreneurs and non-entrepreneurs who had already been entrepreneurs but did not succeed. The latter are happier, while their attitude toward the government is less favorable. They have changed more locations and are less likely to be employed in a formal sector of economy than the non-entrepreneurs who were thinking of becoming entrepreneurs. In column 3 we show the results between non-entrepreneurs who were not thinking of becoming entrepreneurs and non-entrepreneurs who had already been entrepreneurs but did not succeed. The latter are more likely to be men and are less likely employed in the formal sector.

Table 6. Probit and multinomial logit analysis of characteristics between different groups of Kosovo non-entrepreneurs

Variables	never thought versus thought	thought versus failed	never thought versus failed	never thought	thought	failed
	Probit 1	Probit 2	Probit 3	Multinomial logit 4	5	6
Number of observations	425	250	315	500	500	500
Individual characteristics						
Age	0.396 (0.175)	-0.339 (0.247)	0.053 (0.157)	0.330 (0.138)	-0.379 (0.172)	0.049 (0.102)
Male	-0.245 (0.060)***	-0.149 (0.076)	-0.225 (0.040)***	-0.299 (0.050)***	0.172 (0.054)**	0.127 (0.033)***
Urban	-0.101 (0.048)	0.035 (0.051)	-0.015 (0.035)	-0.084 (0.053)	0.081 (0.044)	0.003 (0.023)
Married	0.052 (0.083)	-0.115 (0.119)	-0.047 (0.064)	0.012 (0.066)	-0.061 (0.091)	0.048 (0.044)
Number of children (mean)	0.097 (0.084)	0.025 (0.080)	0.004 (0.065)	0.084 (0.091)	-0.087 (0.069)	0.002 (0.040)
Education	0.101 (0.106)	0.193 (0.157)	0.157 (0.094)	0.147 (0.120)	-0.026 (0.072)	-0.12 (0.062)
Good health	0.202 (0.070)**	-0.139 (0.074)	-0.018 (0.088)	0.151 (0.059)**	-0.187 (0.062)**	0.035 (0.055)**
Risk taking	-0.278 (0.070)***	-0.071 (0.105)	-0.249 (0.155)	-0.285 (0.059)***	0.184 (0.076)	0.101 (0.092)

Variables	never thought versus thought	thought versus failed	never thought versus failed	never thought	thought	failed
Retire if won €800,000	-0.087 (0.078)	-0.025 (0.063)	-0.054 (0.075)	-0.090 (0.066)	0.054 (0.072)	0.035 (0.033)
Not retire - I want more money	-0.033 (0.058)	0.129 (0.098)	0.039 (0.077)	-0.013 (0.050)	0.059 (0.431)	-0.046 (0.047)
Happy and very happy	0.169 (0.080)	-0.135 (0.034)***	-0.023 (0.037)	0.121 (0.050)	-0.16 (0.064)	0.038 (0.024)
Sociological factors						
Father has higher education	0.062 (0.085)	-0.033 (0.061)	-0.054 (0.051)	0.063 (109)	-0.034 (0.066)	-0.023 (0.022)
Father was a boss	-0.097 (0.160)	-0.116 (0.078)	-0.21 (0.091)	-0.159 (218)	0.048 (0.109)	0.107 (0.036)
Mother has higher education	-0.018 (0.061)	-0.14 (0.118)	-0.133 (0.090)	-0.062 (501)	-0.009 (0.056)	0.07 (0.050)
Mother was a boss	n/a	n/a	n/a	0.495 (0.025)***	-0.377 (0.022)	-0.119 (0.024)
Family members in business	0.091 (0.067)	0.152 (0.093)	0.184 (0.076)	0.140 (191)	-0.050 (0.074)	-0.086 (0.038)
Friends were in business	0.033 (0.036)	0.036 (0.046)	0.03 (0.052)	0.034 (474)	-0.021 (0.037)	-0.013 (0.027)
Institutional environment						
Favorable attitude of the population	0.012 (0.075)	0.012 (0.044)	0.019 (0.036)	0.017 (799)	-0.017 (0.063)	0.004 (0.015)
Favorable attitude of the government	-0.179 (0.032)***	0.119 (0.041)**	-0.009 (0.050)	-0.141 (6689)	0.146 (0.029)***	-0.006 (0.021)
Pay bribes	-0.087 (0.069)	0.107 (0.043)	0.048 (0.033)	-0.051 (7182)	0.085 (0.057)	-0.034 (0.018)
Labor market						
Number of localities	-0.037 (0.215)	-0.330 (0.082)***	-0.192 (0.142)	-0.125 (0.165)	-0.03 (102)	0.162 (273)
Employed in the formal sector	0.534 (0.086)***	0.253 (0.061)***	0.364 (0.061)***	0.569 (0.069)***	-0.456 (256)	-0.118 (218)
Prior status	n/a	n/a	n/a	n/a	n/a	n/a
Working as a manager	n/a	n/a	n/a	n/a	n/a	n/a
Wealth and financial constraints						
Average wealth at 16	-0.047 (0.114)	0.037 (0.110)	-0.032 (0.059)	-0.068 (138)	0.057 (0.105)	0.013 (0.050)
Remittances	n/a	n/a	n/a	n/a	n/a	n/a
Relatively easy to find money	0.173 (0.066)*	0.045 (0.121)	0.084 (0.042)	0.168 (325)	-0.123 (0.054)	-0.049 (0.043)

Source and notes: same as in table 3

Based on the above results we believe that non-entrepreneurs who were thinking of becoming entrepreneurs and non-entrepreneurs who had never thought of becoming entrepreneurs are more likely to be employed in the formal sector of the economy than non-entrepreneurs who had been entrepreneurs but did not succeed. The probability of employment in the formal sector is also higher for non-entrepreneurs who never thought of becoming entrepreneurs than for non-entrepreneurs who had already thought about becoming entrepreneurs. The first ones are, compared to later ones, also less inclined toward risk and expect greater support from the government if they decide to become entrepreneurs. Therefore, they strongly believe that it will be relatively easy to find money in order to start a business. It is evident that the group of non-entrepreneurs who had never thought of becoming entrepreneurs consisted of people who were most likely employed in state or para-state institutions and had a bureaucratic way of thinking, with very little entrepreneurship potential. Our analysis also reveals that the group of non-entrepreneurs who had failed as entrepreneurs were not substantially different from this group. Besides the different likelihood of employment in the formal sector, these two groups are basically the same. The only slight deviation was in the higher inclination towards risk of the non-entrepreneurs who had already thought about becoming entrepreneurs. However, generally speaking there were no substantial differences between the three groups of non-entrepreneurs. This is also confirmed by multinomial analysis. Besides two variables, gender and health, where all three groups were significantly different, there were only a few variables which made a difference. With this we return back to table 4.5, where we compared entrepreneurs in the broader sense with non-entrepreneurs. There we assessed that the group of non-entrepreneurs, compared to entrepreneurs, behaved naively and were not adequately prepared for the challenges of entrepreneurship. Our final results confirm this assessment.

5. CONCLUSION

Our study brings innovation to the debate about entrepreneurship in transitional economies. While other studies attribute the growth of entrepreneurship mainly due to self-employment, our study shows that this is not the case in Kosovo. In our study we divided entrepreneurs in the broader sense into groups of entrepreneurs in a narrower sense (having at least two employees) and self-employees. Such a division can be justified in Kosovo by two reasons. Firstly, in Kosovo there is a small number of employees that have private entrepreneurs. Secondly, there is the substantial growth of enterprises that do not have any employees. These firms were often established due to necessity in order to carry out simple, occasional tasks - mainly in trade. Hence, these firms do not possess a clear concept of their operations and do not have any comparative advantages.

The comparison of entrepreneurs in the broader sense with non-entrepreneurs in Kosovo reveals some characteristics that were not noted in the studies of entrepreneurship in transitional countries. The Kosovo entrepreneurs were less optimistic and more critical of the environment than, for example, the entrepreneurs in Russia and China. Among values, power and service to others are the most important ones. This shows that in Kosovo the extended family still serves as the basic social unit. It is also very interesting to note the low levels of trust (in family members, friends, colleagues, businessmen and the government) compared to Chinese and Russian entrepreneurs and also to Kosovo non-entrepreneurs. The latter are quite naïve about business operations and are quite distanced from reality. Even when we compared the three subgroups of Kosovo non-entrepreneurs (those who had already been entrepreneurs but did not succeed, those who were thinking of becoming entrepreneurs and those who had never thought about becoming entrepreneurs) among each other the results revealed that they

do not differ greatly. As such, Kosovo non-entrepreneurs can not be said to represent a step towards the future growth of entrepreneurship in Kosovo.

Entrepreneurs in the narrower sense (with at least two employees) have a more favorable attitude toward business activity compared to self-employees. They have been involved in business activities for a longer period. They have survived different external shocks and have been able to learn from experience. The diaspora played an important role in the set-up phase of their business activities. They also have a clearer picture of their operations and are very tolerant of their environment (i.e. the state and the population). Above all, the Kosovo entrepreneurs in the narrower sense can be characterized as very optimistic and of good health. Among their family members they do not have many entrepreneurs. They strongly believe that one can not mix friendship with business. Does this indicate that the ideal of the extended family, which has for a long time been a dominant depiction in Kosovo, is disintegrating?

The self-employees are an unsure group with little trust in the environment and in business operations. They come from extended families and their parents were often managers or bosses. It seems that their parents decided to stop taking care of their children. They left them, with their insufficiently developed skills, to a business life where there are very few opportunities. They, on the other hand, would like to do something else besides having their own business. As such, self-employees are also not likely to serve as a potential resource for the future development of entrepreneurship in Kosovo.

With the development of its own state and institutions Kosovo will open to the world. The source of future growth for Kosovo lies in foreign direct investments, mainly in the production of electricity and minerals but also in the unfinished privatization that made progress in the last few years mainly through investments of the diaspora. Entrepreneurship will need to serve as a binding mechanism among those activities and will also need to carry out the role of creative destruction in the production of goods and services that are currently not available for domestic and foreign markets. The origins of such entrepreneurship lie among entrepreneurs in the narrower sense.

It is often claimed that Kosovo entrepreneurs can be irresponsible, with an inappropriate attitude toward property. Such critiques are often legitimate. Our study confirms to some extent that such entrepreneurs exist. Namely, we found that some entrepreneurs do not pay social contributions. These entrepreneurs either started their business due to opportunity or they are situated mainly in Pristina. However, there are also good examples of entrepreneurship (our study reveals that they mainly belong to the group of entrepreneurs that have at least two employees), which show that healthy entrepreneurship activity can also be implemented in the complicated Kosovo environment. Two examples of such entrepreneurship are the firms Elkos and Devolli. While Elkos began operating during the early 1990s, one of the original private enterprises of Kosovo in the trade (import and distribution) of consumer goods, Devolli was founded in 2000 by Mr. Devolli and his sons as a producer of coffee, milk and fruit drinks. Both companies started with no sophisticated management and gradually managed to increase their business operations. Elkos continued to operate in the trading sector, although at a much greater level, taking advantage of hitherto unprecedented levels of consumption. This was primarily fueled by donor funding, diaspora remittances, and the large presence of ex-pats. As such, in 2007 it reached sales of around €120 million and had around 1000 employees. (Elkos, 2008). Devolli, on the other hand, continued to invest in the production activities of milk, fruit and coffee. In 2007 Devolli had

sales of around €27.8 million and 320 employees. In recent years it has also managed to substantially increase its exporting activities, mainly to neighboring countries (Devolli, 2008).

The goal of Kosovo's government is to support entrepreneurship activity. This may be achieved with a suitable industrial and educational policy - one that stimulates all sectors of the economy. However, special focus should be placed on the exporting sector. There should also be more attention given to entrepreneurs who operate in non-trade sectors of the economy. At the same time it needs to provide more choice, such as paid employment, and not simply self-employment or emigration.

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CHALLENGES OF MARKETING COMMUNICATIONS ON A REGIONAL MARKET: HOW CAN WE COMMUNICATE MORE EFFICIENTLY WITH EUROPEAN CONSUMERS?

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1. INTRODUCTION

1.1. Marketing Communications In Financial Crisis

The new financial crisis we have been witnessing since recently stands as yet another momentum when a serious discussion on advertising expenditures needs to be raised. We have learnt by now that any economic slowdown brings serious cuttings of companies' overall costs which usually start within their marketing and advertising departments. However, it has also been proved that not all the companies actually believe in benefits of reducing their overall marketing efforts, especially their marketing communications activities.

On the contrary, while some companies do severely cut their marketing and advertising costs, other even increase their spending to generate more revenue based on their competitors' slowdown and consumers' perceptions of themselves being untouched by the economic crisis. Alternatively, even with a same or a slightly reduced marketing communications budget companies may gain benefits out of the reduced media costs as the mass media generally start lowering their prices whenever being hit by an economic crisis.

The latest economic crisis of 2008 has brought yet another view of how companies should manage their marketing communications to reduce their expenditures while simultaneously keeping in contact with their consumers. The solution is often seen in transferring their marketing communications budgets online, especially to what we call *social media*.

While this rather practical approach is based primarily on tactical changes, here we will examine the potentials of changing marketing communications strategy in order to increase its cost effectiveness. The solution for more efficient communications with consumers in economic crisis may be found in the concept of integrated marketing communications. The concept is based on the idea of more efficient management of overall company communications through centralization of activities. The aim is to reach more consumers through various media while sending consistent marketing message.

For companies operating on several national markets costs efficiency could also be gained through a new marketing communications strategy that would be based on geographic integration of their marketing communications activities. Such an idea has been promoted since the mid nineties of the last century with the concept of globally integrated marketing

communications. While, on a world-while level it may still seem as utopia, it may be possible to use its benefits on a lower level such are for example those European regional markets. Therefore, this paper discusses the possibilities for implementing regionally integrated marketing communications in the Western Balkans.

2. INTEGRATED MARKETING COMMUNICATIONS

2.1. Theoretical background

Regionally integrated marketing communications (RIMC) is a new concept linked to the concepts of integrated marketing communications (IMC) and globally integrated marketing communications (GIMC). Marketing literature introduced the new concept of IMC in the early nineties of the twentieth century. The initial idea was attributed to Caywood et. al whose report from 1991 fuelled further theoretical debates in the field of IMC[1]. Being among the first strong advocates of the new concept, Kitchen and Schultz (1999) however do admit that the idea of "one sight" "one sound" IMC was known in trade literature even before that time. On the other hand, some authors have found the first traces of IMC as far back as in the eighties of the last century, mostly in the theoretical literature connected with public relations.[2]

Since its inception IMC as a new theoretical concept has been raising attention of numerous researchers. The concept was endorsed as a revolutionary one in virtually all general marketing and marketing communications textbooks.[3] The old concept of promotion was proclaimed obsolete and no longer in position to efficiently communicate marketing messages to constantly more demanding customers. IMC itself got a status of a new marketing paradigm.[4] Therefore, the emergence of IMC has been seen *as the most marked example of progress in marketing communications.*[5] After almost two decades, the original concept of IMC has still been drawing attention of many authors. The topics of most recently published papers range from offering the best definition of the concept[6] and providing empirical evidence of its implementation among marketing, advertising and public relations agencies as well as on its adoption by marketing and PR managers[7] to questioning its novelty and/or

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[1] Kitchen, P. J.; Schultz, D. E. (1999) 'A Multi-Country Comparison of the Drive for IMC' *Journal of Advertising Research*, Vol. 39 Issue 1, p21-38 (p.22)

[2] eg. Novelli, W. D., (1989) 'One Stop Shopping: Some Thoughts on Integrated Marketing Communications', *Public Relations Quarterly*, Vol. 34, Issue 4, p7-9

[3] eg. Belch, G. E., Belch, M. A., (2001) Advertising and Promotion, An Integrated Marketing Communication Perspective, McGrow Hill, New York.; Burnet, J., Moriarty, S., (1998) Introduction to Marketing Communications – An Integrated Approach, Prentice-Hall, New Jersey. De Pelsmaker, P. et. al, (2001) Marketing Communications, Pearson Education, Harlow; Duncan, T., (2001) IMC: Using Advertising and Promotion to Build Brands, Irwin/McGrow Hill, New York; Pickton, D., Broderick A., (2001) Integrated Marketing Communications, Pearson Education, Harlow.

[4] Schultz, D. E., et al, (1996) *The New Marketing Paradigm: Integrated Marketing Communications*, McGrow Hill, New York.

[5] Kitchen, P. J., (2005) 'New Paradigm – IMC – Under Fire', *Competitiveness Review*, Vol. 15 Issue 1, p72-80 (p.72)

[6] Kliatchko, J., (2005) 'Toward a New Definition of Integrated Marketing Communications', *International Journal of Advertising*, Vol. 24, Issue 1, p7-34 (p.21)

[7] Cornelissen, J. P, (2003) 'Change, Continuity and Progress: the Concept of Integrated Marketing Communications and Marketing Communications Practice', *Journal of Strategic Marketing*, 11, p217-234 (p. 223)

theoretical validity.[8] In addition to many advocates, the concept also has many critiques considering it *a guru hype*[9] bringing only a new buzz-word rather than offering any novelty in marketing communications in either theoretical of practical sense.

Even after two decades since the inception of IMC we still lack a uniquely accepted definition of the new concept. One of the mostly cited definitions in academic literature in this field is the one by the American Association of Advertising Agencies (AAAA) stating that IMC is *a concept of marketing communications planning that recognizes the added value of a comprehensive plan that evaluates the strategic roles of a variety of communications disciplines e.g. general advertising, direct response, sales promotions and public relations – and combines this disciplines to provide clarity, consistency and maximum communications impact.*[10] This and other definitions of IMC particularly insist on the two main characteristics of the new concept: 1) it promotes the necessity of a coordinated approach in conveying marketing messages to various target audiences, through various channels and using various communications tools and 2) it is based on unique strategic planning process resulting in a coordinated marketing communications strategy. The two general understandings of IMC, as described by Cornelissen (2003) are the 'content' view and the 'process' view. The 'content' view of IMC is based on the idea of communicating consistent messages to target audience through the so called "one-voice' campaigns. On the other hand the 'process' view brings to light the necessity for undertaking organizational changes for bringing all communication discipline under one roof, i.e. in one organizational unit that would be in charge of a company's total communications.

The lack of the unique definition of IMC is reflected in the fact that many academics and practitioners in the field understand the concept quite differently from each other. Due to it, research findings on the adoption of IMC by clients and managers as well as on its implementation in business practices are often based on different definitions of the concept. In an attempt to reveal what can be found under the umbrella of IMC concept, Nowak and Phelps (1994) have analysed *at least three conceptualizations of IMC* mostly found in practitioners-based literature (i.e. *one voice marketing communications*, *integrated communications and coordinated marketing communication campaigns*).[11] According to Grove et. al (2007) *the most often utilized in practice* is *integrated communications* approach which this group of researchers interpret as coupling different marketing communications tools while sending an advertising message to target audience (e.g. newspapers ads containing a coupon, or a telephone number to make a direct call to the advertiser).[12]

While trying to empirically prove the new theory of integrated marketing communications, the researchers have mostly been focusing on analysing perceptions and attitudes of

[8] McGrath, J. M., (2005) 'A Pilot Study Testing Aspects of Integrated Marketing Communications Concept', *Journal of Marketing Communications*, Vol. 11, No. 3, p191-214 (p.192)

[9] Cornelissen, J. P, (2003) 'Change, Continuity and Progress: the Concept of Integrated Marketing Communications and Marketing Communications Practice', *Journal of Strategic Marketing*, 11, p217-234 (p. 217)

[10] Duncan, T. R., Everett, S. E., (1993) 'Client Perceptions of Integrated Marketing Communications', Journal of Advertising Research, Vol. 33, No. 3, p30-39

[11] Nowak, G. J., Phelps, J., (1994) 'Conceptualizing the Integrated Marketing Communications' Phenomenon: An Examination of its Impact on Advertising Practices and its Implications for Advertising Research' Journal of Current Issues and Research in Advertising, Vol. 16, No. 1, p. 49-66

[12] Grove, S. J. et. al, (2007) 'Comparing the Application of Integrated Marketing Communications (IMC) in Magazine Ads Across Product Type and Time', Journal of Advertising, Vol. 36, No. 1, p37-54

Levitt, T. (1983) 'The globalization of markets', *Harvard Business Review*, Vol. 61 Issue 3, p. 92-102

marketing, PR and advertising managers (both agencies' and clients') toward its applicability in practice. Various research studies have been conducted in the U.S. but also world-wide.[13] A survey on agency perceptions and practices concerning integrated marketing communications conducted by Gould et. al added global dimension to the original concept of IMC. The authors argued that marketing communications in the global world *should be coordinated both across promotion disciplines and across countries.*[14] The theoretical background for their survey came from the Grein's and Gould's previously developed new concept of globally integrated marketing communications (GIMC).[15] Though the study happened to be among the most cited thoughts on IMC no other empirical or theoretical work in this field has ever since been published in scientific journals. Referring to the Nowak and Phelps conceptualizations of IMC Gould et. al (1999) found the first and the third conceptualization to be *the most applicable in defining globally integrated marketing communications* (*GIMC*). The original definition of GIMC was given by Grein and Gould in 1996 in which it is defined *as a system of active promotional management which strategically coordinates global communications in all of its component parts both horizontally in terms of countries and organizations and vertically in terms of promotion disciplines.*[16]

IMC definition as *one voice marketing communications* could be understood as a synchronized overall marketing communications campaign aiming at conveying consistent messages to a target audience while building a single market position of a brand. When global dimension is to be added to the original concept it seems necessary to identify individual consumers on global market similar enough to be included in one globally defined target audience. Therefore, this approach seems to be in line with the standardisation strategy. On the other hand, *coordinated marketing communications* as the third definition of IMC, brings the idea of synergy among communications disciplines conducted by various specialized agencies and/or planned within separate company units rather then the need for one positioning strategy. Thus, in this interpretation of IMC the focus is put on the necessity of coordination among communications disciplines while developing different position strategies and targeting different audience.[17] In global terms, according to Gould et. al this can bring *synergies of organizational learning across globally dispersed agency offices and economies of scale that could be addressed through coordination even where one voice approach is not followed.*[18] Hence, concordantly with the compromise school of standardization vs. adaptation debate their founding fathers belong to[19], GIMC concept is based on this third definition of the original IMC concept. In that light the GIMC concept is mostly concerned with organizational aspects of integration (i.e. coordination) of various marketing communications

[13] Eg. Schultz D. E., Kitchen P. J., (1997) 'Integrated Marketing Communications in U. S. Advertising Agencies: An Exploratory Study', *Journal of Advertising Research*, Vol. 37, Issue 5, pp. 7-1; Kitchen P. J., Lee T., (2005) 'Perceptions of Integrated Marketing Communications: a Chinese ad and PR agency Perspective', *International Journal of Advertising*, Vol. 24, Issue 1, p51-78

[14] Gould, S. J., et. al, (1999) 'Agency Perceptions and Practices of Global IMC', *Journal of Advertising Research*, Vol. 39, Issue 1, p7-20

[15] Grein, A. F., Gould, S. J., (1996) 'Globally Integrated Marketing Communications', *Journal of Marketing Communications*, Vol. 2, No. 3, p.141-158

[16] Gould, S. J., et. al, (1999) 'Agency Perceptions and Practices of Global IMC', *Journal of Advertising Research*, Vol. 39, Issue 1, p7-20 (p.9)

[17] Grove, S. J. et. al, (2007) 'Comparing the Application of Integrated Marketing Communications (IMC) in Magazine Ads Across Product Type and Time', Journal of Advertising, Vol. 36, No. 1, p37-54 (p.38)

Levitt, T. (1983) 'The globalization of markets', *Harvard Business Review*, Vol. 61 Issue 3, p. 92-102

[18] Gould, S. J., et. al, (1999) 'Agency Perceptions and Practices of Global IMC', *Journal of Advertising Research*, Vol. 39, Issue 1, p7-20 (p.8).

[19] Melewar, T.C., Vammervick, C, (2004) 'International Advertising Strategy', *Management Decision*, Vol. 42, No.7, p.863-881 (p. 867)

tools the implementation of which is provided by a number of agencies and/or agencies' offices across different countries they operate in. As previously suggested, the main goal of such an approach seems to be more efficient use of resources and achievement of the economies of scales regardless the strategy (standardization or adaptation) which has been used.

2.2. Defining Regionally Integrated Marketing Communications (RIMC)

In line with a theory interpreted by Rojsek (2001)[20] that before acting globally companies should better focus on regional markets the concept of regionalization is presented here as particularly relevant for the new market economies in Eastern Europe. Therefore one of the primary goals of this paper is to discuss the possibilities for a country-wide integration of marketing communication on a regional level. Regionally integrated marketing communications (RIMC) should be understood as another version of the original concept of GIMC, however different from it for at least two main reasons: 1) rather than on one conceptualization of IMC it is based on the general idea of the concept thus bringing consumers back to focus of integration 2) it is based on regional instead of global approach.

With the sound managerial logic it is certainly based on, focusing predominantly on IMC as coordination of marketing communication campaigns, the GIMC concept seems to had gone rather away from the original idea of IMC, which focuses on consumers. Kotler, for example, defined IMC as a new way of understanding overall marketing process from customers' perspective.[21] This seemed to be in line with the original idea of Robert F. Lauterborn who redefined the traditional 4P theory into a communication based concept of 4C.[22] Moreover, although IMC is defined in many ways, each of its definition includes five basic elements, three of which are directly connected with consumers.[23] Therefore, when including an international dimension to the original concept of IMC the consumers still have to be recognized as the starting point based on which further managerial decisions are going to be made. While an internationally integrated marketing communications campaign depends on managerial decisions on how to share knowledge among different country offices in building one global strategy, the possibilities for the implementation of such a strategy are strongly connected with consumers and their attitudes toward marketing communications.

With such a theoretical background and aiming at preventing a myopic view that might result from focusing on only one conceptualization of IMC, the RIMC concept was defined in line with the original overall idea of IMC. Thus, RIMC includes both the 'content' and the 'process' view of IMC. It supports a 'one-voice' approach in terms of favouring communicating consistent messages to target audience on a regional market, while simultaneously promoting the idea of coordination of overall companies' marketing communications on regional markets. Therefore, RIMC has been defined as a concept of international integration of marketing communications by which *development of regional marketing communications strategy is based on coordinated use of various media and tools while communicating consistent message to target audience in all the countries constituting*

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[20] Rojsek, I., (2001) 'A Comparison of the Purchasing and Consumption Behaviour of Slovenian and other Eastern European Consumers', *International Marketing Review*, Vol. 18, Issue 5, p. 509-520

[21] Kotler, P., (2003) *Marketing Management*, Prentice Hall, New Jersey (p. 563).

[22] Schultz, D.E., et. al, (1994) *Integrated Marketing Communications*, NTC Business Books. (p.12)

[23] Kitchen, P. J., (2005) 'New Paradigm – IMC – Under Fire', *Competitiveness Review*, Vol. 15 Issue 1, p72-80 (p.75)

one regional market. As explained by Ognjanov (2007)[24] such a definition includes coordination of marketing media, coordination of marketing communications tools as well as coordination of creative messages. A fully regionally integrated marketing communications strategy needs to include all these three outward appearances of integration. However, while it seems that integration could be more possible on coordination of marketing media and marketing communications tools levels, coordination of creative messages will stay as the most difficult part. In the Western Balkans which was chosen for testing the potentials for regional integration of marketing communications coordination of creative seems to be particularly difficult. It is due not only to similar yet different languages but also due to negative reactions of local population to transferring creative solutions from other countries.[25]

For the purposes of this study potentials for the implementation of RIMC in the Western Balkans were tested according to the ARMECA model as defined in Ognjanov (2007)[26] based on 1) analysis of macro-marketing environment and 2) analysing consumers' attitudes. The main goal is to reveal if there were enough similarities in consumers' perceptions and attitudes toward media and marketing communications tools in Bosnia and Herzegovina, Macedonia, Montenegro and Serbia, for the implementation of a regionally integrated marketing communications strategy. On the other hand, two case studies are described below while examining to what extent the regional companies have been implementing RIMC.

Conclusions derived from all the tree parts of this study could serve as valuable guidelines for developing one regionally integrated marketing communications strategy which could contribute to companies cost savings especially in times of serious economic and financial crises.

3. IMPLEMENTATION OF RIMC IN THE WESTERN BALKANS

3.2. Macro-marketing conditions

The first part of the assessment of possibilities for implementing RIMC in the Western Balkans was based of analysing macro-marketing environments within the four countries of the region (Bosnia and Herzegovina, Macedonia, Montenegro and Serbia). An analysis of macro-marketing conditions usually refers to economic, demographic, cultural, political, legal and technological factors. In this study, macro-marketing environments were assessed to examine their similarities based on which a regionally integrated marketing communications strategy could be developed. Such an analysis was based on using secondary data published in relevant data bases and obtained through various relevant sources. The data are presented below (table 1-4):

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[24] Ognjanov, G., (2007) 'Regionally Integrated Marketing Communications: from global to regional approach in conveying marketing messages', in *Contemporary Challenges of Theory and Practice in Economics: Management and Marketing Under Globalization* - conference proceedings (ed. Branko Rakita et al), CID Faculty of Economics, Belgrade, p. 221-233

[25] Whitford, R., (2001) 'Ad value – Macedonia', *Business Eastern Europe* (January 22nd), the Economist Intelligence Unit.

[26] Ognjanov, G., (2007) 'Regionally Integrated Marketing Communications: from global to regional approach in conveying marketing messages', in *Contemporary Challenges of Theory and Practice in Economics: Management and Marketing Under Globalization* - conference proceedings (ed. Branko Rakita et al), CID Faculty of Economics, Belgrade, p. 221-233

Table 1. Macro-marketing environment in the Western Balkans: Eeconomic indicators

	Bosnia and Herzegovina	Macedonia	Montenegro	Serbia
Economic indicators				
GDP per capita Euro at PPP (2008) Gross Monthly wages avr. In Eur (2008)	6,800	8,400	11,400	9,300
	547	428	609	558

Source: The Vienna Institute for International Economic Studies (Country Expertize), www.wiiw.ac.at (accessed 18.04.2009.)

Table 2. Macro-marketing environment in the Western Balkans: Demography

Demography				
Total population	4,6 mil (July 2009 est.)	2,066 mil (July 2009 est.)	672,180 (July 2009 est.)	7,379,339 (July 2009 est.)
Literacy	96,7% (2000)	96,1% (2002 census)		96.4% (2003 census) *note:* includes Montenegro

Source: The World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/ri.html (accessed 18.04.2009.).

Table 3. Macro-marketing environment in the Western Balkans: Culture

Culture				
Ethnic Groups	Bosniak (48%), Serb (37.1%), Croat (14.3%), Other (0.6%) (2000)	Macedonian 64.2%, Albanian 25.2%, Turkish 3.9%, Roma (Gypsy) 2.7%, Serb 1.8%, other 2.2% (2002 census)	Montenegrin 43%, Serbian 32%, Bosniak 8%, Albanian 5%, other (Muslims, Croats, Roma (Gypsy)) 12% (2003 census)	Serb 82.9%, Hungarian 3.9%, Romany (Gypsy) 1.4%, Yugoslavs 1.1%, Bosniaks 1.8%, Montenegrin 0.9%, other 8% (2002 census)
Languages	Bosnian, Croatian and Serbian	Macedonian 66.5%, Albanian 25.1%, Turkish 3.5%, Roma 1.9%, Serbian 1.2%, other 1.8% (2002 census)	Serbian 63.6%, Montenegrin (official) 22%, Bosnian 5.5%, Albanian 5.3%, unspecified 3.7% (2003 census)	Serbian 88.3% (official), Hungarian 3.8%, Bosniak 1.8%, Romany (Gypsy) 1.1%, other 4.1%, unknown 0.9% (2002 census) *note:* Romanian, Hungarian, Slovak, Ukrainian, and Croatian all official in Vojvodina

Source: The World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/ri.html (accessed 18.04.2009.).

Table 4. Macro-marketing environment in the Western Balkans: Technology

Technology				
Television (broadcast stations)	33 (plus 277 repeaters) (1995)	52 (2007)	13 (2004)	22 (2007)*
Radio	AM 8, FM 16, shortwave 1 (1998)	AM 29, FM 32, shortwave 0 (2008)	31 (station types NA) (2004)	153 (station types NA) (2001)
Telephone (main lines in use)	1,065 mil (2007)	463 600 (2007)	353,300 (2006)	2.993 million (2007)
Mobile cellular	2,45 mil (2007)	1,5 mil (2007)	643,700 (2006)	8.453 million (2007)
Internet users	1,055 million (2007)	685,000 (2007)	280,000 (2007)	1.5 million (2007)

Source: The World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/ri.html (accessed 18.04.2009.). * No. of TV transmitters and repeaters in Serbia: Statistical Yearbook of Serbia 2008, available at: http://webrzs.stat.gov.rs/axd/god.htm (accessed 22.4.2009.)

The tables above reveal important facts which should be taken into consideration when deciding whether to create fully centralized marketing communications departments for the implementation of regionally integrated marketing communications. The table suggests following similarities of the region:

1) relatively low purchasing power in all the four countries of the region which according to marketing theory provides an explanation for the higher impact of TV as a primary marketing communications medium

2) similar languages used by the population of the Region

3) similar level of Internetization and mobile communications development.

On the other hand, the table also reveals severe differences within the Region, even within some countries of the Region thus suggesting the necessity for further localization of marketing communications activities. These differences mostly affecting marketing communications messages both in terms of its creative and media strategies are the following:

1) High ethnic diversity within the region and within particular countries.

2) Although to high extent they are understandable to the local population, a number of different languages are spoken within the Region and even within particular countries (eg. Macedonia).

3) All the countries within the Region have their national media environments which are regulated by national legal documents (eg. Advertising Low, Broadcasting Low, Media Low etc).

3.2. Attitudes of local consumers

Besides macro-marketing analysis described, the possibilities for implementing RIMC in the Western Balkans were assessed based on consumers' attitudes toward marketing communications.

Implementation of RIMC in the four countries of the Western Balkans was tested based on a consumer survey. The population covered by the survey included all individuals who were ready to spend their time going for shopping on Saturday mornings. The main reason for limiting the population of the four countries included in this survey was the fact that these are the individuals most likely to be exposed to any kind of marketing communications thus particularly interesting for marketers in the region. The sample included 700 respondents: 100 respondents from Banja Luka (Bosnia and Herzegovina-Republic of Serbska), 100 from Skopje (Macedonia), 80 from Podgorica (Montenegro) and 220 from Belgrade, 100 from Novi Sad and 100 from Nis (Serbia). Though the sample is hardly representative for overall population of shoppers in the Western Balkans, the findings are indicative for urban population in major cities of the countries covered by the survey.[27] In all the cities, respondents were randomly approached on the main shopping street in each of the cities, on Saturday mornings. [28]

The survey addressed the issues connected with *importance of various marketing media in the Western Balkans, usage of various product information sources by local consumers and their attitudes toward two marketing communications tools – advertising and personal selling.*

Marketing media in the Western Balkans. To find out what are the most important media in the Western Balkans the respondents were asked to state which media they address to when searching for everyday information as well as to state which of those they see as the most reliable sources of information. The survey results revealed that TV has the highest share among the selected media, with 84,86% of respondents stating to be using this particular medium. Daily papers are the second most important mass medium yet the share of those stating to be using it is far less – 58,29%. Surprisingly radio seems not to be perceived as highly important as we have expected, with 27% of our respondents stating to be addressing to it, whereas the obtained results revealing the consumption of Internet (18,29%) is just as expected.

For the purposes of examining the potentials for developing one regionally integrated marketing communications strategy Chi-Square test was applied to analyse if there are statistically significant differences in the answers of our respondents in the four countries of the Western Balkans. Pearson Chi-Square values by types of media are provided in the table bellow along with corresponding p-values in parentheses. The results reveal no statistically significant differences concerning the usage of TV and Internet on country levels whereas the usage of other selected sources of information is significantly different.

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[27] The analysis of macro-marketing environment in Bosnia and Herzegovina indicated high ethnic diversity in. While Banja Luka is mostly settled by the Serbs, the capital of Sarajevo is mostly settled by Bosniak population whose attitudes may significantly differ from their Serbian counterparts. Additionally, Croatian urban population in Bosnia and Herzegovina was also excluded from the survey. Therefore, the findings obtained mostly refer to urban population in one entity in Bosnia and Herzegovina – Republic of Serbska.

[28] For deeper insight into the methodology see Ognjanov G, Nojkovich, A. 'Regionally Integrated Marketing Communications: Some Evidence from the Western Balkans' *Proceedings of the 15th Annual Conference on Marketing and Business Strategies for Central and Eastern Europe*, (ed. R. Springer and P. Chadraba) Vienna University of Economics and Business Administration, Vienna, Austria, 2007, pp. 268-284

Table 5. Consumption of mass media in the Western Balkans

	TV	Dailies	Radio	Internet
Usage of mass media as source of everyday information (%)	84,86	58,29	27	18,29
Pearson Chi-Square (p-value)	2,317 (0,509)	10,810 (0,013)	15,470 (0,001)	6,900 (0,075)

Note: Respondents were invited to provide multiple answers.

On the other hand, in order to assess the importance of TV as a marketing medium in the Western Balkans the respondents were asked to choose among the mass media which they perceive as the most reliable ones. The results reveal that the consumers in the Western Balkans perceive TV as the most reliable source of information (32,29%) comparing it to daily papers (10,43%), radio (2,57%), and internet (7,43%). However, it should also be noted here that particularly high share of our respondents (29,28%) don't find any of the media highly reliable source of information.

Pearson Chi-Square of 16,633 (0,164) reveals no statistically significant differences among the countries with regards to the respondents perceptions of the most reliable media. However, the same test with Pearson Chi-Square value of 13,362 (0,004) indicates that contrary to previous there are statistically significant differences among the four countries of the region regarding their customers' general belief in the media as sources of everyday information. While 29,28% of the respondents from all the four countries state that they do not believe in any of the sources of information, this figure varies among the countries with the least share in Macedonia (15%) and the biggest share in Serbia (32,6%) and Montenegro (32,5%). Detailed data revealing the perceptions of reliability of sources of everyday information in the four countries of the Western Balkans are provided in the table below:

Table 6. Perceived reliability of different sources of information by countries

Reliability	Overall	SER	MA	RS	MO	Pearson Chi-Square
TV	32,29	27,9	46	41	27,5	
Dailies	10,43	10,3	11	11	10	
Internet	7,43	7,6	10	3	8,8	
Radio	2,57	2,9	0	5	1,3	
Any	70,72	67,3	85	74	67,5	16,633 (0,164)
Neither	29,28	32,7	15	26	32,5	13,362 (0,004)

Note: Respondents were asked to choose one medium which they find the most reliable.

Product information sources. To see how they would actually rank alternative sources, the respondents were asked to imagine a situation in which they had to look for product information prior to making a purchasing decision. The question addressed certainty with which they would look for different product information sources, such are advertising, word-of-mouth, sales representatives, journalists, experts or celebrities as well as fairs and exhibitions. The results revealed that when searching for product information most certainly they would address to word-of-mouth (46,2%), journalists, experts and celebrities (36,4%), sales representatives (29,9%), fairs and exhibitions (27,3%) and advertising (21,1%).

Chi-Square testing however showed statistically significant differences among the four countries of the region in the way how their consumers regard these particular sources when looking for product information. The share of respondents in each of the four countries stating that they would certainly address to the offered sources of product information as well as Pearson Chi-Square statistics are provided in the table below.

Table 7: Share of consumers in the four countries of the Western Balkans certain to be using different product information sources when making purchasing decision

Sources of product information	overall	SER	MA	RS	MO	Pearson Chi-Square
word-of-mouth	46,2	49,8	54,5	26	42,5	55,853 (0,000)
publicity	36,4	34,6	46,5	25	47,5	33,686 (0,001)
personal selling	29,9	31,2	42	17	23,8	33,872 (0,001)
fairs/exhibitions	27,3	25,5	47,5	14	28,8	45,399 (0,000)
advertising	21,1	21,7	31	10	20	29,705 (0,003)

Note: Five-point scale was used to measure certainty with which they would address to particular sources of product information. Only the highest scored answers were counted.

Furthermore, consumers' preferences between non-commercial and commercial sources of product information as well as between interpersonal and mass communications messages were tested. The Chi-Square test was applied to find out if the differences in the usage of particular product information sources are statistically different. The test revealed statistically significant differences in all the categories based on which we may conclude that consumers in the Western Balkans prefer non-commercial to commercial sources, as well as interpersonal to mass communication. The results are provided in the following table:

Table 8: Differences in perceptions of importance of product information sources by types

Sources of product information	Interpersonal	Mass	Pearson Chi-Square
Non-commercial	word-of mouth	publicity	33,667 (0,000)
Commercial	personal selling	advertising	68,144 (0,000)
Pearson Chi-Square	45,159 (0,000)	51,556 (0,000)	

Attitudes toward personal selling. Assessment of attitudes toward personal selling as an important marketing communications tool was based on two questions, one of which considered certainty with what it would be regarded as an important source of product information (explained above) and the other measuring consumers' perception of this marketing communications tool's reliability in providing information when making purchasing decisions. As could be seen in table 7, personal selling was regarded as an important source by one third of the respondents who would certainly address to it when searching for product information. However, comparing it to other sources, personal selling comes after another form of interpersonal communications (word-of-mouth) as well as non-commercial media (publicity) with no exception to this rule on country level. On the other hand, Pearson Chi-Square value of 33,872 (0,001) reveals significant differences in consumers' perceptions of the importance of this particular source of product information by countries. Descriptive statistics analysis also reveals differences in its ranking among other tools by countries, with Macedonian and Montenegrin consumers giving preference to fairs and exhibition comparing to personal selling.

The other question by which consumers' attitudes toward personal selling were tested addressed perceived reliability of this tool. The results reveal that 41,7% of the respondents generally believe in the information and suggestions provided by sales representatives. However, Pearson Chi-Square value of 55,909 (0,000) reveals statistically significant differences in their perceptions of the reliability of this marketing communications tool on country level. The share of consumers with positive attitudes toward personal selling regarding its reliability as a source of product information by countries can be seen from the table below.

Table 9. Share of consumers seeing personal selling as reliable source of product information by countries

	overall	SER	MA	RS	MO	Pearson Chi-Square
Reliability of personal selling	41,7	40,6	51,5	41	36,3	55,909 (0,000)

Note: Five-point scale was used to measure how much they would believe to what is suggested by a sales representative. Both categories of positive answers were counted due to only a few respondents gave highest scores to this question.

Attitudes toward advertising. Assessment of consumers' attitudes toward advertising was based on a set of questions regarding their readiness to look for it when searching for product information, perception of its reliability as well as their opinions on current advertising practices as seen on the local TV stations in the four countries of the region. As stated in table 4 the survey results revealed that comparing to other, customers express least readiness to use advertising as a product information source prior to making purchasing decisions. We saw that only 21,1% respondents in all the four countries would certainly look for advertising messages prior to making purchasing decision. By its ranking within the other sources of product information advertising is placed at the bottom in all the four countries covered by the survey. However, Pearson Chi-Square value of 29,705 (0,003) reveals statistically significant differences among the four countries. Descriptive statistics analysis suggests that Macedonian consumers seem to be most ready to be exposed to advertising messages (31%).

The reliability of advertising was tested concerning how much the respondents would believe in advertising messages in the local media. The survey results reveal that 32,5% generally believe in what they find in advertising. However, Pearson Chi-Square value of 47,478 (0,000) reveals statistically significant differences in their answers on country level. The detailed results by countries are provided in table 10.

Concerning interestingness of advertising, 42,6% of our respondents showed positive attitudes. Similarly to previous, however, Person Chi-Square test revealed statistically significant differences in their attitudes toward interestingness of advertising on country level. Data analysis shows that Macedonian consumers gave most positive answers regarding this question (see table 10).

Finally, attitudes toward advertising were also assessed based on how much intrusive it is perceived by local consumers. Regarding this question, we could see that 67,1% of our respondents find advertising on the local media very intrusive, whereas Pearson Chi-Square value of 49,211 (0,000) reveals statistically significant differences among the four countries included in our survey. Results are provided in table 10.

Table 10. Consumers' perceptions of reliability, interestingness and intrusiveness of advertising in the Western Balkans

Attitudes toward advertising	overall	SER	MA	RS	MO	Pearson Chi-Square
Reliability	32,5	27,2	51,5	30	40,1	47,478 (0,000)
Interestingness	42,6	43,4	57,6	32	32,6	26,540 (0,009)
Intrusiveness	67,1	69	52,5	74	66,3	49,211 (0,000)

Note: Reliability, interestingness and intrusiveness were measure on five-point Likert scale. Frequencies of positive scores were calculated and compared.

To conclude on whether local consumers in the Western Balkans have more positive attitudes toward personal selling than to advertising their answers were cross-tabulated. As expected, personal selling is perceived as a more reliable marketing communications tool. Namely, Pearson Chi-Square value of 101,957 (0,000) revealed statistically significant differences

among the shares of the respondents who find personal selling reliable and the share of those who find advertising a reliable source of product information. Descriptive statistics analysis reveals that while 41,7% of respondents believe in what they learn from sales representative, 32,5% of them believe in what they find in advertising messages.

Additionally, as shown in table 4, higher share of the respondents stated to be using personal selling as source of product information then advertising (29,9% comparing to 21,1%). Pearson Chi-Square value of 68,144 (0,000) proves such a difference in their answers regarding the use of the two marketing communications tools to be statistically significant. Therefore, we may here conclude that the customers in the four countries have generally more positive attitudes toward personal selling than to advertising.

In sum, the survey results revealed similarities in consumers' perceptions and attitudes toward marketing communications. As we hypothesised at the beginning, the survey results revealed that TV plays the most important part in the media consumption, that non-commercial communication is given preference to commercial messages, interpersonal communications dominates mass media communication and that consumers' attitudes toward personal selling are more positive than to advertising. While these could be accepted as general characteristics however certain differences among respondents are also evident. Therefore, though the development of one regionally integrated marketing communications strategy seems possible fine-tuning on the local level is still needed. The regional players may therefore decide upon a cost-savings approach which would favour centralization of marketing communications activities and implementation of a more regionally integrated strategy or locally adjusted strategies which would certainly bring benefits to their brand building on a national market. The two case studies described below show that in the period of economic growth regional players generally opted for a more decentralized and locally adjusted approach.

3.3. Two case studies

The third part of this study aiming at examining possible implementation of RIMC in the Western Balkans brings to light the two case studies of regional players. It is an explorative study based on a qualitative analysis of secondary data obtained through various sources. The case study research format is similar to the one applied in another explorative studie the aim of which was to identify typical strategic patterns used by international companies in Central and Eastern Europe.[29] The secondary data sources used in this study included mostly companies' corporate web-sights and press clippings.

The two companies covered by this study are the only two regional players in the telecommunications market in the Western Balkans. These are Telecom Austria, i.e. their mobile operator Mobilkom Austria which operates in Croatia, Macedonia and Serbia and Telecom Serbia and their mobile operator company Mobilna telefonija Srbije operating in Bosnia and Herzegovina (M:tel), Montenegro (M:tel) and Serbia (Mt:S). However, for the purposes of this study to keep it consistent to the other two parts of it communications strategy of Mobilkom Austria was analysed only in Macedonia (Vip oprator) and Serbia (Vip Mobile), while Croatian operator Vip Net was excluded. To analyse communications strategies within the region companies' brands, logos, slogans, creative messages, media

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[29] Schuh A, Schaik C, 'How do CEE firms Compete? Identifying Successful Patterns of Competitive Behaviour in CEE', *Proceedings of the 16th Annual Conference on Marketing and Business Strategies for Central and Eastern Europe*, (ed. R. Springer and P. Chadraba) Vienna University of Economics and Business Administration, Vienna, Austria, 2008, pp. 329-340

strategies as well as corporate and marketing communications departments were assessed. The findings are listed in the table below:

Table 11: Communications strategies of two regional players in the Western Balkans

	Telecom Austria: Mobilkom Austria		Telecom Serbia: Mobilna telefonija Srbije		
	Macedonia	Serbia	Bosnia and Herzegovina	Montenegro	Serbia
Brand	Vip Operator	Vip Mobile	M:Tel	M:Tel	Mt:S
Logo	Identical – Vip brand		Visual layout identical – different brand names		
Slogan	Different messages in different languages (Macedonian, Albanian and Serbian)		Same message uniquely understandable in all official languages spoken within the countries		
Creative	Same format and same corporate colour, locally adapted creative appeals, local actors, local languages		Different formats, different colours, locally adapted creative appeals, local actors, local dialects		
Media strategy	Local: Mostly TV, print and outdoor	Local: Mostly TV, print and outdoor	Local: Mostly TV, print and outdoor	Local: Mostly TV, print and outdoor	Local: Mostly TV, print and outdoor
Agencies engaged	local	local	local	local	local
Marketing Communications and Corporate Communications Departments	local	local	local	local	local
Centralized Coordinating Team and information sharing among companies	Yes: Moblikom Austria Group		Not available		

Based on two case studies described above we may conclude that regional players in the Western Balkans were implementing more localized approach in developing their marketing communications strategies. While such a strategy might be more successful in a period of economic growth it is disputable if it pays the bills in the time of economic slowdowns. Therefore, during a financial crisis companies should rather make a trade off between the advantages of adaptation and the need for cost-savings while simultaneously keeping the overall intensity of marketing communications at the same level. The regionally integrated marketing communications approach seems particularly adequate for the regional players in the Western Balkans. It advocates *prototype standardization* or *pattern standardization*[30] which allows certain level of adaptation still highly needed in this region.

4. CONCLUSIONS

The RIMC concept was developed in concordance with the idea of adding an international dimension to IMC. Distinctively from GIMC which was the first concept bringing to light the benefits of international integration, RIMC favours regional to global approach. Additionally, though the two concepts belong to the so called compromise school of standardization vs.

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[30] Colvin, M. et. al, (1980) 'Developing International Advertising Strategy' *Journal of Marketing*, Vol. 44, Issue 4, p.73-79

adaptation debate, it seems that GIMC insists on the benefits of standardization while leaving certain space for localization. On the other hand, RIMC is grounded in the theory of "pattern" or "prototype" standardization which acknowledges the need for fine-tuning in local conditions markets.

Testing potentials for implementation of RIMC is the Western Balkans covered three parts – analysis of maco-marketing environments of the countries within the region, assessment of consumer attitudes toward marketing communications and two case studies of regional players operating on telecommunications market.

The study results revealed several general characteristics of the region. Namely, these are as follows:

1) relatively low purchasing power,

2) relatively low level of communications development particularly internatization not leaving much space for the use of the new social media as a general cost savings approach applicable in more developed markets (i.e. US and EU),

3) extensive use of TV as a marketing medium.

Therefore a regionally coordinated marketing communications strategy in this region should

1) be based on various forms of interpersonal communications, preferably to initiate and direct word-of-mouth but also to develop a corresponding personal selling strategy in support of their advertising campaigns,

2) include non-commercial communication using public relations activities to raise publicity, as well as think of other forms of communications that are not explicitly perceived as commercial such as events, sponsored programs and discrete product placements

3) use media plans with less frequencies of TV advertising than in some more developed regions of the rest of Europe

4) be based on locally applicable creative solutions.

On the other hand, marketing manages and agencies operating in the region must note that there are significant differences on country levels. These are still mostly connected with the issue of inter-ethnic conflicts and strong national feelings within this region. Moreover, there are no regional media, but media strategy and media plans have to include only national and local media in each of the countries. The marketing communications legislative is also local. There are also some distinctions in consumers' overall attitudes toward marketing communications. For example, while Macedonian consumers seem to be more positive to different types of media and various marketing communications tools, the consumers in Serbia and Montenegro reveal particularly high distrust in any sources of everyday information, while the consumers in Bosnia and Herzegovina (Republic of Serbska) show the highest scepticism concerning the use and reliability of various marketing communications tools.

Consequently, RIMC strategy within the region is particularly applicable as it uses most of the benefits of pattern standardization through the company information sharing and more efficient organization of internal communications departments while leaving space for the local fine-tuning. In the Western Balkans it seems that integration is possible on coordination

marketing communications tools levels and media strategy, while the coordination of media plans and creative messages stays as the most difficult part. However, a coordination of marketing communications would certainly bring benefits in a period of economic slowdown when it is highly important to achieve higher cost-efficiency through centralization on corporate level.

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LINKS BETWEEN TOURISM, EMPLOYMENT, UNEMPLOYMENT, AND PRODUCTIVITY: CASE OF CROATIA

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1. INTRODUCTION

1.1. The tourism-led-growth hypothesis

Tourism policy can strengthen the positive externalities of the tourist's expenditure and thus increase the potential of growth in the economy. Some researchers have proposed a tourism-led economic growth hypothesis that assumes tourism to be a major factor of economic growth in the long run. The main positive economic impacts of tourism relate to foreign exchange earnings, contributions to government revenues, and generation of employment and business opportunities.

This paper aims to re-examine tourism-led-growth hypothesis which states that tourism is negatively related to unemployment and positively to real economic activity, e.g. employment and productivity.

The issue of the growth promoting effect of exports has been a central theme in trade and development literature. Numerous studies have focused on testing whether export expansion leads to improved growth performance, while others have attempted to examine how exports affect economic growth. Economic theory suggests that export expansion promotes economic growth via two paths: (i) by improving efficiency in the allocation of productive resources and (ii) by increasing the volume of productive resources through capital accumulation (Bardham and Lewis 1970; Romer 1989; Basu and McLeod 1991; Edwards 1992; Ghirmay et al 2001). In our paper we postulate that tourism is a proxy for export service, labour

productivity growth stands as a proxy for positive externalities of the economic growth, and employment and unemployment encompass main real macroeconomic variables.

Since tourism growth reflects the economy's long-term prospects we focused on annual data. This paper tests the true hypothesis that tourism production responds positively to aggregate labour productivity. A contra-rational hypothesis is less intuitive and clear than a bare statement that tourism growth induce negative respond to unemployment rate and *vice versa* positively impact to as general employment via multiplier mechanism. Obviously a negative link between labour productivity and tourism could happen because stronger tourism activity causes attraction of employment. As we know tourism is a traditional service & labour intensive sector, and in nature it is much less productive than a various manufacturing production. In generally, overall labour productivity tends to be less robust because of crowding out effects, so growth of tourism activity doesn't necessarily mean that in the long run development labour productivity tends to growth.

It is in this context that the labour productivity, as variable that determines the economic growth, must be considered. A slower productivity growth limits the growth rate of the real income and increases the possibility of conflicts in the distribution of the income (Englander and Gurney, 1994). The differences that are observed in the standards of living between the richest and poor countries reflects the differences that have been observed in the rates of economic growth. "*Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.*" (Krugman, P., 2002).

Two issues are addressed, first if there is a relationship between tourism and the real macroeconomic variables and once this is established the next step is to investigate the type of relationship present. The study uses annual data covering the years 1952-2004, on Croatian economy, and builds a VAR model to test the hypothesis of the positive impact of tourism activity on real economic activity (beside unemployment rate).

In this study a multivariate VAR model is used, where, except for tourism product and labour productivity, the variable of employment and unemployment is included. The focus of the multivariate dynamic model permits us to investigate the impact of tourism on productivity, and identify the factors through which tourism export affect real economic variables. The VAR approach premises the possible existence of short-term relationships between tourism and the other variables. Moreover, it allows us to study the long-run effects of tourism on the other variables. So the second goal of this study is to forecast all relevant variables.

The paper is structured as follows: the next section is entirely devoted to VARs (previous research of main hypothesis, visual inspection of the data, testing for unit root and cointegration, estimation, restrictions, diagnostic testing, casual links, impulse response analysis).

1.2. Literature review

There are few studies investigating empirical relationship between tourism and economic growth. Earlier studies in this area mainly focus foreign trade and tourism (Kulendran and Wilson, 2000; Shan and Wilson, 2001). Recently studies concentrate on the contribution of tourism sector to the economic growth (Balaguer and Cantavella-Jorda, 2002; Diritsakis, 2004; Oh 2005; Gunduz and Hatemi-J, 2005; Kim, Chen and Jang, 2006). On the other hand, there is an unverified question of whether tourism growth actually caused the economic

growth or, alternatively, did economic expansion strongly contribute to tourism growth instead. To date, articles that have analyzed the causal relationship between economic growth and tourism sector demonstrated mixed results. For example, Balaguer and Catavella-Jorda (2002) found that tourism affected Spain's economic growth in one direction. Their study is supports tourism-led economic growth hypothesis. Diritsakis (2004) observed a strong reciprocal causal relationship between tourism earnings and economic growth for the Greece economy. Therefore, his study supports both tourism-led economic growth and economic-led tourism expansion hypotheses. Similarly, Kim, Chen and Jang (2006) found a bi-directional causality between economic growth and tourism expansion in Taiwan. However, Oh (2005) suggested that the hypothesis of tourism-led economic growth is not held in the Korean economy. Gunduz and Hatemi-J (2005) found that the tourism-led growth hypothesis is supported empirically in the case of Turkey. As we know till yet in Croatia's research community there is absent advance econometric study neither is other methodological efforts in this direction done, so we will hope that the conclusion of this paper will stimulate our peers in academy to make deeper research in further.

2. ABOUT DATA AND VISUAL INSPECTION

Družić (2004) contains a real GDP time series of the Croatia (based on USA $ in 1990) from 1952 to 2001 (Table 6.1., pages 228-229), time series of employment (Table 6.5. , page 234) The remaining uncovered data-sets until 2004 as well as data about number of employment, unemployment rata and tourism income was extracted from Statistical Yearbook of Croatia, various issues by the authors. The dummy variable is deduce, after we made transformation of the GDP per capita of the Western Europe (obtained from *www.usd.edu/~rbrown/world.xls* data source).

We used annual data covering 52 years from 1952 to 2004. The analysis involved four macroeconomic variables, because of VAR approach modeling all variables we considered as endogenous.

The time series in this paper are constructed as:

prod = 100*(ln (Croatian real GDP)-ln (Croatian civil employment)
e = 100*ln (Croatian civil employment)
U = Croatian unemployment rate in %
tour = 100*ln (Croatian real GDP of tourism and catering sector)
dummy = 0/1 recession/expansion in the Western Europe.

Hence, prod is used as a measure of labor productivity; e is used for employment; U is the unemployment rate and tour assigns the tourism product. The tour and prod variables values were given in fixed prices (base index in 1990), because real variables are an index numbers. To catch the dummy we suppose that in some years the Western European countries suffered a recession phase of economic cycle (when the actual output per capita was bellow the so cold potential or long-run trended output per capita), and it has been postulated that this recession caused a structural change in the savings /expenditures habits that persisted beyond the end of the recession. Such circumstances in the economy can cause less initiative to spend the rest of the household's income on the tourist vacancies due to its luxury good feature. Through out of our paper we use in such a way tailored dummy variable indicating recession in the circle of Western European countries, e.g. in**:** Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Sweden , Switzerland, and United Kingdom.

Hence, we coded recession years as 0, and expansion years as 1.

Employment

Tourism Output

Productivity
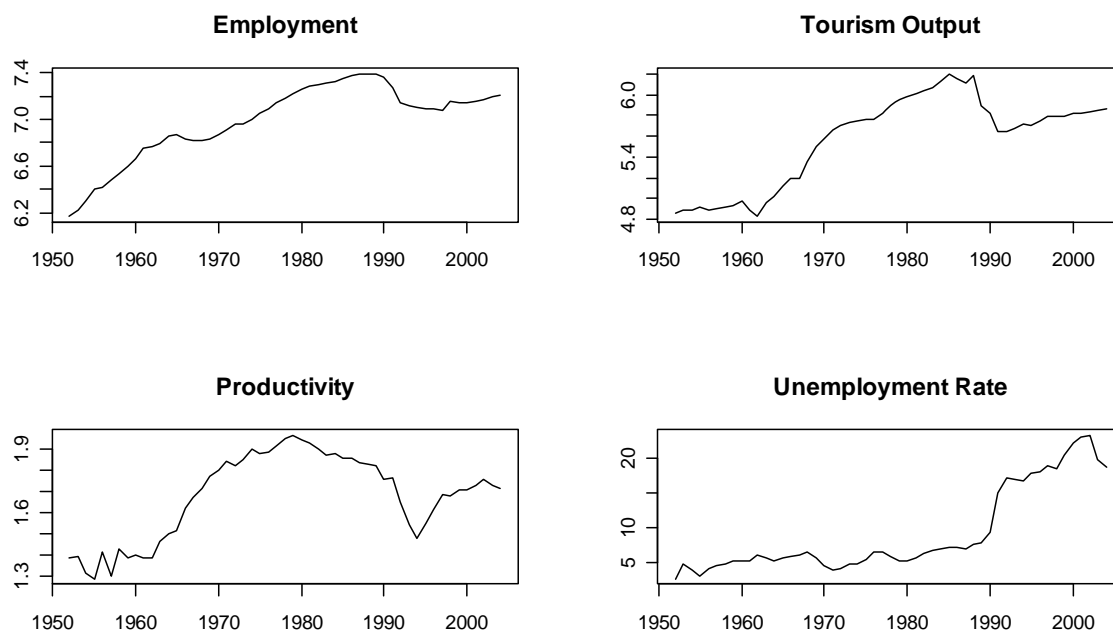
Unemployment Rate

Figure 1. Employment, Productivity, Tourism Output Growth and Unemployment Rate in Croatia 1952-2004

The exploration of our time series begins with a short visual inspection of the data (Figure 1). [1] Croatia's economic performance (both in the terms of growth rate and volatility) was similar to the employment, and tourism output (maximum peak was in the mid-eighties), and slightly less in productivity growth which drastically fall after the first oil crises in mid-seventies. Between 1952 and 1990, the unemployment rate had increased but very slowly and with moderate dynamic but afterward the various shocks as a Homeland War, destruction of capital means, privatization and sucked employers had picked up the unemployment rate in high sky in rest of nineties. Transitional dynamics of tourism output growth after the beginning of nineties is return on earlier trajectory path of very high rate of growth. Upward sloping trend between 1952-1986 and 1991-2004 are almost parallel indicating that tourism economy after the abyss fall in the meantime period progress again in leapfrog pace. The high unemployment rate remaining a great concern for the people living in Croatia.

Table 1. Descriptive Statistics of Variable 1952-2004

Variable	Max.	Min.	Mean	St.Dev
e	7.38	6.16	6.98	0.32
prod	1.96	1.29	1.67	0.19
tour	6.2	4.82	5.56	0.43
u	2.76**	23.22**	9.17**	0.59*

* in log
** in level value

---

[1] Visual inspection of the data is of great importance because it allows us to develop certain intuition about the nature of the fluctuations, the degree of stationarity or non-stationarity, and to guide the selection of appropriate analytic techniques. The "eyeball analysis" of employment, tourist output data and productivity tell us that simple OLS regression analysis across the entire time series would be inappropriate because of non-stationarity. Should we or not proceed with better analysis in the context of a vector-error correction model (VECM), or alternatively analysis within VAR will be answer after the check of VAR (p) stability.

The degree of volatility, in more formal way, is measured by the standard deviation of logged variable. The unemployment rate has the greatest volatility compared to the amplitude of other three main macro-variables. It is not wonder because the minimal unemployment rate has been noted in 1952 (2.76%) whereas the maximal rate in 2002 amounts 23.22%. The tourism output variable as expected exhibits somewhat lesser volatility but still overrated (standard deviation is used as a proxy of amplitude of the oscillation) the volatility of other two variables (employment and productivity growth). Indeed, the standard deviation for the GDP per labor is 19%, and for employment is 32%, i.e. more than 2.26 (or 1.34) times higher in favors to tourism.

3. ECONOMETRIC ANALYSIS

3.1 Unit root and cointegration tests

As a pre-requisite certain properties of the variables in the model must be checked in order to determine the appropriate specification for VAR estimation. The order of integration for each variable is determined using Augmented Dickey and Fuller (1979) and Phillips and Perron (1988) tests. The results of these tests are reported in table 2. As we can see all calculated ADF and PP statistic is higher than the critical values, indicating that the series is likely to be non-stationary (does have a unit root). Those variables all show random walk with drift, i.e. they must be first differenced in order to become stationary since they are integrated of order one I (1). Since the variables are non-stationary in log levels (beside U variable), we perform the ADF and PP test on the differenced series and obtained that all variables are now stationary. We can see that the null hypothesis of non-stationary is clearly rejected in all cases of first differenced variables.

Table 2. Unit root test in levels

		ADF		PP
	C,T	**C**	**C,T**	**C**
e	-2.08 (1)	-2.833 (1)	-1.766(4)	-3.265(4)
prod	-1.013(1)	1.496(1)	-1,159(3)	-1.566(3)
tour	-0.658(0)	-1.562(0)	-1.076(4)	-1.51 (4)
u	-2.205(1)	-0.558(1)	-1.373(0)	0.228(0)

Source*: Authors' calculations.*

Test critical values for C,T:	1% level	-4.148
	5% level	-3.500
	10% level	-3.179

Test critical values for C:	1% level	-3.565
	5% level	-2.919
	10% level	-2.597

Table 3. Unit root test in 1st difference

		ADF		PP
	C,T	**C**	**C,T**	**C**
D(e)	-3.899(0)	-3.354(0)	-3.882(2)	-3,218(2)
D(prod)	-6.951(0)	-6.822(0)	-7.016(3)	-6.923(3)
D(tour)	-5.614(0)	-3.17(1)	-5.758(3)	5.701(4)
D(u)	-4.955(0)	-4.922(0)	-4.807(5)	-4.857(4)

Source*: Authors' calculations*

Generally, there are two different ways of specifying a VAR when the time series under study are cointegrated - an unrestricted VAR in levels or a VECM. Which specification is more appropriate remains debatable though VECM is more conceivable. While the VECM conveniently combines the long-run behavior of the variables and their short-run relations and thus can better reflect the relationship among the variables, there is no guarantee that imposing restriction of cointegration can be a reliable basis for making structural inferences (Faust and Leeper, 1997). Moreover, current finding is still unclear on whether the VECM outperforms the unrestricted VAR at all forecasting horizons. (Faust and Leeper, 1997Naka and Tufte (1997) found that the two methods have comparable performance at short horizons. The support for the use of the unrestricted VAR can also be found in Clements and Hendry (1995), Engle and Yoo (1987) and Hoffman and Rasche (1996).

Since the our results, overall, tend to suggest non-stationarity in log levels of the variables (included U in absolute level) but stationarity in their (log) first differences, we proceed by contending that the variables belong to the I(1) process. Since the four variables are noted to be I(1), there exists the possibility that they share a long-run equilibrium relationship, as was pointed out by Engle and Granger (1987).

Before carrying out the co-integration analysis, it is important to ascertain that appropriate lag length (see Table 4). Information criteria do not give a consistent result: minimum Akaike's Final Prediction error (FPE) and AIC(n) values suggest VAR(5), whereas LR, SC, Hannan-Quinn information (HQ), and Schwartz Information Criteria (SIC) suggest VAR (2). An optimal lag-order is determined according to an information criteria or the final prediction error of a VAR (p). According to the more conservative SC(n) and HQ(n) criteria, the empirical optimal lag-order is 2 (because of annual observation this is obviously more acceptable time-lag than fife years).

Table 4. Optimal lags selection

Optimal lag selection (constant and trend in VAR included)				
LR(n)	**AIC(n)**	**HQ(n)**	**SC(n)**	**FPE(n)**
2	5	2	2	5

Source*: Authors' calculations.*

To test this, we implement VAR-based cointegration tests with two lags using the methodology developed in Johansen (1991, 1995) with both intercept and time-trend determinants. We are suppose that the inference on the cointegration space spanned by its vector is depend on the existence of linear trend in the data sets. By simple visual inspection of the Figure 1 we are aware of that the data time series have a linear trend, in the case of productivity growth, at least that is consistent with the assumption with the steady-state assumption of the productivity growth in the long run that as implied by the Kaldor's first

stylized fact of growth theory[2], but we see that employment and tourism even unemployment [3] time series show upward sloping time trends. Although by the last variable it is unusually performance due to well know stylized fact that the unemployment rate should be stationary in the long run.

Table 5. Number of Cointegrating Relations by Model

Series: e prod tour u dummy		
Lags interval: 1 to 2		
Selected (0.05 level*) Number of Cointegrating Relations by Model		
Data Trend:	**Linear**	**Linear**
Data Trend:	**Intercept**	**Intercept**
	No Trend	**Trend**
Trace	0	0
Max-Eig	0	0

Source*: Authors' calculations*

Table 6 Johanson H0 Test to Determine Number of Cointegrating Vectors (e, prod, tour, u, dummy)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.411818	60.29788	63.87610	0.0964
At most 1	0.308959	33.76192	42.91525	0.2995

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.411818	26.53595	32.11832	0.2062
At most 1	0.308959	18.47779	25.82321	0.3417

Trace & max-eigenvalue test indicates no cointegration at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values
Source*: Authors' calculations*

The conclusions from the trace and max- eigen value statistics are that at a 5 % level, clearly reject cointegration relationship involved in VAR(2) process.

Accordingly, with low computational burden required by the VAR in levels, we implement the VAR using the variables in levels and reject to proceed within the VECM approach which is more appropriate in conditions of cointegration vector.

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[2] "Since y = Y/L (or prod by *author's note*) is a measure of labor productivity, we can say that the productivity of labor exhibits a rising trend in the long –run, and this is know as a Kaldor's first stylized fact In sum, we have

$$\overset{\circ}{y} = (\overset{\circ}{Y} / L) \geq 0 .$$" (Op.cit. Valdes, B. 1999, page 10).

[3] "Another striking feature of time series of unemployment rate is the apparent absence of the time trend in the very long run over several decades…" (Op. cit. Lindbeck, A., 1989, pages 6-9).

3.2. Estimation

The VAR model of order two can be expressed as follows:

$e(t) = a_1 + b_{11} \, e(t-1) + b_{12} \, e(t-2) + c_{11} \, prod(t-1) + c_{12} \, prod(t-2) + d_{11} \, tour(t-1) + d_{12} \, tour(t-2)$
$+....$

$....+ e_{11} \, unemp \, (t-1) + e_{12} \, unemp \, (t-2) + f_{11} \, reces(t-1) + f_{12} \, reces(t-2)$

$prod(t) = a_2 + b_{21} \, e(t-1) + b_{22} \, e(t-2) + c_{21} \, prod(t-1) + c_{22} \, prod(t-2) + d_{21} \, tour(t-1) + ...$

$...+ d_{22} \, tour(t2) + ... + e_{21} \, unemp \, (t-1) + e_{22} \, unemp \, (t-2) + f_{21} \, reces(t-1) + f_{22} \, reces(t-2)$

$tour \, (t) = a_3 + b_{31} \, e(t-1) + b_{32} \, e(t-2) + c_{31} \, prod(t-1) + c_{32} \, prod(t-2) + d_{31} \, tour(t-1) + ...$

$...+ d_{32} \, tour(t-2) + e_{31} \, unemp \, (t-1) + e_{32} \, unemp \, (t-2) + f_{31} \, reces(t-1) + f_{32} \, reces(t-2)$

$unemp \, (t) = a_4 + b_{41} \, e(t-1) + b_{42} \, e(t-2) + c_{41} \, prod(t-1) + c_{42} \, prod(t-2) + d_{41} \, tour(t-1) + ...$

$...+ d_{42} \, tour(t-2) + e_{41} \, unemp \, (t-1) + e_{42} \, unemp \, (t-2) + f_{41} \, reces(t-1) + f_{42} \, reces(t-2)$

In regard aforementioned recession repercussion on the main variables involved in the VAR process, its control is performed by adding recession dummy variable. The dummy variables are added to all equations.

One important characteristic of a VAR(p)-process is its stability. This means that it generates stationary time series with time invariant means, variances and covariance structure, given sufficient starting values. We can check this, if the reverse characteristic polynomial has a root then either some or all variables in the VAR(p)-process are integrated of order one, i.e. I(1). It might be the case, we will say once again, that co-integration between the variables does exist. This instance can be better analyzed in the context of a vector error- correction model (VECM), as we say before.

In a next step, the VAR (2) is estimated as deterministic parameters a constant and time trend are included. The OLS results are shown in separate table in Appendix.

To unrestricted VAR(2) the eigenvalues of the coefficient matrix are: 0.91, 0.91, 0.89, 0.89, 0.76, 0.76, 0.41, 0.39, 0.09, 0.03. The largest eigenvalue, 0.91, corresponds to the employment series which, as we describe above, appears to exhibit the most noticeable nonstationary pattern (measured by simple eyeballing). The smallest eigenvalue (0.41-0.39) are smaller than the other three and corresponds, because of the mildest time trend, to unemployment rate. So, we find enough evidence about a stable VAR(2)-process with a constant and time-trend as deterministic parameters.

It turns out, that not all lagged endogenous variables enter significantly into the equations of the VAR (2). We re-estimate the VAR (2) as a restricted version of VAR with the sample observations from the period 1952-2004.

When, we have re-estimated a VAR (2), and obtained the restricted VAR(2) we checked its stability again. Here, stability does not refer to the coefficients stability, i.e. the stability of the regressions (due to fact that all the remain coefficients in restricted regression are significant), but rather the stability of the system of difference equations. If the moduli of the eigenvalues of the companion matrix are less than one, the system is stable. Hence, the reduced form VAR is stationary provided the roots lie outside the complex circle. Although, the first eigenvalue is pretty close to unity now, we assume a stable restrictive VAR (2)-process with a constant and time trend as deterministic parameter. The eigenvalues are now: 0.99, 0.96, 0.96, 0.93, 0.41, 0.41, 0.36, 0.36, 0.048, and 0.

3.3. Results

From unrestricted VAR(2) is obvious that not all regressors enter significantly (see - Table 9 in the APPENDIX). We re-estimate the VAR by significance, in that system - each equation is re-estimated separately as long as there are t values that are in absolute value below the threshold value (t-value < 2).

Following regressions show the final (restrictive) specification of the VAR(2) model for the relationship between tourism output and macroeconomic variables.

e = 1.017*e.l1+ 0.153*prod.l1 +0.138 tour.l1 -0.007*dummy.l2- 0.96*const-0.009*trend
$prod$ = 0.47*e.l1+ 0.93*prod.l1 -0.46*e.l2+0.0002*trend
$tour$ = 1,01* tour.l1 - 0.001*trend
u = -4.3*e.l1-7.41*tour.l1+0.45*U.l1 + 1.52*e.l2+2.16*tour.l2+0.33*dummy.l2+43.3*const + 0.36*trend

Time lagged: - employment, - productivity, - tourism income - (all lagged by lag one) - appear to be significant at the one per cent level while it exerts a strong positive short-run effect on current employment in former and much less in later two cases; it seems that lagged recession by two years in Western Europe decrease current employment in Croatia (this is intuitive result, and will be left for future comment). In model with employment as an endogenous variable if employment grows by one per cent, future employment will rise 1.02 per cent (it is obviously due to employment growth persistency tested by unit root presence, as we find before), and if labor productivity growth by one percent, future employment increased by 0.153 per cent, if the recession cycle in Western Europe persist two years before employment in Croatia will fall (perhaps as a result of recession's transmission on the Croatia's labor market too from abroad, or mainly from the Western Europe where recession cycle is going on…). We find that (demand for labor) or employment is slightly elastic with respect to changes in the productivity and tourism output growth in the long run. This means that labor demand does refer to a change of tourism supply in Croatia according to our restricted VAR(2) results. In the case of productivity pro-cyclicality of that variable with the future employment rise lay perhaps in the effect of real wage growth in time of rising productivity in a while the substitution effect where greater than the income effect (although those issues are not evident from our data sets). In such circumstances individuals continue to increase supply of labor services as the wage rate increases. Tourism as a variable remain in the restricted regression but unemployment variable is left out as insignificant variable in our restriction VAR modeling of employment equation; so, the testing that tourism activity increase employment has given strong support in this part of the paper. We can resume that the adaptive behavior of economic agents e.g. increase in lagged employment, productivity and tourism predicts future employment booming.

The anti-recession trajectory path in employment behavior is closely linked with productivity booming years which ought to be result of the positive externality of expansion cycle in Croatia, if there is a raise in employment one year it is very probable that same occurrence will remain in the next year. Accordingly to our result we can hypotheses that tourism *via* job multiplier effects induced a bunch of new jobs, tourism cause a spending in construction buildings sector, primary sector and so on as colloquially is often claiming in domestic political circles. Yet, we should not be caution in mentioning   the role of tourism growth as an anti-recession strategy in employing policy. First of all, tourism is remain as significant variable in labor demand regression, that expected result is conclusive as positive proof about tourism- led growth hypothesis. In tourism there is a abundance of seasonally working force involved in creation of tourism product, and that fraction of labor force is suffice to became statistically relevant part of our casually aggregate employment demand function.

According to expectations in restricted regression of tourism output we can't claim that tourism growth influences on elimination of unemployment stock or speeds up an employment or productivity because these variables are left out as insignificant. Tourism output regression appears to be autoregressive of order one, e.g. AR (1). One-time lagged output of tourism has a positive coefficient of about 1,01; if lagged tourism output grows by one per cent, current tourism will rise by 1.01. An expanding tourism continuing on account of „persistent" effect, in fact tourism growth appears to follow an adaptive mechanism. If the level of tourism level is high in current period it is very plausible that it will be remain high (or almost at same level) in the next period. We noted about 0.1% decrease in efficiency of tourism output production per year, due to negative sign in trend coefficient value.

Productivity regression results of restricted VAR(2) model are as follows. For example, if productivity has been higher than expected in the past, people would revise expectations for the future and work much more intense tomorrow. It appears that beside lagged productivity and employment enter statistical significantly and positively in productivity dynamics equation by first lag and negatively by second lag. We can conceive that productivity will be greater if the employment fall and produced output remain the same – those facts are evident if we zero in on second lag elasticity coefficient before second-lagged employment, but it is unclear how the current productivity can raise if the previous employment is raising. It is obviously that both one-time lagged productivity and employment have had benefactor effects on current productivity growth. If labor productivity rises by one per cent in previously year productivity will be rebound very strong by 0.93 per cent in current year; we observe impact of employment rise by 1% in lagged year on current productivity by mild 0.47 % elasticity but still in the circle of relevant stimuli which refers to productivity. We underlie that there is about 0.02% increase in efficiency of labor productivity per year; see the trend coefficient.

Unemployment regression results seems to be the most complex as a collaterally finding of restricted VAR(2) model. We find very consistent picture in remain coefficients of the last unemployment restrictive regression. Former employment growth and tourism in narrow econometric sense can influence on shrinkage of unemployment rate by huge margin in one time-lagged year but not in the second lag period (but the sum of the both dynamic coefficients are negative and predict decreasing unemployment rate when tourism and employment growth persisting). It is very probable that if Croatia's economy experience unemployment growth of 1% in lagged period there will be accelerating unemployment rate by less than 1% (or exactly about 0.45) in a year ahead – which is empirically well – now phenomenon and refers to persistency in the unemployment rate e.g. the unemployment

"hysteresis". The recession lagged by two periods in the Western Europe, there is no doubt, can influence on accelerating unemployment rate in Croatia due to worsening of bi-directional trade linkages among Croatia and Western Europe.

3.4. Diagnostic testing

In this part of paper some diagnostic tests had been done in regard of restrictive VAR(2). The Portmanteau and Breusch-Godfrey LM tests for autocorrelation were performed. They both, Portmanteau and Breusch-Godfrey LM tests jointly reject the null hypothesis of autocorrelation of residuals. The null hypothesis of autocorrelation is rejected in both cases, using a 5% significance level.

The ARCH-LM test is used for testing the null hypothesis of no conditional heteroskedasticity. The multivariate ARCH-LM test is considered and results are in p-values. The $H0$ of ARCH is rejected so we can say that there is no conditional heteroskedasticity in residuals of our restrictive VAR (2).

The results of the multivariate Jarque-Bera test unequivocally point to nonnormality. Lutkepohl (2004, p. 46) argues that nonnormal residuals may signal neglected nonlinearities. In the example above, an OLS-Cusum test of stability is applied to all included equation of restrictive VAR (2). The graphical output we didn't displayed because of limited space in this study. The null hypothesis of a stable relationship cannot be rejected for neither regression in the VAR.

Table 7   Diagnostic tests

Purpose of the test	Test	d.f.	Chi-squared	Probability
Normality	Jarque-Bera(multivariate)	10	243.8	2,2e-16
Homoskedasticity	ARCH LM(multivariate)	1125	680	0,96
Serial correlation	Breusch-Godfrey LM	125	152,12	0.03
Serial correlation	Portmanteau (adjusted)	350	325.56	0.17
Parameter stability in a restrictive VAR(2)	OLS –Cusum test	Indicative of stability		

Source*: Authors' calculations.*

3.5. Causality Analysis

We are interested in the detection of causalities between our variables (besides the recession variable which is duo to binary nature left out from our causality investigations). We shall use the most common one: the Granger-Causality test (Granger 1969). However, this test is not suited to test causal relationships in the strict sense, because the possibility of a *post hoc ergo propter hoc* fallacy cannot be excluded. Aside of this test, a Wald-type instantaneous causality test is implemented too. It is characterized by testing for nonzero correlation between the error processes of the cause and effect variables.

The causality analysis is now first applied for investigating if the tourism output and productivity is causal to employment and unemployment.

The null hypothesis of no Granger-causality from the tourism output and labour productivity to employment and unemployment must be rejected (because the Wald F was 7.7041 with a p-value less than 0.0001), there is weak evidence of a Granger-causal relation from tour & prod to e & U because the p-value of the related test is at least less than 10%; the same result is confirmed because the null hypothesis of non-instantaneous causality cannot be accepted. If

we test causality from tourism output strictly to other variables (the labour productivity, employment and unemployment) the result is unchanged. But in this case there is evidence of strong causality from tourism to erewhile mentioned variables of real economy. Tourism expansion leads to main features of economic growth. On the other hand we find by surprise that bi-way causality persists: because productivity growth does Granger cause employment and tourism growth, and employment does Granger cause other variables the tourism product-lead economic growth.

There is not enough evidence to conclude that unemployment Granger –cause tourism growth and etc. In narrow sense this is desiderate result because we didn't make a logical error in conclusion.

3.6. Impulse response analysis and forecasting variance decomposition

In addition, impulse response functions (IRFs) of the VARs can be estimated to measure the effect over time on the variable of interest due to a change in other variable.

In order to look at the dynamic effects of unitary shock measured by one standard error to a particular regression equation in the unrestricted VAR(2) model on the tourism –led growth variables tour, e, prod, U, r the corresponding orthogonalised impulse response functions are plotted over 10 periods ahead (Figure 3 in APPENDIX).

Although a positive tourism shock does influence labor productivity in the directions one would a priori assume, it does so only significantly for productivity during the time span ranging from the second period to the tenth period. But nevertheless, in this part of paper by these IRF result we proved the hypothesis that aggregate labor productivity (as and externalities of tourism growth) responds positively to tourism production. It seems to us that productivity manifest robust behavior if the exogenous shock in the system occurs in regard to tourism.

The positive tourism output unitary shock does influence employment initially till the end of 4.5 periods in unexpected direction; afterwards the impact goes in the directions one would a priori assume because as a result, its IRF fluctuates above zero. It does so significantly along the time span ranging from the first period to the tenth period. In the case of the unemployment a positive tourism unitary shock takes a spiral form curve oscillating above zero; although is almost nil in the first two periods, from second period till forth the unemployment rate increase, than it tends to decrease and so forth. So we didn't find clear and conclusive evidence that a tourism growth shock induce a negative respond to unemployment rate and *vice versa* positively impact to aggregate employment via assumed multiplier mechanism. But if linked those findings with the first one which encompassed the productivity issue we can conclude that increase of the productivity caused by disturbance of initial equilibrium due to tourism shock jointly involve less employment and relative insensibility in the sphere of unemployment part of the system.

The response of tourism output to its own shock is much higher and remains higher in the first few years than it is the case with productivity but its own shock become insignificant after in 5 th years.

The most interesting finding is that the response of tourism output to positive recession unitary shock (which means suddenly recession in Western Europe economy) is positive with

tendency to slowdown tourism output movement but only until the end of the first year, these influences became insignificant after the first period.

The impulse response functions illustrate the qualitative response of the tourism variable in the system to shocks to productivity, employment & unemployment rate. To indicate the relative importance of these shocks require variance decomposition.

Table 8 FEVD for tour

Period	S.E.	e	prod	tour	u	Dummy
1	0.018207	0.226155	5.448494	94.32535	0.000000	0.000000
2	0.029289	0.406180	10.22397	89.24277	0.105322	0.021758
3	0.042332	0.584271	14.97858	81.34922	2.740204	0.347729
4	0.059471	0.463820	21.20039	71.44307	4.987402	1.905318
5	0.074696	0.365207	28.42698	61.67710	5.246545	4.284164

Source*: Authors' calculations*

Forecast error decomposition, the percentage variance of the error made in forecasting some variable due to a shock in a specific variable, complements the analysis by suggesting comparable degrees of interaction among variables (Stock and Watson 2001, p.101-115).
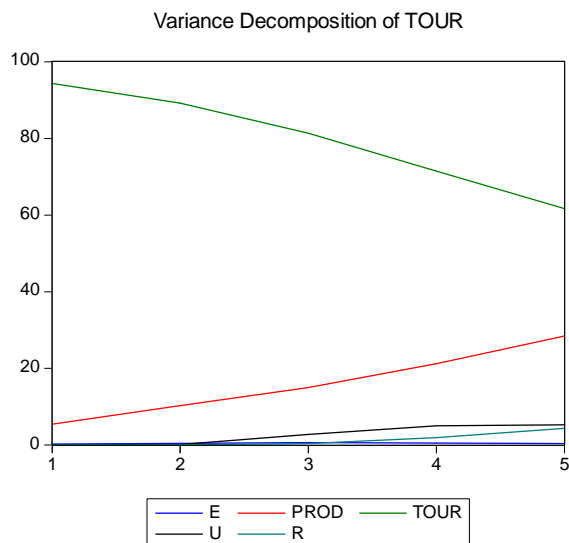
Figure 2 Variance Decomposition of Tour

We examine the forecasting error variance decomposition to determine the proportion of the movements in the time series witch is due to shock to its own series as opposed to shocks to other variable. From the example above, it is evident that aside of tourism output itself; the influence of productivity is contributing the most to the forecast uncertainty of tourism. The implication of this is that in order to produce better forecasts for the Croatia's tourism output series, it is crucially important to utilize correctly the information in the series itself and labor productivity series. The FEVD of tourism for five ahead steps (0-4) is plotted as a line graph (see Figure 2).

4. CONCLUSIONS

This paper employs unit root testing and Johansen cointegration to examine the relationship between tourism output, employment, productivity growth, and unemployment rate controlled by a recession/expansion in Western Europe as a dummy variable, in Croatia over the period 1952-2004. Prior testing for cointegration between the these variables, the ADF and the PP unit root test was applied to check the time series properties and to determine the order of integration of the data used in this study; we are find that all included variables are I(1) or integrated of order I. The results of cointegration test suggested that there is no possibility of cointegration relation between the variables, when intercept and trend is included. We are proceed and opted to estimate of VAR (2) instead of VECM because we find enough evidence of stability of the system of difference equations.

When the restricted tourism regression is extracted from VAR(2) we are obtained the autoregressive regression of order one, e.g. AR (1). One-time lagged output of tourism has a positive coefficient of about one unity; if lagged tourism output grows by one per cent, current tourism will rise in elastic mode, hence proportionally by one. Whit this exercise we didn't prove any influence of other included variable on tourism growth, but we find that tourism growth did remain significant variable in a excepted manner in employment and unemployment regression. In the first one the tourism growth will predict rise of aggregate employment and in the second regression the unemployment fall is linked with tourism growth.

The Granger causality test was applied to investigate the direction of causation between main macroeconomic variables and tourism output in Croatia.

The empirical results suggest that bi-directional causality from tourism growth to main macroeconomic variables and vice versa exist (beside unemployment). Croatia has experienced substantially large-scale development in the tourism sector, especially over the past few years. In this reason, it is examined that causality relationship between economic growth and tourism expansion in the Croatia economy and found that tourism expansion and economic growth (e.g. productivity and employment) cause each other. That is, there is a reciprocal relationship (the two way causality) between the two occurrences.

By the impulse response functions we illustrate the qualitative response of the tourism variable in the system to shocks to productivity, employment & unemployment rate. We find that all reaction follow a direction which couldn't one a priori assume. The IRF shows that labour productivity reaction against a tourism output unitary shock is positive; by these IRF result we proved the hypothesis that aggregate labor productivity could be seen as an externalities of tourism growth. We can't without doubt claim that a tourism growth shock induce a negative respond to unemployment rate and *vice versa* positively impact to aggregate employment via conjectured multiplier mechanism. But if linked those findings with the productivity evidence we conclude that increase of the productivity caused by disturbance of initial equilibrium due to tourism shock jointly involve less employment and relative insensibility in the sphere of unemployment part of the system.

Or in the non-technical words saying, is the tourism growth maybe the channel of labor augmenting technology in other complementary sectors of economic activity, we don't know yet and it should be answered in one of the future paper.

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APPENDIX

Table 9 Vector Autoregression Estimates (unrestricted)

Standard errors in ( ) & t-statistics in [ ]

	E	PROD	TOUR	U	Dummy
E(-1)	1.058315	0.741535	-0.233118	9.020467	0.199904
	(0.11016)	(0.26697)	(0.41023)	(4.63742)	(1.11555)
	[9.60705]	[2.77759]	[-0.56827]	[1.94515]	[0.17920]
E(-2)	-0.050509	-0.751478	0.371416	-14.76073	1.211215
	(0.10810)	(0.26197)	(0.40254)	(4.55054)	(1.09465)
	[-0.46726]	[-2.86858]	[0.92268]	[-3.24373]	[1.10649]
PROD(-1)	0.203069	0.714439	0.246252	-2.090413	0.849255
	(0.06187)	(0.14994)	(0.23039)	(2.60448)	(0.62652)
	[3.28226]	[4.76494]	[1.06883]	[-0.80262]	[1.35551]
PROD(-2)	-0.101431	0.039169	0.039914	1.448056	-0.665229
	(0.05833)	(0.14136)	(0.21722)	(2.45554)	(0.59069)
	[-1.73890]	[0.27708]	[0.18375]	[0.58971]	[-1.12619]
TOUR(-1)	0.094557	0.189095	0.932193	-3.692739	0.061187
	(0.04671)	(0.11320)	(0.17395)	(1.96641)	(0.47303)
	[2.02428]	[1.67040]	[5.35901]	[-1.87791]	[0.12935]
TOUR(-2)	0.079437	-0.250756	0.073135	-5.594739	0.685293
	(0.05912)	(0.14329)	(0.22017)	(2.48894)	(0.59872)
	[1.34357]	[-1.75005]	[0.33217]	[-2.24784]	[1.14459]
U(-1)	0.002340	0.005814	0.005452	0.828112	0.023605
	(0.00404)	(0.00979)	(0.01505)	(0.17011)	(0.04092)
	[0.57901]	[0.59371]	[0.36229]	[4.86802]	[0.57685]
U(-2)	0.009186	-0.005052	0.022688	-0.881606	0.080930
	(0.00378)	(0.00915)	(0.01406)	(0.15900)	(0.03825)
	[2.43208]	[-0.55193]	[1.61309]	[-5.54484]	[2.11598]
Dummy(-1)	0.028440	0.064149	0.010075	0.110918	0.689764
	(0.01945)	(0.04714)	(0.07244)	(0.81889)	(0.19699)
	[1.46203]	[1.36075]	[0.13908]	[0.13545]	[3.50157]
Dummy(-2)	-0.090021	0.050374	0.024062	0.277436	-0.008435
	(0.01779)	(0.04311)	(0.06625)	(0.74889)	(0.18015)
	[-5.06028]	[1.16843]	[0.36322]	[0.37046]	[-0.04682]
C	-0.975428	0.636402	-1.305509	83.06064	-12.83755
	(0.37608)	(0.91142)	(1.40050)	(15.8319)	(3.80844)
	[-2.59366]	[0.69825]	[-0.93218]	[5.24640]	[-3.37082]
@TREND	-0.009965	0.003940	-0.015282	0.701191	-0.082401
	(0.00268)	(0.00649)	(0.00997)	(0.11270)	(0.02711)
	[-3.72226]	[0.60728]	[-1.53288]	[6.22189]	[-3.03952]
R-squared	0.996798	0.960258	0.980048	0.988067	0.895008
Adj. R-squared	0.995895	0.949049	0.974421	0.984702	0.865395
Sum sq. resids	0.012928	0.075931	0.179285	22.91118	1.325783
S.E. equation	0.018207	0.044124	0.067801	0.766463	0.184376

F-statistic	1103.867	85.66701	174.1551	293.5769	30.22331
Log likelihood	138.7781	93.63287	71.72461	-51.96074	20.70460
Akaike AIC	-4.971691	-3.201289	-2.342142	2.508264	-0.341357
Schwarz SC	-4.517144	-2.746742	-1.887594	2.962812	0.113190
Mean dependent	7.016353	1.688556	5.594751	9.383529	0.549020
S.D. dependent	0.284188	0.195480	0.423931	6.196841	0.502543

Determinant resid covariance (dof adj.)	2.55E-11
Determinant resid covariance	6.66E-12
Log likelihood	294.4004
Akaike information criterion	-9.192174
Schwarz criterion	-6.919438

Source: *Authors' calculations*

Table 10 Granger causality

Granger causality H0:	F-Test	d.f1	df2	Probability
prod & tour do not Granger cause e & u	7.7041	4	188	9.052e-06
Tour does not Granger-cause e & prod & u	3.7624	3	188	0.01178
prod does not Granger-cause e tour u	2.4586	3	188	0.06423
e does not Granger-cause prod tour u	2.8863	3	188	0.03693
u does not Granger-cause e prod tour	0.4911	3	188	0.6889

Table 11 No instantaneous causality

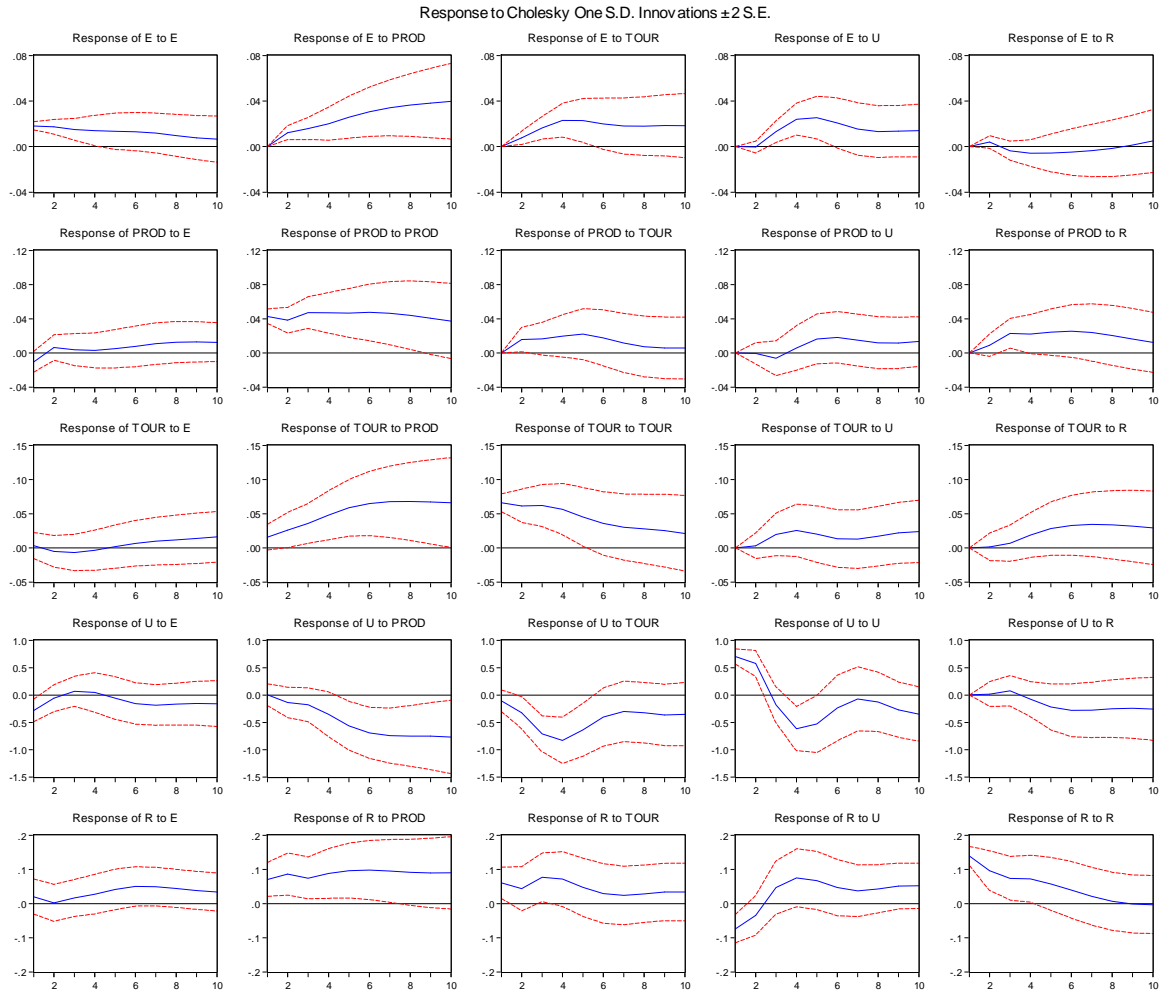| H0: No instantaneous causality between:	Chi-squared	d.f	p-value
prod tour and e U	17.8988	4	0.001292
tour and e prod U	18.5985	3	0.0003310
prod and e tour U	14.5187	3	0.002278
e and prod tour U	13.9342	3	0.002996
u and e prod tour	16.5235	3	0.0008855

Response to Cholesky One S.D. Innovations ± 2 S.E.

Figure 3 Orthogonal Impulse Response

ROLE OF EVENT MANAGEMENT IN THE CRISIS TOURIST SEASON OF THE YEAR 2009

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1. INTRODUCTION

What is the influence of the global economic crisis on the events which are of particular importance for the Republic of Croatia? Will the current negative trend affect the quality and success of staging these events compared to previous years? It is clear that in the battle for every events participant and visitor only the best will survive, those who were always, even before the crisis, offering quality programmes, top entertainment and experiences surpassing everyday frames.

The research was carried out in the pre-season of 2009, on a targeted sample of events in the Republic of Croatia. Using the survey and interview methods with the events organisers, an attempt was made to determine the following: basic events characteristics, composition of the organisational committee, event organisation (preparation of the venue, atmosphere, activities), as well as the influence of the financial and economic crisis on the sucessfulness of the staging of a event.

The aim of the research was to determine the level of organisation of the most prominent cultural special events and special events of a particular importance for the Republic of Croatia, which are, as such, defined on the Croatian Tourist Association internet page, as well as to find out whether the organisers think that the economic crisis will affect the successfulness of the event staging and what the impacts will be.

2. THEORETICAL GUIDELINES OF EVENT MANAGEMENT AND EVENT TOURISM

2.1. Concept of events

D. Getz (1997) defines events from the aspects of both client and organiser.[1] From the client's, i.e., guest's perspective, a tourist event is an opportunity to relax, representing, as such, an exceptional and extraordinary social or cultural experience while, from the organiser's perspective, it takes place only once or rarely and it does not form a part of usual sponsor's or organiser's programmes and activities. J. Goldbatt (1997) gives a definition of

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[1] Van Der Wagner, L., Carlos, B. R.: Event management – upravljanje događanjima za turistička kulturna, poslovna i sportska događanja, Mate d.o.o., Zagreb, p. 4.

manifestation or special event as a unique moment which should be marked by special festivities or rites in order to fulfill specific needs.[2]

2.2. Historical development of event industry

Events of all kinds have formed an integral part of civilisation for thousands of years, from various festivals, carnivals, concerts, fairs, conferences, congresses, political gatherings, sports competitions, weddings, to religious celebrations. This long history of events is explained by the fact that people are simply social beings. With the emergence of industrialisation and related aspects there was greater involvement of people in production processes in industry, who were too tired to socialise and celebrate, as they used to do before. The manner in which people socialised changed, resulting in a new form of entertainment within the very company; commercial celebrations, which enabled the employees to relax after a hard day's work, rest from their company perspective and mutually socialise.

As the 20th century was nearing its end, the whole world was celebrating many special events, which, undoubtedly, promoted the events sector and its tourist value. However, what influenced the increase in popularity of the event industry before the end of the last century? According to the author Goldbatt's paper, four changes[3], or so-called turnabouts, which dramatically affected the increase in demand for various events and manifestations, both in the USA and the whole world, occurred. The four changes concern the ageing of the population, technology, income and free time. According to the first change, the increase in the world population and their social nature influenced the increase in the number of events, while, according to the second theory, by advancements in technology, individuals were striving for higher experiences in order to balance the influence of technology on their lives. The third turnabout concerned the income influx, which is limited in younger events participants, compared to older participants, while the fourth turnabout was closely linked to incomes and work positions and concerned free time.

2.3. Division of events

All events are created for a particular purpose and, accordingly, there are different kinds and sizes of events.[4] Table 1 shows the typology of the fundamental events categories, primarily based on its form, i.e., on noticable differences in their purposes and programmes. Some of the events are dedicated to public celebrations and usually consist of a wide diversity in their programming, aiming to nurture citizen pride and togetherness, while others are planned for the purposes of competition, enjoyment, entertainment, business or socialising.

Events can be categorised according to their size into mega events, regional events, important events and smaller events.[5] Mega events are the largest events, pointing to the international market, and they include the Olympic Games, World Football Championships and Superbowl. Regional events or manifestations have for their goal to increase tourist interest in a particular destination, whether it is a region, city, tourist town or tourist resort. An example is the

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[2] Ibidem, p. 4.

[3] Goldbatt, J. J.: A Future for Event Management: The Analysis of Major Trends Impacting the Emerging Profession, Events beyond 2000: Setting the agenda proceedings of conference on event evaluation, Research and Education, Sydney, 2000, p.4

[4] Getz, D.: Event tourism: definition, evolution, and research, Tourism Management, Volume 29, Issue 3, June 2008, p. 403., http://www.sciencedirect.com (16.02.2009.)

[5] Van Der Wagner, L., Carlos, B. R, Opus citatum, p. 5.

summer music festival Exit, which is held in Novi Sad. The concept of important events concerns events which provide high financial benefits, arouse great community interest and attract large numbers of participants, as, for instance, the Chinese New Year celebration. The last category are smaller events being held in almost every city and tourist town throughout the developed world. At such events organisers gain experience in the organisation and management of various historical, cultural, music and other events.

Table 1. Types of events

CULTURAL CELEBRATIONS	festivals
	carnivals
	commemorations
	religious events
POLITICAL AND STATE	summits
	royal occasions
	political events
	vip visits
ARTS AND ENTERTAINMENT	concerts
	award ceremonies
BUSINESS AND TRADE	meetings
	conventions
	consumer and trade shows
	fairs, markets
EDUCATIONAL AND SCIENTIFIC	conferences
	seminars
	clinics
SPORTS COMPETITIONS	amateur/professional
	spectator/participation
RECREATIONAL	sport or games for fun
PRIVATE EVENTS	weddings
	parties
	socials

Source: Getz, D.: Event management & event tourism, 2nd Edition, Cognizant Communication Corporation, New York, 2005., p. 2.

2.4. Event management

Event management includes various aspects of organisation and management of events, which are increasingly becoming an essential part of choice of tourist destinations. While organising events it is very important to take into consideration the possibility of influence of other events, i.e., great attention is given to the coordination of the event itself with closely associated business activities, as for instance, traffic, safety and similar. Fundamental tourist functions concern destination image making, better promotion, market expansion, extension of stay and tourist expenditure stimulation. Apart from its tourist function, events are also used for the purposes of urban revitalisation, attracting agencies and head offices of multinational companies, but also for building of social identity and community spirit.[6]

Observing the process of event management, it can be concluded that it involves a cluster of several activities for whose conduct and supervision a high level of expertise and skilfulness of event managers are needed, as well as team work. The whole process is composed of a series of steps, which are shown in Table 2., in which is given the description of activities needed in order to realise each of the steps.

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[6] Bilješke kolegija Menadžment manifestacija, Zagrebačka škola za menadžment s pravom javnosti, Studij turizma, ak. god. 2007./2008.

Table 2. Steps in the process of event preparation

	Steps in the process of event preparation
1. STEP	EVENT DESCRIPTION
2. STEP	EVENT ORGANISATION
3. STEP	PERMITS AND AGREEMENTS
4. STEP	MARKETING
5. STEP	FINANCIAL CONTROL
6. STEP	RISK MANAGEMENT
7. STEP	EVENT STAGING
8. STEP	STAFF
9. STEP	SECURITY AND INSURANCE
10. STEP	OPERATIONAL PLANS
11. STEP	EVALUATION

Source: Van Der Wagner, L., Carlos, B. R.: Event management – upravljanje događanjima za turistička kulturna, poslovna i sportska događanja, Mate d.o.o., Zagreb, p. 287-290.

At the first step it is necessary to set out the main guidelines which will serve as the leading ones for the consecutive steps. It is important to determine which event is involved, whether the event is held at the state or regional level, whether it is a more important or smaller event, whether it is sports, art, business, entertainment, commercial or similar. Furthermore, it is necessary to determine the exact name of the event, the date of its staging, its duration, the programme, as well as the desired aims. The second step involves the event organisation, which includes organisational responsibilities, identification of the most important stakeholder groups and agencies, physical preconditions, as for instance, location, route (if a street event), an event map, layout (if the event is held indoors), as well as the impacts, which can be of a social, ecological or economic nature. The third step involves permits and agreements with the state, city or location, depending on the size and type of event, as well as with the road and traffic authority. The organiser needs to procure liquor and music licenses in order for copyrights to be settled. In the fourth step it is necessary to deal with the marketing issues as one of the essential steps in the event realisation. In the market analysis, it is necessary to carry out the market segmentation, investigate what is needed in order to meet consumers' needs, print the programmes and decide on entrance tickets and their prices, as well as a part of advertising and promotion pertaining to the media publicity, and also to ensure press conferences. The financial control constitutes the fifth step in the event preparation, where it is necessary to determine the costs of police and security, local government, music, control system for the use of cash. The sixth step of risk management represents identification, assessment and risk management, as well as incident reporting. The seventh step of event staging is the most demanding due to a series of sub-steps which need to be carried out, not missing a single one. Event staging involves determination of the event theme, decor in the sense of layout, entertainment programme, lighting and special effects, followed by services such as electricity, water, transport, traffic management, road closures, ancillary vehicles, parking, disabled persons access. Catering also falls into this category, i.e., agreement with a caterer who will provide the services of food and drink, followed by refuse management, recycling, required number of chemical toilets within the steps of environmental management and cleaning services. The step which involves human resources management is the eighth step which includes staff selection and recruitment, work position allocations, staff education, informing on event programme, rewarding strategies for the best, as well as volunteer recruitment. The ninth step involves security and insurance. In order to consider this step completed, it is necessary to ensure the safety of the audience, performers, dignitaries, but also of all the staff, access in the case of emergency and first aid. Operational plans form a part of the tenth step and involve special plans in the event of adverse weather, fire, accidents,

crowd control, cancellation, bomb threats and logistics issues. The last, eleventh step, but no less important than the previous ones, is an important step for evaluation. Following the event it is necessary to determine whether the set targets were reached, measure the event impacts, carry out the analysis and submit the report, all this for the purposes of further improving the event in the years to come[7]

None of the stated 11 steps must be bypassed or completed only partially, as the event manager must always bear in mind that events which require such an organisational level, take place once a year or more seldom, as well as that mistakes are not allowed.

2.5. Event tourism

According to the Tourist Dictionary by authors B. Vukonić and N. Čavlek, event tourism is a name for all types of tourist traffic motivated by the staging of various special events of cultural, scientific, business, sports, entertainment and similar character and content. Even since the times of tourism precursors, a man was aware of the fact that event staging brings to a location more or less visitors, who, by coming there and spending their money, increase the usual consumer mass in shops and certain service activities. This awareness has particularly been present in the times of modern tourism and, perhaps the most, in the past two decades of the twentieth century. Event tourism requires corresponding infrastructure both in classical tourist facilities of accommodation and catering and in the venues, tourist attractions and equipment which facilitate the staging of a particular event. Existence of that very infrastructure in large world cities has prompted many among them to encourage the event form of tourist traffic as a significant source of income for its citizens. This is why city authorities usually financially support the staging of particular events, since, apart from acting in a promotional manner for a certain urban area, these events not only bring new customers into the cities, thus increasing employment, but also provide larger incomes for its citizens.[8]

Event tourism is a term mainly used in tourist literature in order to describe a destination, its development and marketing strategy and to meet all the potential economic benefits of events for the tourist traffic of a destination.[9]

3. PREDICTIONS FOR THE IMPACTS OF THE ECONOMIC CRISIS ON EVENT TOURISM IN THE REPUBLIC OF CROATIA

In the tourist market conditions, where a fall in tourist traffic is predicted of between 0 and 2.5%, it is expected that tourism, which is a strategic branch, with seven billion Euros income, constituting 21% of Croatian gross income, will be the saviour for the Croatian economy. The indicators for the tourist season in the year 2009 are shown in the Table 11 below.

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[7] Van Der Wagner, L., Carlos, B. R., Opus citatum, p. 287.-290.
[8] Vukonić, B., Čavlek, N.: Rječnik turizma, Masmedia, Zagreb, 2001., p. 200.
[9] Getz, D: Event management & Event tourism, 2nd Edition, Cognizant Communication Corporation, New York, 2005., p. 12.

Table 3. Indicators of tourist season 2009

Indicators of tourist season 2009
40% EUROPEANS WILL CHANGE THEIR TRAVEL PLANS DUE TO CRISIS
10 MILLION PEOPLE WILL LOSE THEIR JOBS IN THE TOURIST INDUSTRY
-3.6% TOTAL WORLD INCOME FROM TOURISM WILL FALL
-2% IS AN ESTIMATED FALL IN TOURIST TRAFFIC IN EUROPE
15 MILLION LESS TOURISTS IN EUROPE IN COMPARISON WITH 2008

Source: Laslavić, Ž.: Turizam – 20 mjera za spas Hrvatske od sloma, Lider poslovni tjednik, Lider press d.d.,
Zagreb, Vol. 181., 2009., p. 27.

All people are social beings, they like to socialise, talk, clinch businesses face to face, shake hands while making business deals. It is in these human characteristics where lie the secrets and power of the success of the special event industry, various cultural, entertainment, sports, educational happenings or special events. Cost cutting has also affected the event industry and, according to world agencies predictions, various special events budgets will be lower by 6% compared to previous years. Despite the crisis times and negative predictions by experts from the tourism field, the organisers of special events of a particular importance for the Republic of Croatia believe that their experience, long tradition and quality are the elements which will ensure that the economic crisis does not have great impact on the successfulness of organisation and staging of their special events. It is clear that in the battle for every special events participant and visitor only the best will survive, those who were always, even before the crisis, offering quality programmes, top entertainment and experiences surpassing everyday frames. Should the crisis become an incentive for re-examination and advancement of the quality of organisation and content of special events, it is possible that the organisers realise that all is not in statistics and figures, but that the role of event management lies in the quality.

4. RESEARCH METHODOLOGY

The aim of the research was to establish the level of organisation of the most important special events on the territory of the Republic of Croatia, as well as to find out what the organisers think regarding how the economic crisis will affect the successfulness of staging such events.

The research was conducted in the pre-season of the year 2009 and the most prominent cultural events and events of particular interest were taken into consideration, which are, as such, defined on a web page of the Croatian Tourist Association. They include: Splitsko ljeto – Split, Dubrovačke ljetne igre – Dubrovnik, Sinjska alka - Sinj, Vinkovačke jeseni – Vinkovci, Kulenijada – Požega, Đakovački vezovi – Đakovo, Festival of Knights' Games – Korčula, Boat Marathon on the river Neretva – Metković, the Pula Film Festval – Pula. For the purposes of research conduct, all nine special events were contacted, of which the organisers of two of them were not available, for the events of Đakovački vezovi and Festival of Knights' games at Korčula, so seven special events were included in the research.

The event organisers were personally interviewed over the telephone. The survey was divided into four groups of questions. The first group of questions related to the fundamental event characteristics, i.e. who the organiser(s) are, type of special event, period of staging, event duration in days, as well as the number of visitors. In the second part, questions relating to the event organisation committee were asked. Event organisers answered questions on whether

the special event has an organisation committee and how many members there are. The third group of questions asked questions relating to the special event organisation. These questions were intended to reveal the following: are additional activities offered to the guests within the event, types of activities, how many persons are additionally employed during the event, which types of contracts are concluded, whether volunteers are involved, as well as what the event organisers think about the impact of the economic crisis on the successfulness of staging special events. The fourth and the last group of questions relates to the marketing: promotional materials used, internet representation in the event promotion, number of sponsors and appointment of a public relations officer for the purposes of event promotion.

The data is graphically displayed anden processed by statistical methods, univariant statistics, i.e., the frequencies are determined, mean value, mode, minimal and maximal value, as well as the percentage.

5. RESEARCH RESULTS

All the special events included in the research have many years tradition of being staged and the fact that most of them take place under the auspices of the President of the Republic Stjepan Mesić, the Premier Ivo Sanader and the President of the Assembly Luka Bebić tells us that these special events are of a particular importance for the Republic of Croatia.

The following Table shows the event structure according to the types of special events.

Table 4. Types of special events

Rank	Special event	Frequency	%
1.	CULTURAL EVENTS	7	100.0
2.	ARTS/ENTERTAINMENT	4	57.1
3.	SPORTS EVENTS	3	42.9

Source: processed by author

To the asked question regarding the type of special event, all the organisers answered thet it involved cultural events, apart from three events (Sinjska alka, Boat Marathon on the river Neretva and Vinkovačke jeseni), which are of a sports character, while Splitsko ljeto, Kulenijada, Dubrovačke ljetne igre and the Pula Film Festival, cultural and artistic special events.

In the following table, the structure of special events according to the organiser is shown. In the provided answers there were also some options in which a special event is organised by a municipality/town, county, state, county tourist organisations, as well as individual persons not chosen by any organiser.

Table 5. Special event organiser

Rank	Organiser	Frequency	%
1.	ORGAN./ASSOC.	3	42.9
1.	PUBLIC INSTITUTION	3	42.9
2.	MUNICIPAL/TOWN TOURIST ORG.	1	14.3

Source: processed by author

Out of the total of seven special events, three were organised by associations, and one by a town tourist organisation.

In the following table, fundamental elements of observed events are shown.

*Table 6. Fundamental elements of events included in research*

Variables	Arithmetic mean	Min.	Max.
NO. OF DAYS OF EVENT STAGING	17.57	3	46
NO. YEARS OF EVENT STAGING	78.57	12	294
TOTAL NO. OF EVENT VISITORS IN 2008	47,258.71	2,000	150,000
MAX. CAPACITY - SPECTATORS	19,128.57	400	60,000

Source: processed by author

According to the research results, special events last on average 18 days, the shortest being Kulenijada in Požega, whereas the longest are Dubrovačke ljetne igre. On average, special events have been held for 79 years, i.e., the «youngest» special event is the Boat Marathon on the river Neretva, which will be held for the 12th time this year, whilst the «oldest» special event has had a tradition for as long as 294 years. The total number of visitors at special events in 2008 averaged 47,260, and was between a minimum of 2,000 to a maximum of 150,000 guests. Five events are held in the open air, none indoors, while two are partly held in the open air and partly indoors.

The maximum number of visitors in the studied special events varies depending on the type of event, and is between 400 and a maximum 60,000 visitors, with average of approximately 19,100 visitors.

All special events have an organisational committee, whose role in the cases of the Pula Film Festival, Dubrovačke ljetne igre and Splitsko ljeto is taken over by the Festival Assembly, whose members are selected on the grounds of the Statute of the event. The number of members of the oganisational committee or the Festival Assembly varies from three up to a maximum of 15 members, which is shown by the following graph.
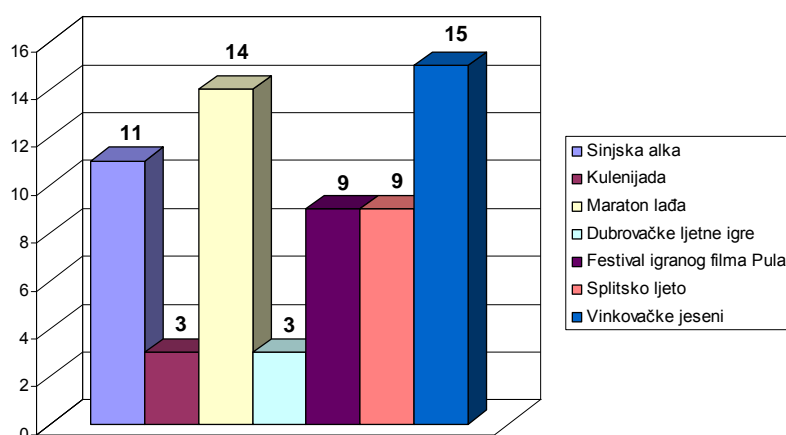
Graph 1. Number of organizational committee's members
Source: processed by author

All the organiser answered affirmatively to the question concerning additional activities on offer during the events. In Table 6 below, kinds of additional activities offered during the special events are shown.

Table 7. Additional activities offered during events

Special event	Activities			
	Sports	**Culinary**	**Cultural/entertainment**	**Educational**
SPLITSKO LJETO	no	no	yes	no
DUBROVAČKE LJETNE IGRE	no	no	yes	no
SINJSKA ALKA	yes	no	yes	no
VINKOVAČKE JESENI	yes	no	yes	no
KULENIJADA	no	yes	yes	no
MARATON LAĐA NA NERETVI	no	no	yes	no
FESTIVAL IGRANOG FILMA PULA	no	no	yes	yes

Source: processed by author

All events offer additional activities to their visitors and participants during the special events. From all the activities offered, cultural and entertainment ones are present at all special events, sports activities on two, while culinary and educational additional activities on only one event.

Due to large numbers of visitors during the days of special events and participants in the events, all organisers but one answered that they needed to employ additional staff in order to achieve quality preparation for the events and quality performance in the events. The following graph shows the number of additionally employed staff during the days of special events.
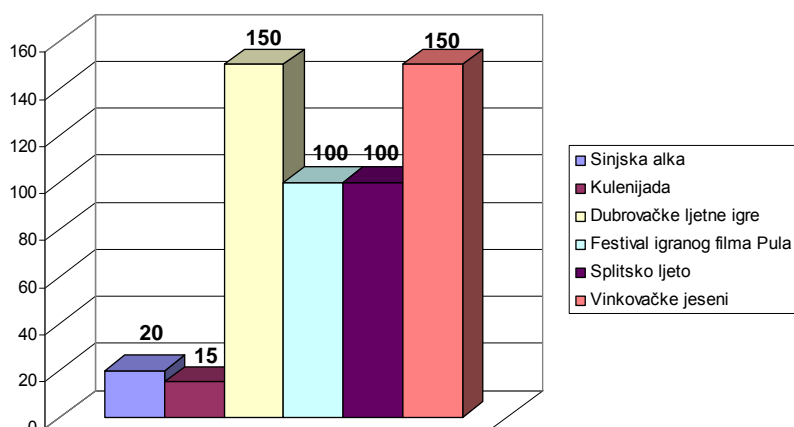
Graph 2. Number of additionally employed staff during special events
Source: processed by author

The least number of staff is employed during the events of Sinjska alka and Kulenijada in Požega, while 150 persons are additionally employed for the needs of Dubrovačke ljetne igre, and Vinkovačke jeseni and 100 persons at the Pula Film Festival and Splitsko ljeto.

The organisers conclude different types of contracts. In the provided answers, the options of a temporary and permanent contract are not selected by any organiser. The data concerning types contracts are shown in the table below.

Table 8. Types of contacts

Rank	Type of contract	Frequency	%
1.	CONTRACT OF WORK	5	71.4
2.	STUDENT SERVICE	4	57.1
3.	COPYRIGHT CONTRACT	2	28.5

Source: processed by author

The largest number of employees conclude the Contract of Work, 71.4% of them, then employees are hired through Student services, 57.1% of them, while the least number of additionally employed persons conclude Copyright contracts.

To the asked questions whether volunteers are hired during the events, the event organisers who employ the largest number of staff as shown in the above graph, answered affirmatively. What is the impact of global economic crisis on the special events which are of particular importance for the Republic of Croatia? Will the current negative trend influence the quality and successfulness of staging of such events compared with the previous year? Out of the total of seven organisers interviewed, five of them think that the crisis will influence the successfulness of staging of such special events and claim that this is already showing its considerable signs. The remaining two organisers think that the crisis will not have any impact on special events.

The opinions of the organisers on the impact of the crisis on the staging of special events are shown in the graph below.
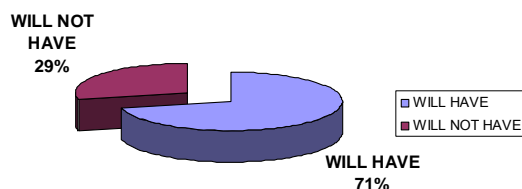
Graph 3. Opinions of organisers on the impact of the economic crisis on the successfulness of event staging
Source: processed by author

According to the research results, five organisers think that the economic crisis will affect the special events in a form of several effects, shown in Table 8 below. In the answers provided, there was a choice of effects of decrease in the number of visitors and decrease in the number of event participants, not selected by any organisers.

Table 9. Economic crisis impacts on event staging

Rank	Impacts of economic crisis	Frequency	%
1.	DIFFICULT FINANCING	4	57.1
1.	LOWER NO. OF SPONSORS	4	57.1

Source: processed by author

The organisers are of the opinion that the crisis impacts were evident in the pre-season of the year 2009, i.e., prior to the events staging, due to a decreased number of sponsors and difficult financing, both from the budget and from sponsors. As for the number of registered participants, that number in April of 2008 does not differ much from the number of those who registered their participation this year, thus the opinion by the organisers that the crisis will not affect the number of special events participants.

All the organisers answered affirmatively when asked whether they use classical promotional materials for the promotion of special events. Table 9 below shows the most frequently used types of classical promotional materials.

Table 10. Classical promotional materials used

Rank	Type of promotional materials used	Frequency	%
1.	INVITATIONS	6	85.7
2.	POSTERS	7	100.0
2.	BROCHURES	6	85.7

Source: processed by author

According to the research results, for the purposes of special event promotion, both classical and modern forms of promotion are used. In Table 10 below, modern forms of promotion are shown.

Table 11. Modern forms of promotion used

Rank	Type of promotional materials used	Frequency	%
1.	THE CROATIAN TOURIST ASSOCIATION INTERNET PAGE	7	100.0
2.	SPECIAL EVENTS INTERNET PAGE	6	85.7
3.	TV COMMERCIALS/DOCUMENTARIES	5	71.4
3.	NEWSPAPERS/MAGAZINES	5	71.4
4.	RADIO	4	57.1
4.	MUNICIPALITY/TOWN TOURIST ORGANISATION INTERNET PAGE	4	57.1

Source: processed by author

Internet is represented as a distribution channel for the purposes of special event promotion. Out of the total of seven events, six of them or 85.7% have their own internet page, while all of them are promoted by means of the Croatian Tourist Association internet page and four of them use municipal/town tourist organisation internet pages for their promotion.

6. CONCLUSION

The aim of the research was to determine the level of organisation of the most prominent cultural special events and special events of a particular importance for the Republic of Croatia, which are, as such, defined on the Croatian Tourist Association internet page, as well as to find out whether the organisers think that the economic crisis will affect the successfulness of the event staging and what the impacts will be. Special events included in the research are: Splitsko ljeto – Split, Dubrovačke ljetne igre – Dubrovnik, Sinjska alka - Sinj, Vinkovačke jeseni – Vinkovci, Kulenijada – Požega, Boat Marathon on the river Neretva – Metković and Pula Film Festival – Pula.

All the special events are of a cultural nature, three of them of a sports character, while the remaining ones are cultural and artistic ones. Out of the total of seven special events, three were organised by associations, three by public institutions and one by a town tourist organisation. According to the research results, special events last, on average, 18 days, the shortest lasting being Kulenijada in Požega, while the longest lasting is Dubrovačke ljetne igre. On average, special events have been staged for 79 years, i.e., the «youngest» event is the Boat Marathon on the river Neretva, which will be held this year for the 12th time, while the «oldest» one is Sinjska alka, which has a 294-year long tradition. The total number of visitors at special events in the year 2008 was averaging 47,260 and was between a minimum of 2,000 guests to a maximum of 150,000 guests. Five special events are held in the open air, none indoors, while two events are held partly in the open air, partly indoors. The maximum number of visitors to the studied special events varies depends on the type of special event and can be between a minimum of 400 to a maximum of 60,000 visitors, averaging approximately 19,100 visitors. All the special events have an organisational committee and the number of committee members varies from a minimum of three members to a maximum of 15 members. Among additional activities offered, the cultural and entertainment ones are present at every special event, sports at two, while culinary and educational at only one event. Due to large numbers of visitors and participants during the running of special events, all the organisers, exept for one, answered that they needed to employ additional staff in order to achieve quality preparations and staging of the events. The least number of persons are employed during the staging of Sinjska alke and Kulenijada in Požega, while for the staging of Dubrovačke ljetne igre and Vinkovačke jeseni an additional 150 are employed and Pula Film Festival and Splitsko ljeto employ an additional 100 persons.

The organisers conclude different types of contracts with extra staff. The questions provided two options concerning the type of contract, temporary and permanent employment, not selected by any organiser. The largest number conclude the Contract of Work, 71.4% of them, followed by hiring through a Student service, 57.1% of them, while the least number conclude Copyright contracts. The question concerning e temployment of volunteers for the duration of special events the organisers employing the largest numbers of additional staff answered affirmatively.

Out of the total of seven organisers interviewed, five of them think that the crisis will influence the successfulness of staging of such special events and claim that this is already happening. The remaining two organisers think that the crisis will not have any impact on special events.

The organisers are of the opinion that the crisis impacts were evident in the pre-season of the year 2009, i.e., prior to the events staging, due to a decreased number of sponsors and difficult financing, both from the budget and from sponsors. As for the number of registered participants, that number in April of 2008 does not differ much from the number of those who registered their participation this year, thus the opinion by the organisers that the crisis will not affect the number of special events participants.

All the organisers answered affirmatively when asked whether they use classical promotional materials for the promotion of special events. Internet is represented as a distribution channel for the purposes of special event promotion. Out of the total of seven events, six of them have their own internet page, while all of them are promoted by means of the Croatian Tourist Association internet page and four of them use municipal/town tourist organisation internet pages for their promotion.

Despite the crisis times and negative predictions by experts from the tourism field, the organisers of special events of a particular importance for the Republic of Croatia believe that their experience, long tradition and quality are the elements which will ensure that the economic crisis does not have a great impact on the successfulness of organisation and staging of their special events.

Should the crisis become an incentive for re-examination and advancement of the quality of organisation and content of special events, it is possible that the organisers realise that all is not in statistics and figures, but that it is much more in the quality.

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THE ROLE OF ENERGY IN ECONOMIC GROWTH: THE CASE OF CROATIA

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1. INTRODUCTION

During the last two decades there have been a number of papers dealing with the causality between economic growth and energy, especially energy consumption. Strong interdependence and causality between economic growth and energy consumption is a stylized economic fact, but the existence and direction of causality is still not clearly defined. Broadly speaking, all papers could be divided in two groups. The first one consists of papers that argue that energy is a crucial input of production and therefore the necessary requirement for economic and social development, but potentially it could also be a limiting factor to economic growth. On the other hand, the other group of papers argued that energy has no significant impact, which is known as neutrality hypothesis.

To the best of the author's knowledge, there are no studies addressing the causal relationship between energy and economic growth in the case of Croatia. The purpose of this paper is, therefore, to investigate the existence and direction of causality between economic growth and energy consumption (in industry and households) and specifically oil consumption. The paper will also examine the causal relationship between economic growth and net energy imports, as well as the relationship between economic growth and primary energy production in Croatia and to obtain policy implications from the research results.

The paper is organized in the following fashion. Section 2 gives the overview of the theoretical and empirical findings on the role of energy in economic growth. Section 3 describes the econometric methodology and presents the obtained empirical results. Final section contains the conclusions.

2. ENERGY AND ECONOMIC GROWTH WITHIN THE THEORETICAL AND EMPIRICAL FRAMEWORK

Theoretical findings on the role of energy in economic growth

The mainstream theory of economic growth pays little attention to the role of energy in economic growth. Considering the theories of production, the neo-classical economic theory explains the economy as a closed system where output is produced by inputs of labour and capital. Therefore, the economic growth is the result of the increased inputs or their quality. Energy inputs have indirect importance and they have been seen as intermediate inputs. According to Stern (Stern, 1999), the mainstream economists have accepted the concept of primary and intermediate factors of production. Primary factors of production are inputs that exist at the beginning of the period under consideration and are not directly used up in production (though they can be degraded and can be added to), while intermediate inputs are those created during the production period under consideration and are used up entirely in production. Capital, labour and land are the primary factors of production, while goods such fuels and materials are intermediate inputs. This approach has led to a focus in mainstream growth theory on the primary inputs, especially capital and labour, while intermediate inputs like energy have got an indirect role. According to them, the quantity of energy available to the economy is endogenously given, though determined by biophysical and economic constraints. (Stern and Cleveland, 2004, p. 5)

The mainstream theories of growth have also not paid enough attention to energy and explain economic growth by technological progress. Starting with the Solow's original growth model, an economy is moving towards its equilibrium where there is no net investment. The technological progress is the only cause of continuing economic growth, though the model didn't explain the sources of technology upgrading. Since they are assumed to be exogenous, these theories are known as models with exogenous technological change. More recent models, known as endogenous growth theories, explain the reasons for technology progress with economic choices and decisions taken by firms and individuals. The most known theory is the Schumpeterian growth model that incorporates imperfect competition, innovations and externalities.

Some recent studies analyse the role of resources in growth models with endogenous technological change. Smulders and de Nooij (Smulders and de Nooij, 2003) argue that energy use has a positive growth rate apart from a possible on-time reduction in the level of energy use. Tahvonen and Salo (Tahvonen and Salo, 2001) develop a model with renewable and non-renewable energy resources and include extraction costs for fossil fuels and production costs for renewable energy resources. Their model very realistically explains the growth process for the economy passes through pre-industrial, industrial and post-industrial stage of development as the use of fossil fuels rises in the beginning and then falls later.

During the time, especially after the oil crisis in 70s and 80s, the energy resources and their prices have gained much more research attention and the alternative views on economic growth have appeared. There are much of the relevant literature outside the mainstream known as ecological economics that emphasis the importance of energy in production and growth. Even more, some of them see the energy as the only primary factor of production, while capital and labour are treated as flows of capital consumption and labour services, rather than stocks. (Gever et.al., 1986) Not just that energy is a crucial production factor according to ecological ecobnomists, but some (Cleveland et.al., 1984) even conclude that

energy availability drives economic growth, in the contrast to economic growth that result from increased energy use. This assumption is in the contrast to development literature in 70s and 80s which concluded that manufacturing sector, as opposed to natural-resource production, leads to a more complex division of labour and hence to a higher economic growth. The question about the long-term growth effects of natural resource production and natural resource price booms was studied implicitly through the issue of whether natural resource production promoted de-industrialization. These models are known as Dutch Disease models and they argue that the existence of large natural resource sectors or booms in these natural resource sectors, will affect the distribution of employment throughout the economy, as wealth affects pull resources in and out of non-traded sectors. Therefore these sectoral shifts can affect long term growth. Sachs and Warner (Sachs, Warner, 1997) found the empirical evidence for a negative relation between natural resource intensity and subsequent growth in the period from 1970 to 1990. Their findings remain significant even after controlling for a large number of additional variables that other studies have claimed to be important in explaining cross-country growth.[1]

The previously mentioned ecological economists focus on the material basis of the economy and consider an economy as an open subsystem of the global ecosystem. Although there exist various schools of thought in the field, they all arrive from common principles – the laws of thermodynamics. The first law of thermodynamics states that energy cannot be created nor destroyed, only transformed. This means that the only available energy source is solar energy that can be used directly or in an embodied state such as fossil fuels. The second law states that the entropy of an isolated system, which is not in equilibrium, will tend to increase over time. It implies that energy can be reused, but it will increasingly reach a less useful state and therefore additional energy is required. This also implies limits to the extend to which energy can be substituted for by other inputs into the production process. (Ockwell, 2008, p. 4601)

Institutional economists have also contributed to the understanding of the role of energy in economic development by introducing the impact of economic, social and political institutions on efficient use of energy. (Paavola and Adger, 2005) However, environment has not been a central concern for new institutional economics which has focused on industrial organization and public choice, but it has demonstrated under what circumstances environmental governance institutions are likely to be effective. This raises the potential for amending institutional structures, for example by altering financial incentives or creating communication networks, to facilitate individual and collective behaviour in order to reach low-carbon economy. (Ockwell, 2008, p. 4603)

Empirical testing

Although strong interdependence and causality between economic growth and energy consumption is a stylized economic fact, the direction of causality between economic growth and energy consumption is not clearly defined. In the last two decades, a number of academic papers explored the relationship between economic growth and energy, mostly energy consumption. On one hand, it is argued that energy is a vital and necessary input along with other factors of production (such as labor and capital). Consequently, energy is a necessary requirement for economic and social development so that energy is potentially a "limiting

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[1] The list of additional variables includes initial GDP, openness policy, investment rates, human capital accumulation rates, changes in the external terms of trade, government expenditure ratios, terms of trade volatility and the efficiency of government institutions.

factor to economic growth" (Ghali and El-Sakka, 2004, p.225). On the other hand, it is argued that since the cost of energy is a very small proportion of GDP, it is unlikely to have a significant impact; hence there is a "neutral impact of energy on growth". The overall findings vary significantly with some studies concluding that causality runs from economic growth to energy consumption, other conclude the complete opposite, while a number of studies find bidirectional causality. One of the first relevant studies was the one from Kraft and Kraft (1978) that examined energy consumption and GNP of the USA over the period from 1947 to 1974. They found that the causality runs from GNP to energy consumption. This pioneering study intensified the interest in the research of the relationship between economic growth and energy consumption. Akarca and Long (1980) changed the time period used in Kraft and Kraft and found no statistically significant causal relationship. Erol and Yu (1987) found a significant causal relationship between energy consumption and income in the case of Japan for the period 1950-1982, supporting the view that Granger causality runs from energy consumption to income. Inconsistent results for the causality direction might be due to the methodological differences and the choice of different time periods. Mozumder and Marathe (2007) find unidirectional causality running from GNP to energy consumption in Bangladesh. Shiu and Lam (2004) report unidirectional causality running from energy consumption to GNP in China, while Jumbe (2004) found bidirectional causality between energy consumption and GNP in Malawi. On the other hand, the neutrality hypothesis is found by Yu and Hwang (1984), Yu and Choi (1985), Yu and Jin (1992) and Cheng (1995). For Taiwan, Yang (2000) investigated the causal relationship between real gross domestic product (GDP) and several disaggregate categories of energy consumption, including coal, oil, natural gas, and electricity, and found that there is unidirectional causality running from economic growth to oil consumption in Taiwan without any feedback effect. Similarly, in the case of South Korea, Yoo (2006) finds unidirectional short term causality from economic growth to coal consumption, and long term bidirectional causality.

Most of the studies focus developing countries, which is understandable because these countries are economies with the highest energy intensity aiming to increase the energy efficiency. Still, the empirical evidence is mixed for industrialized countries as well. Erol and Yu (1987) found a significant causal relationship between energy consumption and income in the case of Japan for the period 1950-1982, supporting the view that Granger causality runs from energy consumption to income. Inconsistent results for the causality direction might be due to the methodological differences and the choice of different time periods. Chontanawat, Hunt and Pierse (2008) tested the causality between GDP and energy on large sample of OECD and non-OECD countries. They find that causality from energy to GDP is found to be more prevalent in the developed OECD countries compared to the developing non-OECD countries, implying that a policy to reduce energy consumption aimed at reducing emissions is likely to have greater impact on the GDP of the developed rather than the developing world.

The most recent study from Žiković and Vlahinić-Dizdarević (2009) on the sample of 22 small European countries found that in less developed countries oil consumption causes economic growth, while in highly developed European countries economic growth causes oil consumption. The exception is the group of four countries (Croatia, Latvia, Lithuania and Moldova) which experienced transition depression and deindustrialization that had resulted in sharp industrial decline and decreased industrial oil demand.

Although the direction or the intensity is not clear, based on the published research one may conclude that there is strong evidence to support the thesis of bidirectional or unidirectional

causality between economic growth and energy consumption. The direction of causality has significant policy implications because knowing the direction of causality has direct implications on forming government policies regarding the energy conservation and subsidies system. Under the assumption that there exists unidirectional causality going from economic growth to energy consumption, it means that energy conservation policies will have little or no adverse effects on economic growth of a country. The policymakers may then use these findings in decreasing the tax burden and attracting the investments or in increased government spending. On the other hand, if unidirectional causality runs from energy consumption to economic growth, state should employ additional resources in subsidizing energy prices and securing long term and stable energy sources for its economy. In such a situation, reducing energy consumption, for example through bringing domestic energy prices in line with market prices, could lead to a fall in income and employment.

3. DATA AND METHODOLOGY

Data used in the analysis of Croatian causality between economic growth and use of energy is real GDP annual series in millions of US$, final energy consumption of industry and households, primary energy production, net import of energy in thousands tons of oil equivalent and oil consumption in thousands of barrels/daily. Time period used in this analysis used is 1993 – 2006. The analysed time period is short due to the short period of Croatia's independence.

The first attempt at testing for the direction of causality was proposed by Granger (1969). Granger's test is a convenient and very general approach for detecting the presence of a causal relationship between two variables. A time series *X* is said to Granger-cause another time series *Y* if the predication error of current *Y* declines by using past values of *X* in addition to past values of *Y*. The application of the standard Granger's causality test requires that the series of variables to be stationary. Therefore, two variables have to be first transformed to covariance stationary processes. This is usually done by taking their first differences. Usually the Augmented Dickey-Fuller or Phillips-Perron test is used in examining the unit roots and stationary property of two variables. To test for Granger's causality between the five above stated energy variables and real GDP, bivariate energy – GDP models are specified. If two variables are stationary, the standard form of the Granger's causality test used in this paper can be specified accordingly as follows:

$$\Delta X_t = \alpha_{11} + \sum_{i=1}^{n} \beta_{11i} \Delta X_{t-i} + \nu_{11t} \tag{1}$$

$$\Delta X_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i} \Delta X_{t-i} + \sum_{j=1}^{m} \beta_{12j} \Delta Y_{t-j} + \nu_{12t} \tag{2}$$

$$\Delta Y_t = \alpha_{21} + \sum_{i=1}^{m} \beta_{21i} \Delta Y_{t-i} + \nu_{21t} \tag{3}$$

$$\Delta Y_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j} \Delta Y_{t-j} + \sum_{i=1}^{n} \beta_{22i} \Delta X_{t-i} + \nu_{22t} \tag{4}$$

where Y_t and X_t are GDP and energy variables, t is the number of lags, α and β are parameters to be estimated, and ν_t is the error term. Eqs. 2. and 4. are in unrestricted forms, while Eqs. 1. and 3. are in restricted forms. But Eqs. 1. and 2. are made a pair to detect whether the coefficients of the past lags of the energy consumption can be zero as a whole. By the same token, Eqs. 3. and 4. are made other pair to detect whether the coefficient of the past lags of GDP can be zero as a whole. Stated differently, if the estimated coefficient on lagged values of X in Eq. 2. is significant, it means that it explains some of the variance of Y that is not explained by lagged values of Y itself. This indicates that X is causally prior to Y and said to Granger-cause Y. Similarly, if the estimated coefficient on lagged values of Y in Eq. 4. is significant, it means that it explains some of the variance of X that is not explained by lagged values of X itself. This indicates that Y is causally prior to X and said to Granger-cause X. Therefore, F statistics are calculated to test whether the coefficients of lagged values can be zero.

Abbreviations:
GDP – real gross domestic product in millions of US$,
FEC_H – Final energy consumption (households) in thousands tons of oil equivalent (TOE),
FEC_I – Final energy consumption (industry) in TOE,
PEP – Primary energy production in TOE,
NIE – Net imports of energy in TOE,
OIL – oil consumption in thousands of barrels per day

Tables 1 and 2 present the descriptive statistics and normality test for level and first differenced variables.

Table 1. Descriptive statistics and normality tests for analysed variables in the period 1993 – 2006

Main statistics	GDP	FEC_H	FEC_I	PEP	NIE	OIL
Descriptive statistics						
Mean	14.882,95	1.638,64	1.422,50	3.935,29	4.100,29	86,52
Median	14.436,24	1.664,50	1.416,00	3.928,50	4.179,00	88,97
Minimum	10.902,62	1.220,00	1.257,00	3.569,00	2.568,00	62,82
Maximum	19.278,98	1.926,00	1.637,00	4.494,00	5.262,00	99,00
St.Dev.	2.536,95	224,28	110,13	270,43	901,00	9,28
Skewness	0,17	-0,59	0,39	0,37	-0,31	-1,09
Kurtosis	2,07	2,39	2,50	2,33	1,78	4,08
Normality tests						
Jarque-Bera test	0,577	1,042	0,493	0,584	1,096	3,467
(p value)	0,500	0,325	0,500	0,500	0,297	0,044
Lilliefors test	0,119	0,156	0,198	0,138	0,164	0,172
(p value)	0,500	0,453	0,141	0,500	0,377	0,307
Shapiro-Wilk/Francia	0,973	0,921	0,947	0,951	0,924	0,901
(p value)	0,914	0,225	0,522	0,583	0,254	0,233

Source: Authors' calculations

Table 2. Descriptive statistics and normality tests for the first differenced logarithms
of analysed variables in the period 1993 – 2006

Main statistics	GDP	FEC_H	FEC_I	PEP	NIE	OIL
Descriptive statistics						
Mean	0,044	0,032	0,016	-0,006	0,049	0,035
Median	0,047	0,023	0,014	-0,002	0,027	0,033
Minimum	-0,009	-0,036	-0,086	-0,111	-0,075	-0,127
Maximum	0,066	0,116	0,133	0,087	0,175	0,224
St.Dev.	0,020	0,046	0,055	0,055	0,077	0,085
Skewness	-1,370	0,255	0,190	-0,534	0,104	0,347
Kurtosis	4,611	2,042	3,249	2,930	1,910	3,758
Normality tests						
Jarque-Bera test	5,472	0,638	0,111	0,621	0,667	0,573
(p value)	0,018	0,500	0,500	0,500	0,500	0,500
Lilliefors test	0,228	0,114	0,193	0,174	0,151	0,221
(p value)	0,062	0,500	0,203	0,335	0,500	0,078
Shapiro-Wilk/Francia	0,854	0,974	0,948	0,937	0,966	0,916
(p value)	0,141	0,933	0,490	0,422	0,841	0,305

Source: Authors' calculations

While changes in the real GDP is border line normally distributed, energy variables are normally distributed with slight positive skew and platokurtotic, meaning that extreme changes were not recorded in the observed period. We use the Augmented Dickey-Fuller method to test for the existence of unit roots and identify the order of integration for each variable. Unit root tests are performed allowing for an intercept and a time trend. The Newey and West method is applied to choose optimal lag lengths. Unit root test for level and first differenced GDP and energy variables in the period 1993-2006 is presented in table 3.

Table 3. Unit root test of tested variables

Variables	Level ADF values	First difference ADF values
GDP	0,592	-1,924
FEC_H	-2,002	-2,355
FEC_I	-0,583	-3,527*
PEP	-2,501	-3,437*
NIE	-1,663	-3,345*
OIL	-3,081	-4,033*

* Signification at the 10% level. The critical value of the ADF statistic at the 10% level is approximately 3,17.
Source: Authors' calculations

Table 3 shows us that we can reject stationarity of levels for all tested variables. For final energy consumption in industry, primary energy production, net import of energy and oil consumption differencing transformed them into stationary variables. GDP and final energy consumption in household remained nonstationary after differencing and had to be filtered with an ARMA model to become stationary.

Recent developments of the cointegration concept indicate that a vector autoregressive (VAR) model specified in differences is valid only if the variables under study are not cointegrated. If they are cointegrated, an error correction model (ECM) should be estimated rather than a VAR as in a standard Granger causality test (Granger, 1988). Hendry and Juselius (2000) emphasize the importance of correct model specification. Following Granger (1988), we use an ECM instead of a VAR model, since the VAR model is misspecified in the presence of cointegration. VAR models may suggest a short run relationship between the variables because long run information is removed in the first differencing, while an ECM can avoid

such shortcomings. In addition, the ECM can distinguish between a long run and a short run relationship among the variables and can identify sources of causation that cannot be detected by the usual Granger causality test.

ECM model used in this paper can be written as:

$$\Delta X_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i} \Delta X_{t-i} + \sum_{j=1}^{m} \beta_{12j} \Delta Y_{t-j} + \theta ECM_{t-1} + u_t \qquad (5)$$

$$\Delta Y_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j} \Delta Y_{t-j} + \sum_{i=1}^{n} \beta_{22i} \Delta X_{t-i} + \lambda ECM_{t-1} + \varepsilon_t \qquad (6)$$

Regardless of the formulation used, similar studies have shown that the result of causality is very sensitive to the lag length adopted in the models. Fortunately, Hsiao (1981) introduced a way to help determine the optimum lags to be used, by combining the Granger definition of causality and Akaike's FPE criterion. The Hsiao procedure involves two steps. For the first step Eq. (2 and 4) or Eq. (5 and 6) are estimated with various lag lengths for ΔGDP but with the energy variables and ECM terms omitted. The final prediction error (FPE) is computed for each lag length of ΔGDP with the optimal lag (n^*) being the one with the minimum FPE, denoted as FPE(I). For the second step Eq. (2 and 4) or Eq. (5 and 6) is estimated, with the lag length on the ΔGDP terms pre-determined by step one, but different lag lengths for energy terms. Again a form of the FPE is calculated with the optimal lag length (m^*) being that with the minimum FPE, denoted as FPE(II). Finally FPE(II) is compared with FPE(I): if FPE(II) < FPE(I) then energy (Granger) causes GDP; whereas if FPE(II) > FPE(I) then energy does not (Granger) cause GDP. These tests determine whether energy variables cause GDP. These can be confirmed by using a number of statistical tests. For the standard Granger model, Eq. (2 and 4), causality can be confirmed by doing a joint *F*-test for the coefficients of the lagged energy variables. For the error correction model, Eq. (5 and 6), where causality comes from two sources, the ECM term and the lagged energy variables, causality can be confirmed by undertaking a joint *F*-test of the ECM coefficient and the lagged energy coefficients. The Hsiao (1981) procedure enables a systematic approach which minimizes arbitrary decisions on an individual level.

By using standard Wald test we evaluate Granger weak causality by testing H_0: $\beta_{12j} = 0$ for all *j* in Eq. (5) or H_0: $\beta_{22i} = 0$ for all *i* in Eq. (6). Asafu-Adjaye (2000) interpreted the weak Granger causality as short run causality in the sense that the dependent variable responds only to short-term shocks from the stochastic environment. ECM terms in Eqs. (5 and 6) provide for another possible source of causation. The coefficients on the ECMs represent how fast deviations from the long run equilibrium are eliminated following changes in each variable. If, for example, θ is zero, then GDP does not respond to a deviation from the long run equilibrium in the previous period. This can be tested using a simple *t*-test. If there is no causality in either direction, the "neutrality hypothesis" holds.

When testing for cointegration using the Johansen procedure, we employed the specification that allows for a linear trend in the data with an intercept but no trend in the co-integrating vector. Critical values for the test using MacKinnon, Haug, Michelis (1999) p-values. Results of Johansen cointegration test and short and long-term causality between GDP and energy consumption, production and import are presented in tables 4 - 9.

Table 4. GDP and energy variables causality in Croatia

Variable	Cointegration	Causality		Variable
		Short term	Long term	
GDP	√	→	→	FEC_H
GDP	√	→	→	FEC_I
GDP	√	→	→	NIE
GDP	√	→	→	PEP
GDP	√	→	→	OIL

Source: Authors' calculations

Table 5. ECM regression between GDP and FEC_H

$$\Delta GDP_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i} \Delta GDP_{t-i} + \sum_{j=1}^{m} \beta_{12j} \Delta FEC\_H_{t-j} + \theta ECM_{t-1} + u_t$$

$$\Delta FEC\_H_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j} \Delta FEC\_H_{t-j} + \sum_{i=1}^{n} \beta_{22i} \Delta GDP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

		C	D(GDP(-1))	D(GDP(-2))	D(FEC_H(-1))	D(FEC_H(-2))	Coint_Eq	Akaike AIC
D(GDP)	Parameter_value	426,939	0,681	-0,390	1,198	-0,902	-0,060	14,584
	Standard_dev	-305,822	-0,389	-0,488	-1,607	-1,823	-0,226	
	t test	[1.39603]	[1.75187]	[-0.79870]	[0.74550]	[-0.49473]	[-0.26713]	
D(FEC_H)	Parameter_value	-124,568	-0,027	**0,227***	0,177	0,545	**-0,148***	9,959
	Standard_dev	-30,278	-0,038	-0,048	-0,159	-0,180	-0,022	
	t test	[-4.11418]	[-0.70709]	[4.69742]	[1.11007]	[3.01929]	[-6.63306]	

Source: Authors' calculations

Table 6. ECM regression between GDP and FEC_I

$$\Delta GDP_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i} \Delta GDP_{t-i} + \sum_{j=1}^{m} \beta_{12j} \Delta FEC\_I_{t-j} + \theta ECM_{t-1} + u_t$$

$$\Delta FEC\_I_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j} \Delta FEC\_I_{t-j} + \sum_{i=1}^{n} \beta_{22i} \Delta GDP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

		C	D(GDP(-1))	D(GDP(-2))	D(FEC_I(-1))	D(FEC_I(-2))	Coint_Eq	Akaike AIC
D(GDP)	Parameter_value	519,689	0,618	-0,395	-0,607	-0,940	0,194	14,485
	Standard_dev	-591,534	-0,531	-0,738	-2,569	-2,269	-0,779	
	t test	[0.87855]	[1.16491]	[-0.53606]	[-0.23630]	[-0.41439]	[0.24897]	
D(FEC_I)	Parameter_value	185,029	**-0,113***	**-0,150***	0,638	0,000	**0,306***	9,029
	Standard_dev	-38,648	-0,035	-0,048	-0,168	-0,148	-0,051	
	t test	[4.78756]	[-3.24720]	[-3.12203]	[3.79862]	[-0.00106]	[6.00322]	

Source: Authors' calculations

Table 7. ECM regression between GDP and NIE

$$\Delta GDP_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i}\Delta GDP_{t-i} + \sum_{j=1}^{m} \beta_{12j}\Delta NIE_{t-j} + \theta ECM_{t-1} + u_t$$

$$\Delta NIE_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j}\Delta NIE_{t-j} + \sum_{i=1}^{n} \beta_{22i}\Delta GDP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

		C	D(GDP(-1))	D(GDP(-2))	D(NIE(-1))	D(NIE(-2))	Coint_Eq	Akaike AIC
D(GDP)	Parameter_value	606,975	0,567	-0,276	-0,230	-0,483	0,020	14,473
	Standard_dev	-333,925	-0,447	-0,522	-0,626	-0,442	-0,327	
	t test	[1.81770]	[1.26822]	[-0.52775]	[-0.36658]	[-1.09446]	[0.06155]	
D(NIE)	Parameter_value	-434,392	0,819*	1,101*	-1,574	-1,058	-0,811*	14,265
	Standard_dev	-300,854	-0,403	-0,471	-0,564	-0,398	-0,295	
	t test	[-1.44386]	[2.03323]	[2.33902]	[-2.79046]	[-2.65802]	[-2.75141]	

Source: Authors' calculations

Table 8. ECM regression between GDP and PEP

$$\Delta GDP_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i}\Delta GDP_{t-i} + \sum_{j=1}^{m} \beta_{12j}\Delta PEP_{t-j} + \theta ECM_{t-1} + u_t$$

$$\Delta PEP_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j}\Delta PEP_{t-j} + \sum_{i=1}^{n} \beta_{22i}\Delta GDP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

		C	D(GDP(-1))	D(GDP(-2))	D(PEP(-1))	D(PEP(-2))	Coint_Eq	Akaike AIC
D(GDP)	Parameter_value	877,456	0,315	-0,632	0,768	0,633	0,023	14,487
	Standard_dev	-382,315	-0,503	-0,395	-0,870	-0,642	-0,074	
	t test	[2.29511]	[0.62700]	[-1.60179]	[0.88266]	[0.98587]	[0.31181]	
D(PEP)	Parameter_value	-17,956	0,469	-0,505*	-0,628	-0,300	0,081*	13,247
	Standard_dev	-205,692	-0,271	-0,212	-0,468	-0,345	-0,040	
	t test	[-0.08730]	[1.73530]	[-2.37716]	[-1.34064]	[-0.86856]	[2.03403]	

Source: Authors' calculations

Table 9. ECM regression between GDP and OIL

$$\Delta GDP_t = \alpha_{12} + \sum_{i=1}^{n} \beta_{11i}\Delta GDP_{t-i} + \sum_{j=1}^{m} \beta_{12j}\Delta OIL_{t-j} + \theta ECM_{t-1} + u_t$$

$$\Delta OIL_t = \alpha_{22} + \sum_{j=1}^{m} \beta_{21j}\Delta OIL_{t-j} + \sum_{i=1}^{n} \beta_{22i}\Delta GDP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

		C	D(GDP(-1))	D(GDP(-2))	D(OIL(-1))	D(OIL(-2))	Coint_Eq	Akaike AIC
D(GDP)	Parameter_value	168,362	1,015	-0,136	-50,161	-2,744	-0,230	14,306
	Standard_dev	-703,346	-0,903	-0,908	-110,691	-68,081	-0,819	
	t test	[0.23937]	[1.12448]	[-0.14950]	[-0.45317]	[-0.04031]	[-0.28126]	
D(OIL)	Parameter_value	7,432	-0,011*	-0,004	1,064	0,338	0,011*	2,587
	Standard_dev	-2,006	-0,003	-0,003	-0,316	-0,194	-0,002	
	t test	[3.70546]	[-4.29940]	[-1.40861]	[3.36969]	[1.73968]	[4.80626]	

Source: Authors' calculations

The direction of causality has significant policy implications because knowing the direction of causality has direct implications on the forming of government policies regarding the energy conservation and subsidies system. As we found that in Croatia GDP growth is cointegrated with energy consumption, primary energy production and net energy imports, there must be

either unidirectional or bidirectional Granger causality, since at least one of the error correction terms (ECMs) is significantly nonzero by the definition of cointegration.

We find both long and short term dynamics for all energy variables moving in the same direction, from economic growth to energy variables. Our results are different from most of the studies analysing developing countries, which found that causality runs from energy variables to economic growth. On the other hand, opposite causality is common in developed, post-industrial economies with strong tertiary sector. Although Croatia is developing and transition country, it shows similar economic structure to developed countries with dominant service sector that makes up to 60 per cent of its GDP. These similar structural characteristics are the consequence of completely different reasons. Privatisation process in Croatia has resulted with brown-field investments in service sector (especially telecommunications and financial sector) because of the high profits in these oligopolistic markets. On the other hand, the industrial production dropped sharply due to the closure and restructuring of heavy industry which was the biggest energy consumer and thus the energy consumption in industry decreased considerably. Uncompetitive position of Croatian industry has been additionally enforced by strong national currency and extensive trade liberalisation which led to further decline in industrial production and industrial energy consumption.

Our research results reflect relatively low energy intensity in Croatia which is, though higher than the average for OECD Europe, much lower than in all other Western Balkan countries and most of the new EU Member states. Croatian economy has been oriented mainly towards services, especially tourism, and light industries (e.g. food processing, pharmaceuticals, textile industry) which are not energy-intensive. Therefore the causal relationship cannot run from energy to economic growth, while relatively high GDP growth has induced energy consumption in industry and households, primary energy production and net imports of energy.

4. CONCLUDING REMARKS

This paper examines the causal relationship between energy and economic growth in Croatia over the period 1993–2006. We used a bivariate model of real GDP and five energy variables: energy consumption in industry and households, oil consumption, primary energy production and net energy imports. Since we found cointegration for all of the tested relationships, we use an ECM instead of a VAR model, since the VAR model is misspecified in the presence of cointegration. Apart from that, VAR models may suggest a short run relationship between the variables because long run information is removed in the first differencing, while an ECM avoids this shortcoming. In addition, we were interested in distinguishing between long and short term relationship among the variables and ECM allows us to do that since it can identify sources of causation that cannot be detected by the usual Granger causality test.

In the case of Croatia the causality runs from GDP growth to all energy variables and can be related to transition depression during the 1990s and deindustrialization that had resulted in sharp industrial decline and decreased industrial and overall energy demand. The causation between economic growth and energy consumption, production and imports is more related to personal transportation and heating (cooling) needs than industrial demand. Under the assumption that there exists unidirectional Granger causality going from economic growth to energy, it means that policies aimed at decreasing energy consumption and oil dependency will have little or no adverse effects on economic growth of a country. The state may then use

proceeds from increased taxes or lower incentives to increase government spending, which is especially welcomed in the current global crisis or decrease the tax burden and attract domestic and foreign investors.

The limitation of this study is the short time period available for Croatia and questionable quality of data in the early '90. In the future it may be interesting to investigate causality over a longer time span and higher frequency data, for example, quarterly data, since temporal aggregation of higher frequency to annual data may weaken causal relationships between the variables. Despite these limitations this is, as far as is known, the first systematic analysis of causality between energy and economic growth performed on Croatia. The results we obtained have important consequences for similar transitional countries in light of the ongoing desire to reduce energy consumption and reduce CO_2 emissions.

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