Knowledge and Sustainable Economic Development

# KNOWLEDGE AND SUSTAINABLE ECONOMIC DEVELOPMENT

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Partium Press
Oradea/Nagyvárad
2012

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The edition was supported by

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**Descrierea CIP a Bibliotecii Naţionale a României**
**Knowledge and sustainable economic development** / ed.: Bélyácz Iván, Fogarasi József, Szabó Katalin, Szász Erzsébet. - Oradea : Partium, 2012
ISBN 978-606-8156-30-9
I. Bélyácz, Iván (ed.)
II. Fogarasi, József
III. Szabó, Katalin (ed.)
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# FOREWORD

In recent years, the world economy has been affected by crisis in financial and commodity markets which in turn have defined the priorities and attitudes of policy-makers in addressing the consequences of these recent events. Consequently the aim of this book is to provide a broad-ranging account of the social and economic terrain demarcated by the intersection of knowledge and sustainable development in order to reach conclusions and offer guidelines for both the public and the private sector. This book contains mostly the selected papers of the international conference *Knowledge and Sustainable Economic Development* organized by Faculty of Economics, Partium Christian University in Oradea, Romania, 27–29 October, 2011.

Traditionally, sustainable development stood for environmental issues and its main concern was the management of exhaustible natural resources. Due to the global economic and financial crisis, the notion of sustainability gained a much broader meaning. The sustainability of public government or public finances or the sustainability of the euro has become more and more prominent in recent years. Thus the first chapter examines macroeconomic issues and the second chapter financial aspects.

A precondition of sustainable economic development is that the enterprises and economic agents from various sectors of economy to operate based on sustainable development principles. Therefore the third chapter is focused on agricultural and rural development and the fourth chapter on environmental economics and business economics topics.

The problems of sustainability can only be dealt within an interdisciplinary way, building an adequate knowledge. Therefore the last three chapters presents empirical results on knowledge and innovation, higher education challenges and improving teaching methods of mathematics for students enrolled in economic and business undergraduate programs.

Iván Bélyácz, József Fogarasi, Katalin Szabó, Erzsébet Szász
*Editors*

# MACROECONOMIC DEVELOPMENT IN THE EMERGING ECONOMIES OF CENTRAL AND EASTERN EUROPE

# ON THE SUSTAINABILITY OF THE SINGLE CURRENCY

László CSABA*

*Among the three customary dimensions of sustainability – environmental, social and financial – in this paper we address only the third one. We try to solve the following puzzle: while several EU and even EMU members had to resort to giant multilateral rescue packages, the single currency has been alive and well. As major members of the euro-zone have been downgraded in 2011-12 by rating agencies in a row, including France, Italy and Spain, the value of the single currency has remained stable internally and rather strong externally. In solving the puzzle we offer some potential cures for more efficient crisis management by the EU member-states and the Community, than the ones experienced to date.*

**Keywords:** EMU, crisis, euro, sustainability
**JEL codes:** E02, E63, F40, G38.

## 1. Peculiarities of EMU and its raison d'etre

Financial arrangements of European integration have always been a subject to debate in the theoretical literature. From the very outset, many economists – especially in the Unites States – tended to be of the opinion, that the single currency is misconstructed, if for no other reason, because of the lack of political union, and the ensuing lack of fiscal union.[1] The thrust of the argument goes as follows: voluntary co-ordination of policies, as stipulated by the basically intergovernmental arrangements of the EU in the post-Lisbon architecture, is insufficient to offset the imbalances resulting from a unified monetary policy in the absence of unified, not just co-ordinated on voluntarily harmonized fiscal policies. More specifically, lacking the transfer mechanisms that exist inside national states to offset regional imbalances and also divergent responses to external shocks was bound to lead to trouble (Feldstein, in: Foreign Affairs, 1997).

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It is hard to deny that there is a modicum of truth in this argument, even though it is fairly textbookish economics and overlooks the difference between nation state and a community of states a loose commonwealth of unitary territorial states. If we follow this logic, it is hard to escape the conclusion, advanced most recently by Scharpf (2011) - that any attempt to rescue the construct, as experienced in the 2008-2011 period, is bound to exacerbate the situation in both economic and political terms. It is because the Greek, Italian, Spanish, Irish crises only uncover a number of democratic deficits and professional inefficiencies, lack of accountability and of enforcement mechanisms, deeply rooted in the political compromises having molded EU policies and institutions over the past decade or so. The contrarian argument, advanced by a number of analysts is that the EU is, by the crisis, triggered into the jump it has long and rightly feared of, namely to *move seriously towards a political union.* Already the six pack measures, but even more the fiscal union project of December, 2012, still under elaboration and approval at the time of writing, do make such a move. For it is only within a singular political community constituted by a single *demo,* translating representation into taxation, and thereby control of spending by the legislative, where burden sharing is inevitable, natural and feasible in any democracy. The jump would imply complementing monetary union with a degree of open fiscal federalism, subordinating national fiscal policies to some of the common procedures, goals and measures. This is clearly at odds with the Lisbon Treaty, in force since December 2009, but the latter could in theory be revised along the German propositions, provided national legislations get along with this idea. Moreover, just following the innovations of the Lisbon Treaty, the European Parliament also has to find a convincing majority for this step - which is less than automatic under its usual splintering along national and party lines.

## 2. Some Empirics of EMU

While libraries have been produced to explain the emergence and functioning of the European Monetary Union (EMU), at times of crisis it is perhaps inevitable that fundamentals are being raised again and again. In the first part of this section we ask who benefits form the single currency, and in the second part we offer a brief survey of how we, as a Community, have gotten there where we are now.

If one asks about the benefits of the euro, rather straightforward answers can be given, both at the macro and micro levels. A single currency saves considerably on transaction costs, especially in a continent known for big banking fees and margins. Furthermore, comparability of national prices allows for the evolution what is known in economics as the 'law of one price', i.e a tendency to equalize charges for the same output or service performed. In short, if the flow of commodities and services is free, competition and arbitrage creates a situation where prices no longer show the traditional wide spreads across the EU countries and regions. The process is well demonstrable via the observation of wholesale and retail prices, basically across the board, including non-tradables. This has to do with the opening up of markets along the Single European Act, to global competition, but also to the direct comparability of prices charged by individual suppliers, from airfares to foodstuffs.

Third, stiffening competition itself is a source of consumer benefit. Fourth, by creating a zone of stability, the currency zone is institutionalizing the gains of the period of 'Great Moderation' in terms of price stability and – ideally – also financial policies, both in the fiscal and monetary legs (Hodson, 2011).[2] Finally, by creating a largely closed economy, comparable with that of the Unites States, the currency zone shelters its members from external shocks – so the conventional wisdom goes. This applies *a fortiori* for small open economies, where the efficiency of monetary and fiscal policies has long been undermined by processes of globalization and capital market liberalization.

How far have those theories been born out by the facts? Historically speaking the rather complex arrangements of the EMU (Hodson, 2011) have never followed from pure theoretical considerations that were grounded either in economics, or in political science, let alone integration theory. In reality, the EMU – conceived several times and by several 'founding fathers' – has been by and large the outcome of decades of learning by doing. This took place in countries with very different histories, and especially following the oil shocks of 1973 and 1979, when the efficiency of conventional Keynesian demand management has been subjected to serious doubt.

All across the 1980s a steady and gradual conversion of one economy after the other to what many term as 'monetary orthodoxy' took place. One by one countries adopted unilateral exchange rate pegs, turned away from fiscal profligacy and a de facto D-Mark union has been in the making. As the insightful analysis of Issing *et al.* (2004) shows, this was more of a series of trials and errors than adoption of any clear theoretical stance. And while insights from monetarism were playing a role, insights from other schools were at least as important. For instance fixing the exchange rate has always been an anathema to any serious monetarist, ever since the publication of the defining piece by Milton Friedman (1953).

Let us underscore: the practice of European monetary integration has therefore been by and large the opposite of what would have followed from monetarist teaching. Here the red thread has been the gradual conversion to exchange rate stability, later price stability and the discontinuation of the practice of fiscal profligacy. This long story (cf recently Marsh, 2011) has been to a large degree one of trials and errors all across the 1970s and 1980s. By the time the Maastricht Treaty was adopted in 1992, all political parties with a chance to get close to government, and any academic economist with an influence on policy-makers, on left and right, have been convinced of the virtues of price and exchange rate stability. By that time a de facto D-Mark zone emerged, with first small open economies like Austria and Finland, later large economies like France, Spain and finally Italy pegging their respective currencies unilaterally to the German mark, thereby importing stability.

Let us note, that this 'conversion to orthodoxy' was an outcome of *societal learning, not of academic consensus*. In the academe voices hostile to the European monetary project have always been strongly represented, not least because of the vocal opposition of the Anglo-American guild, providing the mainstream for economic thinking. However experiences with competitive and occasional devaluations, with instability and volatility of exchange rate arrangements across the 70s and 80s have lent support to those practitioners, who advocated the artificial creation of the zone of stability, i.e the currency union. Alas, this latter outcome is already in line with the emerging wisdom of financial economics, the 'bipolar view' in which only irrevocably fixed or

freely floating exchange rates are sustainable in the long run, the latter calls for small open economies like those constituting the EU, to join into a currency bloc.

Joining the currency union therefore has not required extra sacrifices in terms of 'giving up the exchange rate instrument'. Since such an instrument is out of question among countries forming an economic union. Furthermore, as it is a platitude by now, the criteria of optimal currency area to be largely endogenous, thus being self-fulfilling. Indeed, on the ground business cycles tended to be synchronized and intra-EU trade increased. Asymmetric shocks, an issue discussed widely in the literature, have not proven to be policy relevant, given the quite similar economic structures of the member-states, with intra-industry and intra-firm exchanges dominating over the traditional inter-industry or even inter-sectoral trade as postulated in the classic theorem of comparative advantage at Ricardo.

Measured against the background of truly severe external shocks having characterized the two decades since the adoption of the Maastricht Treaty, it seems that the considerations and institutional arrangements of the EMU elaborated in a series of compromises- and documented in the summary volumes cited above- have proven viable and resistant to crisis. Neither inflation, nor deflation emerged, and not only because the ECB adopted a more rigorous – thus longer lasting – concept of recession than is customary in the United States. The harmonized index of consumer prices, i.e the indicator elaborated and regularly controlled by the joint statistical agency Eurostat, has never been below 0.6 percent per annum and never exceeded 3.3 percent – in the troublesome year of 2008. As a rule it fluctuated between 2.1 and 2.6 [3] percent per annum, i.e slightly above the numerical target of the ECB[4], but *ensuring price stability for any practical purpose*. The single currency has remained strong, especially during times of the financial crisis of 2008-9, against all competing currencies except the Swiss franc. The EU has never experienced major current account deficits or surpluses. Current and capital account taken together fluctuated between a mere +0.2 percent and -1.4 percent of joint GDP even in the crisis period of 2007-2011. Thus the level of the cross exchange rate must be considered to be an equilibrium level, despite regular complaints by some politicians and industrial interests.

If we disregard those criticisms in the literature, as well as in the public discourse, which demand *attaining objectives which are explicitly not assigned to the ECB,* we get a clear picture.[5] If we accept that any joint agency must follow its mandate, set by its statutes, the EMU actually has delivered what it promised: price stability for a long period of time, i.e over 13 years. *Criticisms blaming the single currency for what it is not constructed for*, or which is not to be influenced by monetary policy, is therefore *misdirected*. These criticisms are rarely born out by statistics, including the euro's alleged contractionarly effects, unfavourable labour market impacts and the like. In the first run thus we have to consider the Euro-zone as a major success. This stands out especially if we compare this venture to other major policies of the EU, such as the Lisbon Agenda, enlargement, reforming common agricultural policy or improving the efficiency of cohesion funds, let alone the Doha Round of global trade talks. Against the limited if any success of those areas, the single currency is one of the *unqualified success stories of European integration as a whole.* While the jury is still out if, and to what degree, this outcome is attributable to the monetary and especially the fiscal framework safeguarding the common currency, the fact of the matter is that on the Community level it seem to have worked (cf also Monti, 2011).

We must add the proviso, that the European Union has remained intergovernmentalist in its basic features. Therefore it does not and should not have any organ with supranational competences, able to enforce, in the worst case by military or other disciplinary measures, the decisions taken at Community level. As long as fiscal policy, unlike monetary policy, is not vested in a single supranational centre, it would contradict to the nearly exclusively *national anchoring* of any democratic legitimation. Since those take place through elections to the legislation of territorial states, the latter deciding over 98 percent of expenditures in the EU, the common pool problem of who will foot the bill, in what proportions and on what grounds, can not be eschewed at the Community level. As these weighty issues are not clarifies in sufficient detail in the currently emerging fiscal pact, [6] *fiscal cooperation, truly needed for successful monetary union, can only be based on voluntary compliance.* And this is the crux of the matter.

The European Union, ever since its inception, has been a club of gentlemen. In other words, cooperation was based on commonality of values, objectives and revealed preferences of the participants to do things together, attributing a value on its own to the factor of doing things together. This idea of the 'ever closer union' has been formative all across the history of the EU, acting as the driving force for various projects of deepening. In this context, sanctioning, let alone, excluding any of the participants would run against the spirit of the entire enterprise. Following the stipulations of the Lisbon Treaty of 2009, a member state may well voluntarily decide for an exit from the club. But other members, or their majority, *can not simply eject an other fully-fledged member,* as the horse-trading on the sanctions against Austria in 2001 have amply demonstrated. [7] Nor is the replication of the British-Danish opt-out from EMU an option, ever since the adoption of the Amsterdam Treaty of 1997. Therefore is the sustaining of *the weak if any sanctions on trespassers,* be that basically in any areas of common policies. While in exceptional cases the European Court of Justice may superimpose Community legislation over national decisions, however *this is exceptional, rather than recurring, let alone regular.* The attempts in the 1997-2009 to politicize and federalize Europe have foundered, therefore this state of affairs must be taken as a given.

## 3. Policy Games without Rules

Let us re-call: all European policies and institutions are based on voluntary compliance and goodwill, thus in each and every of the policy areas the spirit of co-operation is being pre-supposed. For instance it is not obligatory to any member-state to join the single currency[8]. It is possible to join or not to join the European Security and Defence Policy. The model of differentiated integration has long been a fact of life (Dyson and Sepos, 2010). As exemplified by the varied involvement of Scandinavian members, while some countries volunteer for closer co-operations, others abstain and guard their national elbow room and join perhaps other common actions. An 'everything or nothing' stance is truly exceptional, though British positions under the Conservative governments often come close to a virtual exit to an observer status. A recent example is the Competitiveness Pact, signed in June 2011, when four

very different members – Britain, Sweden, Hungary and the Czech Republic – decided to abstain, obviously on entirely different grounds.

This 'soft law' nature of European arrangements also imply, that identification with Community ownership – much the same as IMF parlance would call 'domestic ownership of reforms' – is even more important than otherwise. Law abiding behaviour in general pre-supposes the agents' internal identification with values and objectives, formalized – always imperfectly – by the legislators. In case of conflict, the spirit of the law, the intention of the legislator is a matter for concern, up to the point of being decisive in settling court cases.

Under this angle it should have been disturbing to see an ever growing number of states openly dodging the commonly elaborated arrangements. Beetsma *et al.* (2009) elaborate in great length that the stiffening of controls at times when players do not identify with the logic/value judgements behind the formal rules, has actually induced *regular and large scale cheating across the board.* This was the case with fiscal policies, an issue we shall elaborate in some detail.

It is certainly difficult to provide a lump sum assessment of complex developments of an entire decade, between 1999 and 2009. However, two or three general remarks may suffice for our purpose. *First,* as we have seen above, in the first decade – actually until the eruption of the Greek crisis – the arrangements, however half-hearted, seem to have sufficed for sustaining price stability, and the exchange rate against the dollar even appreciated. *Second,* even if in a very incremental manner, debt/GDP ratios in most eurozone countries tended to decline, approaching the Maastricht limit by 66.3 percent in 2007, before exploding, as a sign of Keynesian crisis management to 85.3 percent by the end of 2010 (ECB: op.citp.46). *Third,* in the years of the Great Moderation of the 1992-2008 period, there was a general tendency, both in much of the academe and the policy-making influenced by them, of believing that crises will never come back. What is seen from today's perspective as complacency was fairly widespread, both in the academic literature and in policy-making. Thus acting on the fiscal front, calling for more stringency, or merely complaining about the lacklustre efforts at structural items of fiscal consolidation sounded overzealous and

pedantic textbook economics, especially to practitioners on the market and in the state administration alike.

Let us note, that a number of countries were performing well, or even extremely well, as Ireland until 2008, Estonia, Luxemburg, Finland, Spain, Slovenia and Slovakia, but the performance of the Netherlands, Austria and Cyprus also looked acceptable. Some countries outside the euro-zone, such as Bulgaria, Latvia, Denmark, Lithuania, the Czech Republic, Romania, Sweden and even Poland were, even in 2010, well within the Maastricht set limits of debt ratios. In other words, *we do not see any evidence,* theoretical or empirical, that would warrant the usual litany of some economists *about the irrationality, unfeasibility, non-practicality of meeting the Maastricht criteria at a generalized level.* The more we note that the extensive Scandinavian welfare states all fared very well also under this criterion, the doubt seems more than justified.

Under this angle we may advance the hypotheses that countries which were severely derailed in the 2008-2011 period, were the ones where some fundamental features of economic policies went wrong, and that for a longer period of time. If public debt explodes without any preliminaries, it must be a reflection of some previously covert structural imbalances in the given economy. And it is hard not to observe that the asset bubble in both Ireland and Spain, the mismanagement of banks in Greece and Ireland, the dodging of structural reforms in Portugal, and not least Italy,[9] all count among the platitudes of the literature by now. The hopeless state of Italian public finances is not to be observed by surprise since it counts among the evergreens of the public finance literature over the past few decades. One may indeed wonder, especially against the background of the wide acceptance of the theorem of efficient markets in the pre-crisis decade, how the allegedly super-rational, fully informed and ruthless capital markets allowed Italy to get away with its lousy and non-improving public finances, chronic deficits and 100 percent plus debt rates, without even attempting to deliver the punishment, which according to finance textbooks, preaching the efficient markets hypothesis, should have been 'instantaneous' and devastating.

In short, it seems rather straightforward that problems that emerged by the country listed above are *peculiar to the individual economy on the*

*one hand, and have fairly little, if anything to do with the common framework* of fiscal coordination, let alone with the joint policies spending a mere one percent of the joint GNI of the EU members. By contrast the trespassing, with or without EMU, has been flagrant and extreme, recurring and structural in nature, indeed, in each and every of the cases.

By the same token, it is important to underscore: the nature of each of the respective crises has been different, not least because these were not attributable primarily to EMU and SGP (Stability and Growth Pact) arrangements. True, EMU, by allowing for cheap financing for heavily indebted countries, irrespective of their debt burden, and also ECB practices of accepting debt obligations of heavily indebted countries without a discount, in the name of mutuality, solidarity and single currency zone without differentiation, all *contributed to the ills.* But it could be hard to ascribe the ills *in toto* or even in their bulk to an arrangement which has by no means caused similar outcomes in countries with different policy options. The number of the latter, as listed above, is considerable. Furthermore, as could be documented prior to the crisis (Csaba, 2007, ch. 9) regular trespassing, primarily by big players, have remained notoriously unpunished. This has surely contributed to undermining the credibility of the joint fiscal framework and surveillance mechanisms, for reasons quite unrelated to the spillover of global financial instability.[10]

Let us merely note how different the respective crisis by the country has been! In the case of Ireland the overheating of the economy, an asset bubble and lack of regulation, as well as lasting inaction by the governmental agencies at times when the crises was already open, together created the trouble (Honohan, 2010). In short, this was a trouble with overheating, with non-interventionism and an overdose of *laissez-faire*, which created parallel bubbles in the construction sector as well as in banking financing those. By contrast, Portugal, according to all accounts, has been a country with miniscule if any productivity growth, with little if any economic dynamism, minimalist policies across the board and the ensuing lag in terms of competitiveness, indicated emphatically already years ago inter alia by Blanchard (2006). Finally Greece is an entirely separate case, where analysts highlight the de facto failure of the Greek state as well as the political instrumentalization of

various adjustment packages for domestic policy ends, irrespective of longer term ramifications (Visvizi, 2012). This experience, elaborated in detail in the paper cited above, is by and large a reflection of a popular attitude just opposite to what proponents of fiscal federalism (Hallerberg, 2011) consider as a necessary pre-condition for their suggestion to work on the ground. Namely: a popular opinion holding policy-makers responsible for fiscal irresponsibility and non-remedying structural reasons in which the dismal outcomes are rooted in each of the troubled countries.

What we have in common in the three open crisis cases is the fundamental incongruence of domestic policies and institutions with the underlying logic of the monetary model of European integration, and even with the basic logic of political integration, understood as a deepening project. Once a member no longer identifies itself – at the level of decision-makers and elites broadly understood – with the original project of the political union, or *finalité politique,* the concrete arrangements that emerge as an outcome of intergovernmental bargains may look as absurd, irrational and of limited use (to attain the pedestrian, immediate targets of the policy-makers). Once this assessment prevails, *a minimalist approach replaces the traditional commitment to European goals*. While the latter has long helped overcome the series of crises, which is rightly seen as the *modus operandi* of European integration in most of its fifty plus years of existence, lack of commitment, foot dragging over macroeconomically insignificant issues and financial flows, and generally, playing a theatre scene for domestic audiences instead of focusing on the solution of Community goals, both in the technical and political planes, translates into inaction and drifting. The defining feature of the 2008-2011 period has been the collapse of the Great Moderation and the peaceful waters that used to characterize that period. By contrast, ever since the eruption of the financial crisis and the domino effect on a number of EU countries[11], fire fighting has replaced strategic thinking. Managing the task of the day clearly prevails over any broader consideration, including the strategy of the EU, the Europe 2020 project.

## 4. The Crisis of Crisis-Management

Crisis management in the EU has, by the time of writing, reached a new dimension. First and foremost, the global economy has not returned to the normalcy of the pre-2008 period, not least because of the *crisis of confidence* which rules on financial markets. Most players remain unconvinced both about the ability and willingness of major governments to manage their public debt, which is only exacerbated by these governments – implicitly and explicitly – assuming responsibility for a large part of private debts in their countries.[12] Indeed, for market players the insight, that there is no Chinese wall between public and private debts accumulated in the same country, *implies a Copernican tun in the way market participants evaluate* macroeconomic indicators. It is not least because of *the additive nature of the two debtmountains* that undermined the faith of markets in governmental politics, which in 2009-2011 showed little if any commitment to revert the tendency, which is obviously a warning sign, according to the historic evidence marshalled by the book cited above. By the same token combined fiscal and monetary easing, as practised in the USA, can do precious little for alleviating the problem, which is not rooted in effective demand, but in actors' anticipating further worsening, quite in line with the traditional Lucas (1976) critique of the inefficiency of such policies.

The period 2009-2011 has seen an unprecedented degree of attempts to create new mechanisms for fire-fighting, crisis management and also to bring about a sustainable and lasting, permanent mechanism of preemption and cure, the European Stability Mechanism, effective from 2013. We do not provide a detailed summary of this issue, which is extremely complex both in terms of management techniques and in terms of institutional arrangements. For one, Benczes (2011) argues convincingly, that transposing the Stability and growth pact to national fiscal rules and independent fiscal councils could largely have prevented the accumulation of crises over the years. On the other hand, it may also be objected, that this experience has fundamentally shaken the credibility and thus the efficacy of any formalized arrangements, especially of institutional straightjackets, for reasons and via the mechanisms and incentives documented by Beetsma *et al.* (2009).

First and foremost, the three open crises, exacerbated by the eruption of previously covert, but lasting instability in Italy[13], and to a lesser extent in Spain, have made the underlying contradiction between sustaining intergovernmentalism in decision-making and supranationalism in terms of substance. The latter is particularly clear when national debts are 'mutualized', to use the euphemism by former Commission President Jacques Delors, when the idea of issuing common European debt obligations has been gaining acceptance, and when the *de facto co-funding of individually made debts, explicitly forbidden by the Stability and Growth Pact is becoming an ongoing practice.*

It is perhaps unsurprising to see the former socialist leaders, themselves largely responsible for the explosion of debt, calling for more solidarity and de facto community level decisions on fiscal policy.[14] But it is perhaps equally unsurprising to see the conspicuous resignation of German guardians of price stability from ECB positions. While personnel problems - nomination of Vice presidents and members of the board – have finally been solved by skilful diplomatic compromise, the ongoing debate on the possible further increases in quasi-fiscal and even openly fiscal activities of the ECB in the form of issuing Eurobonds, still reflect the deep and unbridged divisions over the fundamentals.

Second, we may formulate the strain as follows: if the SGP contains and explicit no-bailout clause, the idea of political community and European solidarity also contains *an implicit no bankruptcy clause.* As we have argued above, for a decade the two contradictory considerations seem to have been co-existing pretty well. But once the fundamental assumptions over gentlemanly behaviour are violated, when the Irish, Greek and the former socialist Portuguese governments run openly counter to their own obligations to revert the financial catastrophe, a system based on understandings and the spirit of co-operation was clearly and openly challenged. This is why many observers by now talk about the crisis of the periphery being gradually but irrevocably transformed into the crisis of the euro-system. For if it is a recurring practice of non-abiding with the rules followed by non-sanctions, it is clearly a sign of erosion of the arrangement as a whole.

Third, it is hard to overlook that policy improvisation without a map – or what Germans would call *Ordnungsdenken* - inevitably leads to a dead

alley. For even if we were sympathetic to the policy-makers acting under informational constraints and bounded rationality, that would not help us over the unresolved fundamentals, which are like devil, coming back through the window once thrown out of the door.

To cut a long story short, the 12 years leading up to the adoption of the Lisbon Treaty was an attempt to politicize and deepen the European Union. Whatever are the reasons - and those range from the reign of popular media to the decreasing democratic legitimation of top EU rulers bargaining behind closed doors[15] – the outcome has clearly been an outright rejection of anything, even symbolically, supranational and avowedly federalist. Reh (2009) rightly talks about the de-constitutionalizing of the Union in and by the Lisbon Treaty, implying the watering down of the top-down, federalist and structurally binding components of previous drafts.

By the same token it is ironic to see propositions, such as coming from the Dutch prime minister and minister of finance where fiscal trespassing by another member state could be actually punished, to the point of ejecting the sinner from the euro-club. Let us recall: it is not about the compelling nature or the economic rationality of their argument, which is also questionable, since the need to overcome the obvious moral hazard implicit in the ways the 2009-2011 crises were managed are clear. It is just that the constitutional, legal, political and thus technical pre-conditions have not been created, and even consciously weakened. While 'European governance' may, on the surface, recall command planning memories by some of us (Mihályi, 2011), on the ground it is perhaps the opposite problem which prevails: the complete lack of enforcement mechanisms. True, the European semester practised since 2011 have created the rituals for some ex ante coordination and also much tighter monitoring of details on the spot, it remains to be seen that the Commission, being a servicing rather organ than a central government of supranational prerogatives, can indeed ensure implementation by non-abiding members.[16]

The long lasting row between the European Parliament, employing its enhanced powers of co-decision, anchored in the Lisbon Treaty on the one hand, and the traditionally all-powerful and single-handedly acting Council over the quasi-automatic nature of sanctions to be hanged over

trespassers is just a formal sign of the deeper problem. For issuing eurobonds, or accepting government bonds of highly indebted countries as a collateral, without a discount, equals to re-tailoring the burden of debt at the Community level, *without however enjoying the legitimation of the citizens,* who will, at the end of the day, have to foot the bill, now or in later generations. While technically speaking it could help alleviate the problem of heavily indebted countries, in political and legal terms it remains a non-starter. The less transparency and accountability, required in usual banking and business practices, the more so, since it remains entirely opaque, who will foot which part of the bill and in what timeline. The less accountability and transparency are embraced, the more so.

And here we have come to a true borderline. European financial solidarity without political foundations, *without checks and balances, without remedying mechanism* and enforcing accountability of those responsible for the dismal outcomes, *comparable to those existing in the corporate world*[17], or even in the much sheltered medical profession, is a *contradiction in terms* anyway. Therefore far reaching suggestions to strengthen actual fiscal federalism along the lines of the Brazilian example (Hallerberg, 2011) are missing the point. At the end of the day, Brazil has been a federal state, with centralized conduct of fiscal policy, whereas the European Union has never been. Moreover the formative features of the most recent editions of the Treaty on the European Union, though accommodate measures already taken in setting up the European Financial Stabilization Facility and the European Stability Mechanism, still clearly fall short of delegating, even in part, responsibility for the conduct of fiscal policy to anybody 'in Brussels'.

## 5. Should the EU Federalize Debts?

It goes without saying that any forecast is a speculative exercise. The experience of the 2007-2011 period in the EU has casted doubt over the majority approach in the literature which took for granted continuation of muddling through as the baseline scenario for any policy-relevant analysis. With the time passing, day by day new options become politically feasible, even ones that used to belong to the realm of phantasy only a few months before.

The *first option,* which is being pushed by the creditor countries, perhaps Finland, the Netherlands and Slovakia, would openly move toward *a degree of formal fiscal federalism.* This has long been a proposal in the EU literature, still was constantly rejected on political grounds. One would need to see how fiscal rationality would be able to dominate the underlying political, legal, historic and emotional considerations. Asking for collateral per se is anything but appalling. However, when the Finnish minister of finance suggested something similar, it triggered Greek outrage, understandably so. But in a Community, where the Competitiveness Pact with its much softer arrangements was adopted by less than unanimity, generalizing stricter solutions does not seem to be trivial.

The *second option* is return to the old ways, including reliance on understandings and compliance basically through *voluntary action, gradual adjustment and coordinated external finance.* This would pre-suppose a co-operative and even ambitious approach from the debtor side, a case which one can observe in the case of Portugal and Spain, not however in Greece and Ireland, the major culprits. Here the basic insight is that of Reinhart and Rogoff (2011) citing two centuries of evidence on the formative role of *domestic* debt and of the subordinate role of external exposure in case of each sovereign default in modern times.

Finally *a third possibility is one of disintegration,* where some member states either leave the euro-zone or are expelled by the others. This option, long forecast by American and academic critics of the EMU would solve one problem by creating two new ones. First, the exiting country, adopting its old currency, is likely to fall even deeper in inflation and recession, owing to the foreseeable devaluation of the national currency. Second, this would be a heavy blow to the entire European project, whose significance is perhaps beyond our ability to understand. The old continent without over-arching political and institutional cohesion has, indeed, been a dangerous place, primarily for its inhabitants in the entire three centuries following 1648.

Irrespective of which of the options will materialize, it seems, that current magnitudes of external debts, such as of Ireland and of Greece, having reached 96.8 percent and 142.8 percent for the end of 2010[18], which continued to grow ever since, are unlikely to be managed in any organized

way, short of an open, but *organized and managed* default and the ensuing parallel debt restructuring of official as well as private outstanding debts. This option materialized only in smaller in part in November, 2011; however it left the larger part of outstanding debts, owned by the public authorities, unresolved. If a country is contracting by 7.5 percent and external debt service is over 8 percent, as in the case of Greece in 2011, this situation is unsustainable. The solution might lie in the resort to Brady bonds, which allow for avoiding open rescheduling, while allowing for swapping the official debts at a 50 percent discount to market agents. This option, practised in managing the Latin American debts of the 1980s, allowed the heavily indebted countries to restructure their economies and grow out of debt in a sustainable fashion.[19]
Likewise, the tripling of Irish debt in 2007-2010, as well as the initial unwillingness of the new government to follow the logic of IMF-EU rescue package, created a situation where return to the pre-crisis normalcy is likely to be slow and incremental, despite the considerable progress made by the workout process in 2011. While the situation of the two nations is dissimilar, and so is the perspective for Portugal and Spain to the others, arithmetics remains aritmethics, and sustainability conditions are yet to be worked out by those involved. It is perhaps unfortunate, that orderly debt restructuring has only very incrementally and unwillingly become official policy, at times when markets tended to react in seconds and governments in quarters rather than months.

In this paper we argued in favour of *preserving the original economics behind the EMU framework* rather than replacing it with something untested or incongruous to the peculiar legal and political architecture of the EU. In the original political economy approach EMU has never been presented as a matter of financing techniques. Rather it was seen and also meant to be a prelude to broad de-regulatory and marketizing reforms and structural adjustments on the large scale. Those who warned countries with rigid social structures and fatigue, even hostility to economic flexibility, from joining in (Feldstein, 1997), were proven to be right. But short of the shallow *post hoc ergio propter hoc* argumentation the outcome should not be presented as something pre-ordained or inevitable. On the other hand, unified monetary policy, complemented with synchronized, but separate national fiscal policies, has been a fact of life ever since the emergence of the de facto D-Mark zone in the

1980s. The puzzle is thus no longer open: dodging the rules – in economics and politics – tends to be myopic, or as Kydland and Prescott (1977) would have it: *time-inconsistent*. Our empirics has lent, retroactively, support to their seminal finding. Voluntary coordination could work, but under myopic policies, has not.

Does this experience prove the non-sustainability of EMU? We hope to have provided a contribution to the answer in the negative. We have not seen anything inherently unfeasible in the construct. Nor have we seen reasons for subscribing to the propositions for the complete overhaul of the architecture. We hope to have convinced the reader: it would create more problems than it solves. EMU can and should be sustained, but *the conditions for its viability should finally be created and/or completed,* in line with the original project, and supported by the evidence of mismanagement of the crisis.

## Notes

[1] Jonung and Drea (2009) provide a meta-analysis of over five dozens of criticisms why the single currency should have collapsed from the very outset.
[2] For a balanced retrospective cf Hodson (2011).
[3] Source, unless otherwise indicated: ECB: *Statistics Pocket Book,* November, 2011.Frankfurt/M.
[4] Given that the ECB has never adopted a strategy of inflation targeting, much in fashion over the past decade in the academic literature, but not necessarily among major central banks, like the Swiss, Japanese or even the FED, the mere fact of numerical missing is irrelevant, as long as it is not sizable. Experience has led to the convention seeing price stability somewhere between 2 and 3 per inflation cent per annum in order to remain on the safe side and avoid deflationary threats (more on that in Issing et al. 2004).
[5] It should perhaps be a subject of a separate analysis, that crisis management, as practised under President Mario Draghi, including the purchase of state bonds on the secondary and increasingly also on the primary markets, is in line with the statute of the ECB. The latter explicitly prohibits any quasi-fiscal activity, not least because there is no common tax pool from which to fund it.
[6] The idea of enforcing those unclear rules on non-eurozone members was clearly a reason for eight countries and the UK to ask for parliamentary approval; else it would have implied signing a blank cheque.

[7] For a good background, including political and legal aspects, cf Merlingen et al. (2001).

[8] Technically speaking new members, including Sweden and the East, are compelled by the accession agreements to join. However, Sweden has deliberately abstained, not least because of the referendum of September, 2003, and most eastern members simply do not seem to qualify in the current decade.

[9] The long overdue, still somewhat unexpectedly timed demise of Silvio Berlusconi, in November, 2011 following the G20 summit of Cannes, was just the latest and most conspicuous casualty in the saga.

[10] The inability of Eurostat, Eurogroups and ECB together to revert malpractices of the Greek authorities, uncovered basically every second year since 2001, is a case in point.

[11] These included, besides the three chronic cases, also Latvia, Hungary, Romania, Spain and Italy, the first three having to resort to IMF standby packages, a measure that used to be axiomatically excluded from the policy options of any EU member in the pre-2008 period.

[12] Iceland is perhaps an extreme case where the government guaranteed the repayment of all deposits, way above the 20 thousand Euro limit stipulated by EU banking regulations. But bailing out big firms, like GM and Chrysler, or big banks, like Fortys or Hypo Vereinsbank, implied by and large the same for the fiscal position of the respective countries.

[13] According to the *Wall Street Journal,* 10 Sept, 2011 over 70 per cent of the bond purchases by the ECB, reaching close to 80 bn euros, was directed to the troubled southern members, leading to the ECB owing the larger part of external government debt of these nations, which is bizarre, given the statutory prohibition protecting the ECB from financing any government debt.

[14] Cf *Handelsblatt,* 10 September, 2011.

[15] This is the core of the lack of legitimacy argument advanced in detailed by Scahrpf (2011), rightly reminding of the lack of transparency and direct accountability of Ecofin and Council decisions.

[16] This is clearly spelled out in the detailed first assessment of the DG EcFin of the Commission (Flores, 2011), elucidating the details in terms of procedures and competences. We may not agree with the supranationalist propositions of the paper, but appreciate its analytical substance.

[17] Tax underreporting - i.e doctoring accounts of the firm - triggers fines, or even jail terms, in EU countries such as Holland or Sweden, while Greek and Italian ministers and treasury officials are still at large.

[18] These are the last numbers officially certified by Eurostat and ECB in: ECB: op.cit.p46, all more recant data are sheer estimates.
[19] Here the major problem may lie in the fact that either ECB, nor IMF, currently holding governing bonds of the problem nations, is allowed by its statutes to sell those claims at a discount and cover the loss from their reserves, as private banks or indeed, fiscal authorities may do.

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# THE INFLUENCE OF MACROECONOMIC INDICATORS ON THE BANKING ACTIVITIES IN SERBIA

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*The main focus of this paper will be on the availability of capital necessary for the everyday functioning of enterprises. We will try to establish a possible connection between the macroeconomic indicators and banking activities - credit lending and deposit collection. By using the following statistical techniques - linear trend equation, rolling correlations and correlation coefficients - we will try to determine the influence of macroeconomic conditions on the availability of domestic financial resources. Government expenditure, the unemployment rate and the level of wages are taken as the main macroeconomic indicators and are analyzed in the paper. Moreover, the demand and supply related to financial means will also be presented, as well as the ways of overcoming the gap between them. Since most banks have tried to overcome this problem by cross-border lending, it appeared to be both the solution and the transmission mechanism for crisis shifting. In the end, the strong correlation has been established between the level of wages and the national savings trend and cross- borders and local loans to the corporate sector. However, domestic resources appear not to be sufficient to satisfy the investment demand of the enterprises. The additional problem is the growing Government expenditure that increased its share in borrowing financial means from the banks, thus crowding out private investments. This, on the other hand, has jeopardized the already weakened Serbian economy. Therefore, we come to the overall objective of this paper which is to explain the correlation and influence of macroeconomic indicators on the microeconomic ones that represent the main milestone for a transitional country like Serbia.*

**Keywords:** government expenditure, unemployment rate, wages, deposits, credits, banking sector
**JEL code:** G00

## 1. Introduction

The first chapter analyses the macroeconomic situation in Serbia through the results of fiscal and monetary policies in the period from 2008 to 2011. Macroeconomic stability represents a necessary condition

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for the development and functioning of efficient and productive enterprises, and influences the level of the overall competitiveness of the country. According to the Global Competitiveness Report 2011-2012 (GCR), Serbia has worsened its rank of competitiveness by 11 places in comparison to 2008 (a fall from position 85$^{th}$ to 95$^{th}$).

The second part of this paper analyses the state of the Serbian banking sector as well as the availability of capital to the enterprises in the country and its connection to macroeconomic indicators (wages, unemployment rate, government expenditure). Therefore, the terms for securing a credit, as well as sector-related banking activities within the last decade, will also be presented in the paper. Moreover, the authors give emphasis to the level of domestic savings, including the comparison of the relation between wages and the unemployment rate and the savings trend. Both the level of deposits collected and credits issued is compared with other countries in the region. However, since the mentioned level is not enough to satisfy enterprises' investment demand (which is shown as local and cross-border credits), the lack of supply (deposits) is compensated through cross-border credits that are accompanied by more favourable interest rates than the local ones.

The aim of this paper is to explain the correlation and influence of macroeconomic indicators on microeconomic ones that present milestone for transitional country such as Serbia. The overall banking activities (volume of corporate credits and deposits collected) will be compared with long and short term liabilities of 30 companies in Serbia. The authors of this paper will try to establish the connection between those two previously mentioned variables. The last part of the paper includes a sample comprising 30 companies which were chosen in accordance with the following parameters- net profit, EBIT, EBITDA and revenues generated in 2010, and special attention will be given to ways of collecting financial means needed for corporate and project financing.

This chapter provides an overview of the national fiscal and monetary policies and illustrates the effects of these policies on the everyday functioning of the companies. The analysis of the fiscal policy and growing government expenditure will precede the analysis of the monetary policy.

*1.1. Growing Government expenditure*

Fiscal policy is of great importance for the enterprises, as well as for the establishment of a favourable business environment. High taxes may have a distortional effect on the market, while colossal government spending can crowd out investment, increase interest rates, raise inflation level, lead to financial market instability, etc.

Since the escalation of the financial crisis, government expenditure has been gradually increasing while the incomes have been reducing, creating a bigger budget deficit. Even though the expenditure has risen, a proportional increase in capital investments has been omitted causing a lower level of capital expenditures in comparison with the level established prior to the crisis. Therefore, budget deficit may cause higher inflation and create macroeconomic instability in the following period. Government had decreased its public debt in the period between 2002 and 2008, but it adopted measures in order to help the weakened economy influenced by the crisis, thus affecting the further increase of debt (NBS, 2011b). According to NBS (National Bank of Serbia) data, public debt at the end of 2010 amounted to EUR 12, 2 billion (42.2 % of GDP). Public debt increased at the end of the year by 8.1 p.p. (percentage points) in comparison with the previous year and the rise was a result of budget deficit financing in December (NBS, 2007). The upper limit of public debt amounts to 45% of GDP, as introduced by the Law on the Budget System.

*1.2. Monetary policy*

Besides fiscal policy, monetary policy also represents a vital component of the macroeconomic policy of a country. NBS, in charge of providing monetary and financial stability in the country, has price stability as its main aim. Creating the environment with low and stable inflation includes the coordination of both the measures adopted by the NBS and the Government. However, the effects of financial crisis have additionally stretched the competencies of the NBS to the limit.

NBS has gradually introduced the Strategy for targeting inflation on the basis of the Memorandum on New Monetary Policy Framework adopted in August of 2006. The new Strategy was formally implemented on 1 January 2009, following the adoption of the Memorandum on inflation

targeting as a Monetary Strategy by the Monetary Board in December 2008. According to the Memorandum of the National Bank of Serbia on Monetary Strategy for the period from 2010 to 2012, the targeted inflation for 2010 amounted to 6% with a tolerance band of ±2 percentage points[1] . However, for the first time since the adoption of the Strategy, half-year inflation growth in October 2010 has moved above the upper end of the target tolerance band. The half-year inflation growth continued to increase in the following two months reaching the level of 10.3 % at the end of 2010, breaking the upper limit by 2.3 p.p. (NBS, 2009).

In order to restrain high inflation expectations, the level of expansiveness of monetary policy has been decreased. Since August 2010, NBS has been constantly increasing the key policy rate till June 2011 when it reached the level of 12%. [2]We may add that, due to the apparent lessening of inflation pressure, the central bank started reducing the key policy rate the current level of which now amounts to 10.75%. NBS has also continued to lower the level of monetary expansiveness by introducing a new Regulation on the required reserves of banks (calculation of required reserves in Dinars and Euros depending on maturity).

*1.3. Macroeconomic indicators influencing business environment*

Macroeconomic policies considerably influence the business environment in the country. Irresponsible and unsustainable fiscal policy observed during the last decade has brought the country in a very unsatisfactory position. For years now, real growth had been generated by high consumption (instead of investment) and additionally encouraged by foreign capital accumulation (FDI, cross-borders, remittances). The crisis may appear just as an excuse for bad government policies adopted in the previous ten years. During the crisis, the foreign capital inflow decreases and GDP growth falls as well. The main question is the sustainability of macroeconomic stability in a situation where public debt has increased considerably and has been followed by the rise in budget deficit. The unemployment rate reached the level of 20% and the average wage lessened during the last two successive years.

Serbia has its own distinctiveness in the domain of monetary policy. When the crisis broke out, the central bank increased the key policy rate, which was contrary to what central banks should normally do in a

moment of the escalation of the crisis. At the beginning of economic crunch, NBS raised its key policy rate by 2 p.p., from 15.5 to 17.5 %. The interest rate was reduced in the following period, reaching the level of 8% on 11 May 2010. Considering the unfavourable situation in the global market, NBS started increasing the key policy rate till June 2011. In September 2011, inflation was still above the targeted level and has the tendency to fall even lower (NBS, 2009).

Generally speaking, the biggest threat to macroeconomic stability of the country is high government expenditure. In the following period, the introduction of Fiscal Council and a new arrangement with IMF may appear to be a good solution for controlling and possibly blocking government spending beyond the planned level.

## 2. Banking sector in Serbia

Having presented the fiscal and monetary policies, the authors focus on the analysis of the Serbian banking sector. The stable financial system that makes capital available to enterprises is essential for the normal functioning of every country. According to the GCR 2011-2012, capital availability can be defined through the following indicators: Financial Market Sophistication, where Serbia is ranked on 96$^{th}$ place, Financing through Local Equity Market ranked 112$^{th}$, Ease of Access to Loans ranked 121$^{st}$, Venture Capital Availability ranked 97$^{th}$ , and Soundness of Banks ranked 116$^{th}$ (WEF, 2011).

The results indicate that the quality of financial market and the banking sector in Serbia (ranked from 96$^{th}$ to 121$^{st}$ place in 2011 out of 139 countries) appears to be quite unsatisfactory. The conditions related both to the financial markets and the banking system have various competitive disadvantages, thus annulling the general opinion of their quality. The overall level of efficiency of the banking sector is inadequate. The high structural misbalance is evident in relation to the financial strength and the business results of the banks - the number of banks present in Serbia (33) is high above the potential of the domestic market and the future reduction in the number of banks is highly necessary in the following 5-year period.

*2.1. Analysis of the banking sector*

Out of the total number of banks, 21 are in foreign ownership (foreign banks are members of banking groups from 11 countries) whereas 12 banks are in domestic ownership (Table 1). The foreign banks have a 75% share in overall assets and a 71% share in overall capital of the banking sector. The countries that count the biggest number of banks which are present on the market are: Austria (4 banks), Greece (4), France (3) and Italy (2). In terms of their share in the total banking sector assets, the most significant foreign banks are those originating from Italy and Austria (21% and 18%, respectively). In terms of their share in the total banking sector profit, Italian banks dominate the market with a share of 49% in overall profit and Austrian banks make 19% of the profit.[3] With a large number of banks holding small shares in total assets, lending, deposits and income, the Serbian banking sector is considerably fragmented. At the end of 2010, the HHI[4] concentration index did not exceed 1000, the level indicating only moderate concentration (NBS, 2010b).

Table 1: *Banking sector in Serbia in the period from 2001 till 2010*

| Year | 2001 | 2005 | 2009 | 2010 |
|---|---|---|---|---|
| Number of banks | 49 | 40 | 34 | 33 |
| Number of foreign owned banks | 7 | 18 | 20 | 21 |
| % share in overall assets | 13.2 | 66 | 74.7 | 74 |
| % share in overall capital | 15.7 | 49 | 73.5 | 71 |

Source: NBY (2001), NBS (2007, 2008, 2009)

At the beginning of 2000, there were 108 banks. The reduction in the number of banks functioning in Serbia is easily noticeable and a further decrease is yet expected. The above mentioned drop is mainly caused by the integration of state-owned banks and by the acquisition of private-owned banks both on the local and the regional level. It is important to mention that the main goal of most foreign banks is to gain at least a 10% market share which can be accomplished only through the acquisition of another bank, not through organic growth, especially in case of banks that have recently appeared in Serbia.

*2.2. Corporate lending in Serbia*

The first part of this chapter will describe the lending conditions related to the banking sector and will be followed by the illustration of capital availability through financial market.

During the crisis, the lending activity of the banks was steadily growing despite the cyclical oscillation, reaching the level of EUR 16 billion. Such lending growth was certainly influenced by the Agreement called "Vienna Initiative" that was launched at the height of the financial crisis to provide a framework for coordinating crisis management and crisis resolution of financial sector issues that were highlighted by the economic downturn and involved large cross-border bank groups systemically important in the emerging Europe region. The aims of the initiative were to prevent a large scale and uncoordinated withdrawal of cross-border bank groups from the region. The final agreement was that the foreign banks would not reduce their exposure below the set level from December 2008 until the end of 2010. Furthermore, banks committed themselves to holding liquidity and capital adequacy ratio level on the acquired level. In its reports, EBRD (European Bank for Reconstruction and Development) confirms that the stability of the Serbian banking sector is preserved due to the measures of NBS and that 70% of the Serbian banks involved in the initiative have kept their part of the agreement (EBRD, 2009). However, in the same report, EBRD points out the growing level of bad loans within the lending portfolio of the banks in Serbia and emphasize slow credit growth. The following Table 2 illustrates bank lending by sectors in the period between 2001 and 2010.

Table 2: *Banking sector – foreign banks' share in assets and capital in the period from 2001 to 2010*

| Sector | 2001 | 2007 | % | 2008 | % | 2009 | % | 2010 | % |
|---|---|---|---|---|---|---|---|---|---|
| Corporate sector | n.a. | 5,520 | 57.5 | 7,135 | 61.5 | 7,826 | 58.7 | 8,898 | 56 |
| Household sector | n.a. | 3,818 | 39.8 | 4,112 | 35.5 | 4,119 | 30.9 | 4,763 | 29.7 |
| Housing construction | n.a. | 1,128 | 11.8 | 1,815 | 15.6 | 1,961 | 14.7 | 2,390 | 14.9 |
| Public sector | n.a. | 175 | 1.8 | 196 | 1.7 | 1,230 | 9.2 | 1,991 | 12.4 |
| Other financial organizations | n.a. | 89 | 0.9 | 155 | 1.3 | 156 | 1.2 | 364 | 1.9 |
| Total | 6.326 | 9.602 | 100 | 12.598 | 100 | 13.331 | 100 | 16.019 | 100 |

Source: BSi (2011), Central Bank of Bulgaria (2010), Central Bank of Croatia (2010), Central Bank of Montenegro (2010), EBRD (2009, 2010a), Jelenkovic and Milic (2010).

The most important lending destination during 2010 was lending to the public sector. Table 2 shows that bank credit exposure towards the public sector increased by 7.5 p.p. in 2009 in comparison with 2008. The mentioned increase in the banking sector exposure to the public sector has crowded out lending to the private sector, which consequently resulted in a more complicated and complex everyday functioning of the companies. The decrease of 2.8 p.p. in bank credit exposure to the corporate sector is noticeable in 2009 in comparison to 2008. However, Table 2 shows the growth in the mentioned exposure of 4 p.p. in 2008 in comparison with 2007.

It is important to highlight that banks were implementing a restrictive credit policy until the end of 2008. The data available from the Chamber of Commerce of Serbia show a high level of bank restriction in lending activities due to the unfavourable business results of Serbian enterprises. High level of credit exposure denominated in foreign currency and domestic currency depreciation led to a high level of bank risk aversion in relation to credit issuing. The above mentioned factors led to the condition where every third credit application was approved by the bank (Jelenkovic and Barjaktarovic, 2010).

EBRD (2009) reports, Doing Business Report (The World Bank Group, 2010) and the GCR (WEF, 2011), confirm the previously presented problem - one of the main obstacles in doing business in Serbia is the process of credit approval (Serbia worsened its position from 4$^{th}$ to 15$^{th}$ place according to the indicator Getting Credit). The advantages of the Serbian banking sector in the process of obtaining credit are: the functioning of the Credit Bureau (NBS, 2011c) and the possibility of out-of-court settlements related to bad loans. The results of credit lending as % of GDP (Gross Domestic Product) in Serbia is compared to the countries in our region (Table 3):

Table 3: *Overall level of credits issued to non-monetary sector as % of GDP*

| Country | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 |
|---|---|---|---|---|---|---|
| Slovenia | 97 | 95 | 90 | 82 | 66 | 56 |
| Bulgaria | 74 | 70 | 64 | 56 | 41 | 40 |
| Hungary | 69 | 68 | 69 | 61 | 58 | 53 |
| Romania | 41 | 40 | 39 | 36 | 38 | 28 |
| Macedonia | 44 | 44 | 42 | 35 | 29 | 24 |
| Croatia | 71 | 67 | 66 | 64 | 61 | 54 |
| Bosnia and Herzegovina | 56 | 54 | 53 | 45 | 44 | n.a |
| Montenegro | 74 | 80 | 91 | 84 | 39 | 21 |
| Serbia | 61 | 51 | 42 | 37 | 17 | 33 |

Source: BNR (2010a, b), BSi (2010, 2011), Central Bank of Bosnia and Herzegovina (2010), Central Bank of Bulgaria (2010), Central Bank of Croatia (2010), Central Bank of Montenegro (2010), Matic (2002, 2006), UniCredit Group (2009a, 2009b)

The presented results show that Serbia is behind the following countries in relation to credit issuance - Slovenia, Bulgaria, Hungary, Croatia and Montenegro. Even though we said that every third application was approved by the banks, the statistical growth in credit trends in comparison to the level of GDP in Serbia is quite apparent in comparison with the previous years.

In the further analysis of the banking sector, the increasing level of nonperforming loans[5] (NPLs) is noticed, which amounted 16.9 % out of the total number of issued credits (NBS, 2010b). The same data indicate that the corporate sector has the biggest share, a share of 72% in the total amount of nonperforming loans. The most significant categories in terms of their share in total NPLs of the corporate sector in December 2010 are the following: processing industry 37%, trade 29%, construction 10%, agriculture 10% and hotels and restaurants 6%. Further analysis provides an overview of the banking sector liabilities.

The satisfactory level of banking sector capitalization along with the measures implemented by the central bank[6] enabled the banks to face the financial crisis without any bigger damage. The overall capital level reached the amount of EUR 4.73 billion in the end of 4Q in 2010 (NBS, 2010b).

Deposits of the nonbanking sector were steadily growing during 2010 reaching a level of EUR 14.3 billion. If the currency composition of deposits is analyzed, it is easily noticeable that the deposits denominated in foreign currency are dominant (79.1%), especially within the household sector. According to the NBS data, if the maturity of deposit is taken into account, then short-term deposits are dominant in bank portfolio (73.5%). Also, it is worth mentioning that, according to the GCR, the indicator of national savings (National Savings Rate) worsened its position during 2010, reaching 131st rank (125th rank in 2009). In Table 4 the level of deposit as % of GDP in Serbia and the countries from the region is presented:

Table 4: *Deposits level as % of GDP in the period from 2005 till 2010*

| Country | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 |
|---|---|---|---|---|---|---|
| Slovenia | 66,1 | 66,6 | 55,5 | 56,1 | 56,4 | 55,7 |
| Bulgaria | 70 | 62 | 60 | 64 | 57 | 49 |
| Hungary | 55 | 56 | 55 | 48 | 47 | 44 |
| Romania | 37,6 | 36,3 | 31,2 | 32,6 | 27,9 | 25,8 |
| Macedonia | 49 | 46 | 43 | 43 | 37 | 31 |
| Croatia | 65 | 62 | 60 | 63 | 58 | 53 |
| Bosnia and Herzegovina | 57 | 54 | 51 | 56 | 52 | n.a |
| Montenegro | 59 | 61 | 64 | 78 | 50 | 27 |
| Serbia | 41 | 39 | 33 | 35 | 28 | 24 |

Source: BNR (2010a, b), BSi (2010, 2011), Central Bank of Bosnia and Herzegovina (2010), Central Bank of Bulgaria (2010), Central Bank of Croatia (2010), Central Bank of Montenegro (2010), Matic (2002, 2006), UniCredit Group (2009a, 2009b)

The figures in the Table 4 indicate the poor level of overall deposits in Serbia in comparison with the countries in our region. The consoling thing is the growing trend of the mentioned variable in the period from 2005 till 2010. However, Serbia is at the bottom of the regional comparison related to the supply of financial resources. The best ranked country in the region is Bulgaria. The results revealed the fact that the overall level of credits issued by the banks in Serbia makes 61% of GDP, and the level of overall deposits presents 41% of GDP in Serbia. The last mentioned indicates the evident gap between the supply of the resources and the demand for them.

The above mentioned confirms the fact that accumulated domestic saving is not enough for the investment demand of the corporate sector. Also, we have tried to find correlation between: 1) the wages and unemployment rate, and the savings trend in Serbia, and 2) the level of: deposits, local and cross-border loans, and the investment demand of the corporate segment in Serbia (presented in Table 5). At the end of 2010 investment demand reached the level of EUR 18 billion (calculated by adding corporate lending to cross-borders). The domestic savings (household deposits) reached the level of EUR 7.4 billion representing 41% of investment demand. The correlation coefficient between investment demand and household savings was 0.96[7] showing that the increase in demand was followed by the bigger amount of household deposits collected by the banks (NBS, 2010b). Further analysis showed that the increase in household savings was followed by the increase in wages. The correlation calculated for the above mentioned variables for the period between 2002 and 2010 reached the level of 0.93 indicating the high level of correlation between household deposits and the wages of individuals.

However, the domestic resources were not enough to satisfy enterprises' demand. The banks tried to solve the problem in question via cross-border transfer credits which were accompanied by more favourable interest rates (credits issued directly to domestic enterprises by foreign banks).[8] The cross-border level reached EUR 9.6 billion at the end of 2010, 46.3% out of which was issued by the enterprises related to the borrowers, 29.6 % was issued by foreign banks and financial institutions related to domestic banks and 22.1 % was acquired from other creditors (NBS, 2010a). The correlation between cross-border credits and corporate lending was 0.96 for the given period showing that the components of investment demand rose, simultaneously supplementing each other due to the low domestic resources.

Furthermore, we have also tried to establish the correlation between government expenditure and corporate loans (Table 5). The strong correlation (0.94) was established between the growing trends of government spending and overall corporate lending. However, the strong positive correlation (0.98) was determined also between the increased government expenditure and cross-border lending, an indicator that may

point out the fact that the enterprises tried to compensate crowding out effects through cross-border lending. The mentioned correlation coefficients are presented on the following table:

Table 5: *Influence of macroeconomic indicators on banking activities*

| Variable | Correlation coefficients |
|---|---|
| Wages/Unemployment rate | 0.08 |
| Household deposits/ Unemployment rate | 0.19 |
| Household deposits/ Wages | 0.93 |
| Deposits/Investment demand | 0.96 |
| Local credits/Crossborders | 0.96 |
| Government expenditure/ Corporate loans | 0.94 |
| Government expenditure/ Crossborders | 0.98 |

Source: NBS (2010a, b, c, 2011a)

Moreover, the cross-borders credit transfers became a transmission mechanism through which the crisis shifted from the developed to the developing countries. The foreign banks, trying to satisfy the local investment demand, initiated capital concentration and credit issuing only in their own countries. They have also restricted the amount of cross-border credits to the minimum, thus raising the level of interest rates. As already mentioned the foreign banks are dominant in Serbia and among them Austrian banks have an important role in cross-border lending. If cross-border credits represent a suitable mechanism for crisis shifting from one country to another, this can influence the functioning of enterprises in Serbia that have already been dealing with problems such as illiquidity and indebtedness.

## 3. Growing liabilities of the enterprises

In the following chapter the correlation between the banking indicators and the overall level of loans taken by the companies will be presented. The banking indicators taken into consideration are the overall corporate loans issued by the banking sector in Serbia and the national savings that present the level of household deposits in Serbia. The level of loans taken by the companies in Serbia is presented in the balance statements

of 30 companies in Serbia. The sample of the companies analyzed in the paper is made in accordance with the level of their revenues, EBIT and EBITDA during 2010.

Since we aimed at establishing correlation between the overall level of corporate loans issued by the banking sector in Serbia and the amount of the long term loans approved to each company from the sample in the period between from 2007 till 2010, the final results of our research revealed that the strong correlation was established between the mentioned indicators in 22 companies out of 30. In 16 companies the results showed the existence of a strong positive correlation between these two variables- overall corporate loans and the company's long term liabilities towards the banking sector. This means that the growth of the overall number of credit issued by the banking sector in Serbia was followed by the increase in company exposure to the long term bank credits. It indicates that the companies during the crisis increased their long term liabilities towards the banking sector.

Furthermore, we have tried to determine the connection between the overall number of corporate credit and short term liabilities of the companies towards the banking sector. The survey showed that there is a strong correlation between the mentioned indicators in 20 companies out of 30. The strong positive correlation was established in 19 companies out of 20. The last mentioned indicates that the upward trend of the level of overall corporate credits was followed by the rise in the level of short term liabilities of sampled enterprises towards the banking sector in Serbia. The increase in both long and short term credits in Serbia was influenced by the Government measures that include subventions related to the interest rates of credits issued to both the household and corporate sector.

In the end, we have tried to establish the correlation between the supply and demand for financial assets in Serbia. We have already presented the problem related to the gap between the demand for financial resources and their supply. In our research, we have tried to determine the correlation between national savings (supply) and the loans taken by 30 companies we have sampled. The strong correlation was established in 22 companies out of 30. The positive correlation was set in 18 companies

out of 22. It means that the increase in the supply of financial resources was followed by the increase in corporate lending of 30 companies representing our sample (Table 6).

Table 6: *Correlation between banking indicators and the credits taken by the sampled companies*

| Companies | Correlation coefficient - overall number of corporate loans/long term loan taken by the company | Correlation coefficient - corporate loans/short term loans taken by company | Correlation coefficient - National saving/ Loan (short and long term) taken by the company | Correlation coefficient - National saving/ Loan (short and long term) taken by the company | Correlation coefficient - overall number of corporate loans/long term loan taken by the company | Correlation coefficient - corporate loans/short term loans taken by the company | Companies |
|---|---|---|---|---|---|---|---|
| Tigar | 0.99 | 0.87 | 0.81 | -0.38 | 1.00 | 0.89 | Impol Seval |
| Metalac | -0.13 | 0.88 | 0.30 | -0.28 | -0.41 | -0.84 | Bambi Banat |
| Sojaprotein | 0.31 | 0.32 | -0.22 | -0.57 | 0.12 | -0.13 | Jafa |
| Alphaplam | / | / | / | 0.70 | 0.59 | 0.87 | Sunce Sombor |
| Imlek | 0.84 | 0.81 | 0.85 | 0.72 | 0.75 | 0.78 | Velefarm |
| Messer | 0.97 | 0.97 | 0.75 | -0.93 | 0.97 | 0.91 | Knjaz Milos |
| Telefonija | 0.88 | 0.92 | 0.98 | -0.94 | 0.96 | 0.87 | Soko Stark |
| Frikom | 0.68 | 0.67 | 0.92 | -0.89 | -0.66 | -0.82 | Voda Vrnjci |
| Galenika Fito | -0.73 | 0.19 | -0.62 | -0.78 | 0.17 | -0.74 | Mlekara Sabac |
| Umka | 0.51 | 0.85 | 0.34 | 0.90 | 0.68 | 0.34 | Banini |
| Projektomontaza | 0.73 | 0.85 | 0.94 | / | 0.73 | 0.84 | Palanacki kiseljak |
| Lasta | 0.93 | 0.94 | 0.97 | 0.73 | -0.04 | 0.70 | Galeb GTE |
| Energoprojekt | 0.32 | 0.88 | 0.72 | 0.53 | 0.00 | 0.86 | Vital |
| Jedinstvo Sevojno | 0.20 | 0.23 | 0.20 | -0.74 | 0.06 | 0.26 | Carnex |
| Dijamant Zrenjanin | 0.79 | 0.93 | 0.95 | 0.90 | 0.73 | 0.90 | Neoplata |

Source: NBS (2008, 2010c), Serbia Business Register Agency, Financial statements (2007, 2008, 2009, 2010)

*3.1 External funding of the companies in Serbia*

In this chapter we are focusing on the external financing of the companies from our sample. The research of the financial statements and prospects of the companies showed that the companies, during the period from 2007 to 2010, used bank lending as the most dominant way of financing their activities. The research showed that 29 companies out of 30 used credits issued by the banking sector. Also, the second dominant way of external financing was leasing. Our research revealed that 20 companies used leasing to finance the acquisition of equipment. However, only 5 companies issued securities in the mentioned period and 8 companies issued shares without public offer. The last mentioned implies that capital market is not used for capital obtaining. The main purpose of the capital market in Serbia is the privatization of companies not their financing. The level of awareness related to corporate principles and diverse corporate financing should be increased in the Serbian business environment. The general conclusion is that the companies in Serbia used bank lending as the most dominant way of external capital obtaining.

## Conclusion

Macroeconomic policy plays an important role in creating a favourable business environment. However, there are certain problems related to its components - fiscal and monetary policy. The biggest problem is colossal spending and it has to be reduced as soon as possible. The lack of domestic capital accumulation is gradually becoming a serious problem due to the lack of capital inflows. Public debt and budget deficit are constantly growing and its restriction will prove to be quite a challenge in the following period. Inflation has gone above the targeted level. In our opinion, macroeconomic stability can be more easily accomplished in the sphere of monetary rather than the fiscal policy. The central bank shows the signs of determination in accomplishing the targeted inflation level and it has the instruments to achieve this aim. However, the problems related to fiscal policy would be harder to tackle even if a far more efficient political system existed. At this moment, the upcoming elections along with many other political system inefficiencies make the fiscal policy reform entirely demanding.

The biggest problem of the banking sector is the fact that accumulated domestic saving is not enough for the investment demand of the corporate sector. The banks tried to solve the problem by cross-border lending. However, the cross-border transfers turned out to be an appropriate mechanism for the crisis shifting from one country to another. Moreover, the possibility of obtaining credit represents one of the main problems in everyday enterprise functioning. It is important to highlight that banks were implementing restrictive credit policy until the end of 2008, where every third credit application was approved. The increasing level of NPLs indicates the problems related to enterprise illiquidity.

Also, the correlation between macroeconomic indicators and banking activities in Serbia was set. The level of wages is in a positive correlation with the level of deposits collected by the banking sector. Moreover, the colossal government spending is in strong correlation with both corporate and cross-border loans. The former only confirms the fact that during the crisis both the government and the corporate sector increased their liabilities towards banking sector. However, the strong correlation between cross borders and the increased government expenditure may indicate the fact that the private investments were crowded out by the public sector, and solution was found in cross-border lending by the enterprises.

The results relative to the financing of the companies in Serbia show that the most dominant way of external financing of the companies is bank lending. Leasing is presented as a frequent means of financing as well. The usage of the capital market is a mode of external financing that must be increased in the following period. The representatives from the Serbian companies are in favour of establishing the Bank for Development that may satisfy the Government's needs for capital investment, thus leaving more space for commercial banks to finance the corporate sector in Serbia.

In the end, it is important to mention that long-term collaboration between banks, clients and educational institutions is essential, as well as the support of international financial institutions. This cooperation may strengthen the role of the financial sector in ensuring financial means for enterprises' investment activities.

## Acknowledgment

This Research Paper was the part of the project "Advancing Serbia's Competitiveness in the Process of EU Accession", no. 47028, in the period 2001-2015, financed by the Serbian Ministry of Science and Technological Development. All authors are engaged in the project.

## Notes

[1] Site NBS, Monetary Policy, Memorandum of the National Bank of Serbia on Setting Inflation Targets for the Period 2010-2012, http://www.nbs.rs

[2] Site NBS, Monetary policy, http://www.nbs.rs

[3] The data were calculated using exchange rates available on the official site of the central bank on the 31st December of every year.

[4] Herfindahl Hirschman Index (HHI) is a commonly accepted measure of market concentration, calculated as the sum of square values of individual bank shares in the category observed (assets, loans, deposits, etc.). HHI up to 1000 indicates that there is no market concentration; 1000-1800 indicates moderate concentration; above 1800 indicates high concentration.

[5] Non-performing implies the status of outstanding debt on individual loans (including the amount overdue) for which the payment of either principal or interest are past due by 90 or more days since the initial due date; for which interest accruing on debt in the triple monthly amount (and higher) is capitalized, refinanced or its payment delayed; for which payments are less than 90 days overdue, but the bank has estimated that the debtor's ability to repay the debt has deteriorated or that there are doubts that repayment will be made in full.

[6] NBS offered the following conditions to the banks that adopted the Vienna Initiative: new liquidity resources (loans denominated in dinars with the maturity up to 1 year, short term foreign currency swaps, and exemption from required reserve calculation for foreign deposits and credits (from October 2008 till December 2010). Additionally, banks were allowed to include subordinate obligations up to 75% of primary capital (instead of 50%) for the regulatory needs and to raise exchange rate indicators from 10 to 20% of the capital.

[7] figure calculated for the period from 2002 to 2010.

[8] *Cross-border* credit transfer presents transaction initiated by the creditor through a institution or its daughter company in order to make available certain

financial means to a borrower in a certain institution or its daughter company in one of the member country, and the creditor and the borrower may be the same person (According to the Directive of the European Parliament and the European Council 97/5/EC since 27.01.2007). Cross-border transfer includes direct lending in other country. It is certainly one of the ways in which bank creditor expands its business beyond border, creating new opportunities for the profit.

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# CAUSES OF FOREIGN DIRECT INVESTMENTS IN ROMANIA

Kinga Magdolna MANDEL*

*The paper on Foreign Direct Investments in Romania not only aims at evaluating the motivation theories (push and pull) of FDI applicable in the case of Romania, but it also tries to analyze the specific features of the foreign investments in Romania with a focus on the American FDIs.*
*Nowadays FDI is a main force in the economic development, the ultimate reason being the anticipation of further profit. However there are a variety of factors that motivate FDI decisions such as market size and location, openness to trade, availability of capital, cost of labor and supply, the possibility of profit remittances and other cost and efficiency factors. My project is supported by quantitative research tools to gather and process the available international macro statistical data on the Romanian economy.*
*The outcome of the study is a clear picture of the reasons, trends and evaluation of the last 10 years of FDI inflow in Romania.*

**Keywords:** foreign direct investment (FDI), Romania, motivations, advantages
**JEL code:** F21

## 1. Conceptual framework

According to the definition of International Monetary Found FDI happens when residents of a nation acquire a controlling interest of at least 10 percent in a business in another country (IMF, 2003), investors having total control of the acquired securities and financial assets even if they lack control of the company as a whole.
Whereas the design of international sourcing strategy is based on the interplay between a company's competitive advantage and the comparative advantage of various countries (Kotabe and Helsen, 2010) the theoretical frame is offered by Ricardo's theory of comparative advantage, Michael Porters notion of competitive advantage together with the Diamond model of factor conditions and Dunning's eclectic theory.

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Competitive advantage influences the decision regarding which activities and technologies a company should concentrate its investments on. Comparative advantage affects the company's decision on where to source and market, based on lower cost of labor and other resources in one country relative to another (Kotabe and Helsen, 2010).
The law of comparative advantage (Ricardo, 1817) refers to the ability of a party (an individual, a firm, or a country) to produce a particular good or service at a lower opportunity cost than another party. Porter (1985) identified two basic types of competitive advantages, the cost and differentiation advantage. A competitive advantage exists when the firm is able to deliver the same benefits as its competitors but at a lower cost (cost advantage), or deliver benefits that exceed those of competing products (differentiation advantage). Thus, a competitive advantage enables the firm to create superior value for its customers and superior profits for itself. Cost and differentiation advantages are known as positional advantages since they describe the firm's position in the industry as a leader in either cost or differentiation.
A resource-based view emphasizes that a firm utilizes its resources and capabilities to create a competitive advantage that ultimately results in superior value creation (Porter, 1985). The diamonds of competitive advantage are (a) factor conditions (labor, natural resources, raw material, infrastructure); (b) demand conditions (home market's character); (c) related and supporting industries (constant and close interaction with the suppliers); (d) firm strategy, structure and rivalry (management practices, organizational modes, or essence of strong rivalry).
The eclectic theory (Dunning, 1995) concentrates on the advantages of investing abroad in three elements of ownership, location and internalization (OLI).
The above mentioned theories give a stabile base for the understanding of the enterprises that are going international by investing in Romania, enforcing their competitiveness by putting the different conditions and OLI advantages to work in their favor.

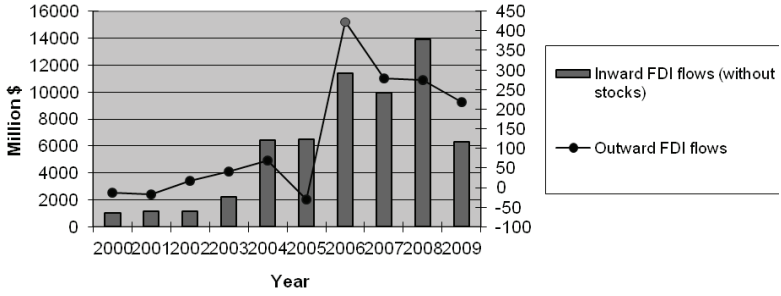
I suppose that the foreign investments are pulled by cost and efficiency factors, such as the market size, low cost and highly skilled labor force, tax incentives, home and host government support, the network of foreign embassies and companies in Romania. This study seeks to answer what are the dynamics and major characteristics of FDI in Romania;

examines the evolution of FDI flows after 2000 in Romania, seeking to explain the changes that have occurred over time.

## 2. Investing in Romania: key motivations

The top determinants of FDI in South and Eastern Europe were the market size, political stability, GDP growth, regulatory environment, profit repatriation, macroeconomic stability, the GDP size, quality of business, presence (or lack) of competitors and cost/quality of labor force (Kearney, 2010).
The FDI flows to Romania remained very low during the first six years after the fall of communism in 1989. FDI flows increased to a level between one and two billion dollars per year between 1997 and 2003, which was still much less than the annual FDI flows to Poland, Hungary or the Czech Republic. The country experienced a significant FDI growth just after 2003, the year when Romania was admitted in NATO and a decision was made to consider Romania for a 2007 accession in the EU (Egresi, 2008); and reached the peak of 13 billion USD in 2008. The FDI setback in inflow could be related to the changes in European and global economical environment. The economic environment that favored the FDI inflow also fosters the FDI outflow.

Figure 1: *Inward and outward of Romanian FDI flows, 2000-2009.*

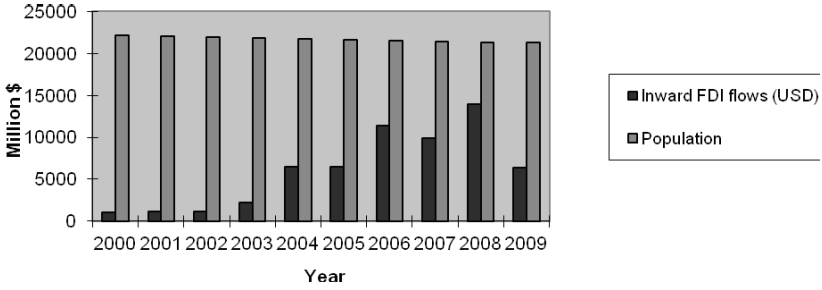



Source: World Databank, 2011.

*3.1 Market size*

The market size is among the main FDI drivers worldwide, and it is the principal reason for investment in South and Eastern Europe (SEE) as well (Kearney, 2010). Romania represents the second largest market with its 21.2 million of people after Poland in Central Europe and it is the 7th largest among the EU countries (Hasegan, 2010). It is the unique market gateway of the EU which makes possible the access to approximately 500 million consumers. The country has an attractive location: situated at the turning point between EU, the Balkans and CIS countries, is crossed by three important pan-European transportation corridors.

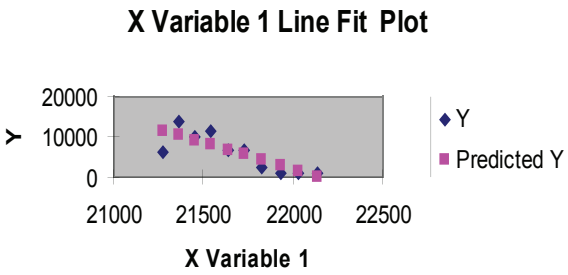
**Figure 2:** ***Population size and total FDI inflows in Romania, 2000-2009***




Source: World Databank, 2011.

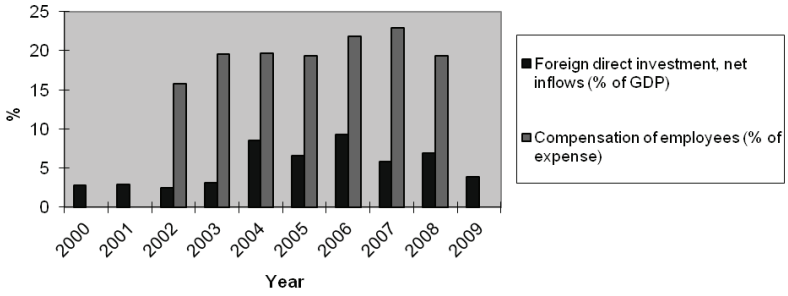
We found that there is a strong *negative* linear relationship between the market size and the FDI inflow: the less the population, higher the FDI inflow is, which is a rare development or specific of the country (Figure 2). The line fit plow measured in R square is relevant (64%), meaning that 64 percent of the variation in the FDI could be explained by the changes in the number of population (Figure 3).

Figure 3: *Regression analyses of the population size and total FDI inflow in Romania.*




Source: World Databank, 2011. Note: Adjusted R Square value: 0.6495.

Figure 4: *FDI inflows and the level of compensations*




Source: World Databank, 2011.

*3.2 Resource Advantage – Human resources*

The highly skilled labor force at competitive prices (solid knowledge in foreign languages, technology, IT, engineering, etc) makes Romania attractive for FDIs, not to mention the rich natural resource endowment, including surface and underground waters, fertile agricultural land, oil and gas. Wage has been the most controversial of all the FDI determinants, as it is widely agreed that the labor cost is important in attracting multinationals. Cheap labor is of particular interest for countries where labor prices are high and they are looking for outsourcing activities. In the case of SEE countries the wages are only at the 10$^{th}$ position in importance (Kearney, 2010), in Romania seems that

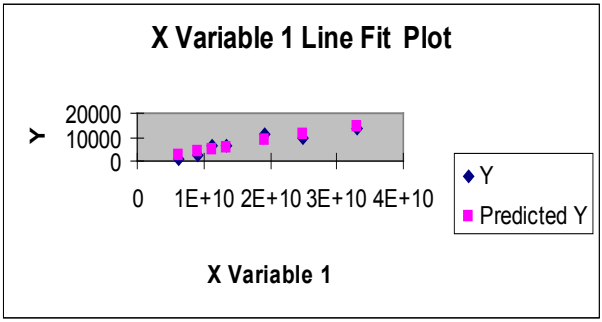
the wages are much more interrelated with the FDI inflow. While hourly labor costs remain low, even by Eastern-European standards, a tightening labor market and skill shortages, partly due to lower nativity and outward migration, that accentuated even after 2000 (between 200-350 thousand people leaving the country every five years, according to the World Databank 2011), have contributed to significant increases (Figure 4) in private sector wages (making up 20-23% of the company's expenses).
We found an R square of 83 percent (Table 1), meaning that 83% variation in the FDI inflow could be explained by the changes in the level of compensation.

Table 1: *Regression analyses: compensation and FDI inflow.*

| Adjusted R Square | 0,833399 | | | | |
|---|---|---|---|---|---|
| | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1,14E+08 | 1,14E+08 | 31,01424 | 0,00257 |
| Residual | 5 | 18390856 | 3678171 | | |
| Total | 6 | 1,32E+08 | | | |
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* |
| Intercept | -272,728 | 1548,915 | -0,17608 | 0,867143 | -4254,34 |
| X Variable 1 | 4,56E-07 | 8,2E-08 | 5,569043 | 0,00257 | 2,46E-07 |

Source: Author's calculations.

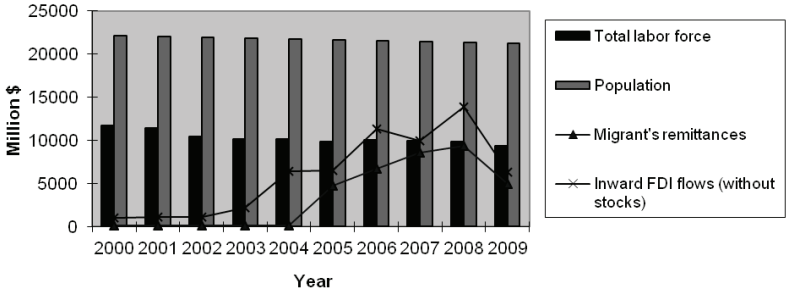
Figure 5: *Regression analyses: compensation and FDI inflow.*




Source: World Databank, 2011.

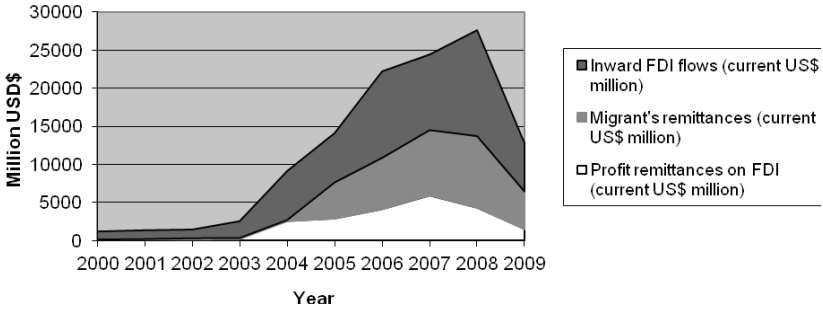
One of my hypothesis - backed by the week ties theory (Granovetter, 1973) and the network theory developed recently (Barabási, 2011) - is that the FDI is driven by personal networks.

Figure 6: *Population, labor force, FDI inflow and migrant's remittances*




Source: World Databank, 2011.

Figure 7: *FDI inflow, Migrant's and FDI profit remittances*




Source: World Databank, 2011.

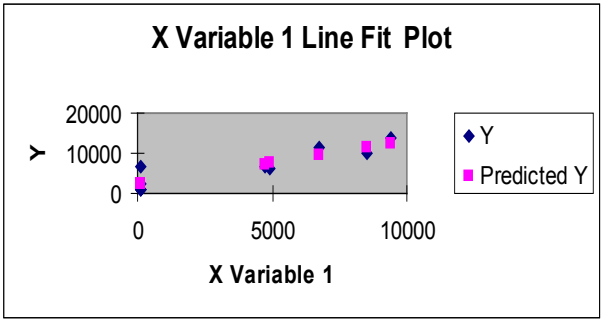
The migrants that left the country not only contribute to the Romanian GDP by directing home their savings, often they are also the bridge of foreign relations between countries, fostering FDI inflows.
Migrant remittances being the independent (explanatory) variable and the FDI inflow the dependent one we found an accentuated fit in the line supported by an 81% R square, meaning that 81% variation in the FDI inflow could be explained by the changes in the migrant's remittances.

Table 2: *Regression analyses of migrant remittances and the FDI inflow*

| | *Df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 1,62E+08 | 1,62E+08 | 41,00767 | 0,000208 |
| Residual | 8 | 31541161 | 3942645 | | |
| Total | 9 | 1,93E+08 | | | |
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* |
| Intercept | 2120,591 | 872,4626 | 2,430581 | 0,041165 | 108,6887 |
| X Variable 1 | 1,111077 | 0,173505 | 6,403723 | 0,000208 | 0,710974 |

Source: Author's calculations.

Figure 8: *Regression analyses of migrant remittances and the FDI inflow*




Source: World Databank, 2011.

*3.3 Location advantage*

Romania is seen as a zone of stability and democracy in its immediate neighborhoods. Its geostrategic political role is backed by the great power's policy and mantra "trade instead of war", eliminate the existing conflicts in the world by establishing stabile trade relations and intertwining the opposing parts with economic interdependency.

Romania's importance is also backed by its neighbor oil and gas exporting countries such as Russia and Ukraine that is getting of primordial importance as the world energy resources are limited. According to the EU plans Romania and Hungary will be transmitting the future oil and gas pipe channels supplying Western Europe. To be at the tap of those economies could represent a competitive advantage in the future for many multinationals (MNCs) and governments.

*3.4 Political stability and international relations*

Romania is supposed to guarantee stability in South Eastern Europe. It joined the NATO in 2002 and generally has supported the American foreign policy, including the war activities in the Middle East; therefore some analysts see a clear relationship between diplomatic links and increasing American business in Romania (Egresi, 2008).

The country's EU membership is other positive political factor, however its large and diversified minorities (18 minorities are living in its territories, 6.6% Hungarians and more than a million of Roma) remains a potential risk factor of conflict.

Bilateral agreements between Romania and other countries on investments promotion and protection also make the country attractive for FDI. Romania has bilateral diplomatic relations with 177 out of the 191 United Nation member states. The country is Member of the UN and other international organizations, like: OSCE (Organization for Security and Co-operation in Europe), Council of Europe and International Organization of La Francophonie. Romania has free trade agreements with EFTA countries, CEFTA countries and it is member of WTO member since January 1995.

The country has similar legal provisions as in UE (Acquis Communautaire implementation) and a Fiscal policy regulated by the Fiscal Code. The IMF bailed out Romania with 20 billion Euros in 2009. This package results in government spending cuts and slower economic growth that affects the FDIs profitability in the next couple of years.

The social and legal advantage of investing in Romania is based on the agreement between Government and Major Unions, preventing from major Union Movements, the tradition of permanent dialogue with the employee associations, and the labor regulations set by the Labor Code (Popa, 2008).

The intensity and direction of FDI are also influenced by national and local authorities' attitude toward foreign investment and „institutional arrangements significantly determine the FDI trajectories in CEE" (Bandelj, 2002). Egresi (2008) states, that although we know that there is a strong correlation between the political settings, the level of corruption and the FDIs, these relations are most difficult to prove by empirical researches.

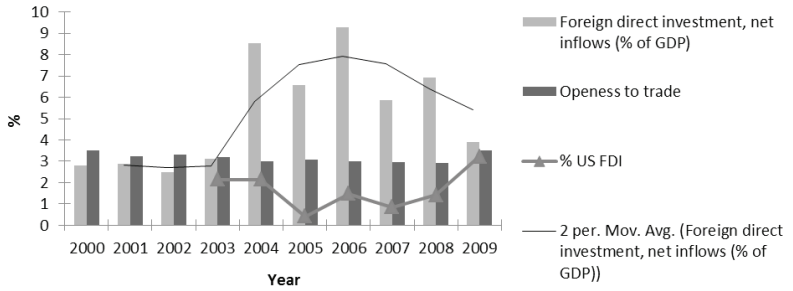
As a consequence of the above mentioned, FDI is very unevenly distributed within Romania. More than half of all foreign-owned companies and

over 50 percent of the FDI stocks are concentrated in Bucharest, the capital of Romania. Other regions preferred by foreign investors are the Northwest, the West (next to the Hungarian border) and the Center while the Southwest and Northeast have attracted the least foreign investment (Egresi, 2008).

*3.5 Macroeconomic stability*

An advantage offered by the country is the tax exemption of the reinvested profit. There are state aid schemes for encouraging investors to take upon Romania as well. It also offers increasing interest on behalf of Foreign Investors – leader destination for FDI in the region (Kearney, 2010). Furthermore the country has a stable fiscal policy (16% flat tax).

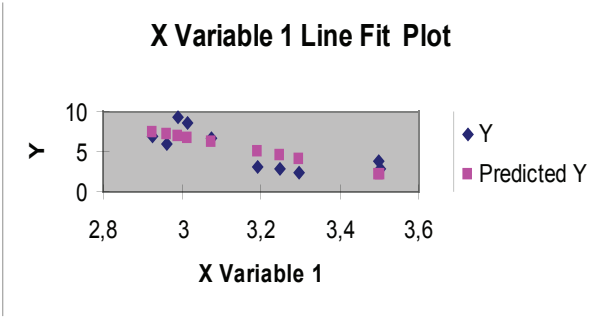
**Figure 9:** ***FDI inflow and Openness to Trade 2000-2009 Romania***




Source: World Databank, 2011.

The openness to trade is measured by the ratio of exports plus imports divided to GDP (Figure 9). Openness to trade being the independent variable and FDI inflow the dependent, we found a relevant fit in the line plots (adjusted R square 53%) meaning that 53% variation in the FDI inflow could be explained by the changes in the openness to trade of the country.

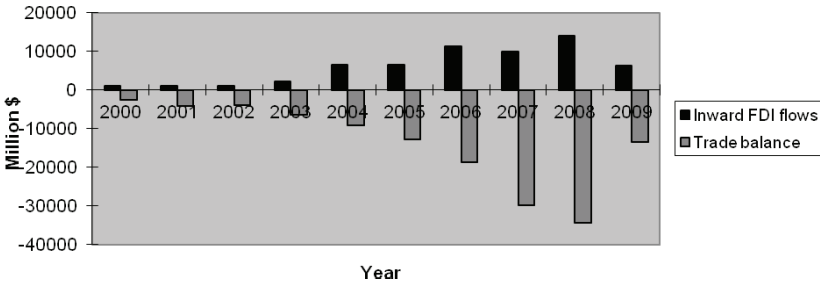
Figure 10: *Regression analyses: FDI inflow and Openness to Trade.*




Source: World Databank, 2011. Note: Adjusted R Square value: 0.5390

Romania was very much criticized for its negative term of trade. In communist times had an artificially enforced high level of export and very low size of imports, whereas the urban population was starving because of the disadvantages of the scarcity economy. Although the country experienced a beautiful GDP growth and in foreign direct investments (until the crises), its trade balance remained constantly negative, favoring the imports over exports, the deficit in products and services in a country are attracting FDI inflows.

Figure 11: *Trade Balance and FDI inflow in Romania 2000-2009*

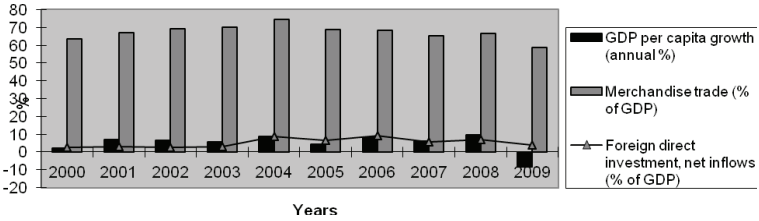



Source: World Databank, 2011.

Before 1989 Romania attracted virtually no FDI, the stock of investment in all Central and Eastern European region represented just 0.1% of total

world investment stock. After 1990 minimal FDI begin to inflow the region. The real impact occurred in 1995 when FDI flows grew by 80% over the prior year, amounting to 4.3% of total world FDI (Bandelj, 2002).
After the EU accession the European Union countries became the main export partners of the country. In 2009 merchandise exports totaled US$40.6bn and merchandise imports totaled US$50bn; the current-account deficit was US$7.1bn, equal to 4.4% of GDP. Around 65% of exports went to the EU27 in 2009 (EIU, 2010).

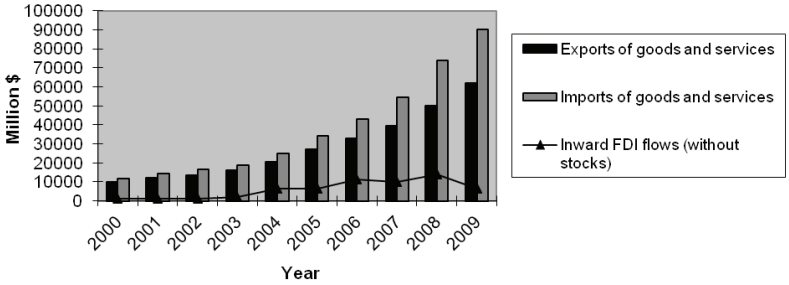
Figure 12: *GDP per capita growth, Merchandise trade and FDI inflows Romania 2000-2009*




Source: World Databank, 2010.

Romania's traditional exporting features include machinery and equipment, textiles and footwear, metals and metal products, minerals and fuels and chemicals.

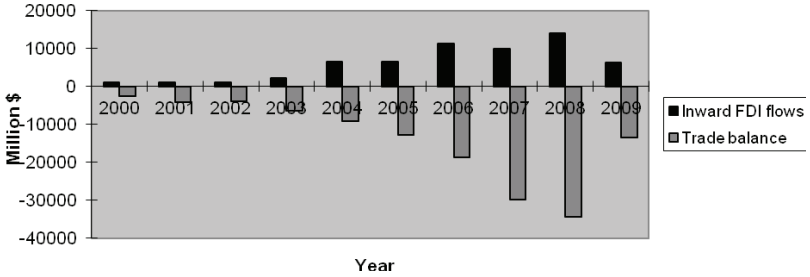
Figure 13: *Exports, imports and FDI inflow*




Source: World Databank, 2011.

This is the case in Romania, where the relation between the trade balance and FDI is a negative linear relationship. Taking the FDI to be the dependent and the balance of trade the independent variable, we get the line fit plow measured in R square to be highly relevant (84%) meaning that 84% variation of the total FDI inflow could be explained by the changes in the trade balance. Romania's balance of payment remained continuously negative in the past as the country imported more goods and services than exported. Moreover the size of imports grows faster than the level of export as we can see in the chart below.

Figure 14: *Trade balance, total and American FDI inflows*



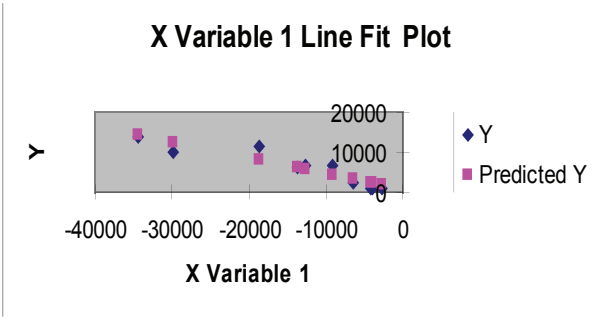

Source: World Database, 2011.

Table 3: *Regression analysis of balance of trade and FDI inflow*

| Adjusted R Square | 0,844593 | | | | |
|---|---|---|---|---|---|
| | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1,67E+08 | 1,67E+08 | 49,91262 | 0,000106 |
| Residual | 8 | 26691224 | 3336403 | | |
| Total | 9 | 1,93E+08 | | | |
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* |
| Intercept | 706,3154 | 946,0449 | 0,746598 | 0,476672 | -1475,27 |
| X Variable 1 | -0,39045 | 0,055266 | -7,06489 | 0,000106 | -0,5179 |

Source: Author's calculations.

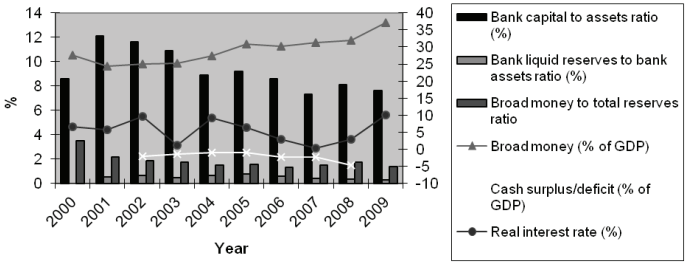
Figure 15: *Regression analysis of balance of trade and FDI inflow*




Source: World Databank, 2011.

In line with the regional trend towards the introduction of lower tax rates and flat-tax regimes, Romania introduced a flat tax of 16% for both personal income and corporate profits in January 2005. The 19% rate for value-added tax (VAT) was raised to 24% as of July 2010. Social security contributions are high, despite a series of reductions in recent years, and total 49.5% of gross wages. Tax rates are likely to be raised as a result of fiscal shortfalls in the short term. (EIU, 2010) This could be other reason why the number of FDI-s decreased 36% from 2008, besides the global economic crises.

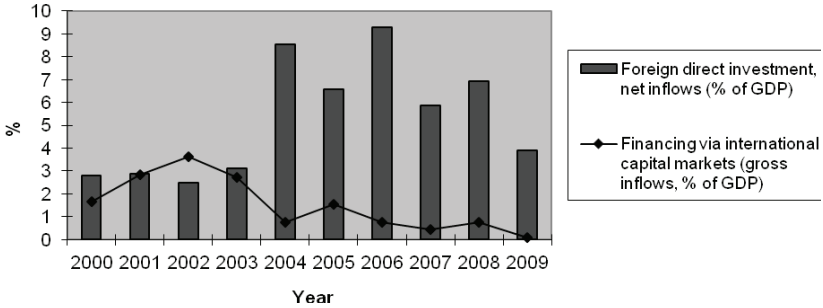
Figure 16: *Availability of capital Romania 2000-2009*




Source: World Databank, 2011.

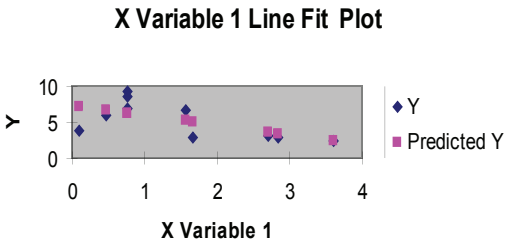
The presence of branch offices and representatives of various well-known international banks makes capital more easy to access in Romania, however we found that the total FDI inflow is related more to the financing via international capital markets (gross inflows, % of GDP) (R square 34%) than to the domestic credit to private sector (R square 13%) or domestic credit provided by banking sector (R square 5%). This relation is negative, meaning that the less the availability of the international financing, the more the FDI inflow is.

Figure 17: *FDI and financing through international capital market, Romania, 2000-2009*




Source: World Databank, 2011.

Figure 18: *Regression analyses of FDI inflow and financing through international capital market, Romania, 2000-2009*




Source: World Databank, 2011. Note: Adjusted R Square: 0.3461

*3.6 Government deficit, inflation and interest rates*

According to the Maastricht criteria the ratio of the annual government deficit to gross domestic product (GDP) must not exceed 3% at the end of the preceding fiscal year. If not, it is at least required to reach a level close to 3%. Only exceptional and temporary excesses would be granted for exceptional cases. Romania's government debt to GDP was around 8% in 2009.

The ratio of gross government debt to GDP must not exceed 60% at the end of the preceding fiscal year. Even if the target cannot be achieved due to the specific conditions, the ratio must have sufficiently diminished and must be approaching the reference value at a satisfactory pace. Romania's gross government debt was 30.5% in 2009. This is the only Maastricht criteria that the country fulfilled in 2009.

The Romanian domestic public debt is rising fast, but foreign-exchange reserve coverage is good, thus the country could be considered stable. The funding deal with multilateral agencies, worth US$27bn, means that according to the experts, Romania should not experience financing difficulties in 2010-11 (EIU 2010).

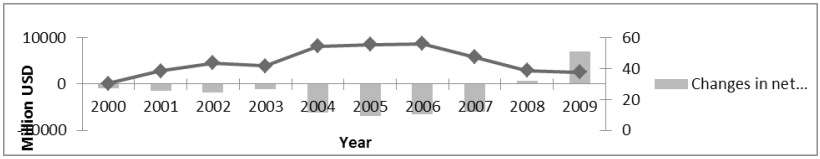
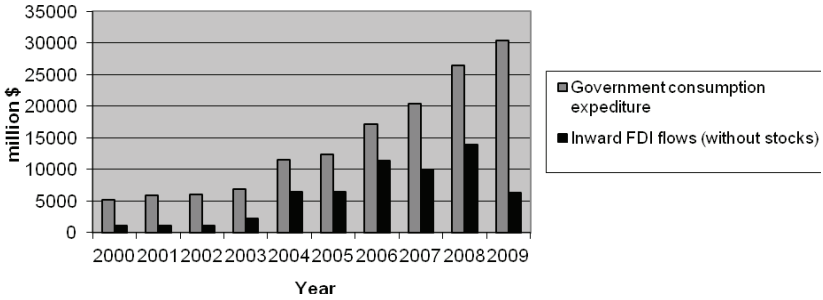



**Figure 19:** ***Reserves and debts***

Source: World Databank, 2010.

In 2010 Government revenues have significantly underperformed, as the economy is set to contract by a further 2% (after a 7% reduction in 2009), and will result in a larger than expected deficit. Financing requirements this year were met by support from the IMF, EU and World Bank as well as a new Eurobond issue and funding from domestic banks. In 2011 prospects look less certain as rising inflation and heightened global risk aversion will likely leave the government facing much higher external borrowing costs just as the IMF program expires (EDC 2010).

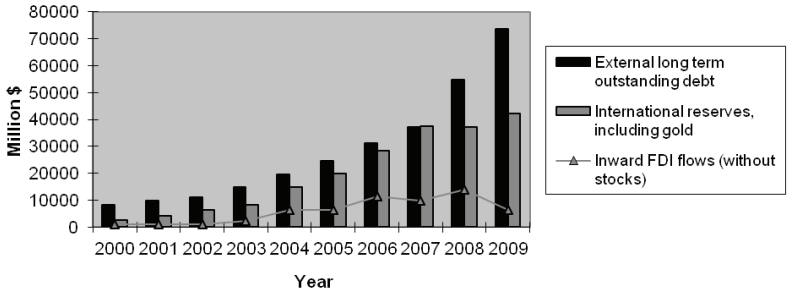
Figure 20: *FDI inflow and government spending Romania 2000-2009*




Source: World Databank, 2011.

Romania plans to adopt the Euro in 2015 but needs to fulfill the Maastricht criteria in order to sign the accession to the monetary union. The country's debt is expanding exponentially while its international reserves and FDI inflows remain constant which in a long run results in insolvency and high country risk.

Figure 21: *Long-term debt, International reserves and FDI in Romania*

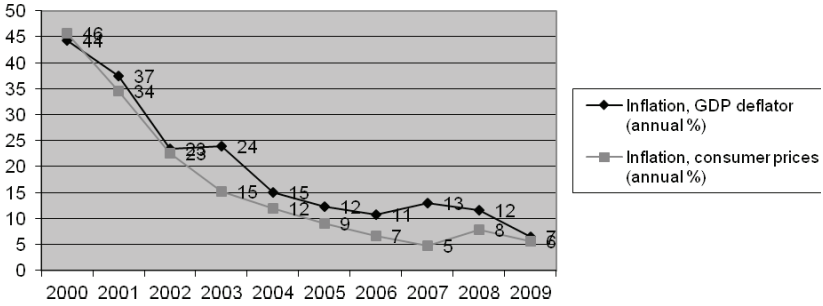



Source: World Databank, 2011.

One of the Romania's arduous problems is its current-account deficit: far more money has been pouring into the country than going out. An important inflow of banknotes are coming from the estimated 4 million of Romanian citizens - almost 25 percent of the total population – working in different foreign countries such as Italy, Spain, England, Germany,

France, Ireland and US, sending their earnings back to support family. But with those economies now struggling with the crises effect, many emigrants is expected to return home empty-handed (Zoltán Tibori-Szabó 2010).
The inadequate level of inflation was a huge concern of the country at the beginning of the 2000's. In order to meet the Maastricht (Euro convergence) criteria and get accession into the EU, the country was forced to control its inflation. The Maastricht criteria for inflation is no more than 1.5 percentage points higher than the average of the three best performing member states of the EU. With the 5-6% annual inflation rate Romania still does not fulfills the criteria (max 1%).

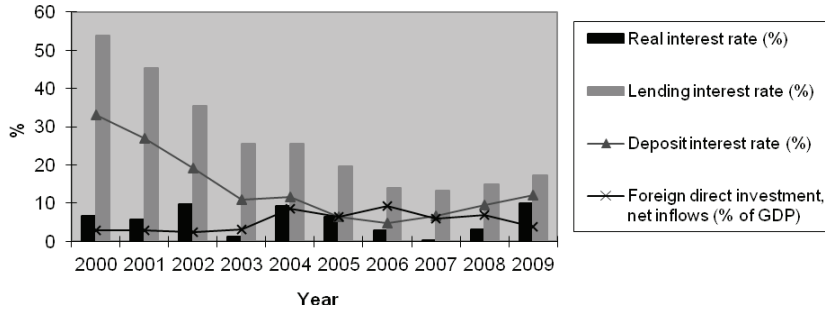
Figure 22: *Inflation in Romania 2000-2009*




Source: World Databank, 2011.

According to Maastricht criteria the nominal long-term interest rate must not be more than 2 percentage points higher than in the three lowest inflation member states (max 6%). Unfortunately there was just couple of years around the accession time, when Romanian could fulfill these criteria.
The growing interest rates 10% in 2009 could also hold back FDIs in Romania.

Figure 23: *Interest rates and FDI inflow in Romania, 2000-2009.*



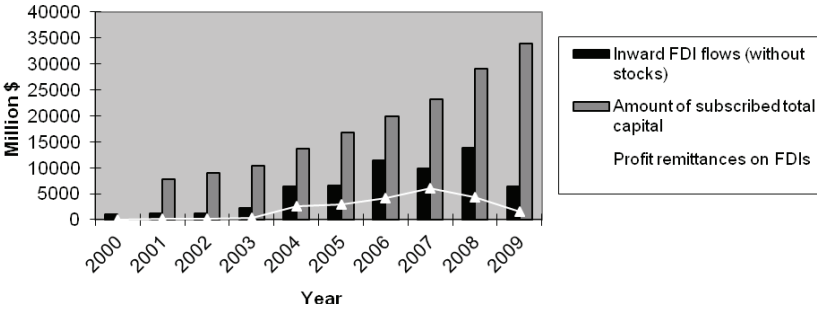

Source: World Databank, 2011.

Our data analysis shows that the level of real interest rates has no effect on the total FDI inflows (R square is 0.04). However the level of lending interest rates (R square 43%) and that of deposit interest rates (R square 49%) have a definite influence on the total FDI inflow. The relation between the two is negative, meaning that the higher the lending and deposit interest rates, the lower the FDI inflow is. The fact that the real interest rate has no effect at FDI could be explained by the fact that the real interest rate is not adjusted to the inflation and the deposit and lending rates are indirectly connected to the so called prime rate, both, however depend upon the strength or value of the collateral and the repaying ability of the borrowers (ratings) in large scale.

### *3.7 Profit repatriation*

According to Kearney (2010) the possibility of profit repatriation is the fifth major reason for FDI investment in South and Eastern Europe, this is a main reason for investment in Romania too. We found a decisive line fit plot of 80% R square, meaning that 80% variation of the FDI inflow could be explained by the changes in the profit remittances on total FDIs.

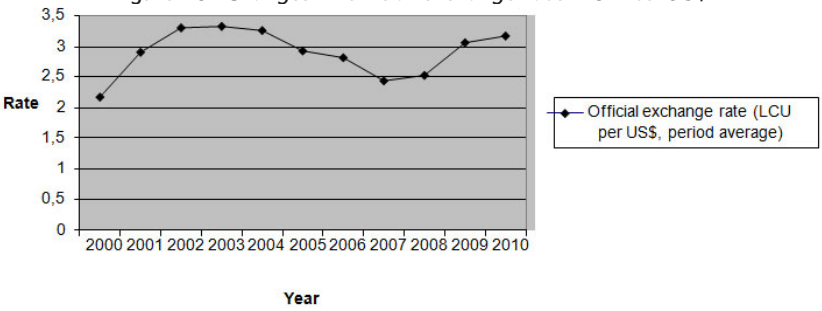
Figure 24: *FDI inflow, total subscribed capital and FDI profit remittances*




Source: World Databank, 2011.

Romania has a two-tier banking system: with the National Bank of Romania (BNR), which publishes an official reference exchange rate for LEU (RON - Romanian New Leu) on a daily basis and the Commercial Banking Companies. Commercial banks are entities which conduct business transactions mainly in the area of financing, investment and payment operations. Currently, the minimum share capital for setting up a bank is RON 37 million (approximately EUR 10 million). (ARIS, 2010) The national currency has a managed floating exchange rate regime against the single European currency, compatible with the inflation targeting policy currently promoted in Romania. The estimates of equilibrium exchange rates suggest that the LEU (the Romanian currency) is still overvalued, posing problems for competitiveness. Although the LEU steadied in the third quarter, it remains vulnerable to negative market sentiment. However rating agencies still consider the country stable regarding the exchange rate equilibrium (EIU, 2010).

Figure 25: *Changes in official exchange rate RON to US$*




Source: World Databank, 2011.

The LEU steadied in 2010, and seemed fairly resilient in the face of renewed euro zone turbulence, so that Romania's rating on currency risk has been upgraded to BB (EUI, 2011).
The exchange rate is often considered critical determinant of FDI. According to currency area hypothesis the weaker the currency of a country the less likely is that foreign firms will invest in that location because of the high exchange risk. Taking the official exchange rate as a dependent variable and the net FDI inflow as dependent one we found that there is no relation between the two (R square 0.003, P-value 0.87).

*3.8 GDP size and growth*

In Central and Eastern Europe is widely believed that the standard of living and prospects for economic growth that FDI brings, widely outweigh its disadvantages (Janicki and Wunnava, 2004 citing Barell and Holland 2000) as forces political and macroeconomic stability, and transparent legal regulations concerning foreign ownership and profit repatriation (Janicki and Wunnava, 2004 citing Resmini 2000).
However some argue that FDI is not a solution for jump-starting economic development in a transition country. Rather than foreign investments determining economic transformation, political and economic transformation motivates foreign companies to invest in that country (Bandelj, 2002; Egresi, 2008), meaning that the relation is working just in one way and no opposite. Economic and political stability are preconditions for significant foreign investment.

Furthermore, a study developed between 2000 and 2007 argues that the FDI growth in Romania was driven by the „unhealthy" economic development of the country, fostered by consumption, meanwhile the growing consumption in its place led to further increase in the FDI in a vicious circle. The analysis states that 1% increase in the FDI causes an increase of 3.5% in consumption meanwhile in the gross fixed capital formation (GFCF) just 0.98%. Furthermore 1% consumption growth leads to 0.66% increase in FDI in the following years and 1% increase in consumption leads to 0.53% increase in imports. Moreover 1% growth in imports generates destabilization of current account with 0.27% and 1% growth of current account deficit leads to 3.22% growth in FDI (Masca and Jude, 2009).

The GDP growth reached its highest level of 8.3% in 2006 according to the statistical office of the Romania, and 8.0% in 2007. Romania's Gross Domestic Product at purchasing power parity (PPP) is predicted to stand at $16,982.323 per capita in 2015, when the country is expected to join the Eurozone (IMF, 2010).

The economy is estimated to have contracted by 1.2% in 2010, after shrinking by 7.1% in 2009. Modest growth, of 1.2%, is expected in 2011, accelerating to an annual average of 4.5% in 2012-15. The current-account deficit is not expected to exceed 7% of GDP in 2011-15, after shrinking to an estimated 4.5% of GDP in 2010. The Economist Intelligence Unit forecasts a slow return to growth in 2011, when real GDP is expected to expand by 1.2%, following an estimated contraction of 1.2% in 2010. (EUI, 2011).

According to the growth hypothesis, a rapidly growing economy provides relatively better opportunities for making profits than one growing slowly or not growing at all (Chakrabarti, 2004; Kotabe, 2010; Janicki and Wunnava 2004). According the World Databank data the 78% of the FDI inflow could be explained by the variation of the GDP based on the purchasing parity.

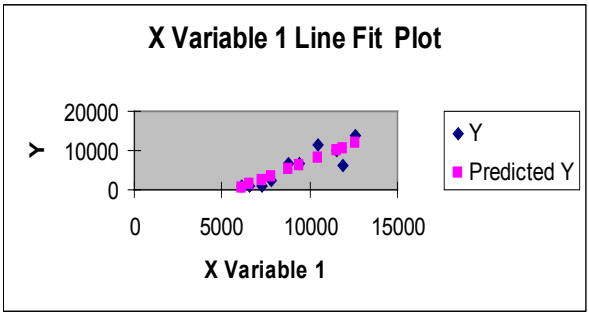
Table 4: *Regression analysis of GDP based on per capita PPP and FDI inflow*

| Adjusted R Square | 0,780797 | | | | |
|---|---|---|---|---|---|
| | *Df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1,56E+08 | 1,56E+08 | 33,05784 | 0,000429 |
| Residual | 8 | 37648321 | 4706040 | | |

| Total | 9 | 1,93E+08 | | | |
|---|---|---|---|---|---|
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* |
| Intercept | -10581,8 | 2964,389 | -3,56963 | 0,007298 | -17417,7 |
| X Variable 1 | 1,793935 | 0,312011 | 5,749595 | 0,000429 | 1,074437 |

Source: Author's calculations.

Figure 26: *Regression analysis of GDP based on per capita PPP and FDI inflow*




Source: World Databank, 2011.

The low competition due to the detriment of the technology used by the enterprises in Romania also makes this market attractive for the investors.

### 3. Features and characteristics of FDIs in Romania

The main foreign companies attracted by the Romanian market were specialized on the wholesale and retail trade (42.9%) sustaining the market size theory and the professional, scientific and technical activities (10.4%), that shows us that the country lacks this services although has quality education in sciences and technology.
An interesting development is that FDI have shifted from manufacturing to services in almost all regions (Kotabe, 2010). There is a raising interest towards the service sector as destination of FDI in Romania, however still the largest beneficiary of FDI stocks remain the industry with almost half of the inward investments in 2007. Other sectors with high potential of attracting FDI in the future are: transport equipment, fur-

niture, vehicles and spare parts and ship building (Hasegan, 2010). Despite clear signs that FDI is moving Romania up the value chain there is still room for catching up with other Central-European countries in terms of per capita stock and exports (Pauwels and Ionita, 2008).
Romania cached up rapidly with the development of networks of mobile telecommunications in GSM system, and broadband internet connection. It has developed industrial infrastructure including oil and petrochemicals. The country enjoys the presence of various well-known international banks and their branch offices or representatives. Furthermore offers extensive maritime and river navigation facilities, a newly developed highway infrastructure which is committed to improve to European standards (Popa, 2008).
The aggregate effect of the main variables on the FDI investments was measured by a multiple regression analysis. To measure the compound effect of the major variables that exercised individually a strong or significant effect on the FDI inflow we took the market size (expressed by size of the population), the labor cost (expressed by compensation of the employees), openness to trade, the profit remittances of the FDIs and the network effect (expressed by the migrant's remittances as independent variables and the total FDI inflow in Romania the dependent variable. I found a strong relation between the aggregate variables and the FDI investments in Romania (R square 0.76), meaning that 76% of the variation in the FDI inflow of the country could be explained by the changes in the population, level of employees' compensation, the openness to trade, the FDIs profit remittances and that of Romanian migrants. This is further confirming the hypothesis, stating that the foreign investments are attracted in Romania by its market size, the country's openness to trade, relatively low labor costs, easy profit repatriation possibilities and the personal networks facilitated by the migrants.

Table 5: *Multiple regression analysis of the market size, the labor cost, openness to trade, the profit remittances of the FDIs, the migrant's remittances and the total FDI inflow*

| *Regression Statistics* | | | | |
|---|---|---|---|---|
| Multiple R | 0,876398 | | | |
| R Square | 0,768073 | | | |

| | | | | |
|---|---|---|---|---|
| Adjusted R Square | -1,15963 | | | |
| Standard Error | 2,35054 | | | |
| Observations | 6 | | | |
| *Regression Statistics* | | | | |
| Adjusted R Square | -1,15963 | | | |
| ANOVA | | | | |
| | *Df* | *SS* | *MS* | *F* |
| Regression | 5 | 18,29732 | 3,659463 | 0,827927 |
| Residual | 1 | 5,525038 | 5,525038 | |
| Total | 6 | 23,82235 | | |
| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* |
| Intercept | 1959,86 | 1389,802 | 1,410172 | 0,392686 |
| 21929,92 | -0,08927 | 0,063451 | -1,40684 | 0,393397 |
| 197 | -0,00062 | 0,001622 | -0,38203 | 0,767687 |
| 143 | -0,00156 | 0,001203 | -1,29481 | 0,418661 |
| 6,17E+09 | -8,7E-10 | 6,75E-10 | -1,28513 | 0,420972 |
| 5,51E-08 | 0 | 0 | 65535 | #NUM! |
| RESIDUAL OUTPUT | | | | |
| Observation | Predicted 2,49647951247323 | Residuals | Standard Residuals | |
| 1 | 3,045487 | 0,05329 | 0,055533 | |
| 2 | 8,451708 | 0,083261 | 0,086766 | |
| 3 | 7,790565 | -1,2372 | -1,28928 | |
| 4 | 7,404226 | 1,885802 | 1,965187 | |
| 5 | 6,500642 | -0,63766 | -0,6645 | |
| 6 | 7,086531 | -0,1475 | -0,15371 | |

Source: Author's calculations.

## 4. Bottlenecks and the effect of crises on the foreign direct investments in Romania

The major bottleneck of the FDI in Romania is the political and macro-economic instability (Bitzenis, 2003 cited by Egresi, 2008) the lack of financial intermediaries (consultancy, credit institutes), the flourishing black economy (we should consider that for many households the black

economy is the only source of income), the corruption and low transparency in governmental decisions (Wallace and Latcheva, 2006).
Other obstacle is the high rate of outflow of labor, causing shortage and increase in labor cost in private sector (Pauwels abd Ionita 2008). Although they caused a major deficit in qualified workers, their wages sent back to their families represent a major financial boost for the economy, representing more than four billion Euro in 2007 (Welsh and Dragusin, 2009).
Besides the EU accession's positive effects, like the accession to larger markets, the adherence to EU regulations (for ex. environmental, labor protection) also reduced flexibility and caused additional costs not only to the investors but for all (Egresi, 2008).
The American Chamber of Commerce in Romania identified ten outstanding issue that should be tackle in order to became more attractive for FDI, such as the inflexible labor market, meaning, that the existing Labor Code tight strongly the hands of employer as it is difficult to hire and fire a person. Secondly the VAT refunds are long overdue, companies are supposed to pay the VAT immediately but they get the refund in months that cause financial hardship. The frequent time consuming and expensive tax audits by the fiscal authorities reduce the productivity and often result in arbitrary and unfair assessment of penalties levied against the subject company. Furthermore the legislation is not applied or enforced equally. Other problem was raised by the EU accession as the tariff barriers remain high for the US meanwhile the EU competitors was lowered. The intellectual property rights are still not enforced by law in the country and the high level of bureaucracy prevails. Obtaining all the authorizations to enable operational capability is still quite time consuming and expensive, particularly for the SMEs (Business Romania, 2004).
Masca and Jude (2009) argue that the current economic crisis could have positive effect on the FDI targeting Romania and the countries consumption in spite of the fact that some of those have contradictory effects. (1)Romania investors' strategies will be affected by the turbulences on the world financial market and will reduce FDI in Romania; (2) investors may be reoriented from developed markets confronted with recession towards countries less affected by the crisis, as Romania; (3) the restrictive credit policy now put into place in Romania discourages foreign investors. Furthermore the reduction of the population's income and the prudent credit policy of BNR (National Bank of Romania) and

commercial banks will discourage consumption in Romania. The two effects put together, that of FDI and consumption in crisis context will disengage the vicious circle, stopping from alimenting an unhealthy economic growth. In a paradoxical way, the crisis, by its effects, creates the premises for reconsidering the growth generating factors and the support for investment (domestic and foreign) as catalyst of economic progress in the long run (Masca and Jude, 2009).

Masca and Jude (2009) are opting for public policies that are (1) Reconsidering the factors generating economic growth; (2) Shifting from a consumption-led growth to a growth based on supply and gains of productivity; (3) Reversing the ratio Industry & Agriculture/Services in favor of the first, in order to sustain the supply by domestic investment and to promote a healthy economic growth; (4) Increase of net export and maintaining under control the current account deficit; (5) Promoting FDI that finance investment and not consumption, in order to contribute the growth of the aggregate supply and to a sustainable economic growth; (6) Attracting FDI in deficient sectors, as Industry and Agriculture; (7) Putting into place an active fiscal policy to restrict consumption and encourage investment (domestic and foreign) (Masca and Jude 2009).

Unfortunately the government decision in the summer 2010 to hike VAT to 24% from 16% sends a very unfortunate signal to foreign investors and it is likely to have negative impact on economy (Business Review, 2010).

**Acknowledgement**

Special thanks to Dr. Sylwia Starnawska, Assistant Professor at the Business Department of D'Youville College for her precious professional advice, coordination and support in developing this research.

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# CATCHMENT AREAS BEFORE AND AFTER THE IMPLEMENTATION OF THE SCHENGEN AGREEMENT IN THE HUNGARIAN-ROMANIAN BORDER REGION

Ferenc SZILÁGYI*

*Subsequent to the regime change and due to the start of the integration process, Central European state borders have been completely reinterpreted. While they formerly had a strongly marked dividing role, nowadays state borders are becoming virtual and those acting as barriers are continuously withering away. After the East-Central European states joined the Schengen area, a homogeneous economic area came into existence in this region as well.*

**Keywords:** catchment areas, border region, Schengen agreement, metropolitan area

**JEL codes:** A12, Q25

## Introduction

Subsequent to the regime change and due to the start of the integration process, Central European state borders have been completely reinterpreted. While they formerly had a strongly marked dividing role, nowadays state borders are becoming virtual and those acting as barriers are continuously withering away (Sallai, 2003). After the Central and Eastern European countries joined the Schengen area, a homogeneous economic area came into existence in this region as well. Nowadays, Hungary has already become a member of the Schengen area and against all political procrastination Romania's accession is also imminent. Thus, a certain kind of obliteration of this frontier zone is to be expected, although the negative example of the Slovak-Hungarian border proves the fact that entering the Schengen area by itself is not enough to do away with the dividing lines existing in people's head (Mezei, 2008). These lines can be strongly preserved by nationalistic, offensive policy even in an ethnically homogenous medium lacking geographical boundaries.

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With the homogenizing economic area urban hierarchy has also changed since the subjects under discussion are the urban systems of the neighbouring countries which have been mostly isolated so far, being touched by the breath of integration as well. As it is to be expected, a hierarchical relationship will develop between the settlements located on the different sides of the border. It is also necessary to link up national development plans (see the incompatibilities of the Hungarian National Spatial Plan and the law on Regional Development in Romania) since development in the border region in the previous sense may not necessarily be valid in the future. Both states and larger towns will have to show due regard for the territories located in their immediate vicinity but on the other side of the border. These redefined attraction zones may constitute the engine of the integration. Becoming aware of this and patterned after the New Széchenyi Plan in Hungary, the elaboration of the Mikó Imre Economic Development Plan has started in Transylvania, which is its quasi-extension and which, in compliance with the Wekerle Plan would constitute part of a unified development plan in the Carpathian Basin. In the Mikó Imre Plan Transylvania's strongly marked regions: Seklerland, Inner Transylvania and Partium complemented by Banat, are separately handled, since in all three of them both residents and economic actors encounter area-specific realities. Thus, there is a need for different strategies (Mikó Imre Plan, 2011). The Partium strategy is based on the border location, trying to turn previous disadvantages into advantages. Within such a transforming system the transformation of the catchment area is a crucial question both for the two neighbouring states and the eight county seats of the state border region. A considerable part of the border implies the possibility of changing from periphery into centre region, thus the reinterpretation of this area will transform the urban hierarchical system and the spatial structure of the two states as well.

The emergence of an integrated, cross-border metropolitan area is most likely in the case of the two large cities, Debrecen and Nagyvárad, being contiguous with each other in the middle section of the state border (Süli-Zakar, 2010). However, besides their cooperation actions, they are each other's main rivals at the same time, since both of them carry the chance of becoming the regional centre of the north-eastern part of the Carpathian basin, which has several economic, infrastructural and national political aspects.

The object of my research is the Hungarian and Romanian state border, which came into existence as a result of the Treaty of Trianon and came into effect on 26th July 1921 (Act XXXIII of 1921). In the course of marking the borders no administrative, historical, ethnic, ethnographic borderlines of any kind were taken into account. The state border traverses several former counties, districts, settlements or communal peripheries (Figure 1).

Figure 1: *Catchment areas*


Source: google.com.

It can be regarded as a strategic, infrastructure-based border demarcation of common knowledge, which follows the Timișoara-Satu Mare-Halmeu railway line along the eastern Hungarian market line and west of it provides Romania with a defence line of variable width (1-30 km)[1] (Palotás, 1990).

Previously tightly knit areas were split in two, such as Torontál, Csanád, Arad, Bihar, Szatmár and Ugocsa counties, the area of several communes, leaving in many cases inhabited or unpopulated outskirts on either side of the border[2] (Szilágyi, 2009).
This is a distinctly artificial border, since the 434 km state border traverses the area of the Tisza Plain, where there are no sharp regional obstacles. Its lowest point along the River Mureș is 75 m and its highest one is 155 m, measured on the sand dunes of the Nyírség region. Thus, on its full length the maximum altimetric difference is of only 80 m. No more than the 25 km of the frontier section along the River Mureș can be accepted as a natural border, which constitutes 6% of the entire state border. The constant physical-geographic character of the frontier zone is strengthened by the fact that we can talk about a bisection not only when interpreting the Tisza Plain as an integral whole, but its components are also divided one by one: Someș Plain, Crasna Plain, Ecsed Moorland, Érmellék and Nyírség areas, Crișurilor Plain (and its parts: Bihar Plain, Crișul Repede basin, Salonta Plain), Mureș Plain; Arad Plain and Torontal Plain belonging to it as well (Hajdú-Moharos 2007).

In so far as trying to identify bygone administrative borders along the Trianon border, in particular we can find lower level district borders on the present-day borderline or in its immediate vicinity, mainly in the southern part of the border zone. This constitutes one-third, i.e. 156 kilometres of its total length. The state border partially coincides with the ethnic border before Trianon along the southern border zone as well, although it did not explicitly form a language boundary here either or only a rugged one (Palotás, 1990). The division into southern and northern sections of the border zone along the route Salonta-Kötegyán is justified because, while the southern part has continuously existed since Trianon, after the second treaty of Vienna, between 30th August 1940 and 20th January 1945 the northern part did not exist at all, definitely regaining its border function only after the Treaty of Paris (Zeidler, 2003).

Despite its artificial character, it was considered difficult to traverse. After Trianon several railway lines were closed and torn up. During the decades of planned economy, it was regarded as the most strictly guarded border section within the socialist block as well. In those decades only three road (Csengersima-Petea, Ártánd-Borș, Nagylak-Nădlac) and three railway border crossing points (Ártánd-Episcopia Bihor, Lökösháza-Curtici, Valea lui Mihai-Nyírábrány) with heavy traffic were in use, road border crossing often taking even 6-10 hours. Subsequent to the regime change the number of road border crossing points grew to 11 and that of railway crossing points to 5 (Table 1). However, after opening of the Schengen borders several new roads of local interest and two-five bygone railway connections will be possible to restore.

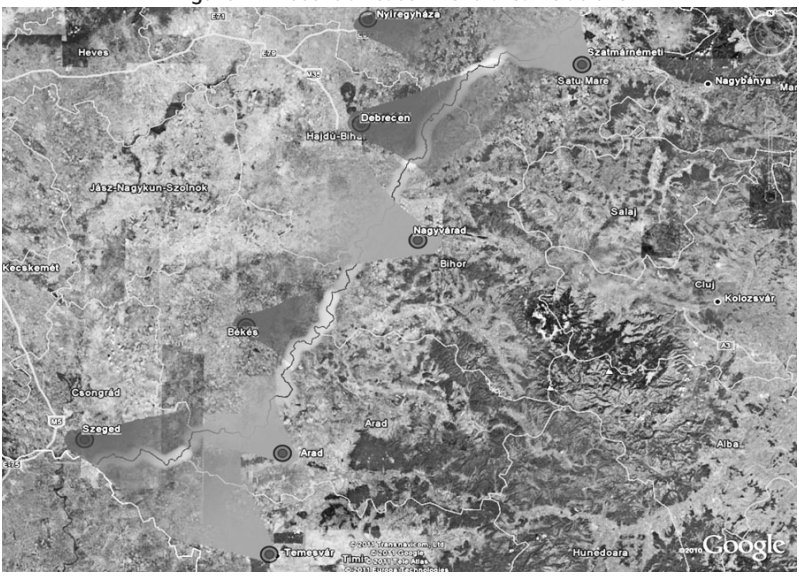
Table 1: *Crossing points on the Hungarian-Romanian border in 2012*

| No. | On the Hungarian side | On the Romanian side | Type |
|---|---|---|---|
| 1. | Kiszombor | Cenad | public road |
| 2. | Nagylak | Nădlac | public road |
| 3. | Battonya | Turnu | public road |
| 4. | Lőkösháza | Curtici | railway |
| 5. | Gyula | Vărșand | public road |
| 6. | Méhkerék | Salonta | public road, railway |
| 7. | Biharkeresztes | Oradea | railway |
| 8. | Ártánd | Borș | public road |
| 9. | Létavértes | Săcuieni-Bihor | public road |
| 10. | Nyírábrány | Valea lui Mihai | public road, railway |
| 11. | Vállaj | Urziceni | public road |
| 12. | Mérk | Berveni | railway |
| 13. | Csengersima | Petea | public road |

Source: http://vam.gov.hu, http://www.politiadefrontiera.ro/

When drawing the state borders, relations within the catchment area of the epoch were also left out of consideration, six of the eight seats of the border counties being located in the immediate vicinity of the state border (at less than 30 km distance). Thus, for example, Szeged (lying at a distance of 15 km from the state border) has deeply influenced the area of Banat and in particular Torontal County. Similarly, Arad (18 km) polarized part of Csanád and even Békés County. The catchment area of Békéscsaba (20 km) and in particular that of Gyula (5 km), the county seat of that time, has expanded over part of Arad and Bihar county. The catchment area of Oradea (11 km) included almost the whole of Bihar that remained with Hungary, that of Satu Mare (10 km) remained restricted to the three districts of Szatmár County, that remained with Hungary as well, while Debrecen (28 km) controlled its traditional catchment area, the Érmellék (Szilágyi, 2011). These meant the loss of catchment areas having a population of 50,000-150,000 people, varying from case to case. These historical catchment areas can nowadays be referred to as potential catchment areas; even if transformed, they can come into existence again.

Figure 2: *Potential catchment area relations*




Source: google.com.

By drawing the Trianon borders the most significant settlements of the eastern Hungarian market line passed to the Romanian side (Figure 2). Three of these (Timişoara, Arad and Oradea) had been the highest level of the urban hierarchy in the Kingdom of Hungary, while Satu Mare had been a third-rate town (Beluszky, 2003).

Thus large non-urbanised areas came into being on the Hungarian side, primarily in the truncated counties of Szatmár and Bihar. In fact, the main cause of the development and urbanisation of Békéscsaba was the loss of the great eastern centres. At the same time, the other stop-gap urban supplementation attempts, the development of „supplementary county seats" such as Mátészalka and Berettyóújfalu failed, these settlements having no hope of retaining their status in the long run (Hajdú, 2005). Even some of the settlements which had already enjoyed similar status started to stagnate as well (Gyula, Makó, Hódmezővásárhely). On the Hungarian side the leading roles were taken up by Szeged and Debrecen, both of regional significance, while in the north the gap was filled by the quick development of Nyíregyháza. Particularly Debrecen and Nyíregyháza are not exactly border settlements, and this is in part the reason why the border area assigned to them found itself in a peripheral status on multiple levels. These are to this day the most underdeveloped regions of Hungary (Süli-Zakar, 1992). These micro-regions present the lowest standard of living, highest unemployment rate, and a high proportion of ethnic Roma and unprivileged social classes. After 1990 the need for cooperation between the towns on the opposite sides of the border arose (Nyíregyháza-Satu Mare, Debrecen-Oradea, (Békéscsaba-)Gyula-Arad, Szeged-Timişoara). Sister town contacts were established, and euro-regional initiatives were taken. Perhaps the most far-reaching of these has been the cooperation between Debrecen and Oradea, which gave rise to the plan of forming a common metropolitan area, DEBORA (Hungarian Development Plan, 2011). The implementation is being hindered by countless difficulties, such as the problems of the many-fold marginal state of the border area, local specific social issues or the Roma-question which is looming up like a social iron curtain on both sides of the border (Szilágyi, 2010).

The evolution of the hierarchical relationship among the eight county seats may develop in an interesting way in the future, as four of them (Debrecen and Szeged on the Hungarian, Timișoara and Oradea on the Romanian side) are fit to play and have ambitions towards a regional role. In all eight cases, the immediate catchment area may change and become international. It is still uncertain which of these towns can take the initiative, or whether they will support or hinder each other, or which regions will they become primary centres of. What role the ever more porous state border or the linguistic border will play in this ambition or what paths the economic lines of force will take is still an open question.

**Nyíregyháza** (117,852 inhabitants – KSH, 2011), seat of Szabolcs-Szatmár-Bereg county (5,936 km$^2$ and 555,496 inhabitants) is situated in the western part of the county, at a distance of 42 km from the Slovakian, 47 km from the Romanian and 57 km from the Ukrainian border as the crow flies. It has been a county seat since 1867, first as the seat of Szabolcs county, then after Trianon that of Szabolcs-Ung (Révai, 1935), and is currently the centre of Szabolcs-Szatmár-Bereg county. With the fading of national borders it is possible that the eastern micro-regions of the county, primarily those of Csenger and Fehérgyarmat along with part of the Mátészalka micro-region may slip out of its direct catchment area, though it is also true that three micro regions of Zemplén County (Bodrogköz, Sátoraljaújhely and Sárospatak) are still partially under its influence. 440,000 people will surely remain in its catchment area, and it may become the centre of a region with a population of 628,000 (the full county and the micro-regions of Zemplén). It can also strengthen its central commercial role towards Transcarpathia.

**Debrecen** (208,016 inhabitants), is the number one centre of the Tiszántúl region. It is the second largest city of Hungary and it is a regional centre in its own right. It is the seat of Hajdú-Bihar County (6,211 km$^2$ and 539.674 inhabitants). From 1867 it had been the seat of Hajdú County (Hajdú, 2005) and became that of Hajdú-Bihar in 1950. Its immediate urban catchment area includes the county itself, but due to the withering away of borders it will lose ground (in most of the Berettyóújfalu micro-region) to Oradea. It can compensate for this in the east, toward the Érmellék, in the area of Săcuieni-Marghita-Tășnad-Carei (Székelyhíd-Margitta-Tasnád-Nagykároly), where it can gain a catchment area with a

population of around 100,000 (Szilágyi, 2011). Thus, the population of the possible catchment area may exceed 600,000. As a regional centre it can play the dominant role in the whole area of Hajdú-Bihar County, in Szabolcs-Szatmár-Bereg, in Satu Mare County in Romania, in Jász-Nagykun-Szolnok and Békés County, in the north of Bihor County in Romania, in the western part of Sălaj County and even in Maramureș County to a smaller degree, as well as in Transcarpathia.

**Békéscsaba** (64,074 inhabitants), has been the seat of Békés county (5,630 km$^2$ and 361,802 inhabitants) since 1950. It is the smallest county seat in the border region, and it used to be one of the largest villages on the continent (Beluszki, 2003). Békés County as a whole can only be viewed as its catchment area with certain reserve, only the micro-regions of Békéscsaba, Békés, Szarvas and Gyula being unarguably within its reach (212,000 inhabitants). The effects of Oradea can be felt in the micro-region of Sarkad, while in the micro-region of Szeghalom that of Debrecen and Oradea, in the Orosháza micro-region that of Szeged, and in the micro-region of Mezőkovácsi the influence of Szeged and Arad is also present. This attracting force may not extend beyond the county limits in the case of Békéscsaba, but it does so in the case of Gyula, reaching a few north-western settlements of Arad County.

**Szeged** (170,285 inhabitants), is interestingly the most recent county seat on the Hungarian side, having only been the seat of Csongrád county (4,263 km$^2$ and 421,827 inhabitants) since 1962 (Hajdú, 2005). By population it is the third largest city in modern-day Hungary, a regional centre in its own right, which projects its influence beyond the county limits, partially covering the micro regions of Orosháza and Mezőkovácsháza in Békés county, Bácsalmás and Kiskunhalas in Bács-Kiskun county along with the northwestern corner of Timiș county. Its immediate catchment area thus includes a population of about 650,000. As a regional centre it may also have an influence on the northern part of Vojvodina.

**Satu Mare** (97,753 inhabitants[3]), is the northernmost and smallest county seat on the Romanian side. It has only played this role since the redrawing of county boundaries in 1968 and the re-establishment of Satu Mare County (4,418 km$^2$ and 336,117 inhabitants). Its catchment area still only covers part of the county, as the influence of Baia Mare in the

east and of Zalău and Baia Mare in the southern part of the county can also be felt. Due to the withering away of borders the influence of Debrecen may also show in the southwest (to the Carei-Tășnad line), but in turn it can acquire a large hinterland in the micro-regions of Szabolcs-Szatmár-Bereg county (Csenger, Fehérgyarmat, Mátészalka). If these changes occur, 300,000 people will live in the closer- and 420,000 in the broader catchment area of Satu Mare.

**Oradea** (184,861 inhabitants), is the centre of Bihor (7,544 km$^2$ and 558,613 inhabitants) and Partium, being the second level regional centre of western Romania. Its current catchment area includes Bihor county and the western part of Sălaj. With the disappearence of the border, the urban catchment area may extend toward the southwest onto the Berttyóújfalu region of Hajdú-Bihar and the Sarkad region of Békés County, while losing ground in the north in the region of Érmellék and Sălaj (Szilágyi, 2011). This process can be moderated by the construction of the North-Transylvanian Motorway. Its immediate catchment area has a population of 600,000-700,000. It may aspire to a regional role in which it may be the main competition or complement to Debrecen. As a regional centre it radiates beyond Bihor towards the south of Hajdú-Bihar, the north of Békés and Arad and the western part of Sălaj and Satu Mare counties.

**Arad** (144,484 inhabitants), is the traditional centre of the eponymous (7,754 km$^2$ and 412,235 inhabitants). It used to be a rival to Szeged and Timișoara, at present being more of a complementary to the latter. Its immediate catchment area covers Arad County and may partially extend to the Mezőkovácsházi micro-region of Békés County in the future. It may cede a few townships to the Gyula-Békéscsaba conurbation area. Thus, there is little change to be expected, as the hinterland will admit a population of about 400,000-450,000.

**Timișoara** (301,761 inhabitants), is the seat of Timiș county (8,697 km$^2$ and 654,773 inhabitants) and at the same time the centre of the Western Region of Romania, a regional city in its own right, which exerts a draw beyond county limits upon Arad, Caraș-Severin and part of Hunedoara County. With the accession of Serbia to the European Union Timișoara may regain this status in the Serbian part of the Banat region as well (its linear distance from the Serbian border is 32 km), thus

possibly becoming the centre of a region with almost 2,000,000 inhabitants. Its distance from the Hungarian border is more significant (64 km as the crow flies), so the north-western settlements of Timiș County may be drawn away by the influence of Szeged. The immediate urban catchment area of Timișoara includes a population of 700,000 people.

## Notes

[1] It is widest in the neighbourhood of Arad, where the linguistic border was taken into account in favour of Romania, and narrowest around Șilindru where the border was drawn right next to the railway line.

[2] The most well-known examples are the division of Nagylak and the case of Salonta, where the areas that had remained within Hungary formed the parish of Újszalonta.

[3] Data sources on population in Romania are retrieved from the database of the National Institute of Statistics (Institutul Național de Statistică) published in 2011, before the national census of 31st October 2011: Situation of homes and population by county and locality until the end of 31st October 2011, www.recensamantromania.ro/wp-content/uploads/2011/11/Situatia-locuintelor-si-persoanelor-recenzate-pana-la-sfarsitul-zilei-de-31-Octombrie-2011.doc

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# THE IMPACT OF THE ECONOMIC CRISIS AND THE EXCHANGE RATE CHANGES ON THE TOURISM OF THE BALTIC STATES

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*The aim of the paper is to study the effects of the global economic crisis on the tourism of the Baltic States. The research focuses on the changes in the incoming and outgoing traffic, taking into account the changes in the exchange rate of the euro as well. The result of the research is a short and a mid term forecast about the possible future trends in the above mentioned sectors. As a result of the research we can determine that while in Estonia an increase could be observed in the course of 2011 in both sectors, in Latvia and Lithuania the fluctuation of the euro exchange rate had a rather erratic effect on the incoming and outgoing tourism sectors.*

**Keywords:** global economic crisis, Estonian tourism, Latvian incoming tourism, Lithuania outgoing tourism, exchange rate of the euroe
**JEL codes:** R11, R12, Y 90, Y91

## 1. The Baltic States and the Global Crisis

The financial crisis unfolding in the global economy and as its result, the ever deepening economic crisis had a fundamental impact on the economies of the three small Baltic States (Estonia, Lithuania and Latvia). The most important characteristic of the development curve of the three Baltic States in the last decades is that after getting over the crisis of the 90s, they managed to achieve a remarkable growth after 2000, which only increased after they joined the EU in 2004 (Rosenberg, 2009). This is partly due to the independence process and partly to the events taking place in the world economy (Vida, 2006; Tury and Vida, 2007, Vida 2008).

### *1.1. The Economical Situation of Lithuania, Latvia and Estonia before the Crisis.*

Starting from a relatively low level of economic development, Lithuania, Latvia and Estonia managed to achieve an increasing economic growth after their joining of the EU in 2004, as compared to both the other member states of the European Union and the general trends in the World Economy as well (*Table 1*).

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Table 1: *The economic growth rates*

| | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|
| Estonia | 5.9 | 10.2 | 11.2 | 7.1 |
| Latvia | 8.5 | 10.6 | 12.2 | 10.3 |
| Lithuania | 6.7 | 7.9 | 7.7 | 7.8 |

Source: Eurostat

There are several factors behind the outstanding GDP growth that faltered only for a year or two in case of some of the countries. The outstandingly high level of home consumption had been the defining driving force for all three countries. Privatization and the capital inflow from greenfield investments acted as additional impulses encouraging economic growth. The level of these has increased spectacularly first in Estonia and then in Lithuania, however during 2006–2007 Latvia has closed the gap as well. Beside the inflow of working capital, the presence of *financial capital,* – which plays a fundamental role in the expansion of home consumption – had *increased* significantly as well. This capital had its source mostly in the Scandinavian countries, first of all in Sweden and Denmark and to a smaller extent in Norway and Finland. The demand fuelled by the opening and expanding markets has also significantly contributed to the economic growth. In all three countries the fast paced and for several years ongoing GDP growth has contributed to the first slow, but later significantly faster increase in inflation. In the case of all three countries, the rocketing inflation has delayed the date of joining the Euro zone by several years (Barysch, 2009).

Despite improving tendencies, in all three countries, but mostly in Lithuania and Latvia the level of economic activity as compared to the European average has stayed relatively low. In spite of the growing consumption, the level of home savings has turned out extremely unfavourably (the consumption was fuelled by the favourable external credit opportunities). The growth of productivity lagged far behind the increase of wages: between 2006 and 2007 the approximately 20% increase in real wages had been accompanied by a 6-7% growth in productivity.

In all three countries, the factors contributing to the growth were the ever increasing deficit of the foreign trade balance and current balance of payment. The later amounted to 17.7% of the Estonian, 13.0% of the Latvian and 14.0% of the Lithuanian GDP in 2007. The embedded

state of the foreign trade in the three states, considering the trade structure and the relational distribution, heralded future weaknesses. On the one hand, the Latvian and Lithuanian export was dominated by low added value products and the sales prospects of these mostly raw material based export look particularly grim due to the recession of the processing industry that characterized the market. On the other hand, one of the most important driving forces of trade growth in case of all three Baltic States was the turnover between the three states themselves, which presented a huge problem due to the near simultaneous decline of the near concurrently moving markets.

*1.2. The Effects of the Crisis on the Economies of the Baltic States*

The events of 2008 had a spectacular and negative impact on all three Baltic States. In *Lithuania* the GDP managed to climb by 5% in the first quarter, however it stagnated in the next quarter and fell by 4.8% in the last three months. In *Latvia* the first quarter brought a GDP increase of 3.6%, but in the next one the GDP stagnated, the third quarter brought relapse of 4.6% followed by a decline of 10.5 % in the fourth.
In *Estonia* the first quarter of 2008 brought a decrease of 0.5% followed by 0.9% which further deteriorated to 3-4% in the last six months.
This is an unprecedented and dramatic relapse compared to the approximately 10% or even higher increase of the previous two-three years. The factual data of the first quarter of 2009: In the first three months of the year, the GDP decreased by *10.9% in Lithuania, 18.6% in Latvia and 15.6% in Estonia* compared to the first quarter of the previous year.

Table 2: *The Evolution of the Main Economic Indicators (2007-2010)*

| | Estonia | Latvia | Lithuania |
|---|---|---|---|
| GDP real increase rate in % | | | |
| 2007 | 7.1 | 10.3 | 8.8 |
| 2008 | **-3.6** | **-4.6** | **3.1** |
| 1009 | -13.9 | -18.0 | -14.8 |
| 2010 | **3.1** | -0.3 | **1.3** |
| Inflation rate in %-(consumer prices) | | | |
| 2008 | 10.4 | 15.3 | 10.9 |
| 2009 | -0.1 | 3.5 | 4.5 |

| | | | |
|---|---|---|---|
| 2010 | 2.4 | -1.2 | 0.9 |
| **Unemployment rate %** | | | |
| 2007 | 4.7 | 5.7 | 3.7 |
| 2008 | 5.5 | 5.3 | 5.8 |
| 2009 | 13.8 | **17.1** | 13.7 |
| 2010 | **17.5** | 14.3 | **17.9** |

Source: Eurostat

Concurrently to the fall of the economy the unemployment rate began to sore as well. In 2009 the unemployment rate was 13.8% in Lithuania, 15.7% in Latvia and 11.3% in Estonia. A significant increase of *inflation* could be felt as early as 2008 and in 2009 the recorded inflation was *3.6% in Lithuania, 4.6% in Latvia and 0.6% in Estonia.* A significant narrowing down of credit opportunities, extreme difficulties in financing of the balance of payment deficits and an increase of debts amongst the populace in foreign currencies could be observed in all three states from the second half of 2008 (Table 2).*Economical Factors Influencing the Tourism Industry*

The main factors influencing the operating of the tourism industry include wages, household expenses and the trends in consumer prices. The changes in these factors define the trends in the discretionary income of the households, which in turn defines the amount of freely distributable income that can be and that is actually spent on tourism.

Table 3: *Monthly average wages (2004-2010)*

| Years | Estonia | | Latvia | | Lithuania | |
|---|---|---|---|---|---|---|
| | EUR | % (previous year) | EUR | % (previous year) | EUR | % (previous year) |
| 2004 | 498 | - | 320 | - | 345 | - |
| 2005 | 550 | 110,4 | 387 | 120,9 | 387 | 112,1 |
| 2006 | 672 | 122,1 | 500 | 129,2 | 473 | 122,2 |
| 2007 | 724 | **107,7** | 566 | **113,2** | 522 | **110,3** |
| 2008 | 825 | 113,9 | 682 | 120,5 | 623 | 119,3 |
| 2009 | 784 | **95,0** | 656 | **96,2** | 595 | **95,5** |
| 2010 | 792 | **101,0** | 633 | 96,5 | 576 | 96,8 |

Source: Eurostat

In the period between 2004 and 2008 the average monthly wages increased in all three Baltic States. In 2007 a small decrease could be observed which was followed by a huge relapse due to the effects of the economic crisis: The decrease was 18.9% in Estonia, 24.3% in Latvia and 23.8% in Lithuania compared to data from 2008. 2010 brought about a small increase, mostly in Estonia with 6% but in the two other Baltic States this value remained under 1% compared to the previous year. (*Table 3*)
In the first quarter of 2011 the average wages increased by 4.2% in Estonia, 3.9% in Latvia and 1.7% in Lithuania compared to the same period of 2010. In the second quarter the increase was 8.2% in Estonia, 5.5% in Latvia and 2.5% In Lithuania compared to the same period of the previous year.

Table 4: *Changes of the Consumer Price Index Compared to the Previous Year*

| Year | Estonia | Latvia | Lithuania |
|---|---|---|---|
| **2008** | 10.4 | 15.4 | 10.9 |
| **2009** | -0.1 | 3.5 | -10.6 |
| **2010** | 3.0 | -1.1 | -4.3 |

Source: Eurostat

In 2010 the monthly household expenses per capita in Estonia were 265 Euros, showing a 11.6% increase compared to 2009. The monthly expenses per capita amounted to 178.01 Euros in Lithuania, 9.65% higher than in 2009. In Latvia this data is 196.2 Euros, 12.35% higher than in 2009.

Table 5: *Exchange Rates in Estonia, Latvia and Lithuania (2006-2010)*

| Country/currency | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Estonia – Estonian kroon (EEK)/US dollar | **12.473** | 11.535 | **10.700** | 11.230 | **11.800** |
| Latvia – Latvian lats ((LVL)/US dollar | **0.5422** | 0.5056 | **0.4701** | 0.5056 | **0.5422** |
| Lithuania – Litas (LTL)/US dollar | **2.7498** | 2.5362 | **2.3251** | 2.4787 | 2.6637 |

Source: economywatch.com

The offering price of touristic products is defined by the trends of the exchange rates. The primary defining factors of the price of touristic products are the trends of currency and foreign currency exchange rates. In case of inbound traffic, the sum of the touristic products incurred expenses is calculated in HUF, however the offering price is given in EUR or USD. The price of travel destinations received in HUF has to be exchanged to a foreign currency based on the daily foreign currency purchase exchange rate of the accounting bank of the travel agency. In the case of outbound traffic the base expenses given by the partners and service providers are always in EUR or USD. The base expenses have to be exchanged to the currency of the give country according to the current foreign currency selling rate, based on the exchange rates of the tourist office's accounting bank. In case of tours in annual or even longer term program brochures, the prices are determined according to an estimated exchange rate, different from the daily exchange rate, so that the travel agency can at least partially eliminate the inevitable price increase due to exchange rate changes.

## 2. Trends in the Tourism of the Baltic States

The tourism of the Baltic States shows varying tendencies in the period of 2005-2010. This variability differs according to the countries and industry branches we inspect, depending on whether the economies of the given country and the factors influencing the tourism industry took a positive or negative turn.

In the tourism industry of Estonia (Table 6) the incoming sector suffered the most from the effects of the 2008 economic crisis. Compared to 2005, the number of tourist arriving in Estonia decreased by 30.9%. Despite this quite significant decrease in numbers, the nights spent per capita still hovered around 3 and 7 nights. Compared to 2008 the increase of incoming tourist traffic was 7.6%, however the number of nights spent decreased to 1-3 per capita, and the income from ingoing traffic dropped by 10%.
In the outgoing tourist traffic every second year shows positive trends.

Table 6: *The Tourist Traffic of Estonia (2005-2010)*

| Years | Incoming traffic (1,000 person) | Change (%) | Income (mill. USD) | Outgoing traffic (1,000 person) | Change (%) |
|---|---|---|---|---|---|
| 2005 | 389 | 100 | | 455 | 100 |
| 2006 | 287 | 73,7 | | 477 | 104,8 |
| 2007 | 285 | 99,3 | | 516 | 108,1 |
| 2008 | 197 | 69,1 | 1,189 | 542 | 105,0 |
| 2009 | 190 | 96,4 | 1,090 | 486 | 89,6 |
| 2010 | 212 | 111,5 | 1,071 | 452 | 93,0 |

Source: Own calculation base on UNWTO and EESTI data.

In 2010, 1.56 million1 foreign tourists stayed overnight at the accommodation establishments of Estonia. Their number increased by 13% or by 183,412 compared with 2009. The number of nights spent was 3.2 million (+17% compared with 2009). This means an all-time record. Foreign overnights exceeded the pre-crisis level (i.e. 2008) by as much as 9% and the previous record level (from 2006) by 6%. Monthly figures show that in January, July, August and December, the number of foreign overnights exceeded considerably the results of all the previous years, whereas the results of other months just reached again the pre-crisis level.

As the number of overnights increased more than arrivals, the average length of stay also increased slightly. Overnights on holiday trips increased by 21%, overnights on business trips by 12% and overnights on other trips by 8%. In absolute figures, the biggest increase occurred in holiday tourism (which accounts for the biggest share of foreign overnights – about 2/3). Both holiday and business trips were slightly longer than in 2009. However, the growth in arrivals and overnights was achieved with lower prices: while all overnights (domestic + foreign) increased by 14%, the sales of accommodation services increased by 8.7%.

The majority of the priority target markets showed an increase. In absolute figures, the two biggest target markets (Finland and Russia) accounted for the majority of the increase. With 1.66 million overnights in 2010, tourism from the biggest market Finland reached the level of the all-time-record achieved in 2004. In 2010, Finnish arrivals at accommodation establishments increased by 11% and their overnights by 17.5%. The majority of the growth occurred in Tallinn where their overnights exceeded substantially the previous record level. In Tallinn,

the length of stay of the Finnish people showed a good increase (with the number of Finnish tourists increasing by 11% but their overnights increasing by as much as 23%). Finnish overnights increased substantially also in West Estonia. Both in absolute figures and in relative terms, their overnights increased somewhat more in spa hotels than in other accommodation establishments. Tourism from Finland has been boosted by a combination of several factors: marketing activities by the public and the private sector, new tourist attractions, as well as the general growth trend in Finnish outbound travel. Arrivals and overnights of Russian tourists reached a new peak in 2010 when 142,000 Russian tourists spent 330,000 overnights at accommodation establishments (arrivals increased by 51% and overnights by 49% compared with 2009). It has to be remembered that Russia was one of the very few growth markets also in 2009, thus such a growth rate is especially noteworthy. Their number increased substantially throughout the year. The majority of the growth occurred in their most popular destination Tallinn but also their overnights in many other destinations increased substantially. Their overnights increased somewhat faster in spa hotels than in other accommodation establishments. In 2010, 1/3 of their overnights were spent at spa hotels (a year ago this figure was 27.5%). In 2010, Russian outbound tourism increased considerably, benefitting a big number of European destinations. Several positive factors influenced also tourism from Russia to Estonia: increasing popularity of Estonia as a New Year trip destination for Russians, lowering of the minimum sum for purchases eligible for a VAT refund (for non-EU travellers), active marketing by the public and the private sector, some additional transport connections. European Figure Skating Championships in January and various smaller events and conferences also helped (Table 7).

Table 7: *The Main Touristic Indicators of Lithuania (2005-2010)*

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2010/2008 |
|---|---|---|---|---|---|---|---|
| Number of incoming tourists (1,000 person) | 136,4 | 123,7 | 109,9 | 101,8 | 77,0 | 83,4 | |
| Change in % | 100 | 90,7 | 88,8 | 92,6 | 75,6 | 108,3 | -18,1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Guest nights/ capita of incoming tourists | 473.4 | 462.6 | 430.1 | 376.1 | 303.0 | 338.5 | -9,9 |
| Number of outgoing Lithuanian tourists (1,000 person) | 193,9 | 233,7 | 253,0 | 318,7 | 223,6 | 198,7 | |
| Change in % | 100 | 120,5 | 108,2 | 125,9 | 70,1 | 88,9 | -37,6 |
| Guest nights per capita in the case of outgoing tourists | 1 249.4 | 1529.4 | 1 824.4 | 2 416.7 | 1 600.1 | 1 441.0 | -40,3 |
| The tourism incomes in Lithuania (mill. USD) | | | 1.153,0 | 1,338,0 | 1.207,4 | 1.195,4 | |

Source: Own calculations based on stat.gov.lt.

In addition to the 1.56 million foreign tourists who stayed at the accommodation establishments, about 0.56 million stayed with friends or relatives or at their own apartments. The total number of foreign overnight visitors in 2010 was therefore about 2.12 million (+12% compared with 2009).

Table 6: *The Tourist Traffic of Latvia (2005-2010)*

| Years | Incoming traffic (1,000 person) | Change (%) | Income (mill. USD) | Outgoing traffic (1,000 person) | Change (%) |
|---|---|---|---|---|---|
| 2005 | 157,0 | 100 | | 273 | 100 |
| 2006 | 270,0 | 171,9 | | 389 | 142,5 |
| 2007 | 238,0 | 88,1 | 671 | 488 | 125,4 |
| 2008 | 168,5 | 70,8 | 803 | 478 | 97,9 |
| 2009 | 132,3 | 78,5 | 723 | **432** | **90,3** |
| 2010 | 137,3 | 103,8 | 640 | 461 | 106,7 |

Source: Own calculation base on UNWTO and www.euromonitor.com/latvia data.

## 3. Conclusion

The future trends in the tourism of the Baltic States depend largely on economic growth. The diverging economic growth of the different states will be the deciding factor in the course of the development of the tourism industry. Estonia, Latvia and Lithuania have already announced their objectives for the development of the industry in the "Tourism Program until 2020", however it is unlikely that these goals can be accomplished unless the states also manage to maintain their economic welfare.

In Estonia, the 1 January 2011 introduction of the Euro as the country's currency is likely to bring about an increase in tourist traffic due to a more stable commodity stock and package price in the case of outgoing traffic, and a decrease in the number of incoming tourists in case of possible exchange rate fluctuations. In Latvia and Lithuania, the trends and development of the tourism industry will be defined by the exchange rates and the stability of the economy.

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# SUSTAINABLE FINANCIAL DEVELOPMENT AND LESSONS FROM THE CRISIS

# GLOBAL FINANCIAL CRISIS: CAUSES AND CONSEQUENCES IN FINANCIAL THEORY

Iván BÉLYÁCZ*

*Prolog*

*"Financial markets are nothing more than arenas where investors who need cash today can obtain it by selling the present value of future cash flows to other investors willing to wait for the cash payoffs from their capital." (Peter Bernstein)*

**Keywords:** financial crisis, securitization, asset price bubles, risk assesment, leverage
**JEL codes:** G01, G14, G32

## Basic characters of financial crisis

Until early 2007 we were living in a period often described as the "Great Moderation". The world economy was growing vigorously, macroeconomic indicators were significantly less volatile, and most importantly inflation was low. Financial markets were performing strongly. Many asset prices were rising, while volatilities and risk premia were exceptionally low. Profitability in the financial sector was high, and banks seemed liquid and well capitalized. However, there were warning signs that global markets were "priced for perfection" and that even a small change in conditions could severely disrupt financial markets. The turmoil erupted in August 2007 when investors around the world suddenly faced a dramatic change in liquidity conditions, and it became increasingly difficult for banks to refinance themselves in the whole sale money market. The storm intensified very significantly in mid-September 2008, when some large failures of financial institutions led to a general loss of confidence and to a very severe reaction in financial markets. This transformed the turmoil into crisis, and the liquidity shortage became a massive threat to solvency for many financial institutions in a large set of countries (Allen *et al.*, 2009). That crisis was different from the 1990s

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dot-com boom in several ways. First, the dot-com boom was based on the introduction of a general - purpose technology that affected the entire economy. Second, debt played a critical role in the 2007-2009 financial crisis, but not in the dot-com bust. Finally, the asset at the core of the recent crisis – real estate – is a significant item on the consumer's balance sheet. The broader context for the recent financial crisis is important in this analysis because that context will be repeated again and again.

The root cause of the crisis was the overall and massive undervaluation of risk across markets, financial institutions and countries (Baily *et al.*, 2008). This derived from two main factors. First, the probability of certain events was misjudged. This means, that these events were considered highly improbable, if not impossible. Second, the impact of an increase in fundamental uncertainty at the systematic level on the distribution of returns across asset classes was largely neglected. Both the under pricing of the unit of risk and the underestimation of the quantity of risk, had contributed to the emergence of the crisis. Severe financial crises share three characteristics. First, asset market collapses are deep and prolonged. Second, the aftermath of banking crises is associated with profound declines in output and employment. Third, the real value of government debt tends to explode.

Many episodes of financial instability over the last decades were characterized by a sharp increase in general "uncertainty". The reaction of investors is to suddenly assign very high probabilities to events they deemed very unlikely before. They concentrate on "bad" outcomes and worst case scenarios and show a strong preference for safety and liquidity. Market participants used evaluation models that did not account properly for an additional dimension of risk. The distribution of returns depends on which "state of nature" prevails, for example if we are in normal market times or in crises times. Very small changes in beliefs can translate into large changes in behaviour, which in turns have large effects on markets.

Short-termism is sometimes cited as a factor contributing to the global financial crisis. Short-termism means choosing a course of action that is best in the short term, but that is suboptimal if not destructive, over

the long time. When managers have strong incentives to grow profits or gain market share in highly competitive industries, they often become more aggressive in areas like pricing and product innovation. A mix of short term incentives was the cause of the excessive risk that companies took (Fuller and Jensen, 2002). These incentives not only rewarded managers for delivery quarterly earnings and near-term share price increases, but also served as performance measures for promotion within the organizations. These perverse incentives governed the values of large public companies and encouraged managers to take value-destroying risks. The main problem is the practice of rewarding managers for short-term performance rather than longer term value creation. This practice is antithetical to the fundamental principle that individuals should bear the consequences of their choices.

### Securitization and credit rating failures

That system changed as the securitization market evolved: lenders were able to repackage mortgage loans and sell them as part of larger securities bundles; they got compensation immediately. The most perverse incentive in the mortgage origination market though, is the ability of originators to immediately sell a completed loan off their books to another financial institution. One institution provides the initial funding of the mortgage but then quickly sells it of to another financial institution, where either it is held on a balance sheet or packaged with other mortgages to be securitized. The "disintermediation" process, by allowing originators to pass off the risk of their loans, increased the supply of credit and encouraged them to lend to risky borrowers who previously were ineligible for loans. Thus, by increasing the availability of credit to riskier borrowers, disintermediation increased housing demand and house prices during the boom years.

As long as homeowners made their mortgage payments on time, the participants in the mortgage game lending organizations, appraisers, credit-rating agencies, investment banks and investors in mortgage – backed securities – prospered. But falling home prices, rising mortgage defaults, higher interests and significant tightening of credit triggered the mortgage crisis in the summer of 2007.

Normally the financial institutions would hold the loan until it was repaid and they would monitor the financial health of the borrower until that point. Securitization was seen as a solution to the problems with the "saving and loan" model. Under the old system, lenders could only make a limited number of loans based on the size of their balance sheet. The new system allowed lenders to sell off loans to a third party takes it off their books and use that money to make even more loans. Securitization has been an extremely positive innovation for credit markets (Shim, 2009). By allowing banks to sell whole loans off their books, and by distributing risk according to the risk appetite of investors, it has lowered the cost of lending for all and facilitated the extension of credit to new borrowers who otherwise would be shut out of credit markets.

Securitization of mortgage assets went beyond the point of value and created assets that were not transparent. The lack of transparency further exacerbates the problem of asymmetric information and magnified the potential for systemic risk. The general public was not given adequate warning of the emerging dangers in the mortgage market. Credit rating agencies failed to accurately assess the risk of securitized assets they graded. A major problem was that the credit ratings provided by the agencies were accepted without adequate knowledge of the risks of the underlying mortgage portfolios. Rating agencies had evolved to an incentive structure that created the possibility of conflicts. The major credit rating agencies – Standard and Poor's, Moody's and Fitch Ratings – presumably earn their fees for representing the investors. But they face a conflict of interest because it is the issuer that pays them. Specifically, they were paid by the issuers of securities, not by the buyers of by the regulators. Moreover, the fees that they earn are contingent on their providing the desired rating. Complexity and a lack of transparency masked the underlying risk of mortgage-backed securities. As a result, investors bought securities with yields that were too low to compensate them for the risks that they were assuming. While the rating agencies appear to have faced perverse incentives, it was opacity of the entire system that magnified the effect of their poor judgement and "rating inflation".

The term "leverage" typically refers to the use of borrowed funds to magnify returns on any given investment. One of the central reasons the current crisis has been so severe (and that the bubble inflated so enormously) was that much of the subprime mortgage exposure has been concentrated in the leveraged financial sector. If as set prices are rising, and the cost of borrowing is low, then banks will naturally try to maximize their exposure to rising asset prices by borrowing as much as they can. Credit insurance and CDSs are valuable innovations because by assuming the default risk of transaction, they facilitate lower funding costs and easier access to funding liquidity for institutions that may otherwise not have access to it. The erosion of mortgage lending standards stands out that something that could and should have been stopped, especially when there were fears of a housing bubble. Asset price bubbles are characterized by a self-reinforcing cycle in which price increases trigger more price increases, but as the level of asset prices move increasingly out of line with economic fundamentals, the bubble gets thinner and thinner and finally bursts.

The nature of the business of certain financial intermediaries relied almost exclusively on the roll-over of short-term debt to finance longer term assets. The ability of these players to stand the consequences of a significant market correction turned out to be greatly overstated. To make things worse these consequences were intensified by the high leverage and the parcelling of risk. When the crisis occurred, the general loss of confidence and the large number of linkages among financial institutions resulted in a quick and powerful transmission of fears (Main and Sufi, 2008). Regulated markets, characterised by standardised products, and a broad base of investors, with access to information and legal protection, generally offer better-quality information. However, the markets for structured products work largely over the counter, and a large part of the financial sector is unregulated. New unregulated, or lightly regulated, financial entities have come to play a much larger role in the financial system, undoubtedly enhancing stability against some kinds of shocks but possibly increasing vulnerabilities against others. This implies that a fair evaluation of the instruments and of the counterparty risk is extremely difficult, not only for supervisors and institutions concerned

with financial stability but also for the market participants themselves. More standardised securities exchanged on regulated market would make it easier to price these instruments, as investors could rely on public information and on the observations of traded prices. At the same time, it would help policy makers and regulators to understand where risks are located and thus monitor the accumulation of imbalances.

When the credit crisis hit, risk that was meant to be dispersed throughout the system was in fact heavily concentrated among leveraged institutions at the heart of the financial system. Capital requirements lower the profitability of the banks, since they limit the extent to which banks can leverage any initial share holder investment. The managerial point is simple: do not have excessive leverage and plan for financial market disruptions. This is an old maxim for effective management: financial mobility is the ability to adjust the magnitude and timing of corporate funds flows in response to unexpected events (opportunity or adversity) and thus to assure solvency and continuity.

Bubbles are part of basic market economic system; they have always existed and there is no way to eliminate them. Systemic banking crisis are typically preceded by credit booms and asset price bubbles. Banking crises often follow collapses in asset prices after what appears to have been a bubble. Asset price bubbles can arise for many reasons, but one important factor is the amount of liquidity provided by the central bank as money or credit (Trichet, 2008). At some point the bubble bursts and the stock and real estate markets collapse. The boom of mortgage borrowing was sustained by low interest rates and easier lending practices. The deterioration in lending standards over the course of the boom is remarkable. Fraud, lack of due diligence and deceptive practices occurred on both sides of the mortgage transactions. Accounting tricks also played a role in the financial crisis of 2007-2009. For instance, Citygroup, Bear Stearns, Merrill Lynch and other major financial institutions kept billions of dollars of risky mortgages off their balance sheets by creating special purpose entities.

The long upward movement of house prices convinced nearly all stakeholders that these prices had nowhere to go but up. The fall in house prices led to a fall in the prices of securitized subprime mortgages,

affecting financial markets worldwide. If there is a general downturn in housing across the country (in USA), then the probabilities of default go up across the board. Moreover investment banks were not supervised like deposit-taking commercial banks and did not have the same capital requirements, thus they were able to increase leverage to a greater extent. A key point in understanding this system-wide failure of risk assessment is that each link of the securitization chain is plagued by asymmetric information. The asymmetric information focuses on the differences in information available to different parties in a financial contract. Borrowers have an informational advantage over lenders because borrowers know more about the investment projects they want to undertake than do lenders.

This informational advantage leads to adverse selection. Asymmetric information between borrowers and lenders also results in a moral hazard problem which affects the efficiency of financial markets. The increase in adverse selection and agency problems causes a decline in investment and economic activity. Inadequate assumptions were made about the distribution of returns to highly complex, new financial securities. This implied that the unit of risk was generally underpriced. Because of the enormous size of the market and because participants created new financial instruments, which financial institutions used to leverage their exposure to an asset class and put very little capital on the line. Moreover, some large financial institutions showed a massive concentration of risk, suggesting that risk management systems failed to identify the quantity of risk that financial institutions were accumulating.

### Consequences and conclusions

These systems also failed to assess the systemic consequences arising from a global loss of confidence. There are two additional elements that played a role in the underpricing of risk. First, the large ex ante excess of savings over investment, which was one of the consequences of the bursting of the internet bubble. A second factor closely correlated to the innovation in financial markets. Amongst other factors there was also a considerable lack of transparency about the allocation of risks across financial intermediaries, in particular in new and often highly leveraged players.

Main factors to be addressed to the future:

- First, there has been considerable short-termism which means an excessive focus on near-term returns. Modern financial systems have favoured instruments and intermediaries that promise large returns in the short term.
- The second main factor concerns transparency. Despite all the regulatory advances and progress in information technology, the financial system that has emerged over the last decade has been characterized by lack of transparency in certain securities markets and intermediaries.
- The third factor is the excessive pro-cyclicality of the financial system. There seems to be an inherent tendency for financial systems to cause periods of booms, by building up imbalances, and than to go through busts – the rapid and disorderly unwinding of these same imbalances.

*Epilogue*

*"It is hard to overstate the economic value of trust. Trust greatly reduces the cost of transacting business and thereby increases economic efficiency. Without trust, businesses have to spend considerable amounts of time and money to be sure that other parties are living up their obligations with integrity."*
*(Alfred Rappaport)*

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# THE ROLE OF CORPORATE FINANCIAL FLEXIBILITY DURING LIQUIDITY CRISIS

Mónika KUTI*

*The liquidity shock during the global crisis required corporate-level adjustment policies. The financial and real economy crisis revalued corporate liquidity, financing and investment flexibility, as well as the mitigation of corporate cash flow volatility using risk management techniques. This study links the corporate cash-flow-at-risk concept with financing flexibility through high risk capacity, highlighting the relationship between lower side risks and financing constraint in periods of decline in liquidity. A company determines the sequence of cash flow allocations over different cash commitments, such as marketing expenses, research and development, capital expenditure, dividend disbursement and debt service, in view of the expectations concerning future cash flow volatility. The low and high levels of corporate free cash flow resulting from a scenario analysis open up a new version of corporate valuation methodology enriched by cash-flow-at-risk models. With an increase in lower side risks, the role of risk management is to provide additional flexibility for investment and financing decisions.*

**Keywords:** cash-flow-at-risk, financing flexibility, hedging
**JEL code:** G32

## 1. Enterprise risk management

The holistically integrated approach of enterprise risk management (ERM) comes into antagonism with the risks managed independently and separately from one another, i.e. arranged in 'silo type' classes *(silo approach)*. For example, financing, operational, competitive and legal risks belong to typical risk classes like this. The significance of risk aggregated at a corporate level lies in the degree of the probability of the company's ability to meet important – operational, investment and funding – targets. The aggregate effect of the various risk exposures, which covers the present and future operating cash flows as well as the intertemporal trade-offs between investment and financing decisions, has to be managed at a whole-company level. Risk aggregation allows the exploring of the interdependence of risks that depend on one another in various ways, and facilitates the management's decision regarding which risks to keep and

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which ones to subject to risk management, in view of the trade-off between risk and opportunities. Enterprise risk budgeting (ERB) is a quantitative risk management method that unifies portfolio theory and corporate risk theory under the whole corporate risk universe *(see Table 1)*.

Table 1: *Classification of approaches to corporate risk management*

| | | Risk Aggregation | |
|---|---|---|---|
| | | No | Yes |
| **Risk Capacity considered** | Yes | Silo-Approach | Enterprise Risk Management (ERM) |
| | No | Silo Risk Budgeting | Enterprise Risk Budgeting (ERB) |

Source: Alviniussen and Jankensgård, 2009, page 16.

Recognising individual factors of the total enterprise risk facilitates the predictability of the volatility of corporate free cash flow and its probability. In lieu of the deterministic models of traditional scenario analysis and vulnerability examinations, it builds upon a dynamic methodology based on a high number of simulations, while integrating enterprise risk management, financial planning, the cash-flow-at-risk concept and hedging.

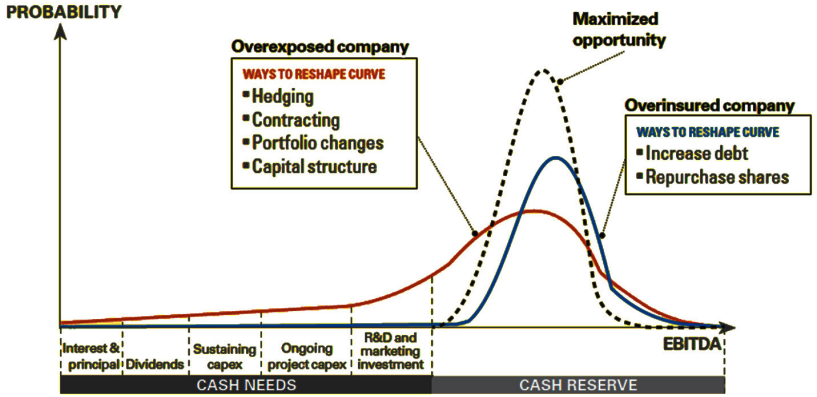
## 2. Cash flow at risk

A distinction needs to be made between the various earning-at-risk (EaR) and cash-flow-at-risk (CFaR) measures. The former include operating income at risk (OpINC@R), earnings before interest, taxes, depreciation and amortisation at risk (EBITDA@R), earnings before interest and taxes at risk (EBIT@R) and net income at risk (NI@R). The cash-flow-at-risk concept was developed by the Riskmetrics Group within J. P. Morgan in 1999, when they attempted to create the cash flow equivalent of the VaR model. According to the Riskmetrics definition, the CFaR aims at the cash flow volatility that depends on market risks stemming from various factors, including foreign currency exposure, interest rate risk or revenues and expenditures sensitive to commodity prices. According to another definition, cash flow at risk, depending on the currently available information, refers to the probability distribution

of corporate operating cash flow projected to a future time horizon. CFaR is a risk measure that provides information about the declines in corporate cash flow, which can be captured with a certain associated probability, and which are experienced by the company from time to time. Therefore, it belongs to the subject of enterprise risk management (ERM). The difference between the CFaR and the analogy of value at risk (VaR) is that the CFaR focuses on the operating cash flow, whereas the VaR on the asset value, and the time horizon of the CFaR can even be a quarter or one year. The essence of the CFaR metrics is to condense the overall corporate risk exposure into one manageable figure. Management must be fully aware what risk measures are monitored by those concerned within the company, and has to disclose the related information in the form of a risk report accordingly.

The EBITDA is a popular factor of operating profitability, the probability normal distribution of which is risk management field. Corporate cash flow needs may fall victim to the risks appearing along the left tail of the normal distribution curve in the spectrum of the volatility of the operating profit before depreciation and amortisation. As a result of EBITDA shocks, the level of expenditures that can be allocated to the area of research-development-innovation has to be reduced, the magnitude of costs that can be spent on marketing has to be lowered, the approvability of decisions on future capital expenditures (CAPEX) has to be revised, the sustainability of the dividend disbursement policy has to be reviewed, and the affordability of debt servicing burdens needs to be questioned. On the asset side, these items are the real option settlement prices of the implementation of future growth opportunities (R+D+I, CAPEX), whereas on the liability side they are the bases that ensure continuity for the funding background of this same future potential (dividend disbursement, debt service).

Figure 1: *Normal distribution of the probability of the EBITDA*




Source: Buehler et al., 2008, page 107.

Based on *Figure 1*, the risk absorption capacity of a company (the area of cash surplus) is well distinguishable from its gradual shortage taking shape along the sacrificing of cash expenditure items (cash requirement). The high risk capacity indicates the possibility of manoeuvring, i.e. to what extent the company is able to survive hard times without having to adjust business activities in a costly manner. Alviniussen and Jankensgård (2009) call attention to three relevant areas: cash and securities levels as well as the amount of voluntary asset sale, capacity to take on additional debt, and hedge positions.

In the case of *high risk capacity*, it is possible to realise the present value of growth opportunities (PVGO) and achieve the rate of return required by the financers, i.e. to meet the expectations of the owners and creditors. In the case of *low risk capacity*, present or future investment has to be restrained, expenditures on research-development-innovation need to be cut, marketing costs have to be reduced, annual dividend needs to be lowered or perhaps temporarily discontinued, or the company is compelled to breach creditors expectations (for example, covenants). Accordingly, in the allocation of funds to these areas management should strive for risk optimisation.

The missing cash flows along the left tail realisations are costly for the company. These implicit costs reduce shareholder value, the main areas of which may be captured in the lost present value of growth opportunities (PVGO), the lemon costs of the increasing risk premium of the user cost of capital, the costs of financial distress and in the costs of bankruptcy. Due to the decline in EBITDA, the commitment opportunities of the company are impaired over the cash payments required by the capital expenditures, owners and creditors, the earlier outlined negative series of events of which become even more costly when the debt service capacity also suffers a permanent shock. The cost of keeping negatively asymmetrical or skewed distribution exposures is usually much higher than that of positively skewed exposures. Moreover, if a company has a negatively skewed exposure, it seeks hedging transactions in a much more aggressive manner, and in the meantime its investment strategy will be less aggressive, but more diversified (Froot, 2003).

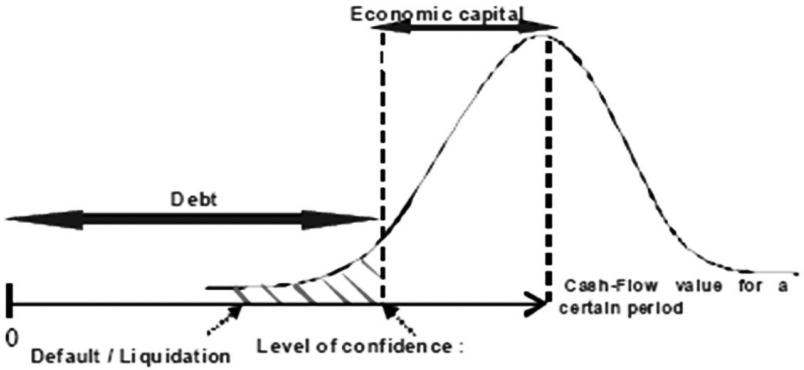
In terms of risk management, a company is able to *shape the EBITDA distribution probability curve* with its own operating, investment and financing decisions. According to Buehler *et al.* (2008), embedded risk management methods include:

- in operational decisions: value chain planning, outsourcing, labour cost saving, diversified production in a geographical sense, flexibility of supplier systems and hedging transactions (options, futures);
- in investment decisions: the identification of the negative NPV range and the application of real options;
- and in financing decisions: the trade-off relationship between cash flow at risk and corporate value as well as the relation between hedging transactions and debt capacity.

A company that is excessively exposed to aggregate corporate risk can move its risk level towards the optimum level by applying hedging transactions, lowering gearing, managing the individual risks of corporate assets using a portfolio approach or by applying risk reducing contracts in its operational activities. An overinsured company, in turn, may strive to reach the optimum level through additional borrowing or by tapping the surplus cash flow in the form of cash returned to the owners, which adds to liquidity risk.

EBITDA and its riskiness constitute the operating cash flow related pillar of the free cash flow to firm (FCFF), and are thus key factors of corporate value. The consequences of left tail volatility may reduce corporate value. As long as the company manages and transfers risks at an acceptable cost and the probability of negative consequences is reduced, the value of the company can increase. Bancel and Tierny (2010) integrate the cash-flow-at-risk approach with the methodology of corporate valuation, when they apply the economic capital concept of Merton and Perold (1993) to non-financial corporations as well *(see Figure 2)*. Economic capital indicates to what extent the company is able to absorb uncertainty and risk, i.e. to create a *survival buffer for the worst-case scenario*.

Figure 2: *Economic capital and firm risk profile*




Source: Bancel and Tierny, 2010, page 10.

Pursuant to their cash-flow-at-risk model, with the help of scenario analysis, they distinguish between the minimum and maximum of the free cash flow to firm (FCFF). In their opinion, the minimum of FCFF is sufficiently safe for free cash flow to debt (FCFD); therefore, it is also a suitable basis for debt finance, which reflects the acceptable financing structure of shareholders' relative risk aversion. The difference between FCFF and FCFD is the economic capital, which the owners have to invest into the company. In this context, the significance of corporate

asset diversification lies in the extent to which the stand-alone risk of the incremental cash flow generated by the individual asset is able to reduce whole-company risk and thus lower economic capital needs. To put it more to the point, equity capital is the option basket of risk pooling, a cushion against the risk of bad corporate performance.

Table 2: *Main approaches to corporate risk measurement*

| Risk measure/ framework | Concept | Comments |
|---|---|---|
| Standard deviation | Measures the degree of dispersion around the mean | • Symmetrical perception of risk<br>• Relies on normal distribution |
| Cash Flow at Risk | Measures the maximum loss associated with a certain statistical confidence level | • Asymmetric, i.e. treats losses differently than gains<br>• Based on operating cash flow |
| Lower Partial Moments (LPM) | Measures risks as the deviations below a target level penalised by a risk aversion coefficient | • Adopts easily to varying levels of risk aversion<br>• Makes no explicit reference to debt capacity |
| Conditional Lower Partial Moments (CLPM) | Makes reference to a second probability distribution to separate risky from non-risky shortfalls | • Incorporates information debt capacity |

Source: Jankensgård, 2008, page 8.

There is a correlation between the minimum of EBITDA at risk and the so-called *below-target risk* concept of Culp *et al.* (1998). In the opinion of Jankensgård (2007), the limitations of cash flow at risk lie in the fact that on the shortfall of cash flow the concept does not reflect the costly 'states of nature', i.e. it disregards the costs of risk. This problem is addressed by the introduction of the conditional lower partial moments (CLPM) framework *(see Table 2)*, which allows distinction between non-risky and risky outcomes by including a critical threshold level (Jankensgård, 2008). Non-risky liquidity shortfall may be supplied with funds by

external financing up to the extent of the debt capacity, when the company is still able to continue with its strategic plans (R&D, CAPEX) and to meet its other important cash commitments (such as dividend and interest payment); risky liquidity shortfall may result in negative consequences of the missing debt capacity. The former is called *covered*, whereas the latter is referred to as *uncovered liquidity shortfall*.

It is about creating a cash flow risk (liquidity risk) measure that depends on debt capacity, where, according to Froot *et al.* (1993), debt capacity itself is also a stochastic, state-dependent variable. The conditionality of the correlation between cash flow at risk and debt capacity may be linked to the net debt/equity ratio, debt covenants or credit rating. Moreover, a business plan may also serve as the basis for the targeted level. The framework of conditionality that can be included in the CFaR model can be expanded by the inclusion of the conditionality related to macroeconomic and market factors (Andrén *et al.*, 2005), or with three corporate factors: with the development of the conditionality related to total assets, capital expenditure (CAPEX) and change in net working capital ($\Delta$NWC) (Maurer, 2011) as well.

## 3. Cash flow at risk and financing flexibility

The relationship between financing policy and financial flexibility can be understood in the context of the management of the total – systematic and company specific – risk. Financing flexibility refers to the company's ability to react to unexpected corporate cash flow changes or investment opportunities in due course and in a value maximising manner. It means the way companies treat negative cash flow shocks and the way they are able to react to the positive shocks of their investment opportunities. From the aspect of liquidity management there are various interrelations among costly external financing, uncertain cash flows and unpredictable growth opportunities (Denis, 2011). The issues of financing flexibility cover the holding of cash, the cash flow sensitivity of cash holding, the real effects of corporate liquidity as well as the capital structure and dividend policy decisions that provide the flexibility of the access to low-cost financing. The existence of financial frictions makes financing policies that preserve flexibility even more valuable. If external financing is

costly, companies are interested in accumulating financial slack in order to avoid shocks to profit or to investment opportunities.

*The relationship between financing flexibility and the normal distribution of cash flow at risk* has to be managed by the company in the return/risk dichotomy between the preservation of growth opportunities (R&D, CAPEX, PVGO) and the access to capital market financing (dividend, debt service), while cash payment commitments may have their shares in the whole-company operating cash flow periodically in a volatile market environment. High risk capacity entails a high degree of financial flexibility. During recession, as a result of profit losses, credit contraction and the fall in shareholder value, cash flow volatility increases, the shape of the normal distribution curve changes, and financing flexibility alters as well.

It is an interesting question how *forward-looking financing flexibility* is managed by companies expecting future probability of recession. The latter refers to the framework of conditionality of the CFaR model extended to macro factors. According to a survey of French firms about the impact of the global financial crisis, two-thirds of chief financial officers reported a strong impact of the crisis and cited liquidity problems, banks' reluctance to lend and cost cutting as their major concerns, and only firms with internal financing were exposed to lower crisis impacts (Bancel and Mittoo, 2010). During recession, typically the other forms of flexibility – such as overdraft facilities, cash flow, asset sales and debt capacity – dry up. Consequently, cash holdings become important, but only financially unconstrained companies that have no lack of *ex ante* cash are able to accumulate such reserves (Ang and Smedema, 2011). Understandably, the motivations of keeping cash reserves include the volatility of operating cash flow, which can be reduced by corporate diversification. It is no coincidence that the value of cash holdings is significantly lower at diversified firms as opposed to single-segment ones (Tong, 2011).

## 4. Forms of financing flexibility

*Cash holdings* are a source of financing flexibility. Increased cash holdings in the decade of the turn of the millennium are attributable to increasing cash flow volatility and the level of intangible assets (Bates *et al.*, 2009). The value of cash holdings grows together with the increase in the uncertainty of future cash flows (Gamba and Triantis, 2008). In terms of flexibility, cash holdings provide unconditional liquidity at any time, whereas credit lines mean conditional liquidity, because they are open until the creditor is ready to renew its commitment again and again, if the firm does not breach a covenant, and its creditworthiness is also maintained.

Credit line contracts account for the greater part of the outstanding debt of most firms. Moreover, the amount of unused lines of credit is twice as much as that of used ones (Sufi, 2009). For companies with low cash flow and high agency costs, cash holdings and credit line cannot be considered liquidity instruments that substitute one another (Yun, 2009). As corporate liquidity sources, lines of credit are imperfect substitutes for cash, because access and borrowing through a credit line are tied to the conditionalities of the debtor's credit rating, its alternative external sources and, in the case of financial constraint, its high external financing costs as well as of the creditors' conditions (Demiroglu and James, 2011). The two types of corporate liquidity are used to cover different risks. Cash holdings for non-operating purposes provide protection against future cash flow shocks in bad times, while credit lines provide an option for companies, allowing them to exploit future business opportunities at the right time. In other words, companies hold cash surpluses as general-purpose assurance, while credit lines are for financing future growth options (Lins *et al.*, 2010).

The issue of *debt capacity* is also a pillar of great importance in terms of financing flexibility. Debt capacity is the extent to which the company is able to access new loans at a user cost that does not exceed the company's expected risk-adjusted rate of return on these additional sources. Debt capacity is sometimes defined as 'untapped borrowing power'. A company's debt capacity becomes exhausted if borrowing by the company is limited, it does not receive new loans or its balance sheet

is so weak that new borrowing adds to the costs of financial distress in the future. Not surprisingly, companies primarily use their cash surpluses for debt repayment instead of stock repurchases or accumulating cash reserves (Byoun, 2008). The maturity structure of loans also plays a role in the manageability of debt capacity. *Short term debt overhang* limits a company's willingness to invest more strongly than long term debt overhang (Diamond and He, 2010). During the 2008 credit crisis, investment declined more significantly in the case of those companies where the portion of long-term loans maturing within one year was higher than in the case of those where this portion was lower (Almeida *et al.*, 2010). Accordingly, short term debt overhang is a weak link of debt capacity during a credit crisis.

Debt capacity opens new dimensions in capital structure dynamics. Companies are interested in maintaining low leverage as long as they can preserve their borrowing power for the periods of high capital needs (DeAngelo and DeAngelo, 2007). When cash flow is scarce, the possibility of access to so-called *transitory debt* is the source of financing flexibility for satisfying non-anticipated capital needs (DeAngelo *et al.*, 2011). Following temporary borrowing, it is not the primary objective of firms to rebalance their capital structure towards a long-run target through debt repayment as soon as possible. In fact, corporate cash flow surplus is needed to reduce the level of indebtedness; if liquidity remains scarce, they borrow even more, even if leverage becomes significantly higher than the target ratio (Denis and McKeon, 2011). As reflected by the results, debt ratios may simultaneously and in parallel have permanent and transitory components.

The so-called transitory debt shapes corporate capital structure dynamics in the context of *intertemporary financing frictions*. The opportunity cost of debt in the present may be that the firm will not be able to borrow in the future. Optimum financing policies ex ante preserve the ex post access to capital markets in the case of cash flow declines or unexpected investment opportunities.

In times of scarce liquidity, financing flexibility may also be provided if the company unblocks cash flow by *asset sales* in order to avoid restraining investment or dividend disbursement. For constrained companies, the

cash flow sensitivity of investment to funds from voluntary asset sales is significantly stronger than that of the control group (Hovakimian and Titman, 2003). However, the illiquidity of corporate assets makes this option unaffordably costly (Shleifer and Vishny, 1992; Pulvino, 1998).

*Cash disbursement to owners* is the fourth major area of financing flexibility, in addition to cash holding, debt capacity and asset sales. After satisfying the investment needs and debt service obligations, the company may either return its remaining flow of money as dividend and stock repurchase to the owners, or may reserve it in the form of cash and securities. Of the cash returned to shareholders, stock repurchase allows greater flexibility for the company than the 'sticky' dividend disbursement, although there is flexibility in the latter as well if the disbursement policy complies with the corporate life cycle. In a dynamically changing, uncertain environment, the dividend flexibility hypothesis (DeAngelo and DeAngelo, 2006; Blau and Fuller, 2008) suggests that rapidly growing companies pay dividends in line with flexibility considerations, whereas slowly growing ones pay because of the agency problem of free cash flow (Lee *et al.*, 2011).

The lesson from the S&P survey conducted on a sample of 1,500 companies for the period between 1992–2006 is that very few firms (6%) cut dividends, the majority (68%) prefer to make significant cuts in investment. Investment cuts make up for approximately half of the shortfall in cash flow, with the other half being covered primarily by debt financing. Net equity issues, reductions in cash balances and asset sales account for a trivial percentage of the shortfall (Daniel *et al.*, 2010). On this basis, the authors draw some important conclusions that question the earlier consensus prevailing in the relevant literature:

- the significance of debt capacity is higher than that of cash holding in times of scarce liquidity,
- in the cash flow hierarchy, dividend disbursement precedes residual investment policy,
- in capital structure dynamics, the so-called transitory debt builds up and increases corporate leverage as a result of cash flow deficit; later, in times of cash flow surplus, the firm repays its debt, and thus the volatility of indebtedness ratio largely moves together with the changes in cash flow in time.

Financing flexibility depends on *operating flexibility*, and vice versa. Financial flexibility facilitates the maintenance of operating flexibility (Shapiro, 1990). Due to managerial discretion, the untrackable production flexibility increases risk shifting, which reduces debt capacity. In contrast, due to managerial opportunism, investment flexibility adds to the problem of asset substitution, which the creditors attempt to prevent with restrictive contracts and stricter covenants, but this form of real flexibility allows higher debt capacity. Based on this argumentation, *real and financial flexibility are substitutes* (MacKay, 1999).

One must not forget the *'dark side' of financing flexibility* either. In addition to the higher agency costs, the relatively poor investment opportunities move the palette towards the policy of a higher cash disbursement to owners (Officer, 2011), which results in increasing liquidity risk. Moreover, higher cash holding carries lower rate of return, exacerbates agency problems through managerial empire building, the higher level of equity forgoes the tax savings of interest payment, increasing the weighted average cost of capital, and hedging transactions also have their own disadvantages.

## 5. Cash flow at risk and financial constraint

The lower side risks of the normal distribution of cash flow at risk raise the problem of financial constraint. If the operating cash flow does not reach the expected degree of investment and dividend payment, the company needs to reduce dividends and restrict investment, or needs to raise funds in the capital markets or through asset sales. Constrained firms that show continuously low and declining cash flows are unable to accumulate adequate cash reserves; consequently, the investment costs of these companies largely depend on the current cash flow (Denis and Sibilkov, 2010).

The correlation between cash flow and investment on the basis of the different costs of internal and external funds is discussed in the literature of financial constraint (Fazzari *et al.*, 1988). Internal funds are cheaper than external ones due to capital market frictions, such as information asymmetry (Myers and Mayluf, 1984) or agency problems (Myers, 1977;

Jensen and Meckling, 1976). These imperfections may result in credit rationing or situations where the feasibility of corporate investment depends on internal financing.

Firms facing financial constraints are unable to implement additional future investment without reducing their current investment or without striving to hold more cash, as they have depleted their external sources of financing. Constrained firms show higher willingness to reserve cash from the incremental cash flow than unconstrained firms. Moreover, the cash flow sensitivity of the cash holding of constrained firms increases in times of recession, which is not true for unconstrained companies (Almeida *et al.*, 2003). During the crisis, companies that had limited access to credit lines had to decide between savings and investment, while firms that did not struggle with cash shortage could afford higher levels of expenditures. Consequently, credit lines mitigated the impact of the global economic crisis on corporate spending (Campello *et al.*, 2010). The higher cash holding of financially constrained firms is also sensitive to cash flow volatility because the financing constraint creates intertemporal trade-off between current and future investments (Han and Qiu, 2007). According to the authors, the non-diversifiable nature of future cash flow volatility incites constrained firms to hold precautionary cash.

For financially constrained companies, the long-term costs of the liquidity shock of the global economic crisis materialise in the drastic cuts in cash expenditure that are reflected in the reduced or cancelled investment expenditures (of positive net present value), in lay-offs, in curtailing the amounts spent on research and development, and that undermine future growth prospects and value creation (Campello *et al.*, 2009). With financing constraint, a firm without adequate cash reserve can become illiquid and can be forced into a state of default, while it still remains solvent over the long term. Interaction between liquidity and solvency is provided by information, hedging transactions and channels of leverage (Gryglewicz, 2011).

## 6. Hedging transactions

Operational and financing hedging transactions may reduce the consequences of costly volatility and ensure the level of corporate cash flow. Risk management transactions create operational and financing flexibility, and thus may create corporate value. Risk management – referring back to the cash flow at risk and economic capital models – can practically be considered the direct substitute of equity (Stulz, 1996), because it creates debt capacity. In general, corporate level *advantages* of risk management, and thus of hedging strategies, include:

- the reduction of bankruptcy costs (Smith and Stulz, 1985), the mitigation of expected tax payment,
- the reduction of shareholders' risk compensation (Shapiro and Titman, 1986),
- the management of the underinvestment problem due to external financing costs (Froot *et al.*, 1993),
- the avoidance of dividend reduction steps (Lessard, 1990) and
- the exemption from the involuntary sale of assets (Schleifer and Vishny, 1992).

The inefficient market of corporate assets, in other words the risk of asset illiquidity, encourages firms to apply hedging transactions, as relative to the discounted value of future cash flows the compulsory sale of assets represents a further discount (Jankensgård and Hagströmer, 2011).

The *disadvantages* of hedging transactions appear if in the forward contracts the upside potential has to be given up, if it would have been possible to use the option premium in an alternative manner as well (for example as investment expenditure), if the accounting of hedging transactions results in accounting noise, if the so-called 'margin call' makes liquidity troubles and if the poorly structured hedging transactions trigger 'hidden risks' (Alviniussen and Jankensgård, 2009).

If there is a *liability overhang* in the balance sheet, underinvestment makes hedging strategies valuable, but if access to external funds is sufficient for the cash needs of the firm, i.e. debt capacity can be depleted, hedging transactions become less attractive. Referring to Table 2, if the difference between the lower partial moment (LPM) and the conditional lower partial moment (CLPM) is positive, hedging transactions may actually function as equity substitutes (Jankensgård, 2008).

## Conclusions

In a volatile environment, the demand for flexibility increases, which the firm's management needs to take into account in the asset management, capital structure and dividend policies in an integrated manner. Corporate decisions regarding cash holding, the adjustment and timing of investment and the voluntary sale of assets provide asset-side flexibility; credit lines, 'transitory debt' and cash disbursement to owners mean liability-and-equity-side flexibility. Liquidity flexibility is less valuable in the high risk absorption ranges of cash flow at risk than in the lower one. The management of left tail risk builds debt capacity and substitutes equity, and on the whole it may create corporate value.

## Acknowledgement

This study has been supported by OTKA Project No. 81542.

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# FOREIGN CURRENCY POSITION AND THE FINANCIAL STATEMENT

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*The financial recession started in Hungary on the fall of 2008 resulting in the deterioration of the financial market due to hectic exchange rates and higher loan payments in consequence of the weak forint. The majority of loans based on Swiss frank and on Japanese yen diminished, conditions of applying for foreign currency (exclusively Euro) based loans became strict and the existing portfolios decayed as well, therefore the provisions booked increased. According to the accounting approach, there is no significant difference between foreign currency and foreign currency based transactions, meaning that regulations are the same regarding activation and evaluation. The same stands for asset units' loss of values calculated through evaluation and qualification processes. In the essay, we present the magnitude of this problem through statistical data, then introduce the effects of different applied currency exchange rates on financial statements and highlight the foreign currency positions in the balance sheet.*

*The importance of impairment resulting from foreign currency or foreign currency based assets is significant and raises numerous questions, which I explain by quantitative presentation of two different solutions. In this matter, we emphasize the order of different tasks to be fulfilled during the annual report preparation and the effects on business' earnings based on the differences of provision in foreign currency or foreign currency based transactions, including foreign currency position and its impact on the profit disclosed.*

**Keywords:** accounting, foreign currency, monetary items, impairment
**JEL code:** M41

## The importance of foreign currency loans in light of statistical data

There is basically no heading in balance sheets that would not contain any foreign currency or foreign currency based assets. The most frequent ones are foreign currency deposits, liquid assets, foreign currency claims and liabilities, especially loan debts and marketable securities. Foreign currency evaluation problems could also arise in Provisions, accrued incomes and expenses, and in the Tied-up provision within the Equity Capital's unit as well (Adorján *et al.*, 2010). The most significant is undoubtedly the foreign currency credit so next we present the order of it.

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The balance sheet asset value of credit institutions operating as public limited companies increased from 8,427 billion HUF to 27,520 billion HUF between December 31, 2000 and June 30, 2011 during 10.5 years, which means that it tripled. The outstanding loan amount for the same period increased from 4,323 billion to 16,739 billion, which is almost a four-time increase, meaning that the weight of outstanding loans increased. Meanwhile, the degree of growth exceeded 200% in the case of forint loans and exceeded 600% in the case of foreign currency, including foreign currency based loans reflecting the increased ratio of foreign currency loans.
The fact that the ratio of foreign currency loans made up 37% of the total outstanding loan in 2000 and 68% of that in mid 2011 corresponds with the above-mentioned. Obviously, this change is greatly influenced by the increase in exchange rates along with the growth calculated in foreign currency (Terebe, 1997), which enhances the dynamics and ratio of foreign currency loans calculated in forint.

In the case of euro and euro based loans, the above-mentioned analysis shows that while the amount of euro loans denominated in euro increased by 10% between 31 December 2006 and 31 December 2010, the currency exchange rate increased by 39%, which raised the forint amount of euro loans by 54%. It is clear now that it would be necessary to analyze foreign currency amounts to demonstrate the significance of foreign currency loans but since most of the debtors can only pay with forint cash flow, the change in forint is also relevant.
The quality of foreign currency and foreign currency based loans worsened due to the recession. The rate of average impairment starting with 0.9% at the end of 2006 (which is equal to 63 billion HUF) increased to 3.3% by end of first half year of 2010 making up 470 billion forints.[1]

For the first sight, the above-mentioned analysis suggests that foreign currency and foreign currency based loans are widespread in the bank sector, which indirectly indicates the importance of it in the whole economy since foreign currency financing for enterprises by the banks appears in their passives as foreign currency liabilities.
All these clearly show the significance of a proper economical handling of foreign currency assets and sources.

## Positions of foreign currencies in the balance sheet

The first act on accounting in Hungary was based on the fact that the enterprises regulated by it used the forint as a functional currency, operated domestically, had their expenses typically in forint but their earnings partially came from abroad and the gained foreign currency was later used again domestically. In this period, at the beginning of the 90s, the obligation to convert foreign currency incomes to forint supported this approach. Since all incomes and cash of enterprises were available in forint, they could attain foreign currency sum by buying it out of forint. Banks applied buying rates for the conversion of foreign currency to forint while selling rates for purchases out of forint, and this practice was implemented into the legal regulation. From the mid 90s, steps towards the liberalization of foreign currency regulation allowed in a gradually extending degree and in a wider range of sectors that enterprises did not need to convert foreign currency incomes coming from sources determined in legal regulation to forint. This way, if they wanted to use it in foreign currency without conversion and loss in connection of it, they were free to do that. This possibility changed the reality that should have been reflected in the financial statement prepared in accordance with the accounting law. The overall foreign currency liberalization[2] along with the further applications of different rates to assets and liabilities related to them would have been improper – it became clear that lawmakers could require the application of only one exchange rate in the annual report.[3] The following unanswered question is what this exclusive rate should be. Next, we explain the background of this decision.

In the case of enterprises that possessed both foreign currency assets and liabilities following the implementation of free economical management of foreign currencies, the foreign currency risk (possibility of earning modification due to exchange rate differences) appeared in open position in the annual report[4], i.e. in the difference between assets and liabilities in the particular foreign currency (Róth *et al.*, 2009). As long as foreign currency assets exceeded liabilities, the exchange rate increase resulted in gains, otherwise in loss in the report. When foreign currency assets were the same as liabilities, the exchange rate difference did not alter earnings and in the case of a small asset-liability difference, this effect was not remarkable.

Lawmakers during the creation of Act C, 2000 took the assumption that enterprises are not only aware of foreign currency positions in their balance sheets but also consciously and effectively manage them through assets set-up[5] within the report. In this case, the application either of the National Bank of Hungary (NBH) or of the commercial banks average exchange rates serves the purpose since the P&L effect of exchange rate differences cannot be significant[6], i.e. any rate could be appropriate for the evaluation.

In the case of material foreign currency surplus amount on the assets side, either the exclusive application of buying exchange rates, or the exclusive application of selling rates would reflect the reality. Lawmakers have made and still make the application of these rates compulsory for enterprises –however until 2010, it was complicated because they had to show the difference in profit and loss calculated by the application of the two previous exchange rates.

As a consequence of this obligation, enterprises, especially those that were not obligated to audit their books[7], have not really applied this prescription of the accounting law. However, they applied for loans to banks and they submitted data about their financial and earnings position to client qualification. Nevertheless, banks have always been handling accounting data appropriately, even if the data did not represent reality well, and since loan-taking enterprises had foreign currency excess on liability side, banks converted these liabilities to forint not at exchange rates of NBH but at the selling rate of loan issuer, and they took into consideration that particular rate during the financial standing process. This process is understandable in the cases when there are assets denominated in forints, while loans are payable in foreign currency, hence to pay them back a conversion is necessary.

In this case, there is no foreign currency item in the asset side of the balance sheet while in the liability side there is the foreign currency liability. According to the balance sheet, the enterprise has an open position, which represents a foreign currency risk, so this way leaving the risk factor untreated, the financial statement will show foreign currency gain and loss if forint exchange rate is changing (Adorján *et al.*, 2010).

Furthermore, there is another problem: when the source of repayment of foreign currency or foreign currency based liabilities is the future income in foreign currency as well. In this case, there is no open position

financially or its extent is not the same as it would have been calculated based on the balance sheet. Accordingly, these enterprises reached a deadlock.
When they have their income typically in foreign currency[8], they will be able to settle their due foreign currency debt payments out of those, so they will not have exchange losses, but they do not have the ability to make gains either. Accounting could have theoretically two solutions to solve this[9]: either to consider the effects of expected foreign currency incomes on exchange earnings in advance or to decrease the financially unrealized exchange loss produced during the re-evaluation of liabilities. The first solution raises several problems that we explain through the Example 1.

**Example 1: Problems with future foreign currency incomes**
*A logistic company signed a 3-year contract with its partner from the EU according to which it does logistic work for it in at least 100,000 EUR value per month. In order to do the job it bought cargo vans for credit in 2,500 EUR value, the full term of credit is the same as the duration of the contract and the sum of Cash Flow to pay is 10% less than the expected euro income.*
*Foreign currency solely appears at the liabilities in the amount of credit as 2,500 EUR on the balance sheet of the logistic company. According to the accounting regulations, the exchange rate difference should be registered in the Profit and loss statement annually.*
*However, in practice there will not be formed any exchange rate difference, if the contract entirely realizes.*
*The realization of the contract depends on several factors: Will there be order placed in this amount? Does the partner pay reliably? Does the contract last for 3 years or ends sooner?*

There has to be a solution for this problem not only from accounting side, but it also creates a decision-making situation in the enterprise which has to find answers to these questions if it wants to reduce the risks. It has to decide how much of Cash Flow it should consider at the asset side determining the foreign currency rate position, which practically means the set of discount factors that reflect the time-value of money and the uncertainty of future incomes.[10]
From accounting part, there is a solution to set the due date present value of all future cash flows according to the most likely outcomes of

Cash Flow at the asset side, and in accordance with this result to register a potential gain, maybe as accrued income on the balance sheet. This solution is not accepted yet, especially in the national regulation emphasizing prudence; however, current modifications and proposals of IFRSs require the consideration of similar aspects[11].

The Hungarian regulation of accounting has given a solution to this problem from 1995. This answer has been in force since then[12], and enterprises could administer it for 16 years, though we do not have reliable information about its frequency.

The solution made it possible to defer the unrealized exchange loss of liabilities hoping that a future exchange gain will balance it. Certainly, the problem is the same as what we explained at the asset side: when and to what degree will the deferred exchange loss be returned? The act on accounting does not try to solve this problem; instead, it requires the administration of a simple accounting estimation (realizing the time-tailored loss) in accordance with that it adds an independent item – provision – into the P&L and the passive side of the balance sheet.

The problem with this solution is that lawmakers did not lay down any conditions. The application of it does not require any contract from undertaking aiming future incoming Cash Flows in foreign currency; any enterprise could apply that if there is a need for smoothing out the loss realized, e.g. because of the capital situation or from the owners' earning expectations. Even though this implementation seems to correctly reflect financially closed but accountably open foreign currency position in reports, it overshoots the mark because it makes enterprises able to amend earning fluctuation where there is no financial reason for it at all.

### Foreign currency or foreign currency based?

The foreign currency law (Act XCV, 1995) and the 88/2001 (06.15.) directive about its enforcement eliminated limitations of conversion of national currency from June 16, 2001. As a result of these regulations, the forint became completely convertible, economic entities could pay their liabilities to one another in foreign currency. This regulation was repealed on January 1, 2002. From this point on, Act XCIII, 2001 on elimination of foreign currency limitations makes it possible for domestic foreign currency users, meaning enterprises, to pay for their liabilities to one another in foreign

currency as well, so not only the calculation itself but the linked invoicing and cash flow can also be in the same foreign currency .
In response to the above-mentioned changes, Act C, 2000 on accounting lays down in its §60 (7) that "if the law allows domestic foreign currency users to define prize and their installments on the basis of foreign currency in their contracts, paragraphs (1)-(6) have to be applied in registration and at the year-end evaluation".
Consequently, the law does not distinguish the evaluation of transactions exclusively in foreign currency or foreign currency based transactions in the financial statement. In this section, we analyze how strong this approach is, how the report prepared this way could show a true and fair picture of the enterprise.
In the case of foreign currency based deals, liabilities of a company are denominated actually in foreign currency while the creditor expects payments in forint not in foreign currency. At this point, the enterprise has *foreign currency receivables* but it is not able to pay for its *foreign currency based liabilities* directly only after conversion to forint. This is a double burden for the enterprise: the conversion to forint is on buying rate and for payment it is on selling rate, so the difference created this way is clearly the burden of the enterprise.
All these mean that enterprises had to and still have to make responsible decisions about the foreign currency type of their financial liabilities in their calculations and payments. In the case of actual foreign currency income, it is recommended to apply for real foreign currency loan, which is calculated in foreign currency and requests payment in the same currency, instead of foreign currency based one. If they do not follow this, they will have open position even in cases of both receivables and liabilities denominated in the same foreign currency, and in the same amount; consequently, they could have even exchange profit or loss. We explain this through the Example 2.

**Example 2: Problems with foreign currency based liabilities**
*An enterprise has a 100 EUR receivable from a client who will pay for it in euro. It will finance the receivable from a loan, which has to be settled in Forint on the bank's selling rate.*
*At both asset and liability sides of the balance sheet, the enterprise has 100 EUR so according to the regulation there is no exchange P&L-impact expected.*

*At the time of receiving the 100 EUR liability, the buying exchange rate of the financing bank is 250 and the selling is 260. The enterprise sells the incoming 100 euro to the bank and receives 25,000 HUF for it. The payment for the creditor is 100 EUR×260HUF/EUR=26,000 HUF - so the debt cannot be settled. Consequently, it will not have foreign currency at the asset side but will have 10,000 HUF debt at the liability side – typically not in foreign currency, since banks at due date often convert debt to forint. If in the sense of loan contract, the bank registers liability still in foreign currency, it means 3.84 EUR (10.000/260). In the first case, there is no profit or loss from exchange rate difference though there is a need for extra source to pay off the loan, and in the second case, the exchange rate risk is still on, so exchange P&L appears.*

The consideration above requires that foreign currency based and exclusive foreign currency items have to be separated at the determination of foreign currency position based on the financial statement, and in order to make a financially closed position, they do not need to be the same, rather there has to be some surplus at the asset side. The question is how this surplus amount could be determined or whether it could be determined at all.
As we could see in the 2nd example, the amount of liability, produced by the conversion of foreign currency receivables (*250/260×100 EUR=96.15 EUR*), could be determined in the view of the ratio of selling and buying rates, this way the amount of loss as well. The execution of this calculation becomes complicated because the due dates of receivables and liabilities are often different; the enterprise is connected to not only one bank, so to determine the applicable exchange rates is uncertain. If this uncertainty reaches or exceeds the level of potential exchange risk, execution of it seems unnecessary, or even harmful.

The previous problem could be highlighted from a reversed point of view: in the case of *foreign currency based receivables and exclusively foreign currency liabilities*, the risk derives from the difference between the rates (in the contract) applied to convert the receivable to forint and the selling rates of the bank running the payments. There are typically contracting rather than accounting methods to prevent this – to convert foreign currency receivables, selling rate on due date is the generally applied rate - this way the exchange risk is out of the question.

**Example 3: Problems with foreign currency based receivables**

*An enterprise has 100 EUR receivables from a client who will pay for it in forint. It will finance it from a loan, which it has to pay off in foreign currency.*

*At both asset and liability side of the balance sheet, the enterprise has 100 EUR so according to the regulations there is no exchange earning expected.*

*a) According to the contract, the client is obligated to pay the liabilities on buying rate of the financing bank, which is 250 HUF/EUR. The enterprise converts this incoming 25,000 HUF (=100 EUR×250) to foreign currency on selling rate (260 HUF/EUR) of the refinancing bank and it becomes 96.16 euro, which is not enough to settle the foreign currency debt.*

*b) To settle the whole amount to the creditor it needs 100 Euro×260 HUF/EUR=26,000 HUF, which could be available if the payable forint amount is assigned by the application of foreign currency selling rate in the contract.*[13]

Notice, that there is no exchange risk in Example 3, b) not even when the refinancing liability is exclusively in foreign currency. This time the proper amount of foreign currency for payment could be obtained from the forint amount on selling rate for the liabilities.

In the previous chapter, enterprises with open foreign currency positions were analyzed in accordance with the balance sheet– typically having surplus at the liability side meanwhile having continuous future foreign currency income in accordance with their contracts.

In this chapter, we analyzed the same situation with the difference that future incoming Cash Flows are expected not in foreign currency, but in forint on foreign currency basis.[14]

The possible solution – to realize the certain amount of expected exchange gain in advance – described in the previous chapter is also applicable here with the restriction that this solution assumes the definition of income conversion on selling rate in the contract as well.

### Annual report and impairment

In connection with the foreign currency liabilities, beyond usual questions regarding loss in value, the exchange rate to apply and the priority of annual foreign currency evaluation have to be defined in the annual evaluation.
According to the accepted widely taught and published view[15], the first step is to determine the *loss in value in foreign currency* in case of foreign currency receivables, which is followed by *registration on book rate*. The last step is the *revaluation* of foreign currency amounts including both the original receivables and the registered impairment. We analyze these issues in the Example 4.

**Example 4: Problems with foreign currency based receivables**
*An enterprise has 100 EUR receivables from a client who will pay for it in foreign currency. The receivable was registered in the books in the current year on 250 HUF/EUR book rate. From the receivable there is no 10% return, which is the 255 HUF/EUR rate applied at year-end evaluation.*

*According to the recommended solution, 10 euro impairment has to be registered on book rate, so 2,500 HUF (=10 EUR×250 HUF/EUR) appears under other operating expenses. Following this, the net book-value of receivable will be 90 EUR, the revaluation difference of it will be 450 HUF (=90×(255-250)), which appears under the other income from financial transactions – if the summarized exchange rate result is a gain, while under other expenses in case of summarized loss.*
*In the next year the value of receivables in foreign currency does not change, because of that the booking of additional 50% impairment was necessary, and the rate was 260 HUF/EUR at the end of the year.*
*Consequently, the sum of additional impairment: 10,200 HUF (+40×255 HUF /EUR, so we define increment in euro on book rate, in this case the one used at revaluation at the end of previous year). Next step is the revaluation of the remaining net foreign currency receivable (50 EUR) resulting in the appearance of additional 250 HUF exchange gain.*
*To sum it up:*

| *Category* | *1st year* | *2nd year* |
|---|---|---|
| *Impairment (other expense)* | *-2,500* | *-10,200* |
| *Exchange gain* | *450* | *250* |
| *Summarized effect on profit and loss* | *-2,050* | *-9,950* |

The method considers impairment as a foreign currency item, just like the receivable itself that was impaired.
In my opinion, this consideration is well established from the side of financial reality as well: when the payment of a receivable becomes doubtful, we "waive" - not legally -the estimated unpaid part by booking impairment, so we realize its loss. The conclusion also means that in the future we do not wish to bear further losses regarding this impairment - in the example concerning 10 and additional 40 euros. Exchange rate change would cause such a loss that we would like to exclude it, so we take into calculation this impairment at the asset side of the balance sheet decreasing the position.
This solution only partially reflects the previous train of thought. On the one hand, it is in accordance with the principle since only the net receivable is revalued after registering the impairment, so additional exchange earning does not appear in the books.
On the other hand, impairment was booked at a previous book value, which contradicts the principle of true and fair view: the impairment loss is born the moment it is registered - at least based on the financial thinking - so the registration of it should not be on a past rather than a present rate.
At the same time, we have to say that applying past exchange rate absolutely suits the principle of going concern as the basis of the act on accounting. The evaluation on cost value of assets is the consequence of this principle and as result we register assets on their original price until canceling. This approach is overruled at several points by the law even in case of enterprises not applying fair value measurement. On the one hand, it allows to valorize assets by value correction, on the other hand it makes booking of impairment obligatory not only in case of receivables but in case of tangible assets and inventories as well, if their book value permanently and significantly exceeds their market value.
However, the law makes an exception in case of foreign currency asset parts because of their nature, the volatility of exchange rates and the handling method of risks in them, it prefers the principle of true and fair views i.e. the application of year-end rate.

Since marking **impairment** is a duty related to the periodical closing, the cost value should be the **due date exchange rate**. We analyze the effect of the recommended method through the Example 4.

*According to the proposed solution, first the gross receivable has to be revalued; as a result, an FX-gain of 500 HUF (=100×(2550-250)) appears in the earnings of financial transactions. After this the 10 euro impairment could be accounted, now on due date rate, so 2,550 HUF (=100 EUR×255 HUF/EUR) appears under Provisions.*

*In the next year the value of receivable in foreign currency does not change; because of that the accounting of additional 50% impairment was necessary, and the rate was 260 HUF/EUR at the end of the year. As result of it, in the new annual revaluation there is an additional 450 HUF (=90×(260-255)) exchange gain marked, and the sum of impairment to book is 10,400 HUF (+40 EUR×260 HUF/EUR).*

*To sum it up:*

| *Category* | *1st year* | *2nd year* |
|---|---|---|
| *Impairment (other expense)* | *-2,550* | *-10,400* |
| *Exchange gain* | *500* | *450* |
| *Summarized effect on profit and loss* | *-2,050* | *-9,950* |

It is clear, that although the structure of the loss had changed, the solution above leads to the same total loss as the commonly accepted method.

In my view, the second solution reflects the situation better and it is more consistent since, in accordance with it, the impairment is booked always on daily exchange rate, while in the first case either on original rate or on any later balance sheet date rate, if the receivable had been still in the books for more than a year.[16]

Reserve due to the uncertainty of receivables has to be booked as negative signed item – impairment – at the asset side of the balance sheet. This has not always been so in Hungary. Even in the history of act on accounting, there was a solution that required not the reduction on the asset side, but the appearance of a new item on the liability and equity side of the balance sheet, called provision. In this case, the exchange rate of creating a provision was obvious since it was about booking a new passive, which has to be registered not on an exchange rate of an already existing asset, but on the actual daily rate.

Impairment booked on foreign currency receivables is also in the same currency, hence it is taken into consideration at the determination of foreign currency positions – this way creation of impairment affects the position, which reflects in the books as well.
The question is whether this point of view should be applied also in the case of *foreign currency based transactions*.
There are foreign currency based transactions where the type of the applicable exchange rate is laid down in the contract[17], but the due date of the conversion is not, so it could not be determined in advance on what exchange rate should the installment be converted to Forint, meaning that the particular amount of foreign currency is indeed a foreign currency until paid. This means that the evaluation of this type of foreign currency based transactions – including the description at accounting of impairment – is the same as settled at exclusively foreign currency transactions.
At another type of foreign currency based transactions – as we claimed before – the contract could possibly contain the day when exchange rate on which the debtor is obliged to pay the converted Forint amount. In the case of such foreign currency based transactions, it turns out to be a Forint receivable on exchange rate of due date- typically on selling rate. The consequence of this solution is that such receivables are not actually foreign currency ones; at due date or at the end of their term, they become to be determined in Forint. Consequently, their impairment is also not in foreign currency but in Forint during the whole tenor of the deal. This is true both for receivables already translated into Forint at their due date and receivables due in the future, hence still in foreign currency. To prove my statement, here is the following example:

**Example 5: Loss in value of foreign currency based receivables**
*An enterprise gave a 1000 EUR foreign currency loan to one of its partners. Half of it is due on 30, October, and the other half is due on 30, April of the next year to the due date, in forint. The cost value rate is 250 HUF/EUR, the selling rate at due in October is 260 HUF/EUR, at annual evaluation it is 265 HUF/EUR, and at the final due date it is 254 HUF/EUR. The enterprise refinances the transaction out of a foreign currency loan, with the same timing as the timing of the asset side's item. The enterprise creates a 20% impairment at the balance sheet date for the 500 EUR receivable due in the future, since the debtor paid the first installment 50 days overdue.*

*In the case of the impairment created in foreign currency, the open position of the enterprise determined by the financial statement according to the act on accounting will be the following:*
*Assets: 500 EUR receivable due in the future- 40 EUR impairment,*
*Liabilities: 500 EUR liability, due in the future.*
*The enterprise had not had an open position before the booking of impairment, the value of euro assets and liabilities was the same. The position virtually opened by registering the impairment, and the enterprise got into the exchange risk that it wants to avoid. According to the book that reflects the financial reality, the position has not opened since the company can still expect 500 EUR FX-gain from the debtor as the contract says. If the receivable is lost indeed (cancellation, factoring), the forint amount due is calculated on actual selling rate; this way there will be no exchange loss, instead the credit loss increases.*
*In the case of hedging a seemingly financially open position on due date exchange rate, it means that it fixes the rate of the generated 40 EUR impairment so that it surely realizes 10,600 HUF loss. In case it converts the receivable to forint on due date on 254 HUF/EUR rate, it becomes obvious that the hedging transaction, according to the year-end impairment estimation, was unnecessary, because that did not avoid exchange rate risk, but brought it into the operation of the enterprise.*
*In point of this unsettled 500 EUR, the enterprise did not have any exchange risk – the hedge is built into the credit transaction.*

The deduction above attracts attention to that, though receivables with due dates after the year-end of foreign currency based contracts have to be revaluated in the balance sheet using the year-end foreign exchange rate and should be taken into consideration at the determination of foreign currency position, whose starting point is usually the accounting data, in the same way as exclusively foreign currency receivables, but impairment of these transactions has to be handled separately.

## Summary

The article proves that accounting rules of foreign currency asset items follow the changes of the economical environment and the changes of enterprise reality determined by it – they try to give proper answers to the revealed problems by the modification of regulations.
The answers could be supported in different degree with theoretical considerations. While in the case of applicable exchange rates the updated act on accounting is acceptable and reflects reality, the deferral of unrealized exchange loss seems to be a partial solution.
It is proved that the same handling of foreign currency and foreign currency based transaction does not distort the true and fair picture, but direct application of it in the determination of the enterprise's foreign currency positions could be misleading – respectfully to the impairment of foreign currency based transactions.

## Notes

[1] In the case of forint loans, the impairment was far more unfavorable: from 2.2% in 2006, it increased to 7.6% for the first half of 2010. The degree of increase however lags a little bit behind the increase of foreign currency loans' impairment, while forint loans take up less than a third of total loan portfolio – and there is no special accounting consideration about it since changes in exchange rates do not affect it.

[2] Act XCIII, 2001 made the total liberalization possible, for the preparation of it, they broadened the intervention zone in March, 2001, which was ±15% from this time until it was terminated in February, 2008, although the pre-announced sliding devaluations were terminated already on 1st October, 2001.(Source: http://www.mnb.hu/Statisztika/statisztikai-adatok-informaciok/adatok-idosorok/vi-arfolyam/ftleert-2003 )

[3] This also means that the explanation of Act C, 2000 reflects not the actual motivation but its superficial version, even if it is relevant from the applicable exchange rates' sides.

[4]The open position is calculated data in the balance sheet, but if the enterprise has off-balance sheet assets and/or liabilities, those also have to be included in position calculations.

[5] In the case of surplus at liability side, the conversion of forint assets to foreign

currency, or the conversion of foreign currency to forint could be a hedge appearing in the balance sheet. The effect of the above-mentioned directly appears – through the balance sheet – in the financial statement, while in the case of hedging with derivatives, their effect reflects only in the profit and loss statement.

[6] Here I do not use the term significant in the meaning of act on accounting.

[7] This statement primarily reflects my faith in accounting profession: I assume that the reports are audited, support the true and fair view in every case.

[8] Such enterprises are e.g. international logistic companies.

[9] Purpose of accounting is certainly not the handling but the presentation of risks. These enterprises got into the situation when their risks are exaggerated in their financial statement prepared according to the accounting rules; that is why accounting regulations have to be adjusted to reality.

[10] Methods of determining position in such cases and applicable hedging strategies will be discussed in my next paper.

[11] I list here the modifications of IFRS 9 being already in force, and the layout of leasing standards that is intended to come into force instead of IAS 17 to this point.

[12] The detailed regulation has changed many times, lawmakers considered experiences gained through practice and made corrections.

[13] These types of contracts are signed typically by those financial enterprises (not banks) that finance their receivables not of their own incoming Cash Flow – since they do not have the right for cash collection – but of the refinancing loans that they got from commercial banks. Since the effective financing and repayment happen in forint, even if foreign currency based, the financial enterprise applies for the same kind of loans from the refinancing bank.

[14] Typically, these enterprises are e.g. the office buildings which can pay their installment of foreign currency based loans taken for the construction from their future euro based rental incomes.

[15] This opinion appears in the 1.4 Chapter of Hungarian Accounting Chamber's accounting educational publication as well. Author: Jozsef Roth.

[16] In the first example, the impairment created in the year when the receivable was booked appeared in the books on rate 250, while the next year impairment appeared after the first revaluation; that is why it reflected the particular daily rate. If the enterprise chooses to make a monthly revaluation – which could legally do that, and according to regulations of its parent company, it is usually obliged to – we almost reach the second solution.

[17] Typically selling rates.

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# INNOVATIVE FINANCING OF ROAD INFRASTRUCTURE IN THE EUROPEAN UNION

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*Infrastructure, particularly transport infrastructure investments are often seen as drivers of the economy. The road and rail infrastructure development projects both in theoretical and empirical approaches can stimulate economic growth, increase employment, attract capital, promote regional development and competitiveness – even though we can also meet the opposite opinion and ambiguous evidence in the economic literature. This research is paying special attention to the financial innovation (public-private partnership and the active role of private capital) in infrastructure in the European Union and introduces the experiences of some member states. European countries are no exception from the ongoing and continuously increasing process of indebtedness. In spite of the lack of state resources, governments still wish to play the challenging role of infrastructure provider in order to satisfy the high infrastructural needs. That is why it is essential for them to cooperate with the private sector, which has a growing share in design, construction and operation of infrastructure – recalling the experiences of the 19th century.*

**Keywords:** infrastructure, public-private partnership, EU
**JEL codes:** H54, E62, H81

## 1. Introduction

Private investors can often provide surprisingly innovative solutions for complicated social problems. Of course, these new technologies are good business opportunities as well. Just think about telecommunications companies who have speeded up the use of a microwave transmitter stations and have built up cellular networks providing numerous data services at the same time. Such technological innovation at first glance does not seem to be common in road construction, but we find very creative projects (Small, 2010) such as A86 outer ring road around Paris, where a *tunnel under the Versailles palace has been constructed to reduce congestion*. An automatic data collecting system is used for interactive traffic. The data is forwarded to a traffic directing centre for

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the quick and effective directing of incoming and outgoing vehicles. Major technological innovations have been implemented by private companies regarding toll collection, too. *Innovation can also be seen in the field of financing:* there is cooperation between enthusiastic private companies and (often indebted) governments.

This process dates back to those decades, when millions of kilometres of roads were built worldwide and *road transport had an overwhelming advance* compared to other transport modes. At the same time, satisfying of growing demand for fast, flexible and convenient transport is often subject to political and economic considerations. The construction and maintenance of road networks are assumed to have an effect on stimulating economic growth, increasing employment and improving competitiveness as well as enhancing the ability to attract capital.

This can also be seen in the European Union (EU) where roads have a more than 70% share not only in passenger transport but also in freight transport (ERF, 2010) (see annex No.1). The EU has many objectives regarding transport in general and in road transport in particular. To reach the aims a lot of measures and steps have been taken by the EU that are introduced in the next chapter as a legal background for public-private partnership (PPP). In the third chapter we will see some successful and unsuccessful European examples – highlighting major risks and opportunities. Finally, the study finishes with the summary and concluding remarks.

## 2. Early objectives, slowly evolving measures and instruments

The conception of *Trans-European Networks was first mentioned in the Treaty of Rome* (1957). After, there was not considerable attention paid to transport policy for several decades, even though in 1985 a White Paper referred to transport networks as a significant obstacle to the establishment of the Single Market (COM, 1985). *The next milestone* in European infrastructure policy *is the Treaty of Maastricht* (1992), in which the Member States declare their commitment to Trans-European infrastructure networks (129 b-d), stating that the Community supports the national financial efforts, particularly through feasibility studies, loan

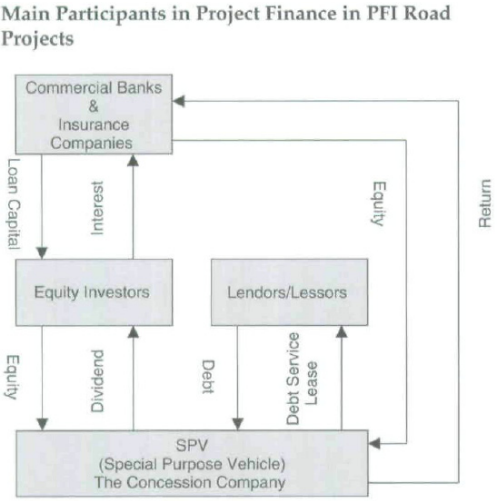
guarantees or interest subsidies. The Treaty distinguishes the following groups of Trans-European Networks: Trans-European Transport Networks (TEN-T), Trans-European Energy Network (TEN-E) and Trans-European Telecommunications Network (eTEN).

*Common Transport Policy (CTP) was set up in a White Paper* (COM, 1992) in line with the Treaty *but the question of infrastructure financing was still not answered*. In 1993 the Council rendered a decision (EC, 1993) in which Trans-European Road Network (TERN) was established within TEN-T. This current essay is paying attention to this and *focusing to the financing of European road investments*. In 1994 *Cohesion Fund was set up* in Regulation No. 1164/94 (EC, 1994) that also provides financial support for TEN-T projects. It is available for those member states whose gross national product (GNP) does not reach 90% of EU average.

The *detailed legal basis for financing transport networks was elaborated in Council Regulation* (EC) No 2236/95 (EC, 1995) emphasising the essential role of private capital in TEN-T funding. Granting of Community financial aid was *further developed in Regulation* (EC) No 680/2007 regarding: grants for studies or works; grants for works in the framework of availability payment schemes; interest rate rebates on loans given by the EIB or other public or private financial institutions; loan guarantee instrument; risk capital participation for investment funds; and a financial contribution to the project-related activities of joint undertakings (EC, 2007).
The above mentioned tools and opportunities were *supplemented in 2011 White Paper* (COM, 2011) according to which better coordination of the Cohesion and Structural Funds with transport policy objectives is needed. The *internalisation of external costs and infrastructure use charges* could be used, which could create additional revenue streams making infrastructure investments more attractive to private capital. The *EU project bonds* initiative – as a new financing instrument – in a Special Purpose Vehicle (SPV), can support PPP financing on a bigger scale. This could be achieved by using the EU budget to support projects to the extent required to enhance their credit rating, and thereby attract financing by the EIB, other financial institutions, and private capital market investors like pension funds and insurance companies (COM, 2010). The relationship of UK road infrastructure as an example of PPP

in a SPV is introduced in Figure 1. Typically 90% of the total anticipated finance requirement is provided by bank loans and the remaining 10% is provided by the SPV shareholders (the construction company, the operation company, the facility management and maintenance company) (Akbiyikli *et al.*, 2006).

Figure 1 *Main participants in project finance in PPP road projects*




Source: Akbiyikli et al. (2006: 70)

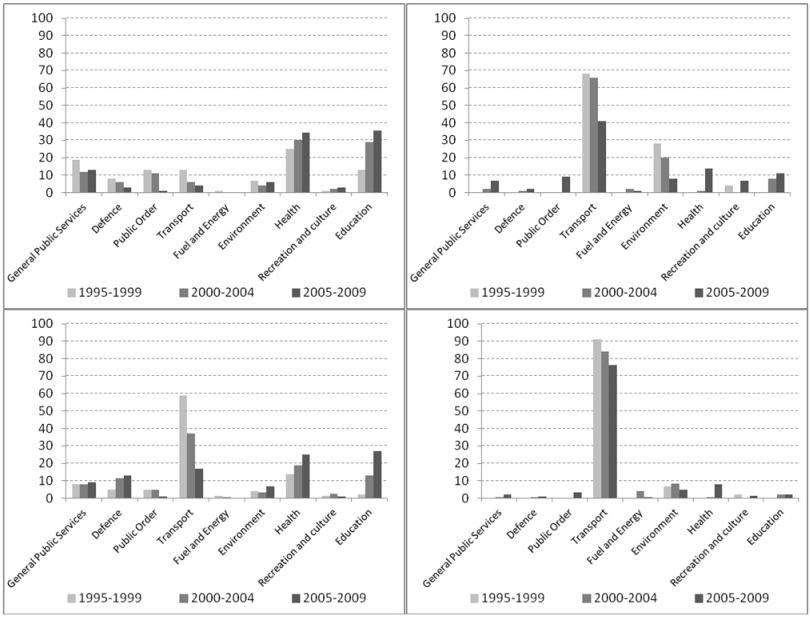
The distribution of infrastructure investment between modes (see annex No. 2.) represents the source allocation being in line with transport needs: from 1995 road investments represented 2/3 of total infrastructure investment in Western Europe, while in Central and Eastern Europe there is a growing proportion up to 2005, but also in 2008, road investments take nearly 80%. The question arises: *is the EU's extensive support system for project financing useful and efficient, and why it seems attractive and / or necessary for private capital to take part in these projects*. This is examined through case studies in the following section after the introduction of cooperation of the public and private partners.

## 3. Public-Private Partnership: success and failure

It can be seen from the second half of the nineteen century that the governments' size and their spending remarkably increased. In the 1870's the public spending amounted to about 10% of GDP, but this number reached 46% by 1996 with the introduction of Marxian thinking, the Great Depression, the step back of laissez-faire policy, the world wars and the emergence of the welfare states, (Tanzi and Schuknecht, 2000). The *growing and oversized governments* often have not had the necessary potential to meet the expectations and they have had to realize *fiscal shortages and high debts*. Beside the lack of sufficient public capital, the *low efficiency* and standard of the provision of public goods and services are the main motivations for the involvement of private capital (Báger *et al.*, 2007).

European countries are no exception from the ongoing and continuously increasing process of indebtedness: in 2007 the government deficit to GDP ratio was 0,9% and government debt to GDP ratio was 59% in EU27, but in 2010 these ratios increased to 6,4% and 80%, respectively (EUROSTAT, 2011). Obviously, not the current crisis is the main driving force for the public and private cooperation, as the applicability of PPP-s was also highlighted in 1990s. Undoubtedly, alternative solutions are needed to find funds for the meeting of the requirements of the secure, enlarged and high quality European road network. *PPP seems to be a shelter that* – as we soon see – *can be a solution but it is not a remedy*.

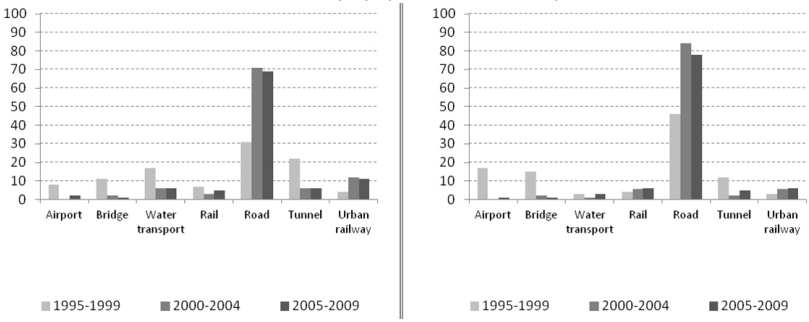
Figure 2: *Breakdown of PPP investments by sectors in the UK and in the EU (%)*




Source: Kappeler and Nemoz, 2010: 11-12.

The Figure 2 shows the breakdown of PPP investments by sectors regarding the number (upper diagrams) and investment value (lower diagrams) in the UK (left) and in continental EU (without UK) (right). In the UK regarding transport sector there is a sharp drop not only in the number of projects but also in the value, moreover, transport significantly lost its position compared to other sectors between 1995 and 2009. Despite of the similar tendency, the situation is somewhat different in the EU where the concentration of PPP investments remained. The breakdown of PPP investments by sub-sectors within transport in the EU (%) (without the UK) on Figure 3 shows that number (left) and the value (right) of road investment projects nearly doubled from 1999 to 2004. This remarkable increase was followed by a solid decrease owing to the crises.

Figure 3: *Breakdown of PPP investments by sub-sectors within transport in the EU (%) (without the UK)*




Source: Kappeler and Nemoz, 2010: 11-12.

The United Kingdom had a dominant role in developing and dispersing PPP programs. Already in the 1980s the private sector came to the front on areas where previously the services were state delivered and in 1992 the first Public Finance Initiative (PFI) project was launched within institutionalized framework. *The cooperation was motivated by the „value for money"* (VMF) and higher quality standards besides the *fiscal austerity* due to Maastricht convergence criteria (Harris, 2004). Another argument is *„meeting the investment challenge":* 70 percent of non-PFI projects were delivered late compared to only 20 per cent of PFI projects; and 73 per cent of non-PFI contracts ran over budget compared to 20 per cent of PFI projects (HM Treasury, 2006: 16).

In 1994 there were several PPP project in the UK among them 10 major high value road investments of which 8 were launched during 1996-1997 in a value of £ 590 million representing 35% (!) of new road investments between 1996-2001 (Stafford *et al.,* 2010). For the evaluation and for the examination of cost efficiency of these 8 pilot projects *Public Sector Comparator (PSC) can be used.* It is a comparison of net present values of a project to see in which case „value for money" is represented: when it is PPP implemented, or, when by the government (Báger *et al.*, 2007).

UK roads No A30/A35, A50, A 19, A1(M), A419/A417, A69, M40 and

M1-A1 were constructed in Design-Build-Finance-Operate (DBFO) conception (a kind of PPP), for 30 years. Bain (2010) used the PSC and did an ex post evaluation and concluded that, although the use of today's recommended test discount rate of 3.5% reduces the value-for-money from seven of the first eight PPP roads, the programme as a whole remains value-for-money from the public procurement perspective. On the other hand, lack of *accountability and transparency overshadow the success of these projects* (Edwards *et al.*, 2004).

Just a few years after the first UK PPP road projects started, the high value, 560 km long A1 motorway project was launched in BOT scheme in Poland in 1997. Private partners were asked to join the project but *the government wanted them to take the total traffic risk*. This means that the revenue would solely depend on the tolls from the vehicles that use the motorway. At that time, *tolling risk was not predictable* as Poland did not have a history of how drivers would react to having to pay tolls to use a new road. This proved to be a reasonable concern; for example in Hungary M1 motorway was completed on schedule and on budget in 1995, but initial traffic volumes were 40% lower than anticipated. Finally the Polish government and the financiers for A1 motorway agreed to *use shadow tolls*. The initially proposed cost was $ 1.2 billion that was almost 1 % of Polish GDP in mid 1990s and it was not affordable, that is way the motorway was split into two sections (it made the financing easier). The situation was also difficult for the lack of appropriate legal background, more precisely: the relating legislation did not exist in 1997. The *time consuming legislation* process finished in 2004, so it took seven years to finalize the documentation and sign the contract, which could not have been viable without the *patient behaviour of private sector partners* (Underhill, 2010: 30-31).
The third project is the German A5 motorway – as part of the TEN-T – with 30 year duration (2009-2039) and with 59.8 km length, within the framework of the A-Model[1] that includes design, construction, operation, maintenance and finance. The concessionaire will gain revenues from the "Toll Collect" truck toll system, based on real heavy goods vehicle traffic numbers on the concession. The consortium is led by Vinci. The successful "Via Solutions Südwest" SPV includes Vinci Concessions, Meridiam Infrastructure, Kirchhoff (subsidiary company of Strabag). A major constraint for the bidders was the public sector pres-

sure to hold their original bid price, in changed market conditions, besides, they had to *take a high traffic risk* as well (Uppenberg, 2011). At the same time, the project has a *robust and secure financial background* having the support of EIB in the form of Loan Guarantee Instrument for TEN-T Projects (LGTT) [2].
Now the motorway is under construction with a 2014 completion date so there are only limited experiences. The high commitment of stakeholders remarkably represents that the financial background can set up quickly: only two months were needed after the contract was awarded (Uppenberg, 2011: 46). However, the success of a project does not depend only on funding as we can see in case of Warnow tunnel[3].

The 730 m long Warnow tunnel was one of Germany's first tolled roads. Bouygues, and ETI Macquairie together contributed 20 % of the € 219 million construction costs as equity. 68 % were financed as a loan by a banking consortium led by Deutsche Bank, NordLB and Kreditanstalt für Wiederaufbau (and guaranteed by the European Investment Bank). The remaining 12 % were state aids from the EU's TEN programme (€ 8 million), the Land Mecklenburg Vorpommern and the city of Rostock. 20,000 cars per day would have been needed to cover investment costs, but *the actual number of users was around 50 % short of the profitability threshold*, moreover the traffic growth rates were decreasing. That's why in 2004 the banking consortium announced to go bankrupt because of the low traffic volume. After a 2 year negotiation process the parties agreed to prolong the concession period by 20 years to a total of 50 years and the tolls were changed, too. But *what was the reason for the serious failure*? The possible explanations include:

- Private investors had to face higher interest rates than the government could have because of lower ratings[4];
- better allocation of demand and political risks between the public and private partners would have been needed (construction of a toll-free (tax-funded) road parallel to a previously built toll road can significantly decrease the traffic of toll road);
- demographic and socio-economic trends cannot be ignored, e.g. Rostock lost 20 per cent of its inhabitants during the first decade after reunification due to high unemployment rates.
- high reluctance of potential users to pay toll even if the additional costs of by-passing the toll road (time, fuel) often exceeded the toll.

## 4. Old problem and old solution: financial innovation from the 19th century?

The introduced projects have more common features which are generally true for road PPPs. The most remarkable is *long duration to which the political risk is directly proportional and transparency is in inverse proportion*. Shifts in governments and political forces during such a long period – in spite of the fixed contractual terms – provide a less predictable legal and economic environment that is further *complicated by demographic trends, or changes in traffic manners*. These together can undermine the success of a project through the increase of demand risk. To reduce such risk, the *EIB introduced the LGTT* but its experiences are rather shallow, even if it facilitates financial viability and helps avoiding white elephants (valuable but burdensome and useless infrastructures).

The single European transport area is essential for the indebted member states and for the EU but apparently a huge effort is needed in the field of coordination of projects in general and in finance in particular. *The cooperation of public and the private sector seems to be inevitable*, so the current public-private partnerships and investments should continuously be monitored because it can help providing *transparent and rational institutional frameworks* for future road constructions not only for governments and private investor but also for users and taxpayers. Surprisingly, it is worth go back in time because it seems as if history repeats itself this time, too.

In the 19th century in North-America private capital was exploited to play significant role in huge railway construction projects to avoid and mitigate bureaucracy. Contemporary government also was essential but its intervention often created more difficulties – instead of solving the problem – because of the inadequate operation of the public sector and the wasting of public capital resources (Eichengreen, 1995). In the 1830's in Belgium an extended railway network was built and financed by the state to stimulate export and trade. But after the main lines were constructed by the state, the side lines and supplementary tracks were accomplished by private constructors. Similarly, in Germany: in some cases state owned companies, in other cases state subsidized private companies and in some special affairs the cooperation of the two were

the owners and in charge for the operation. In 1836 in Czech areas the railway age started in a concession form, but after a few years the government took over the construction. In the next decade there were financial difficulties, therefore the rail network was continued by the private sector again (Cameron, 1998: 251-252).

The partnership and the battle of public and private partners date back a longer time than we would think at first sight, so interesting lessons can be drawn from contemporary experiences as well. At the same time we can conclude that *the system of partnership* has became more sophisticated and modern through decades and centuries so it *is not the financial innovation of today, instead it is a revival of an old solution for an old problem.*

## Notes

1 In Germany PPP is regulated in the 2006 amendment of Fernstraßenbauprivatfinanzierungsgesetz (FStrPrivFinG), distinguishing between A-Modell-t for roads, motorways and F-Modell for other infrastructures (bridges, tunnels) (Straßenbaubericht, 2006).
2 „PPPs for TEN-T projects in which the private sector takes on risk relating to the possible variations in demand often face difficulties in attracting competitively priced private financing. The LGTT is a guarantee facility that helps by partially covering these risks by making up shortfalls in revenue that result from lower than expected traffic growth in the early operational periods of projects. In this way, it improves the financial viability of a project and its overall credit quality" (COM, 2009, 9).
3 The introduction of Warnow tunnel project is based on Knorr *et al.* (2008).
4 Then the LGTT that could increase credit rating, was not available.

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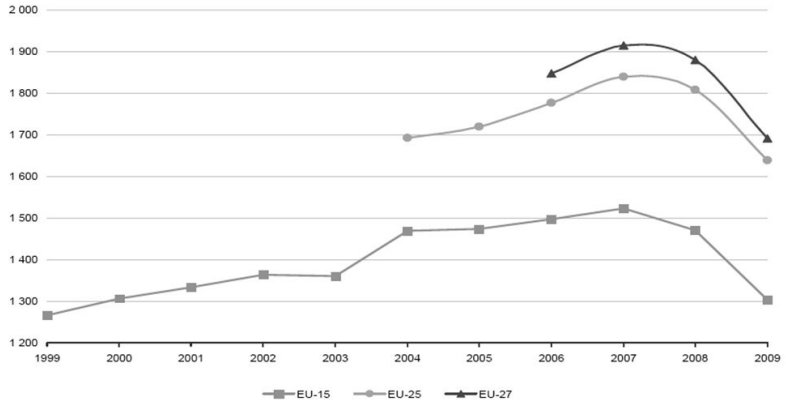
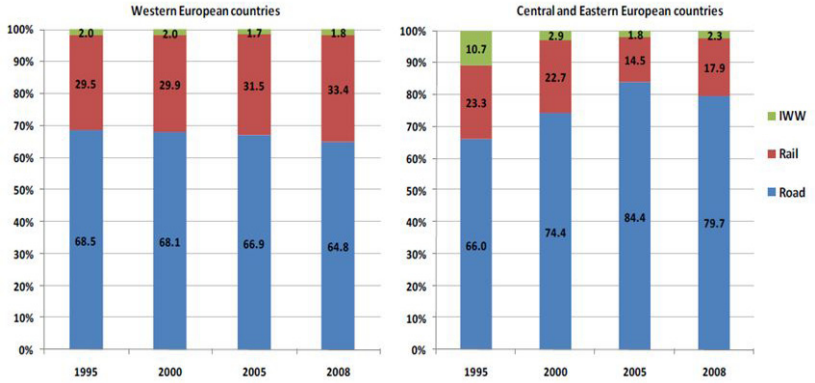
Annex No 1. Evolution of EU annual road freight transport, 1999-2009 - billion tkm




Source: Wrzesinska, 2011: 2

Annex No 2. Distribution of infrastructure investment between modes, selected years




Source: International Transport Forum, 2010: 5

# HOW TO PAY ATTENTION TO AVOID AND OVERCOME THE RISK OF AN INVESTMENT FOR A TRAVEL OPERATION?

István TALABOS*

*There are definitely different risks for the companies during their operation. The travel agency business is not an exception. There are risks occurring during the life cycle of a company. Whenever a travel agency decides to introduce an ERP system to support the everyday operation the aim is to be more efficient and cover all the requirements there are several questions to answer.*
*The first question is how long will the project take, how much will this investment cost, what will be the benefits, would it cover all the needs etc. Among the questions to be answered there is it a right time to invest?*
*One of the main question will be not only which ERP – SAP, ORACLE, J.D. Edwards, NAVISON etc. – system to choose but will it help, will the operation be more efficient, can we measure etc.?*
*The paper highlights the problem areas and also makes a suggestion for the travel operations how to avoid i.e. choosing ERP system the focus should be not on the ERP but on the business process of the travel operation.*

**Keywords:** travel agency's requirements, travel agency operation, efficiency, business content, risks measuring the success
**JEL codes:** O33, O40, O47, O49

## 1. Introduction

In today's economical environment, managing a business processes and to make a company successful is extremely challenging. In order to become successful and lead a company to success means that the management, the managers need the maximum information possible to achieve for taking decisions and more competences than before.
Success requires more careful investigation and a more proactive engagement. It is also necessary to be more innovative because the business processes are more subtle and dynamic particularly in terms of additional factors such as a technical development is changing very rapidly.

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Globalization affects the business risk factor in determining what potential challenges may arise in the future These risk factors relate to the following but not exclusively eg.*: financial related risk due to the change of exchange rates or the credit period becomes longer, cash flow and liquidity related etc. Many companies fail due to underestimating the working capital requirements*
The aim is to "handle" the risks to avoid or minimize the potential loss (Feher, 2008). Technical development has a serious effect on the economy and its development and also means that there are new trends in customer behaviour leading to the change in business processes, marketing activity and also the information system (IT) used in order to evaluate and control the activity.
Every company must also pay attention to the macro level risks that can relate to *political, economical, and human activities,* but in order to control the business processes and support the decision making process both operationally and financially we need to have a subtle Management Information System (MIS) supported by information system and technology in the small and medium enterprises (SMEs).

To use an information system (IT) to support the everyday operation might become essential very quickly after setting up a company. The need to support and help management by IT is obvious when the company starts to grow and the management devotes more and more time to evaluate and understand the present situation and answer the question: Where are we, where should we go, what should be the next action. It is specially becomes obvious without any question when the management asks the same information from the different sections of the company awaiting the same answer but in the reality the answers are different.

In order to make the right decision the management needs up to date information but it is very difficult to get valuable information about the SMEs as they do not have in the majority of the cases IT supported MIS. The MIS usually is considered the "head" of the owner (Nemethy, 2011 p 15).

More difficult is the situation in the New EU Member States (and those in the process of applying for EU membership). Here the legal environ-

ment has not been developed as in old EU Member States. It means that the legal environment is not yet adaptable to handle the leftovers of the old system and the "black economy". Although it must be not forgotten that even in Western Europe the black economy is thriving! If the management faces situation like this it means that the company had already grown to that level when a single, homogenous IT system must be used by everyone meaning that everybody uses the same database. Using the same database and system by the entire firm creates the possibility to become more competitive.

## 2. Requirements of an ERP

The majority of SMEs (approx. 90 %) use some kind of business application in order to support the daily operation and increase their competitiveness. These business applications however, are not always integrated with the other systems of the companies.
There is a tendency all over the world that companies try to solve their needs with one piece of software. The main focus is in the majority of the cases on the daily operation but the daily operation is business oriented, meaning to serve and meet the daily requirements and serve the clients. To create and build a system based on the processes and managing the risks is not easy at all but it is impossible without the information technology support (Feher, 2008).
Integrated information systems are usually used by companies in case they feel that one of the business processes or activities needs to be supported by Information Technology. Therefore, they concentrate on stock management, invoicing or human resource management.

In Hungary 30-40 % of the enterprises use Enterprise Resource Planning (ERP) system. There are many companies where the IT system is used specially for them customised system has been developed (HVG, 2007). It is obvious that competitive advantage can be achieved only in cases where processes are optimized. Therefore companies realizing this understand and try to choose an ERP system to meet all their needs.

*2.1. Standard needs/requirements of an ERP*

The standard needs of and ERP are: financial, controlling, material and asset management, cash-flow management, liquidity management, and industry specific needs. Whenever an ERP system is chosen the management looks how the industry specific needs are met, that means how they are solved, how the ERP system supports and answers the industry specific needs. The industry specific needs must be covered. Some of the industry specific programs are quite general but some of them are very much customised.

The aim user is of course, to have everything „at one place" i.e. feeding the information in only once, and get the necessary information from one single central database.

It is also an advantage and advisable to have as a must, an ERP system that is modular (Lengyel, 2010; Gyarmati, 2010), and easy to learn and operate with low operating costs.

*2.2. The main requirements*

The ERP should support all the activities and processes of the company i.e. purchasing, selling, financing, controlling, marketing, planning etc.

The management has special requirements like: to support decision making, to provide statistical information for decisions, planning, to gain financial indicators on different levels, to serve the MIS, to provide information for analyzing different departments, to provide information about customers, human resource etc.

*The above mentioned means, that there is a need for an ERP software in order to increase efficiency.*

In 2008 the World Competitiveness Yearbook IMD stated that Austria and Germany are quite efficient the SMEs and big company sector reaching 8 and 7 on a 10 grade scale. Hungary reaches the same grade in the SME sector as Austria and Germany but in the big company sector is lagging behind. Czech Republic, Slovakia and Finland together with Slovenia reach 6 close to 7 in both sectors (See Appendix 1).

The efficiency of the companies (SMEs and big) are in line with the ERP system. McKinsey having made a research in Austria, Germany and in Switzerland, and their study showed evidences that in 22 months the invested amount is returned and obtaining information is 30 percent more efficient meantime the sales activity becomes 15 percent more

efficient. Speaking about the internet sales that is very important nowadays too and the result is that the efficiency increases by 40 percent, and in case of the Customer sales activity result confirmed an increase of efficiency by 40 percent (Meixner, 2003).

*2.3. Main requirements and System Integration*

*Whenever we decide to invest in an ERP system the aim is to find and lead in a balance between human resource, business processes in order to meet the financial needs and also to serve our clients.* This is what we have to find the right technology for. In order to reach integration of the systems used, any company must take seriously to reconsider the business processes and also the readiness to invest not only in the software but in the hardware too.

At the same time in order to be successful in the future it needs the concept to forget about financials at the beginning but look at the requirements.

*The requirements must be defined precisely in order to be successful in the system integration project in which we have to reach the consolidation of information technology and also the consolidation of different applications:*

- Operation systems
- Networks
- Active and passive elements
- Software
- Hardware
- Databases
- To reach configuration of applications and databases
- To realize communication between different systems etc.

Companies usually do not like and do not want to spend time and money on an IT audit but it is absolute necessary to have a clear picture about the recent software and hardware used and make a decision that how it is able to serve future needs and goals. This is a real milestone preparing the ERP project but in cases the client (the company ready to invest in ERP) and would be ERP developer devotes enough time to prepare the project the success is almost 100 percent.

There are ERP developers offering free 2 day workshops to the client bearing on mind to have ERP. Of course, the implementation of an ERP system it requires an investment from both sides. The client can only

gain spending two days with the ERP developer company's specialists because it becomes clear and obvious what need to be changed. *These workshops are focusing on the business and administrative processes.* These processes must be identified precisely and they are the base of a good ERP development project.
Nowadays, the SOA (Service Oriented Architecture) and the BPM (Business Process Management) are very much used by the SMEs. If we want to have the real best system that meets our requirements the decision should be made not based on the price of the system. The cheapest solution usually comes out to be the most expensive in a medium and long run, not talking about if our needs are not covered as 'promised' (Business IT, 2011).

### 3. Advantages of having an ERP system

- Administration and business processes are automatic
  - Information is fed in once – integrated data management i.e. data there is no different data on different levels and departments
  - Information is structured – many times can be viewed graphically too
- The same information is for everybody – the same information is on all levels
- Integrated data management
- The company is better manageable
- Processes are automated – growing efficiency
- Possibility to serve clients directly on the web (B2C and B2B)

There are not only advantages but there are disadvantages too when the management decides to invest in an ERP. One of the main disadvantages to be mentioned investing in an ERP it comes with supporting the changes. Change in the already well known and used processes, well known application.
*The ERP will require in many cases a new approach with different logic, different workflow, and sometimes it might mean different/changing hierarchy, in the beginning even slower fulfilment of the daily job.*
We have seen companies where the decision of the management was to have regular Windows training for their staff because they were not able

to use the mouse and in another case the employees wanted to prove that there is no need for a new ERP system so did everything to block the change.
These examples show that identifying requirements and future goals are needed but it is only one side of the coin to be successful. The company installing the ERP system must be familiar with the industry, must have experts of the industry in order to understand the needs of the clients".

*3.1. Measuring the value of ERP implementation*

The owners, the management look on and evaluate every investment with the indicator of ROI. Can we talk about and measure investing in an ERP system with ROI indicator?
It is possible but instead of the 'traditional' indicators some other ones must be used for the ERP evaluation.

The META Group has undertaken research questioning 200 companies about the ERP and set up some indicators:

- TCO (Total Costs of Ownership): includes hardware, software, and the implementation fee. This indicator contains the costs of two years operation after implementation.
- ICO (Implementation Cost): ICO are part of the TCO but good to have it separately too.
- TTI (Time to Benefit): this is the time when the first advantage appears since implementation
- Relative TCO: TCO compared to the sales volume

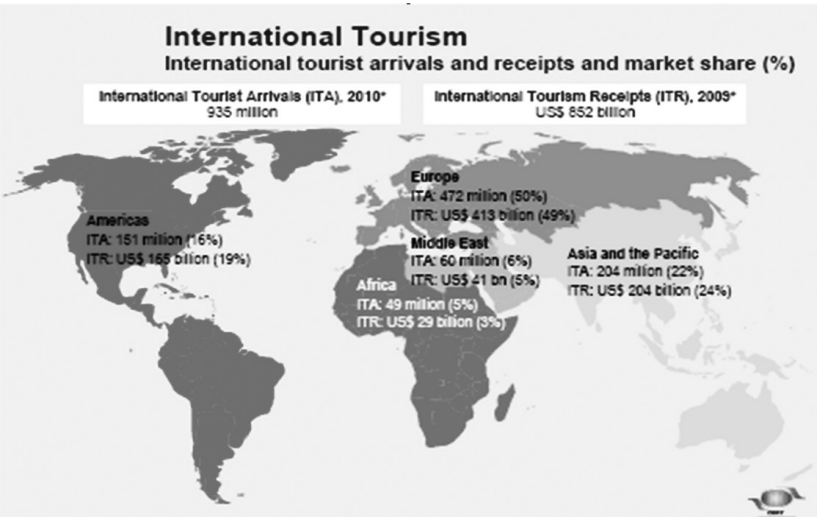
In general we can say that the first real advantage is visible in 27 months after stating the implementation according the research of META Group. On average the full implementation is 20 months and the first advantage appears in 7 months after implementation.

## 4. ERP in Travel Agencies

*4.1. Risk factors of implementing ERP in travel agencies*

Tourism worldwide is an important industry as in 2009 International Tourism Receipts (ITR) reached USD 852 billion and grew to USD 935 billion in 2010 (Figure No. 1)

Figure 1: *International Tourism Arrivals*




Source: Kester (2011)

Tourism is one of the most important industries Hungarian service sector too as the country's ITR totalled at 4.1 billion EUR in 2009 meaning a contribution of 8-9 percent to the GDP and 12-13 percent to overall employment.

With reference to Hungarian legislation according to the Governmental Decree 213/1996 (XII.23) - in line with the internationally used differentiation – makes difference of the tour operator and travel agent. Tour operator is organizing tours and the travel agent sells tours organized by tour operator. In Hungary the word travel agency is used widely meaning that the travel operation company might organize and only act as an agent for other companies.

The number of travel operations meaning enterprises carrying out tour operation and agent activity was 1,212 in 2009. These enterprises in 97 percent employed less than 20 staff. The majority of these enterprises (961 of the 1,212) carried out tour operation and agent activity as well while 129 acted only as an agent and 122 was only a tour operator. Tour operation means 77 percent of the ITR (KSH, 2010).

### *4.2. IT supported systems used by travel agencies*

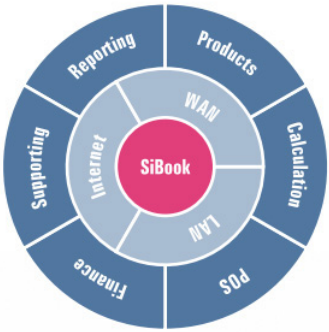
#### 4.2.1. CRS-GDS

Travel agencies (here we understand tour operators only) use different systems to sell their products. One of the „database" they use in case of selling airline tickets is one of the Computer Reservation Systems (CRS) but nowadays the Global Distribution System (GDS) are more preferred in this activity. These ticket systems like GALILEO, SABRE, and WORLDSPAN offer accessibility to airlines schedules, hotels, car rental etc. They definitely need to have access to one of these systems in case they want to sell airline tickets i.e. to be an IATA (International Air Transport Association) agent.

#### 4.2.2. Systems supporting sales activity

There are a few systems that support sales activity of a travel agency. In Hungary Bon Voyage, Y Travel, and „Nagy Utazás (Great Journey) are known and used by the Hungarian travel agencies. In international ticket booking GILBOA and SIBOOK are the most used. They are industry specific 'applications' supporting and helping the everyday operation of the Front Office of a travel agency (Figure 2). However, these industry specific applications support only the sales activity and are not able to give other MIS like to prepare a balance sheet, operating statement, profit and loss statement etc.

Figure 2: *Modules of SIBOOK Travel Agency system*




Source: Brochure of S&T

## 5. Conclusion

Looking at Figure 2 we can see that these systems do not take care of the accounting and controlling system. These systems support only sales which needs to be a very special one as we have different products: inbound, outbound, conference, domestic tours.
The front line system must handle contract types and a travel agency has allotment, rent, charter flights, and hoc etc. contracts. Each product has very special features that have to be followed. Mentioning only one that in order to follow and support selling ski tickets, insurances requires several options. It is noteworthy that those V.A.T. rates in Hungary vary in accordance with the European Guidelines some of the travel agency activities are taxed by 0% V.A.T. and some of activities by 25% V.A.T.

One of the main mistakes could be the introduction of an ERP system for travel agency, which has only one system for every corporate function: sales, finance and accounting. The best is to select on the one hand a right Front Office system that serves 100 % the sales activity and to choose and on the other hand a finance and accounting system, which could be one of the well known ERP systems, that serves 100 % the requirements and have an interface between them to ensure the integration (Appendix 2).

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APPENDIX 1 - Efficiency of companies 2008

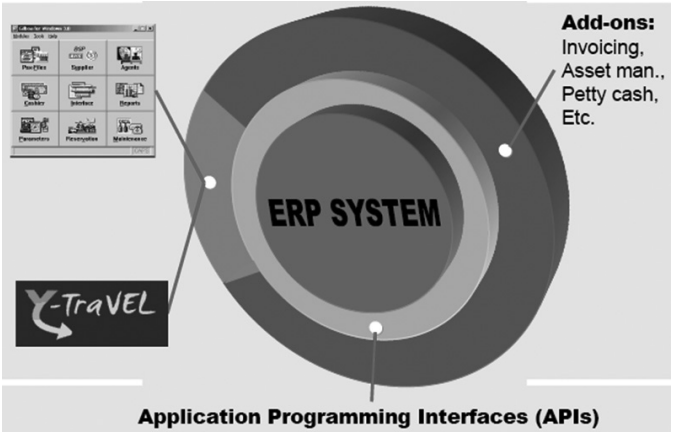

Source: World Competitiveness Yearbook (2008)

*Notes*

**List of countries from the top:** Austria, Hungary, Germany, Czech Republic, Slovakia, Finland, Romania, Estonia, Slovenia, Bulgaria, Poland

1= not efficient 10 = efficient dark blue indicates big companies, and light blue SMEs

APPENDIX 2 - Integration of travel agency's system




Source: Author's presentation on behalf of S&T (2007)

# REAL OPTIONS IN THE ENERGY SECTOR

Vivien CSAPI*

*Given the increasing awareness of climate change and the depletion of fossil fules, the aim of this paper is to study how real options theory can contribute to the determination of "optimal" power generating mix. The goal of this study is to emphasize the multiple opportunities real options give to investment risk management: Real options can be viewed as a way of thinking, as an analytical tool, and sometimes as an organizational process. The findings of the paper enable the selection of possible real options to find the optimal investment decisions in the energy sector.*

*Several methods will be used to develop a better understanding about the specialties of investment decisions in the energy sector, and how real options theory suits into decision making process. These methods include a literature review and the development of a theoretical model. The literature review intends to examine the theoretical background of energy investments and real options and their interface related to managerial flexibility.*

*This paper provides a useful theoretical framework showing how managerial flexibility can be exploited through decreasing the level of (downside) investment risks, and through harnessing the (upside risk) opportunities.*

*The paper provides useful information for the decision makers, and risk managers in the energy sector.*

**Keywords:** investment decision, energy sector, managerial flexibility, real options
**JEL codes:** G11, G17, G31

## 1. Introduction

In the coming years, both the demand for climate-friendly energy generation and the replacement of aging conventional generation facilities will lead to very large capital investments and planning efforts in the utility sector. With these massive investments ahead, the competitiveness of nearly all electricity utilities depends on meaningful ways of valuing these multi-billion euro investments.

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The sector's economic and environmental leading role in climate change is in no danger in the upcoming decades. The economic importance of the electricity industry is likely to grow in the future, as the electricity demand is projected to continue rising, despite ongoing improvements in end-use efficiency. As of the environmental part, the three key factors that are driving the increasing importance of a sustainable electricity industry:

a) ***The deregulation of the power markets*** The electricity sector has undergone dramatic structural changes, moving from a system of monopolies to a mixed system that now creates opportunities for investors that were previously shut out of the generation market. Over the past years the private equity industry took over the most capital intensive sector, as a vast number of investors and venture capital funds have emerged that are specifically targeting sustainable energy technologies as an investment. They invest in a wide range of innovative energy projects all along the electricity value chain. These investments are consistent with strategies to improve the efficiency of power systems or to reduce the use of fossil fuels by switching to more environmentally friendly sources of power (Moore and Wüstenhagen, 2004).

b) **The environmental pressures** As a major contributor to emissions, the electricity sector could achieve substantial greenhouse gas (GHG) reductions - without major impacts on the economy or on consumer lifestyles - through the deployment of low-carbon technologies over the next several decades. At the same time, more immediate emissions reductions can be achieved through lowering demand by increasing energy efficiency; substituting natural gas for coal; expanding deployment of renewable energy based technologies; and through the optimization of the generating-mix. These immediate measures can be expected to reduce electricity growth, expand low-carbon electricity generation, while also reducing emissions from higher-carbon generators (Morgan *et al.*, 2005).

c) **The security needs** There are many different kinds of security interpretations. In relation to energy systems, Mitchell *et al.* (1996) identified three different kinds of threat to security – the threat of sudden interruption, the economic threat posed by a cartel, and the threat of long-term disruption of supplies associated with resource distribution and

depletion. The security driven measures in the industry have increased post 9/11, which means that the first interpretation gives the sector the most concerns. It is felt by many authors that distributed generation can contribute to reduce the risks and costs of blackouts and system failures (Pepermans *et al.*, 2003). The renewed interest for distributed generation, loosely defined as small-scale electricity generation, can be derived from five major factors according to the International Energy Agency (IEA, 2002) i.e. developments in distributed generation technologies, constraints on the construction of new transmission lines, increased customer demand for highly reliable electricity, the electricity market liberalisation and concerns about climate change.

To summarize the discussion above, we can state, that every coin has two sides. The energy sector is not only a villain, it is also exposed to the impacts of climate change, and the consequences of structural changes. The sector is deploying significant efforts to identify, develop and deploy technological solutions, adaptation methods with the objective to contribute to achieving substantial reductions of global greenhouse gas emissions while ensuring security of supply and economic sustainability (E8, 2008).

### *1.1. Risks and uncertainty in the electricity sector*

With the liberalization of electricity markets and the introduction of exchanges, the objective of electricity producing firms has changed drastically. Until the mid-nineties, the monopoly of power supply companies was justified by the existence of a public energy supply and with the existence of a natural monopoly in the field of energy supply. Prices for electricity have been approved on the basis of the cost structure of the utilities, the forecasted electricity sales and a reasonable profit margin for energy utilities. The only uncertainty was the actual demand for electricity and the possibility of technical failures. The understanding of risk was entirely about operational risk that might lead to supply of electricity falling below demand. Electricity producers were obliged to meet this demand with their own generation assets and their objective was to do so at minimum cost. However, energy supply companies are exposed to significantly higher risks than in regulated markets (Möst and Keles, 2009).

As pointed out by many recent books and articles in the new liberalized environment electricity firms face a quite different challenge. Above all, generation companies are affected by changing framework conditions, as they are exposed to different risks from liberalised energy markets in contrast to monopoly. In the context of liberalized markets, risk does not only refer to physical problems eventually leading to an electricity shortage but also price risk and therefore financial risk (Hlouskova *et al.*, 2005). Uncertainties that generation companies now face include the development of product prices for electricity as well as for primary energy carriers (e.g. oil, gas, coal and uranium), technological developments, availability of power plants, the development of regulation and the political context, as well as the behaviour of competitors (see Table 1).

Table 1: ***Risk and uncertainties in the electricity industry before and after liberalization***

| Type of risk involved | | Monopoly | Competition |
|---|---|---|---|
| Technical risk | *Availability of the technology* | ! | ! |
| | *Lifetime of technology* | ! | ! |
| | *Technological progress* | ! | ! |
| | *Social acceptance of the technology* | ! | ! |
| Market price risk | *Electricity price* | Ø | ! |
| | *Fuel price* | ! | ! |
| | *$CO_2$ price* | Ø | ! |
| Volumen risk | *demand* | Ø | ! |
| | *Power plant capacity* | Ø | ! |
| | *Load of power plant* | Ø | ! |
| Regulatory risk | *Government policy* | ! | ! |
| | *Environmental costs* | Ø/! | ! |
| | *Market structure* | Ø | ! |
| | *Political context* | ! | ! |
| Cost risk | *Investment costs* | ! | ! |
| | *operational costs* | Ø | ! |
| | *O&M costs* | Ø | ! |
| Operation risk | *Operations management* | ! | ! |
| | *Failure, break down, shot down* | ! | ! |

Source: adapted from IEA/NEA, 2005; Joode and Boots, 2005; Wiese et al., 2008

In the coming years, both the demand for climate-friendly energy generation and the replacement of aging conventional generation facilities will lead to very large capital investments and planning efforts in the sector. With these massive investments ahead, the competitiveness of nearly all electricity utilities depends on meaningful ways of valuing these multi-billion euro investments.
The producers in the electricity sector face a lot more uncertainty than under the old regime. But there are other special features, that make investment decisions in the industry a more complex task than ever. These include the relative irreversibility of investments, the flexibility of timing investments and the above mentioned uncertainty surrounding the decisions to install power plant equipments.

### *1.2. Risk management*

In principal, there are two ways to take account of risk when considering investment. First, we can mitigate the risk by straightforward methods such as diversification, insuring or hedging. One of the most common ways to deal with risk exposure of investment projects is to 'never put all of your eggs in one basket'. This is a method adopted from finance theory. Modern Portfolio Theory (MPT) was introduced by Harry Markowitz in 1952 with a sole focus on financial securities, has since been applied to several types of assets and industries, including the electricity industry. The theory proposes how rational investors will use diversification to optimize their portfolios. An investor can reduce portfolio risk simply by holding assets, the returns of which show diverging patterns of covariance. In other words, investors can reduce their exposure to individual asset risk by holding a diversified portfolio of assets. If the returns on any two assets in the portfolio have a correlation of less than 1, the portfolio volatility will be less than the weighted average of the volatilities of the portfolio's individual assets (Fabozzi *et al.*, 2002). The practice of diversification and the mathematics of MPT have been employed extensively within the arena of financial risk management. More recently, their application has been extended to other industries, including electricity.

The analysis of return and risk, the principles of diversification and the identification of, and selection among, efficient portfolios all have application to the physical assets, particularly the generating assets, compris-

ing an electricity system (Ringer *et al.*, 2007). Applications of MPT to the power generation sector enable policy makers and electricity supply system analysts to consider the mix of power generation technologies by performing portfolio analysis. A key distinctive feature of the portfolio analysis approach, compared to conventional least-cost power system expansion planning, is that it allows for the incorporation of risks surrounding projections of the unit energy costs (MWh costs) of alternative electricity mix portfolios (Jansen *et al.*, 2006).

Approach and basic application objectives of the portfolio theory vary depending on whether the analysis identifying an optimal portfolio is carried out by a power producer or we are searching the optimal portfolio of consumers. The basic portfolio theory methodology has been primarily applied for four distinct purposes (Ringer *et al.*, 2007): determining an optimal portfolio for generators, determining an optimal portfolio for consumers, determining an optimal generation fuel mix and determining an optimal strategy for generators.

The second way to take risk into account is an approach when potential investment proposals are quantified on their costs and revenues. Traditionally, large companies use the net present value (NPV) as their primary valuation tool in investment decision. The above mentioned characteristics of the industry make the static NPV method, which assumes an irreversible investment decision, for investing inappropriate. In reality, the new environment also offers opportunities to the industry participants. One of the most important ones is that they have the opportunity not to produce: A liquid spot market for electricity has the effect that the electricity producer always has the choice to turn off its own production and buy the necessary electricity in the market. The problem of when to turn on or off production assets resembles the exercise decision for a financial option. The real option approach can account for the different flexibility options.

## 2. Real options

Real options theory provides a framework, in which investment under uncertainty can be investigated when irreversibility and flexibility are involved. The real options approach is founded on the fact that most investments are irreversible and that the investor has the option to wait, i.e. delay the investment to a later date (Dixit and Pindyck, 1994). A firm with an opportunity to invest is holding an "option" analogue to a financial call option. It is important to note that the term "option" in this context should not be understood as a synonym for choice or alternative. An option as it is meant here is the right, but not an obligation, to realize an investment opportunity.

Originally developed for valuing financial options in 1970s (e.g. Black and Scholes, 1973), economists soon realized that option pricing also provided considerable insight into decision-making concerning capital investment. The real options approach thus builds on the theory and insights developed for pricing financial options, while also making use of techniques from the discipline of decision analysis.

Real options techniques or processes can be categorized into the following classes (Triantis and Borison, 2001):

- ✓ ***Real options as a way of thinking***. In such cases, real options are used primarily as a language that frames and communicates decision problems qualitatively.
- ✓ ***Real options as an analytical tool.*** Real options and option pricing models in particular, are used primarily to value projects with known, well-specified, optionality.
- ✓ ***Real options as an organizational process.*** Real options is used, as part of a broader process, as a management tool to identify and exploit strategic options.

Magnusson (2002) distinguishes specific types of real options, including the option:

- ✓ to wait, i.e., to deter the investment to a later date,
- ✓ to stop temporarily, for example in reaction to fluctuations in input and output prices or to mothball a power plant,
- ✓ to abandon, i.e. sell equipment and/or knowledge,

- ✓ to switch input, output or risky assets, for example in power plant valuation,
- ✓ to develop, e.g., R&D projects and start-ups,
- ✓ to expand or upgrade, implying an extension of activities,
- ✓ to grow, e.g., strategic acquisitions or multiple-generation product development.

Early real options applications were mostly found in the energy industry. And since then, the energy industry has been a fertile field where an enormous literature has been spawned. The energy industry has several reasons to stimulate real options applications. Firstly, the energy industry is characterized by its intensive capital expenditure. Secondly, operational flexibilities along with the investment opportunities, are the sources of option value that are embedded in energy assets. Thirdly, the outputs of the industry are mostly traded commodities.

Frayer and Uludere (2001) give an overview of the level and area of optionality of different types of generation assets (Table 2)

Table 2: *Optionality of generation assets*

| Asset type/Fuel | Applicability of real options | Area optionality |
|---|---|---|
| Existing gas/oil | HIGH | Very flexible, able to exploit volatility of spark-spread |
| New peaker single-cycle gas turbines | HIGH | Low start costs; high operating flexibility |
| Hydro (storage) | HIGH | Storage capacity; operating flexibility |
| Mid-merit coal | MEDIUM | Profit more dependent on price volatility than baseload stations |
| New baseload combined-cycle gas turbines | MEDIUM | Able to benefit from electricity and gas volatility |
| Hydro (conventional) | MEDIUM | Limited storage may generate some options value |
| Baseload coal | LOW | Not flexible |
| Nuclear | LOW | Not flexible |

Source: Frayer and Uludere (2001).

Early frameworks were developed by McDonald and Siegel (1986), Pindyck (1988, 1991, 1993), and Dixit and Pindyck (1994). The basic idea is that standard investment theory relying on NPV calculations generally do not take into account the interaction between three important characteristics of numerous investment decisions: the irreversibility of most investments, which implies that a substantial portion of the total investment cost is sunk, the uncertainty surrounding the future cash flows from the investment, which can be affected by e.g. the volatility of output and input prices, and the opportunity of timing the investment flexibly.

Nowadays, in the context of electricity producing firms, real options applications fall into two broad categories: operational and capital investment decisions. Operational decisions that can be supported by real options models are amongst others *("Real options as an organizational process")*: the unit commitment problem, peak off peak play on pump hydro assets, fuel switching capabilities, locational arbitrage on regional prices, arbitrage between energy and ancillary services markets (Griffes *et al.*, 1999). Capital investment decisions relate to the building of new plants or the extension of current plants *("Real options as an analytical tool").*

## 3. Conclusion

As we learned, the electricity sector exhibits a number of special features. These include the relative irreversibility of investments, the flexibility of timing investments and, the in detail examined uncertainty surrounding the decisions to install power plant equipment. While traditional net present value methods are simple and straightforward, and have been used extensively for evaluating investments, their ability to account for flexibility options of investments is small. The real option approach is better suited to investment opportunities that have high degree of uncertainty. However, pricing of an option is mathematically complex and often has to rely on data that is either hard to obtain or hard to predict. Also, while real options theory has become an increasingly popular tool among analysts in the electricity industry, "the value of real options theory is closely linked to the benefits of having more flexibility'' (Roques, 2008, p. 13). While real options theory may be able to contribute to greater flexibility, it does so only with regard to one

generation asset and does not take into account portfolio flexibility as a whole (Hickey *et al.*, 2010). Thus, while real options theory has gained industry attention in the last few years, its application is more suitable for asset valuation problems, instead of operational decisions.

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# ACCOUNTING, AUDITING AND ETHICS AFTER ENRON

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*Trust is the foundation of the accounting and financial services industries. Past problems, some resulting from corporate scandals and others from recent financial crises have undermined this foundation. After Enron and the following crises, there has been an increase in the production of substantial regulations in general and of the accounting profession in particular. The main goal of these regulations was to regain public trust. However, if integrity is the most important factor that influences trust and is closely related to it, crises-caused regulations will not solve the problem.*

**Keywords:** corporate scandals, financial crises, regulations, ethics
**JEL codes:** M41, M42, M48, M29

## 1. Introduction

According to Abbott (1988), professionals *'heal our bodies, measure our profits and save our souls',* and they gain public trust because they have the ability to solve these crucial individual and social problems. Given the complexity of business relationships in our modern economies, professionals like accountants, auditors, security analysts and others typically provide monitoring service, and we call these professionals *trust builders*.
Without trust, businesses have to spend money and time to be sure that other parties are living up to their obligations with integrity. When Arrow (1974) highlighted the role of trust in economic life, he argued in this way:

> "Now trust has a very important pragmatic value, if nothing else. Trust is an important lubricant of a social system. It is extremly efficient, it saves a lot of trouble to have a fair degree of reliance on other people's word. Unfortunately this is not a commodity which can be bought very easily. If you have to buy it, you already have some doubts about what you've bought. Trust and similar values, like loyalty, or truth-telling, are examples of what an economist would call externalities" (Arrow, 1974, p. 23).

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The decade of experiences left behind as beginning with Enron and others – corporate frauds, accounting scandals, financial crises, bank failures and crises – may suggest, what professionals had created – using their expertise and taking advantage of their special privileges like monopolies, restrictive arrangements, self regulation, – instead of resolving individual and social problems. In this way, they were trust destroyers instead of trust builders.

Financial scandals have demonstrated how much the international financial network relies on the assumption of trust. McMillan (2004) considered that the real value of Arthur Andersen was in the trade of conferring trust on company accounts through the implicit trust they held in the financial community, and it does not exist any more because it had lost the trust of the market. He also mentioned that in just over a year, the lost of trust within the final four large international accounting firms had reduced the value of PWC's consulting arm by 80%. The effects of these scandals confirm that the financial system is underpinned through a system of mutual trust. Once that is lost, the whole system goes into turmoil and dramatic reductions in value results.

It is hard to overstate the economic value of trust, but if we underestimate it, we could lose it, and then we will see the dramatic value reduction.

## 2. Criticizing accounting and auditing after Enron

The level of interest in the accounting profession immediately following the Enron scandal indicates that accounting performs a hugely important function within a market-based economic system. The unexpected collapse of Enron and the demise of Arthur Andersen in the aftermath sent shock waves through the accounting profession. The highly questionable accounting and auditing practices associated with the Enron scandal and labeled as 'Enronitis' or 'Enron debacle' were widely condemned and they undermined confidence in corporate financial reporting and auditing. The accounting profession has to deal with an ever-growing mix of new rules on corporate governance, audit independence and financial reporting among other prescriptions.

Carnegie and Napier (2010) have studied the critical accounting literature in the post-Enron period to examine how existing stereotypes of the

accountant were used by commentators, and to investigate how the existence and use of accountant stereotypes affects the legitimacy of the accounting profession. They claim that professionalization is a dynamic, ongoing process that may also involve a 'range of "negative signals of movement" which, if particularly strong and sufficiently high-profile, may hinder or even divert the professionalization trajectory of accountants not just within a single country but internationally' (Carnegie and Napier, 2010, p. 362). They have shown how the accounting literature makes use of both the *traditional accountant*[1] and *business professional*[2] stereotypes to characterize particular accountants and present the changes that had occurred in the professionalization process of accounting over the years. They have mentioned that the writers often comment on how the modern auditor is very different from the auditor of previous generations. The firm's behaviour in the 1990s does not reflect the original motto of Arthur E. Andersen, "Think straight, talk straight":

> [O]n the audit side, the company was stuffed with younger and younger people who were brash and aggressive but knew less and less about actually investigating their clients' accounting practices. The people who made partner, in turn, were great salespeople but not as technically proficient...[O]ld-fashioned accounting... was boring and did not bring in enough money anyway. The new, unstated motto was 'Make it Work'. Give the client what he wanted. (Swartz, 2003, p. 95, cited in Carnegie and Napier, 2003, p. 368).

Many autors provide evidence about the business culture that had dominated the audit firms and the conflicting environment in which they operate – conflict between serving the public interest and maintaining profitability (O'Brien, 2003; Squires *et al.*, 2003).

These negative signals of movement in the professionalization process of accounting revealed by the critical accounting literature after Enron, which became public knowledge by Enron's and Artur Andersen's collapse, show that accounting faces a process of deprofessionalization.

But that process of deprofessionalization in accounting emphasized after Enron is not a new phenomenon that got started after, or a few years before the Enron scandal. In his book *'The coming crises in accounting'* Ahmed Belkaoui (1989) noted that accounting has not been immune to the phenomenon of deprofessionalization. Various social, political, and economic changes have altered the same environment that facilitated

the emergence and dominance of the accounting profession, and have precipitated the deprofessionalization in accounting, that is, a decline in the autonomy and monopolistic privileges of accountants.
Lee (1995) criticized (*before Enron)* the professionalization of accountancy and he claimed that the fundamental influence driving professionalization throughout its entire history has been economics. His analysis suggests that accountants use the public interest argument continuously as a means of protecting their economic self-interest. 'Criticism originated before professionalization as a public concern about the ability of public accountants to discharge legally-based responsibilities effectively, and evolved over many decades into a concern about the flexibility of accounting practices and the inadequacy of audit procedures. Today, criticism involves doubts about the ability of accountants to resist managerial pressures to misreport.' (Lee, 1995, p. 64).

## 3. Rules and regulations after Enron

The superstructure of accounting and auditing standards have created a body of rules and instructions that has meant to provide reliable transparency of financial data as well as reliable performance of the auditing function. These superstructures were created so as to correct faults seen in the reporting system. However, the most recent scandals have indicated that the superstructures of standards and rules cannot prevent a concerted effort to deceive and misdirect information. This could lead one to be suspicious of any serious correction of the most recent failings through any new governmental regulations. They may even indicate that they may increase the probability of their reoccurrence (McMillan, 2004).

By means of the passage of the Sarbanes-Oxley Act (SOX) enacted in 2002, following a series of corporate scandals, and similar reforms in other countries, governments began to exert more control over the activities of accountants with the purpose of regaining market trust in the accounting profession. Many researchers have criticized the effectiveness of the SOX, because it does not actually deal with the causes of the systematic failure of that trust, and so it does not ensure the prevention of future failures of that trust. Carnegie and Napier (2010) have supported, for example, that additional regulation and the work

that it has created, have tended to increase the business of the most affected accountants, and increasing regulation may actually work in favour of the Big Four in their competition with other accounting firms. Surprisingly, years after adapting SOX, the business model of the Big Four accounting firm is under attack from the European Commission, which is pushing for tough rules that would force the firms to abandon their consultancy businesses and share audit work with smaller rivals (Barker and Hughes, 2011). This draft regulation aims to transform the accounting sector in the wake of the financial crises and restore "trust" in financial reporting, with the same purpose as SOX and other regulations after corporate scandals. Mr Barnier's team believe the conflicting commercial interests of the big firms have eroded trust, stifled competition and compromised the scepticism of the accounting profession, and this would mean that the SOX did not meet his expectations.
It is not surprising, that many researchers who have examined different topics related to specific changes expected from SOX, such as increased independence requirements and responsibility over reporting on a client's internal control, obtained little evidence that could ensure the effectiveness of SOX. Several studies found evidence of an increase in the issuance of going-concern opinions after the passage of SOX in relatively short time periods (Nogler, 2008). Auditors behaved more conservatively when the profession was in the headlines, after the Enron bankruptcy. Extending the time period examined, Feldmann and Read (2010) have found that the immediate post-SOX change to more conservative auditor reporting behaviour appears to be temporary.

The Global Financial Crisis has prompted a wide range of ad hoc government responses internationally, that include new forms of government involvement in the financial sector and new forms of financial regulation. Davis (2009) points out that these regulations are short-term responses (that include measures to promote investor confidence; restore liquidity to capital markets; prevent destabilising speculation, etc.) and claims that 'finnacial regulation faces a difficult task in a world of financial innovation, where new financial products and techniques are rapidly created to get around regulations which constrain profit opportunities and where under-recourced regulatory agencies are always playing 'catch-up' in dealing with those developments.' (Davis, 2009, p. 453).

## 4. Ethics after Enron

The Enron debacle and the global financial crises once again brought the ethics of accountants and auditors into question.
The Sarbanes' primary focus was on regulating corporate conduct in an attempt to promote ethical behaviour and prevent the fraudulent financial reporting. H. Rockness and J. Rockness (2005) explores the financial reporting scandals of the past decade and the resulting U.S. legislative attempts to impose ethical behavior and control the incidence of new reporting problems via the Sarbanes-Oxley legislation. They have documented the failures of laws, corporate internal controls, and corporate culture, including SOX, to deter unethical and fraudulent financial reporting. None, taken alone – they conclude – have stood the test of time in guaranteeing appropiate corporate ethical behavior.
"The root cause of the global finnacial crisis was not a failure of regulation, but of ethics", maintains Simon Longstaff, executive director of Sydney's St James ethics Centre (Post-Crisis Ethics: Shifting Mindsets or Business as Usual?, 2010). Strong concerns about ethical problems at an institutional level include the insane focus on the short term, the rewarding way of senior executives and the fact that the organisations are valued according to short term indicators only.

According to Koslowski (2010) certain forms of securization and derivatives are also ethically problematic, because of their opacity characteristic. If we create securitized instruments that are not understood, this can cause enormous damage. The real issue is not their sophistication and complexity – it is the openess and honesty of the institutions that trade them. Complexity is not a reason, it is an excuse. The greatest risk derivatives bring to the marketplace is the shadowy way in which they can be used by the companies. The solution for that problem is not more regulation; it is better and fuller disclosure (Lacke, 1996, p. 177). The actors in financial institutions and financial markets have a service function, their job is to serve the costumer and they have a duty to act in the costumer's interest (as accountants and auditors have the duty to serve the public). 'The impression we are given by many financial intermediaries is that if anything goes wrong, it is a result of the general risk or market sentiment, but certainly not the result of their bad advise.' (Koslowski, 2010, p. 66).

## 5. Ethical challenges for accounting profession

When the organization and nature of commerce is becoming even more complex, and we are talking about globalization, finacial engineering, knowledge economy, etc., intangibles, complex financial instruments and pensions are just a few of the associated ethical challenges for the accounting profession. And all of these come at a time when many moral philosophers are suggesting that our traditional ethical resources have been undermined, we are ethically illiterate (McPhail and Walters, 2009). There are many new ethical challenges associated with the knowledge economy (almost all of them are related to information), but 'the implicit ethics of the knowledge economy is the ethical capital required for the knowledge economy to work poperly. For example, there are new kinds of risks associated with the knowledge economy and therefore trust is essential.' (McPhail and Walters, 2009, p. 195).
If anything, ethics has become more functionally important within this new form of capitalism and values and ethics are considered to be of increased importance to the continued viability of a company.

## 6. Conclusions

The corporate collapses, the economic and global financial crisis, like all far-reaching historical crises, has not just one, but several causes. We could blame the accountants, the auditors, the bankers, the politicians or the customers, because everybody played a part in this game. More regulation could not stop unethical business behavior, because they shift our focus away from ethical judgments to satisfying the rules and prescriptions of the legislation.

In this globalised, complex economy and new form of capitalism we all need to put emphasis on responsibility, not only on accountability, and we must still deal with the issue of integrity. Service and public trust should not be subordinated to personal gain and advantage.

## Notes

[1] The *traditional accountant* stereotype is more strongly associated with the view that accounting is a profession, whose primary purpose is to serve the public interest and the client interests are subordinated to it. It is quite appropriate for the *traditional accountant* to be cautious, prudent and risk-averse.
[2] The business professional sees accounting as a commercial undertaking, and the main function of the business professional is to add value to clients through the provision of services, such as audit and assurance, tax advice and general consultancy. The most effective business professional is one who is able to support rather than oppose client management. The business professional serves the public interest indirectly, more likely through providing advice that enhances social welfare indirectly through corporate profit maximization.

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# ACCOUNTING ASPECTS OF PRICING DECISIONS AND CALCULATION OF TRANSFER PRICING DURING ECONOMICAL CRISES

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*The pricing methods in practice need really complex view of the business situation and depend on the strategy and market position of a company. At the same time the price calculations are based on the reliable accounting information. The structure of the prices seems simple, cost plus margin, but in the real pricing decision managers need to find the reasonable content of the cost category, choose the most consistent cost allocation way or calculate a "good" margin. All these tasks require complex business information. This is the reason pricing and transfer pricing are part of management accounting.*

*The significant part of the international business activities occurs between affiliated companies. There are some important reason to built up and use transfer prices in this internal sales activities, like tax optimization or avoidance, increasing the efficiency of the company level budgeting, to enhance the motivation on the different level of the management. From taxation point of view the subject is under OECD control. By the transfer pricing documentation the multinational companies have to present the market circumstances and justify their fair price calculation. Of course the international economical situation causes the revision of the built up system.*

*The main objectives of this paper are: analyzing the pricing methods from management accounting aspects to show out the role of the accounting system in the short term and long term pricing decisions; summarizing the factors from accounting point of view to find the best price range which acceptable by the external and internal requirements; thinking about the critical changes in pricing decisions because of the world wide circumstances in the time of economic crises.*

**Keywords:** pricing, transfer pricing, cost plus method, market price, break-even point

**JEL code:** M41

## 1. General rule of accounting in pricing decisions

Accounting is the part of the corporate management which functions as a language in the communication of the interests of an organisation. With providing financial and non-financial information the rule of planning, following and controlling the processes ensures relevant base to business decisions. In case of pricing we can define expectations of both management and financial accounting. This task has been clear for some

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decades, since the globalization and the changes on the global market have started.
The prices of issued products and performed services are entered into the accounting information system through the sales revenues of the enterprise. The sales revenue is a fundamental component of one of the most important accounting documents (Profit and Loss Statement) therefore the issue of pricing is especially important in financial accounting. On the other hand, management accounting, which performs the internal information supply functions of accounting for the most extensive analysis and planning of the activity, relies on the prices and the external and internal environmental factors affecting them. However, as the realisation is fundamentally related to the output of the enterprise (sales), a lot of functions relate to pricing which are important in production and sales.
It is absolutely necessary to reconsider the organisational structure of the company if we talk about transfer prices. The category is matching to a company or group, which works by decentralised organisation structure. It means inside the organization the different levels of the management have responsibility making decisions according to the division/ daughter company objectives. It can be effect to the efficiency of the company, because of the information quality, quantity and flowing is much easier. Of course the company top management has to take attention to the conformity of the lower level decisions and the company level strategy goals. Transfer price is applied in the inside merchandise transactions of the decentralized organization. It means the transfer price calculation is in the interests both of the seller and buyer, because the price effect to their profit structure (Kaplan and Atkinson, 1998).

Nowadays this issue is becoming increasingly important. From 80s the global market has changed a lot, the number of multinational companies increased and the internal sales on international level is really high. Respect for international guidelines and the co-ordination of the national tax systems accordingly become increasingly important, and the documentation of co-operation is an even greater challenge with regard to domestic corporate groups. Naturally, financial management considers the transfer price issue important with regard to tax regulations and sanctions, yet transfer prices are much more widely related to accounting. This is the reason below I shall still try to identify the criteria applicable to pricing from the point of an accountant.

The category and process of pricing is a rather complex issue. With their output, enterprises obviously intend to cover their resource consumption and all other expenses related to their operation, yet they cannot achieve long-term profitable operation without the consideration of the market factors, relying only on the internal information system. Consequently, there are two basic theoretical pricing methods, the cost-based and the market-based pricing (Horngren and Foster, 1991)

The *cost-based* method is a seemingly easy method based on costs and the expected profit. On the other hand, both categories require a wide information base and a diversified analysis. The cost content is fundamentally based on the historic value of the product. The direct resource requirement of the historic value can generally be measured well, yet naturally the price must also cover the expenses which cannot be directly allocated to the product or activity for the purpose of long-term operation. Consequently, the allocation of the expenses classified as general expenses requires the reconsideration of the processes. With regard to general expenses, the traditional cost calculation can be mentioned among the allocation options, during which the general expenses are allocated to the cost bearer based on a selected cost characteristic, but we can also opt for the ABC (Activity Based Costing) cost allocation, during which the cost drivers, influencing most the serving processes, are used as the basis of allocation. However, as pricing does not take place subsequently, based on the actual data of the production process, the cost structure and cost information can be used consistently only on an empirical basis, by taking into account the future estimated impacts and using a thorough planning system. Naturally, on the one hand, this inspires experts to think prudently and, on the other hand, it also calls for the application of some standard in order to simplify the calculation process.

Whenever prices are established, the market conditions must also be taken into account. It is important to assess the price acceptance and pricing policy of the market actors, i.e., the conduct, price sensitivity and pricing practice of the customers and competitors. In this context, the microeconomic model considers the estimated demand and supply functions the most important factors. However, there are numerous limits

for that in practice. It is also true that no price can be established with sufficient profitability without the thorough knowledge of the market. The experts need to understand the market product structure, in which they sell their products in order to be able to assess the substitute products and the price reactions of the manufacturers and to also understand the decision-making habits of their customers. In other words, they must understand the other factors that also influence the purchases apart from price and can have an impact on the entire activity in terms of the product structure (material consumption, accessories, function, quality, etc.) and sales processes (advertising, other marketing-type relationship with the consumer, etc.) (Anthony and Govindarajan, 2007).
In *market-based pricing*, the cost structure, with the help of which the expected profit can be achieved, is established on the basis of the price formed according to the market information. This concept refers back to the target cost calculation topic, where the historic value of the product is established on the basis of market information, by taking into account the customers' requirements in terms of quality, related services, durability and substitution. In this context, the required profit is an exciting issue. The profit can be defined by combining several factors. The required profit is a key issue mainly for those stakeholders who measure the activities of the enterprise in the profit or their profit share. The degree of profitability is limited by their interest in the profit, yet the volume of the budgeted costs represent a minimum limit too, because the manufacturing of a product requires certain resources, which may be changed only by deteriorating quality or functionality if the intention is to increase the profit.

## 3. Time factor in pricing decisions

The above mentioned two methods are theoretically basics of the enterprises' price calculation, but some other factors from the environment have to be taken in to account. On the one hand, the market share of the enterprise limits its pricing conduct Drury (1997 and 2008) said a company with a considerable market share has a price setting position in cost calculation and in the establishment of the historic value of the product compared to another enterprise which must fit into its cost and

income budget on the basis of the market prices. According to the price setting role, the enterprise may define the historic value of the product by integrating the actual resource requirement and define its price on the basis of the principle of covering the total costs, estimated on the basis of empirical experience and calculated with strategic steps.

Short-term thinking practically applies to ad hoc contracts and irregular customer relations. In the sales activities of each enterprise there are ad hoc orders originating from irregular business activities of new customers or existing customers. Naturally, an enterprise with a price setting role has a much wider scope of competence also in this respect than enterprises that follow the prices because the maximum utilisation of the capacity limits is sufficient motivation for accepting an order. In this respect the pricing itself could be a special issue and instead of the general pricing model a price generated on the basis of the additional expenses for an order facilitating capacity utilisation could be an attractive offer. In general, the additional expenses can typically be considered the variable costs of the product. In this context, the cost content used in pricing could be significantly lower than in the pricing of a usual and ordinary trade relationship. The scope within which the enterprise can stretch itself in order to generate the profit margin included in the price must be defined not only on the basis of the information contained in the accounting records, because the understanding of the specific market conditions and factors causing the change relate to the competence of another enterprise management unit. Anyhow, accounting can provide the following information for decision-making (Veres, 2011a):

- the variable costs associated with the product (product service)
- cost allocation and information about fixed costs
- the degree of capacity utilisation
- the stock turnover and trade debtors' turnover
- the output margin
- the output level at the break-even point
- the impact of capacity utilisation on the margin by product
- potential capacity enhancement due to special orders, its availability in time and its impact on the prime costs.

For an enterprise that follows the prices in terms of its market position, this problem concentrates more on the need of understanding the capac-

ity limits. With regard to fixed market prices, the enterprise could be open to any business relationship that can provide sufficient profit for it. Naturally, the attempt is to increase capacity utilisation, and therefore the enterprise is fundamentally interested in accepting special orders up to the maximum of its potential capacity. The accounting impact of this will definitely be positive, providing that the enterprise still does not have any influence on pricing, because any price decrease would detrimental for its long-term presence.

## 4. Pricing policy

Some sort of general pricing model needs to be developed in order to enable an enterprise to manage easily its decisions related to its output and market relations. In this context, the accounting information system can be used as the main information base (Veres, 2011b). What information may be needed and how can the pricing framework be established in internal communication?

- The variable costs of products and activities must be understood. This method is covered in the Prime Cost Calculation Regulations (which is part of the Accounting Policy);
- The resource requirements of the operation of the enterprise, i.e., the general expenses of the company, without which market presence is unavoidable, also need to be understood;
- The costs coming from operation context the realization process;
- General level of used capacity and the profit structure and the profit on that level;
- The profitability requirement for achieving the strategic goals of the enterprise must also be calculated.

In the market realisation process, the product issuer intends to cover all the above factors with the price formed in the trading relationship, but the profit amount is the specific margin which covers the permanent costs of the activity and the income realised on the product. This can be identified on the basis of empirical data and the estimated changes of the fixed costs. However, on the basis of the accounting information system, the margin may be analysed further in order to make the fixed

asset value required for the activity and the profit impacts of the serving processes clear. The assets required for operation must be interpreted more widely than the value of fixed assets and intangible assets. These asset groups naturally fix the company's funds for a longer term and naturally with regard to their return the analysis can be based on the profitability of the long-term financial investments. It needs to be noted that the amortisation of the invested asset value is usually an item appearing among the fixed costs to be covered, therefore the capacity utilisation level of those definitely influences the recovery period.

However, tangible fixed assets and intangible assets represent only one area in the fixed asset value category, because the assets of the enterprise contain also components that are necessarily created in the operation, yet the improvement of their efficiency has a fundamental impact on the costs and income of the enterprise and the estimated profit, and therefore it should be interpreted as a factor affecting the pricing process. One issue is the inventories relating to the activities of the company and generating a warehousing demand. The analysis of inventories is an important aspect of the review of the financing activities with regard to purchased and produced inventories. Not only because the liquid assets invested into the inventories were taken from other financing processes and with regard to short-term use the risk is more complex, but also because warehousing is a rather cost intensive activity. The adequate level of inventories, the resources required for their warehousing and the mitigation of the risk factors need to be planned thoroughly when prices are established.
The volume of accounts receivable is also important in terms of the expenses of the trading process. The liquidity situation is a typical risk factor related to accounts receivable. On the other hand, the maintenance, or potential improvement of the turnover of accounts receivable, and the minimisation of loan losses require an effective customer monitoring and management system.
Consequently, when an enterprise establishes its margin, it can strive for the recovery of the capital invested into the areas referred to above and to achieve the profit projected from the business in the form of the margin contained in the price. With thorough analyses, the ROI (return on investment) based pricing method can be applied effectively, forming the invested capital category according to the outlined capital compo-

nents and calculating the appropriate risk factors into the expected recovery with regard to all categories. (Kaplan, 1998) It is an important advantage that all capital fixing referred to above are typical factors in the corporate performance evaluation. Naturally, even so truly relevant return figures can be calculated only with longer-term data and a longer-term activity base, assuming a certain level of long-term capacity utilisation. It is difficult to manage the impacts and changes of the economic environment, and pricing itself cannot be sufficiently flexible.

## 5. Pricing in the internal trading relations

Pricing is an especially exciting aspect of the intra-company trading relations. Naturally, intra-company trade relations take place only if the corporate activities are performed in separate organisational units and these units are interested in making profit and their performance measurement depends fundamentally on their profit impact, influenced by their decision-making responsibilities. It is definitely important to indicate that naturally the internal sales prices are assessed assuming that the purpose is to establish a price that has some profit content otherwise we could only talk about cost allocation. Under such conditions, the organisational units can apply the pricing methods referred to above with regard to the services rendered and goods sold to each other, i.e., they can use market-based pricing and cost-based pricing. However, the application of these basic types is interpreted differently than their general concept.

With regard to *cost-based pricing,* the accurate prime cost calculation is as important for internal sales as for external sales, and, in fact, certain cost elements can be avoided through the co-ordination of certain partial processes of the entire activity. Typically those costs can be defined as avoidable costs category which incur in the sales process of the product, with regard to certain special customer requirements. The examples could include the costs of packaging, transportation or supply of information to customers, which are not required due to internal use, or can be simplified. However, even in cost-based pricing it is important to integrate into the price the fixed costs required for the long-term operation of the enterprise and to consider also the degree of capacity

utilisation. If the function of a particular organisational unit is to ensure the operation of the entire enterprise then, naturally, the maximum capacity must be built in line with the capacity of the other units. Otherwise, on the basis of internal prices, too high fixed costs must be assumed, which may result in a distorted historic value. Even in such cases it is necessary to consider seriously the margin of the price, because the thus calculated margin will be practically the distribution of the total company-level margin among the divisions. Naturally, the divisions may have an impact on the amount of profit based on their decision on internal efficiency, but the consideration of the costs required for the activities is always important in the selection of the average margin. As an example, let us assume an enterprise with two divisions, one of which manufactures and the other one performs distribution tasks. If the activities of the manufacturing division also contain product development, then the costs of product development represent a considerable amount of general expenses which must be taken into account during the distribution of the margin earned at company level. Otherwise, the internal conflicts will have a detrimental influence on the total company interests.
According to the research results, the internal prices are established most frequently with the total cost based pricing method. However, if an internal supplier has a trading relationship with several internal customers, the total cost content is not necessarily a good basis, because the services assisting the activities of the division are not always used equally. Naturally, a solution could be activity-based cost allocation and the planning of needs, thoroughly considered with regard to customer requirements.

*The market-based pricing* can be applied in intra-company trading practices if the divisions of the company have full independence and maximum freedom in establishing their performance. In such cases they rely on reasonable criteria in purchasing their resources in order to achieve the maximum profit, i.e., they will opt for the lowest possible price. This means the review of the offers of the market actors.
With regard to market prices, the pricing structure should be reviewed not only from the aspect of the internal purchaser, but also from the aspect of the sales unit. As the market realisation process is a factor generating basic performance for a division operating as a profit centre,

it is a natural process to select the best sales opportunities in line with the better utilisation of the capacities.
What price range can the seller and the buyer envisage in relation to intra-company sales? The ceiling of the price range is determined by the customer, because he will not pay more than the lowest price available at external suppliers. The upper range can be more flexible, depending on the capacity utilisation level at which the seller can operate his activity. After summarising Adams and Drtina (2010) results the range can be defined as follows.

Table 1: *Transfer price range by market pricing model*

| | PRICE RANGE | |
|---|---|---|
| | MINIMUM (SELLER) | MAXIMUM (BUYER) |
| CAPACITY UTILIZATION = 100 % | Best **selling price** on the external market (*without avoidable costs)* | Best **purchasing price** on the external market |
| CAPACITY UTILIZATION < 100 % | Additional (variable) costs | Best purchasing price on the external market |

Source: Edited by the author.

Consequently, with maximum capacity utilisation for longer-term contracts, the range can be narrowed until it reaches the price established on the basis of the highest sales price on the market, taking into account the costs avoidable in internal sales and preferences given for the purpose of capacity utilisation. As the Table 1 shows the free capacity possibilities can make wider the range of transfer price until the additional, so variable costs level.

## 6. Transfer price as a management asset

When we are thinking about transfer price we can understand it is a very useful technique in the company management's hand. We can summarise two main function of the transfer price:
*1. Profit allocation* inside the company. It means keeping the company strategy in the focus of the inside pricing decisions, the management can find the way to allocate the profit between divisions with slightly the performance evaluation system.

*2. Profit maximisation.* According to the knowledge of taxation systems the company management can transfer the profit between divisions to minimize the tax base or in multinational level to regroup the profit to the lower tax rate economical environment and minimize the global tax payment.
Both functions have advantages and disadvantages, and both of them needs information from accounting system to control or analyze the realization of profit allocation. Especially multinational companies (MNC) have challenges to build up acceptable evaluation system and to make documentation about the comparison of their transfer prices and the arms' length prices. Let's take attention to the main factors of inside and outside control of the MNC's.

### *6.1. Profit allocation*

Transfer price is used in the inside merchandise transactions, the participants are independent companies with the right to make business decisions. Of course the decisions concentrate to the divisional objectives, but in the same time these have to be appropriate with the long term company strategy too. The situation needs a consistent performance evaluation system to keep the motivation on the division management level to follow the interest of company too.
The performance evaluation is part of the management accounting research area. Historically the techniques of analyzes based on different level of earning measurements. The most typical calculations are sales margin, operating profit, ROI. Of course these measures can be calculated easy from a good integrated system and can be used easy to evaluate the daily situations. The question is, how the motivation can be kept inside the daughter company if the transfer price gives limit for example of the sales margin, or other part of profit structure? Is it really reasonable to use ROI if the investment decisions made and hardly controlled by top management? Can operating profit be motivator when fixed costs has directly invoiced management fee? In this case the company management has to find other factors to control the performance on lower level of the management, which can show clearer picture about the efficiency of their decisions. Of course there are some possibilities to measure the activity, for example to analyze the realized margins on the whole chain, to clear the fixed cost structure by inside invoiced services. On the other hand the evaluation system needs based

always some kind of comparison. This is the reason the important role of choosing good bases of the control. Inside an international business organization the possibilities are more meaningful. The most important comparison way is coming from the budgeting system, which is determinate, the main expectations from the company, mainly decided by taking consideration of the specialities and approved by both side. The second evaluation possibility to make analyzes inside the MNC between the daughter companies' measurements. It has to be important not only for get clear numbers, but the divisions can understand their place in the structure. The company management has to be careful with it in order to motivation.

The daughter companies of MNC work in different environment and it also has effect to their performance, so during the setting up a performance evaluation system it has to be into consideration. Many of the factors of the circumstances are really independent of the company decisions but effect seriously to the performance. As the result of management accounting researches (Abdallah, 2009) we can define the following environmental parameters:

- *Economical* differences are the most important environmental factors, because of the effects can be quantifiable. Under this category MNC-s have to calculate mainly with inflation and interest rates, fluctuation of exchange rates, restrictions or barriers in international trading, etc.
- *Political and legal* differences have to be considered because these factors mean high degree of risk or uncertainty of the MNC. Changing of the political forces and governments can effect to the efficiency of the legal system and acceptance of foreign businesses inside the country.
- *Educational* differences can be perceptible in quality and structure of education side of a country. It can be really attractive or retention too for foreign investors. The management style, reliability of their knowledge, expectations of management trainings and acceptance of company culture are depends on the educated level.
- *Social* environmental factors include cultural, moral and religious features of the country. These factors can be realized also in economical and education factors, because the acceptance and follow – up the laws and regulations depends on historical cultural and social changes.

*6.2 Profit maximization*

It is natural pursuit of MNCs to maximize the profit by taking advantages of different taxation systems. By the internal sales between the daughter companies MNC can restructuring the realised profit according to the minimization of global tax payment. In the same time to increase market position on the global market, to handle the risk of exchange rate differences are also important objectives. From this aspect accounting systems have again important role to find out the differences between the taxations of the countries, analyze the risk of exchange rates, tariffs, duties and find the ways of transfers.

From this point of view transfer price category has been in the focus of international professional communication for many years. It is clear the countries with higher tax rate system have disadvantages if MNC transfers inside according to profit maximization. That was the reason a regulation was needed to handle this profit transfer between the countries.

## 7. Transfer pricing regulation and the changing environment

Going through the history of transfer pricing regulations, it is unquestionable, the changing world has effected for that. The significance of this business factor has increased in the last twenty years a lot and it can be followed by changes of regulations.

The first noteworthy regulation was approved in 1968 in U.S., Internal Revenue Code Section 482 set up the arm's length price (Cook, 1969) and three methods to calculate this price: 1. the comparable uncontrolled price method, 2. the resale price method 3. the cost plus price method. This regulation suggested the theoretically accepted price calculations to compare the company internal prices to the prices of arm's length transactions. In case if the methods the order of suggestion is same like the above mentioned order. It had been kept alive for nearly 20 years. The first significant change was made by The Tax Reform Act of 1986 when income from transfer of intangible property was built in. The income from intangible property transfer has to be commensurate with the income to the income attributable to the intangible. (Martinson *et al.*, 1999)

"White Paper" in 1988 (18 Oct) was the modification of IRS 482. In the "White Paper" there was suggestion to analyze more detailed way the

arm's length principles. Four methods were described: exact comparables, inexact comparables, BALRM (basic arm's length return method), and profit split in addition to the basic arm's length return method (Frisch, 1989). The exact comparable method has absolute priority and the others can be used according to regulation, like in Table nr 2.

Table 2: *Methods and types of fact patterns in White Paper*

| METHODS | TYPE OF FACT PATTERNS |
|---|---|
| Inexact comparable method | Normal intangible and each party uses other significant and complex intangible |
| BALRM | Unique intangible, and licensee engages in function that use measurable factors of production and routine amounts of intangibles |
| Inexact comparable method and BALRM | Normal intangible and the licensee will engage in the simpler set of functions |
| Profit split method | Unique intangibles and each party owns significant self-developed intangibles which will be used in exploiting it |

Source: Edited by the author.

The next milestone in the history of regulation was the final IRS 482 in 1994, which determined (based on earlier year temporary regulation) that during the arm's length analyzes the result of comparable transaction have to be under comparable circumstances (Rooney and Suit, 1994). This final regulation gives five factors to analyze the circumstances: functions, contractual terms, risks, economic conditions and property or services being transferred, and provides six methods to determine the arm's length prices: 1. the comparable uncontrolled price method 2. the resale price method 3. the cost plus method 4. the comparable profit method 5. the profit split method and 6. unspecified methods. The requirement is to find the arm's length range by applying a single price method selected under the best method rule two or more uncontrolled transactions of similar comparability and reliability. Comparable profit methods was criticised, but it was explained by the following: the third party profit level indicators in the comparable profit methods may not account for relevant differences between the taxpayers being compared. The unspecified methods described as make-or-buy analysis,

general analyses of the economic conditions factor. Summarizing the result of this final IRS 482, it was quite detailed according to the real life business transactions, gave more flexibility by choosing the best methods and in analysing comparable selection. After summarising the most important steps in changing of arm's length principle regulation in United States it is clear the business environment is the cause of the renewals. The expansion of the types of business transactions in volume and in structure need continues attention from legislation.

In 1995 the Organization for Economic Cooperation and Development (OECD) adopted rules of international transfer pricing. Based on these rules many countries have already built in their taxation and take attention to develop the control of internally used prices and required documentation. This regulation was absolutely needed and continuous revision made it more and more useful not only for tax expansion, but to understand the need of comparability and transfer pricing calculations based on arm's length pricing principle. These regulations are consistent with IRS. Because of the importance of comparability the economic environment has direct influence to the arm's length price (OECD, 2010 and MKVK, 2005). The main factors are summarised in Table 3.

Table 3: *Factors determining comparability*

| *Factors of comparability* | *Analysed areas* |
|---|---|
| Characteristics of property and services | Tangible property, physical features of property, quality, reliability, availability, volume of supply |
| Functional analysis | Structure and organisation, economically significant activities, responsibilities, used assets, assumed risks |
| Contractual term | Terms of transactions, written contracts, following of the terms of contracts, etc. |
| Economic circumstances | Relevant market, market features: geographic location, competition, demand, availability of products and services, customer structure, government regulation, etc. |
| Business strategies | Innovation, diversification, risk aversion, assessment of political changes, etc. |

Source: Edited by the author.

During the financial crises there were so big changes in the global market. The above mentioned factors are the most important features of a company. Because of the crises caused the changing in business and market strategy, restructuring the organisation and internal functions, review of general contractual parameters, changing in routines of financial transactions and also the operative processes behind of working capital, the regulation had to follow the new situation.
Finally OECD made revision of the Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations. The first three about the comparability and profit methods has detailed and one new chapter of report on the transfer pricing aspects of business restructuring was added. All mentioned modifications serve the most reliable analyses in transfer pricing case.
The short overview of the history of the transfer pricing regulation confirms and predicts the role of the transfer pricing administration. It is somehow a serious pressure on the management but in the same time need collection of the information about the external circumstances (market, competitors, different business strategies, etc.) and comparison with the internal factors.

## 8. Summary

*In summary,* the price and transfer price calculation needs really complex view of the company situation from both of inside and outside. This is the reason the subject is in focus of different management sciences. My objective was to point out the main interests from accounting side. The accounting information system has a fundamental role in pricing, as it fully grasps all processes of the business activities in terms of accounting. Management accounting provides information about costs, costs structures, cost allocations, revenue expectation on different level of the performance, information about capacity and utilizations of capacity and financial accounting manages the delivering of reliable a true information to the different interest bearings. In the changing world the market player are much more opened to react effectively and fast in the business contacts and also the regulation has to be prepared to adjust the changing conditions. In internal transaction, transfer pricing case the requirement of arm's length transactions and price documentation seems a

compulsory duty of the companies, but as an accounting specialist I am sure the importance is high also for the company itself. During my research it was really good to get picture about the interaction between the business processes and regulations in the global world.

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# THE OPERATIVE AND STRATEGIC CONTROLLING CONNECTION WITH DECISION MAKING

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*Due to the change of the economic and market circumstances, such as expansion of the private capital, globalization of markets, getting stronger of the international competition, information revolution, nowadays the companies meet new challenges. Currently the most topical guidelines of financial and accounting management are to meet these challenges in order to increase the competitiveness both on micro and macro level. Consequently the accounting-based data should be prepared on the way that they shall be suitable for executing multilateral and simultaneously clear analysis. Internal accounting – management accounting – has the most important role right here. Financial and accounting fields together with the connected expediently formed indices offer extensive leading opportunities and tools for the management.*

**Keywords:** controlling, competitiveness, accounting

**JEL codes:** M4, O20

## Accounting

The accounting indices were developed for reporting and controlling purposes – still today these are their main function. The accounting indices provide information about accomplishments in the past, and beside this they can be often used as decision-criteria by creating plans for different terms. Among the indices which are used for accounting measurements you can find the following categories: the accounting profit categories, the earnings per share rate, the price per share rate and several refund rates. By estimation of the index numbers the revenues, the book value or the profit before income tax – among others – can be set as a base of the valuation, where the value will be determined primarily with the help of market comparison data by multiplication of the given characteristic. The main advantages of the accounting indices are their easy cal-

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culation, the availability of the necessary information, they are well known widely and they are easy to communicate – owing to this last characteristic the accounting indices are often used for reporting, both for the management internally and for the investors externally. The accounting indices offer detailed information about the facts, and provide a certain kind of report about the company's performance in the past and about its current situation. The disadvantage of these indices is that the accounting reports are not inevitably suitable for business analysis and valuation purposes. Regarding the application of accounting measurements it is better to be careful too, mainly if they are used for supporting the management's decisions, performance-measurement or planning. The accounting indices are based on accounting data, which were generated for meeting the requirements of the reports stipulated by the law. So the numbers are not developed for performance measurement, and the reports are completely different even within the regulations of the law. When we try to compare the international accounting data, these abovementioned issues tend to be even more serious. The accounting indices focus on the past and on short time-period, and they do not take into consideration the risk or the time value of the money. Most of the accounting data concentrate mainly on the profit and loss report, and underemphasize the cash-flow deduced partly from the balance. Those companies, who focus on the net profit of the given year, prove their short-sighted attitude, and they are susceptible to neglect the opportunities in the balance or in some capital elements – such as management of working capital or effectiveness of capital expenses. Being forced to maximize the accounting rates or the accounting refund-rates may lead to undesirable results. Furthermore the accounting indices correlate poorly both empirically and theoretically the actual market value of the companies. According to all of this information it can be observed, that accounting indices should be used for preparing external reports, as well as for law and budgetary controlling purposes, but they were not planned for company valuation and for conducting of strategic plans – they are even not suitable for these purposes. So it is necessary to find a better way for value-measurement, which should meet two very important criteria. First of all, it should focus on cash-flow and not on the accounting-based income, and second of all, it should recognize that all costs are in connection with the invested capital. Several modern economic value-measurement methods try to meet these requirements.

While examining the literature about the methods of value-measurement we can find a complicated mass of procedures established by various consulting firms and/or schools. The information about the efficiency of the different approaches is rather limited, considering the fact that the original authors were strongly interested in the final results of the researches regarding the utility of the methods. Consequently the management-supporting accounting should be defined even more as a tool which belongs integrated to the decision making. It is also to be noted that the various researches and studies concerning the management-accounting do not attempt to develop an integrated management-accounting theory. The integrated management-accounting means first of all only the improving of the internal accounting systems of the medium-size enterprises. But this should include already the strategic tendency in the field of the information content of the indices as well.
The designation of the financial-accounting system on strategic level is as follows:

- To ensure the validation of the regulations of the Act on Accounting.
- To support the successful and profit oriented management of business administration; to provide information for decision making.
- It has the goal to work up a business administration practice which meets the requirements of the law, the strategic management and the business administration, and which supports the successful operation.
- In order to elaborate the accounting policy and to reconcile the accounting-organization processes the management has to define first its strategic and business administrational operating purposes. The management also has to determine the form they want to fix the questions of the accounting policy about the selection of the opportunities offered by the law.

In the course of the strategic connection in the accounting policy it is to be clarified, how and with what kind of valuation approaches the appointed strategic goal can be reached. The strategic accounting concept has important role in the settlement of internal operating procedures i.e. basically it has to belong to them. The most relevant elements can be as follows:

- The increasing role of the human resources, competency accounting.
- Appearance of the environment-awareness in the accounting.
- Integrated accounting accomplishment-measurement.
- Reconciliation of strategic maps and settlements.
- Value-orientation.
- Conformity of internal operating settlements of account to long-term goals.

In an organizational structure where the basic activities are allocated into functional departments, there are three main leading functions: marketing, production and finances. The book-keeping, the human-resources, the purchasing and the sales belong to executing function. The organization possesses communication and reporting system (e.g. budget) in order to coordinate the reciprocities among the different leading and execution functional departments. The environment where the company operates includes investors, suppliers, government (state, federal), financiers, accountants, attorneys, competitors etc. The management has several levels: top management, middle-level management and low-level management – the relevancy of the hierarchic system is that the decision making occurs on different levels.

## Management

The evolving and actuation of the management accounting depends on the followings: basic goals, role of management, the characteristic of decision making, role of accounting department, and the characteristic of accounting information.

*The role of management:* The management can affect and guide the occurrences with its activity (decisions) within limits. In order to reach the requested results, the management applies various planning and leading techniques and principles. These include the business cost-planning, the cost-volume-profit analysis, deviation analysis, flexible cost-planning, examination of the segments' profitability, application of inventory, reserving and capital budgeting models.

*The decision making:* Those decisions which are to be made by the management belong to marketing, production and finance groups. But they can be also sorted into strategic, tactic, long-term and short-term

decisions. The main purpose of the decision making is to ensure the optimal utilization of business capital and resources. *The effective decision-making requires relevant information and special data-analysis.*
*The accounting department:* The accounting department is the main source of information which is necessary to decision-making. This department has to provide relevant information to all levels of the management, who may consider whether the information offered by them is suitable for making marketing, production or financial decisions both on operative and strategic level.
*The accounting information:* Of course in order to create significant data-analysis by the accounting department, it is necessary to separate the fix and variable costs from other kind of costs. All special management techniques require identifiable information type. It is expected from the accounting department that they should ensure relevant information to each special tools.
The management has to identify the different decisions according to decision types (marketing, production and financial ones). This process is indispensable in order to apply correctly the management accounting techniques on operative and strategic level. The Table 1 describes few typical management decisions of a product enterprise such as the marketing, production and financial decisions.

Table 1: *Management decisions*

| Marketing | Production | Finances |
|---|---|---|
| Pricing | Units of equipment | Issuing of bonds |
| Sales forecast | Wage of the factory workers | Issuing of shares |
| Number of sales specialists | Overtime, second shift | Loan from bank |
| Benefits of sales specialists | Replacement of machinery | Repurchase of bonds |
| Number of products | Store levels | Dividend |
| Advertisement | Measurement of order | Investment into securities |

Source: own construction

The interpretation of a financial report is necessary for the management in order to make correct decisions. The financial reports are prepared by the accountants, but basically they are created by the management by

realizing the various decisions. The financial reports may represent efficiency or inefficiency in the decision making process. The basic balance congruency is as follows: assets = current and non-current liabilities and equity. In the management accounting the assets or resources originate from the creditors (liabilities) and shareholders (capital). It is the leaders' responsibility to have control of both sides of the equation, which means that the management has to make decisions regarding the resources (assets) as well as the sources of the assets (liabilities and capital). Each balance element covers a management field. The differently defined items in the financial reports express the sensitivity of the critical fields on the inaccurate leading. In the Table 2 we would like to represent some examples where we connect decisions to some financial report items.

Table 2: *Financial decisions*

| Balance item | Decision |
|---|---|
| Cash | Minimum level |
| Receivables | Payment term |
| Inventories | Order quantity |
| Fixed assets | Capacity level |
| Bond issuing | Amount and interest rate |
| Profit & loss statement | |
| Sales | Price, number of products, number of sales specialists |
| Benefits of sales specialists | Salaries and commission fees |
| Advertisement | Media and advertisement - budget |

Source: own construction

The stock of the cash, receivables, inventories, fixed assets, liabilities etc. cannot be too high or too low – consequently all items need to have an optimal level. It is the board's responsibility to make the most accurate decisions considering the items of the financial reports. In the management accounting the decision-making process can be very easily defined: it is like the choice of operation-series from different alternatives. If there are no alternatives, there is no need for making decision

either. According to the basic theory the best decision is the one which includes the most revenues or the fewest costs. The board's duty is to find the most appropriate alternative together with the leaders of the management accounting. The process of the decision making usually contains the followings:

1. Identification of various alternatives for a given type of decision.
2. Collection of the required information to the analysis of different alternatives.
3. Analysis and determination of consequences of each alternatives.
4. Selection of the one alternative which seems to be the most suitable considering the achievement of the required goals.
5. Realization of the selected alternative.
6. Assessment of the results of decisions and their comparison with standards and other expected outcomes in a convenient appointment.

From the model describing the basic theories and from the assumption of the business perspective of the management accounting it is clear, that the substance of the management accounting is the decision making. It is worth to differentiate two groups of decisions: strategic and tactic decisions as well as short-term and long-term decisions.

In the management accounting the main purpose is not definitely to make the very best decision but to make a good one. Due to the connections being in complex reciprocity it is almost impossible to find the best decision. The management's decision making is quite subjective. Whether a decision is good or acceptable, it depends on the goals of the board. Consequently it is a requirement of decision making to set goals, targets by the management; e.g. the management has to decide about such strategic questions like product line of the company, pricing strategy, product quality, willingness for risk-taking, profit expectations.

In determination of the strategic goals and questions it is useful to discern strategic and tactic decisions (Table 3). The strategic decisions are wide-ranging supported and quality-type ones, which comprise or reflect the goals. The strategic goals do not have quantitative characteristic. The strategic decisions rest upon the subjective mentality of the board concerning the goals and intentions.

The tactic decisions are quantitatively executable ones; they are the direct results of strategic questions. The distinction of strategic and tactic decisions is very important in the management accounting, since

the management accounting techniques belong primary to the group of tactic decisions. The management accounting typically does not provide determining techniques in supporting of the strategic decision making.

Table 3: *Strategic and tactical decisions*

| Decision items | Strategic decisions | Tactic decisions |
|---|---|---|
| Cash | Keeping the minimum level without extreme risk | Cash on definite level |
| Receivables | Trade credit | Definite credit conditions |
| Inventory | Keeping inventory on safe level | Inventory on definite level |
| Price | Sales persons on quantitative level with keeping the prices lower than the competitors | Determined price |

Source: own construction

Once a strategic decision is made, it becomes possible to apply a definite management tool for supporting the tactic decisions. For example, if the strategic decision is set to avoid shortage of inventory, then with applying of a model determining a safe inventory level may help to define the appropriate inventory.
Dividing the decisions into strategic and tactic ones logically generates the cogitation in qualitative and quantitative dimensions. In the management accounting the supporting of decision making is basically quantitative. It handles decisions requiring quantitative data. In technical meaning, the management accounting consists of mathematic techniques or decision models, which are supportive in decision making on quantitative level (Table 4).

Table 4: *Quantitative decisions*

| Decision | Quantitative criteria |
|---|---|
| Price | Maximal profit |
| Order quantity | Minimal complete inventory cost |
| Purchase of new tangible asset | Lowest operating cost |
| Loan conditions | Maximal net profit/sales |
| Compensation of sales specialists | Minimal complete compensation |

Source: own construction

The profitability goals which can be selected by the management for maximizing may include the followings: net profit, sale (quantity of sold products), asset-proportional profitability, profitability of equity, and profit per share.
The decision making process is consistently affected by the profitability intention and the choice between short- and long-term ways. If the goal is to maximize the sale, then it is less important how to finance a new asset. However, if the short-term goal is to maximize the net profit, the management might decide rather to issue shares instead of bonds in order to avoid interest-costs. For a short period, it is possible that the profit has to suffer costs concerning preventive maintenance or research and development.
*The instruments of the management accounting - like, cost-planning, deviation-analysis – were not developed for handling long-term goals and decisions.* Consequently the achievements reached with application of management accounting instruments should be considered as short-term benefits instead of long-term ones. Hopefully the decisions proven useful on short-term shall be also expedient on long-term.

## Management accounting decision models

The management accounting contains several instruments which are certainly useful in decision making, including the data of incomes and expenses (Table 5).

Table 5: *Management accounting instrument*

| Financial report item | Management accounting instrument |
|---|---|
| Balance | |
| Cash | Monetary stock planning<br>Capital budgetary models |
| Trade debtors | Deviation analysis |
| Inventories | Optimal order quantity models, models defining the safety inventory level |
| Fixed assets | Deviation analysis, capital budgeting |
| Profit & loss statement | |
| Profit | Cost volume – profit analysis, segment reports, deviation analysis |

| | |
|---|---|
| Costs | Cost volume – profit analysis, deviation analysis |
| Net profit | Direct costing |

Source: own construction

### Decision making and the necessary information

It was proven by more examinations that the management uses the instruments of management accounting in decision making (Table 6). The application of each instruments and indices requires special information, which needs to be provided by the management accountant. The management accounting texts traditionally highlighted the structure of the methods, slightly emphasizing how to collect the required data. In many cases the impossibility of ensuring the needed data renders the given instrument useless.

Table 6: *Management accounting instruments*

| |
|---|
| 1. Extensive business cost-planning |
| 2. Flexible cost-planning and variance analysis |
| 3. Variance analysis |
| 4. Capital budgeting |
| 5. Deviation analysis<br>Keeping or change<br>Added extent of the business<br>Loan analysis<br>Demand analysis<br>Benefit-analysis of sales specialists<br>Capacity analysis |
| 6. Cost-volume-income analysis |
| 7. Cost-behavior analysis |
| 8. Investment-return analysis |
| 9. Analysis of optimal order quantity |
| 10. Analysis of safety inventory/refilling time |
| 11. Analysis of segment reports |

Source: main construction

The Table 7 represents few examples about the information required to the given instruments:

Table 7: *Necessary information to different models*

| Instrument | Required information |
|---|---|
| Flexible cost-planning | Reaction rate of variable costs |
| Variance analysis | General costs |
| Optimal order quantity models | Benefit-sacrifice, avoiding costs |
| Capital budgeting models | In- and outflow of future cash |
| Cost-volume-income analysis | Proportion of variable costs, fixed costs, expected income |

Source: main construction

Therefore the management accounting is such an approach which simplifies the complex connections with indices and models established for handling the most significant variables and restrictive conditions: financial report item, strategic decisions, tactical decision making instruments, and management accounting information

## Results and consequences

According to the concept of the strategic accounting the monitoring of the internal procedures of an enterprise ensures its short-term successfulness, and hereby its long-term market results as well. The value-chain-attitude deserves special attention in the management approach, which represents repeatedly a new direction in the strategic management accounting. This accordingly the settlement of incomes and costs should be taken into consideration not only in the given organization, but during the whole lifecycle of the product. Based on my investigations in the special literature it is to be stated that even within the scope of the strategic accounting more development directions and practical methodologies were established. In my opinion the long term mentality (target value controlling) represented in the settlement-orientation for the board may definitely support the reasonability of their decisions and practicability of their future prospects. At the same time it is also clear that such a form of strategic direction in accounting prefers the appearance of

management decision-supporting systems – like management information system, controlling – and their technologic application. According to Zéman (1998) the board's decisions shall be safer and free from risk with this way, since the decision mechanism of the financial management cannot neglect the information of the accounting settlement-tasks. One can accommodate to this from strategic point of view only on a given level, therefore it is reasonable to enlighten of the internal procedures from management accounting-side. The developing of responsibility-principled accounting can be a base for such an approach, where in the centre there is the accomplishment-settlement of the internal self-rendering units. But another approach exists as well, where the accounting appears as the complex describing instrument of the establishment and pursuance of strategy. The models and methods belonging to here represent a step forward into the matter of the strategic management. One of the most characteristic and in the practice most popular way for the strategic accounting is the Balance Scorecard concept. Fónagy and Zéman (2010) have found in their company value-determining examinations, that the different measurement methods of the financial accomplishment cannot be applied in all kinds of situations. Each financial analysis-technique has its own strengths and weaknesses, and all of them provide useful information about the value-creating process. The most prudent solution is to use the coordination of the measurements, which ensures expedient self-controlling opportunities; furthermore it might make some other accounting aspects expressive for economic analysts. Inside the enterprise the process of value-creation should be connected to the most modern methods, which help to show relevant picture about their achieved performance even on long-term.

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AGRICULTURAL AND RURAL DEVELOPMENT

# PROBLEMS OF RURAL DEVELOPMENT IN ROMANIA AND THE TRANSFORMATIVE POWER OF THE CAP?

Matthew GORTON*, Carmen HUBBARD** and Mihaela***

*The implementation of the Common Agricultural Policy (CAP) in Romania represents a major transfer of funds. This paper evaluates rural development problems in Romania and the power of the CAP to adequately address these difficulties, drawing on the theory of neo-endogenous rural development as a conceptual framework. In Romania, the main beneficiaries of the CAP to date have been relatively large farms. These actors are not the most in need. The transfers to them have financed largely intensification and capital investment. While boosting the competitiveness of large farms, such transfers have neither led to widespread benefits for other actors nor challenged the main problems faced in rural Romania – poor employment prospects, weak infrastructure and inferior quality of life. While direct payments do provide an additional revenue stream for small-scale producers, they are not a "game changer", being insufficient to finance substantial modernisation or expansion of agricultural or non-agricultural activities.*

**Keywords:** rural development, Common Agricultural Policy, Romania
**JEL codes:** O18, 021, P25

## 1. Introduction

When measured by population and land area, Romania is the second largest of the New Member States. According to national definitions, some 87% of Romania's territory is defined as rural and 45% of the total population lives in rural areas (*Institutul Național de Statistică*, 2009). Agriculture remains the mainstay of these rural areas with Romania possessing approximately 1.8 million farms between 1 and 5 hectares, with a similar number of holdings of less than 1 hectare (*Ministerul Agriculturii și Dezvoltării Rurale*, 2008). Poverty in rural Romania is

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severe and widespread. Implementation of the Common Agricultural Policy (CAP), however, implies a substantial flow of financial resources into agricultural and rural policy – the budget for the 2007 -2013 financial period is €13,525 million. This represents a huge increase in spending on agriculture and rural policy when compared to pre-accession levels. The future welfare of rural Romania depends partly on how well this money is spent, particularly whether these resources address the persistent structural problems. At the European level, the performance of rural development measures in Romania will be scrutinised closely as it is an important test case of the ability of the CAP to tackle structural problems in the New Member States.

This paper evaluates rural development problems in Romania and the power of the CAP as it is currently constituted to remedy weaknesses. The study draws on the theory of neo-endogenous rural development as a conceptual framework. Three main sets of problems affecting rural Romania are identified: insufficient quantity and quality of jobs in rural areas, difficulties of service provision and deficiencies in quality of life. The appropriateness of the CAP to resolve these problems is assessed, with attention paid to the distribution of, and difficulties in accessing CAP funds.

## 2. Conceptual Framework: Neo-endogenous Rural Development

This section outlines the neo-endogenous approach to rural development contrasting it with exogenous and endogenous models (Table 1). Two assumptions underpin the neo-endogenous model. First, the interplay of local and external forces shape development (Lowe *et al.,* 1995) rather than the latter being solely determined by either exogenous or endogenous resources. Exogenous models are criticised as they rest too heavily on the attraction of external capital, for example branch plants of multinational firms. Such initiatives are vulnerable to changes in tax and subsidy arrangements and often lead to insubstantial skill formation, technology transfer, fostering of entrepreneurial spin-offs or reinvestment of profits to the rural host region (Amin and Thrift, 1994).

Table 1: *Models of Rural Development*

| | *Exogenous development* | *Endogenous development* | *Neo-endogenous development* |
|---|---|---|---|
| **Key features** | Rural areas are peripheral but may attract external capital depending on relative costs of production | Employing local resources (natural, human and cultural capital). Create self-sufficient 'enclosed' economies. | Interaction between local and extra-local forces. Seek participation of local actors in local and external networks and development processes |
| **Major rural development issues** | Peripherality and relative costs of capital, land and labour | Limited capacity of areas/groups to participate in economic activity | Resource allocation and competitiveness in a global environment |
| **Focus for rural policy** | Attract external capital | Local capacity building (skills, institutions etc.) | Enhance local capacity and actors participation to direct local and external forces to their benefit |
| **Criticism** | Dependent and dictated development | Self-sufficiency inadequate for poor and remote rural regions. Ignores the reality of contemporary economies. | To date operates at a level of insufficient empirical evidence |

Source: adapted from Ward *et al.* (2005) and Hubbard and Gorton (2011)

Endogenous models, in reaction to the weaknesses of the exogenous approach, focus on local self-sufficiency. However, in sparsely populated rural regions with weak purchasing power this is often inadequate. For instance the growth of firms based in such remote, rural areas often depends on accessing larger, extra-regional markets. A focus on self-sufficiency ignores the realities of contemporary markets with significant regional and international movement of capital and labour (Atterton *et al.,* 2011). Rural development cannot be built solely on exogenous or

endogenous resources, so that the critical issue is how 'local circuits of production, consumption and meaning articulate with extra-local circuits' (Lowe *et al.*, 1995, p.93) and how the benefits of development can be retained at the local level (Ray, 2006).

The second assumption of the neo-endogenous approach is prescriptive – that the centre of rural development initiatives ought to be the enhancement of local institutional capacity so that it can 'both mobilise internal resources and cope with the external forces acting on a region' (Ward *et al.*, 2005, p.5). This second assumption can be labelled as the *spirit* of neo-endogenous development (Hubbard and Gorton, 2011).

Ray (2000) argues that critical to the development of local institutional capacity is human and social capital. Integral to human and social capital, are 'soft connections' and informal networks. These networks should not only involve local actors but others with national and global connections, who can link localities into wider circuits of capital and knowledge (Atterton *et al.*, 2011). Linking local and extra-local actors often requires creating new institutional forms (e.g. alliances, networks and partnerships).
Ray (2000) argues that the LEADER[1] programme is especially suited to fostering neo-endogenous development. This is because development strategies should be in accordance with local needs, problems and capacities (bottom up agenda) but requires linkages with extra-local actors for their successful realisation. The neo-endogenous approach does not therefore prescribe specific policies from the outset but represents a framework for development where the emphasis should be on interventions that mobilise local resources. This requires capacity building with both horizontal and vertical integration (Shucksmith, 2010).

## 3. Rural Development Problems in rural Romania

Rural areas in large parts of Western Europe have witnessed a population turnaround (counter-urbanisation), with a substantial net migration from urban to rural areas. While initially this trend was restricted to the most accessible rural localities surrounding major urban conurbations, gradually it has affected remoter rural locations (OECD, 2006). Rural

migration has been weighted to middle class families and retirees seeking a better quality environment to raise children or enjoy retirement (Murdoch and Day, 1998). The process is linked to, and reinforces, the establishment of rural areas as significant places of work and residence, in their own right, increasingly independent from agriculture (OECD, 2006). In-migrants to rural areas bring new skills, contacts and capital, making over time a significant contribution to rural economies (Atterton *et al.,* 2011). Such a pattern is in stark contrast to the situation in Central and Eastern Europe, particularly in rural Romania, which is exposed to three, inter-related sets of problems.

a) *Lack of employment opportunities*

Wage rates and household incomes in rural Romania remain substantially lower than those in urban areas. Throughout the 2000s, average wage rates in rural areas were at least 22 percent lower than those in urban locations (*Institutul Național de Statistică*, 2010). The gap between rural and urban areas grew in the late 1990s and early 2000s: between 1997 and 2006, average incomes in all economic sectors in Romania increased by 54%, while incomes in rural areas only increased by 10% over the same time period (Alexandri and Luca, 2008). While the official rate of unemployment is lower in rural areas, this disguises much underemployment (Fieldsend and Kerekes, 2008).

Most rural areas remain overly dependent on agriculture, with few well paid opportunities in other sectors. Romania's mass of small, semi-subsistence farms, while providing a basic safety net offer only meagre returns (Davidova *et al.,* 2012). These small scale farms continue to account for a relative high share of the total number of farms and utilised agricultural area (UAA) by European standards (Hubbard and Hubbard, 2008; Knight, 2010). In 2007, farms smaller than 5 hectares accounted for approximately 90% of Romania's total number of farms but only 35% of UAA (Davidova *et al*. 2010). Farm Structural Survey data indicates that 81% of Romania farms produce largely for own consumption (subsistence orientation) (Davidova *et al.,* 2010).

A high proportion of Romanian farmers survive on incomes below the official poverty threshold. For instance, in 2006, the rural poverty rate (22.3% of households below the absolute poverty line) was over three

times greater than the comparable figure for rural areas (6.8%) (Institutul Național de Statistică, 2009).

b) *Weak Infrastructure*.
Rural Romania is generally characterized by a substantial lack of infrastructure, with poor quality roads, a limited access to medical services and education, rudimentary water and electricity supply and an inadequate public sewage system. Rural internet access is almost inexistent and available only in some public institutions (e.g. local administration). Out of approximately 80,000 km of total public roads, 80% represent regional and local roads. However, most of these roads are poor by European standards and serve only 60% of the total rural population (*Ministerul Agriculturii și Dezvoltării Rurale*, 2008).

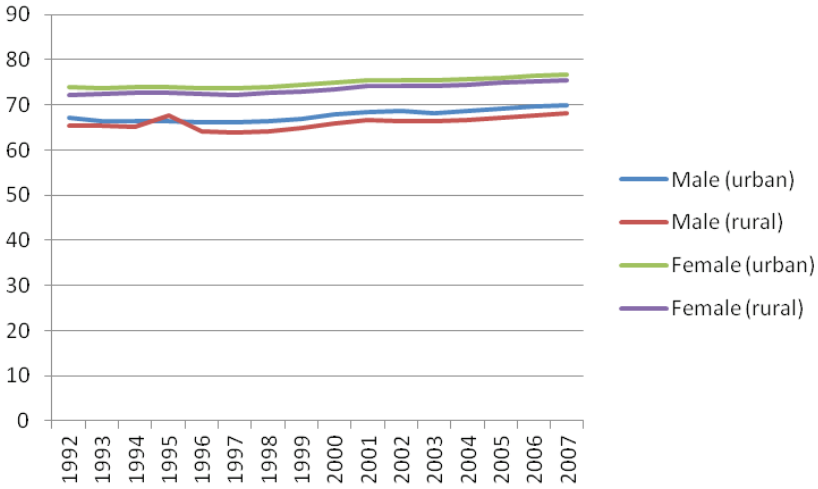
Providing water, electricity and heating supplying services remain significant challenges for rural Romania. Only a third of total rural population (or 3.4 million) has access to a public water supply, meaning that 70% of rural households get their water from wells. Just 2.4% of rural households benefit from central heating, while 89% still use wood, coal and oil. Regarding electricity, there are still 1,772 partially electrified and 121 non electrified rural localities (*Ministerul Agriculturii și Dezvoltării Rurale*, 2008). A 2002 study for the SAPARD programme underlined the impoverished state of rural infrastructure, with at the time only 16% of rural households connected to the public drinking water system, 24% had running water, 10% were connected to the public sewerage network and 12% possessed a flushing toilet inside their house (cited in Alexandri and Luca, 2008). While SAPARD funded some improvements, significant problems remain.

Weak purchasing power, resulting from low levels of income and sparse population, represents a major problem in rural Romania. It limits the growth of small and medium sized businesses and makes the provision of services by both private agents and the state increasingly problematic. Basic services have already been lost. Transport services are scarce if present at all. For instance, *Căile Ferate Române* (Romanian Railways) faced with mounting losses has cut services on rural branch lines. The number of post offices in rural areas has also dramatically fallen from 10,168 in 1991 to 6,110 in 2007 (*Institutul Național de Statistică*, 2009).

c) *Deficiencies in quality of life.*

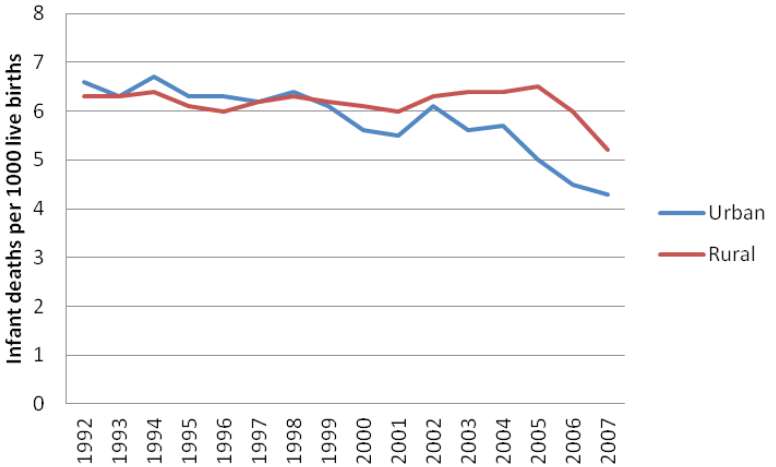
Underpinning the population turnaround in Western Europe has been a belief, widespread amongst a significant proportion of the population, that rural areas offer a better quality of life (Murdoch and Day, 1998). By contrast, in Romania, in general rural areas are not seen as attractive places to live and work (Fieldsend and Kerekes, 2008). On many indicators of quality of life, the performance of rural areas is significantly worse than urban locations. For instance, life expectancy for both males and females remains consistently higher in urban areas (Figure 1). While in the early to mid-1990s infant death rates were marginally lower in rural areas, more recently mortality rates have been significantly higher in rural areas (Figure 2).

**Figure 1:** ***Life Expectancy (years) for males and females in urban and rural areas***




Source: data extracted from Institutul Național de Statistică (2009).

Figure 2: *Infant death rate per 1,000 births*




Source: data extracted from Institutul Național de Statistică (2009).

A significant 'pull' factor for migration from urban to rural areas in Western Europe has been significantly lower crime rates in the latter. In Romania, according to official statistics, the crime rate is lower in rural areas, but the differential is not great – in 2007 urban areas accounted for 60.4% of reported crimes and 55.0% of the total population (*Institutul Național de Statistică*, 2009). Moreover, the differential has fallen slightly in recent years – in 2000 urban areas accounted for 63.5% of all reported crimes and 54.6% of the total population. Many rural areas in Romania have, by European standards, high crime rates.

Difficulties have been compounded by net outmigration of young people. In the worst affected rural villages, a distorted population structure is apparent, with inhabitants largely limited to the very young (school age and under) and pensioners, as those of working age have left (many of them abroad) in search of employment. The viability of these villages as service hubs is in danger. This problem is most severe in north-east Romania (*Moldavia*). Although precise figures are unavailable, it is estimated that between 1.2 and 3 million people have emigrated (International Organization for Migration, 2008). However, most of those who work outside the country send money back to family and relatives

## 4. Accessing CAP funds: patterns and problems

The main measures under Pillar 1 of the CAP are direct payments and, of less financial importance, market interventions. The total sum budgeted for Pillar 1 measures in Romania, funded by the European Agricultural Guarantee Fund (EAGF) for the programming period 2007-2013 is approximately €5,502 million. Since accession, Romania has implemented direct payments in the form of a Single Area Payment Scheme (SAPS), with the distribution of funds linked to the eligible area farmed. As direct payments are being phased in gradually, the financial envelope (from EAGF) for this measure has risen year on year. In 2007, the ceiling for direct payments was €447 million, which when divided by the total *eligible utilised area*, equated to approximately €50 per hectare (ha) (Cionga *et al.* 2008). In 2008 and 2009 the ceilings for direct payments were approximately €535 million and €623 million respectively (Table 2).[2] To date, the vast majority of the money available for direct payments was disbursed, with over 1 million claims approved every year. Since accession, Romania has set the minimum farm size threshold for receiving direct payments at 1 ha. This was designed to reduce the administrative burden as well as promote farm consolidation and competitiveness.

Table 2: *Distribution of Direct payments in Romania (2007-2010)*

| Year | Application forms submitted | Application forms approved | Ceiling approved by the Commission | Total amount paid EAGF | |
|---|---|---|---|---|---|
| | No | No | (Euro) | (Euro) | % |
| 2007 | 1,241,857 | 1,177,500 | 447,313,766 | 427,641,945 | 95% |
| 2008 | 1,130,330 | 1,094,080 | 534,675,467 | 529,197,757 | 98% |
| 2009 | 1,121,736 | 1,068,021 | 623,419,000 | 604,277,773 | 97% |
| 2010 | 1,092,535 | - | - | - | - |

Source: Agenția de Plăți pentru Dezvoltare Rurală și Pescuit, unpublished data.

The budget for market intervention is substantially less (between €6.8 million in 2007 and €82 million in 2010) (Table 3). The vast majority of funds available for market measures have also been dispersed.

Table 3: *Market measures paid from EAGF 2007-2019*

| Financial year | Application forms received | Application forms approved | Payments made | Ceiling | Payments made |
|---|---|---|---|---|---|
| | no | No | Euro | Euro | % |
| 2007 | 61 | 61 | 6,893,687 | 6,893,687 | 100% |
| 2008 | 1022* | 488* | 59,637,653 | 61,791,062 | 96,52% |
| 2009 | 1343* | 1647* | 76,269,134 | 77,656,547 | 98,21% |
| 2010 | | | | 82,105,000 | |

*Application forms submitted in the financial year *n* can be approved and paid in the financial year *n*, *n*+1 or *n*+2

Source: Agenția de Plăți pentru Dezvoltare Rurală și Pescuit, unpublished data.

Given the link between direct payments and eligible area farmed, the distribution of direct payments is highly skewed. Cionga *et al.* (2008) estimated that Romania possessed 1.23 million farms that were eligible for direct payments in 2008 (Table 4). Over one million of these eligible farms operated between 1 and 5 hectares, but received only around one quarter of total expenditure on direct payments. Nearly one half of direct payments went to farms operating over 100 hectares.

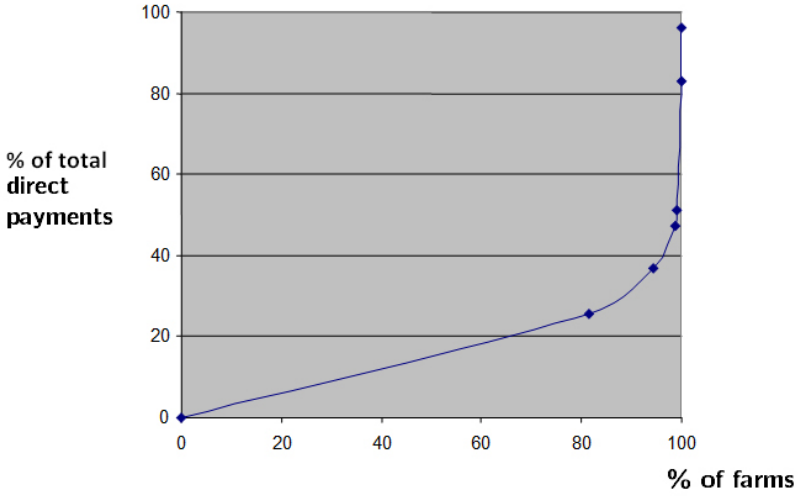
Table 4: *Distribution of total direct payments, by farm size, Romania, 2008*

| Size class & ownership | Total eligible farms | Total eligible UAA (ha) | Total estimated direct aid (€) | as % of total direct aid |
|---|---|---|---|---|
| 1-5 ha | 1,001,409 | 2,436,816 | 237,589,560 | 25.7 |
| > 5-10 ha | 159,428 | 1,058,554 | 103,209,015 | 11.2 |
| > 10 - 50 ha | 52,273 | 982,022 | 95,747,145 | 10.4 |
| > 50 - 100 ha | 5,436 | 384,073 | 37,447,118 | 4.0 |
| Over 100 ha<br>Over 100 ha<br>of which: | 10,819 | 4,624,540 | 450,892,650 | 48.8 |
| >100-1,000 ha | 10,029 | 3,024,540 | 294,892,650 | 31.9 |
| >1,000-5,000 ha | 752 | 1,217,000 | 118,657,500 | 12.8 |
| > 5,000 ha | 38 | 3,83000 | 37,342,500 | 4.1 |
| **Total farms** | **1,229,365** | **9,486,005** | **924,885,488** | **100** |

Source: Cionga *et al.* (2008), based on data from the Ministerul Agriculturii și Dezvoltării Rurale.

Cionga *et al.*'s (2008) analysis reveals that for farms operating between 1 and 5 hectares direct payments varied between €98/farm and €490/farm. These sums are typically insufficient to fund major farm modernisation or investment. In contrast, farms operating over 100 hectares received a minimum of €9,800. Anecdotal evidence suggests that payments to these relatively large farms, which are overwhelmingly legal entities rather than individual farms, has funded investment in machinery, storage and other physical inputs such as fertilisers and pesticides. While this has improved the competitiveness of such large farms, it has led to little job creation. Rather the substitution of labour by capital may accelerate the decline in agricultural employment. For instance, a 300 ha arable farm, which during the socialist era employed 350-500 people, can now operate effectively with 15 to 20 employees. Figure 3 illustrates the uneven distribution of direct payments across Romanian farms.

Figure 3: *Lorenz Curve for Total Direct Payments, Romania, 2008*



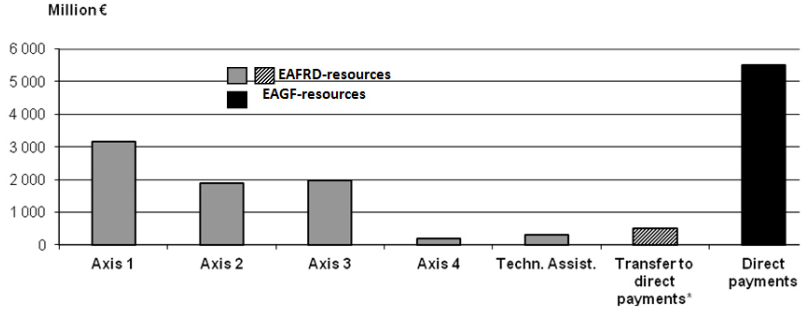

Source: Cionga *et al.* (2008).

Direct payments, in terms of the neo-endogenous theory of rural development, do little to enhance local institutional capacity and are not

focused on the local needs, problems and capacities, which form the basis of the bottom-up agenda.

Under Pillar 2 of the CAP (rural development measures), Romania, over the period 2007-2013, should receive €8023 million from the European Agricultural Funds for Rural Development. This a substantial investment in rural policy, split between four axes (Figure 4). The most well resourced element is Axis 1, designed to improve the competitiveness of agriculture and forestry (42.2% of Pillar 2 budget). Substantial sums are also allocated to Axis 2 (improving the environment and countryside – 25%) and Axis 3 (quality of life in rural areas and economic diversification – 26.3%). In contrast, just 2.5% is allocated to Axis 4 – implementation of the LEADER approach.

Figure 4: *Allocated CAP funding for Romania in the period 2007-2013*




Source: Ministerul Agriculturii și Dezvoltării Rurale (2008)

The implementation of Pillar 2 measures has been delayed. By August 2010, measures 121 (modernisation of agricultural holdings), 123 (adding value to agricultural and forestry products), 125 (infrastructure for agriculture and forestry), 312 (micro-enterprises) and 322 (village renewal) had been oversubscribed in terms that the value of applications exceeded the total funding available for the period 2007-2013 (Table 5). For the village renewal measure, within the first few months of the call for applications being opened the value of applications exceeded the total funding available for 2007-13 and this measure is closed to new applications.

Table 5: *Distribution of funds under Selected Pillar 2 Measures*

| Measures | Measure type | Financial allocation 2007 – 2013 (euros) | Up to 27th August 2010 | | |
|---|---|---|---|---|---|
| | | | Value of applications as % of funding available under measure | value of contracts signed as % funding available under measure | payments as % of funding available under measure |
| 111 | Vocational training | 119,019,349 | - | - | - |
| 112 | Assistance to young farmers | 337,221,484 | 32.9% | 17.3% | 9.5% |
| 121 | Modernisation of agricultural holdings | 913,394,603 | 213.4% | 57.7% | 20.0% |
| 123 | Adding value to agricultural & forestry products | 999,243,407 | 129.2% | 50.6% | 8.3% |
| 125 | Infrastructure for agriculture and forestry | 483,226,817 | 191.0% | - | - |
| 141 | Support semi-subsistence farmers | 476,077,390 | 31.5% | 9.7% | 1.9% |
| 142 | Setting up producer groups | 138,855,905 | 1.1% | 1.0% | 0.0% |
| 143 | Agricultural extension / advice | 158,692,463 | - | - | - |
| 312 | Creation and development of micro-enterprises | 385,237,628 | 141.2% | 48.2% | 1.5% |
| 313 | Tourism | 534,682,774 | 44.7% | 19.6% | 0.7% |
| 322 | Village renewal | 1,570,127,631 | 473.2% | 96.3% | 4.7% |

Source: Agenția de Plăți pentru Dezvoltare Rurală și Pescuit, unpublished data.

The signing of contracts and especially the distribution of payments has been slow. For instance, while the allocation of money under measure 322 (village renewal) has been decided, with contracts signed for proj-

ects worth 96.3% of the funding available, less than 5% of funds under this measure had been distributed by the end of August 2010. For all measures there are significant lags between the signing of contracts and the distribution of payments. In terms of the latter, the best relative performance is for Measure 121 (modernisation of agricultural holdings). A particular problem for Pillar 2 measures has been meeting co-financing requirements. In the first years of EU membership there was little political will to support the attraction of EU money with some public officials remaining ignorant of the importance of the funds and co-financing requirements.

Applications for some measures have been lower than initially expected. For instance, given that Romania possesses over 1 million farms operating between 1 and 5 ha, one may have expected substantial interest in Measure 141 (support for semi-subsistence farmers). Yet applications valued at only 31.5% of the available funding had been received by the end of August 2010. Measure 141 is designed to aid semi-subsistence farmers to commercialise, providing income to aid the farm restructuring process. It is available in Romania to those operating between 2 and 8 European Size Units (ESUs) with a maximum age of 62. The maximum amount per beneficiary is €1500 per year. Applicants must present a business plan, most of which are prepared by external consultants and have been of varying quality. Funding is on a 'three plus two basis'. After three years, beneficiaries must demonstrate a 20% increase in marketed production and an increase in size of at least 3 ESUs. If this is achieved, an additional two years funding is available. There are additional requirements: beneficiaries in Romania must enrol in vocational training courses if they wish to gain the additional two years funding. However, the delay in the certification of vocational training providers (under Measure 111), means that beneficiaries cannot yet fulfil this obligation. The greatest obstacle for implementing Measure 141, however, is that most semi-subsistence farmers are unaware of the funding available.

Small farms are not the target beneficiaries of the other measures within Axis 1. For instance, Measure 121 (modernisation of agricultural holdings) has a minimum farm size of 2 ESUs. Moreover, all of the initiatives financed under the measures must meet a minimum project value of €5,000 (*Ministerul Agriculturii și Dezvoltării Rurale*, 2008). Small scale

farms also typically lack collateral and struggle to obtain credit (Davis and Gaburici, 1999), which also limits their ability to access Pillar 2 funds as they cannot meet co-financing / pre-financing requirements.

Novel measures that require new systems and style of administration present the greatest challenge for implementation of the CAP (Wegener *et al.* 2011). This is clearly apparent for Axis 4 (LEADER). By the time of the interim evaluation of Romania's Rural Development Programme for 2007-2013, no specific projects had been implemented (*Ministerul Agriculturii și Dezvoltării Rurale*, 2011). Preparations for the implementation of LEADER began, however, in 2006 (Marquardt, 2011). Administrative networking, across agencies, appears particularly problematic with most relevant LEADER information flows limited to the Ministry of Agriculture and Rural Development and its subordinated agencies, with 'a lack of reciprocal or reverse flow and of horizontal relations between agencies' (Marquardt *et al.*, 2011, p.26).

## 5. Conclusion

The implementation of the CAP in Romania represents a major funding stream for agriculture and rural development – €13,525 million for the programming period 2007 to 2013. This is a huge increase compared to the level of funding prior to accession. Romania provides an important test case of the efficacy of CAP measures in an environment of severe, ongoing structural problems in rural areas. Outcomes in Romania will thus be scrutinised closely at the European level.

Regarding implementation of the CAP to date there has been a stark contrast between Pillar 1 and Pillar 2. Under Pillar 1, the main measures, direct payments and market intervention, were successfully distributed from the first financial year onwards. For direct payments, this has involved payments to over 1 million beneficiaries annually. The successful distribution of Pillar 1 money has been aided by the lack of co-financing requirements. For Pillar 2, despite a high degree of interest in and applications for funding the signing of contracts and distribution of money has been subject to delay. Novel measures targeting non-agricultural actors have generated the greatest administrative problems.

In Romania, the main beneficiaries of the CAP to date have been relatively large farms. These actors are not the most in need. The transfers to them have financed largely intensification and capital investment. While boosting the competitiveness of large farms, such transfers have neither led to widespread benefits for other actors nor challenged the main problems faced in rural Romania – poor employment prospects, weak services and inferior quality of life. Direct payments to large farms are also unlikely to stimulate diversification into non-agricultural economic activities (Chaplin *et al.*, 2004).

Despite the large scale resource flows into agricultural and rural policy, Romanian small-scale farmers have to date benefited only modestly from implementation of the CAP. While direct payments do provide an additional revenue stream, because they are linked to eligible area farmed, for small-scale producers they are not a 'game changer', being insufficient to finance substantial modernisation or expansion of agricultural or non-agricultural activities. The specific measure for semi-subsistence farmers has proved difficult to access because of the requirements for funding (business plan, knowledge of the scheme). Large-scale farms are in a far better position to know of potential funding opportunities and have the ability to respond to the calls.

## Notes

[1] *Liaison Entre Actions de Développement de l'Économie Rurale* (Links between Actions for the Development of the Rural Economy).
[2] While being phased in, direct payments could be topped up by national direct payments, funded by redirecting money allocated to rural development measures (Pillar 2).

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# THE IMPACT OF MACROECONOMIC VARIABLES ON AGRICULTURE

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*This article presents a brief survey of the increasing body of literature on the effects of macroeconomic factors on agricultural prices, incomes and trade. The most publications in this topic are focused mostly on the developed countries and there are no many studies published on transition economies of Central and Eastern Europe. In the transition economies where major macroeconomic and agricultural transformations have been taken place it is a key question to study the influence of macroeconomic variables on agricultural development, which becomes even more important in period of macroeconomic turbulences. In the first stage are reviewed separately the impact of exchange rate change and volatility, of money supply change and of inflation change on agriculture. In the second stage are surveyed empirical findings on the influences of most important macroeconomic variables on the agriculture.*

**Keywords:** macroeconomic effects on agriculture, exchange rates, overshooting
**JEL codes:** Q14, E44, F14, Q17

## Introduction

Changes of macroeconomic policy have become increasingly important for the agro-food sector as agriculture has become more capitalized and more dependent on international markets, thereby becoming more vulnerable to changes on money supply and inflation rate, interest rates, exchange rates, business cycle fluctuations and international growth rates. After the collapse of Bretton-Woods Agreement a floating exchange rate regime of U.S. dollar was introduced in the United States which has encouraged agricultural economists to pay an increasing attention to the relationship between agriculture and the macroeconomy in the last three decades.

Previous empirical research based on mainly U.S. agriculture reveals that any changes in macroeconomic variables should have an impact on agricultural prices, farm incomes and agro-food trade. The most publications

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in this topic are focused mostly on the developed countries and there are no many studies published on transition economies of Central and Eastern Euroep. In the transition economies where major macroeconomic (Csaba, 2011) and agricultural (Csáki, 2000; Fertő,1996) transformations have been taken place it is a key question to study the influence of macroeconomic variables on agricultural development, which becomes even more important in period of macroeconomic turbulences.
This paper undertakes a survey of previous literature on macroeconomic impacts on agriculture. In the next section are presented the effects of exchange rate change and volatility on agriculture. This is followed by the examination of monetary impacts on agro-food products. Before the last section are presented some results on the impact of inflation on agriculture. Finally the impacts of macroeconomic variables are investigated.

## The effects of exchange rates changes on agro-food trade and prices

Schuch (1974) in his pioneering paper emphasised the importance of macroeconomic policy to agriculture through its impact on exchange rates in causing economic fluctuations in agriculture. Exchange rates are a key variable in determining domestic prices for agricultural commodities and for tradable goods link domestic prices to world prices. The primary concern over exchange rates has been their impact on agricultural prices, some agricultural economists have also been concerned with other impacts of exchange rates on agriculture i.e. exchange rate would affect the amount of land used, employment in agriculture, farm income and productivity. The increase of world trade volume Such (1976) attributed to the change in the U.S. exchange rate system from fixed to flexible. Gardner (1981) found that the exchange rate elasticity of land price is bounded to unity. Chanbers and Just (1981) confirmed a negative relationship between agricultural incomes and exchange rate changes.
Orden (2002) discuss the effects of exchange rate appreciation or depreciation on agro-food trade underlying the evidence that depreciation raises dollar prices and increase export quantities, whereas for import value these effects have adverse effects (e.g. depreciation raises dollar prices and lowers import quantities). The recent boom of high agricultural prices and net farm income has occurred in a period of weak dollar and exceptionally low interest rates (Orden, 2010).

The advancement of the literature exploring the effects of exchange rate on agriculture in addition of assessing the impact of exchange rate *change* an extending body of literature is published on the effects of exchange rate *volatility* on agricultural trade. The theory suggests that exchange rate volatility can have both negative and positive effects on the volume of trade. Risk aversion and costly adjustment of production factors may lead to negative impact of exchange rate volatility on exports, while convexity of the profit function with respect to export prices may lead to positive impact (De Grauwe, 1988).
Kadilov (2008) found a large negative impact of exchange rate volatility on agricultural trade according to previous studies (McKenzie, 1999; Cho *et al*, 2002; Sun *et al.*, 2002) and the effect of exchange rate volatility is largest for developing country exporters and smallest for developed exporters. Fertő and Fogarasi (2012) studying the effects of exchange rate volatility and institutional quality on agri-food trade on the Central and Easter European Countries found negative correlation between exchange rate volatility and trade of agro-food products.
Positive effect of exchange rate volatility on agricultural trade is reported by Langley *et al*. (2000) and McKenzie (1999) in his survey of exchange rate volatility effects on international trade.

### The influences of money supply change on agriculture

The exchange rate is not the only mechanism by which macroeconomic factors can affect agricultural economy. Empirical research of monetary impacts on agriculture reveals that any changes in macroeconomic variables should have an impact on agricultural prices, farm incomes and agricultural exports.
The overshooting hypothesis indicates that changes in money supply can have real short-run effects on agricultural prices. 'Overshooting of a price is defined as a temporary change in its value beyond its long-term equilibrium' (Saghaian et al., 2002, 91). Dornbush (1976) developed the overshooting theory to explain volatility in exchange markets. The overshooting hypothesis is based on the assumption that the prices of all goods adjust slowly relative to exchange rates and assets markets. Dornbush's model and overshooting hypothesis was applied by Frankel (1986) to a closed economy. Bordo (1980) was the first to show evidences that

U.S. commodity prices respond more rapidly to macroeconomic changes. The impact of monetary policy on agriculture in transition economies of Central and Easter Europe was investigated by Bakucs et al. (2009, 2012). They conclude that money neutrality does not hold for Poland as well as they found that agricultural prices react faster and more profoundly to changes in money supply than the industrial sector. They found similar results in Slovenia i.e. agricultural prices adjust faster to money shocks than industrial prices do, affecting relative agri-food prices in the short run, but in the long-run money neutrality hypothesis does not hold.
Asfaha and Jooste (2007) reported also a long-run relationship between South African agricultural and industrial prices, the exchange rate and money supply. They found also that agricultural prices adjust faster than industrial prices to innovations in money supply, providing evidence for the hypothesis that agricultural prices overshoot their long-run values in the short-run.

### The impact of inflation variation on agro-food markets

The analysis of connection between inflation and relative price variability has an extended literature after the pioneering work of Park (1978). Real costs of inflation are attributed according to Dormberger (1987) in the impact on changes in intramarket relative price volatility. Loy and Weawer (1988) analyse the roles of anticipated and unanticipated inflation as determinants of changes in the relative price structure of agro-food products measured by relative price volatility. They found empirical evidences that 'inflation costs are not only a result of surprises originating in macroeconomic announcements, but can also rise as a result of sticky prices that slowly and differentially adjust across spatial markets and across products' (Loy and Weawer, 1988, 391). They also found that the positive correlation between rate of inflation and price volatility is due solely to anticipated inflation.
Lapp and Smith (1992) presented evidences that the variability of relative prices in agriculture is related to average rate of nominal price change among agricultural products and to actual and unexpected aggregate inflation.

Liu *et al.* (1993) estimate a set of foreign and domestic macroeconomic variables such as aggregate output and price levels, real domestic absorption, current account, government expenditures, tax, real foreign tax money supply , and exchange rate assessing their effects on U.S. meat exports. They found that domestic money supply shock has an insignificant effect on meat exports, while a shock in foreign money supply is very important. In general they concluded that foreign macroeconomic variables exercise more significant and persistent effects on U.S. meat exports than domestic macroeconomic variable.
Lechaal and Womack (1998) presented evidences that macroeconomic developments are important to Canadian agriculture. They found after testing the impact of prices, wages, rates of returns, resources, fiscal and monetary variables on agriculture that Canadian agriculture is responsive to relative price changes.
The long-run analysis of Kaabia and Gil (2000) indicate that most of the theoretical relationships among macroeconomic and agricultural variables hold. The real demand for money is neutral with respect to aggregate income and agricultural prices are homogeneous. In the short-run agricultural prices react more quickly than input prices, which indicate that the terms of trade for agricultural sector have been deteriorated in Spain.

## Acknowledgement

József Fogarasi gratefully acknowledges financial support from the 'János Bolyai' scholarship of the Hungarian Academy of Sciences. All opinions expressed are those of the author and have not been endorsed by Hungarian Academy of Sciences.

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# TO COOPERATE OR NOT TO COOPERATE – FROM POINT OF VIEW OF SOCIAL AND ECONOMIC SUSTAINABILITY

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*Signs of the crisis of the Hungarian agriculture are in relation with the economic and social model that has become rigid throughout the past two decades. The evolved structure of agricultural holdings increased their ecological footprints, at the same time the social relationships, the networks among the farmers have been restructured as well as become looser. The degree of trust has reduced. Based on the principles of the modern economic schools, i.e. the new institutional economics and the game theory, the study examines the existing trust level among farmers, as well as how it affects the farmers' preferences of choice among the different forms of dependencies, as well as which factors affect the individual utility functions, focused on the role of subsidies from the social transaction costs, also taking the experiences of a questionnaire research into consideration. Due to the information asymmetry between farmers and the lack of confidence as a result, the individual and the social expenditures are higher as those economically reasonable, instead of the optimum.*

**Keywords:** agriculture, payoff, utility, decision, game theory
**JEL codes:** C72, Q12, D23

## 1. Introduction

The transition from the socialist regime has basically reconstructed the ownership conditions and property structure of the arable land in most of the Central-Eastern European countries (Takács-György *et al.*, 2008). In addition to the changes in ownership, the farm scales have also been modified and the landed property structure has diversified (Takács-György and Sadowski, 2005). The new property structure has resulted significant alterations in land use (Bozsik and Magda, 2010) and high number of small-scale, divided farms have emerged. Limitation of the

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land market (Magda, 2001) preserves, permanently maintains the diversified estate structure in a sense. The technical requirements under the new conditions impose great challenges to the farmers as well as to the government.

The social-economic processes, the economic and social tensions make it clear that new problems require the development of new structures (Magda and Marselek, 2010) which consider the economic, social and environmental interests of the local communities, as well as their sustainability.

The present paper covers two theoretical aspects that are less related in general: sustainability and its social sustainability part which is often put into the background, as well as the game theory, which uses models to support economic decisions and thus tries to explain the reasons for the real processes, in order to find scientific explanations for the attitudes of local communities in connection with cooperation (Takács, 2000; Baranyai, 2010).

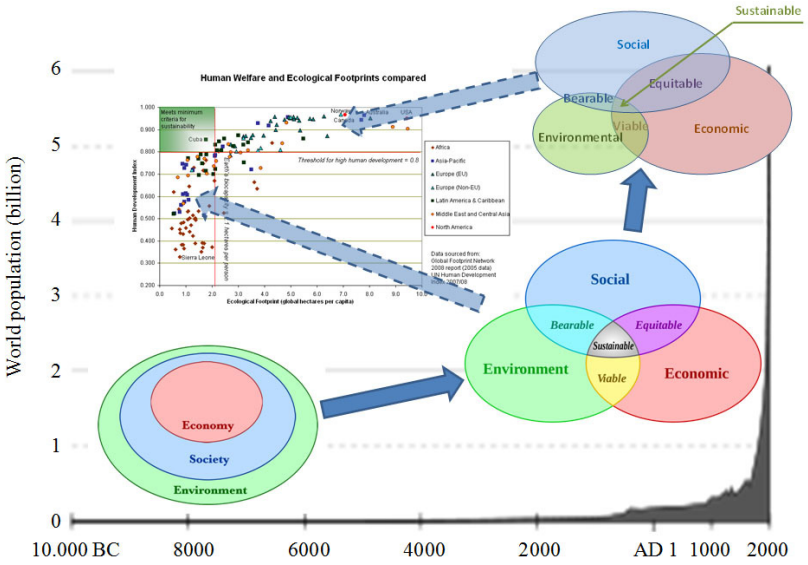
Supposing that the general aspects and features are widely known, we tried to focus on those sides of the question which can help to find the reasons (and necessity) of machinery sharing arrangements or the lack of cooperation (and economic rationality behind this decision) between farmers, who are the main targets of our research.

*1.1. Arguments for sustainability*

Sustainability is defined by Harnos and Hufnagel (2007, 175. p.) that „the sustainable environmental strategy should include resource management in a way that it meets the requirements of the current generation without reducing the possibilities of the future generations" By our days, however, it has become obvious – without disputing the general truth of the original definition – that sustainability should be defined in a broader sense (Pearce and Atkinson, 1995; Bongiovanni and Lowenberg-DeBoer, 2004; Láng, 2003; Csete and Láng 2005; Várallyay 2007). According to the Burtland report (World Commission on Environment and Development, 1987) the sustainable development is a process that includes the present and the future: the current requirements and necessities meet in the process with the own later needs of the future gen-

eration (Willers 1994). It also means that the social sustainability includes the production of foodstuff and industrial (energy-related) stuff in volumes that meet the social needs and the producer meets the economic criteria and conditions of environmental responsibility (Figure 1).

Figure 1: *Dimensions of sustainability and their changes*




Source: Own construction on the basis of Adams (2006) and Wikipedia (2011) diagrams

The question of sustainability, however, cannot be separated from the people, who – in contrary to the other actors of the living world – form the natural environment more intensively, consumes its resources and tries to limit the self-regulation role of natural processes by several means. The result is the dynamic growth of mankind on the Earth that could be observed in the recent centuries. Due to the technical development, it has been going together with the growth of natural resource needs, too, and typically – but very differently – for the whole Earth the population aims to improve life quality which results increasing quantities of resources per one time unit. Together with the generally successful

steps in the interest of increasing life expectancy, the biocapacity needs have grown in a multiplicative way as a common effect of factors. In case of many countries, these needs go beyond the capacity of available areas and it has required new social responses (see Korten, 2002). The shrinking natural resources (often in absolute values), the economy that is growing according to the requirements of growth-oriented economic paradigm, the population that is increasing due to the relative well-being and other impacts, may sometimes reduce the number of elements which correspond to the criteria of sustainability (to all the three aspects simultaneously). In case of different interests, the partial correspondence (that is bearable (simultaneous correspondence to the requirements of society and the natural environment), viable (simultaneous correspondence to requirements of economy and natural environment) and equitable (simultaneous correspondence to social and economic requirements)) can result adequate outcomes.
So, as regards the topics of research, the solutions meeting both the conditions of sustainability and equitability can be accepted (of course, only if these solutions do not affect negatively or do not deteriorate the natural environment compared to its previous state, but do not by all means meet fully the criteria of sustainability).
All these mean for us that our economic decisions should create structures which meet at least the conditions of equitability.

*1.2. The prisoner's dilemma, or the implementation of game theory in exploring the problems*

From the aspect of game theory, the economic processes can be regarded as the game of two or more players, who make decisions in the game (Kreps 2005). The explanatory models usually start from the point that the decision is rational (the player is homo oeconomicus) and identical decisions can be expected because the condition system remains unchanged.
Starting from the non-cooperative game theory, we prioritize the implementation of the normal form in our research. According to the non-cooperative game theory, the players make decisions independently, thus there is no self-restraint during decision-making, and everybody aims to maximize profit. It is not indifferent whether the decision-maker knows the decision of the other player or not. The normal form is appropriate for describing the decisions made simultaneously (in the lack of knowing

the other's decision), while the extensive form – that we do not use – as a decision tree, the graphic description of decisions, in which the subsequency of decisions appear, too, due to the features of description.

**Figure 2:** *Payoffs of players described in table, according to the normal form*

| | | *B* | |
|---|---|---|---|
| | | $S^B_1$ | $S^B_2$ |
| *A* | $S^A_1$ | $a_{1,1};b_{1,1}$ | $a_{1,2};b_{1,2}$ |
| | $S^A_2$ | $a_{2,1};b_{2,1}$ | $a_{2,2};b_{2,2}$ |

*or in matrix form* $\boldsymbol{P} = \begin{bmatrix} a_{1,1};b_{1,1} & a_{1,2};b_{1,2} \\ a_{2,1};b_{2,1} & a_{2,2};b_{2,2} \end{bmatrix}$ (1)

Source: Own construction

The normal form is the description of players' payoffs in a matrix (***P***), which gives the due pairs of payoffs of strategy pairs. (Figure 2, Equation 1).
The rows show the strategies of player one (A in our case), while the columns show the strategies of the other player (B in our case). The result of the rational selection is that the player chooses that possibility which offers higher payoff (profit). Therefore there are balance decision pairs called Nash equilibriums. The point in Nash equilibrium is that the player follows the strategy that is the best for him/her (results the highest payoff) until the other player does not change his/her own best strategy and vice versa.

The researchers of the game theory have studied a lot of cases and developed the „games" as the basis of economic modelling. In our research – considering the decisions of machinery use or machinery investments – we tried to find games, which meet the following conditions: two players are involved, each player has two possible strategies, the players do not have the perfect information and it is not zero sum game. There are several games that meet these criteria: Battle of the sexes, Chicken (aka hawk-dove), Deadlock, Prisoner's dilemma, Stag hunt and War of attrition. Out of them we chose Prisoner's dilemma and Stag hunt in the explanatory model.

The Prisoner's dilemma is primarily about the trust in the partner. According to the game, the players (prisoners) make confession separately from each other and they should make decisions independently, not knowing about the decision of the other. If they trust each other and they do not betray each other, then this strategy is the most rewarding (and Pareto efficient), none of them is sentenced. If, however, one of the players betrays and the other remains silent, then it results less sentence for the betrayer while the other is sentenced for more. If both parties confess against the other, then both of them are sentenced – but still for less than the longest sentence, due to the cooperation with the authorities. The Nash equilibriums of the game, if one of the parties betrays, the other remains silent, while because both players – supposedly – considers the possibilities similarly, and none of them trusts that the other chooses to remain silent, therefore he/she betrays. Since it can be supposed that both of them acts the same, the actual sum of their 'payoff" is the least beneficial. And though they know that the most beneficial would be for them to trust each other, since they are afraid that the trust is not mutual, they choose the solution – as a damage minimization – which is not favourable for them but still it is not the least favourable solution.

Stag hunt is also an often applied game theory model to describe the social cooperation. The players should cooperate to „shoot" the stag (deer) which would provide enough food for all the players, so it is the maximum payoff for the players. According to the game, the players are waiting for the stag (deer) but all of a sudden a rabbit comes. If one of the players shoots the rabbit, he/she will have enough, but also scares away the big game, so the others remain hungry. The players should take double risk: on the one hand that the stag (deer) may never come and they remain hungry, or the rabbit is shot by another player and all the others remain hungry. The imperfect information and the risks result that one of the players shoots the rabbit in spite of the fact that waiting for the stag (deer) would be more beneficial for him/her, too.

The normal form of description of the two games is identical, but the content of the payoff matrix is considerably different. Both games gave us ideas for the development of our model. The model is introduced in details later in the Materials and method chapter.

### *1.3. Risks and information asymmetries in the machinery sharing arrangements*

One of the central questions of machine sharing cooperation is the moral hazard, which can be either labour-related moral hazard or machine-related moral hazard (Allen and Lueck, 2002). We speak about machine-related moral hazard when the user of the machinery does not consider – because he is not interested in – the maintenance of long-term value of the machinery used because it is not his own, or only partly (Holmstrom and Milgrom, 1994), which means imperfect supervisory rights above the machinery (in case of joint ownership, lending of machinery or renting).

The so-called labour moral hazard actually means the „fare-dodger" behaviour. If the personal efforts of individuals cannot be observed or identified in the group but everybody receives the same share from the output, then the members of the group are inclined to invest less energy in the group work (Holmstrom, 1982; Eswarten and Kotwal, 1985). The factor treating the moral hazard – among others – is the social norm and the group pressure (Barron and Gjerde, 1997; Kandel and Lazear, 1992; Radner, 1986).

Time is a very important production factor in agricultural production. The actions carried out earlier or later then the due time involve extra costs or losses (profit losses) (Edwards and Boehle, 1980), which is called timeliness cost (Short and Gitu, 1991; Larsen, 2008).

The experiences prove that the joint machinery sharing arrangements may result the loss or forced surrender of independence, image losses, sometimes professional jealousy or envy, which can often be led back to the generation gap and the farmer's pride (Haag, 2004). According to the Hungarian experiences, the negative aspects of machinery sharing arrangements include the increasing dependence of the individual and the pressure to consult before decisions or actions (Takács, 2000; Takács, 2008).

## 2. Material and method

During the research we have developed a model by adapting the game theory methodology and examined the investment decisions of field crops farms from game theory aspects. On the basis of the data of survey documented by Baranyai (2010) and data of basis farm by Gockler (2011) we outlined the parameters of the model in which each of the two players participates with two possible cooperation strategies (Table 1). The number of actual players, of course, is significantly higher, but in most cases the players can be divided into two sets (those owing machinery and performing machine investments, and those not having and not wanting machinery). These two groups can be substituted with two players. The payoffs of the players come from the balance of the possible income (production, services, land-based subsidy given to the producers in some models) and costs (variable costs of production: fertilizer, pesticide, etc., variable costs of machine use; variable costs of machinery services, divided permanent cost of asset use (amortization); and the opportunity cost of land use). We have examined four types of models in order to analyse how the subsidies affect the farmer's decisions and the observed fact, according to which the farmers usually calculate with the return of the actually risked, own financial means disregarding the subsidies received for the investment. The model variants are as follows:

1) Without land-based subsidy and amortization-reducing factors (basic case)
2) With land-based subsidy, without amortization-reducing factors
3) With land-based subsidy, factor that reduces amortization: subsidy
4) With land-based subsidy, factor that reduces amortization: subsidy + residual value

The calculation of the payoff is made with equation (2), according to which the payoff vector is the product of the coefficient matrix of factors involved in the model variant (3) and (4), and the payoff factor vector (5). The payoff vector (6) gives the net output of players by strategy pairs.

Table 1: *Strategies of the players*

| Player | Strategy | Description of strategy |
|---|---|---|
| A | A1 | Invests and offers services |
| | A2 | Has no equipment, does not invest, looks for services |
| B | B1 | Invests and offers services |
| | B2 | Has no equipment, does not invest, looks for services |

Source: Own construction

Table 2: *Variables of the model*

| Denomination of variable | Sign of variable |
|---|---|
| Production value from production | $\acute{A}_T$ |
| Production value from machinery service / fee of machinery service | $\acute{A}_{SZ}$ |
| Variable cost of production | $K_V^T$ |
| Variable cost of machine use | $K_V^G$ |
| Variable cost of machine services | $K_V^{SZ}$ |
| Amortization of machine tools | $K_{\acute{A}}^A$ |
| Income from land-based subsidy | $\acute{A}_S$ |
| Amortization of asset value reduced by subsidy | $K_{\acute{A}}^{A\text{-}E}$ |
| Amortization of asset value reduced by subsidy and residual value | $K_{\acute{A}}^{A\text{-}S\text{-}M}$ |
| Opportunity cost of land | $K_{\acute{A}}^L$ |

Source: Own construction

$$\bar{p} = \boldsymbol{E} \cdot \bar{f}^T \qquad (2)$$

where $\boldsymbol{E} = \begin{bmatrix} e_{1,1}\, e_{1,2} \cdots e_{1,j} \cdots e_{1,m} \\ e_{2,1}\, e_{2,2} \cdots e_{2,j} \cdots e_{2,m} \\ \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ e_{i,1}\, e_{i,2} \cdots e_{i,j} \cdots e_{i,m} \\ \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\ e_{n,1}\, e_{n,2} \cdots e_{n,j} \cdots e_{n,m} \end{bmatrix}$ (3) and $e_{i,j} \equiv sgn\{f_j | p_i\}$ (4)

in case of involving $f_j$ into the equation and sign in case of strategy pair belonging to $p_i$ payoff.

The model variables determining the payoff vector (Table 3) enabled the all-round examination of payoffs that provide the basis for decision. Only some of the results are introduced below due to the lack of space:

$$\bar{f} = \begin{bmatrix} f_1(\equiv \acute{A}_T) \\ f_2(\equiv \acute{A}_{Sz}) \\ f_3(\equiv K_v^T) \\ f_4(\equiv K_v^{GT}) \\ f_5(\equiv K_v^{GSz}) \\ f_6(\equiv K_{\acute{a}}^A) \\ f_7(\equiv \acute{A}_S) \\ f_8(\equiv K_{\acute{a}}^{A-S}) \\ f_9(\equiv K_{\acute{a}}^{A-S-M}) \\ f_{10}(\equiv K_{\acute{a}}^L) \end{bmatrix} \quad (5) \qquad \text{and} \qquad \bar{p} = \begin{bmatrix} p_1(A: A1 - B1) \\ p_2(A: A1 - B2) \\ p_3(A: A2 - B1) \\ p_4(A: A2 - B2) \\ p_5(B: A1 - B1) \\ p_6(B: A1 - B2) \\ p_7(B: A2 - B2) \\ p_8(B: A2 - B2) \end{bmatrix} \quad (6)$$

The coefficient matrixes of model variants are described by equation (7):

$$\boldsymbol{E_1} = \begin{bmatrix} 1 & 0 & -1 & -1 & 0 & -1 & 0 & 0 & -1 \\ 1 & 1 & -1 & -1 & -1 & -1 & 0 & 0 & -1 \\ 1 & -1 & -1 & 0 & 0 & 0 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \\ 1 & 0 & -1 & -1 & 0 & -1 & 0 & 0 & -1 \\ 1 & -1 & -1 & -1 & 0 & 0 & 0 & 0 & -1 \\ 1 & 1 & -1 & 0 & -1 & -1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \end{bmatrix}; \quad \boldsymbol{E_2} = \begin{bmatrix} 1 & 0 & -1 & -1 & 0 & -1 & 1 & 0 & -1 \\ 1 & 1 & -1 & -1 & -1 & -1 & 1 & 0 & -1 \\ 1 & -1 & -1 & 0 & 0 & 0 & 1 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & -1 \\ 1 & 0 & -1 & -1 & 0 & -1 & 1 & 0 & -1 \\ 1 & -1 & -1 & -1 & 0 & 0 & 1 & 0 & -1 \\ 1 & 1 & -1 & 0 & -1 & -1 & 1 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & -1 \end{bmatrix};$$

$$\boldsymbol{E_3} = \begin{bmatrix} 1 & 0 & -1 & -1 & 0 & 0 & 1 & -1 & 0 & -1 \\ 1 & 1 & -1 & -1 & -1 & 0 & 1 & -1 & 0 & -1 \\ 1 & -1 & -1 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \\ 1 & 0 & -1 & -1 & 0 & 0 & 1 & -1 & 0 & -1 \\ 1 & -1 & -1 & -1 & 0 & 0 & 1 & 0 & 0 & -1 \\ 1 & 1 & -1 & 0 & -1 & 0 & 1 & -1 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \end{bmatrix}; \quad \boldsymbol{E_4} = \begin{bmatrix} 1 & 0 & -1 & -1 & 0 & 0 & 1 & 0 & -1 & -1 \\ 1 & 1 & -1 & -1 & -1 & 0 & 1 & 0 & -1 & -1 \\ 1 & -1 & -1 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \\ 1 & 0 & -1 & -1 & 0 & 0 & 1 & 0 & -1 & -1 \\ 1 & -1 & -1 & -1 & 0 & 0 & 1 & 0 & 0 & -1 \\ 1 & 1 & -1 & 0 & -1 & 0 & 1 & 0 & -1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \end{bmatrix} \quad (7)$$

Table 3: *Starting data of model calculations*

| Denomination | Unit | A | B |
|---|---|---|---|
| Land size | ha | 50 | 50 |
| Crop | | cereals | cereals |
| Yield average | t/ha | 6 | 6 |
| Unit price | Ft/t | 40.000 | 40.000 |
| Gross asset value | Ft | 30.000.000 | 30.000.000 |
| Amortization | year | 6 | 6 |
| Opportunity cost of land | Ft/ha | 40.000 | 40.000 |
| Variable production costs without machinery | Ft/ha | 50.000 | 50.000 |
| Variable costs of machinery | Ft/ha | 30.000 | 30.000 |
| Fees of machinery services | Ft/ha | 70.000 | 70.000 |
| Land-based subsidy | Ft/ha | 48.000 | 48.000 |
| Subsidy ratio of machine investment | % of purchase price | 40 | 40 |
| Calculated residual value of machines in case of new purchase | % of purchase price | 30 | 30 |
| Payment period | year | 10 | 10 |
| Year of shifting strategy | year | 5 | 5 |
| Discount rate | % | 10 | 10 |

Source: Own construction

## 3. Results

The payments of model variants are summarized in Table 4. Figure 3 shows the payoffs of the two actors for the right upper payoff pairs according to the normal form, in relation to the machinery service fees (that are determined by the service market). It can be stated that there is no dominant strategy. The Nash equilibrium (payoff pairs in bold letters), however, can be identified in case of most of the players and it supposes cooperation willingness (one of the parties believes that the other will provide services to him, therefore he does not purchase machinery. The other one is willing to meet this demand with the available equipment). These payoff pairs are Pareto efficient but not fair and

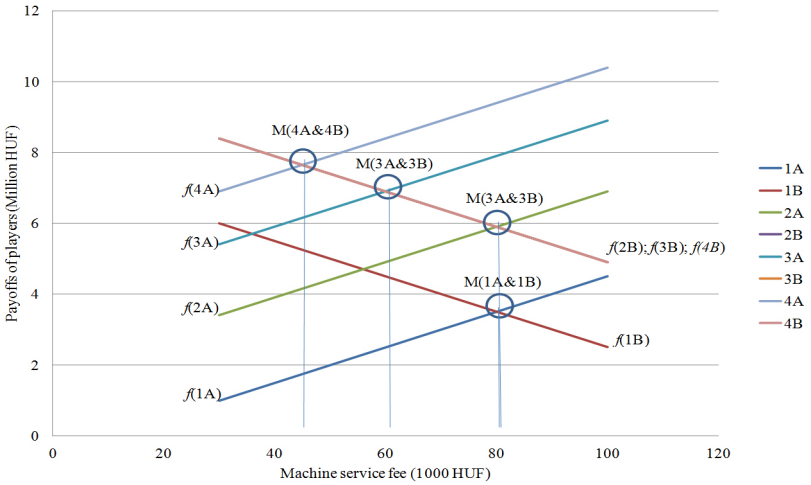
the fair strategies (ensuring the same payoff) are not Pareto efficient, except for those cases when the fee of services result the same payoff for both parties in the given model variant. It can be regarded as the balance price of the service because in different cases the party receiving lower payoff is stimulated to change his strategy in order to increase the income. (This situation is somewhat similar to the problems of the Stag hunt game.) If the fee of services is equal to the variable costs, then it is not worth for the provider to provide the service, but the one requiring the service can realize significantly (inequitably) higher extra income.

Table 4: *Payoffs in case of subsidy alternatives*

| 1) Without land based subsidy and amortization reducing factors (Basic case) | | | | | | |
|---|---|---|---|---|---|---|
| | B | | | | | |
| | 100.000 | | 70.000 | | 30.000 | |
| A | (1.0,1.0) | **(4.5,2.5)** | (1.0,1.0) | **(3.0,4.0)** | (1.0,1.0) | (1.0,6.0) |
| | **(2.5,4.5)** | (-2.0,-2.0) | **(4.0,3.0)** | (-2.0,-2.0) | (6.0,1.0) | (-2.0,-2.0) |
| 2) With land based subsidy, without amortization reducing factors | | | | | | |
| | B | | | | | |
| | 100.000 | | 70.000 | | 30.000 | |
| A | (3.4,3.4) | **(6.9,4.9)** | (3.4,3.4) | **(5.4,6.4)** | (3.4,3.4) | (3.4,8.4) |
| | **(4.9,6.9)** | (0.4,0.4) | **(6.4,5.4)** | (0.4,0.4) | (8.4,3.4) | (0.4,0.4) |
| 3) With land based subsidy, amortization reducing factor: subsidy | | | | | | |
| | B | | | | | |
| | 100.000 | | 70.000 | | 30.000 | |
| A | (5.4,5.4) | **(8.9,4.9)** | (5.4,5.4) | **(7.4,6.4)** | (5.4,5.4) | (5.4,8.4) |
| | **(4.9,8.9)** | (0.4,0.4) | **(6.4,7.4)** | (0.4,0.4) | (8.4,5.4) | (0.4,0.4) |
| 4) With land-based subsidy, amortization reducing factor: subsidy+ residual value | | | | | | |
| | B | | | | | |
| | 100.000 | | 70.000 | | 30.000 | |
| A | (6.9,6.9) | (10.4,4.9) | (6.9,6.9) | (8.9,6.4) | (6.9,6.9) | (6.9,8.4) |
| | (4.9,10.4) | (0.4,0.4) | (6.4,8.9) | (0.4,0.4) | (8.4,6.9) | (0.4,0.4) |

Source: own construction

Figure 3: *Payoffs of players in relation to machine service fees, by modelling the supporting impacts*
*(Strategy of players: A = Invests and offers services; B= has no equipment, does not invest, looks for services (wants to cooperate)*




Source: Own construction

The production and investment subsidies significantly affect the actual payoffs and payoffs that are imagined by the farmer. The actual service sector prices result lower balance fees for services and relatively great income difference may occur among parties, therefore those not having machinery are stimulated to invest in equipment.

As regards machine purchases, the distributors count the second-hand machine with significant residual value (as we saw it is about 30% of the original purchase price) and many farmers considers this in investment decisions, but not calculating with the time value of money. In case of this latter attitude (decision-making method) the one without machinery can increase his payoff if invests, which does not encourage cooperation. Model estimation was also made for ten-year-maturity, without shifting strategies and with strategy changes carried out in the meantime. On the basis of the present value of payoffs, the above statements cannot be essentially modified. According to the experiences, the

present value of payoff pairs following the investment decision moves toward fairness (i.e. equitable) direction, but the total actual payoff of the two players decreased compared to the theoretically achievable.

## 4. Conclusions, suggestions

The long-term sustainability or at least fair (i.e. equitable) and not environmentally deteriorating operation of social-economic processes is an essential interest, which should also include the rural communities dealing with food production. The research – with the tools of game theory supporting economic analysis – tries to explore the explanatory factors in the investment decisions of farmers, which help to understand the low cooperation willingness of farmers and the impetus in most of the farmers to perform production with own machinery. It can be stated that:

- The game theory models have confirmed that the current subsidy system affects the investment decisions of farmers (as homo oeconomicus), increases the willingness to invest and implicit reduces the consideration of efficiency criteria;
- The differences in payoffs among observed farmers (since the payoff pairs are not fair in many market situations) encourage the party with no equipment to invest until his payoff becomes equal;
- The low machine service supply, the high service fees (the relatively small difference between the yields of the two strategies), as well as the current risks and individual benefits encourage investment (see the dilemma in Stag hunt: sure rabbit or unsure stag /deer);
- Considering all the above – explained also with rational decisions – the Hungarian agricultural producers are in the trap of Prisoner's dilemma and thus they fail the maximum payoff that could be realized together in case of efficient, well-coordinated joint machine investments and machinery sharing.

The title of the paper is the analogy of the first line of Hamlet's famous monologue, but we should realize that in the long run, the question of cooperate or not cooperate will in fact mean „to be or not to be" for most of the agricultural producers. At the same time, under the current conditions it is not the cooperation that ensures the highest payoff for the rationally deciding homo oeconomicus, although the payoff is the key factor in deliberation.

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# BEING EXPOSED TO FOOD PRICES? WELFARE CHANGES AMONG HUNGARIAN SOCIAL CLASSES

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*The aim of this study is to adapt Firici's (2003) and Hubbard's (2007) methodology to estimate food price-change impacts due the Hungarian EU accession on the different Hungarian income level groups. Secondary price and consumption data for the years 2003-2008 supplied by the Hungarian Central Statistical Office were utilized. In order to measure welfare effects Laspeyres and Paasché indexes were used. These price indexes are able to measure changes in the cost of living, while Compensating Variation and Equivalent Variation can determine the amount of additional wage that is needed to maintain the consumers' standard of living or the amount of money that a consumer would pay to avert the price increase due to the EU accession.*

**Keywords:** Laspeyres index, Paasché index, Compensating Variation, Equivalent Variation, food prices

**JEL codes:** D11, D60

## 1. Introduction

The European Union (EU) is an economic and political union of 27 member states operating through a system of supranational independent institutions and inter-governmentally made decisions negotiated by the member states (Albi, 2005). EU policies aim to ensure the free movement of people, goods, services, and capital and maintain common policies on trade, agriculture, fisheries and regional development (Overview of the European Union activities, 2008).

Hungary submitted a membership application to the EU in 1994 and negotiations on entry began in 1998. Hungary joined the EU on 1 May 2004. According to Balázs (1998) the main advantages of Hungary's EU accession were the expansion of markets, opening of economic opportunities that creates jobs, helps to increase living standards and pensions.

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However the preconditions of market access are the price level convergence towards EU levels. By signing of the Accession Treaty Hungary accepted to achieve priorities linked to political and economic criteria, like economic reform, regional policy and cohesion and agriculture. Among others the medium-term agricultural priority was to enforce the Common Agricultural Policy.

Studies claimed, that Hungary's EU accession will not cause significant increase in prices (Ferenczi *et al.*, 2002) while other studies (Hubbard and Podruzsik, 2006) showed, that accession to the Single Market caused negative impact on consumers.

Scientific researches about possible price- and especially food price increase were published in different European countries after their EU accession: Georgakopoulos (1990) in Greece, Kol – Kuijpers (1996) in the Netherlands, Hubbard-Thomson (2007) in Romania. These studies reported 7-20 percent price increase in the above mentioned countries.

The aim of this study is to assess the welfare effects that might been caused price and income changes after Hungarian EU accession of the low income, middle income and high income households.

## 2. Materials and methods

The object of this research is two-fold. One aim is to present secondary data about price and income level changes. Disposable income and average food prices originate from the Hungarian Central Statistical Office (HCSO, 2010). Changes during the examined five years are calculated by the authors.

The other goal is to measure changes in the cost of living if applicable. This study focuses on the welfare effects of food price changes. For the analysis a food market-basket was defined. The content of the chosen basket consisted of the following 20 food products that represent basic food in Hungary:

- Cereals: bread, wheat flour, rice
- Meat products: pork, poultry, beef, fish, salami-sausage-ham

- Dairy products: milk, cheese, eggs
- Fruits and vegetables: potato, tomatoes, onion, apples, oranges
- Fats and oils: lard, sunflower oil, margarine
- Sweets: sugar

One way to measure changes in the cost of living are the price index formulas. In order to estimate welfare effects Laspeyres and Paasché indexes were used. In the Laspeyres formula (1) it is assumed that consumers purchase the same amount of commodities both at the base period and the observation period, but quantities are fixed at the base period.

$$L_I = \frac{\sum_{i=1}^{n} q_{i\ 0} * p_{i\ 1}}{\sum_{i=1}^{n} q_{i\ 0} * p_{i\ 0}} * 100 \qquad (1)$$

In the Paasché formula (2), quantities are fixed at the observation period.

$$P_I = \frac{\sum_{i=1}^{n} q_{i_1} * p_{i_1}}{\sum_{i=1}^{n} q_{i_i} * p_{i_0}} * 100 \qquad (2)$$

where $q_{i_0}$ = purchased quantity of item *i* in the base period, $q_{i_1}$ = purchased quantity of item *i* in the observed period, $p_{i_0}$ = price of product *i* in the base period, $p_{i_1}$ = price of product *i* in the observed period. The model was developed by Firici (2003) separating food and non-food expenditure and considering the latter one to be constant. In this study the Firici formula was adopted.

With the support of the Laspeyres and Paasché indexes Slutsky Compensating (3) and Equivalent Variation (4) were counted:

$$CV = I_{2003} * (L_i - 1) \quad (3)$$
$$CV = I_{2008} * (P_i - 1) \quad (4)$$

where $I_{2003}$ and $I_{2008}$ are the total disposable income, monthly average. CV is able to measure and to determine the amount of additional wage that is needed to maintain the consumers' standard of living. Equivalent variation measures the amount of money that a consumer would pay to avert the price increase due to the EU accession. Equivalent variation uses old prices and new utility levels.

The secondary data source of the calculations was the stat-data table for 2003 and 2008. Household consumption data ($q$), disposable income ($I$) and information on commodity price changes ($p$) was supplied by the (HCSO). To eliminate the effect of inflation, GDP deflator was chosen for the calculations. The value of the GDP deflator between 2003 and 2008 (where 2003=100%) originated from the Economic Statistics Database. Prices given in HUF were exchanged to EUR using the average exchange rate of 2003 (1 EUR = 253.51 HUF) and 2008 (1 EUR = 251.25 HUF). With the help of price information and kg/person, liter/person and pieces/person consumption data set, unit values were calculated for the index estimations.

In order to estimate the distributional welfare effects between 2003 and 2008, the following assumptions were considered:

- prices of all other goods and income of the households remain constant during the examined period
- total income equals total expenditure, no net savings
- differences in household's tastes and quality of food products are negligible
- all food products are considered as normal goods.

## 3. Results and discussion

The study focuses mainly on food price changes and food basket instead of the total market basket. Food expenditures represent a large share in the Hungarian total household expenditure, which can be seen in Table 1. The data shows, how much of the total expenditure is spent on food products in percentage.

Table 1: *Share of food expenditures in the total expenditure (%)*

| Year | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| 2003 | 27.0 | 31.0 | 27.5 | 21.7 |
| 2008 | 23.0 | 26.5 | 23.1 | 19.1 |

Source: HCSO, 2010 and authors' calculation

Food share has been decreasing from 2003 for all groups. It is still the highest for the low income group whiles the lowest for the richest part of the society.

Table 2 and Table 3 show the average yearly price and the price changes of 20 food products. These items are commonly consumed in Hungary and represent the Hungarian food basket. Nominal price for fruits almost doubled, while price of meat products increased around 50 percent between 5 years.

Table 2: *Average prices and price changes of some food products in Hungary (€/kg)*

| | Pork | Poultry | Beef | Fish | Salami | Potatoes | Tomatoes | Onion | Apples | Oranges |
|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 3.0 | 1.8 | 3.5 | 2.9 | 8.0 | 0.4 | 1.4 | 0.5 | 0.6 | 0.7 |
| 2008 | 4.3 | 2.8 | 5.1 | 3.4 | 11.9 | 0.4 | 1.8 | 0.6 | 1.1 | 1.3 |
| change % | 42.3 | 54.2 | 45.1 | 15.1 | 47.4 | 5.8 | 23.0 | 9.9 | 87.6 | 99.4 |

Source: HCSO 2010 and authors' calculation

Rise of vegetables, cheese, sugar and fish price is slight compared to other products.

Table 3: *Average prices and price changes of some food products in Hungary (€/kg, €/liter, €/piece)*

| | Bread | Flour | Rice | Milk | Cheese | Eggs | Lard | Oil | Margarine | Sugar |
|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 0.6 | 0.3 | 0.7 | 0.6 | 5.2 | 0.1 | 1.0 | 0.7 | 2.1 | 0.7 |
| 2008 | 1.0 | 0.5 | 1.1 | 0.9 | 6.2 | 0.1 | 1.8 | 2.0 | 3.4 | 0.8 |
| change % | 58.5 | 82.7 | 68.0 | 38.1 | 18.3 | 59.3 | 74.8 | 170.9 | 58.4 | 17.2 |

Source: HCSO 2010 and authors' calculation

The highest increase can be observed in oil price per liter, which was 170 per cent during 5 years. The changes of cereals and lard prices are not negligible either.

Household welfare is influenced not only by consumer prices but disposable income levels as well. Table 4 converts consumers' yearly average salary into amounts of EUR.

**Table 4:** ***Nominal average incomes in Hungary in 2003 and 2008 (€/year)***

| Year | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| 2003 | 2603 | 1401 | 2367 | 4118 |
| 2008 | 3481 | 1767 | 3155 | 5631 |

Source: HCSO 2010 and authors' calculation

Amount of disposable income increased after 2003, high food prices serve the reason to suppose, that consumer welfare has changed during the examined 5 years. The estimated results according to Firici's model are displayed in Table 5.

**Table 5:** ***Laspeyres index for different household types***

| | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| Laspeyres index | 104.5 | 103.7 | 102.6 | 101.6 |

Source: authors' calculations

Laspeyres indexes give the changes in cost of living for each group as a result of changes in food prices due to accession ceteris paribus. If LI >100, consumer welfare loss, if LI < 100, consumer welfare gain can be recognized. From Table 5 it can be appointed, that Laspeyres indexes exceeded 100 percent for all three consumer groups in the year 2008. It means that the increasing food prices had negative impact on the overall consumer welfare. The highest increase (4.5%) was observed among the low income group which leads us to draw the inference that this group is the most hard-hit due to the accession.

Results of the CV calculations are presented in Table 6. It shows the monthly CV values in EUR that a person from each income group should receive to remain as well off as before the food prices have changed.

Table 6: *Amount of CV for different household types*

| | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| CV (€/person/ month) | 4.8 | 4.2 | 5.0 | 5.3 |
| % of total income | 2.6 | 3.7 | 2.6 | 1.6 |

Source: authors' calculations

The average amount of the compensation varies between 4.2 and 5.3 EUR in 2008. The highest compensation amount should be added to the low income group to remain as well off as in 2003. Table 6 also appoints the percentage of initial income that a consumer needs to receive as compensation. It is about 1.6 percent for the richest income group but 3.7 percent for the poorest. According to the results the biggest loss was suffered by the low income group.

Paasché index is a ratio that compares the total purchase cost of a specified bundle of current-period commodities with the value of those same commodities at base-period prices. Results of the calculations are shown in Table 7.

Table 7: *Paasché indexes for different household types*

| | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| Paasché index | 101.0 | 101.4 | 100.9 | 100.6 |

Source: authors' calculations

Paasché indexes were needed to estimate equivalent variation for the consumer groups. It is a measure of how much more money a consumer would pay before a price increase to avert the price increase. It is called equivalent variation because it causes equivalent harm as that of the price increase. Table 8 presents the results of the EV calculations. For the low income group 2 EUR, the high income group 2.5 EUR should be taken to harm the individual as much as the price-increase. In terms of percentage of

total income this amount varies between 0.6-1.4 percent between the poor and rich groups.

Table 8: *EV for different household types*

| | All households | Low income | Middle class | High income |
|---|---|---|---|---|
| EV (€/person/ month) | 2.3 | 2.0 | 2.4 | 2.5 |
| % of total income | 1.0 | 1.4 | 0.9 | 0.6 |

Source: authors' calculations

## 4. Summary

As a result of the calculations it could be realized, that Laspeyres indexes exceeded 100 percent for all three consumer groups in the year 2008. It means that the increasing food prices had a slightly negative impact on the overall consumer welfare. The highest increase (3.7 percent) was observed by the low income group which leads us to draw the inference that this group is the most hard-hit due to the accession. The average amount of the compensation varied between 4.2 and 5.3 EUR in 2008. In average compensation amount that should be added to the average households to remain as well off as in 2003 is 4.8 EUR. Because of the difference in the weightings used for the Laspeyres and Paasché indexes, the two indexes produced different results for the same period. Similarly the equivalent variation varies between 2-2.5 EUR among the low and high income group.

## 5. Acknowledgments

We would like to thank Dr. Carmen Hubbard for the empirical support she has given for calculating indexes and Compensating Variation/ Equivalent Variation.
The study was achieved according to the OTKA K 79195 contract

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# THE POSSIBILITIES OF INCREASING EMPLOYMENT IN AGRICULTURAL ECONOMY: THE EXPERIENCES OF HUNGARIAN SOCIAL LAND PROGRAMME

Orsolya TÓTH*

*Following the political and economic transformation of Hungary, at the beginning of the 90's rapid and radical changes took place in the labour market; the tensions and contradictions in the employment strengthened. From the beginning of the nineties 1.7 million jobs disappeared, which was a drop of 30%. In 1993 the unemployment rate touched its bottom by 12.6%; unfortunately, the current rate (11.2%) is approaching to it. The labour supply and the new established workplaces had not agreed together. Temporary consolidation – by creating 260 thousand new jobs – took place between 1997 and 2002; however, this could not repair the employment anomalies (increasing regional differences and worsening social problems). The unemployment rate was higher than the national average in the rural areas, where agriculture was (and it remained) almost the only way of subsistence, that is, a way of escape from deep poverty. Owing to the modest results of the employment policy programmes more and more attention was paid to the solutions that were adapted to local conditions and bound to agricultural production requiring active and personal cooperation of the local population. The social land programmes have disposed of the most adaptable experiences. The programmes not only assist the production providing the daily subsistence but also maintain and develop the willingness and ability to work, assist the formation of communities, and provide moral and mental support. By similar concepts, programmes, more resources and social recognition these could lead to more attractive results.*

**Keywords:** agricultural employment, rural subsistence, social land programme, employment generation

**JEL codes:** Q15, J43

## 1. Introduction

Accompanied by the decreasing employment, political and economic transformation shocked fundamentally the subsistence and population retention ability of rural areas. The consequences of the process continuing up to present and its regional effects (increasing unemployment, deepening and expanding subsistence and social problems which can be

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seen also at present) need real and permanent solutions and this had not been postponed. Employment generation and employment increase is an outstanding objective of the government and of the economic policy: the agricultural sector, rural development and the variety of employments all have special roles. The solutions bound to agriculture and connecting production and training serve this purpose and from these the social land programmes have the most adaptable experiences. First are presented the main characteristics of the Hungarian labour market, the tendencies and the experiences at the time of the political and economic transformation and in nowadays and then, is examined the development of the agricultural and rural employment. Finally is presented a promising solution to be applied in agriculture for increasing the employment, that is, the social land programme.

### *1.1. Characteristics of the Hungarian labour market: employment situation at the time of the political-economical transformation and at present*

The political and economical transformation between 1989 and 1990 resulted in an increased **labour supply** in the whole economy. In consequence 1.7 million jobs disappeared; the labour supply increase was the largest in the agricultural sector due to the changes of the property structure and production forms.

Owing to the increased labour supply the part of the population, which *inactive (but they are in active age)* increased 1.7 times during the last two decades, accounted for 40% of the population in active age (15-64 ages) (Adler, 2008). On the basis of the survey of the Central Hungarian Statistical Office (KSH) the proportion of inactive people in the age group of 15-64 accounted for 38%, that is, 2.6 million people.

The indicator of employment is the employment rate indicating the proportion of the employees in the age group of 15-64 in the total population of the same age group. The *employment rate* harmonized in content to the EU regulations decreased in Hungary between 1992-2002 by 2%; at present it attains *55.4%,* 8.8% down to the average of the EU Member States (64.2%). A warning sign is that between 2000-2010 the employment rate increased in both groups of the EU Member

States, while in Hungary a hectic up and down change could be seen, or jet, by now Hungary is among the three Member States of the lowest employment rates – with Malta and Italy – that, is where the rates are much lower than the average (Eurostat Yearbook, 2010).

The *unemployment rate*, indicating the share of unemployed in the economically active population of the relevant age group (employed and unemployed together), stabilized in the fist decade of the century at a level of 5-6% and then from 2005 it increased to 7-8%. In 2009 due to the disadvantageous economic tendencies the rate exceeded 10% and after two decades it is approaching the disastrous 12% of 1993 (in 2010 11.2%). In the 27 Member States of the EU the unemployment rate reached 9.7%, which is by 1.5% lower than the Hungarian value.

The *differences in economic activity by regions and settlements* in Hungary are increasing (8-10%). Unemployment is characteristic in the small settlements; its rate is often 3-4 times larger than in cities (Tóth, 2002). The employment opportunities available for the rural population are in inverse ratio to the size of the settlement. In villages with less than 500-1000 inhabitants the share of inactive population – requiring in fact social or family support – sometimes exceeds 70%; however, there are settlements where the total population needs social support or any kind of governmental or local governmental subsidies. At present the general characteristic of the labour market is the increased extremities regarding the regions, age groups or qualifications, the average 18-month permanent unemployment status and the increase of the unemployment expanding over generations (sometimes even three generations)

### *1.2. Situation and problems of the agricultural and rural employment*

As part of the above mentioned labour market developments, the *earlier role of rural areas providing subsistence* and agricultural employment broke down. From the sectors of the national economy the largest labour supply increase – in terms of rate and dimension – was generated in the agricultural sector. In 1990 the sector's annual share in employment reached 17.5% (697 thousand employees), last year it accounted for only 4.5%, that is, 172 thousand employees. A significant part of the

labour supply increase was generated up to 1994; however, the role of agriculture in employment has not been clarified yet.

Another consequence of the restructuration process is the fact that the number of part time employees and those who are engaged in subsistence farming and commercial farming is several times higher (6.5 times) than the number of full time employees.

In the individual farms 1.1 million people are engaged in agricultural activities accounting for 11.4% of the total population. In the previous decade their number and share dropped almost to half. In 2010 the number of individual farms (567 thousand) is by 40% less than 10 years ago (HCSO, 2011). The changes are definitely due to the significant and permanent decrease of agricultural employment.

The real and comparable number of employees is difficult to define due to the seasonality, fluctuating duration, type and purpose of agricultural work. In the EU for measuring the labour use (working time) the *Annual Work Unit* (in accordance with the methods applied by EUROSTAT and KSH 1 AWU = 1800 working hours) is applied. In Hungary the agricultural labour used in 2010 amounted to 414.4 thousand full time employees, that is, 40% less than the working time used ten year ago.

In the regions of unfavourable economic, social and income conditions the share of agricultural employees is higher than the national average. It has been proved (Dorgai *et al.,* 2008; Tóth *et al.*, 2009) that the share of agricultural employment is in *inverse ratio* to the level of economic development. In the regions of unfavourable conditions its share approaches 40% in the population. In the economically undeveloped regions agriculture is a way of escape for the local population from deep poverty.

In spite of the more and more critical state of agriculture its role played in rural employment, in subsistence of rural population and in decreasing the social tensions is more important than its share represented in employment, which is due to the significant weight of agriculture in the national economy (Hamza and Tóth, 2006). In all the regions of Hungary the role of agricultural employment is not clear; we can see, how-

ever, that there are areas, where agricultural production is still significant due to the favourable conditions, traditions and relative economic advantages. Southern Great Plain, Southern Transdanubia and Northern Great Plain, which is regarding its counties rather diverse and moderately industrialized, are all in this category (Bihari and Kovács, 2006). Agriculture due to its multicultural role may alleviate the problems of subsistence and employment but the development cannot be expected merely from agriculture.

In the last two decades numerous active and passive labour market measures were applied to alleviate the employment problems. The resources were used mainly in the form of passive measures, that is, in the form of subsidies. The training and vocational training as well as the programmes aiming at encouraging entrepreneurs did not prove to be efficient due to the rather limited or decreasing employment opportunities. The programmes developed for the crisis could not start or replace the real economic development (Tóth, 1998). The passive subsidies financed without performing any kind of labour rather consolidated the unemployment instead of decreasing it.

## 2. Social land programmes

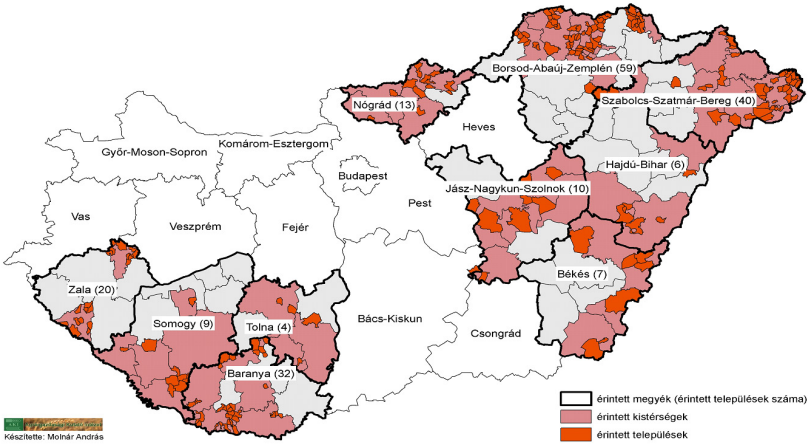
The social land programmes were launched in 1992 on the initiative of the Ministry of Social Welfare. The programme aims at small settlements and villages in the micro regions of low economic development and in disadvantageous situation. The target group was that part of the population, to which have not received unemployment benefits, which was not qualified and earlier was mainly engaged in agriculture (Bartal, 2001).

The social land programmes, on the one hand, are developed by considering the social conditions (permanent unemployment, low qualification and income, large families) and, on the other hand, the regional characteristics (economic development, social and demographic situation) are also taken into account. The subsidies are financed by the local organizations (mainly local governments) to the beneficiaries; therefore, the organisation is adapted to the local conditions.

The main point of the programme is that the local resources of agricultural production (land, machinery) and the inputs required for the production (materials) should be provided as allowances in kind – by connecting these with the unused work force of the families participating in the programme. The products produced can be used for self supply by selling them on markets generating a modest additional income. As for the more developed forms of the social land programmes the participants may also pay for the services provided.

The first pilot programmes were launched in 1992 in two counties (Békés, Szabolcs-Szatmár-Bereg), in 6 settlements. In 2010 social land programmes were operated in 5 regions and 11 counties. These regions and the majority of the counties can be found in the eastern part of Hungary. From among the economically more developed Western regions the counties of Southern Transdanubia are different since regarding their economic indicators and agricultural characteristics they seem to be similar to the Eastern regions (Figure 1).

**Figure 1:** *Distribution of micro regions participating in the social land programmes (1992-2007)*



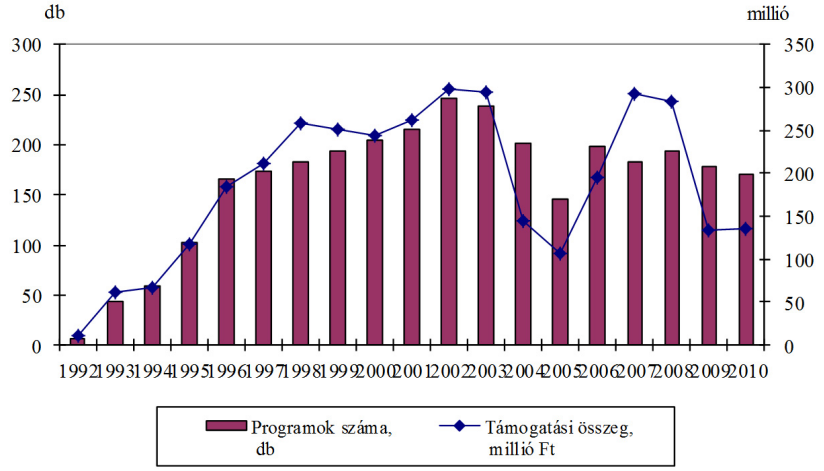

Remark: the number of settlements is published in accordance with the state of 2006.
Source: Based on the data of SzMM

The resources of the social land programmes are significantly fluctuating in accordance with the changing opportunities and intentions of the central budget (Figure 2). Between 1992 and 2010, in total HUF 3.5 billion were used. The micro regions included in the programmes could use annually HUF 3-6 million and their settlements HUF 0.7-1.5.

The amounts of the subsidies increased year by year up to 1998, then following a temporary decrease achieved the top of HUF 300 million in 2002-2003. The amounts of the subsidies of the following years (with the exception of 2007) fluctuated, but in fact they decreased. The drop was the largest in 2009-2010. In the year of the Accession the financing of the land programmes could not be integrated into the EU subsidy schemes since according to the EU legislation land programmes are hidden (disguised) agricultural subsidies, which are not legal in the EU. Between 2007 and 2013 pillar 3 of the ÚMVP programme originally included the scheme of the social land programmes, however, the approved programme did not include any more the intention to implement it. The *demographic land programmes* should also be mentioned since these by granting state owned land could provide assistance to the retention of young and qualified farmers and to the establishment of viable enterprises.

75% of the subsidies utilized in almost two decades were provided to the counties in the Northern Great Plain and in the Northern Hungary Region. 60% of the amount was used by the settlements in the counties of Borsod-Abaúj-Zemplén and Szabolcs-Szatmár-Bereg. In fact following the political and economic transformation of Hungary these two counties were the most significant and most exposed focuses of the crisis, this means that the funds were granted to regions, which were really in need.

Figure 2: *Number and funds of social land programmes (1992-2010)*




Source: Based on the data of SzMM and Esély Public Foundation

More and more settlements recognizing the subsistence assisting, social expenditure decreasing and community and work ethics forming effects of social land programmes, have launch own developments. By participating in the programme people start to cultivate the abandoned farms and uncultivated fields, lease undivided properties and exchange part of the woods in local government ownership for arable land.

*2.2. Production structure of social land programmes, resources and long term objectives*

In the production structure of the programmes crop production dominates. Especially the labour intensive food products (fruits and vegetable) for basic nutrition are preferred. The most popular is the potato, which is indispensible in the Hungarian consumption. In more and more settlements the participants are engaged in activities connected to vegetable production, that is, in seedling and in seed production. Crop production aims at covering the feed demand of a low-level animal husbandry (pig and poultry).

The efficiency of the utilization of the resources varies. Based on estimations the *return ratio of the specific input is 2.5.* The incomes of the

families account for HUF 70-110 thousand, but sometimes these amounts to a monthly additional income of HUF 10-15 thousand. In the well-operating programmes if they do farming by care may cover the basic food demand of the family.

The long term objective of the programme is to increase the self-supporting capacity of rural areas and to enlarge the fruit and vegetable areas by focussing on and assisting the labour intensive sectors. The other outstanding objective is to enable the participants to perform quality agricultural work (too) by know-how transfer and in the form of training courses.

### *2.3. Types of social land programmes*

The social land programmes have various types indicating the level of the development (Tóth *et al.,* 2009). The types and characteristics are the following:

- Programmes assisting self supply: this is the first and initial level of the programme, in which crop production for self supply (for example, crop production in kitchen garden) and animal husbandry for own consumption (pig and poultry) are the most popular programme. The works are performed jointly in parcels assigned and a part of the material costs are reimbursed. The coordination of the production and the animal and plant health protection constitute essential parts of the programmes.

- Programme to increase the number of products (horizontal): the aims of the programmes are: regular and increasing working hours to reach self supply, to gain new and high level special knowledge and furthermore to increase the level of working ethics. Food processing and food sale on markets can also be potential objectives.

- Vertically developing programmes: in addition to the self supply food processing and the production of products of high value added are also included, sale on markets, as well as the development of

tools. The working hours are extended, the variety of the activities require the acquisition of special knowledge. The professional level of production increases; the professional and market relationships as well as the integration of the settlements are all essential parts of the programmes. As a result of a few programmes the extremely high unemployment rate decreased to its fragments, and there are examples when it disappeared totally and the claims for unemployment benefits dropped significantly. By supplying food products to public institutions the well-managed and viable programmes can make the settlement almost self supporting.

- Solution for increasing the complexity of the program: Among the effects added the life style, mental and moral problems of the population are more and more increasing. This is the reason why in more and more settlements the targeted interconnection of the land programme, social way of thinking and training might provide a solution. Agricultural production, public services and social attention might also create jobs.

The majority of the programmes (80%) indicating also the *level of development* serve only the self-supply, 15% serve not only the self-supply but also marketing the products produced. Only 1.3% of the programmes deal with integrated production. A promising perspective can only be seen in the expansion of the two latter types of programmes. The driving force of the development might be the strengthened self organizing capability of rural population and if they become able to cover partially their own consumption requirement.

In Hungary there are also other initiatives, which are similar to the land programme in terms of objectives and solutions offered. The primary aims of these are to support the *employment generation in rural areas*, provide solutions for the local employment of rural population, primarily in the labour intensive agricultural sectors; and furthermore, organise training, which are adjusted to the local training needs and are not based on central regulations.

A large number of the research results prove that in the settlement, in which social programmes are already operated the reception of the new

programmes is more intensive and sometimes the programmes – by assisting and complementing each other – may also cooperate effectively.

The programmes have a self-organizing and community developing character. They themselves organise the production, processing and sale. As a result of the process a sound competition among the participants might be created, and, moreover, the costs of social support might decrease.

## 3. Summary

The permanent critical and even worsening state of the Hungarian labour market as well as the increasingly disadvantageous situation of the regions with low economic development have led to the intensification of programmes aiming at assisting rural subsistence.

The social land programmes operating for almost two decades have proved that in the case of positive personal and material conditions it has a positive effect on retaining the population in the rural areas, on maintaining the willingness to work and providing a chance to acquiring qualifications and obtaining permanent or temporary employments.

By the help of well-functioning land programmes the partial subsistence of the settlements might be increased (attained); by producing basic food product the public institutions might be supplied and producing products characteristic for the region might even develop tourism.

The acceptance and efficiency of the programmes depends largely on the personality of the major, his/her activity, capacity and commitment. The decreasing role of local government might also have an unfavourable effect on the future operation of the programmes.

The local success of the land programmes is largely influenced by the mentality of the participants, by the availability of the resources required for the operation, the skills and qualification of the managers, by the proper selection of the products, continuous sale opportunities and the availability or lack of free information flow.

It is very important that the resources of the social land programmes would be calculated forward and the increase of the resources would be safe – on the expense of passive and active labour market measures.

However, the programmes assisting the self-organising capacities in the settlement and activating the participants involved cannot be considered market-based employment generation. Their role in alleviating social tensions and making savings for the central budget is of crucial importance. The fact is that without real and permanent employment generation the subsistence of rural areas and the low level of agricultural production cannot be increased, moreover, the stagnation of the unfavourable processes might also be expected.

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# CHALLENGES OF THE HUNGARIAN ORGANIC PIG AND POULTRY FARMING

Kinga NAGYNÉ PÉRCSI* and Virág SZABÓ**

*In connection with putting emphasis on the protection of the nature, the food-safety and the differentiation of the product, organic farming become sustainable alternative for some of the actors in the supply chain (stakeholders). It was often claimed in many publications that the small and medium sized firms of the poultry and pig (fodder based) sector can take a chance from organic production. Many stock-breeders have problems with the allocation of the manure and on the other hand the conversion to organic production can only be imaginable if the soil-plant, plant-animal, animal-soil cycle is provided. At the moment the animal density in the organic farming is very low, which excludes the evolvement of the cycle.*
*Nowadays the organic farming lags behind in Hungary in the following areas: Lack of supply and sale cooperation; low volume of the organic animal keeping; lack of developed common marketing; proportion of the processed product does not approach the level evolved in the old member states of the EU.*
*In this article we analyse the main limiting factors and problems in the Hungarian organic animal husbandry.*

**Keywords:** organic animal stock, Biokontroll Hungária Nonprofit Ltd., Hungary Eco Guarantee Ltd., soil-plant-animal cycle, financial problems, organic market

**JEL code:** Q57

## 1. Introduction

Organic farming is in line with the principle of sustainable agriculture, as its methods are environmentally friendly and usage of substances or technologies that are harmful for health and environment is prohibited or restricted (KSH, 2008).

In connection with putting emphasis on the protection of the nature, the food-safety, and the differentiation of the products, organic farming becomes a sustainable alternative for some of the actors in the supply chain (stakeholders) (Villányi *et al.*, 2000). It was often claimed in many publication that the small and medium sized firms of the poultry and pig sector can take a chance from organic production.

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However, attention must be called to some limiting factors of the organic production. It causes problems also in the conventional producing forms that no agricultural area belongs to the 25-30% of the present livestock production and there is a higher rate of those who have inadequate area. On the one hand many stock-breeders have problems with the allocation of the manure, and on the other hand the conversion to organic production can only be imaginable if the soil-plant, plant-animal, animal-soil cycle is provided. (At the moment the animal density in the organic farming is very low, which excludes the evolvement of the cycle.)

## 2. Material and method

The material background of the research consists of the critical comparison mainly of the national literature. We used the data and annual reports of the largest controlling organization of the organic farming, called Biokontroll Hungaria. We can use the data of the other control organization only as additional information, because they have only four publicly available annual reports from the last four years. So we can not use the data in our comparative analysis.

## 3. Some important characteristics of the organic animal husbandry

The volume of the organic animal breeding is at a very low level also in the EU; its proportion of the total stock number is 1.8% in the case of cattle, 0.3% of pig, and 0.8% of poultry. The rate of the organic sheep stock is a little bit higher with its share of 2.6% and it was between 26-32% in four countries (Lithuania, Estonia, Czech Republic, and Austria). In Hungary only 10% of the 1,441 organic farmers kept organic animal, their proportions means only 1% of the EU average by animal species (KSH, 2009).
Constant and consistent growth of the number of organic animal keeping farms can be observed until 2004. This process is reflected by the growth of the livestock unit. However there is a decrease in the number of farms since 2005, we can see a concentration process which can be followed up in the last column of table 1. (livestock per farm).

Table 1: *The evolution of the organic animal keeping farms in Hungary*

| Year | Number of farms | Livestock unit | Livestock per farms |
|---|---|---|---|
| 1999 | 48 | 3784 | 79 |
| 2000 | 60 | 5083 | 85 |
| 2001 | 72 | 8387 | 116 |
| 2002 | 83 | 11855 | 143 |
| 2003 | 137 | 11210 | 82 |
| 2004 | 160 | 12253,6 | 77 |
| 2005 | 156 | 15673 | 100 |
| 2006 | 148 | 14931 | 101 |
| 2007 | 134 | 16430 | 123 |
| 2008 | 113 | 16111 | 143 |

Source: Biokontroll Hungária Kht, and own calculation on the basis of the data

The preliminary data of the farm structure survey in 2007 was shown that hardly more than 1,300 organisation were controlled organic farms. (It means 12 % decrease during 2 years). Only 141 farms have organic livestock. Cattle and sheep were the dominant species in the structure of the livestock according to the data of the Central Statistical Office and the Biokontroll Hungária.

The Hungarian organic farms are rather growing organic plants than keeping animals. This is due to the fact that the organic product consumers are definitely vegetarians. On the other hand the organic meat consumption is not general because of their relatively high prices. However the main reasons are the producing and trading traditions as the main income of the sector is practically given by the cereals since the end of the eighties (Varga, 1998; Molnár and Morky, 1999 cited by Szente, 2005). The statistical observations and our analysis equally confirmed the fact that the output of organic animal keeping and the processing of organic animal products is still at a low level.

Table 2: *Structure of the livestock in organic animal keeping farms*

| Livestock unit (pcs.) | 2003 | 2004 | 2005 | 2006 | 2007 | *2008* | *2009* |
|---|---|---|---|---|---|---|---|
| Poultry | 85,4 | 147,2 | 144,15 | 108,02 | 188,5 | *145,01* | *938,74* |
| Buffalo | 289,2 | 327,4 | 348,1 | 345,3 | 539,2 | *938,6* | *1019,00* |
| Red deer | - | - | 23,15 | - | - | | |
| Sheep | 2273 | 2121,8 | 2087,57 | 1676,95 | 1255,95 | *1108,7* | *1601,85* |
| Goat | 260,5 | 252,8 | 200,88 | 284,42 | 304,26 | *204,13* | *279,45* |
| Horse | 341,2 | 247,3 | 209,8 | 386,74 | 229,92 | *73,04* | *140,80* |
| Rabbit | - | - | 0,16 | - | - | | *3,06* |
| Mule | - | 1,4 | - | - | - | | |
| Pig | 444,8 | 703,5 | 527,19 | 655,8 | 830,45 | *1001,87* | *2232,50* |
| Donkey | 12,5 | 32,8 | 19,3 | 20,7 | 35,2 | *30,7* | |
| Cattle | 7503,4 | 8419,4 | 12112,6 | 11453,1 | 13046,1 | *12608,6* | *14356,40* |
| Total: | 11 210 | 12253,6 | 15673 | 14931,03 | 16430 | *16111* | *20571,8* |
| *Growth %* | | *9,30* | *27,90* | *-4,73* | *10,03* | *-1,94* | *27,7* |

Source: Annual reports of Biokontroll Hungária Kht.

The organic animal stock is still at a low level in Hungary, the development in the area started at the beginning of the twenties (Table 2.). Between 2003 and 2008 among the examined species the cattle-stock means the base of the organic farming with its rate of 70-80-percent (Table 3). The second most important species was the sheep (10-20%), while the sustainable 10 % is given by pig, goat, horse, buffalo and poultry. The above mentioned facts are also true in the previous some year (Kovács and Frühwald, 2005), however in the last year the number of the pig and poultry kept in organic farms is increased drastically.

Table 3: *Structure of animal breeding in livestock unit*

| Livestock unit (%) | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| Poultry | 0,76 | 1,20 | 0,920 | 0,72 | 1,15 | 0,9 | 4,56 |
| Buffalo | 2,58 | 2,67 | 2,221 | 2,31 | 3,28 | 5,8 | 4,95 |
| Red deer | - | - | 0,148 | - | - | | |
| Sheep | 20,27 | 17,32 | 13,320 | 11,23 | 7,64 | 6,9 | 7,80 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Goat | 2,32 | 2,06 | 1,282 | 1,90 | 1,85 | 1,26 | 1,36 |
| Horse | 3,04 | 2,02 | 1,339 | 2,59 | 1,40 | 0,45 | 0,68 |
| Rabbit | - | - | 0,001 | - | - | | 0,00 |
| Mule | - | 0,01 | - | - | - | | |
| Pig | 3,97 | 5,74 | 3,364 | 4,39 | 5,05 | 6,2 | 10,85 |
| Donkey | 0,11 | 0,27 | 0,123 | 0,14 | 0,21 | 0,19 | |
| Cattle | 66,94 | 68,71 | 77,284 | 76,71 | 79,41 | 78,26 | 69,8 |
| Total % | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Annual reports of Biokontroll Hungária Kht.

If we separately examine the species, we can see that the buffalo-stock increased in the highest degree and in the horse-stock was the biggest decline in the period of 2003-2008 (Table 4). Furthermore, if we analyze the fluctuation of poultry-stock, we can determine that there was a decline in 2005 and 2006, there was only development in 2004 and 2008 (Table 2). Maybe the bird flu caused the huge recession in 2006. The organic poultry are more endangered by bird flu because of the keeping technology. (They live between natural surroundings in the outdoors.)
Unfortunately, farmers keep few animals temporarily; moreover these animals are bred by 40 % of the farmers. This is a disadvantage for the farmers, because they can not take advantage from the complexity of organic farming, which bases on the principle, that the plant growing has a role in the feed supply and the animal keeping gives the needed manure (Abayné, 2002; and Marselek, 2004 cited by Salamon *et al.*, 2004)
There is a demand mainly for the organic pork, poultry meat and beef. The organic egg and dairy products made from cattle and goat milk are also very popular (Kecskés and Kulcsár, 2003).
It can be stated that the export of the organic mangalica is growing steadily. It is our second most important export product after the grey cattle. The Spanish export became more and more important, because the mangalica is requested in Iberia as the raw material of the famous serrano ham. But there is an increasing demand for mangalica meat and processed meat also in Hungary in the last couple of years (Miklósné, 2004).

Table 4: *Change of the organic animal stock between 2003 and 2008 (%)*

| Livestock unit | 2003 | 2008 | Change % |
|---|---|---|---|
| Poultry | 100 | 169,80 | +69,80 |
| Buffalo | 100 | 324,55 | +224,55 |
| Red deer | - | - | - |
| Sheep | 100 | 48,77 | -51,23 |
| Goat | 100 | 78,36 | -21,64 |
| Horse | 100 | 21,40 | -78,6 |
| Rabbit | - | - | - |
| Mule | - | - | - |
| Pig | 100 | 225,24 | +125,24 |
| Donkey | 100 | 245,6 | +145,6 |
| Cattle | 100 | 168,03 | +68,03 |

Source: Own calculation

To get some more information from the other control organization of the organic production we can take a look at the Table 5.

## 4. Problems in the organic farming

The cattle stock represents an exceptional section of the animal stock involved in organic farming in Hungary. This rate determines and confines the circle of produced goods, thus for the development of animal eco-goods production and the widening of organic product offer, there's a need for structural changes in animal husbandry. Less than half of the organic farms examined by Földes (2008) sell the produced animal goods as organic products, and similarly to international experience it's not an uncommon phenomenon that products originating from grazing-based animal keeping are sold at conventional markets at a conventional price (Földes, 2008).
The economic motivation becomes dominant at the farmers decision making process as the farm size increases. The main aim of bigger farms is getting profit from the organic farming while the motivation of the smaller ones is the protection of the environment, and the production of healthy food (Szarka Gáborné, 2007).

The regulation of the organic farming is in accordance with the regulations of the EU. The logistic system, the marketing work, the product processing and the education are a little bit underdeveloped in Hungary. To improve the unity of organic farming, the proportion of the animal products must be increased within the organic products (Pummer and Marselek, 2004).

Table 5: *Number of animals kept by the farmers controlled by Hungária Öko Garancia*

| Animal group (lifestock unit) | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| **Poultry** | | | | |
| Chicken | 85,4 | 266 | 288 | 291,62 |
| Laying hen | | 0,098 | | 0,0098 |
| **Waterfowl** | | | | |
| duck | | 25 | | 132,54 |
| Goose+turkey | | 1,8 | | 36 |
| **Solid-hoofed** | | | | |
| horse | | | 11 | 11 |
| **Suidae** | | | | |
| Brood-sow | 51,5 | 65 | 56,5 | 56,5 |
| Piglet upto 25 kg | 9,47 | 8 | 1,59 | 8,964 |
| Fattener 25-110 kg. | 108,3 | 228,3 | 132,8 | 110,4 |
| boar | 51 | 13,2 | 4 | 2,1 |
| **Ruminants** | | | | |
| Calf until 6 months old | 2,4 | 70,4 | 94,4 | 18 |
| Cattle between 6-24 months | 115 | 257,2 | 355,2 | 367.8 |
| Cattle older than two years of age | 10 (tejelő) | 16 | 553 | 687,2 |
| heifer | | 40 | | 16,8 |
| Other cattle | | 498 | | |
| ***Bovine total*** | ***137,4*** | ***881,6*** | ***1002,6*** | ***1089,8*** |
| Sheep | 0,6 | 2,8 | 3,45 | 3,45 |
| Goat | 38,25 | 23,7 | 39,6 | 31,35 |

Source: Annual Reports of Hungária Öko Garancia

Regarding home and outside market sales, the former rate of 20%-80% has changed to 40%-60%, which we can basically evaluate as a positive sign, although this doesn't result in the development of a larger scale animal husbandry on account of the separation of the home product fields. Among producers the single-route selling method is the dominant one, apart from the direct or indirect method of home sales that is they only sell through one commercial channel. While in indirect sales the processing plants, the wholesalers and the bio-stores are the ones who prevail, due to the strategy and price policies of supermarkets and store chains, still less than 10% of the producers make use of this sales channel (Földes, 2008).

There are four areas where the organic farming lags behind in Hungary: the lack of supply and sale cooperations (1), the low volume of the organic animal keeping (2), the lack of developed common marketing (3), and the proportion of the processed product does not approach the level evolved in the old member states of the EU (4).
This last one can be explained by the narrow development sources/means and by that it is not easy to access to the subsidies and loans. Taking subcontractors into the shaping of the supply chain can be a solution. There are good cooperations for years, which might have advantages for both participants. The free capacity of the processor can be engaged and the organic farmer can place more processed products in the market (Roszík, 2008).
Naturally the subcontractors must be involved into the controlling system of the organic farming, which means costs. Sometimes the costs exceed the profit, which can be available from the sale of the more processed products. So it is important that the services of a subcontractor would be used by more than one organic farmer. This way the emerged costs can be divided (Roszík, 2008).
To highlight the problems waiting for solution in the field of organic animal breeding the followings can be mentioned.

1. Financial problems: the costs increased more than the incomes. The asynchronies between the cost and the income in the time.
2. Market problems: sales problems, disappearance of distribution channels, weak yield, lost of markets.
3. Human factor: breach of contract, one-sided reduction in the agreed price.
4. Rules and subsidies: missing of subsidies, much administration.
5. Marketing problems: improper communication of the organic label, lack of informative and sales promoting actions.

## 5. Conclusion

The organic farming means a solution mainly for the farmers which keep more animal species, grow plants and have a smaller poultry stock. The higher sales price and the possible subsidies let the farmers to achieve more income than the conventional farmers.
On the basis of the publications it can be said that there is no solvent demand for organic poultry and pig products. We cannot talk about serious organic poultry breeding among the farmers only some additional activity which has an economical function. Prospectively the production will not be determinant since the available land is narrow and since there is lack of domestic solvent demand.

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# REVERSE LOGISTICS IN HUNGARIAN WINE SECTOR

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*The objective of our research is to examine the supply chains from the aspects of the packaging materials, and wine treatment materials and technologies used in winery, and ways of tracking in supply chain, mentioning is areas of inverse logistics. Biotechnology is not aiming at changing the fundamental processes involved in winemaking, but rather in significantly increasing the choices of viticulturists and oenologists. The additional tools will strengthen their hands in the process of making the wine industry more demand driven, rather than production driven.*
*Based on theoretical knowledge and the results of our research, proposals will be elaborated about the actions to be taken in our circumstances to make winery supply chains more successful from the aspects of member cooperation and information flow.*
*Based on theoretical knowledge and the results of our research, proposals will be elaborated about the actions to be taken in our circumstances to make winery supply chains more successful from the aspects of member cooperation and information flow.Biotechnology can be seen as one particularly powerful tool to - in the long term - address many of the problems identified by viticulturists and winemakers, and to make wine production economically and environmentally more sustainable.*

**Keywords:** reverse logistics, wine sector, biotechnology, supply chain
**JEL codes:** Q5, Q57

## 1. Introduction

The general need for food and the food safety requirements continuously increase the role and significance of logistical thinking in the food industry. The optimized logistics of production, distribution, exchange and consumption results not only in a cost saving, but in many cases quality and safety advantages for the participants which can easily be turned into price advantage and market dominance (Ayers, 2006).
In the wine industry where the end product is not classified as a basic consumable and beer represents a serious interchangeability in the market of alcoholic drinks, it is highly important to cut costs, as well as to

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produce and put products of stable and reliable quality into the market. (Radócz and Györe, 2006) Consequently, our research has the following major objective: Assess the possibility of tracking winery packaging, and treatment materials in supply chain -inverse logistics.

## 2. Material and methods

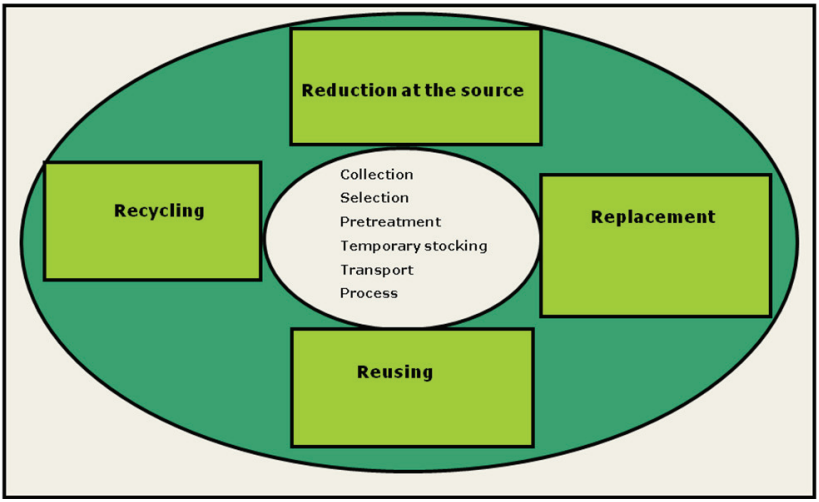
As the first step of the research based on the literature available, we described the conformation of the supply chain, its development through the development of logistics, and later the connection of the inverse logistics to the above.

Later on the world market of the wine, its major characteristic, key players, the wine sector of the EU, its potential development directions and we try to place on the market Hungary's wine sector.
In this part of the study we described the tendencies of the world's and EU's winery supply chain, compare both the structure and operations of domestic winery supply chains against the EU's supply chains.
During the comparison of the supply chains we covered packaging materials and wine treatment biotechnological products used in winery, and the possibilities of tracking them within the supply chain, including the area of inverse logistics.

## 3. Results and discussions

*3.1. The main objective of inverse logistics*
The main objective of inverse logistics is the promotion of waste utilization – salvage, and the active participation in waste management
„The reverse logistics is nothing but movement of products starting for their final purpose of usage into any other direction, to gain value or for the purpose of waste management." (Réger, 2009)

Figure 1: *The waste logistics in the narrow and in the wider sense*




Source: Déri and Vándorffy (2005)

Integrated waste management is the complex of activities which result in the environmentally and economically efficient solution of wastage problems (Mosonyi, 2008). According to András Déry, integrated waste management is to be examined in both a narrow and a wider sense (Figure 1). Its scope of different functions in the more narrow sense is related to the specific flow of materials and consists of the following: collection, selection, classification, pretreatment, temporary stocking, cleaning, transport, processing, recycling, disposal, etc. (data management, supervision, administration).
The elements of this enumeration are identical in the reference literature, however, there is no such common basis concerning the functions in the wider sense. In certain cases 4, in others 5 R can be observed.

We will particularly take a look at the 4 R model according to which we are able to distinct between preceding and posterior functions. The first preceding function is the *reduction* of the proportions and quantity at the source, the basis of which is waste prevention. In the wine industry there is a splendid example which is the reduction of wine processing

materials, such as reducing the weight of PET bottles and their labels, the amount of glue or omitting packing wherever it is possible.
The second in the row of preceding functions is the *replacement* of traditional materials with environmentally friendly materials. The growing importance of biotechnology must be expressed here. These improved biotechnological products, as well as speciality yeast and bacteria, he added, are being developed to, for example, reduce the use of water or of agrochemicals and additives and to make the production of wine more environmentally sustainable. The leading biotechnology companies (Italian, German and French) are willing to use the materials processed by the wine industry technologies e.g.:

- Substances composing many wine filter aids are built by chemically inert molecules, free from any impurity.
- Many experimental trials showed the very high efficiency degree of filter aids that, before being commercialized, pass complex physical-chemical quality trials apt to grant the product purity and validity.
- Wine clarifiers, e.g. bentonite for microdose applications stabilizers, anti-oxydasic stabilizers, color and cream of tartar stabilizers, biologic stabilizers, all preparations offered in function of the final result are the result of trials enabling to select the most suitable components to the different production needs (Gayon and Dubourdieu, 2006).
- Gum arabic utilization in oenology is known since the end of 1800 and in 1933 Ribéreau-Gayon showed that the addition of measured quantities of gum Arabic was a useful technique in order to markedly improve stability and to reinforce organoleptic characters in white and red wines (Eperjes *et al.*, 1998).

The third and last preceding function is the *reusing* of materials. A typical example of this is the multi-way utilization of packing materials, such as glass wine bottles, plastic crates, plastic cans and pallets. Using this method significantly complicates the existing logistics structure because the traditionally one-way system has to be replaced with a two-way system. (Mike, 2002) In the case of reused materials the later described GLN (indicating the subject or organization) and GTIN (e.g. indicating a product or packaging material) numbers will be of special significance. Not only the different enterprises, but also some specific products and their packaging materials can be traced with their help.

The last function of inverse logistics is the processing and *recylcling* of materials. In this case the product loses its original function - the purpose of the process is to regain the still usable materials. When this regaining is of good quality it can be used again at the production of the original component. The processing can be achieved through several methods the same characteristics of which are that they need the consumption of serious amount of resources. However, this amount is still less than it would be needed for the production of the original raw material.
All of these mean the returning of products once they have been used, and hence an inverse flow from the customer to the producer; i.e. what is known as a reverse logistics chain (Fleischmann et al, 2000).

*3.2. New regulations related to the enviromental product fee*

The objective of the Act LXXXV adopted in 2011. Environmental law is to determine a new regulatory framework and through this the complete overhaul of the industry's activities, the promotion of the wider spread of re-usable products (re-use) and also to significantly increase waste management in line with the requirements of the European Union and general interest of the Hungarian Society.
Parallel with the termination of the coordinating organizations, a separate 100 percent state-owned National Waste Management Agency (OHÜ) would be established under the control of the ministry responsible for environmental protection, the objectives of which would be to exercise the rights of the State, as well as to carry out its duties and obligations.
The proposal incorporates cost elements into (the rate of) the product fee, ensuring adequate resources to meet requirements of collection and utilization, as well as to enforce "the polluter pays" principle.
The industry (branch) would be governed by a two-tier organizational structure, the first part of which would be the product fee committee which is the expert, consultant and decision support body of the minister responsible for environmental protection, and who are responsible for the strategic decisions that affect an entire industry. The second part is the OHÜ, which is responsible for carrying out the industry tasks.

*3.3.Treacebility system according GS1 Hungary*

In order to work, traceability systems need to know everything that happens at every step of the way, from the farm to your kitchen table. Customers also play a fundamental role in reverse logistics, since they are the first link in the reverse chain and exert strong environmental pressure on firms. But with theincrease in extended and highly global supply chains and the growing use ofcontract manufacturing, tracing food products from end of end has become more difficult. On the other hand, the environmental implications of logistics systems are one of the future challenges to companies (Abukhader and Jönson, 2004).

GS1 standards make traceability systems possible, on a global scale – no matter how many companies are involved or how many borders are crossed as food and food ingredients travel from one end of the supply chain all the way to the consumer.

Traceability is especially important if something goes wrong and food products must be recalled. Recent legislation in the European Union obliges manufacturers to inform authorities and consumers of any potential risk to consumers from their products. Many other countries are reviewing their own legislation on this same theme. Individual growers, producers and manufacturers, eager to protect their brands from the harm done by tainted materials or poorly-managed recalls, are boosting their own internal recall policies and methodologies. GS1 standards can play a vital role in product recalls. Because they are global, reaching from one end of the supply chain to the other, they ensure immediate access to accurate product information, which enables swift, comprehensive recalls.

But perhaps more importantly, GS1 standards also facilitate quality assurance and accurate inventory control. And that contributes to making recalls as unnecessary and as infrequent as possible. (www.gs1.org)

## 4. Conclusions

A comprehensive theoretical study will be conducted on the various types of possible, successful and competitive supply chains in the wine industry, as well as the strategic games and collaboration patterns among winery supply chain members.

New and novel knowledge will be given on the cooperation perceived in

the Hungarian wine industry, including the extent, modes and experiences of such cooperation. When reviewing the supply chains we will touch upon the packaging materials used in winery, and ways of tracking in supply chain, mentioning is areas of inverse logistics.

Based on theoretical knowledge and the results of our research, proposals will be elaborated about the actions to be taken in our circumstances to make winery supply chains more successful from the aspects of member cooperation and information flow.Biotechnology can be seen as one particularly powerful tool to - in the long term - address many of the problems identified by viticulturists and winemakers, and to make wine production economically and environmentally more sustainable.

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# SUSTAINABILITY FARMING OF THE HUNGARIAN CHICKEN SECTOR

Virág SZABÓ* and Kinga NAGYNÉ PÉRCSI**

*The most important characteristic of the alternative poultry breeding is that it serves the development of a sustainable agriculture. The structure of the Hungarian alternative organic animal breeding is very different as compared to the conventional production. It is reasonable to draw a bigger proportion of poultry into the organic and other alternative farming. One option for this is the development of the variety of "Hungaricum" poultry product in the family farms.*

*The professional literature keeps count of the spreading of the alternative farming methods as the opportunities for the development of the countryside. A survey was made in the Institute of Regional Economy and Rural Development as a part of a Scientific Student Conference Study to find out the importance of this farming method in the rural areas and to know the potential enterprises or enterprising capacity of the inhabitants. The survey was made by personal interview. The query of the questionnaire was holistic.*

*Analyzing the situation from the view of the village we can state that a strong cooperation of the inhabitants of the village is needed to introduce and maintain any of the systems. Summing it up we can say however the organic farming is considered as a tool for rural development in many publications it has a less importance in the case of poultry breeding if we think on the level of settlements. Our final consequence is that the organic poultry keeping will not be a determinant segment of the rural production.*

**Keywords:** self-produced poultry, native Hungarian poultry, organic chicken keeping, Hungaricum Poultry Products, Model Village Programme

**JEL code:** Q57

## 1. Introduction

The most important characteristic of the alternative poultry breeding is the serving of the sustainable agriculture. On the basis of this, the alternative production and keeping methods, technologies and the adequate species, which are suitable for this kind of production, can be deter-

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mined. The structure of the Hungarian alternative organic animal breeding is very different as compared to the conventional production. That is way it is reasonable to draw a bigger proportion of poultry into the organic and other alternative farming. One option for this is the development of the variety of "Hungaricum" poultry product in the family farms of the countryside.

One of the main bases of the sustainability farming is to keep the traditional species for the future economy. The position of the genome has become very critical in the developed countries because of the spreading of the intensive poultry sector. This resulted in the disappearance of the old and traditional poultry species in general and from the small villages as well. This is why alternative methods are required. There is a program proposed by the Association of Hungarian Small Animal Breeders for Gene Conversation which aims are to restore the traditional species to their natural environment which means the chicken-yard of the farm life.

## 2. Literature review

The old native Hungarian domestic animal species are individually Hungaricums, their products nevertheless. In the interest of this the Association of Hungarian Small Animal Breeders for Gene Conservation (MGE) worked out the programme of HU-BA (Hungaricum Poultry Products, HU-BA Production System for Premium Quality, Special Poultry Products in Hungary).

**The direct aim of the project was to support:**

- the self-supply of the local inhabitants by self-produced poultry products in excellent quality;
- the improvement of the local general organic farming with the help of poultry (the maintenance, the weeding, natural manuring of small gardens, orchards, the usage and maintenance of the wetland habitat);
- the starting of the production programme of HU-BA controlled and declared by MGE (Association Of Hungarian Small Animal Breeders For Gene Conservation) in the interest of local tourist and catering trade development (rural tourism, the local pro-

duction and consumption of poultry product in excellent quality) as a result of the developments (Szalai, 2009).

**The target audiences of this program:**

- Family farming of small communities
- Ecological farms
- Enterprises and local residents interested in rural tourism
- The local growers and enterprises through the production, the processing and sales of the controlled HU-BA poultry meat and egg
- To help the disadvantaged villages and retired residents to have a steady income and continuous work as well aligned with the development of rural programs (Szalai, 2009).

The project tries to achieve the aims mentioned above by putting out of the progeny of the old native Hungarian poultry species stocks maintained in the frame of gene reserve programmes in an environment which is suitable for organic keeping (Szalai, 2010).

**The method of the program:**

- to survey the residents' demand on keeping different poultry types
- Based on the proper keeping and certain demands the MGE – discussing with the breeders of the old, Hungarian types of poultries – purchases and organizes the hatching of the eggs
- to transport the chicks from the brooder and deal them to the local residents. According to the number of the chickens provide proper nutrients for chicks.
- to raise the chicks on farms, to give breeding and keeping advice continuously by MGE and control as well
- in order to further breeding and gene retaining in the future it is necessary to appoint breed animals on family farms; to consume and sell those chickens which won't be kept for further breeding
- to organize local HU-BA program and product tasting (Szalai, 2009)

The aim of the program beside preserve the genes are to develop a product which is environmental friendly and can assure a steady income for those who live in rural areas (Szalay and Kovácsné Gaál, 2008).

The poultry sample village program has been operating successfully for many years in Bedő, Oszkó, Egerág and since 2009 in small villages around the Sümeg area. The directory of Danube-Dráva National Park has joined the program so do the MGE breeders. In order to popularize the program local festivals are organized. The attendance has the opportunity to taste the traditional Hungarian meals which are made from Hungaricum Poultries. With the support of the Agricultural Ministry the first Nationwide Hungaricum Poultry Festival was held in Megyer in 2009. In the spring of this year the smallest Hungarian village Megyer has joined this Program. 300 native chicks were placed in Megyer for free. The aim of the village is to preserve the stock with the natural reproduce.

## 3. Methods

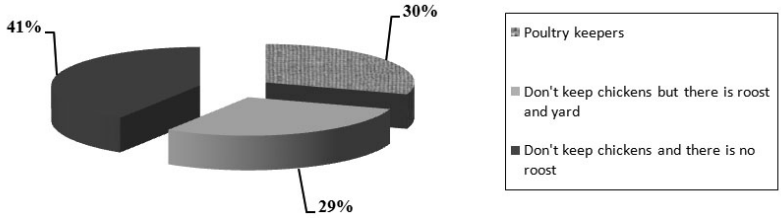
The basic idea come from an interview made with István Szalay who is the chairman of the MGE. He offered us to give a helping hand in a project which aim was to place native chicken in a rural area. Through this project the inhabitants could have gotten an extra income source and it would have been adequate for the breeding conceptions of the alternative poultry keeping trends.
The literature argues that the spreading of the alternative farming methods it is a real opportunity for the development of the countryside. A survey was made in the Institute of Regional Economy and Rural Development as a part of a Scientific Student Conference Study to find out the importance of these farming methods in the rural areas and to know the potential enterprises or enterprising capacity of the inhabitants. Sarkeszi village was chosen for the place of the survey because of personal relations. Sarkeszi is situated in the Middle Transdanubian Region, in Fejér County, about 13 km from Székesfehérvár. The total numbers of the inhabitants were 614 heads in 2009. The density of the population was 41.71 head/km 2,207 flats are found in the village (KSH, 2009). The survey was made by personal interview. The query of the questionnaire was holistic.

## 4. Results

At the moment of interview there were 62 houses in the village keeping chickens from 207 households. By the determination of the size of the fowl stocks the number of the baby chicks, the laying hens and the cocks are also counted in, so the total registered number of the chickens was 1,375 pieces in the village. The average size of the fowl stock in the individual households was 22.17, approximately 22 chickens.

According to the respondents there are 60 houses in the village where every circumstance is given for keeping poultry. These households were dealing with subsidiary husbandry earlier, but they gave it up because of different reasons.

**Figure 1:** *The division of poultry keepers according to the number of houses in Sárkeszi*




Source: Szabó (2010)

The Figure 1 shows the division of the households in percentage. We can see in the figure that 30% of the inhabitants keep chicken, 29% has an opportunity for it but in most cases (41%) there is not any opportunity for keeping chickens.

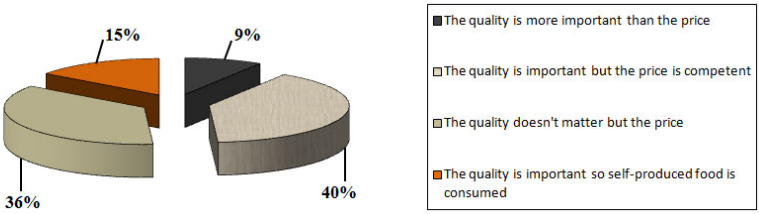
28 households out of 60 answered that they would keep chickens again if it brought extra income for their households. This rate is only about half of the respondents (47%). Those who do not want to keep chickens in the future have the following reasons:

„I am in bad health condition and old, I cannot deal with subsidiary husbandry."

„However there is a fowl-house next to my own house it was built

by the former proprietors. I move out from the town, I don't care for agricultural activities."
„I have no time for it."
„I have no money to keep chickens (to buy the feed)."

Figure 2: *The consumer behaviour at buying of poultry meat*




Source: Szabó (2010)

In the followings we asked the inhabitants about their poultry and egg buying habits. Only 9% of the families pay attention to the quality characteristics of the food, sometimes they put the quality and origin of the product before the price. However 40% of the households consider the origin, but they make their choice mainly based on the price at purchase. 36% have no idea about the origin of the lately purchased poultry product. They can only tell the name of the shop where they bought the product. 15% of the inhabitants consume self-produced products usually and they purchase rarely eggs and poultry meat in a shop (Figure 2). The most important factor for them is the quality of the product and they rely only on the self-produced products, they do not think that the products at retailers are the same quality as the self-produced ones.

In the village many buy eggs from those who are keeping laying-hens. Those inhabitants, who buy eggs from the shop, are not sensible of the origin, so we can say that only the price counts in the case of the egg purchasing. The markings on the eggs are mostly unknown and those who know something about them can identify only few numbers. The markings on the eggs are unknown by the consumers of the village.
In the following part of the questionnaire we were curious about the parameters which can be decisive in the determination of the maximum number of fowl-stock which can be put out to the inhabitants.

We calculated the average the size of the available fowl-house and in this way we found as a result that the average size of the outbuildings suitable for poultry keeping is 8 square meters per a household. If we multiply this size by the number of the houses, which can provide the circumstances of the poultry keeping at the moment, than we get that they totally give out a fowl-house in a size of 976 square meters. Let us assume that every house where adequate fowl-house is given would keep poultry in maximum capacity. This means 88 pieces poultry in HU-BA programme per courtyard. According to the standard directives of HU-BA programme the amount of native chicken which can be settled down is 11 pieces per square meter from the age of 5 weeks. Consequently in total 7,920 pieces chicken can be put out in Sárkeszi in the frames of Poultry Model Village Programme.

## 5. Conclusion

The requirements of native poultry keeping are less strict than the organic production and it is cheaper in addition, because of the lower cost of the conventional feed. The weak point of the Model Village Programme lies in that yet that they cannot provide the processing opportunity. Investment of an entrepreneur or public subsidies is needed for the processing.

Analysing the situation from the view of the village we can state that a strong co-operation of the inhabitants of the village is needed to introduce and maintain any of the systems. However Sárkeszi is a small settlement it counts a little big in this relation, because the co-ordination of the activities of 90 households is not a simple task. Maybe is not accidental that those villages where the Model Programme operate are very small settlements with few inhabitants, because the reasons for the lack of agricultural integration can be accounted for the problems of co-operation of the inhabitants in different settlements.

To sum up we can say that the roosts of the villages are unexploited. At the same time the inhabitants are less willing to keep domestic animals because of the mentioned reasons. For the success of the program a new approach is needed on the people's part. The Hungarian consumers should emphasize the quality and the origin of the product. The consumers are very price-sensitive; the price is the first fact in the course of buying.

The maintenance of the genome potential is indisputable; however more subsidies from the European Union would be needed because the biggest barrier of the extension of these programs is the lack of suitable funds. In many cases the lack of the feed causes problems too, so the insurance of the input materials will be needed in the future.

If the collective selling of Hungaricum poultry products could be solved, maybe, more participants would join this Program. More activists would be needed to survey the villages. The villages which joined would get an important role in the incubation and the reproduction. Village-building training would be required in order to intensify the cohesion and to solve the producer-organizational tasks.

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ENVIRONMENTAL AND BUSINESS ECONOMICS

# FIFTY YEARS OF ENVIRONMENTALISM

Sándor KEREKES*

*The meaning of development is somewhat more complicated, as it might be interpreted in quantitative as well as qualitative terms, for example as the continuous increasing of welfare or well-being. It is not indifferent, naturally, which interpretation we opt for. GDP growth, for example, does not necessarily imply an improvement in welfare and especially not in well-being. The improvement of well-being includes the development of education, increasing people's health span, improving life and social security and even factors like personal freedom, which are all elements of people's standard of living. Without underrating the negative impact economic development trends have on the natural environment, we have to remain objective and admit that right now, the majority of effects threatening sustainable development originate in the social dimension.*

**Keywords:** environmentalism, sustainable development, happiness
**JEL code:** Q50

## From Rachel Carlson to the Club of Rome

This profession of ours, environmental protection has a history of about half a century. For the citizens of Central Europe, this last half century has been different from any previous fifty-year period, as it was primarily a period of peace, disturbed by some local wars only. However, this same fifty years have witnessed humanity using up more natural resources than what had been consumed altogether during the preceding thousand years, the biosphere has suffered some radical changes and we are still at war - yet not with each other this time, but with nature. This all has happened since the time we had started dealing intensively with environmental protection. It is exciting to see with our own eyes where humanity's efforts to save the Earth have taken us. Fifty years ago, Rachel Carlson must surely have already begun writing her book, *Silent Spring*. In 1962, Carlson shocked the world by concluding that the concentration of DDT builds up along the food chain, threatening to deprive humanity of the bird world. Many of us were touched by her book, yet possibly even more people just waved dismissively, and they

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are the ones who have ever since been recounting the blessings of scientific advancement over and over again. And there is plenty to recount, of course. The insecticide effect of DDT was first detected by Paul Hermann Müller in 1934, and in 1948 he was awarded the Nobel Prize in Medicine for that. Quite a lot has been found out about DDT since that time, yet a number of countries still use it, as having to make a decision between malaria and DDT is anything but easy. Substitute compounds for DDT tend to decompose rather quickly, especially at higher temperatures, thus they are not effective enough.
In 1972, the Club of Rome published a work that stirred a great deal of debate: *Limits to Growth*, which tried to introduce to the public the idea of "zero growth". The warnings were issued, yet political and economic actors did not take them very seriously. However, a circle of researchers was formed who began to systematically analyze the problem, striving to give more and more accurate predictions based on global models. In 1974, Mesarovic and Pestel published the second report to the Club of Rome, titled *Mankind at the Turning Point*, which promoted the concept of "organic growth". This second report was already available in Hungarian, yet only for the "chosen ones", as the book was only "published" in the form of a couple of numbered copies. The models had become somewhat more elaborate, but the main point did not change: the Mesarovic-Pestel model was rather pessimistic about the future, too.

## Scientific Realization of Global Problems

Meanwhile, in 1973, Schumacher published his book *Small Is Beautiful* in the United Kingdom, which was a real success and made it to the bestseller list in no time. Schumacher did not bother with models, but questioned the fundamental values of the economic status quo. Such thoughts were considered dangerous, thus the long-lasting lack of a Hungarian translation of the book was hardly a coincidence.
The third report to the Club of Rome was not dealing with models any more, either. And that was in spite of Jan Tinbergen, the leader of the research group, having achieved world fame with his work in dynamic modelling. The paper published under his name meant a real breakthrough in the research of global issues. The work of the research group headed by Jan Tinbergen was published in 1976 under the title *RIO:*

*Reshaping the International Order*. In Hungary, it was published by KJK, thus it was already legally available to anyone, even if with a three year delay (1979). Jan Tinbergen had been awarded the Nobel Prize in 1969, thus the *RIO Report* of 1976 was already the work of a Nobel Laureate. Tinbergen's group argued for the need to create a new economic world order, and thus the problem of our environment was shifted to a scientific level.

### We Have a Solution! Or do we?

The alarming reports of the Club of Rome were followed by some relieving publications. Maybe I am not completely wrong in suggesting that the optimistic line of thought in environmentalism all started out with the Brundtland Report. In 1987 the Brundtland Report introduced the notion of sustainable development, which, along with eco-efficiency, became the focus of the 1992 conference in Rio.

The Brundtland Report, however, talks about meeting the needs of present and future generations, that is, about the welfare of these generations, which is dependent on both the amount of accumulated capital and the size of the population to be catered for. Assuming that the stock of natural capital is not decreasing with time (strong sustainability), welfare might still be adversely affected by an increase in population. The increase in the size of the population might be counterbalanced by technological development, resulting in a unit of natural capital yielding a higher "amount" of welfare. Technological development does not only improve labour productivity, but the so-called eco-efficiency, as well. The energy efficiency of steam engines, for example, was as low as 5 to 15 percent, while today's engines frequently boast ratios of about 50 to 65 percent. If the rate of technological advancement exceeds that of population growth, even the strong sustainability criterion can theoretically be met.

The 1992 book of the World Bank (*World Development Report*) demonstrated that beyond a certain level of economic growth, growth and pollution begin to diverge. Above a per capita GDP of ten thousand US dollars, ecological indicators like sulfur dioxide emissions, amount of untreated wastewater, airborne concentrations of lead and other heavy metals etc. clearly tend to improve. In environmental economics, the

curves representing such relationships are typically called Kuznets curves. Simon Kuznets, who could certainly be considered the pope of economic growth theories, was awarded the Nobel Prize in 1971. It might have been quite natural that Kuznets was optimistic about growth. In his Nobel Lecture, though also admitting to the negative impacts of growth, he clearly stated that: „Two points are relevant here. First, the negative effects of growth have never been viewed as so far outweighing its positive contribution as to lead to its renunciation - no matter how crude the underlying calculus may have been. Second, one may assume that once an unexpected negative result of growth emerges, the potential of material and social technology is aimed at its reduction or removal... Still, one may justifiably argue, in the light of the history of economic growth, in which a succession of such unexpected negative results has been overcome, that any specific problem so generated will be temporary - although we shall never be free of them, no matter what economic development is attained."
That is, what Kuznets asserted in 1971 was that no-one had ever questioned that growth had yielded more good than bad, and that growth itself had presented solutions to counterbalance its own negative impacts in the form of new technologies. By the time Kuznets received the Nobel Prize, the Club of Rome had already started working on its first report, *Limits to Growth*. As soon as 1972, the book by the Meadows group was published, questioning the long-term sustainability of growth, and its effects being more positive than negative, as well. Of course, the authors in the Club of Rome were not arguing with Kuznets. The above statements, if scrutinized closely, make it apparent that the growth theory of the now-classic economist does actually incorporate more or less everything that researchers have formulated - as a criticism of the growth theory, for the most part - during the past thirty-five years. For Kuznets, though having regarded technology and social innovations as the bases for growth, also considered important a number of natural, social and cultural dimensions in asserting that "modern technology with its emphasis on labour-saving inventions may not be suited to countries with a plethora of labour but a scarcity of other factors, such as land and water; and modern institutions, with their emphasis on personal responsibility and pursuit of economic interest, may not be suited to the more traditional life patterns of the agricultural communities that predominate in many less developed countries."

Naturally, Kuznets did not interpret GDP as an indicator of well-being; what is more, he clearly formulated in his aforementioned lecture that "the conventional measures of national product and its components do not reflect many costs of adjustment in the economic and social structures to the channeling of major technological innovations; and, indeed, also omit some positive returns. ...This shortcoming of the theory in confrontation with the new findings, has led to a lively discussion in the field in recent years, and to attempts to expand the national accounting framework to encompass the so far hidden but clearly important costs, for example, in education as capital investment, in the shift to urban life, or in the pollution and other negative results of mass production. These efforts will also uncover some so far unmeasured positive returns - in the way of greater health and longevity, greater mobility, more leisure, less income inequality, and the like." Let me underline, once again, that it was only much later, during the 1990s that attention shifted to the Human Development Index (HDI) or the Index of Sustainable Economic Welfare (ISEW) by Daly and Cobb.

*Faktor Vier*, first published in 1995 in German, was probably the first truly optimistic report to the Club of Rome. In 1997 came the English edition, confirming that all hope is not lost. Ernst von Weizsäcker, Amory B. Lovins and L. Hunter Lovins described the opportunities that science and technology would offer. They concluded that the dramatic improvement in eco-efficiency would enable us to double wealth while halving our resource use at the same time. This was the time when the Cleaner Production Centers of UNIDO were founded, when Americans established "Pollution Prevention Centers", and when everyone was happy to see environmental protection leave behind an era of defensive strategies. Prominent personalities of the business world have joined the "club", among them Michael Porter, who strived to turn environmental protection - and later on (2006), corporate social responsibility - into a "business case", into an integral part of corporate strategy. Furthermore, factor books have kept and still keep being published almost each year; factor five, factor ten, and they all praise the inexhaustible creativity of humanity, claiming that far less materials, energy and pollution can yield a far higher degree of well-being than what we have achieved so far, and thus the Earth is capable of providing for as much as 9 billion people, if...! Yes, at the end of the sentence there is this *if*, symbolizing that we cannot go on the way we have been so far. This *if* means that we must

change our ideas and expectations about well-being, comfort, consumption, production and quite everything else we have got used to. The stock society needs to be transformed into a flow society. We must not possess the goods, we have to settle for the use of the services they provide. The cheapness and the comfort of fossil fuels should be offset by more expensive and less energy dense renewable energy sources.

The so-called hydrogen economy might possibly solve energy issues, yet raw material sources will still represent certain limits, and raw material prices are bound to increase with time, too. If the adjustment of our wages to the EU level was slower than that of our quality of life, and if quality of life was defined in a way different from how the citizens of the EU had defined it. If politicians did not promise a prompt advancement in life conditions and immediate improvements in the individual's material wellbeing, and if they did not impose measures serving such purposes, but rather opted for a more moderate pace, a slower rate of adjustment, and set the country on a path different in quality from the one followed by the majority of Europe's average citizens, that would certainly pay out in the future.

For the time being, unfortunately, the increase in eco-efficiency has been offset by an increased consumption. Due to the decrease in the amount of materials and energy used, products have become cheaper and thus people can buy more products with their income, which then again leads to an increased use of natural resources when expressed in terms of "natural" units (kilograms, joules). This phenomenon is what we call rebound effect, an expressive example for which is Finland, where per capita material use expressed in natural units is some 70 percent higher now than it was fifteen years ago.

We have to economize, we have to reuse everything, we must not throw anything away, neither deposit anything in landfills, and so on, and so forth. There is hardly anything we may go on doing the way we have always done it before.

Models have slowly become things of the past, even though a 2004 book by Dennis and Donella Meadows, and Jorgen Randers (*Limits to Growth - The 30-year Update*) reminded us of the original work from 1972, giving proof that the then predictions were correct for the most part. Quite naturally, however, this was not what we were concerned with in 2004.

Of course, we still have some pessimists who do not believe in the almightiness of human knowledge. New theories have appeared which rather resemble the earliest reports of the Club of Rome. An excellent French professor, Serge Latouche has been „touring" the world to promote the theory of **'Degrowth economics: why less should be so much more'**, he wrote a book titled *Farewell to Growth* (in literal translation from the French original: *Little Treaty of a Serene Degrowth*) and he is giving lectures all the time - though, admittedly, the audience are already "believers" for the most part.

Maybe we should go back even further in time when outlining the history of this problem. Returning to the roots, it is certainly Malthus who should be considered the "theoretical father of all global problems". Malthus[1] wrote his famous essay in 1798, suggesting that food supplies would be inadequate for the growing population, as while the latter one tends to increase geometrically, food supplies could only grow arithmetically. At the time of Malthus, the Earth was only home to less than one billion people. By 1930, there had been two billion, and in 2010, the figure reached seven billion, already. The opponents of Malthus[2] almost immediately claimed the theory was invalid, among others because it had not taken into account scientific and technological advancement. Malthus'1803 essay, which gained far more attention than the first one, also included in its title the recently rediscovered topic of human happiness (*Effects on Human Happiness*). Thus he was not interested in how the others should be overcome but in the happiness of humanity as a whole. And the excellent British researcher Ruskin, deceased in 1900, was engaged in the very same topic: 'There is no wealth but life. Life, including all its powers of love, of joy, and of admiration. That country is the richest which nourishes the greatest number of noble and happy human beings; that man is richest who, having perfected the functions of his own life to the utmost, has also the widest helpful influence, both personal, and by means of his possessions, over the lives of others.'[3]

It is high time we understood that it is not competition, but cooperation that brings more happiness to humanity. Even game theory might be used to prove this, by applying the logic of the prisoner's dilemma. Still, people keep forgetting it, even those who otherwise admire the achievements of *Neumann-Morgenstern*[4]. Seventy years ago, János Neumann's

team knew, 120 years ago Ruskin knew and even the previously cited Malthus did know why mankind is destined to live on Earth.

## Psychologists and Economists in Happiness Research

It is hard to stop this optimistic-pessimistic dichotomy, yet it is not exactly easy to go on with it, either. After all, having returned to the roots, the ultimate purpose of any human activity, and thus that of any economic activity, as well, is to make us, people, happy. Nobel Laureate Kahneman cited Easterlin (1974), who, having examined the relationship between economic growth and happiness, concluded that "large increases in the standard of living have almost no detectable effects on life satisfaction or happiness". Easterlin (1995) found that "the average self-reported happiness level did not increase in Japan between 1958 and 1987, although real income increased fivefold." This seems to contradict both our own intuitions, and, even more so, fundamental economic doctrines. Whereas, as Kahneman concludes, 'in the long-run well-being is not closely related to one's circumstances and opportunities.' The explanation might be, according to Kahneman, that people tend to regularly adjust their aspirations to the level of utility they have already achieved, and consequently they fail to report higher levels of satisfaction even though they have actually experienced significantly improved levels of well-being.[5] The highest satisfaction values were detected for the citizens of Northern European countries, there is no correlation between GDP and happiness in relatively rich countries, the countries of the former Soviet Bloc are extremely dissatisfied (historically, of course), and surprisingly, the citizens of South America were found to be satisfied.

In his article from 2000, Csíkszentmihályi questions the general theorem put forward by Maslow that consumers behave rationally when making decisions about satisfying their needs (Maslow's pyramid). Csíkszentmihályi established that in a welfare economy, consumers tend to be less concerned with their "existence" itself and their attention is shifted to "experiential" needs instead. Thus they require activities that can provide them with such a practical experience. Interestingly, consumers in the "developed world" do not really care much about what they buy; they are more interested in the experience of buying, if anything. Such a change

might have its consequences, both positive and negative, with respect to sustainable consumption. Happiness researchers (YEW-KWANG NG 2008)[6] concluded: "Public policy should put more emphasis (than suggested by existing economic analysis) on factors more important for happiness than economic production and consumption, including employment, environmental quality, equality, health and safety." And the Korean author continues with the rather interesting assertion that "scientific advance in general and in brain stimulation and genetic engineering in particular may offer the real breakthroughs against the biological or psychological limitations on happiness."

According to happiness researchers, "despite a huge increase (several times instead of just several percentage points) in real income or consumption levels, the average happiness level of a country has typically remained largely unchanged." (Easterlin, 1974, 2002) (cited in NG Y-K, 2008) Based on a comparison of various countries' average happiness levels, countries with a lower income level tend to have a lower level of happiness, while it is usually higher for those with higher incomes, though the relationship is less obvious above a per capita income level of 7.500 US dollars (Inglehart & Klingemann, 2000; cited in NG). Some other socio-economic factors, like "living in a marriage", demonstrated a much stronger correlation with happiness than income or consumption. Interpersonal relationships are a key factor to happiness (Bruni, 2006; in NG).

If these statements are true, suggests NG, then a revolution in economic thinking is necessary, as proposed by Layard (2005). On a social and global level, ensuring economic growth might appear as an illusion, without even fostering the achievement of the agreed upon objective: increasing happiness. What is more, "if account is taken of the environmental disruption effects, economic growth may well be welfare-reducing, if not survival-threatening." (Ng & Ng, 2001)

Sustainability means that the uninterrupted existence of "something" can be ensured. The meaning of development is somewhat more complicated, as it might be interpreted in quantitative as well as qualitative terms, for example as the continuous increasing of welfare or well-being. It is not indifferent, naturally, which interpretation we opt for. GDP growth, for example, does not necessarily imply an improvement in welfare, and especially not in well-being. The improvement of well-being includes the development of education, increasing people's health span, improving life and social security and even factors like personal freedom,

which are all elements of people's standard of living. Without underrating the negative impact economic development trends have on the natural environment, we have to remain objective and admit that right now, the majority of effects threatening sustainable development originate in the *social dimension*. Income gaps keep widening, and certain channels of social mobility, like education, are getting blocked. Certain layers of the society are particularly severely struck by disadvantages and discrimination. In consideration of these problems – underlining that the adequate quality of our natural and man-made environment is of primary importance not only to the quality of human life but to the operation of the economy, as well –, sustainable development strategies must not exclusively prioritize the sustainability of our use of nature.

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# NATIONAL BUSINESS CULTURE: THE FOUNDATION FOR SUSTAINABLE ECONOMIC DEVELOPMENT

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*Starting with the 2008 Global Financial Crises, the topic of "Sustainable Economic Development" became a subject of interest to governments, practitioners and academicians alike. Development has always been the "holly grail" of economics, and generating prosperity has been the challenge of most governments regardless of political philosophy. However, as the current global economic crises are stubbornly proving, there are limits to governmental intervention and stimulus. We argue that governmental acts are predicated upon the existence of a healthy business culture, and it has to be developed in the newly globalized economies of Central and Eastern Europe in order to achieve long-term sustainable economic development.*

**Keywords:** Economic Civil Society, Culture, Sustainable Growth, Shared Value
**JEL codes:** O17, O57

## 1. The Missing Ingredient

A casual review of current economics and business literature may lead us to believe that traditional capitalism is in trouble. There are significant tectonic shifts and major transformations of the free-market capitalism system, paradoxically in its historical cradle of Western Europe and North America. This debate has many facets and the fundamental question pundits ask is can liberal capitalism still deliver prosperity and economic development? If so, why has it failed in pervious four years? What is the missing ingredient, especially as this "prosperity formula" stands to be extrapolated in the newly integrated nations of Eastern Europe? In this paper, we suggest that the most subtle, yet effective ingredient in economic development is culture. We refer to culture as the mentality of a population that results from its history, religion, geography and national choices over time, that is visible in that country's choices of government and social structure. Culture must be cultivated in an intentional manner, especially the economic kind that generates prosperity and economic development.

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No doubt, European leaders yearn for growth that can enhance employment and solidify the tax-base badly needed for the sustainment of social initiatives. Jose Manuel Barosso, the President of European Commission stated: *"In a changing world, we want the EU to become a smart, sustainable and inclusive growing economy."* and "*...economic growth is within our reach if we can break down the barriers that stop money, services and people flowing through our Union as they should."* This imperative for growth is on the back-drop of western governmental debt crises. Wang Jianye, the chief economist at The Export-Import Bank of China, declared at the 2011 World Economic Forum in Davos: *"A year ago, we thought we were struggling with post-crisis problems: now we seem back in crisis mode, but with a difference. Now governments, especially in Europe, are struggling to gain control of their fiscal positions, at a time when the economy remains weak. That struggle may take some years to resolve."*

The Lisbon Treaty in 2001 set out to make the European Union *"the most entrepreneurial economic block on the face of the planet."* It was suppose to transform the traditional manufacturing based European economy into a knowledge-based economy. Governments thought the Union has set aside generous sums of money to stimulate the economy either by bailing out certain sectors or by stimulating others, yet the results have been less then satisfactory. The October 2010 McKinsey report compares the European Union with its ideological counterpart the United States and concludes that (Roxburgh *et al.*, 2010):

- GDP per Capita is 24% lower in the EU-15 than in the US
- Productivity is 15% lower in the EU-15 than in the US
- Europeans work on average 5 weeks less then people in the US

That may be true when comparing the US with the EU, yet both regions still suffer from low growth rate, high unemployment and limited entrepreneurial activity. If that is true considering these two developed regions, it is even more so when referring to newly integrated European nations such as Romania. Their communist heritage, their religion and government burdens have been impediments rather than stimulants to economic growth (Văduva, 2004). Yet, our observation is that this paradigm needs a significant upgrade. Economists and politicians tend to view economic growth and development as the exclusive responsibility of governments and most prescriptions tend to focus on government

initiatives with the assumption that the private sector is too impotent or too fragmented to stimulate entrepreneurial activity. The reality is that if government initiatives do not resonate with the economic community, entrepreneurial behaviour will never emerge.

## 2. The limits of governmental activity in stimulating entrepreneurship

Isenberg (2010) outlines some of the common mistakes governments undertake in their credible attempts to stimulate entrepreneurial activity. We are assuming that these initiatives are taken in good faith – even if that is not always the case – yet even in those situations, they might be doomed to fail. Some of those common mistakes are:

1) *Emulate Silicon Valley*. Most governments would like to take political credit for creating the next "entrepreneurial hot-spot". These initiatives may be industrial parks, business incubator or financing schemes. Silicon Valley may have great appeal, but it cannot be replicated with ease and within a four-year political mandate. The Valley was created over long periods and its growth was natural and organic with limited government involvement.

2) *Government-managed entrepreneurial initiatives*. Some governments enter the start-up business either directly or indirectly. The Singapore model is often cited as a successful form of "state-capitalism", yet in most places of the world, government officials are at the opposite spectrum from entrepreneurs. In Eastern Europe, many government-managed entrepreneurial initiatives were fronts of siphoning government money and rewarding political clients.

3) *Government-picked winners*. There is a temptation for the government to decide who the "strategic industries" are, based on the Japanese model. Even if this initiative has a lot of merit, there are real dangers for the government to pick the winners based on political motives or wishful thinking. For example, in Romania, agriculture and tourism seem to be the government chosen, yet most of the population does not share the government enthusiasm.

4) *Government as a venture-capitalist*. The allocation of capital is an essential component of economic activity. The liberal view proposes this should be done by private banking and investment based upon

feasibility and profitability of entrepreneurial initiatives. The socialist view, claiming that private interests are too demanding, would like to invest on reasons other then feasibility. The Economist special report, "State Capitalism", claims that almost $230 billion have been misallocated by China alone in its drive to finance new ventures.

The *Public Choice* scholars in government and public administration studies outline some of the inherent flaws of governments and why their ability to stimulate entrepreneurial behaviour is intrinsically limited. In most cases, governments are natural monopolies. Therefore, they have a natural propensity towards inefficiency given the fact that outside the election cycle and major media scandals the instruments to increase their efficiency are quite limited. Second, there is an inherent corruption in all governments given the "power tirade" between the private sector, public administrators and politicians. The private sector invests money into political campaigns in exchange for public works contracts and legislative influence. Finally, governments in the West are bankrupt. This stems from two different directions: first, there are unsustainable social contracts governments have with their citizens in the form of pensions, healthcare, education, etc. and second, there are limited revenue streams given the diminishing working-age population, slow economic growth and limited entrepreneurial activity (Osborne and Gaebler, 1993).

There are pitfalls in government entrepreneurial initiatives; however, there are certain activities that governments can do. The first and most important service governments can provide is legislative stability. This is of outmost importance in Eastern Europe who is struggling with the communist legal legacy and the implementation of newly imposed European Union rules. However, as we see in Western Europe, legal stability and predictability are necessary but not sufficient to generate entrepreneurial behaviour. The second, and in the opinion of this author most important, governments ought to purpose themselves to educate the national culture of a nation (Schumpeter, 1962).

Senor and Singer (2007) outline those characteristics as they are found in the Israel culture, a nation of only 7 million people that has more start-ups listed than the European Union, China, and all of India combined. Those cultural characteristics are:

1) *Creativity and innovation***.** These are the bedrocks of entrepreneurial activity, where restless individuals not satisfied with the status-quo, attempt new things either with new start-ups or with significant improvement to the products and processes of their current organization.
2) *Risk taking*. Entrepreneurial nations have a unique social characteristic where their populations are more inclined to assume risks with new products, new processes or new organizations. Further, they have a tolerant view of failure, understanding that it is a necessary and predictable component of development. In contrast, non-entrepreneurial nations limit their exposure to failure and when it does happened it is viewed as final.
3) *Frugality*. Traditionally, economists called this *"savings rate"*, where a large portion of the population is in the habit of saving a part of their income for future "rainy days". The existence of this habit at the national level is most valuable for venture creation as the capital for the first business is typically borrowed from family and friends.
4) *Hard-working and delayed gratification***.** This has significant impact upon the sustainability of a firm, especially in the early period where the results are delayed. Nations that have hard work and delayed gratification as national characteristics are more inclined to start new companies and less likely to abandon then in their initial, non-profitable periods. Further, the social circles of the entrepreneur – most likely their investors – are more supportive and understanding of the normality of start-ups.
5) *Pro-activity*. Failure, change and chaos are natural components of the start-up process. Fatalistic, non-active national trademarks discourage entrepreneurial activity, building a self-fulfilling prophecy of failure. In contrast, a pro-active national trademark enables individuals to keep going in spite of set-backs and failure.

Paradoxically, the presence of an overly active government, as in the case of Europe and increasingly the US, discourages and atrophies these national characteristics. These are the trademarks that generate entrepreneurial behaviour, growth and development, and the 21st century government's responsibility is to stimulate and develop them.

North (1990) outlines the importance of supporting formal and informal institutions in creating an entrepreneurial national culture. Economic development, sustainable growth, the reduction of unemployment and the eradication of poverty is possible only if these institutions exist. Naturally, he singles out predictability as one of the most important factors that sustains development, and the following formal and informal institutions. First, there are solid social institutions such as family, churches, temples and synagogues that provide a solid social foundation and bear some of the expenses assumed by the state in recent decades. Second, he outlines the importance of universities and research facilities as places that experiment, foster dialogue, educate and generate healthy ideas for a society. Third, he pleads that there needs to be a healthy private capital venture fund that offers finance to new start-ups, but more important expertise, oversight and connectivity. Finally, he says that there is a need for affordable business services such as legal, marketing and management along with like-minded and complimentary firms that can foster a healthy entrepreneurial ecosystem.

### 3. The business civil society: a possible generator of business culture

To properly diagnose the problem and, hopefully, arrive at a solution, let us review the basics of economic activity. Economics is the interaction of four distinct interest groups that ought to provide the appropriate balance for a healthy and sustainable economic sector. There are the *households*, whose interest is to maximize satisfaction through either the increase of their income or the reduction of their expenses; there are the *firms*, who want to maximize their profits by lowering their expenses or increasing their revenues. There are the *governments*, elected to make and enforce the laws, but also to provide "public goods" in exchange for taxes. The least analyzed and most confused sector of our economy is the *civil society*, which refers to all activity that is not comprised in the pervious three and is *voluntary* in nature. It is our suggestion that the solution for increased entrepreneurial activity and economic development lies in this "third sector" (Gunn, 2004; Drucker, 1989).

Unfortunately, in Europe, the civil society has become synonymous with political opposition, disgruntled intellectuals or corrupt business people

looking to hide their shady dealings. Historically that was not the case; the civil society was religious and voluntarily in nature, forged by deep moral and social convictions in response to the social ills of society. Illiteracy, slavery, children and women rights, urban misery and many others were the social causes that ignited great voluntary movements on both sides of the Atlantic in the past two centuries and "unintentionally" cause the greatest economic development in the history of man-kind. Among many others, Webber (1958) and de Tocqueville (2003) are the classic sociologists and political scientists that outlined the merits of the civil society in creating a culture of prosperity and entrepreneurship among the Protestant Europe and America.

First and most importantly, the civil society had the role of educating the public – not just the elites – in what normal and healthy behaviour is. Innovation, creativity, risk tolerance, frugality, hard work, delayed gratification, pro-activity and other such trademarks are not isolated, accidental characteristics. On the contrary, they are voluntarily nurtured over long periods of time and often in unfavourable conditions. The inherent by-product of a vibrant civil society is an accountable and more efficient government that in a sense has to compete with the civil society for the production of some public goods.

The traditional capitalistic voluntary civil society did not only have a pedagogical role, but was also an active provider of voluntary public goods and services, such as healthcare, education, research and public works. Many American and European capitalists were actually deeply devoted philanthropists, a tradition that is carried on by the likes of Bill Gates, Warren Buffet and Sir Richard Brunson. The so-called rubber barons at the turn of the 19$^{th}$ and the beginning of the 20$^{th}$ century saw the voluntary, private non-profit initiatives, as the appropriate response to societal ills not government intervention as the communist were demanding. Andrew Carnegie, the steel magnate, in his famous 1889 essay "The Gospel of Wealth", articulated the dangers of government intervention and lack of private, non-profit initiatives that were vindicated exactly a century later with the fall of the Berlin Wall. Most experts agree that the lack of civil freedom was one of the major causes for the fall of European communism (Fukuyama, 1994; Berger and Neuhaus, 2000).

By definition, the civil society is more efficient and less corrupt then the government because of its voluntary nature. The government, regardless of its inefficient and corrupt nature, still has the authority to tax the public; the civil society, given its voluntary nature, has the influence only to solicit charitable donations. Our proposal is that Europe, and especially Eastern Europe, must recognize the limits of governmental activity and must rediscover the civil society. However, this proposal is not only the resurgent of the traditional social civil society, but the formation of a modern *business civil society* who's primary purpose is the education of society to the importance and the workings of the entrepreneurial era of globalization. In Romania, as in most other former communistic nations, the fundamentals of a free-market economy must be taught and internalized. Over the past two decades, it seems that the language and the institutions of a free-market economy have been adopted, but without the substance. The value of hard work and frugality must be taught; pro-activity and innovation must be modelled and the national benefits to risk-taking must be highlighted and redeemed.

In conclusion, as tempting as it may be, we would insist that the funding for the business civil society should not come from government funding. If we study the history of the traditional civil society, its demise started when churches, arts, medicine, research, etc., became paid by the governments. Being on the governmental payroll inhibited the civil society to be the "prophetic voice" holding government accountable. Further, it took the edge out of *social entrepreneurship*: NGOs no longer had to respond to real societal problems and offer innovative solutions to raise their funding; all budgets became guaranteed by the governments on different criteria. Perhaps the biggest service government can do for the business civil society is to offer tax-deductions for their donations.

The true and biggest challenge is actually for the business community who truly has no apparent incentive to undertake such a large social initiative. However, we would like to remind the business community what Porter and Kramer (2011) stated:

> *unless businesses respond with some social initiatives, unless they redesign the system they are operating, weather out of fear or altruism, capitalism as we know it, will be finished.*

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# "CHANGE IS THE ONLY CONSTANT" – OR HOW SHOULD ENTERPRISES ANTICIPATE CHANGES?

Judit VÁGÁNY* – Judit KÁRPÁTI-DARÓCZI**

*The eternal message of Heraclitus's quote was the inspiration for our presentation. The ever-accelerating changes in the economic environment mean a constant challenge to the enterprise leaders. The global economic crisis makes it even more difficult to constantly adjust to the less and less predictable conditions of the environment. The development of leadership is always connected to changes. Enterprises want to resort to their good old, familiar methods even in turbulent times, but they do not necessarily deliver the expected results. In our article we would like to find an answer to the question whether the conventional, routine leadership methods in the changing environment differ from the successfully applicable leadership methods or not. The state of SMEs is very much affected by how and how quickly they can react to the changing circumstances. Our study is examining the SMEs as their proportion in the Hungarian economy is very significant.*

**Keywords:** enterprises, turbulent environment, SMEs, chaotic, leader
**JEL code:** M00

## Introduction

The global economic crisis has had major impact on all enterprises because risk and uncertainty become more evident in turbulent environment. The reasoning of the global economic crisis goes beyond present article. However, in Hungary 99.8% of all enterprises are SMEs according to the Hungarian Central Statistical Office (KSH) and as a result they have a strong, direct impact on the national economy. The global economic crisis might lead to the redistribution of markets and those adapting fast to changes can strengthen their position whereas those failing to adapt can lose their position.

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## Material and method

The following section – based on Anglo-Saxon management literature – introduces leadership methods most often used in dynamically changing environment. Also, some leadership method alternatives will be elaborated on which can bring success and effective adaptation to environmental constraints.

## Results

The most common crisis responses given by enterprises are the following:

- cutting back on labour,
- reducing training budget,
- reducing R+D budgets (suspending product development, lowering technology costs, "replacing" innovation strategy etc.)
- cutting down on marketing costs,
- stretching to attract new customers before securing the core,
- cutting costs in general and in all areas, etc. (Vágány and Kárpátiné, 2010)

Most company leaders know and apply one of these two approaches when handling chaos as a result of the newly emerging turbulent environmental pressures:

- Take only a few precautionary measures – if any – as if they were waiting for the storm to pass as unexpectedly as it came.
- Take refuge in cost cutting (see the most common crisis responses above)
    - Cutting back on labour costs (dismiss staff, reduce training costs drastically etc.) is one of the most of common responses. The negative impact of these measures can only be felt after the crisis ease and enterprises start to recover: the lack of talented employees who had been dismissed eventually result in resource scarcity.
    - When outlining cost-cutting measures the uniqueness of the company, customer needs and organizational values and culture should also be considered carefully (Kotler and Caslione, 2010).

Generally, it is wise to follow von Clausewitz's advise on war: "A defender must always seek to change over to the attack as soon as he has gained the benefit of the defence."

According to research carried out by the Boston Consulting Group (BCG) companies whose responses to a downturn are tentative typically overreact later on (e.g. cutting costs more than they ultimately need to). This results in an expensive recovery for the company when the economy rebounds. BCG associates offer a two-step solution:
The first step is the stabilisation of business protecting it from downturn risk. Then, and only then, can you identify ways to capitalise on the downturn in the longer term, partly by exploiting the mistakes of less savvy rivals. The authors also set up a recession checklist focussing on three main areas: financial fundamentals, share price and current business. Since current paper concentrates on SMEs only two of the checklist areas will be covered here.

Our basic assumption is that liquidity is a key factor to survival and to successful business operating in tough times. It is especially true when both cash to meet current obligations and capital for investing in the future are scarce. The following recession checklist is based on our basic assumptions.

**Table 1:** ***Recession "to do" list***

| Financial Fundamentals | Current Business |
|---|---|
| 1. Monitor and maximise your cash position.<br>2. Tightly manage customer credit.<br>3. Aggressively manage working capital.<br>4. Optimise your financial structure. | 1. Reduce costs and increase efficiency.<br>2. Aggressively manage the top line.<br>3. Rethink your product mix and pricing strategies.<br>4. Rein in planned investments and sell assets. |

Source: Rhodes and Stelter, 2009

During a prolonged period of economic recession the management - whether the CEO or a manager leading an ad hoc company initiative – face unpredictability. The crisis demand complex response. As a result

there are two phases of crisis management leadership: one, focussing on urgent steps to take in order to stabilise the business and to save time. The other is the adaptive phase when the causes of the crisis are tackled as well as skills are developed, which help later on to deal with new circumstances.

There is a hidden danger in today's economic situation that those in power hang on to their original ideas and find short term solutions such as strict leadership, austerity measures affecting everyone and reform programs. In order to reduce the level of frustration and suppress concerns regarding the uncertain environment they fundamentally tend to use old techniques. The primary solutions of crisis survival rely on already existing skills.
This is self-understood since the main concern of those possessing power is to protect employees from external pressures so that the business can eventually return to normality. Nowadays though, not even the most competent leadership is able to provide full protection. Organisations which depend solely on their top management when finding responds to challenges can easily fail.

Managers following the practices of "adaptive leadership" think differently: chaos in the present is used to close the past. During that process the basic rules of the game are changed, some aspects of the organisation are adapted to the dynamic environment and even employees' tasks and responsibilities are altered.
The adaptation process is not easy. Leaders are often required to oppose traditional solutions and practices and have to be aware that efforts to change them can have the opposite effect.

In the course of crisis leadership is more improvised. Skills that under normal circumstances enable leaders to be in control – analytical problem solving, fast and affirmed decision making, clear policies – often obstruct success.

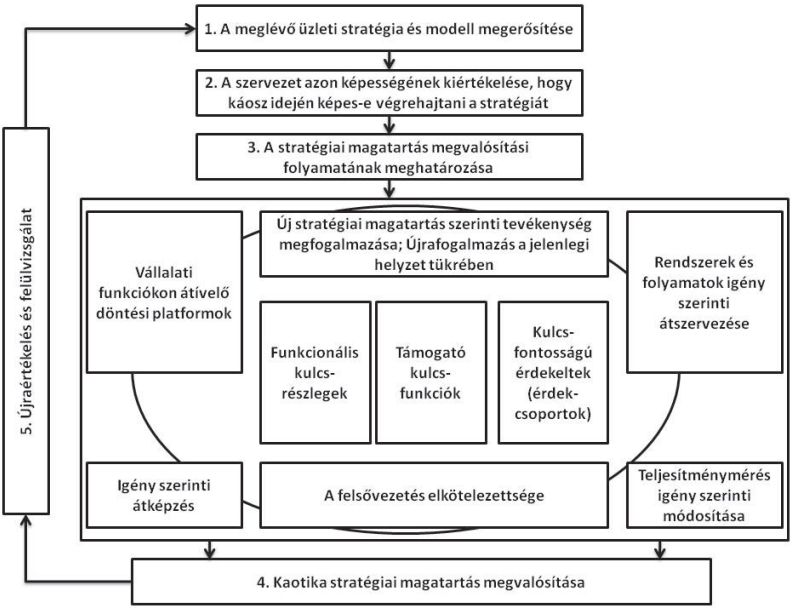
It is advisable to avoid overly detailed strategic planning in times of uncertainty (e.g. crisis) because the future is especially difficult to predict. Instead experimenting is more purposeful despite the fact that some of them will fail and constant realignment will be necessary along

the way. But the bypasses will have a decisive role in the formation of new skills that will enable enterprises to develop better products and more efficient processes (Heifetz and Grashow, 2009).

Research results of Heifetz and his colleagues are similar to the results of Kotler and Caslione (2011) and the list of tasks they made. According to their view leaders should follow a "Two -Playbook" approach, which includes both short and long-term vision.
Based on their theory planning is needed for the present and the future, too. When the present is in the focal point, the organisation is adapted to the needs of current customers keeping excellence and credibility. In this case the main aim is to maximise efficiency of organisation functions being aware of the present business opportunities. When the future is in the focal point, the enterprise is adapted to ultimately become more competitive. This often requires more risk-taking during the adaption process to prepare the enterprise for future challenges.
"Triple planning" is favoured in the adaption process which includes short, medium and long-term planning.

In the age of turbulence a new type of "strategy for chaos" is needed for continuous value creation. The execution plan of " chaotic strategy" is shown on Table 1.

Table 1: *Chaotics strategic behaviours execution plan*




Source: Kotler and Caslione (2011).

The most talented leaders resist extreme measures by preparing themselves for the worst scenario and focusing on areas their companies perform the best in. Chaos can lead those to success who recognize hidden but significant opportunities nestled among bad economic news.

## Conclusion

Enterprises have entered into an entirely new era. Business leaders as well as those evaluating the success of companies are required to adopt an entirely different approach. Earlier, companies optimised production based on increasing revenue. However, as a survey by Ernst&Young approved, the maintaining or increasing results during the economic crisis is the goal of companies. The question remains how long profit can grow if revenues do not increase. It is a fact that profit and revenue are interdependent.

The relevance of "German mid-sized enterprises" model called "Companies lead as Entrepreneurships" is unquestionable. (in German Unternehmerisch Geführte Unternehmen, UGU). The essence of the model is that it is not primarily the company value which is increased rather the company itself. In accordance with the model entrepreneurs are not motivated to increase profit but to gain independence. In order to stay independent, entrepreneurs avoid debt and risky acquisitions financed through loans and instead find safe financing options. This attitude contributes to their survival and provides protection against acquisitions. They do not sacrifice certain skills in order to temporarily improve cash-flow risking skills that might be needed later on. Entrepreneurs devote their time and talent to the development of companies and not to growth and profit. (Simon and Vrannai, 2010)

"It follows that acceleration in the rate of change will result in an increasing need for reorganization. Reorganization is usually feared, because it means disturbance of the status quo, a threat to people's vested interests in their jobs, and an upset to established ways of doing things. For these reasons, needed reorganization is often deferred, with a resulting loss in effectiveness and an increase in costs." (Bower and Walton, 1973)
It is rare that organisational change fail completely although not many initiatives are fully successful. Not many organisations venture needed changes because of managers' fear of successful implementation (Kotter and Schlesinger, 2009).
Nevertheless, it is vital that leaders of enterprises innovate and with continuous planning (short, medium and long-term), training and dealing with the lack of credibility they establish networks and clusters (Vágány – Kárpátiné, 2011).

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# THE EXAMINATION OF CORPORATE PRICING POLICIES IN THE LIGHT OF THE ECONOMIC CRISIS AND ITS RELATIONSHIP WITH THE CORPORATE MARKETING STRATEGY

Ferenc KATONA*

*The aim of this paper is to address the question of how company pricing policies are influenced by the effects of the economic crisis due to lower profitability, declining consumer demand, or the decreasing market size. The degree to which the price competition has been increasing over the years of the crisis and whether the number of businesses struggling to survive has risen is investigated. Furthermore the way in which company pricing policies are consistent with their marketing strategies are highlighted – for example whether a company concentrating on increasing profit or sales volumes at the level of its marketing strategy would also be able to make equally appropriate decisions at the level of its pricing strategy.*

*This analysis is employed Kotler's (1999) model of pricing strategy created for composing pricing strategies and pricing objectives, and the theory of Hughes and Kapoor (1985) applied for evaluating theories over pricing principles.*

*This study is based on primary research in addition to the results of a recent survey of small and medium Hungarian enterprises, carried out by the author. One of the main issues of this analysis is to justify the hypothesis that an economic crisis strengthens the goals for survival and the efforts taken to maintain the current market situation.*

*The question of whether the crisis may cause appreciable effects on companies, regarding their choice of pricing strategy, will also be examined. Fundamental changes in the theories for pricing strategies and the restructuring of marketing strategies will have a long-term effect on the future activities of enterprises on the market.*

**Keywords:** pricing policies, economic crisis, marketing strategies
**JEL codes:** L11, M30, M31

## Methodology of Pricing Strategies

The price of products or services for a company has vital importance. It simply determines the amount that consumers are willing to accept as expenses of the company (Chikán, 1997, p. 193). However, it is extremely difficult to judge consumer willingness to pay for a product. Therefore each company needs a clear vision of the amount they would like to receive in exchange for their products. Principles and methods for designing these ideas are connected by pricing policies.

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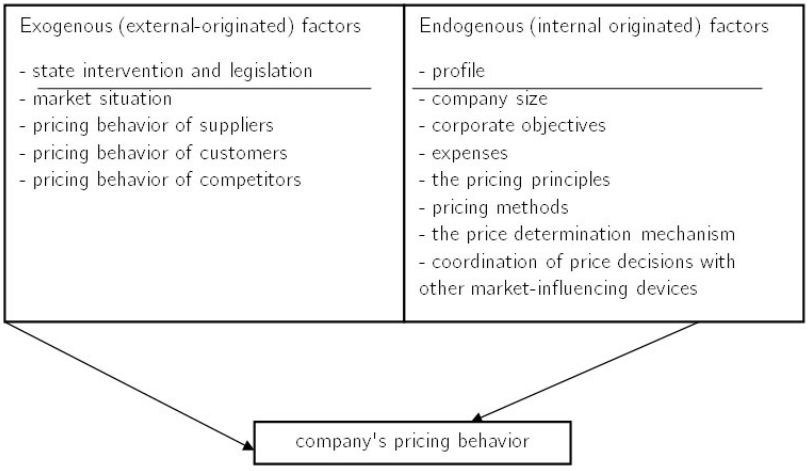
Kotler (1999) finds pricing strategy feasible along the next steps: selecting price policy goals, determining the demand, estimating costs, analyzing pricing methods of competitors, selecting pricing methods, and determining final price.

Pricing is an important element in the choice of price policy goals, which should be in line with the company's strategic goals and strategy, since the appropriately used pricing policy is a main cornerstone in implementing company strategy. Pricing objectives are usually identified in the literature according to Kotler (1999), Hughes and Kapoor (1985), Chikán (1997) as the following: profit maximization, revenue maximization, return on investment, revenue growth, increasing market share, surviving, current pricing for maintenance, and leading product quality.
Beside these pricing methods and pricing objectives the decision-makers should pay attention to further influencing factors. These factors may be of several types, which can be classified as factors of external or internal origin (Figure 1). The number and importance of the factors depend on the nature of the industry, on market size, on company size, on the number of suppliers, including the size and position of bargaining, on the nature of the regulatory environment, on customers' price elasticity of demand, etc.

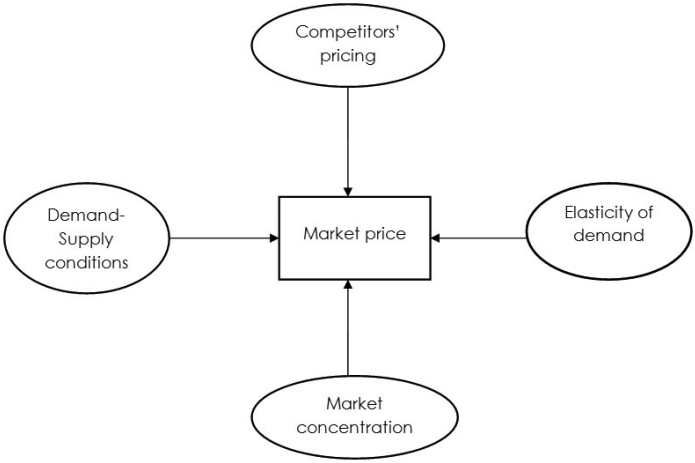
**Figure 1:** ***The factors of price determination***




Source: Barancsi et al., (2001, p. 103-104)

According Francsovics and Kadocsa (2005, p. 100) approach, pricing strategies consist of cost-based pricing and market pricing. Cost-based pricing is based on calculated production costs and on the expected profit rate (profit) of the owners.
Regardless of which of these approaches enjoys priority, a more thorough understanding is certainly necessary. Determining the costs of a manufacturing product and expenses of other processing activities, as well as exploring a product's cost structure is also a part of this process. Next step could be an analysis of the cost-volume ratio, which might mean the definition for economies of scale as well as the exploration of the break-even point. The third step might be the investigation of competitive advantage, during which process the company's and its competitors' costs are compared and the direction of deviation is defined. The following step is the evaluation of the role of practice and experience. Past production experience might have significant impact on reducing costs, since it might greatly increase the efficiency of production. The final step is the definition of the degree of control over the costs (Józsa, 2000, p. 216-217).

**Figure 2:** ***Market pricing***




Source: Francsovics and Kadocsa (2005), p. 104.

Market pricing (Figure 2) however takes into account a number of factors, but they all consider the effects of demand factors and the effects of

competitors' behaviour. These factors are: the elasticity of demand, the demand-supply conditions, competitors' pricing and market concentration.

Pricing decisions may be strongly related to the product's life cycle. Depending on the life-stage the product it is recommended to use different pricing strategies (Józsa, 2000, p. 222). During the introductory stage it is advisable to take on skim or penetration pricing, introducing special offers for those, who are eager to try the product and discounts for traders. In the stage of growth phase it is essential to change the price: in case of penetration prices, rates should be increased, while they should be cut in case of skim pricing. Over the maturity stage, the protective function of prices to be confirmed by the introduction of low-priced brands or by the implementation of alternative sale channels which will accept higher rates. The responsibility of pricing at this stage covers the prolonging of maturity stage, as long as we can and at the same time to maximize sales turnover and/or profit. At the decline stage pricing plays an important role again in profit-maximizing; either by reducing prices or by increasing prices, depending on the sensitiveness of target markets for price value.

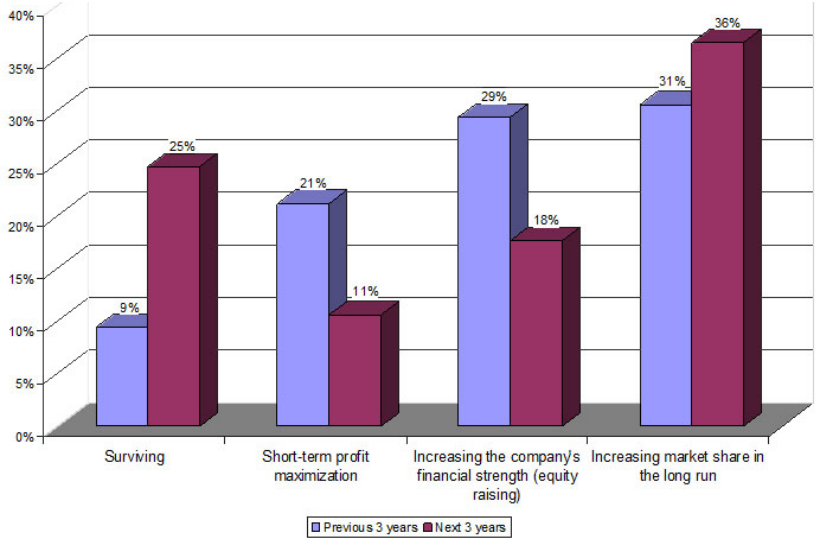
## Research Methodology and Features of the Sample

The results presented are those of a survey carried out among mainly small and medium-sized Hungarian enterprises. The majority of the questions were closed questions. At certain areas questions have been put in statements, so that respondents could evaluate at a five-grade Likert scale where 1$^{st}$ category refers to 'not at all true', and the 5$^{th}$ category represents 'fully truth'. Questions or statements examining product strategy and pricing strategy also belong to these kinds of questions.

The number of questionnaires worked up is 106, at the time of writing. A total of 60% of companies in the sample are based either in Budapest or in Pest County, therefore we cannot draw conclusions on the whole Hungarian business world from the sample.
Discrepantly to the multitude of features the sample included a much smaller ratio of micro enterprises, then in the tested multitude. We applied a few categories somewhat differing from the statistical multitude. For example the first category covers those companies employing 0-20 persons and 57 percent of the enterprises within the sample belonged to this group.

Further categories are: 20-49 persons group represents 12 percent, 50-99 persons group represents 8 percent, 100-249 persons group represents 6 percent, 250-499 persons group represents 6 percent, 500-999 persons group represents 6 percent, 1,000-4,999 persons group represents 2 percent, and above 5,000 persons group represents 2 percent in the sample. More than 40 percent of the companies participating in the sample are held by managers, while 32 percent of them are in domestic private ownership. 29 percent of the companies within the sample operate in retail trade or engross trade, 16 percent in the building industry, 15 percent of them in manufacturing, and 8-8 percent of them in the tourism industry and in the transport sector. Other industries only include companies in the sample between 0-5 percent, except for the other services with 11 percent.
On the domestic market operating companies in the sample represents 72 percent, thus only one-quarter of them deal with export activities. In regard to the export markets, the Eastern-European market and the Western-European market play a major role, 17 and 16 percent of the companies are present at these markets with their goods and services.

Figure 3: *Strategic business objectives*

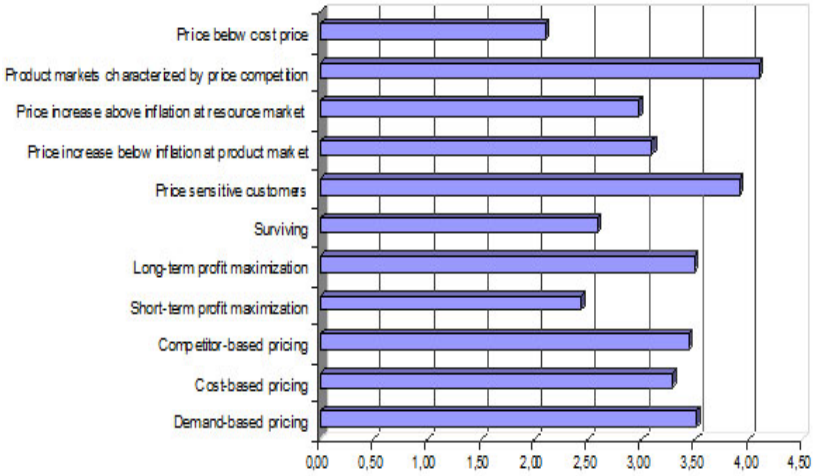



Source: Katona (2010), p. 257.

## Analysis of pricing strategies

Principles specified in pricing strategy greatly affect the other areas of the company's marketing strategy. In company product-policy, in case of cost-consider pricing, cost reduction of the product or service will have a greater emphasis, which, for example will derive in degradation in case of lower quality materials. Another solution for reducing the quality of the product might be the relocation of manufacturing to an area with cheaper labour, in cases where labour is much less experienced in manufacturing the products, especially if this is a knowledge-intensive manufacturing process, requiring professional experience (Figure 3).
Surprisingly, results show that amongst pricing objectives of the company, survival does not play the most important role with its grade of 2.59, which is below the average grade of 3 on the Likert scale. Therefore we could consider that the majority of businesses do not consider the development of prices essential in terms of the company's survival. This is particularly interesting, considering the stated strategic goals of the industrial enterprises; especially that a quarter of the respondents stated that survival was their strategic goal in the forthcoming period (Figure 4).

Figure 4: *Pricing principles, pricing objectives*




Source: Author's analysis of primary data.

Indeed, the applying pricing principle that is strongly connected to the survival strategy - cost-based pricing – or being handled as a prioritizing feature is not common and it only shows the grade 3.28.

Those employing demand-based pricing had the highest mark (3.51), since most of the respondents admitted that they mainly have taken the consumer needs into account when designing price rates. This provides an interesting result; competitor-based pricing has almost the same grade (3.44), as demand-based pricing, which takes consumer demands into consideration, despite the fact that companies consider their customers quite price-sensitive. Of course there might be other reasons explaining the relative popularity of competitor-based pricing, such as low market efficiency of the respondent companies and the quite high price competition characterising those companies' target markets (4.09).

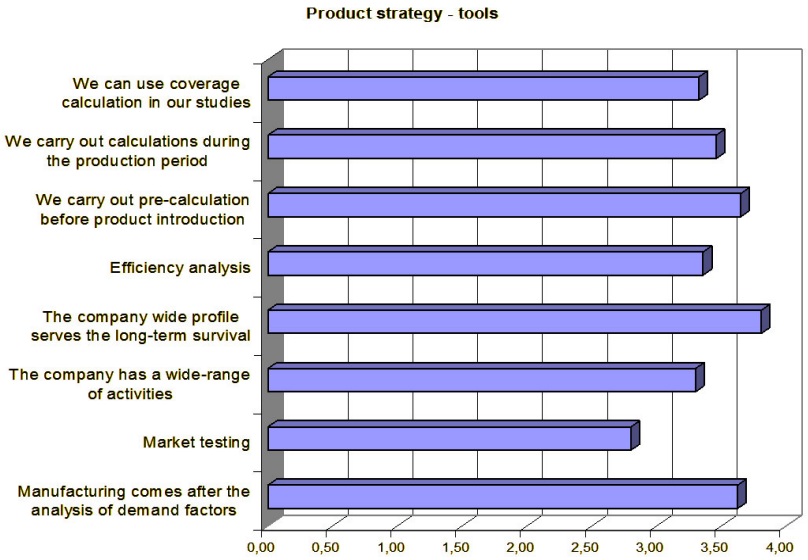
Figure 5: *Features of company product strategies*


Source: Author's analysis of primary data.

## Analysis of product policy effects

The majority of respondents claimed (Figure 5) that their companies could flexibly respond to alterations in customer needs (3.92). How is this possible at all, knowing the small and medium corporate sector problems and their capitalization? Their financial resources for further development of existing products or for new product developments are quite limited. Possibly, it is about the difference between the company's values and the actual activities carried out. Enterprises are often faced with trends that reflect current social expectations, raised for companies, varying from social sensitivity to environmental awareness.

Figure 6: *Features of company product strategies – Strategic tools*




Source: Author's analysis of primary data.

In reality, small and medium businesses have neither financial resources nor the necessary knowledge to guarantee these. So placing customer needs above everything else is mostly, merely a publicly-declared value, in an effort to comply with the expectations of society.

Situation is similar in regard of product quality, for which responsible business leaders will declare that quality is not important for them? However, SME sector companies are usually limited by their resources, so product development is one of the saving factors for them with regard to inputs. Development costs for small companies may represent a considerable proportion in relation to their income. Obviously, these problems could partly be solved if small businesses would co-operate in repairing similar critical factors. However to answer these questions is not the topic of this study.

Quality improvement and product modernization are often encumbered by the fact, that enterprises are not able to enforce their coverage into the prices of products or services. This is substantiated by the results of the research: that the companies surveyed had not experienced price rises greater than inflation in recent periods, in their products' markets (3.09). It should also be emphasised, that according to the outcomes of the survey, respondents experience similar situation at the resource markets (2.96). Obviously, it will be true, considering businesses in average, but in some areas, particularly in the market of raw materials and energy resources, prices rise is well above inflation.

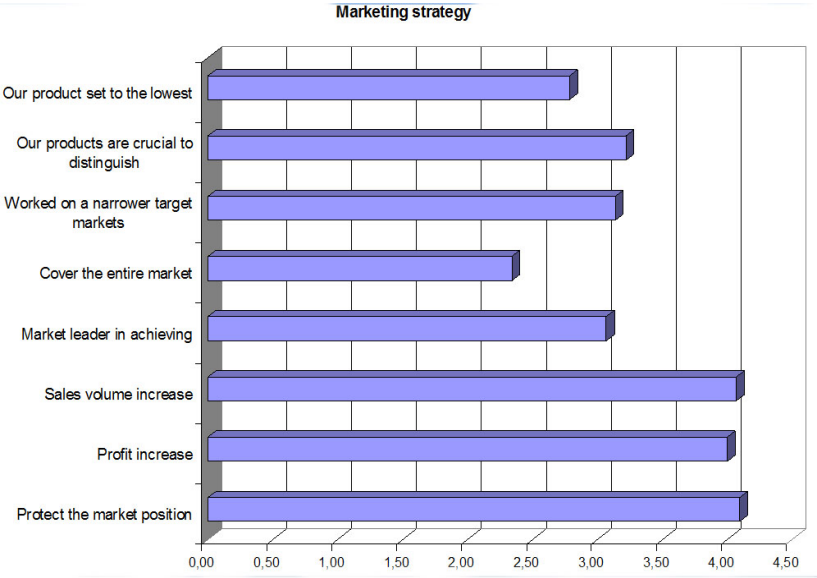
### The effect of crisis on pricing

In case of businesses with declining markets, in particular the lack of their capitalization, getting into "mortal" price competition is not recommended, since such a step can easily lead to the run out of their last reserved resources, which in this case leads directly to bankruptcy. Therefore determining rates below production cost, similarly to companies professed practice of companies, namely that price determination below production cost, is very rare (it reached 2.10 on Likert scale) – will be correct, since such actions can only be carried out by capital-intensive companies with diversified product portfolio, in order to effectively apply new markets or to gain market share. Such solutions occur since in the current situation, caused by the crisis, there are really no other options to increase turnover apart from gaining market growth through redistribution.

### Effect of crisis on marketing strategy

Because the growth opportunities are limited or curtailed businesses are trying to discover niche markets (Figure 7) of which they have not paid attention so far, and to increase profitability as more specialized needs, and therefore a smaller target groups were lower as far as the main segment. However, in contrast to their size and companies are able to enforce a higher profit margin.

Figure 7: *Marketing strategy*




Source: Author's analysis of primary data.

It is interesting that despite the economic crisis we cannot observe strong efforts from the companies' sides due to the special requirements, to reduce the cost of manufactured products (Figure 7). Obviously it is not only the loss of intention, but companies are also short of opportunities / reserves to reduce costs, with the possible exception of workforce reduction, which narrowing markets might also provide reason for. However on other areas - such as resources, raw materials, and

energy sources - expenditures might significantly increase that greatly restricts the increase of production cost efficiency.

## Conclusion

In connection with the company's marketing strategy, our findings suggest that the majority of enterprises have recently been following a survival strategy. This is likely to be related to the fact that their sales usually decline, their profitability decreases, their target markets shrink and their future opportunities are more and more hopeless. Majority of the small and medium businesses are already part of a loss-making, the further spill of the economic crisis and the deteriorating macroeconomic environment poses a major challenge to the viability of these enterprises, most of them already push their limits of tolerance.

The results seems to confirm the hypothesis that the crisis has an impact on business pricing policies, since target markets hardly tolerate price increase in cases when their income situation deteriorate, their savings fall back, and as a result of the realization of exchange rates risks, their indebtedness drastically increase. The survey results show that companies only raise their average rates close to the level of inflation rate, although in general they do not perceive average market price increase higher than this.

The cost-cutting pressure sooner or later will reflect in the quality of manufactured products. Therefore, companies will be forced to reconsider their marketing strategies, reposition their products and change their messages broadcast towards their target markets, to be able to sell lower quality products.

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# COMPOST DAY – EDUCATIONAL INNOVATION FOR SUSTAINABILITY IN HUNGARY

Andrea NAGY*

*A new and on-going educational innovation had been investigated in this case study by participant's observation. The main question is whether it is high time to implement a countrywide new green day so called Compost Day. The initiation was suggested by several non-governmental organizations (NGOs) and the target groups would be schools, kindergartens and other NGOs. The action composting itself - as being part of an environment-friendly way of life - and the partners are coming from different levels of the society would ensure to develop a new way of thinking about natural resources, waste problems and would contribute to the education for sustainability. The studied bibliography about other international and national green days had been serving several lessons for this case study. The main issues of these green days are air pollution, water and nature protection. None of them is dealing with the soil protection.*

*The best practices for composting in schools and in NGOs had been gathered by questionnaires. The actual process of the development of Compost Day had been documented by summaries. The facts of these research methods were taken into consideration in this case study. There were found several arguments which confirm the necessity and importance of this educational innovation with cooperation of local institutions and non-governmental organizations.*

**Keywords:** innovation, education for sustainability, soil protection, cooperation with NGOs
**JEL code:** I29

## 1. Education for sustainability

The United Nation declared the decade of education for sustainable development the period from 2005 till 2014 (Varga, 2006). Education for sustainability is a practical process of life long learning, which gives informed and active citizens, who have creative problem solving methods, know about nature and environment, society, economy and law as well as they are ethical and aware of decisions and actions they take individually and commonly (Wheeler and Bijur, 2000).

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In our case study we are studying the above mentioned activity, composting which can develop several skills, attitudes and knowledge related to the curriculum of education for sustainability. The youngsters and adults also can act locally to solve the waste problem, to get smaller ecological footprint. They can realize how small or microscopic living creatures can transform organic waste into humus. It can be obvious that the change is possible in their mind too, so for instance they develop their own critical and creative thinking on composting.

## 2. Case

We intend to study an ongoing pedagogic innovation by qualitative methods. In our case we wish to focus on the so-called Compost Day as a planned new green day. In this sense it is a case study. The key question set in our research is whether the process of composting can become a green day. First we would like to know how these days were formed, and what sort of green days are mentioned in bibliography of environmental education. Another aspect is what conditions should be introduced to initiate such a green day?

## 3. Method

As a part of our qualitative research strategy we undertake some document analysis. On the other hand we will present the results of a questionnaire carried out in May and June, 2011. We wish to depict an actual view of the incidence of the green days via internet searches, since no statistic data can be found to show the spread of this activity.
Our researcher attitude can be regarded as strongly committed to environmental and natural values. Being involved in this innovation process we used the method of a participant observation. At this point it is important that a controlled subjectivity should be carried (Golnhofer, 2010) thus all the studied documentation are opened or composed in this study.

## 4. How the green days were formed

The effect of the change in the social system in 1989 can be tracked in the fast development of the civil society, just as in many environment protection days. After laws declaring the right of assembly and union the

number of associations has developed by leaps and bounds in Hungary. Many individuals or professionals took the chance, skills of organizing capability and created either a charitable or a public organization by their hobbies, interests and values. There are about 50,000 civil NGOs in Hungary presently of which about 1,000 are involved in protecting the nature and our environment. There are about 500 NGOs working and thinking actively in network-like system whilst the other part mainly serves on local level (Schróth, 2004). These non-governmental organizations just like the institutions involved in environmental education acting in collaboration or individually welcome the opportunity to organize their approaches around the green days.

The traditional old peasant era had some significant days too in relation to the periodically performed significant activities or holidays. Our traditions representing the power of society either died out or got distorted due to the permanent great changes of the society. New communities have carried out new traditions as well (Molnár, 2010). During the 20$^{th}$ century mostly those people leading an urbanized life started to organize trips, gardening, protecting birds and through these activities to turn to nature. István Chernel was who organized for the first time a so-called Day of Birds and Trees in Kőszeg in Hungary in 1902. This green day became a compulsorily celebrated one in schools. New behaviours, habits, traditions formed due to the changed circumstances are all good examples for celebrating green days like Earth Day, Environment World Day, Clean Up the World Day (Nyirati, 2005).

The Folkhighschool of Galga Valley Region (FGVR) as an NGO is committed to participate in organizing regionally green days in the valley of the river "Galga" involving kindergartens and schools from 1998 (Nagy, 2008). We adapted an Austrian model which was initiated by environmental advisors for adults to change their opinion about environmental protection. The idea of holding a Compost Party was to make composting popular (Hruschka, 1998).

## 5. Documents analysis

### 5.1. Green days – methodological guideline

There is a methodological guidance fully acceptable in this topic and gives a review for teachers (Nyirati, 2005). 14 green days are introduced in this guideline, mostly the ones which are more frequently celebrated, or should be celebrated in schools. According to our study we even may miss some aspects since though it deals with the main life spots and environmental elements (see Table 1) keeping balance on those, but none of them related to the soil protection and organic waste handling.

**Table 1:** ***Theme groups and the number of relating green days***

| Theme group | Number of days in the studied edition |
|---|---|
| Water | 3 |
| Climate | 2 |
| Earth | 2 |
| Flora and fauna | 5 |
| General topics | 2 |
| Soil protection /organic waste reuse | 0 |

Source: Based on Nyirati, 2005, edited by author.

There are more than 50 green days per year that could be celebrated according to Hungarian Earth Day Foundation (Varga, 2010). For example in Australia there are 67 environmental events in a year which are registered by the Australian Government (2011). The question rises what makes a subject to become a green day's topic?

For example foreign model exists for focusing composting. There is the so called Composting Awareness Week which has been celebrated since 1995. It was started in Canada then followed by the United Kingdom, the United States and Australia. Nowadays it's called International Composting Awareness Week (ICAW) and are held on the first week of May in each year (US Composting Council, 2011). Searching these initiatives we find economical interests in the background.

Nowadays it is even more vital dealing with the composting process, because the United Nations declared 2011 as International Year of Forests (UN, 2011). As known topsoil of the forests is the natural compost. We may say that compost is a source of food, provide habitat to biodiversity and play a vital role in maintaining the productivity of soils in a natural way. In pedagogical aspect its creating processes is a brilliant model for lifecycles in nature. So green days are emerged when teachers, local governments, civil NGOs, media or politics focus data, facts, processes make people think or make people get involved in green activities.
In Table 2 we classified all the days listed in the edition of Nyirati (2005) and in Table 3 we depict Compost Day as a planned day using our several-year experiences (Nagy, 2008; 2010).

Table 2: *Green days*

| Green day/ aspects of analysis | Date | Spreading | Focus | Aims |
|---|---|---|---|---|
| Memorial Day of Life of River Tisza | February 1 | n/l | cyanic pollution, heavy metal pollution | Life circles |
| World Wetlands Day | February 2 | i | Ramsari Agreement on 2.2.1971. Hungary joined in 1971. | Habitat protection |
| World Water Day | March 22 | i | UN initiated in 1993 The use of freshwater | Economic use of water |
| World Meteorological Day | March 23 | i | Meteorological World Organization renewing on 23.03.1961 | Climate protection |
| Earth Day | April 22 | i | Initiation by Dennis Hayes on 22.4.1970,USA; 25 million people for nature | Concrete actions on local and global levels |
| Birds and Trees Day | May 10 | n/i | Started in Kőszeg in 1902 Became school program by law in 1906. By a minister order the date is 10th of May | Nature protection |
| European National Parks Day | May 24 | EU | The first day was on 24.05.1999. Popularize nature protection and the national parks. | Excursions, exhibitions |

| | | | | |
|---|---|---|---|---|
| World Environment Day | June 5 | i | Nature protection World Conference in Stockholm on 5.6.1972. UN call for the protection of nature. | Environment and nature protection |
| International Day for the Preservation of the Ozone Layer | September 16 | i | The Montreal Agreement for the stratospheric ozone layer protection on 16.9.1972. | To know more about ozone depletion mechanism, devices for sun protection. |
| Clean Up the World Weekend | the 3rd weekend of September | i | Idea was come from an Australian man Ian Kiernan. It has been held since 1990. Hungary joined in 1993. | Reduce waste production |
| World Habitat Day | the 1st Monday of October | i | 1986.UN initiative to raise the standards of poverty and life conditions | Environment pro-tection at home, in institutions, question of private hygiene. |
| World Animal Day | October 4 | i | Honor of St. Francis of Assisi - Green day on Hungary from 1991 | Animal welfare. |
| Caring for the Earth | October 21 | i | IUCN, UNEP and WWF coop. in 1991 for sustainable Earth Strategy. | Nature protection and sustainable use of nature sources |
| International Day for Biological Diversity | May 22 and December 29 | i | Biodiversity agreement came to life on 29.12.1993. Putting off to 22 May in 2000 by EU initiation. | Protection of the biodiversity |

* National – n; International – i; Europe – EU; Local – l

Source: Adapted from Nyirati (2005), edited by the author.

5.2. Green days in the Valley of the River Galga

In our region the so-called Compost Party was held in autumn. Adaptation was performed to fit the methods and conditions for our own circumstances. The message of this day is how organic waste produced in village households should be used up. Compost Party became a standalone green day in the schools and kindergartens in 5 settlements in the Middle of Hungary (Tura, Vácszentlászló, Galgahévíz, Zsámbok, Boldog). In 4 of these 5 villages there was introduced a Swiss-like waste selection model in 2001. Table 3 flashes up the substantive elements of a former survey in connection with Compost Day (Nagy, 2008; 2010).

Table 3: *Compost day – 10th of October*

| Green day/ aspects of analysis | Date | Spreading | Focus | Aims | Remarks |
|---|---|---|---|---|---|
| Compost Day | Oct. 10 | n/l | Civil green NGOs initiate a new green day<br><br>Possible adaptation of an event called International Composting Awareness Week (ICAW) for one day long green day to Hungary | Education for sustainability<br>Environmental benefits: improve soil quality, recycle valuable nutrients and reduce the use of artificial fertilizers, prevent greenhouse gas emissions and reduce the amount of organic waste going to landfill, improve water savings<br>Social benefits: traditional cultural events can be involved, local educational institutions, NGOs and local governments may cooperate for a common purpose<br>Economical benefits: money savings, composting industry can contribute | Methodological publications are needed as a background of the educational programs.<br>e.g.: FGVR has some attempt to provide coloring books, methodical guidelines.<br>Some special topics could be involved: health protection, food production, ecological gardening. |

Source: Adapted from CORE (2011) remarked and edited by author.

We had been searching for an effective way of raising environmental consciousness. Our main target groups are children and adults in our region at the elementary schools and at the kindergartens. The FGVR and its partners try to ensure an educational program on environment protection outside of institutions whilst the focus is on local environmental problems together with emphasis on the specific features of ages of the target groups.

We analyzed 37 events from 1998 to 2008 through this research. It has been found that these events are well working in raising environmental awareness and giving lifelong experience. Some critical remarks must be taken into consideration, but on the whole these days can stand as a frame for the cooperation on education for sustainability.

## 6. On-going educational innovation

According to Nyirati (2005) for organizing a green day it have to list some useful components: an initiative, a team, a plan (aims, target groups, planned activities, and needed expenditure) and the financial background.

And now let us step backwards a bit and let us know what we need to get an activity becoming a green day?
- An environment-friendly activity socially recognized and practiced for a while in educational institutions, NGOs.
- Partners cooperating in this project.
- Plan and action plan.
- Financial sources
- Media contacts, ICT devices and competencies, pedagogical background.

The educational innovation started with the popularizing of Compost Day in early stage. It was documented by summaries which was put together on the meeting of the representatives of 3 civil organizations, and as such can be considered a document. It is a fact now that the interest and demand in the society for the composting is gradually growing.
We must draw our attention to the fact that the forming of this demand was based by publications and composting courses held by the Eco

Forum Foundation in a great extent. Its special story is ahead to be written.

The summaries show that there are partners and existing cooperative networks. Humus Association is likely to stand for this initiation. Magazine Dragonfly is ready to publish articles about composting in autumn issue; a possible place of opening ceremony could be the Culture Centre of Klebersberg's House (in the 2nd district of Budapest).

As a first step Compost Day is launched as a civil initiation. There has already been examples for such an initiation, for instance recently the "Recycled Paper Day" (1st of March) was made popular by the Humus Association.
There is no mention on the financial aspect of the program (Point 4.) which is a weak point in our case. Organizers rely on volunteers and interested organizations, sponsors. Additionally focus must be on applications and tender possibilities.

## 7. Survey by questionnaire

There are 13 questionnaires that arrived back in May and June of 2011. These questionnaires (see Table 4) were sent out using the mailing list of green organizations. This sample can be regarded as representative because the participants of the society are diversely present and they are coming from both the capital and from rural regions (see Table 4).

**Table 4:** ***Questionnaires in settlements and institutions***

| Institutes / Settlements | Budapest | other city | village | |
|---|---|---|---|---|
| NGOs | 2 | 3 | 2 | |
| Secondary school | 1 | 2 | | |
| Elementary school | 1 | | | |
| Kindergarten | | 2 | | |
| Sum | 4 | 7 | 2 | 13 |

Source: Author's survey.

From a qualitative point of view not the numbers and rates are important, but the narratives are given. Later it would be useful to ask for help of the eco school network and the green kindergarten network to form a broader view.

7.1. Feedbacks from educational institutions

Secondary and elementary schools reported about their periodic events. Kindergartens haven't organized such events. There is permanent composting in a primary school and 2 kindergartens. Compost is usually made during the whole year. The composting activity has been performing for quite a long time (1.5-10 years). They found professional printed materials. Their target groups are pupils, employees and parents. In schools composting is connected to selective waste collection system. In kindergartens there are different ways to present this activity. Partners can be identified at the half of the answers only. Composting is managed during the entire year. One kindergarten proposed a date for the green day.

7.2. Feedbacks from the NGOs

Composting at the green NGOs are specifically related to permanent activities. Their aim is to stand as a model (Compost Forum, Humus House) giving presentations and demonstrations. Humus Association mentioned several periodic compost programs taken place in the past 4 years, where cooperation had a dominant role. NGOs' composting activity dated back to a 5 to 15 years in time, thus they can be regarded as pioneers for giving model of the composting activities to educational institutions. Apparently, civil society fills a gap, helps and in our case replacing deficiencies of the local governments (e.g. distribution of compost boxes to the public). They publish composting leaflets prepared for adults and children. Their relationships are told to be active. They considered composting not only as a part of selective waste collection, but also a part of horticulture or rather it concern a lifestyle program (ZeroWaste). In special cases it can stand individually.

In the small village Markóc the presence of Ormánság Foundation has affected the curriculum of the local elementary school. They teach composting as a new subject „Orchard and Gardening". It can stand as an excellent model for other regions and settlements, too.

Date of Compost Day was given both for autumn and spring. They add some well-worked slogans and substantive proposals.

## 8. Summary

None of the green days in Hungary are dealing with soil protection and recycling of organic materials. Eleven green days are international events, while 3 days are national or EU level events and none of them are local events in Hungary. There are international events dealing with composting which are adaptable to Hungary. There are "best practices" for composting in schools and in NGOs had been gathered by our own survey.

According to our analysis none of the published green days are dealing with locally organized and complex activity as composting which contributes to the education for sustainability. Composting idea can serve environmental, social and economic benefits too (see Table 3). International model (ICAW) also exists but the Hungarian adaptation of this has not happened yet. Additionally composting gives a well-working model for teachers on sustainability.

Compost Day can serve the locality for several reasons. Those local green NGOs can be initiators which are concerned active on local level (Schróth, 2004). They could offer their organizing skills or professional knowledge to educational institutions, local governments and could cooperate in concrete composting actions for soil protection and waste management to make inhabitants aware of environmental lifestyle.
Eco Forum Foundation had an inevitable role in teaching and spreading the idea of composting in the past. Their work and its multiplication effect need more in dept studies.

We couldn't find statistics on how many institutions (educational, civic, local government) organize, manage or support composting programs. We searched for items in www.google.hu for the keywords are rather interesting, though obviously it can not be the base for scientific analysis (Table 5).

Table 5: *Number of keywords and items (15th of June, 2011 – www.google.hu*)

| Keyword | Items |
|---|---|
| Green days | 51.500 |
| Birds and trees Day | 218.000 |
| Earth Day | 572.000 |
| Compost Day | 133.000 |
| Day of the River Tisza | 9.770 |

Source: our own survey

Day of the River Tisza appears among publicized green days (got a scale of ten thousand items) which is the mostly popular regional green day, plus it is relatively a newly initiated one. Thus its numbers can be compared to that of Compost Day. It can be seen that the Compost Day got a scale of hundred thousand items like Birds and Trees Day or Earth Day. As we can conclude composting is an interesting and emphasized topic that can be tracked on the net.

Whether is it high time to initiate a new green day? What sort of conditions do we need?

- An environment-friendly activity that is socially recognized and practiced for a while in educational institutions, NGOs.

The questionnaires show us a stabile and well working civil organizational background. We can identify institutions dealing with composting on every level of public education. Its number and rate has not been searched yet.
Activity of composting can be easily performed in gardens, around blocks of flat. This can be carried out in an easy way, not too many complicated techniques, instruments should be involved. The ready-to-use compost rich in humus as an output of the composting procedure can be locally used for various purposes.

- Partners cooperating in this project.

According to our survey institutions and civil organizations can find each other. There is an existing relationship and also other networks should be connected. (Eco School Network, Green Kindergarten Network, Volunteer Centre Foundation).

Organizers are coming from Humus Association, Compost Forum Foundation and FGVR. Most of them are paid staff, some volunteers and there is a researcher too. They may manage this environmental educational innovation process.

- Plan and action plan.

Aim: Compost day should become a green day.
Target groups: kindergarten children, pupils, students, teachers and adults.
Planned activity: cultural and environmental educational program as a start
Plans are formed, depending on human capacities and financial sources.

- Financial sources

It is a weak point not yet unambiguously fixed. It can be a good solution to join large organizations, expansion of collaboration or successfully managed tenders can contribute to fulfilment.

- Media contacts, ICT devices and competencies, pedagogical background.

In our case study we have information about the website www.komposztalj.hu powered by Humus Association, thus with their effective help this site can be developed with new contents. Media connections, ICT competences and accessories are not investigated in this study.
Methodical databases and the pedagogic support materials are present at many organizations.
According to the survey there are tips and activities collected for Zero-Waste Network initiated by Humus Association (2011).
The FGVR's publications are available; experiences on Compost parties are gathered at the Projects of the homepage of the Folkhighschool (www.galga-nfi.info.hu). Previously published course books and booklets of Eco Forum Foundation are available.
Compost Forum Foundation follows the courses and lectures on composting mainly in Budapest. Planned games on composting are available at their website (www.komposztforum.hu). Green circles of universities and colleges should be involved concerning composting, researches.

**Concluding** all research data and the facts we can seriously recommend establishing a new green day, "Compost Day" as a festival one for one day of the year to popularize this movement. The rest of the year would be just doing composting at home, at institutions where ever is applicable with the help of local authorities and NGOs.


## Acknowledgement

Special thanks for organizing and helping Compost Day project to Gabriella Eleőd-Faludy (Compost Forum Hungary), Zsuzsanna Portik-Bakay (Humus Association). Interviews were taken with Mária Ruepp-Vargay (Eco Forum Foundation) and Béla Munkácsy (Eötvös Loránd University). Great opportunity and pleasure to have a publication of Liget Foundation: Dragonfly Magazine which announced the first national Compost Day on 10th of October 2011.


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# THE CONTRILLING METHODS POSSIBILITIES IN THE GREEN ECONOMY

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*As a result of the complex crises (economical, environmental and ecological) it has become an important question which strategy we should follow to develop the economy, to create more jobs. Moreover it is also relevant to pay attention to the innovation and different ideas, which can help progress the eco-friendly sectors. Some countries including Hungary as well have realized that "Green economy" could be a developing point. We must change and solve some problems regarding the use of fossil materials during production as it increases the risk of the security of supply and push up prices. The G20 countries believe in the "Green economy" idea as a great example which is necessary to follow. Beside Spain, Austria and Germany will spend 1.7% of their GDP on developing the traffic system – the main part of the project will be the railway system. On the other hand companies which are environmentally friendly are gaining bigger slice of some markets and becoming more "popular". Truly investing into green energy can be quite expensive but mostly pays off in the long run.*

*The "Green economy" for most of the countries will result a renewal in knowledge and innovation. We think these areas can be the "workshop" for "Green economy" thinkers. Achieving that, throughout the innovation process it is essential: to define, to organize-, to structure- and to supervise the circle of information needed. In this progress innovation- and project controlling play a crucial role and give support.*

**Keywords:** controlling, competitiveness, accounting
**JEL codes:** M4, O1, Q5

## Controlling and Green Economy

Controlling and the green-economy as terms, considered separately, have unequivocal definitions but examine them together; that really is a thing to talk about. In today's social and economic changes encourage everyone to choose the material and energy resources in the most efficient and most cost-effective ways. For a long time, manufacturing

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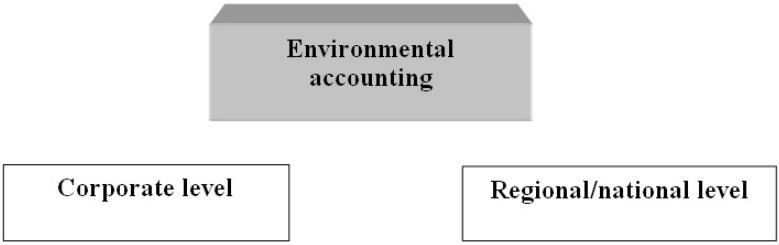
companies have not dealt with this issue, but the environment is where the raw materials for the production are from and through that is needed to achieve profits. This shows that this issue should be a priority; this is a real and growing problem. Therefore the controlling and eco-management become a complementary and supportive process in the company for sustainable development. "Sustainable development is development that ensures the needs of the present without being impossible to meet the needs of future generations "(Brundtland Commission, 2008). According to an ancient American proverb „we do not inherit the land from our ancestors, but we borrow it from our children." (Proverb, Native American)

Sustainable development has always meant competitive advantage for business organizations but the radical change was yet to come starting from the 1970s. The next turn was in 1992 the United Nations World Environment Conference in Rio de Janeiro, which, placed in a different light on these issues. From that point of sustainability as a principle, economic development was faced with a task to be solved, which should take account of the environmental values and their protection. Since then organizations must take into consideration the use of environmental resources, energy as they serve the environmental interests to generate profit. As far as this decision was to work in the long run, at the level of the corporate sector seemed equally difficult (which is just as true today) finding the ways that this principle of sustainability can be operated. Most of these operations require innovation, which involves expenses, and especially in the post-crisis periods, few companies willing to do that.

Take, for example those cars, which operate with vegetable oil. In fact, it "sounds" environmentally friendly, it does not use fossil energy, less destruction in the ozone layer, etc, But for this we must have a special production line that produces our special motors. Although this is an investment that can be solved, but if this "green technology" spreads around a region, then it can mean that a large area is needed for growing crops to provide fuel, which implies that in areas where previously wheat , corn, barley, rye was grown, there would be "oil plants" planted. Thus there would be less wheat and flour; and bread would be more expensive bread, which is basic food, so this is not economical. The eco-environment and controlling have been trying to find the answers to questions such as how to find a solution where the company can meet its profit goals and environmental values are not impaired either.

The initial steps were seemed to be difficult to make for the companies, because it was not easy, and still is not, to use similar priority for protecting the environment (recycling) and maximizing the profit. The G20 meetings and environmental conferences were substantiated by several environmental changes (dramatic population growth, water scarcity, climate change, etc.). It became a global problem that had to be handled on the enterprise-level, with more and more attention. It was sufficient before if the company paid compensation due to environmental damage. More and more people were looking for an effective solution, when an American company called 3M brought up the 3P program.
The 3P (Pollution, Prevention, Pays) meant that pollution prevention pays off. This prevention program is considered the first milestone in the history of environmental accounting. This program included a number of new measures, activities regarding to better and more optimized energy and material consumption; and all these meant eco-friendly solutions as well. Moreover organizations achieve a substantial cost savings on the corporate level.
Then, the next steps were the environmental accounting, eco-controlling, green accounting, environmental controlling, ecological bookkeeping The aim of environmental accounting is to get a more realistic picture of the financial aspects of the environment activities of the company. By this we mean the Environment (Protection) aspects of the company's investment decisions, their exploration and analysis, the definition of revenues resulted from the environment (protection) related items, and the performance of the environment (protection) -related financial data analysis, adaptation of the right decisions. Environmental accounting can be divided into three major levels: corporate level, regional level and national level (Figure 1).

Figure 1: *Levels of environmental accounting*

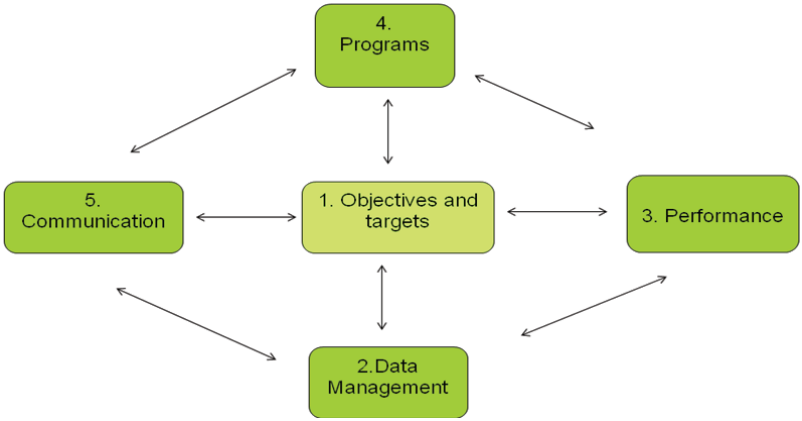



Source: own work

## Environmental controlling and its functions

"Eco –controlling envisages a strategic approach to environmental issues and proposes a systematic management procedure with various steps from target and strategy formulation to data management, decision support, control, implementation and communication." (Schaltegger and Sturm, 1995)

Figure 2: *The concept of eco-controlling*



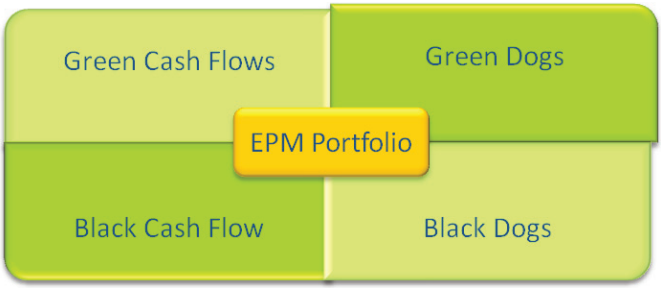

Source: own work based on Sturm (1997).

The eco-controlling concept can be divided into these five modules. The successful co-operation of these five-modules can provide a sustainable process, which is essential to make green accounting and eco-controlling effective and the company more "green".
According to Schaltegger and Strum (1997) we are able to analyze and measure how and to what extent the company uses properly the principles of eco-controlling.

## EPM portfolio

Energy Portfolio Management (EPM) measures the contribution margin per pollution regarding the products. The target is to maximize products with positive contribution and minimize those with negative contribution thus achieving a sustainable growth. The EPM portfolio gives us four categories and this way we can know that our eco-controlling is useful, sustainable or not (Figure 3).
*Green Cash Cows:* When we speak about the green cash cows we must think of those products which are created with a low pollution added and a high contribution margin. With this process they are achieved through integrated 'clean' technologies- which means much more ecological solution. Their environmental impact needs to be already optimized at their development stage. In this way Green cash cow's development means a sustainable growth strategy for a company.

**Figure 3:** ***Four basic categories of EPM Portfolio***



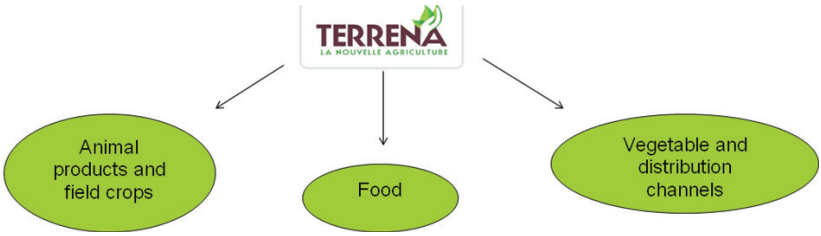

Source: own work

*Black Cash Cows:* When we talk about the black cash cows products we must think of that thing which created by the quantitative growth strategy. That means that were characterized by relatively high financial revenue plus a high pollution-added- with we can't protect our environment. *Green Dogs:* Green products are typically products which,, are environmentally friendly, but achieve a relatively low contribution margin. "In this category we often find products that we have been ecologically improved by using end-of-pipe technologies." (Sturm, 1997) Green dogs products generally achieve a comparatively lower contribution margin than products that were conceived to be more ecological trough using integrated technologies. *Black Dogs:* If we talk about the Black Dogs products-these are typically that products while the process we works with a high pollution added and a negative contribution margin. Especially these later products are economically uninteresting and generally cause enormous environmental damage.

## Eco-controlling in practice

Above we have represented the eco-controlling, the theoretical part of green accounting and what is more interesting is that there are companies which have successfully implemented this model. Companies such as the Terrena-(La Nouvelle Agriculture) are located in the Loire region in France. The company is the 9th largest companies in Europe and successfully uses the eco-controlling and green accounting. Regarding the profile of the company it is a manufacturing enterprise, produces of and has wholesale trade in cereals, meat, poultry, milk, eggs and animal feeds. The group also has interest in the operation of vineyards.

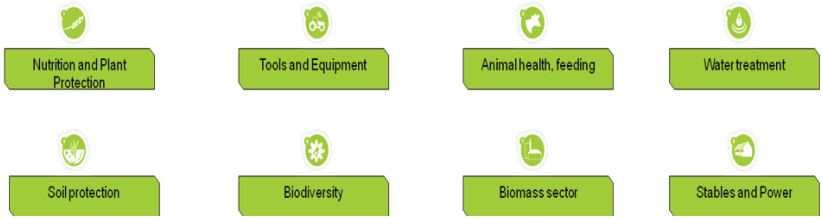
Figure 4: *The structure of Terrena company*




Source: own work, used the source of Groupe Terrena

The company aims for development and dissemination of new agricultural solutions, which in addition guarantees a high quality, but at the same time respects and takes into account the ecological and natural resources, so that it is beneficial for consumers and their health too.
The company to achieve this objective has developed new programs which are expected as new innovations in the agricultural sector, such as: La Nouvelle Agriculture, Les Sentinelles de la terre, and Une Ecologiquement Intensive Agriculture.
These programs' aims are both, to have an intensive production, but also do not exhaust completely the natural resources. Thus, this program pays particular attention to three areas:

Figure 5: *Terrana, Nouvelle Agriculture programs*




Source: own work, using the source of GroupeTerrena

## Conclusion

Eco-controlling puts the focus of environmental management on the particular processes of a given company. It does not attempt to include environmental impact over the life cycle of a company's products. This management tool is adjustable to the specific situation of production sites and firms.
More and more companies are broadening their focus and staining eco-efficiency as an important corporate target. It is widely agreed that eco-efficiency has an economic and environmental dimension.
„It has been shown that via eco-controlling, eco-efficiency, the environmental performance as well as the environmentally induced financial

impacts of the company and its production sites can be managed and improved substantially" (Schaltegger and Sturm, 1995).
Today, the tools for implementing eco-efficiency are becoming increasingly important for the success of a company. Eco controlling is rapidly growing into a core management tool, passing trough stages of development similar to financial controlling.

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# CSR REFLECTED IN ONLINE MARKETING OF ORGANIZATIONS

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*The main challenge in the 21st century for organizations all over the world and of course in Romania, too, is to assure that serving the needs of the next generations should not be altered by serving the actual needs. Different problems arose due to globalization, environmental and social pollution etc. which need global solutions. As a result corporate social responsibility, socially responsible marketing, ethical marketing get an important role in the business behaviour of different organizations. The use of the internet for business purposes makes possible for organizations to integrate the internet in their CSR strategies, policies and activities, to use the internet in order to communicate about their CSR commitments, to use different offline and online marketing tools for CSR. The article presents how organizations embrace the internet for CSR purposes, how CSR is reflected in the online marketing of organizations and reveals the results of a secondary and a primary research, especially using the method of observation.*

**Keywords:** socially responsible marketing, corporate social responsibility, online marketing, eco marketing, social marketing
**JEL codes:** M14, M31

## 1. Social responsibility and characteristics of socially responsible organizations

Stakeholders of organizations among other expectations have ones regarding corporate social responsibility (CSR). There are a lot of definitions of this notion offered by different specialists and there are continuous debates related to the content and extent of CSR.

The first formal definition of social responsibility was offered by Howard R. Bowen in 1953 in his book entitled Social Responsibilities of the Businessman (Carroll, 1999, 269). In 1960 Keith Davis also offered also a definition of social responsibility and elaborated his famous "Iron Law of Responsibility" (Carroll, 1999, 271). Milton Friedman formulated in 1970 another definition of CSR (Dahlsrud, 2006). In 1971 the Commit-

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tee for Economic Development presented its own definition of CSR in the publication "Social Responsibilities of Business Corporations" (Carroll, 1999, 274). S. Prakash Sethi in 1975 expressed the differences between the dimensions of corporate social performance: social obligation – which means corporate behaviour conform to market forces or legal constraints; social responsibility – which goes beyond social obligation, implying corporate behaviour conform social norms, values and expectations of performance; social responsiveness – which means adaptation of corporate behaviour to social needs (Carroll, 1999, 279). In 1979 Archie B. Carroll developed a four-part definition of CSR embedded in a conceptual model of corporate social performance (CSP), containing economic responsibilities, legal responsibilities, ethical responsibilities and discretionary or philanthropic responsibilities (Carroll, 1999, 282-283.). Even Peter Drucker expressed his opinion about CSR in 1954, and offered in 1984 a new meaning of it, concluding that businesses ought to convert social responsibilities into business opportunities (Carroll, 1999, 286). In the 1990s corporate social performance, the stakeholder theory, the business ethics theory and the corporate citizenship theory emerged related to the theme of CSR (Carroll, 1999, 288). In 1991 Carroll developed the idea of the CSR pyramid (Carroll, 1999, 289). His idea was overtaken by Donna J. Wood, who expanded it and in 1991 created a new CSP model in which outcomes or performance were emphasized (Carroll, 1999, 289).

The European Commission defined the social responsibility as a concept through which organizations in a voluntary way can contribute to a better society and cleaner environment, integrating social and environmental expectations in their business activities and interactions with stakeholders (COM, 2001, 4 and 6).

CSR sometimes is described as a phenomenon, sometimes as a process. Different researches were conducted in order to analyze the relation between social performances and financial performances of organizations. There were developed different corporate social performance models.

Van Marrewijk in 2003 expressed that a successful CSR strategy is always context specific for every individual business. At a conceptual level CSR existed for a long time, as businesses generally had social, environmental and economic impact, somehow they were concerned with their stakeholders, reflected some ethical and legal behaviour. But CSR management tools can help organizations to face the new challenges of

the 21st century, among which we can find those related to globalization (Dahlsrud, 2006).
Corporate social responsibility affects the efficiency of the organization (for example environmental efficiency or eco-efficiency, production efficiency etc.), has impact on the social and ecological environment. But expectations of stakeholders regarding efficiency of the organization can influence the way and extent of corporate social responsibility of that organization (Matolay, 2010, 43).
CSR includes environment protection, so efficiency can be improved in activities which assure environmental protection. The main way to obtain eco-efficiency is to reduce the quantity of raw material and energy needed for offering a product or service. Socially responsible organizations can improve their eco-efficiency in many ways, some of them don't need any investments, some of them need few investment which can be recovered in a short period of time, and there exist ways which need serious investments, but can be recovered on the long-run (Matolay, 2010, 44).
Most of the results of researches related to CSR show that there is a positive connection between social and financial performances of the organizations (Matolay, 2010, 45).
CSR is a very useful instrument to develop the image and rename of the organization so communication of CSR, CSR-communication is a very important activity for each organization. CSR is not PR, but communication can also improve CSR activities (Matolay, 2010, 48).
Before making an investment, the business opportunity should be assessed based on different criteria, among which can be found the criteria of ethics and social responsibility. There are socially responsible investment funds which promote ethical investments, socially responsible investments (Bánfi, 2011, 67).
Based on this idea we think that socially responsible organizations should also make socially responsible investments, and the marketing of this orientation can become a priority in this direction.
Companies which offer financial services, and among them banks have the opportunity to achieve sustainable development based on social responsibility and environment protection, they also have to manage greater risks. Probably banks will be forced to modify their credit policies due to the social and legal environmental changes (Bánfi, 2011, 73).
The "greens" will become those which will be the winners of CSR (Bánfi, 2011, 73).

The ISO 26000 Standard was adopted in September 2010 by the International Organization for Standardization as an ambitious International Guidance Standard on Organizational Social Responsibility (and not corporate social responsibility), which is considered as a result of global cooperation in this field, having its core subjects be relevant to all organizations. This standard can be useful as organizations worldwide consider it relevant, useful and applicable in wide areas (Ward, 2010, 1). In many countries governments are concerned about environmental protection, human rights and labour, and their public policies include strategies related to these fields. A standard like ISO 26000 can be a guide which helps governments, organizations to deal adequately the above mentioned issues.

This standard refers to the four dimensions of CSR (Ward, 2010): environmental, social, economic and voluntaries.

The ISO 26000 Standard describes the seven principles of social responsibility as follows, which makes sustainable development its overarching goal (Ward, 2010): accountability; transparency; ethical behaviour; respect for stakeholder interests; respect for the rule of law; respect for international norms of behaviour; and respect for human rights.

The ISO 26000 Standard has seven core subjects presented in detail with related actions and expectations (Ward, 2010): organizational governance; human rights; labour practices; the environment; fair operating practices; consumer issues; and community involvement and development.

Through CSR strategies, policies and activities businesses can obtain competitive advantages and become more competitive, they can obtain economic success on the long term. Among the main characteristics of socially responsible organizations we can mention the following:

- total commitment at organization level – organizational culture;
- mission formulated in broad social terms;
- CSR strategy – generally integrated in the strategy of the organization;
- CSR philosophy;
- CSR policy;
- CSR principles;
- CSR programs;
- CSR activities;
- CSR reports;

- ethical code;
- socially responsible investments;
- socially responsible marketing orientation etc.

## 2. Socially responsible marketing and socially responsible marketing tools

During its history marketing and marketing specialists were many times criticized, sometimes unfounded and without any reasons, but sometimes to certain reasons. As a result it is important for marketing specialists to pay attention for legal, ethical and social responsibility aspects in order to apply the principles of socially responsible marketing.
The expressed critics were formulated especially related to the negative influences on individual consumers, business behaviour regarding competitors and business partners, negative effects of marketing on the whole society (Kotler and Armstrong, 2006, 621-632 and 648). As a reaction, different social and civil movements emerged, like (Kotler and Armstrong, 2006, 633-635):

- consumerism – having the main objective to improve the rights and power of buyers due to sellers;
- environmentalism – having the main objective to protect and improve people's living environment.

Marketing should offer solutions to the problems underlined by the consumerism and environmentalism movements, for example through developing policies at an organizational level regarding ethical aspects. Of course this does not mean that marketing specialists will be able to solve all the complex ethical problems which appear during their activities. (Morar *et al.*, 2008)
Socially responsible marketing refers to marketing activities of organizations through which they behave in a socially responsible way in order to assure the interest of society on long term.
Organizations which reflect the socially responsible marketing orientation should develop standards which take in view the interests of their clients, interests of the whole society and long term profitability expectations of own organization. Socially responsible marketing is more than ethical marketing, and marketing which respects the law.

The American Marketing Association developed The Ethical Code of Marketing which contains prescriptions related to social responsibility (Kotler and Armstrong, 2006, 645 and 646-647.). Organizations frequently develop their own ethical code and philosophy, principles and programs related to their social responsibility (Kotler and Armstrong, 2006, 645 and 647.).

But for ethical and social responsible business behavior an ethical code and social responsibility programs are not sufficient. The main condition is the presence of total organizational commitment and integration of these aspects in the organizational culture (Kotler and Armstrong, 2006, 648).

Organizations which operate in a turbulent business environment of the XXI century can assure their long term success if they use the philosophy of enlightened marketing, which means that marketing should support the best long-run performance of the marketing-system of the organization, and it refers to the following principles (Kotler and Armstrong, 2006, 638-644):

- consumer oriented marketing – senses, serves and satisfies customers' needs;
- innovative marketing – continuous search for product, services and marketing improvements;
- value marketing – investing in customer value-building marketing;
- mission marketing – by defining the organization's mission in broad social terms;
- societal marketing – taking in view besides the needs of the consumers and long-term profit of organization the consumers' and society's long-run interests.

Socially responsible marketing offers desirable products (Kotler and Armstrong, 2006, 642 and 643) for consumers, products which offer immediate satisfaction for consumers and also high long-run benefits for them.

Following the evolution and development of marketing, from focusing on production and distribution to anticipating, determining and satisfying consumers' needs, it becomes obvious that environmental problems should become part of organizations' marketing concerns, which must be solved. This is the specific sustainability expectation of eco-marketing (Morar *et al.*, 2010).

Organizations can use different marketing tools in order to facilitate their social responsibility, for example:

- mission statement – defined in broad social terms and communicated inside and outside organization;
- ethical code, codes of conduct;
- cooperation with governmental institutions, local governmental organizations, non-profit organizations, community etc.;
- establishing funds – having activities related to improvement of social and environmental welfare;
- assistance programs;
- implication of own employees – in social responsibility programs and activities;
- green marketing programs, green products and services, green packages, green technologies, green selling, green marketing communication;
- online marketing tools etc.

## 3. CSR in Romania reflected in online marketing

Organizations all over the world and from Romania can reflect their CSR efforts in their online marketing, using the following marketing tools on the internet: websites, newsletters, forums, blogs, online community sites / social media, online PR for CSR, online publicity, and online marketing researches etc. There are four main socially responsible activity fields which can be financed by governments in Europe: business, environment, workforce market, social (CSR Romania, 2011).

Through secondary research the authors found that governments of European countries were assessed from the point of view of their preoccupation related to supporting social responsibility platforms of organizations, and the "Economic Profits of CSR" study of Accreo Taxand from Poland in 2011 placed the Romanian Government in the middle of the hierarchy of assessed countries (CSR Romania, 2011). This means that although there are initiatives of the Romanian Government related to social responsibility these should be intensified and extended.

There are in Romania online portals which promote the issues related to social responsibility, present interesting case studies of Romanian organizations and organizations which have activities in Romania: www.responsabilitatesociala.ro launched in April 2006, www.csr-romania.ro launched in March 2006. Through a primary research using the method of observation of the CSR portals www.responsabilitatesociala.ro and www.csr-romania.ro the au-

thors revealed that the CSR programs in Romania presented on these sites are focused especially in the following areas: educational, cultural, environmental, social, human rights, sports.
Romanian companies most associated with CSR in Romanian online social media in 2011 were: Petrom, Rompetrol, BCR (Tenita, 2011). The top 10 of organizations mostly mentioned in online social media in 2011 were:

| Nr. | Organization |
|---|---|
| 1. | Petrom |
| 2. | Rompetrol |
| 3. | BCR |
| 4. | Orange |
| 5. | Unicredit |
| 6. | Raiffeisen |
| 7. | Vodafone |
| 8. | BRD |
| 9. | Romtelecom |
| 10. | Unilever |

Source: Tenita, 2011

In the following the authors present two short case studies developed by the authors, related to social responsibility issues: BENE INTERNATIONAL company, and PRIMĂRIA MUNICIPIULUI ORADEA local authority, both from the Oradea, Bihor county, Romania:

**a) BENE INTERNATIONAL**

This company is a private owned company. The main shareholders are family members (husband and wife) and are also the managers of the company. The owners are totally committed to social responsibility, which is reflected in the activity of their organization, as they collect electronic garbage and recycle it. This is reflected on their website. The owners offer financial aid – as an act of charity – for their employees who face different problems, which is not communicated for CSR communication or marketing communication purposes (information obtained through a personal interview with the two owners).


Source: www.bene.ro

## b) PRIMĂRIA MUNICIPIULUI ORADEA

The Mayor's Office from Oradea organized a campaign in order to promote a cleaner city of Oradea. This campaign was launched online on the website of the city: www.oradea.ro, and offline: in local newspapers, posters, leaflets, radio and television. The mayor of the city visited different schools in order to promote personally (not just using the internet)

this campaign and to have discussions with pupils, in order to motivate, educate and engage them in this socially responsible program.


Source: own photo

## 4. Conclusion

Some Romanian organizations realized the importance of CSR, and try to develop their own strategies, programs, activities related to CSR, reflecting among other characteristics upon their availability to adopt socially responsible marketing orientation.
The use of the internet for business purposes makes possible for organizations in Romania to integrate the internet in their CSR strategies, policies and activities, to use the internet in order to communicate about their CSR commitments, to use different offline and online marketing tools for CSR. More and more organizations from Romania embrace the internet for CSR purposes. CSR in Romanian organizations are reflected in their offline and/or online marketing, as they use different offline and online marketing tools for CSR purposes.

Some of these organizations consider that through social responsibility they can obtain competitive advantage, as a result their image will be improved and their profitability will increase.
Considering that in Romania there must be done a lot of efforts to promote social responsibility at national, regional and local level, we must underline the important role of the Romanian Government, local governments and authorities, Romanian companies and foreign companies which are present somehow in Romania through their activities, Romanian non-profit organizations, especially educational institutions and the Romanian population.
Only through this common effort can we assure a viable world in Romania for actual generations and for the next generations, too.

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# THE IDENTIFICATION OF BEST MOTIVATION PRACTICES OF THE EMPLOYEES

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*The importance of human resources in the performance of companies is widely emphasised in the economic and business theory. A synthesis of the principal models of performance fulfilment based on human resources is offered by Analoui (2007) and Reece and Brandt (1999). Following the indications of literature this paper focuses on the man power quality effects on the administration of a company from Oradea. The present study follows up an experimental treatment of human resource motivation in the case of S.C. Limtex S.R.L. Oradea.*

**Keywords:** motivation practices, human recources, business performance
**JEL code:** M54

## Introduction

The principal activity of LIMTEX SRL according to CAEN classification is 1822: fabrication of other clothing articles (exclusive underwear). This class includes the fabrication of other woven garments, knitted or crocheted, unwoven and so on, for women, men and children (clothing, suits, ensembles, jackets, pants, skirts, and so on) and tailoring control. This class of activity excludes: fur clothing; clothing, rubber and plastics not assembled by stitching but merely sealed together; and repair of clothing.

The company is organized as a limited liability company. The company was registered in December 1990 and operates since 3 January 1991. The goal was to establish a competitive company exporting on the German market, providing employment for 300-500 people. With the Romanian foreign trade enterprises decreased their activity, the aim of establishing LIMTEX Ltd. Was to cover a niche market by employing the work force of significantly appreciated Bihor tailors.

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At inception, the company did not have its own production capacity. Fee arrangements have been made mainly with clothing companies and with the cooperatives. After a year of activity, it had been possible to establish a branch in Germany. It was made an investment in a special truck to transport clothing which allowed expansion of business activity. After two years, associates have decided to build a manufacturing factory to have their own production capacity and to ensure the best possible development of company by introducing German technology and labour productivity growth.
Production capacity is located on a total area of 3,600 square meters on the road to Bors. The investment of DM 2 million was financed by two banks from Germany with a credit contract for a period of 10 years and with an interest rate of 6.5%. The factory began producing from January 3, 1997 exclusively to the German market in lohn system. Initially 50 workers were employed organized into one brigade; gradually the number of employees has increased and then reaches 400 employees, organized into seven brigades.

German business development has resulted in an intensification of competition, which led to the disappearance of some of the companies that LIMTEX work. The management of the company has decided to strengthen their market position by collaboration with other market players in order to ensure the continuity of production and a stable outlet. It began the collaboration with "Basler" and "LODENFRAY" two strong companies renowned also at international levels. When the two German partners have realized the advantages to have a company in Oradea, they tried - each separately – to takeover of the company from Oradea. In the competition of take over between the two companies the winner came out Basler GMBH. From 1 June 2004, the company was acquired LIMTEX Basler GMBH, the company form Oradea became a subsidiary of the German company.

Business activity has been continuously developed. Turnover increased from 3.76 million RON in 1996 to 7.96 million RON in 2007. Number of employees increased from 50 workers in 1992 to 476 in 2000. After the company's takeover by Basler, the number of workers varied between 345 and 259.

The management of the company in Oradea since the start of the company has been interested in implementing the best management and human resources management practices. Opening the new firm in Oradea allowed me running an interesting experiment aimed at testing hypotheses of interest in human resources. The purpose of the experiment was to identify best practices for motivating human resources. The results provided information not only on the efficiency of X and Y theories, but also on the validity of predictions.

## Working hypotheses and research methodology

Assumptions were made based on the mainstream theory of motivation in human resources management literature (Storey, 1995; Gandossy *et al.*, 2007). In human resources management enjoys great popularity the X and Y motivational theories developed by Douglas McGregor in his book titled "The Human Side of Enterprise" published in 1960. The premises of the two theories are still studied in undergraduate education cycle. In short, according to X theory the pessimistic people on average are lazy, avoid responsibility and therefore must be closely controlled negatively motivated. Theory Y is the exact the opposite, being an optimistic theory that people on average need to work equally and they need entertainment for better performing. They agree to take responsibility, and positive incentives are at least as effective as negative ones. The two theories are fundamental premise of human resources management. According to McGregor (1960) most managers behave according to X theory, which would be an argument in favour of negative motivation. Based on these ideas, the research hypothesis is: positive motivation is conducting to higher performance than negative.

The undertaken research has four reference points: $T_O$, $T_I$, $T_2$ and $T_3$. Between times $T_O$ and $T_1$ assessing the efficiency of reasoning is compared to $T_O$. Between $T_I$ and $T_2$ is applied X theory. Between $T_2$ and $T_3$ points there are combined the principles of X and Y Theories in a flexible manner. Using flexible motivation methods are assessed the behaviour of workers. The research covers a period of four months and half in 2008.

In this paper there are used two methods of investigation: structured interviews and six semi-structured interviews. We used as a tool for data collection the two structured interviews based on a questionnaire. The first questionnaire is applied before the first method, and the second after application of both methods of reasoning. Semi-structured interviews based on open discussions aiming to obtain profound information about the employees' motivation and behaviour. In developing the questionnaire we used mainly closed questions to facilitate their completion by the administrator of the company, but also the evaluation and structuring of data collected.

Theory X specific methods and techniques that were used are: withdrawals from wages (max. 15%); warnings, threats of dismissal; penalties verbal; and ignoring employee preferences planning work program.

Among the specific techniques used during the experiment Y theory, the most important are: Laude; incentives (days off, bonuses, and gift vouchers); improving working conditions; employee performance Gratitude; and Granting the title of "Employee of the Month"

## The research results

Application of the first structured questionnaire has been considered when the original research ($T_O$) has been performed. Analysis of the first structured interview reveals that the company administrator initially applied methods largely based on Y-theory. The results of these methods were not according the administrator's expectations, that quality has not improved and the number of rejects items has increased or not reduced, and increased the required overtime. The only positive change was to reduce absenteeism.

Consequently the management of the company decided to apply the techniques based on the method of the X-theory (time $T_I$). Of these, the most used techniques were deductions from wages and warnings. Also, special attention was given to compliance with ethical standards, based on that person and the legal provisions.

Following the first semi-structured interviews, we obtained the first information on the effectiveness of new methods of negative motivation of staff. The most significant progress was made on product quality and productivity of physical labour. However, the application of the negative motivation had negative effects. The research revealed that staff directly productive, are more stressed, even outside working hours, employees are afraid of the consequences of their actions if they are not behave according to administrator's expectation. This raises the concern that long-term strategy based solely on negative motivation is not sustainable. Employees have become irritable and impertinent, even causing some strife, were outraged and uninterested in the quality of work. Starting the third week, there were decreases in production and first in productivity.

Company management concluded that attempts to improve employee performance through the exclusive application of X-theory methods have not produced expected results. The solution was, therefore, adopt a flexible strategy, which combines elements of both strategies, depending on the outcome workers. Seventh week begin practicing positive methods belonging to Y-theory. Changes in attitudes of employees and working atmosphere are immediately observable. By the middle of the first week of applying the new motivation strategy of workers conducted to increase in the quantity produced and reducing the overtime required. It should be noted that absenteeism has not increased nor decreased during the research, remaining relatively constant.

## Conclusions

The results based on the experiment, though mixed, show evidences about the effects of application of the negative methods of human resource motivation in the studied company from Oradea. However, as noted, has negative motivation and negative effects, most notably stress and degradation in the workplace atmosphere have not resulted an improvement of the performance of the workforce. Management understood the potential impact on productivity of different methods of motivation. Indeed, even with a rigorous schedule of working hours, there are phenomena that can influence the productivity achieved. This study documents the effectiveness of negative motivation in reducing absen-

teeism, even if adverse effects occur after a long and damaging climate stress at work and workers.

It should be emphasized that this study was possible only because of the openness of new management in the analysed company from Oradea. Organizational learning and innovation is one of the four fundamental areas of business performance, according to balanced Scorecard methodology. We therefore conclude that openness to new of the firm from Oradea is an asset of sustainable competitive advantage.

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# ANALYSIS OF SUCCESSFUL MANAGERS' HANDWRITINGS

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*Everybody wants to become successful. Every manager wants to become a successful manager, and to improve personal performances and their businesses' performances. The article presents how graphology can be used for human resources purposes in order to analyze the handwriting of successful managers. It is very difficult to define what the success is, but regarding success in management we can relay on several aspects which are related to this concept. Successful managers have specific psychological characteristics. The article reveals these characteristics and based on these presents the graphological signs which can be found in the handwriting of successful managers. Using graphology well trained and experienced graphologists can make a graphological analysis and after that a graphological synthesis, and based on the obtained results can draw the graphological profile of the successful manager. Managers and organizations should become aware of the utility of graphology in their businesses, in management of their organizations, in obtaining better performances, in becoming more competitive by assessing their managers and developing their competencies in order to become successful.*

**Keywords:** graphology, human resources graphology, managers' performances, success in management, management competencies
**JEL codes:** M12, M51, M54

## 1. Introduction and definition of success in management

Success in business is essential for every entrepreneur, manager, owner, employer etc. Managers play an important role in assuring the success of their businesses, as a result it is important for each manager to have those personality characteristics which facilitate to become successful managers.

In order to refer to the main topic of the present article the authors formulated several questions which can lead the research in a proper direction to make the needed analysis. These helped the authors to create a theoretical frame for analyzing successful managers' handwritings using graphology, the presentation of which is the main objective of this paper.

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These questions are the following:

- How can be success defined in management?
- Who is a successful manager?
- What are the factors which facilitate success of managers?
- What are the psychological characteristics of the successful manager?
- What are the graphological signs in the handwritings of successful managers?
- What is the graphological portrait of the successful manager?
- There exist differences in the graphological portrait of the successful man and women managers?

Everybody wants to become successful. Every manager wants to become a successful manager, and to improve personal performances and their businesses' performances. It is very difficult to define what success is, but regarding success in management we can relay on several aspects which are related to this concept.

Ludvig Klages, a German graphologist, due to whom the graphology started to take a scientific approach and was introduced in higher education, underlined that those persons become even tempered, balanced personalities who have the opportunity to unfold at maximum there abilities, no matter if on a lower or higher degree or level, but in an active way (Bokor, 2002, 29.).

For happiness everybody needs the feeling of success, indifferent in which field, because this experience is related to our behaviour, work, activities, attitudes reflected in a positive way by others, it is a feedback which makes us pleased and satisfied.

The knowledge accumulated by us in the educational institutions from the kindergarten to higher education is very important, but not enough for success in life. It is also important for the individual to learn how to think, to decide, to feel, to react to different events from the environment, to tackle its own fear and anxiety, to feel happy and delighted etc. In addition to the accumulated knowledge by learning it is important the person's experience and social skilfulness (dexterity) (Pintér, 2004, 46.).

We can make the most of our genetically inherited intellectual abilities only with appropriate emotional intelligence; as a result besides our intellectual competencies have a great importance our emotional aptitudes (Pintér, 2004, 46.).

As a general accepted definition we can affirm that success means that a person can achieve its predetermined and important objectives. It is

true that the notion of success has different meanings for every person; it can be defined individually for each human. Somebody is successful if can obtain self-realization, if can achieve its own dreams, objectives, in a way that must not renounce to itself, to its own values from the own value system, without burning out intellectually, emotionally and spiritually. A person will be successful if with a healthy brain can develop its own physical – emotional – intellectual unity, internal harmony and harmony with its environment. In order to get better knowledge about us and about others it is important to develop a balance between our physical body, our soul and our spirit, because this will lead to harmony. Health is also assured by this (physical, emotional and spiritual health). An adult personality can obtain its own harmony, and can forward this harmony for other persons, too. An adult personality can create harmony between its intellect and emotions.

As we can conclude from the Pyramid of Maslow (Vorzsák *et al.*, 2007), each person has the need for self-realization, which is the highest need in the hierarchy of the needs, representing the state-of-the-art of the human intellectuality, emotionality and physicality. Self-realization requires sacrifices of the person, renouncement to present, momentary advantages, but these will lead to the wanted advantages and objectives in the future, on the long term. For self-realization it is indispensable the capability of making sacrifices, of self delivery and of self-renouncing. Self-realization means also that the person delivers itself through own descendants to the world, assuring the survival of the next generation.

Only emotionally mature persons can become successful, because for success it is indispensable to understand and manage own emotions, passions, moods, and to understand and manage appropriately others' motivations, emotions, reactions (Cohen and Wander, 1997, 47).

It is very difficult, if it is not impossible, to define unambiguously what success is, but this is understandable, because success can appear in different areas, and means different things for different persons. Persons sense in different ways the feeling of the success. A lot of people consider success relatively, comparing it with others' conceptions about success. We should recognize that a person's success mustn't be defined necessarily by others, as an intellectually, emotionally and spiritually balanced person can be its own measure of success.

There exist persons who look for and find their success in career, as emotionally healthy people need to work, to have a profession, to achieve

performance in its workplace. Others can find success in their family life, giving birth and raising children, developing balanced relationship between family members.

A person must be motivated, must have appropriate attitudes in order to become successful, as these will drive toward developing own personality and different competencies: professional, social and human competencies (Ónodi, 2004, 16).

For being successful a person must take in view some principles, which are identified as being the following twelve ones: believe in motivation, positive thinking and acting, foreseeing, establishing goals, time management, management of stress, relationship management, good communication skills, capability of overcoming failure, being a good leader, appropriate self-management, being at ideal level of performances (Gulyás, 2002 a, 2002 b, 2003).

How can we know that in the XXI century a manager or an organization is successful? In the simplest way we could say that this means how efficiently and effectively can use the limited or difficult to obtain resources in order to achieve established objectives. It is not important for an organization to possess the needed resources, it is important to have access to the needed resources, when these are needed, where these are needed and in quantities these are needed. Efficient management, lifelong learning, capability of offering performance, motivation and training of personnel, appropriate organizational structure and culture etc. are those factors which facilitate the efficacy and efficiency of managers and organizations.

How can graphology be useful in order to assess managers' handwritings, in order to determine how successful they are? In the handwriting of each person a graphologist can find those graphological signs which reflect the personality characteristics, psychological traits of a successful manager. So the graphologist must identify what are the main personality characteristics, psychological traits of a successful manager, and can search in the handwriting of the manager those graphological signs, which can be found in the handwriting, and which reflects a specific personality characteristic. Together with other professionals from other scientific fields, like psychologists, human resource management professionals, sociologists etc. graphologists can create the personality profile of (successful) managers, and can help managers to improve those behavior characteristics which are not very developed in their case, but which can increase there performances and success.

## 2. Competencies needed for a manager to be successful

Modern organizations of the XXI. century work mostly with information, their employees being or creators or consumers of information. Managers should focus on attracting and maintaining well trained and experienced employees, which sometimes become a very difficult task. Practical and manual skills are overtaken by capabilities of working with information. Not working performance should be assessed, it is more important to measure performances related to knowledge. Hierarchical organizational structures must be replaced by organizational structures based on working teams, communities. It should be developed organizational cultures that facilitate personal and organizational learning (Cândea and Cândea, 2005, 31).
Needs, roles and needed characteristics of employees are also changing. The "portfolio employee" develops a portfolio of competencies from its applied knowledge, skills and abilities from which can be use those elements which are needed in a specific moment on the workforce market (Cândea and Cândea, 2005, 32).
The concept of the "total employee" appeared recently, referring to that employee who is implied physically, emotionally and spiritually in its work, using its totality of competencies, and from its multiply of competencies uses those which are needed under specific circumstances. (Cândea and Cândea, 2005, 32)
Personality determines the person's value system, motivation, attitudes towards its own person and other persons, and the whole world.
The main responsibility of managers is to work together with their subordinates and to achieve together organizational goals. A manager can become successful if has some congenital abilities, and succeeds to develop some necessary competencies. It is important to be able to recognize own and other employees' feelings, attitudes and motivations, and to manage them appropriately, in order to assure that competencies are used optimally at the workplace. In their daily decision making processes managers use highly rational criteria, but besides these they must be able to use the information from own and other individuals' emotions, too. As a result managers must try to control own emotions and use them in order to obtain success. Organizations activate in a very dynamically changing economic, social, political and technological environment, trying to face those challenges which determine their success. As a result there is a locally, regionally, at the level of EU and globally need of

changes in management processes and in managers' thinking. Managers should develop those competencies which help them to face these challenges and to become successful or more successful.

In each organization during daily activities there are a lot of spiritual, intellectual and emotional processes. It is important for managers to develop own and other employees' personality in an active and creative way, thus facilitating the organization's long-term success. The different components of the managers' multiple intelligences can help managers through their responsibilities and duties to achieve organizational goals and as a result to assure own success: intellectual intelligence (IQ); emotional intelligence (EQ); spiritual intelligence (SQ); and practical intelligence (PQ).

Managers must have intellectual competencies, because they must gather and develop professional and management knowledge in order to fulfil their roles in the organization, both as professionals and managers.

During the 1940-ies David Wechsler defined the concept of the general intelligence, and introduced the IQ indicator which can be used to measure intellectual intelligence of a person. He underlined that general intelligence have both intellectual (cognitive) and non-intellectual (non-cognitive) components. He defined intelligence as the capacity of a person to act in order to achieve specific goals, to think rationally and to be able to face the challenges which appear in its environment. He demonstrated that persons who have the same IQ can manage in different measure the situations arisen in their environment, and their cognitive or intellectual intelligence can explain just in 50-70% their results (Cândea and Cândea, 2005, 51).

Some graphologists consider that IQ can be hardly, if it is possible to be assessed reliably from the handwriting of the persons (Forgács, 2003, 18). But graphologists can conclude from handwriting some mental characteristics of the individual, some intellectual capabilities can be determined through graphology, for example: speed of thinking, flexibility of thinking, quality of thinking (analytic or holistic), capability of variation, fantasy and creativity, recognizing relations, logic, capability of structuring, capability of attention concentration, objectivity, curiosity, critical abilities (F. Visnyei *et al.*, 2001, 12 and 46-54).

Emotional intelligence came in focus of the interest only after 1988. The concept of emotional intelligence was proposed by Reuven Bar-On (Cândea and Cândea, 2005, 52). John Mayer and Peter Salovey defined

for the first time the concept of emotional intelligence (Goleman, 2007, 7). P. Salovey and I. Marshall underlined that emotional intelligence can be developed during the whole life of the person (Cândea and Cândea, 2005, 55). David Goleman expressed that emotional intelligence has an important role in success, and developed a model based on emotional intelligence which can be used in order to develop emotional competencies (Cândea and Cândea, 2005, 56).

At the workplace the following dimensions of the managers' emotional competencies are important (Cândea and Cândea, 2005, 33-34):

- Identification of emotions: awareness and recognition of own emotions and other individuals' emotions (subordinates', partners' emotions);
- Use of emotions: creating emotional status expected by itself or by others, transmitting positive emotions;
- Understanding emotions: knowing what motivates the subordinates, understanding what subordinates feel, what are the effects of their emotions, discovering the emotions present in teams or emotions between team-members;
- Controlling emotions: discovering those information which are transmitted by emotions, appropriate reaction in order to solve problems, to change emotional status, to use thinking in order to reinforce own emotions.

Graphologists can conclude from the handwriting some emotional capabilities of a person, looking for those graphological signs which reflect the existence of these.

Spiritual intelligence refers to the value system of a person confessed in complex and difficult situations, intelligence regarding the sense of life, professional vocation and personal development (Cândea and Cândea, 2005, 54).

Spiritual intelligence is defined as the one with which we can approach and solve problems related to the final intellect and values, the intelligence used to place our life and actions in wider and richer connections, and through which we can assess if an action or a way of life is more intelligent than other or not. Spiritual intelligence (SQ) being our highest level of intelligence, represents the necessary base for the intellectual intelligence (IQ) and emotional intelligence (EQ) to work properly (Zohar and Marshall, 2000, 16).

Managers should have spiritual competencies, too, as they must have visions regarding the future of their businesses and organizations, should

have valuable goals and objectives, should have a holistic look of the work of their subordinates, should give significance for their subordinates' work, should be farseeing and should have capability to make prognoses, should be capable of initiating changes, should have an appropriate system of values and should be capable of transmitting this values for their subordinates.

A person with high spiritual intelligence has the following characteristics (Zohar and Marshall, 2000, 28):

- flexibility;
- high level of self-consciousness;
- capability of facing and making good use of suffering;
- capability of facing and getting over pain;
- capability of being inspired by values;
- not causing unnecessary damage and harm for others;
- holistic thinking;
- capability of asking "Why?" and "What should be, if?" kind of questions and looking for answers for these;
- capability of working against conventions.

Spiritual intelligence can be developed through the following steps: awareness of the possibility for this to be a way of life, assuming that the person wants to do this and revealing its motives, finding possible alternatives and choosing one to commit itself to do it (Zohar and Marshall, 2000, 246).

Graphologists can determine from the handwriting some spiritual capabilities of a person, searching those graphological signs which indicate the existence of these.

Managers should have practical competencies, too, as they have to transform plans into actions, into reality, must be able to use their intellectual intelligence, emotional intelligence and spiritual intelligence in their everyday life and work, must find solutions to practical problems and face practical challenges. Some specialists consider as practical competencies the sensitiveness of the managers to intuition of the implicit messages (Goleman, 2007, 72). In the XXI century there is very important for any person, so for managers too, to be capable of handling technologies, especially information and communication technologies, and to have practical skills and competences in using different equipment which use these technologies.

From the handwriting of a person the graphologists can see if the person is capable to transpose its spiritual, intellectual, emotional capabilities in reality, in practice, if can harness those in daily activities.

## 3. Psychological characteristics of successful managers

Managers who are successful have specific psychological traits, personal characteristics. In order to define these characteristics the authors studied psychological, management and human resource management secondary information sources (for example: Barta and Kristály, 1996; Atkinson *et al.*, 1997; Cohen and Wander, 1997; Mérei and V. Binét, 1997; Zohar and Marshall, 2000; Oatley and Jenkins, 2001; Piaget and Inhelder, 2004; Cândea and Cândea, 2005; Goleman, 2007; Goleman, McKee and Boyatzis, 2007; Ranschburg 2009a; Ranschburg 2009b; Kánya, 2010), and concluded the following characteristics as being the most important in the XXI century, presented in alphabetical order:

- Adaptability (flexibility);
- Ambition;
- Assuming responsibility;
- Authenticity (trustworthy);
- Bearing conflict;
- Bearing stress;
- Capability of development;
- Capability of starting again;
- Capable of work;
- Caring;
- Communication capabilities;
- Consistency;
- Cooperation skills;
- Creativity – capability of innovation – full of ideas;
- Determination – planned actions;
- Diligent;
- Emotional balance;
- Emotional maturity;
- Empathy;
- Enthusiasm;
- Entrepreneurial spirit;
- Flexible thinking;
- Independent;
- Knowledge of mankind;
- Optimism;
- Persistence;

- Positive thinking;
- Psychical balance;
- Purposeful;
- Readiness to act;
- Risk taking;
- Self-control;
- Self-knowledge (real);
- Sense of humour;
- Skilful;
- Strength of mind (moral strength);
- Strength of will;
- Success oriented;
- Uninfluenced – indivertible – resolution.

Of course managers owe these characteristics in different combinations and at different degrees, resulting in a unique personality profile of each manager. This doesn't mean that one manager is more "valuable" than others, it means, that he/she is different and deals with managerial tasks in a unique way. Many of these characteristics are genetically determined, but several traits can be developed through practicing during lifetime. Those managers, who lack some of these characteristics, can strive to develop them, or if they want they can improve some of their characteristics, which they consider as insufficient.

There exist differences in the psychological portrait of successful male and female managers, especially regarding their emotional intelligence and competencies. As Jack Block (cited in Gulyás, 2001, 453) mentions a man characterized by high EQ has the following psychological traits: has initiative, is proactive and fun, not scary, not anxious, is committed to people and causes, is compassionate and caring, has diversified but adequate emotional life, has developed sense of responsibility, is moral, lives in harmony with itself and others. In comparison to this Jack Block (cited in Gulyás, 2001, 453) describes the woman characterized by high EQ as follows: expresses her emotions directly, has a positive self-image, has a sense of life, has initiatives, is sociable, has adequate but expressive emotions, has a good adaptation to stress, develops easily relations with others, accepts herself, is spontaneous, playful, sensual, rarely feels anxiety or remorse, has no tendency to destroy herself.

## 4. Graphological signs in the handwritings of successful managers

Based on the above presented psychological characteristics of the successful managers, certified, well trained and experienced professional graphologists can look for graphological signs in the handwriting of managers which are related to these psychological traits. The presence of each psychological trait is reflected in the handwriting of a manager through a group of graphological signs. Evaluating the presence of these graphological signs graphologists can reveal those psychological traits which uniquely characterize the person whose handwriting is exposed to graphological analysis. This can be done taking in view the empirically proved connections between characteristics of the handwriting and psychological traits, described by specialists in the professional literature available in the field of graphology (for example: Biro, 1930; Balázs and Hajnal, 1943; Cohen and Wander, 1997; Agárdi and Szidnai, 1998; W. Barna, 1998; Fónagy, 2002; F. Visnyei *et al.*, 2000; F. Visnyei *et al.*, 2001; Gulyás, 2001; Forgács, 2002; Vásárhelyi, 2002; W. Barna, 2002; Forgács, 2003; Ónodi, 2004; Pintér, 2004; F. Visnyei, 2007; Gáspár, 2009a; Gáspár, 2009b etc.).

As a general description of the handwriting of the successful manager based on the above mentioned professional literature we can mention the followings: readable handwriting, structured handwriting, fast writing, spontaneous writing, regularity but not rigidity, tight margins, presence of small right margin, big distances between lines and words, straight or moderately tilt to the right writing, straight lines, upward lines, proportionality, dominance of medium zone or balanced zones of writing (equal upper, medium and lower zone), punctual accents, presence of loops, circle ovals opened at right or up-right side, presence of garlands, bounded letters, right tendency, signature is similar with the text or lightly increased in high, etc.

Of course graphologists can make in-depth description, based on the graphological signs' analyses of each psychological trait, and can describe in detail each characteristic. Graphologists can assess on a scale (for example from 1 to 10) each psychological characteristic individually, and based on the graphological signs in the handwriting of a person can determine if that person owns that psychological trait, and if yes at what extent. Each psychological characteristic can be presented on a diagram, and graphologists can obtain the psychological profile of the manager in case.

Specialists present the differences of psychological traits of successful males and females, as a result we can conclude that from this point of view there exist differences between successful male and female managers' graphological portrait. Although gender can not be determined from the handwriting of the person (as every person can have masculine and feminine characteristics), but there exist differences between the managerial style of the male and female managers reflected in their handwritings.

## 5. Developing managers for success using graphology

Graphologists can reveal where lack in a psychological characteristic exists, and which psychological characteristics should be improved in order to facilitate success.
The handwriting of a person reflects his/her personality, psychological traits, attitudes, and inducing changes in the handwriting can be obtained changes in personality or behaviour of that person. Using grafocontrol the manager can develop its own personality by improving its behaviour tendencies (Gulyás and Földényi, 2001) in order to become successful or more successful.
Through grafocontrol using different writing exercises there can be induced changes in the behaviours, attitudes of the writer, using the other hand and not the one normally used for writing (for example a manager who usually writes with the right hand, the writing exercises must be done with the left hand, and in the case of managers, who usually write with the left hand, the writing exercises must be done with the right hand). The graphologist expert in grafocontrol can develop and prescribe the needed writing exercises for a manager, based on the graphological profile regarding the success. Doing these writing exercises for several weeks, modifying characteristics of the writing, the so called graphological signs, the writer will improve its own behaviours and attitudes, and can become more successful.

## 6. Conclusion

The importance of graphology is expressed among others by the fact that year 2002 was declared the "Year of Graphology" all over the world, due to the initiative of Nigel Bradley (a famous specialist of graphology

from the British Academy of Graphology, London), recognizing those values which are offered by this science for the whole society and its wide applicability (W. Barna, 2002, 6).

Contrary to this there exist a lot of misunderstandings related to what graphology is, where and for what purposes it can be used and what are its limits. We can define graphology in the simplest way as being that science which concludes from a person's writing about his/her personality traits. (F. Visnyei *et al.*, 2001, 5)

Romanian organizations should become conscious of the utility of graphology in improving the efficiency and effectiveness of their businesses, of their management and of their activities (Kánya and Gáspár, 2009, 2011).

The Association of Romanian Graphologists was founded in 2005 (Gáspár, 2009d), and the profession of graphologist was officially recognized in Romania in 2007 (Gáspár, 2009c).

Romanian organizations should use the help of well trained and experienced certified graphologists in order to assess and improve their managers' performances and to help them to become more successful, by developing their personalities, their practical, intellectual, emotional and spiritual competencies.

Professional graphologists should respect the legal prescriptions and the International Ethical Code of Graphologists (Grafo Info, 2009).

The theoretical frame developed by the authors and presented in this paper can be useful for graphologists, psychologists, human resource professionals, sociologists etc. as it can be considered a guide for revealing those graphological signs which indicate if a manager owns and at what extent the related personality characteristics needed to be successful.

There exist many psychological measurement tests for assessing different aspects related to human intelligence: the Bar-On Emotional Quotient Inventory, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), the Emotional Competency Inventory (ECI), the Emotional Intelligence Appraisal based on Daniel Goleman's model of EQ etc. Most of these tests consist in self-report measurement tools; as a result they can supply not necessarily objective responses. The presented assessment method using graphology can be more realistic than other methods because while other psychological methods can be susceptible of faking, as respondents generally have to answer different questions, and they can offer responses they consider more acceptable, or which they improve

their image, as a result appears the distortion of reality. Persons can't fake through their handwriting to induce in error professional graphologists, as a result their handwriting will reflect reality, and graphological analyses of the handwriting will supply real information about personal character and psychological traits. Different psychological measurement tools can be combined with the graphological tools in order to obtain a realistic profile of the successful manager and to improve those psychological traits which facilitate success.
The presented theoretical frame can be used by the authors or other graphologists for future researches in order to analyze the handwritings of Romanian managers and to determine their spiritual, intellectual, emotional and practical intelligence which lead to success.

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TOWARDS A KNOWLEDGE BASED ECONOMY

# LEARNING AND INNOVATION

Balázs HÁMORI*

*Learning and innovation – except of some authors and works – has been excluded from the interest of economists up until the 80s of the 20th century. For the outside observers it is difficult to understand why this phenomenon – being so important in the every days of the economy – wasn't an issue for economists. We can find the answer to this question in the social-economic environment of the phenomenon. In the relatively slowly changing societies, as in the industrial capitalism that had dominated the 19th and the 20th centuries, the major innovations followed each other with longer (often decade long) gaps, acquired knowledge was quite "durable". But at the dawn of the 21st century the IT revolution radically stirred everything up. The speeding technological advancement has induced cut-throat competition; the formerly "peaceful" markets have turned into unpredictable global competitive markets. On the "winner takes all" type of markets firms are forced to become permanent innovators. Innovations are not exceptional events anymore; rather they are the indispensable criteria for production. The author attempts to clarify the relationship between learning and innovation, interpreting both as social constructs. Through the analysis of international statistics the author supports his standpoint, according to which even though learning and innovation can be delineated quite well, at the same time there exists a strong relationship between them. Similarly, such strong relationship exists between innovation and competitiveness, and between innovation and corruption. This underpins the author's argument that it is the social environment, which fundamentally defines a country's ability to attain a given position in the international innovation competition.*

**Keywords:** innovation, learning, organizational learning, competitiveness, competitive markets, technological change, IT revolution

**JEL codes:** O30, O31, O33, O38

Learning and innovation – except of a narrow branch of economists, namely the Austrian school (*Schumpeter,* 1911; *Hayek*, 1945; *Machlup*,1962) and a few representatives of other, mostly heterodox lines (*Dewey*, 1933; *March and Simon*, 1958) – has been excluded from the economics up until the 80s of the 20th century. For the outside observers it is difficult to understand, why this phenomenon – being so important in every days of life and the economy – wasn't an issue for

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economists. Even recently, when these twin-terms are echoing in every corner, in the high-theory (unlike the economic life), in the "so called" normal science and in the economic textbooks learning and innovation are not really important issue.

## The relationship between learning and innovation: no generally accepted approach

In the decades before and after the Millennium the usage of the terms "learning & innovation" has grown exponentially, but rather in the management sciences, and not so much in economics (*Jelinek,* 1979; *Kolb*, 1984; *Huber*, 1991; *Howard and Haas* (eds.), 1993; *Senge*, 1990; *Nonaka and Takeuchi*, 1995; *Matanovich and Cressman*, 1996). Despite this enormous big popularity, innovation theory is still an immature "science", and the same is true for the studying of learning. There is no dominant theory on the field and no consensus among academics concerning the core and the methodological background of learning and innovation theory. "In spite of the number of specific publications on innovation and organizational learning, there is still a gap in combining the issues together." (*Perin-Gatterman and Sampaio-Hoffman* 2003. p. 1) Among the researchers of the topic three distinct groups of approaches exist to investigate the relationship between innovation and learning:

- The two phenomena are diametrically opposed
- The innovation is a kind of learning
- The learning is a necessary precondition for innovation

### Leaning and innovation: diametrically opposed

It is not difficult to argue that innovation and learning are complete opposite of each other, since the innovator does not simply work with the ideas, thoughts, statements and truths acquired from others, it is the opposite: he or she questions and redefines them. Experience has shown that the innovators detach themselves from the "conveyor belt" of education, with which they are supposed to be kept on the beaten path, as well as with which they are being led towards the directions of long standing. Often this is not only a symbolic break away, but it manifests itself in a more tangible manner. Innovators, instead of follow-

ing thought standardizing learning, often follow their own way. The heroes of the IT revolution provide numerous examples of this: from Bill Gates to Larry Page, who have never finished their studies, and left their Ivy League Universities after a few semesters. Besides them, it can be said that it is almost customary that from Edison to Einstein in the biography of numerous intellectual stars we can find clashes between them and the educational institutions and the traditional learning methods. Therefore it is only a half-joke Charles Kettering's[1] definition of the inventor: "An inventor is simply a person who doesn't take his education too seriously. ..You see, from the time a person is six years old until he graduates from college, he has to take three or four examinations a year. If he flunks once, he's out. But an inventor is almost always failing. He tries and fails, maybe a thousand times. If he succeeds once, he's in. Those *two things are diametrically opposite*."[2] In the table below we attempted to gather the opposite characteristics of innovation and of learning:

Table 1: *Comparison the characteristics of innovation and learning*

| Learning | Innovation |
|---|---|
| Fixation of existing patterns | Disruption of existing pattern |
| Dissemination of existing knowledge | Crowding out of existing knowledge |
| Partly institutionalized outside the economy | Mostly institutionalized inside the economy |
| Covers the whole population, everybody learns | Covers just small segment of population, not everybody is innovator |
| Basically predictable and partly organized | Basically unexpected and chaotic |
| Mostly well controllable | The most important parts of the process are autonomous |

Source: Set up by the author

While learning – especially its institutional forms – are actions mostly structured and largely moving forward in a linear manner, innovation seems to be: a nonlinear dynamic system. As it is put by the American co-authors "the two most commonly-used explanations of the innovation

process, that it follows either an orderly periodic sequence of stages or a random sequence of "blind" events, are not valid where chaos is found. Chaos tells us that the innovation process consists of a nonlinear dynamical system, which is neither orderly and predictable nor stochastic and random. The findings of chaos also expand existing definitions of organizational learning. Learning in chaotic conditions can be viewed as an expanding and diverging process of discovery." (*Cheng and van de Ven*, 1996, p. 593)

### Blurring of learning and innovation

While the advocates of the previously introduced approach emphasize the differences and even the opposing nature of learning and innovation, another group of researchers argued that learning and innovation share the same key feature: they arise unplanned, unexpected, and emergent, and can't be commanded to occur." (*Sawyer*, 2008)[3] According to *Argyris,* one of the most well-known researchers of the topic, "learning is a process in which people discover a problem, invent a solution to the problem, produce the solution and evaluate the outcome, leading to the discovery of new problems." (*Argyris*, 1982, p. 38) The same definition exactly fits innovation as well. Similar stand is taken by March and Simon the "fathers" of *cognitive economics* in their classical book, according to which *many innovations result from borrowing rather than invention*. In their approach innovation=borrowing knowledge, and it is difficult to consider "borrowing knowledge" as other than learning. According to the rules of logic, thus it follows that innovation=learning. (See *March* and *Simon*, 1958, p. 188)

The somewhat finer more differentiated version of learning that emphasizes the mutual characteristics and inseparability of learning and innovation is based on the dual definition commonly found in the management literature: contrasting the so called *single-loop learning* and the *double-loop learning* (*Argyris and Schön*, 1978), out of which only the later can be combined with innovation. We must differentiate between learning that is a type of challenge against the *status quo*, which is called *double-loop learning,* and learning of routine solutions, a kind of mechanical answer to the changes of the environment based on learned knowledge,

the so called *single-loop learning*. The cognitive abilities of humans allow us to substitute one kind of new knowledge with another, or replace old with new. The authors described the two types of learning in the context of organizational learning as the following:

"When the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives, then that error-and-correction process is *single-loop* learning. Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action. *Double-loop* learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives.
(*Argyris and Schön,* 1978, p. 2-3)

The twin terms of *Argyris and Schön* go back to Gregory Bateson's concepts of *first and second order learning* (*Bateson*, 1972). A first order learning stays inside the system, a second order learning changes the system, and the way of thinking. Similar view is taken by *Fiol and Lyles***,** differentiating between lower- and higher-level learning.

"Lower-level learning occurs within a given organizational structure, a given set of rules. It leads to the development of some rudimentary associations of behavior and outcomes, but these usually are of short duration and impact only part of what the organization does. It is a result of repetition and routine and involves association building... Higher-level learning, on the other hand, aims at adjusting overall rules and norms rather than specific activities or behaviors. This type of learning occurs through the use of heuristics, skill development, and insights. It therefore is a more cognitive process than is lower-level learning, which often is the result of repetitive behavior. The context for higher-level learning typically is ambiguous and ill-defined, making purely repetitive behavior rather meaningless. This ambiguity and environmental complexity characterizes upper management levels of the organization where decision making norms are at least partially determined, that is, where higher-level learning usually occurs."(*Fiol and Lyle*s, 1985, pp. 807-808)

For double-loop learning, for higher level learning, and for second order learning (the three concepts are quite close to each other) we can only find such definitions in the literature, which are difficult to differentiate from innovation, since their most important characteristics overlap with it.

### Learning is the precondition for innovation: An innovation interconnection model

The third group of researchers also ties learning strongly to innovation, but they do not blur them together. They consider knowledge acquired through "external" learning as a necessary condition of innovation. Learning produces knowledge, without knowledge there is no innovation. Here we introduce a new concept into the analysis*: knowledge*. Evidently we can only acquire knowledge through learning. However, the knowledge absorbing capacities of firms and people are decisive in the context of innovation, since the more knowledge they accumulate the easier they will be able to combine the various elements of knowledge in new ways. *Cohen* and *Levinthal* (1990) probably were the first to show that absorptive capacity of the firm is critical to its innovative activities, since knowledge is only absorbed if firms meet the capabilities to internalize it.

"The ability to exploit external knowledge is thus a critical component of innovative capabilities. We argue that the ability to evaluate and utilize outside knowledge is largely a function of the level of prior related knowledge. At the most elemental level, this prior knowledge includes basic skills or even a shared language but may also include knowledge of the most recent scientific or technological developments in a given field" (*Cohen and Levinthal*, 1990, p. 128).

My view about the relationship between learning and innovation is very similar to the approach of this third group. I can summarize it as the following:

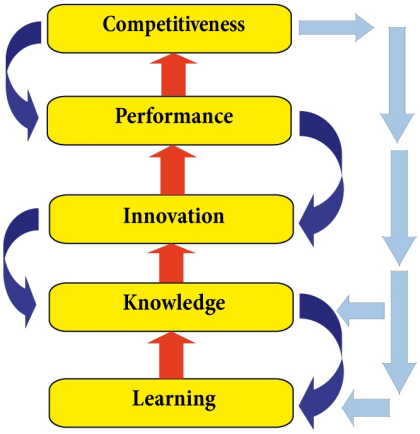
- Learning is to be differentiated from innovation, in spite of some common features, in many senses they can be opposed to each other.
- Learning is the necessary, but not sufficient precondition of innovation, since knowledge can be only accumulated through learning, and innovation is basically not else than the new combinations of accumulated knowledge.

• In this sense I follow the Schumpeterian path of innovation. But the using the existing knowledge is not enough; one should put the stress on the new combination.
• Acquiring new knowledge or abilities and innovation greatly depend on how successfully the economic actors able to break away from their routines, from their old conditioning. Fundamentally important that to what extent the potential innovators are able and willing to erase from their memories the standard roles and behavioral patterns, and whether they are able to preserve and to synchronize the new patterns with the elements that can be useful further in the new market environment as well.
• There is a definite interplay between learning and innovation. Learning gives inputs to innovative combination of the existing knowledge, innovation makes learning, relearning and unlearning unavoidable, and the new knowledge gives new opportunities for innovative combinations.

In the followings, through a comprehensive model we are exhibiting the mutual relationship between learning, knowledge and innovation, and their influence on economic performance, and on the competitiveness of countries.

Figure 1.

**Innovation Interconnections Model**




Source: author's own compilation.

As the arrows in the figure clearly show, the relationship between these factors is not unidirectional. Knowledge stem from learning, but it also reacts back to learning: "Some psychologists suggest that prior knowledge enhances learning because memory-or the storage of knowledge-is developed by associative learning in which events are recorded into memory by establishing linkages with pre-existing concepts (*Cohen and Levinthal*, 1990, p.129). The accumulated knowledge in the firms and in the countries provides opportunities for innovation, and innovation fundamentally influences competitiveness, but the opposite effect can be detected as well. A competitive economy can spend more on education and research and by doing so it can strengthen learning and innovation. The reciprocal relationship exists, but the direct relationships indicated by the upward vertical arrows are stronger, than the feedbacks. (Figure 1.)

## Learning and innovation in a social context – the lessons of country rankings

We can see from Figure 1 that learning is a precondition and a positive influencing factor for innovation. Learning however does not directly lead to innovation, innovation is born only in special cases during the learning process, normally it develops through the utilization and recombination of knowledge accumulated during learning. "A theory of innovation... presumes that new technologies emerge from a firm's accumulated stock of skills. Among these we distinguish technological and networking skills." (*Pennings and Harianto*, 1992) But – as we have already emphasized – in the innovation process we are not simply talking about the utilization of the knowledge stock, rather about the new combinations of existing knowledge elements.

## Correlation between learning and innovation

The strong connection between learning and innovation is evidenced by the comparison of the Lifelong Learning and Innovation Indexes[4] in the case of the EU27. The Lifelong Learning indicator (LLLI) shows the participation of the 25-64 year olds in the various economically useful educational forms – from professional trainings to company trainings. The indicator is often used to illustrate the population's willingness to

learn and its activity in learning. The Summary Innovation index is a composite indicator, which shows the all-around innovation capacities or activities of a given country. As it can be seen in the table, the countries' ranks according to the innovation index follows quite closely our lifelong learning rankings.

Table 2: *Ranking the EU27 on the basis of Lifelong Learning (2010) and Innovation Index (2010)*

| Country | Participation at lifelong learning (%) | Ranking (Lifelong learn) | SII index | Ranking SII | Deviation from Lifelong learning ranking |
|---|---|---|---|---|---|
| Denmark | 32, 8 | 1. | 0,736 | 2. | - 1 |
| Sweden | 24,5 | 2. | 0,75 | 1. | +1 |
| Finland | 23, 0 | 3. | 0,696 | 4. | - 1 |
| UK | 19,4 | 4. | 0,618 | 5. | - 1 |
| Netherlands | 16.5 | 5. | 0,578 | 8. | - 3 |
| Slovenia | 16.2 | 6. | 0,487 | 13. | - 7 |
| Austria | 13.7 | 7. | 0,591 | 7. | 0 |
| Luxembourg | 13.4 | 8. | 0,565 | 10. | - 2 |
| Estonia | 10.9 | 9. | 0,466 | 14. | - 5 |
| Spain | 10.8 | 10. | 0,395 | 18. | - 8 |
| Cyprus | 7.7 | 11-12. | 0,495 | 12. | - 0,5 |
| Germany | 7.7 | 11-12. | 0,696 | 3. | +8 |
| Czech Rep. | 7.5 | 13. | 0,414 | 17 | -8 |
| Belgium | 7.2 | 14. | 0,611 | 6. | +8,5 |
| Ireland | 6.7 | 15. | 0573 | 9. | +6 |
| Italy | 6.2 | 16. | 0,421 | 16. | 0 |
| Portugal | 5.8 | 17. | 0,436 | 15. | +2 |
| Malta | 5.7 | 18. | 0,351 | 20. | - 2 |
| Poland | 5.3 | 19. | 0,278 | 22. | - 3 |
| France | 5.0 | 20-21. | 0,543 | 11. | +9,5 |

| | | | | | |
|---|---|---|---|---|---|
| Latvia | 5.0 | 20-21. | 0,201 | 27. | - 7,5 |
| Lithuania | 4.0 | 22. | 0,227 | 25. | - 3 |
| Greece | 3.0 | 23. | 0,364 | 19. | +4 |
| Hungary | 2.8 | 24-25. | 0,327 | 21. | +3,5 |
| Slovakia | 2.8 | 24-25. | 0,269 | 23. | +1,5 |
| Romania | 1.3 | 26. | 0,237 | 24. | +2 |
| Bulgaria | 1.2 | 27. | 0, 226 | 26. | +1 |

Source: Author's own compilation. The source of the data presented in the table: Eurostat.Lifelonlearning, 2010 (htpp.eurostat.ec.europa.eu/portal/page/portal/education/data/main_tables), and Innovation Union Scoreboard, 2010. Pro Inno Europe, Innometrics, 2011. 1. February.

The strength of the relationship between the SII index and the LLL index is numerically depicted in table 3.

Table 3: *Correlation values related to the Lifelong Learning and SII*

| Results | | Summary Innovation Index (SII) |
|---|---|---|
| Life-long Learning Index | Spearman correlation<br>Sig.<br>N | 0.830<br>.000<br>27 |

**Innovation and competitiveness rankings: strong correlation**

Learning influences innovation through the accumulation of knowledge, and innovation in turn influences economic performance. Of course, economic performance and competitiveness is not only the function of innovation, but in the first decade of the 21st century innovation is a decisive factor of a country's competitiveness. Today the question for firms is not whether they should innovate or not, but how should they go about it (*Prajogo and Ahmed*, 2006).

In Table 4 we try to show the connection between the innovation and competitiveness of EU-countries. The competitiveness index is widely known, therefore in this short paper we are not explaining the way it is calculated.[5] The values for each country are on a 6-point scale, where

6.0 is the highest value. We have already discussed the innovation index. The decisive role of innovation competition in the competitiveness of countries is convincingly shown by the fact that in most cases countries' ranks in the innovation rankings are more or less meeting the rankings on the competitiveness scale. The differences between the two rankings were indicated with a plus sign, when a country stands better on competitiveness than on the innovation scale, and with a negative sign, when they are ranked below than it is expected by the innovation index ranking.

Table 4: *Ranking the EU27 on the basis of the Innovation Index and the Global Competitiveness index*

| Country | Innovation index (SII) 2010 | Innovation index (SII) ranking | (World Competitiveness Index) | Competitiveness (WCI) ranking | Deviation from innovation ranking |
|---|---|---|---|---|---|
| Sweden | 0,75 | 1. | 5,56 | 1. | 0 |
| Denmark | 0,736 | 2. | 5,32 | 5. | -3 |
| Germany | 0,696 | 3. | 5,39 | 2. | +1 |
| Finland | 0,696 | 4. | 537 | 3. | 0 |
| United Kingdom | 0,618 | 5. | 5,25 | 6. | -1 |
| Belgium | 0,611 | 6 | 5,07 | 9 | -3 |
| Austria | 0,591 | 7. | 5.09 | 8. | -1 |
| Holland | 0,578 | 8. | 5,33 | 4 | +4 |
| Ireland | 0573 | 9. | 4,74 | 11 | -2 |
| Luxemburg | 0,565 | 10. | 5,05 | 10 | 0 |
| France | 0,543 | 11. | 5,13 | 7. | +4 |
| Cyprus | 0,495 | 12. | 4,50 | 15 | -3 |
| Slovenia | 0,487 | 13. | 4,42 | 17 | -4 |
| Estonia | 0,466 | 14. | 4,61 | 12 | +2 |
| Portugal | 0,436 | 15. | 4,38 | 18 | -3 |
| Italy | 0,421 | 16. | 4,37 | 20 | -4 |
| Czech Republic | 0,414 | 17. | 4.57 | 13 | +4 |
| Spain | 0,395 | 18. | 4,49 | 16 | +2 |
| Greece | 0,364 | 19. | 3,99 | 27. | -8 |
| Malta | 0,351 | 20. | 4,34 | 21. | -1 |
| Hungary | 0,327 | 21. | 4,33 | 22. | -1 |
| Poland | 0,278 | 22. | 4,51 | 14. | +8 |

| | | | | | |
|---|---|---|---|---|---|
| Slovakia | 0,269 | 23. | 4,25 | 23. | 0 |
| Romania | 0,237 | 24. | 4,16 | 24. | 0 |
| Lithuania | 0,227 | 25. | 4,38 | 19. | +6 |
| Bulgaria | 0, 226 | 26. | 4,13 | 26 | 0 |
| Latvia | 0,201 | 27. | 4,14 | 25 | +2 |

Source: Author's own compilation. The source of the data presented in the table: Innovation Union Scoreboard, 2010. Pro Inno Europe, Innometrics, 2011. 1. February p. 4.; and the World Economic Forum: The Global Competitiveness Report, 2010–2011.

Table 5: *Strong correlation between the innovation and competitiveness*

| Results | | World Competitiveness Index |
|---|---|---|
| Summary (SII) 2010 | Spearman correlation<br>Sig. (2-tailed)<br>N | 0.909<br>.000<br>27 |

The strength of the correlation is numerically depicted in Table 5. We can find countless examples around the world that national governments recognize the decisive role innovation plays in competitiveness, and they are competing to develop programs and new institutions to promote innovation. China has generated a multi-year framework in order to become more innovative. Singapore also has launched several programs to stimulate the innovation. Finland has merged three existing institutions – the Helsinki School of Economics, the University of Art and Design Helsinki and the Helsinki University of Technology – to create a multi-disciplinary "*university of innovation*". The new institution, called Aalto University is a unique, integrated seedbed for innovation, and formally opened in January 2010.[6] We can hardly find such developed or emerging countries, which do not place innovation in the focal point of their strategic plans.

## The social background of innovation: corruption as an innovation barrier

It is important to emphasize that innovation is socially constructed, there is innovation only, where the social climate allows it. János Kornai (2011) in his book considers five preconditions necessary for inventions and scientific achievements to become innovation: 1.) decentralized initiative, individual autonomy and freedom; 2) enormous reward for the

innovators including fame and moral recognition; 3) competition; 4) free experimentation, and the acceptance of failures that come with that; 5) free unengaged money waiting to be invested (pp. 40-41). All such social arrangements that lack these interlinked elements are not suitable for further development.

Numerous foreign and domestic researchers have sought (and found) connection between *innovation and the social environment* (*Hollanders and Arundel,* 2007, *Havas,* 2010, *Bartha* (ed.), 2007.) and we could continue listing them. In one of our earlier papers with my co-author (*Hámori and Szabó*, 2010) we attempted do the same. Our approach is perhaps somewhat special in that regard that – *following Kornai* – we do not emphasize one or another, or perhaps several accentuated factors, rather we highlight the *interrelation between environmental factors* and their logical organization. In other words, we consider the *complexity of social relations* as decisive in terms of innovation.

In this short paper however, we connect only one social factor to the innovation capacities of nations. This factor is *corruption*, in which, as a drop in the sea, the complexity of the social environment serving as a social background for innovation is reflected (table 6). Since, where the corruption index is high, so where corruption is not that significant, there is place for achievements and for innovation. (The index contrary to traditional logic, measures corruption "inversely", so a high CPI index means low corruption, and the maximum value of 10 indicates the ideal situation, if a country is completely devoid of corruption.)

Table 6: *Ranking the EU27 on the basis of the Corruption Index (CPI) and the Summary Innovation Index (SII)*

| Country | Corruption Index (CPI) | CPI Ranking | Innovation Index (SII) | SII ranking | The deviation of the SII from the Corruption ranking |
|---|---|---|---|---|---|
| Denmark | 9.3 | 1. | 0.414 | 2. | -1 |
| Sweden | 9.2 | 2. | 0.750 | 1. | +1 |
| Finland | 8.9 | 3. | 0.696 | 3. | 0 |
| Holland | 8.9 | 4. | 0.578 | 8 | -4 |
| Luxemburg | 8.2 | 5. | 0.565 | 10 | -5 |

| | | | | | |
|---|---|---|---|---|---|
| Germany | 8.0 | 6. | 0.696 | 4. | +2 |
| Ireland | 8.0 | 7. | 0.573 | 9 | -2 |
| Austria | 7.9 | 8. | 0.591 | 7 | +1 |
| United Kingdom | 7.7 | 9. | 0.618 | 5 | +4 |
| Belgium | 7.1 | 10. | 0.611 | 6 | +4 |
| France | 6.9 | 11. | 0.543 | 11 | 0 |
| Cyprus | 6.6 | 12. | 0.495 | 12 | 0 |
| Estonia | 6.6 | 13. | 0.466 | 14 | -1 |
| Slovenia | 6.6 | 14. | 0.487 | 13 | +1 |
| Spain | 6.1 | 15. | 0.395 | 18 | -3 |
| Portugal | 5.8 | 16. | 0.436 | 15 | +1 |
| Malta | 5.2 | 17. | 0.351 | 20 | -3 |
| Hungary | 5.1 | 18. | 0.327 | 21 | -3 |
| Poland | 5.0 | 19. | 0.278 | 22 | -3 |
| Lithuania | 5.0 | 20 | 0.227 | 25 | -5 |
| Czech Republic | 4.9 | 21. | 0.414 | 17 | +4 |
| Latvia | 4.5 | 22. | 0.201 | 27 | -5 |
| Slovakia | 4.5 | 23. | 0.269 | 23 | 0 |
| Italy | 4.3 | 24. | 0.421 | 16 | -8 |
| Bulgaria | 3.8 | 25. | 0.226 | 26 | +1 |
| Greece | 3.8 | 26. | 0.364 | 19 | +7 |
| Romania | 3.8 | 27. | 0.237 | 24 | +3 |

Sources: Pro Inno Europe, Innometrics, 2011. Transparency International (2010): Corruption Perception Index.

Low corruption index, in other words strong infestation with corruption, questions the prevalence of the notion of achievement, there is no incentive for innovation, since economic success is only dependent on connections and size of the corruption payments. This is clearly proved by the strong correlation of the corruption index and the innovation index, which can be seen in the table 7:

Table 7: *Strong correlation between corruption and innovation*

| Results | | Summary Innovation Index (SII) 2010 |
|---|---|---|
| Corruption Perception Index 2010 | Pearson correlation | 0.925 |
| | Sig. (2-tailed) | .000 |
| | N | 27 |

It is not surprising that we can find a very strong correlation between the *corruption in*dex and the *SII index*. Only in those countries the social environment is favourable to innovation, where the CPI is high, in other words, where the country in practically free of corruption, or at least not that infested with corruption. If the later is true, so in the country corruption is quite virulent, then the individuals' income much more dependent on their connections, than on innovation. In the corrupt systems, in general, freedom (freedom of press and individual liberty rights), the eminent precondition of innovation, is limited, since this is the only way to hush up cases of corruption, and to force society to accept the extremely unfair income distribution that is the result of corruption. In these cases the notion of achievement evidently cannot work strongly, thus in the corrupt systems usually growth and capital formation is weak as well. Exception are those countries that have oil or other natural resources, but even in their case the productive capital formation is still quite limited, the ill-gotten income is usually utilized in an unproductive manner by the beneficiaries of corruption. Thus the corrupt countries provide an in every respect unfavourable climate for innovation compared to the clear transparent systems. This is convincingly supported by the unusually high 0,925 value of the correlation between the CPI and the SII indexes.

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There is quite a lot of confusion around learning (both individual and organizational learning), knowledge and innovation, these concepts are often used as synonyms, and there are no widely accepted agreements on the content of these terms. "As a result of this confusion, theorists have referred to learning as (a) new insights or knowledge (*Argyris* & Schön, 1978; Hedberg, 1981); or (b) new structures (*Chandler,* 1962); or (c) new systems (*Jelinek*, 1979; *Miles*, 1982); or (d) mere actions (*Cyert & March*, 1963; Miller & Friesen, 1980); or (e) some combination of the above (*Bartunek*, 1984; *Shrivastava* & Mitroff, 1982)."[7] (*Fiol and Lyles*, 1985) The confusion is even bigger in the case of innovation. Without

clear definitions, without clarifying the relationship between these fundamentally important economic phenomena, it is difficult to develop a scientific dialogue about the topic. However, there is a consensus in one regard among the exponents of the various schools. The significance of learning and innovation, their decisiveness in economic development and the competitiveness and survival of firms is not questioned by anyone.

## Acknowledgement

The paper was prepared in the framework of the sponsoring contract of TÁMOP 4.2.1. B 09/1/KMR-2010.0005, under the subproject titled: The knowledge based economy in Hungary, The Conditions for Strengthening the Innovative Approach and Increasing The R&D Performance. The author is grateful to the members of his research group: primarily to professor Katalin Szabó (Corvinus University of Budapest); Anita Derecskei (PhD student at the University of Szeged); Izabella Feierabend (PhD student at the Corvinus University of Budapest), Tamás Harangozó and Miklós Rosta assistant lecturers (Corvinus University of Budapest); Attila Molnár (psychologist, Co-Va), and László Tóth assistant professor (Corvinus University of Budapest) for their comments to the paper, and to all participants of the debate about the paper at the conference of Partium Christian University held on October 27th-29th, 2011 for their valuable comments.

## Notes

[1] Charles F. Kettering, in full Charles Franklin Kettering (born Aug. 29, 1876, Loudonville, Ohio, U.S–died Nov. 25, 1958, Dayton, Ohio), American engineer whose inventions, which included the electric starter, were instrumental in the evolution of the modern automobile.

[2] Quoted in Management Today, 2011. September, p. 40.

[3] http://keithsawyer.wordpress.com/2008/09/26/harvard-talk-on-learning-and-innovation/

[4] The Summary Innovation Index is calculated by the *unweighted* (!) average of 24 standardized partial indices strongly related to innovation capacities. For more details on the index see Szabó (2009).

[5] The IMD (International Business School for Management Development), founded

in 1990, publishes the rankings of the countries of the world annually, which is established by the summary of numerous partial indices creating a composite index. In the most recent version in 2011 they condensed into a single number and calculated the competitiveness index by applying 331 criteria and partial indices for 59 countries.

[6] Source globalhighered.wordpress.com/.../finlands-aalto-university/:

[7] The sources indicated by *Fiol and Lyles* (1985) are not included in the references. The reader can find these among the references of the quoted paper.

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# KNOWLEDGE AND INNOVATION IN AGRICULTURAL ECONOMY

Jozsef TÓTH* and Áron TÖRÖK*

*The small and medium sized enterprises (SMEs) in the Hungarian agri-food sector play determining role. However, the innovation capacity (efforts, activities and results) of the individual SMEs is very limited. Food production (including SMEs) has to fulfil food safety requirements in a rapidly increasing extent, which implies a continuous innovation and development process from all market players. In Hungary the agri-food sector had to face a suddenly increased competition especially after the EU enlargement. Based on survey data this paper examines the efforts, activities and results in knowledge acquisition, utilisation, coordination and transfer in the Central Hungarian food SMEs. We have found (using ordered logistic regression) that R&D expenditures, achieved innovations, export/import orientation as well as the networking activity of the SMEs play significant role in market development.*

**Keywords:** Hungarian agri-food SMEs, innovation capacity, knowledge management, ordered logistic model

**JEL codes:** Q16, O13, O32

## 1. Introduction

The innovation capacity (efforts, activities and results) of the individual small and medium sized enterprises (SMEs) is very limited. They have to restrict themselves due to their resource constrains. On the other side food production (including SMEs) has to fulfil food safety requirements in a rapidly increasing extent, which implies a continuous innovation and development process from all market players who are involved in the food chain (Ziggers and Tjemkes, 2010; Kühne and Gellync, 2010b). It is widely recognised that knowledge accumulation and coordination as base of innovative solutions for the production and technological processes can play decisive role in keeping the firms in competitive position (Alston, 2010).

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During the last two decades the Hungarian agri-food sector had to face dramatic changes in its competitive environment. In addition the shock of transition process, retail revolution has evolved much faster than in Western European countries. Structural change in retailing, processing and farming, together with growing market saturation and increasing consumers' concerns regarding product and process quality, have had strong influence not only on the organization and structures, but also on the generation of profits along the food chain. Moreover, the agri-food sector had to face a suddenly increased competition especially after the EU enlargement in 2004 (Csáki, 2005, 2007). As a results of these pressures, agri-food chain, which is generally assumed as mature and relatively low technology sector has been forced to introduce changes affecting all aspects of operation. The only chance for them to overcome the stress of the recent economic crisis is if they explore their innovation capacities through their improved networking activities (Kühne *et al.*, 2007; Kühne and Gellync, 2010b).

This paper examines the efforts, activities and results in knowledge acquisition, utilisation, coordination and transfer in the Hungarian food SMEs. The aim of the paper is to determine the pattern of innovation along the food chain focusing on the relationships between the inclination to innovate and a set of firm characteristics. The novelties and contributions of the paper to the literature are twofold. First, although there is increasing literature on the innovation in food industry, but similar research is very limited in the Central and Eastern European countries. Second, contrary to previous studies which concentrated mainly on processors' innovation activity we investigate three stages of food chain: producers, processors, and retailers. This approach allows us to get more insights to better understanding of food chain.
Although innovation is a key concept in economics and widely investigated, there is no unified approach of measuring innovation. Following Lundwall (1992) definition of innovation we focus on four aspects of innovation: product innovation, process innovation, organisational innovation and market innovation. Previous research identified a wide range of determinants of innovation including internal and external factors. We focus on factors which may explain the market success of the firms. These factors are directly linked to innovation (product-, process-, etc.) as well as indirectly influence the sales (like market and export orientation, participation in network activities, etc.)

Our sample is based on a stratified survey 231 SMSs from the agri-food chain: agricultural producers, processors and traders) carried out in the Region of Central Hungary.
We present our results in steps. The first step in the empirical work was an exploratory analysis (principal component analysis) aimed at identifying factors that can help understand food firms' differentiations and which can be used to get an overview of the relationship between firm characters and innovativeness. These relationships were first verified by testing for differences among means. As the next step we then carried out a quantitative analysis to regress characteristics from PCA, to express the propensity to innovate. The third step tests whether the innovation capacity of the firms play significant role in formulating the market development. We regress the firms' R&D expenditures, innovation activity variables, export/import orientation and networking activity against the sales.
Both the exploratory and quantitative analyses revealed the importance of the presence of internal R&D as well as readiness to react on market signal variables to explain the propensity to innovate. The empirical analysis shows that, in the Hungarian agri-food sector, innovation adoption follows different patterns when different level of food chain is considered. Our results highlight the need to provide for diversified intervention strategies to stimulate and enforce innovation in the Hungarian agri-food sector.

## 2. Literature overview

At the end of the 20th century the role of the knowledge has appraised in every field of the economies, the decreasing importance of the knowledge and capital intensive industries accompanied the appraise of the knowledge intensive organizations and their services (Dobrai and Farkas, 2009). Not only theoretical assumptions but also empirical researches prove that the knowledge intensive services are the keys for the success in every field of the modern business. The small and medium sized enterprises use these services usually as external resources.

The capacity of SMEs for innovation is very limited. The development and the maintenance of such capacities are usually facing the limit of

these companies. On the other hand, there are some industries (e.g. winery) where the high level of competition requires having an innovative management attitude. The limited internal resources and the unused economics of scale force the enterprises to use external resources for the extension of the organizational knowledge and for the effective use of the results of the innovation (Kühne and Gellynck, 2010a).

The agricultural SMEs producing traditional products use vertical and horizontal integration to overcome their deficiency in the field of knowledge and information. The research of Kühne and Gellynck (2010b) focusing on Belgium, Hungary and Italy showed that though some examples exist of both vertical and horizontal integration, the cooperation usually fails because of the lack of trust, the inefficient capital and other resources and the skepticism of cooperation.
The success of the agricultural SMEs requires many preconditions. Because of the size-limits these companies – operating usually as family run businesses – have to be very flexible. In North-Carolina – where the number and proportion of family run businesses is over the average of the USA – the success of local farmers depends mainly on six factors (Yeboah *et al.*, 2010). In addition to important management skills (clear goals, management experiences, financial expertise) and the efforts of product differentiation (special products, diversified activities) the authors state that the access to knowledge is the most important key of success. The smaller organizations can only turn their flexibility to advantages if they are in possession of the required knowledge.

Mihailovic *et al.* (2009) made a research for the former socialist countries and found that the knowledge gained from researches and education could lead the agricultural SMEs towards innovation and technological development. On the other hand, the inherited knowledge in the former Eastern Block is hardly could be transform to innovative advantage, as far the centralized researches were not carried out according to the needs of the market. Therefore the first step should be the establishment of such cooperation where the public research capacities are working together with the private sector.

Based on the Czech experiences of the project called „Best European Practices" the knowledge share of the universities and the research institutes have an important role to increase the level of competitiveness

(Tichá and Havlícek, 2008). Therefore these institutions are under a growing pressure in order to fulfil such needs.
It is a general concept that the SMEs use their innovative capacities in order to gain and maintain competitive advantages (Alston, 2010).

## 3. Data and methodology

Data was drawn from a survey carried out in Central Hungary and aiming at the research of cooperation and knowledge management within the SMEs of the food economy. The questionnaires were filled out by trained BSc students and professional interviewers. 231 interviews have been collected according to the structure outlined in Table 1.

Table 1: *The survey structure: number of firms answered*

| | Micro | Small | Medium | **Total** |
|---|---|---|---|---|
| Producer | 20 | 38 | 4 | **62** |
| Processor | 15 | 33 | 4 | **52** |
| Retailer | 20 | 71 | 7 | **98** |
| Other | 2 | 3 | 0 | **5** |
| **Total** | **57** | **145** | **15** | **217** |

Source: Authors' own calculations

However the literature of innovation and knowledge management is rapidly increasing in the recent years, we hardly can find predecessor ones around the Hungarian agricultural- and food sector. Therefore we have started with the exploration of the field in question. Exploratory data analysis (EDA) helps us to maximize insight into a data set and discover underlying structure, which is vital viewpoint in our case. However, we did not use the total arsenal of EDA, but only a single element, the Principal Component Analysis (PCA). PCA is especially useful if the underlying structure is not properly discovered (Patterson *et al.*, 2006). Before we carried out PCA we have tested our original survey data for factor simplicity, using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy. For determining the number of components we applied the Kaiser criterion. Regarding the relative great number of original variables we put the criterion for 2.

According to the previous knowledge (c.f. Alston, 2010), we assumed that the differences between the marketing position (the total turnover) of the firms can be significantly explained by the variation of their innovation's principal components. In the questionnaire we asked not for exact turnover, but turnover categories, because the firms are very cautious of providing sensitive information from themselves. In order to check this assumption we have used logit regression on the revealed principal components. Ordinary logistic regression was applied, because the distance between the adjacent turnover categories is not equivalent and at the same time the categories are ranked from low to high.

The SMEs of the food chain in Central Hungary doesn't compose a homogenous society. Therefore it is also a part of the exploration to point out these differences among them. Basically two dimensions of differentiation can be of interest: along the chain and according to size. The identification along the chain was simple: it was based on their main activity. For the size dimension we could have used the EU standard (micro-, small- and medium employee- and turnover categories), but in this case just a few (not more than 10) firms would have belonged to the "small" category and 2 to the "medium" one. For this reason we applied different categorization, but which is in accordance with the Hungarian standards: a firm is "Micro" in our investigation, if its yearly total turnover is less than 10 million HUF (roughly 40.000 €), "Small" if the turnover is between 10 million and 500 million HUF (between 40.000 and 2 million €) and "Medium" above this amount.

For testing the difference among the principal components along the chain and according to size we used oneway ANOVA as well as Bonferroni, Scheffe, and Sidak multiple comparison tests. These tests examine the differences between each pair of means.
In order to reveal the importance of innovation capacity in formulating the market success we have applied ordered logistic regression for these variables against the market sales. We have tested the first results for the violation of parallel regression assumption with Brant test and after that we used generalized ordered logit model in order to recover the appropriate and significant odds ratios.

## 4. Hypotheses

The examined literature as well as our a priori knowledge has suggested that the innovation characteristics of the firms play significant role in explaining the differences between the performance and behaviour of the organization. We put three hypotheses which have been tested during the empirical analysis.

H1: *There exist factors which explain the differences between the firms' innovation capacities*
The limited innovation capacity (efforts, activities and results) of the individual small and medium sized enterprises (SMEs) means limited resource for the companies. The firms are necessarily different from each other in the sense that they put different emphasis on the different components of this resource. However, the complex effect of these effort, managerial routines and activities result in heterogeneous innovation capacity.

H2: *These factors play significant role in formulating the firms' market positions*
If the innovation capacity of a firm is a real economic resource, the extent of efficient use of this resource contribute in positive or negative way to the market realization of the firms' product and services. We assume that the more intensive use of this source comes together with better market position.

H3: *The factors differ from each other along the food chain and according to the size*
The non-homogeneity nature of the inquired firms incorporates the variance in many aspects. From our point of view the most important dimensions are the position which is occupied by the firm along the food chain, and the size of the firm. According to the previous studies (Gellynck *et al.*, 2009) the differences are bridged by the quality of relationship between the companies and continuously change during the time.

H4: *The innovation capacity of the firms play significant role in determining the market success*
The innovation capacity (efforts, activities and results) of the individual small and medium sized enterprises (SMEs) is very limited. They have

to restrict themselves due to their resource constrains. The current hypothesis checks whether these activities and efforts lead to business success in terms of market sales. We assume that R&D expenditures, innovation activity and results, export/import orientation as well as participation in social cohesion (networking with other SMEs) positively influence the development of sales.

## 5. Results

The analysis was made in steps outlined above and the results are arranged according the hypotheses. We are aware that the scope of scientific problems and questions is much broader than is treated below, but during the exploration of the topic these were the very first questions which were due to start with.

*Result 1*
Table 2 summarizes the result of the principal component analysis. The eigenvalue of the seventh principal component was less than 2, so this one and all the other components afterward have been dropped from the analysis. The names of the components were given according to the highest component weights.

Table 2: *Principal components of the surveyed data*

| | | Proportion |
|---|---|---|
| pc1 | Knowledge accumulation | 19,5% |
| pc2 | Product innovation | 12,4% |
| pc 3 | Anticipated innovation advantages | 9,3% |
| pc 4 | Technological innovation | 5,9% |
| pc 5 | Organizational innovation | 5,4% |
| pc 6 | Innovation environment | 4,6% |
| | **Total** | 57,1% |

Note: Kaiser-Meyer-Olkin Measure of Sampling Adequacy, KMO = 0.701
Source: Authors' own calculations

*Result 2*

Table 3 shows the output of the Stata computation. The analyses have resulted in three significant components out of six ones.

**Table 3:** ***Comprehensive statistics of the ordered logistic regression***

```
. ologit Turnover pc1 pc2 pc3 pc4 pc5 pc6

Iteration 0:   log likelihood = -216.68869
Iteration 1:   log likelihood = -210.46211
Iteration 2:   log likelihood = -210.39266
Iteration 3:   log likelihood = -210.39259
Iteration 4:   log likelihood = -210.39259

Ordered logistic regression                     Number of obs   =        126
                                                LR chi2(6)      =      12.59
                                                Prob > chi2     =     0.0500
Log likelihood = -210.39259                     Pseudo R2       =     0.0291
------------------------------------------------------------------------------
    Turnover |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         pc1 |   .0953689   .0534975     1.78   0.075    -.0094843    .2002221
         pc2 |   .0425345   .0702079     0.61   0.545    -.0950705    .1801395
         pc3 |   .1601305   .0797549     2.01   0.045     .0038138    .3164473
         pc4 |  -.0648899   .1042558    -0.62   0.534    -.2692274    .1394477
         pc5 |  -.1361994   .1073976    -1.27   0.205    -.3466948    .0742961
         pc6 |    .229926   .1165287     1.97   0.048     .001534     .4583179
-------------+----------------------------------------------------------------
```

Source: Authors' own calculations

*Result 3*

The third hypothesis assumes that there are significant differences among the means of the principal components. Table 4 comprises the results of the mean comparisons.

Table 4: *Mean differences along the chain and according to size*

| | Producer-Processor | Producer-Trader | Processor-Trader | Micro - Small | Micro - Medium | Small - Medium |
|---|---|---|---|---|---|---|
| pc1 | | | | | | |
| pc2 | | ** | *** | * | | ** |
| pc3 | ** | *** | | | | |
| pc4 | *** | *** | | ** | | |
| pc5 | *** | ** | | | | |
| pc6 | | | | ** | | |
| | Source: own estimation based on survey data | | | | | |
| | Note: * p<0.1; ** p<0.05; *** p<0.01 | | | | | |

Source: Authors' own calculations

*Result 4*

Table 5 shows the significant factors on the level of sales derived from the sample. According to the calculations the age of the organizational structure, the source of new ideas and the activity in the external trade plays a significant (p<0,05) role on the level of the sales. On the other hand it is important to mention that that the Brant test shows that the parallel regression assumption has been violated therefore we cannot generalize the results.

Table 5: *Significant factors on the level of sales*

Ordered logistic regression — Number of obs = 137; Wald chi2(11) = 42.96; Prob > chi2 = 0.0000

Log pseudolikelihood = -102.36115 — Pseudo R2 = 0.1984

| sales | Odds Ratio | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| #K5_511 | .7127048 | .1195101 | -2.02 | 0.043 | .5130689 | .9900193 |
| K5_201 | 2.094005 | .6663552 | 2.32 | 0.020 | 1.122298 | 3.907036 |
| K4_301 | 4.546942 | 2.624096 | 2.62 | 0.009 | 1.467171 | 14.09153 |
| K4_302 | 3.553339 | 2.026937 | 2.22 | 0.026 | 1.161674 | 10.86899 |

| | | | | |
|---|---|---|---|---|
| /cut1 | -1.953071 | 1.541453 | -4.974264 | 1.068122 |
| /cut2 | 1.835016 | 1.549589 | -1.202122 | 4.872154 |

(#) K5_511: The age of the organizational structure
K5_201: The source of new ideas
K4_301: Export orientation
K4_302: Import orientation

Source: Authors' own calculations

Finally we distributed the sample to three different groups according to the level of the companies' revenue. After the gologit calculations we compared the results of the permeability between the different groups. We could find significant results rather only in the group of the companies with higher level of sales. Table 6 shows the significant results of these the groups.

Table 6: *Significant factor of the companies*

Generalized Ordered Logit Estimates — Number of obs = 137
Wald chi2(22) = 43.03
Prob > chi2 = 0.0047
Log pseudolikelihood = -96.808585 — Pseudo R2 = 0.2419

| sales | Odds Ratio | Robust Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| # K5_201 | 1.902883 | .6593368 | 1.86 | 0.063 | .9648868 | 3.752736 |
| 2 | | | | | | |
| # K5_511 | .649442 | .1231775 | -2.28 | 0.023 | .4478121 | .941857 |
| K5_512 | .615727 | .1312348 | -2.28 | 0.023 | .4054757 | .9349999 |
| K5_201 | 2.534936 | 1.307739 | 1.80 | 0.071 | .9222395 | 6.967716 |
| K5_301 | .3580049 | .2034525 | -1.81 | 0.071 | .1175317 | 1.090493 |
| K4_301 | 6.385361 | 3.770682 | 3.14 | 0.002 | 2.006938 | 20.31594 |
| K4_302 | 4.562839 | 2.726777 | 2.54 | 0.011 | 1.414336 | 14.72034 |
| K4_206 | 7.468038 | 6.028978 | 2.49 | 0.013 | 1.534716 | 36.34001 |

(#) K5_201: The source of new ideas
K5_511: The age of the organizational structure
K5_512: The age of the marketing channels
K5_301: Share of the new ideas coming from inside of the company
K4_301: Export orientation
K4_302: Import orientation
K4_206: Cooperation in purchase

Source: Authors' own calculations

## 6. Discussion and conclusions

The main purpose of this survey is to show up successful patterns for the food and agricultural SMEs in Central Hungary. Our scientific conviction is that the proper treatment of innovation issues within the management of the SMEs can help in successful surviving of the current economic and financial crisis. Only the innovation capacity as economic resource of a firm will not get amortized if it is treated in proper manner. From the other side, the appropriate use of organizational knowledge is a key factor in achieving better market positions.

The SMEs are surrounded by an extremely challenging business environment, where they are pressed both by the suppliers and consumers to innovate. Regarding that their innovation capacity is very much limited; they can utilize this specific economic resource in an efficient way only if they cooperate with other business players.

The scope of this paper partly includes this latter point. As the main target, we were focusing on the main characteristics of innovative behaviour of the agri-food SMEs in Central Hungary, because there is almost no research activity in this field.

Our analysis was made in four steps. **First** we have identified the innovation factors which might explain the differences among the firms. We have found six components which were to be tied to specific innovation areas. The ranking of them shows that the most important factor is the knowledge accumulation: it comprises almost 20% of the original variables' explanation power. It seems to be a bit surprising that the second

one of ranking is the product innovation. In the agri-food industry the product innovation plays usually a rather limited role (Kühne and Gellynck, 2010b). We need to treat this result with care and also need to come back to this point in our next survey.

As a **second** step we carried out an ordered logistic regression so that we could determine the contribution of the principal components (innovation capacity) to the improvement of market position of the firms. Our expectation was that all of them play significant positive role in formulating the turnover. However we experienced that the half of them (**pc1** – Knowledge accumulation, **pc3** – Anticipated innovation advantages and **pc6** – Innovation environment) are significant and positively influence the revenue. The interpretation of these results need some care because coefficient has got other meaning than in the ordinary regressions. Regarding that we applied turnover categories, the pc6 coefficient (0,229926) for example means that if the value of pc6 increased by 1%, the odds of getting into one turnover category higher would be 1,26 (= $e^{0,229926}$).

Within the **third** step we have verified that the companies show up different profiles with respect to their innovation capacity. We have tested the equivalence of means of principal components along the chain and according to size. We made pair comparisons. Due to that procedure we could have made mistakes deriving from the order of subgroups. But the number of the subgroups was just 3 and we carried out three tests which could have revealed if we had made any mistake in the evaluation.

**Finally** we've found that we cannot generalize our assumptions for all the subgroups, the Brant test shows that there are significant differences. Our findings underline that the higher the level of the sales of the selected firm the more significant factors exist those have a great influence on the revenue. Therefore we can say that among the firms with high level of sales the activity in external trade and the cooperation in purchase have a positive effect on the revenue. This later one underlines that the role of cooperation and the networks play an important role in this field. Regarding the innovation the results say that the more new idea is coming from inside of the companies, the more successful the firm is. The negative correlation of the sales with the age of organiza-

tional structure and marketing channels refer to the fact that among the selected company the quick reaction on external and internal change of conditions results t success. The more up to date the firm is in these fields the higher level of sales could be expected.

The results unambiguously show the existence of knowledge-related factors which may explain the differences in the innovation capacity of the food SMEs in Central Hungary. A large share of these factors contributes positively to increasing the firms' turnover. The mean differences are more pronounced along the chain than according to size.

**Acknowledgement**
The research is supported by TÁMOP-4.2.1/B-09/1/KMR-2010-0005 and Hungarian Scientific Research Fund (OTKA), K 84327 „Intergation of small farms into modern food chain"

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# KNOWLEDGE AND PERCEPTION ON SUSTAINABLE ENERGY DEVELOPMENT

Štefan BOJNEC* and Drago PAPLER**

*The sources of energy use by alternative and nuclear energy and fossil fuel energy consumption vary by European countries. The percentage of alternative and nuclear energy in total energy use in Slovenia is above the European Union (EU) as well as the world levels, but it is lower than in France and it is at a similar level as in the Slovak Republic. The major source of energy consumption in European countries as well as in the world is fossil fuel energy, where the Slovenian share is lower than the EU or the world averages, and it is a slightly lower than for the Slovak Republic, but higher than in France. Sources of electricity production also vary by European countries. In Austria the major source are hydroelectric sources, while in Hungary, the Slovak Republic and Slovenia, these are nuclear energy sources. Coal sources are the most important inputs for electricity production in the Czech Republic. In Italy, the major source of electricity production is natural gas. Electricity prices for households in European countries vary. Slovenia is in a group of countries with prices below the EU-27 average.*

*One of the objectives of the EU is an increase in supply and use of energy from the renewable sources of energy. The importance of the field of education on the perception on sustainable energy development is studied on the basis of the empirical research of the survey evidence that is obtained by the written questionnaire. The 516 in-depth surveys were conducted among the scholars, students, and employees from social sciences, natural sciences, electrical energy supply, and energy management in the six different towns in Slovenia. The surveys data are analysed by using descriptive statistics and different tests for homogeneity of variances and mean values. The significance of production of renewable sources of energy from different sources has been confirmed, but there are significant differences in the perceptions on sustainable energy development by the studied educational groups.*

**Keywords:** source of energy, energy consumption, renewable sources of energy, electricity production, educational groups, perception and promotion of sustainable energy development
**JEL codes:** I25, L94, 013, Q43

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## Introduction

Energy markets in Europe have been gradually liberalised with an aim to encourage competition and to increase market efficiency (Papler and Bojnec, 2007, 2012; Bojnec and Papler, 2010). The rationalisation and efficiency improvements in the energy markets are needed due to the rapid increase in energy consumption with increasing environmental awareness and climate change. The energy consumption has increased rapidly due to two main reasons: first, fast population growth, particularly in some developing countries and second, income growth in both developed and some developing countries.

In this paper we focus on two main issues. First, on sources of energy consumption in European countries, on sources of electricity production in selected European countries, and on electricity price comparisons between selected European countries to present different international and national perspectives of energy consumption and electricity production focusing on a particular situation in Slovenia. Second, by using the survey data on the analysis of perceptions on the role of renewable sources energy in production and use of energy that managers and energy users have in Slovenia. The important role in the dissemination of knowledge on a greater use of renewable sources of energy has the promotional and education activities towards an increase in supply and use of energy from the renewable sources of energy.

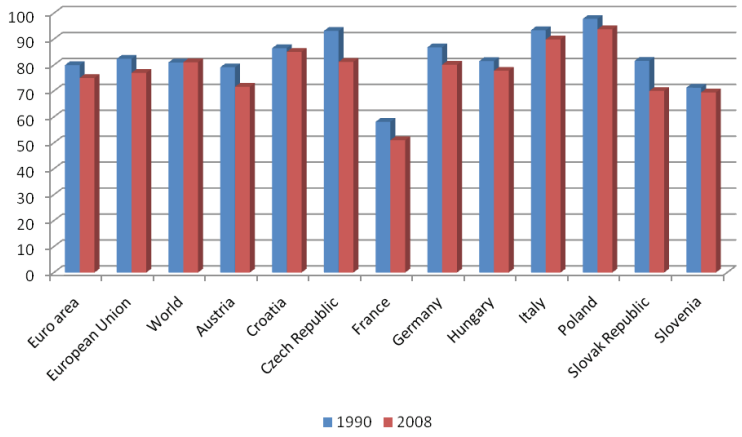
The rest of the paper is organized in the following way. First, we present and illustrate energy consumption and electricity production by source in selected European countries that are boarding Slovenia or they are important for the Slovenian energy and electricity markets. Second, European electricity prices for households are analysed and compared to provide an illustration how these prices might be at different levels by the neighbouring countries. Third, there is a unique in-depth study on consumers' perceptions on sustainable energy development in terms of sources of energy supply and the role of renewable sources of energy. Slovenia is used as a case study. Finally, main conclusions with policy implications are derived from the empirical analysis.

## European energy consumption and electricity production by source

During the recent years a particular focus has been to achieve greater economic efficiency with less energy consumption per unit of product and to contribute to sustainable economic development with considering environmental issues (Bojnec and Papler, 2011b). Regarding the energy production from renewable sources of energy also for European needs, a potential is seen in solar electricity production and use, which can at the same time help to promote economic development in developing countries like in Northern Africa (Bojnec and Papler, 2011a).

However, sources of energy consumption and electricity production by sources vary by European countries. The major source of energy consumption is fossil fuel energy. Figure 1 presents the percentage of fossil fuel energy consumption in total energy consumption. Fossil fuel comprises coal, oil, petroleum, and natural gas products. While the share of fossil fuel energy consumption in total energy consumption is the most important and rather stable in the world energy consumption during the last two decades, its relative importance has declined in European countries. Among the analyzed EU countries, its share is the highest for Poland and the lowest for France. Slovenia has a slightly lower share than its neighbouring countries (Austria, Croatia, Italy and Hungary).

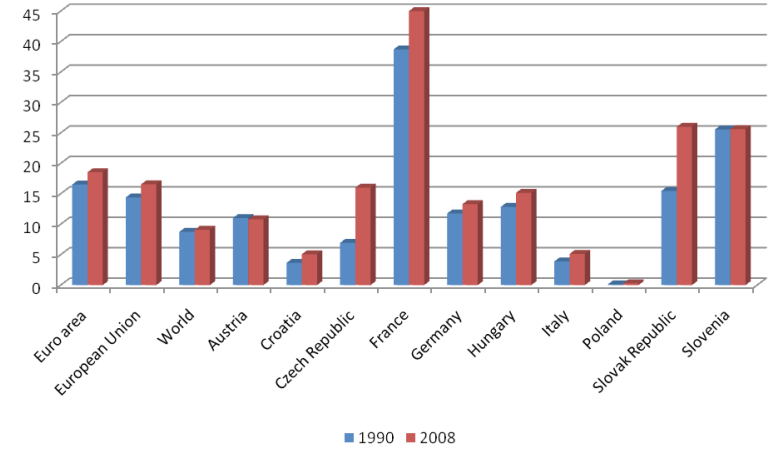
Figure 1: *Fossil fuel energy consumption (% of total)*




Source: IEA (2011) and WB (2011).

Figure 2 compares the percentage of alternative and nuclear energy in total energy use. Clean energy is noncarbohydrate energy that does not produce carbon dioxide when generated. It includes hydropower and nuclear, geothermal, and solar power, among others. As can be seen, this share is the highest for France and to a lesser extent for the Slovak Republic with the increasing tendencies, while Slovenia has had the stable percentage during the last two decades at the level of around one quarter of total energy use.

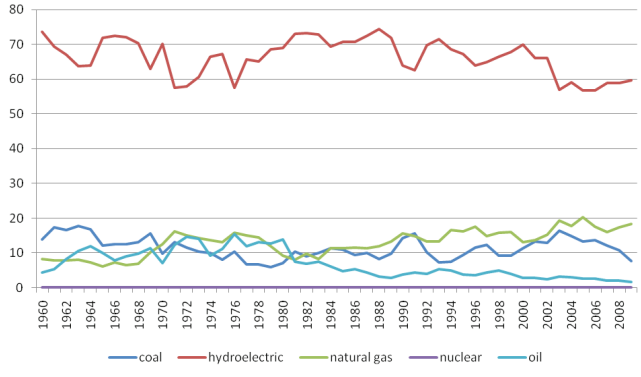
**Figure 2:** *Alternative and nuclear energy (% of total energy use)*




Source: IEA (2011) and WB (2011).

Sources of electricity production refer to the inputs used to generate electricity (IEA, 2011). In Austria, the major source of electricity production is electricity production from hydroelectric sources with around 60% of total electricity production (Figure 3). There is a slight increase in the percentage of electricity production from natural gas sources, and vice versa decline in the percentage of electricity production from coal and oil sources. Yet, there is no electricity production from nuclear sources.

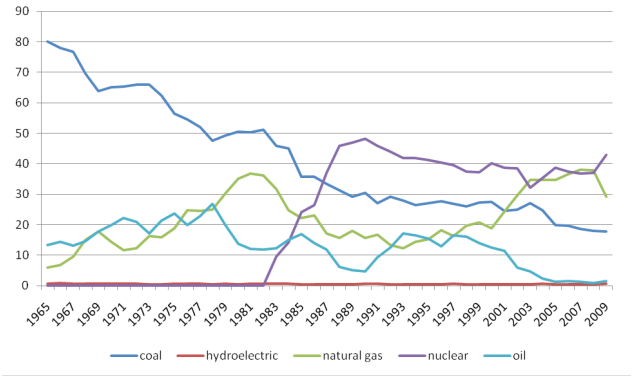
Figure 3: *Austrian electricity production by source, 1960-2009*




Source: IEA (2011) and WB (2011).

In Hungarian electricity production hydroelectric sources are not important (Figure 4). On the other hand there has been an increase of electricity production from natural gas and nuclear energy sources. Electricity production from coal sources has declined substantially. During the last years the decline is also seen for electricity production from oil sources, which with high oil prices on world markets has almost disappeared from the Hungarian electricity production.

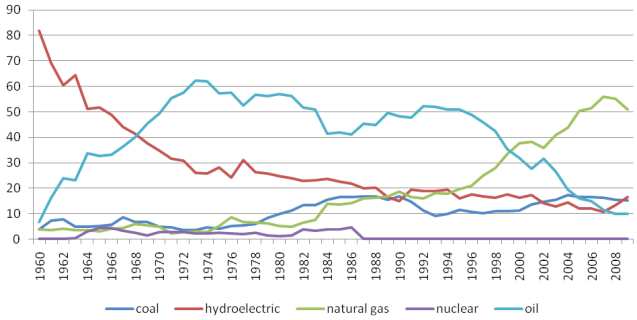
Figure 4: *Hungarian electricity production by source, 1965-2009*




Source: IEA (2011) and WB (2011).

In Italy, the major source of electricity production is natural gas sources (Figure 5). Except for the last years, there is seen a decline for the percentage of electricity production from hydroelectric sources. There is no anymore electricity production from nuclear sources, while electricity production from coal sources has declined substantially during the last decade.

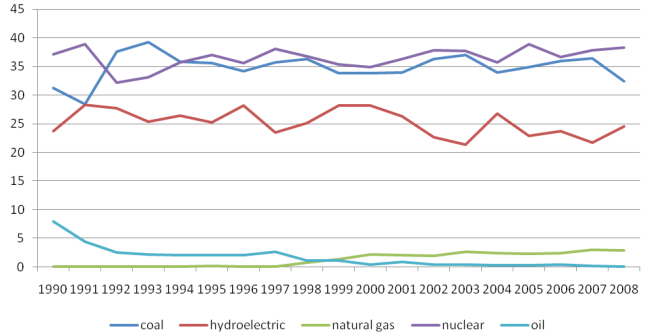
**Figure 5:** ***Italian electricity production by source, 1960-2009***




Source: IEA (2011) and WB (2011).

In Slovenia, the single most important source of electricity production is nuclear source, which tends to increase a slightly (Figure 6). In addition to nuclear sources, there are also important coal and hydroelectric sources with cyclical oscillations by years. Similar as for Hungary, oil sources in Slovenia has become less important for electricity production. The importance of natural gas has slightly increased.

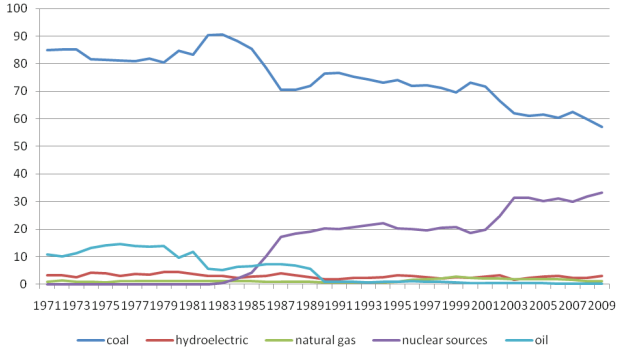
**Figure 6:** ***Slovenian electricity production by source, 1990-2008***




Source: IEA (2011) and WB (2011).

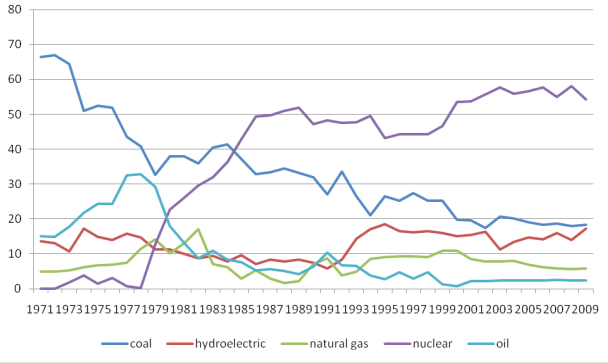
Coal sources are the main source of electricity production in the Czech Republic (Figure 7). Its importance tends to decline by an increasing importance of nuclear sources. Hydroelectric and natural gas sources are less important inputs for electricity production in the Czech Republic.

**Figure 7:** ***Electricity production by source in the Czech Republic, 1971-2009***




Source: IEA (2011) and WB (2011).

**Figure 8:** ***Electricity production by source in the Slovak Republic, 1971-2009***




Source: IEA (2011) and WB (2011).

In the Slovak Republic, nuclear sources are the main input for electricity production, which have been substituting particularly coal sources (Figure 8). During the last two decades, the relative importance of hydro-

electric sources in electricity production has increased, but has declined for oil sources, which are less important than natural gas sources for electricity production.

## European electricity prices for households

Electricity is a good, which is everyday used in households. Table 1 compares electricity prices for standard consumer groups of households DC with annual electricity consumption from 2,500 to 5,000 kWh. Among the analyzed countries, this price is the highest in Italy and Austria. Hungarian prices are close to the EU-27 average, while in the Slovak Republic and Slovenia they are a slightly below the EU-27 average. However, as can be seen, except for the Czech Republic and France, households' electricity prices explore significant variations over time. The lowest electricity prices for households are seen for Croatia, but the price tends to increase.

Table 1: *Prices of electricity for households group DC with annual electricity consumption from 2,500 to 5,000 kWh (euro/kWh)*

| | 2008 | 2009 | 2010 |
|---|---|---|---|
| Czech Republic | 0.1274 | 0.1323 | 0.1345 |
| France | 0.1213 | 0.1228 | 0.1256 |
| Italy | 0.2031 | 0.2098 | 0.1967 |
| Hungary | 0.1548 | 0.1483 | |
| Austria | 0.1779 | 0.1909 | 0.1956 |
| Poland | 0.1259 | 0.1131 | 0.1341 |
| Slovenia | 0.1147 | 0.1346 | 0.1401 |
| Slovakia | 0.1365 | 0.1540 | 0.1520 |
| Croatia | 0.0990 | 0.1151 | 0.1151 |
| EU-27 | 0.1582 | 0.1643 | 0.1676 |
| Euro area (EA-16) | 0.1641 | 0.1733 | 0.1765 |

Source: Eurostat (2011).

*Surveys on consumers' perceptions: sample*
Consumers' perceptions on efficient energy use and renewable sources of energy might vary by fields of education and thus the knowledge of the respondents (Bojnec and Papler, 2011c). The analysis of the consumers' perceptions on sustainable energy development in Slovenia is based on the empirical evidence obtained by the written questionnaire, which was conducted among scholars, students, and employed in social sciences, in natural sciences, in electrical energy supply, and in energy management in different levels of education and in different enterprises. Among the employees and students of the Faculty of Management at the University of Primorska were distributed 300 questionnaires and 180 (60%) were returned in the completed form. Between the employees and scholars of the final years at the Secondary Biotechnical School and the first generation of Higher School of Biotechnical Centre Naklo were distributed 130 questionnaires and 83 (64%) were returned in the completed form. Among graduates of the Higher School for Energetic of the Education System of the Electro-energetic of Slovenia were distributed 800 questionnaires and 136 (17%) were returned in the completed form. Among energy management, which were readers of the expert journal in the area of energy, economy and ecology (journal EGES) and among visitors of the website http://em.com.hr/misc/ove_2020 there were 117 questionnaires completed. In total, we have conducted 516 in-depth surveys by the use of the written questionnaire in the six towns in Slovenia: Ljubljana, Koper, Celje, Škofja Loka, Nova Gorica, and Naklo.

By gender, in the groups of social and natural sciences, the majority of the included in our sample are female, whereas male in the groups of electrical energy and energy management (Table 2). The age structure is biased to the sample selection. By age, in the group of social sciences the most important single group is up to 24 years. By the age structure similar is the group for natural sciences, which includes also secondary scholars. In the groups of the electrical energy and energy management there in a greater extent are included employees of middle-age generation.

By the education level, the university graduates and master students are the most important in the group of social sciences. For electrical energy, the prevailing is higher school, for natural sciences there is important secondary school, and for energy management university degree and to a lesser extend post-graduate degree. By the average years of the completed schooling, including the primary school, on the first place is ranked the group of energy management, followed by the group of social sciences, electrical energy, and then the group of natural sciences.

Table 2: *Structure of respondents by gender, age, and education*

| Structure | Group | Social sciences N=180 | Natural sciences N=83 | Electrical energy N=136 | Energy management N=117 | Total N=516 |
|---|---|---|---|---|---|---|
| Gender (%) | Male | 40.0 | 32.5 | 98.5 | 68.4 | 60.7 |
| | Female | 60.0 | 67.5 | 1.5 | 31.6 | 39.3 |
| Age (%) | up to 24 years | 50.0 | 63.9 | 2.2 | 11.1 | 30.8 |
| | 25 to 29 years | 23.3 | 2.4 | 5.1 | 12.8 | 12.8 |
| | 30 to 34 years | 11.7 | 10.8 | 16.2 | 19.7 | 14.5 |
| | 35 to 39 years | 3.9 | 2.4 | 22.1 | 10.3 | 9.9 |
| | 40 to 44 years | 5.6 | 7.2 | 25.0 | 9.4 | 11.8 |
| | 45 to 49 years | 3.9 | 8.4 | 19.1 | 7.7 | 9.5 |
| | 50 to 55 years | 1.1 | 3.6 | 8.8 | 17.9 | 7.4 |
| | over 55 years | 0.6 | 1.2 | 1.5 | 11.1 | 3.3 |
| Average age (years) | | 28.8 | 35.4 | 40.2 | 39.4 | 34.4 |
| Education (%) | Secondary | 22.2 | 56.6 | 0.0 | 6.0 | 18.2 |
| | Higher | 13.3 | 16.9 | 92.6 | 6.8 | 33.3 |
| | College | 12.2 | 3.6 | 6.6 | 17.9 | 10.7 |
| | Bologna I. | 14.4 | 0.0 | 0.0 | 4.3 | 6.0 |
| | University | 19.4 | 21.7 | 0.0 | 34.2 | 18.0 |
| | Specialist | 11.1 | 0.0 | 0.0 | 8.5 | 5.8 |
| | Bologna II | 2.2 | 0.0 | 0.0 | 0.9 | 1.0 |
| | Scientific master | 3.9 | 1.2 | 0.7 | 16.2 | 5.4 |
| | Doctorate | 1.1 | 0.0 | 0.0 | 5.1 | 1.6 |
| Average completed years of schooling, including primary school | | 14.8 | 13.4 | 14.1 | 16.0 | 14.7 |

Source: Survey results.

*Summary statistics on sources of energy and renewable sources of energy*
The written questionnaire on sources of energy and renewable sources of energy contains 23 questions by the Likert scale ranged from 1 (not important) up to 5 (very important) (Table 3).

**Table 3:** ***Mean values for sources of energy and renewable sources of energy***

| | Social sciences | | Natural sciences | | Electrical energy | | Energy management | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean value | SEE | Mean value | SEE | Mean value | SEE | Mean value | SEE | Mean value | SEE |
| Fossil fuels | 3.93 | .066 | 3.75 | .127 | 3.22 | .081 | 4.03 | .080 | 3.74 | .044 |
| Feasibility 25% | 3.75 | .073 | 3.81 | .105 | 3.13 | .073 | 3.61 | .100 | 3.56 | .044 |
| Sufficiency 25% | 3.56 | .077 | 3.60 | .119 | 3.19 | .080 | 3.20 | .105 | 3.39 | .046 |
| Nuclear energy | 3.49 | .074 | 3.46 | .129 | 4.15 | .069 | 3.67 | .108 | 3.70 | .047 |
| Transport | 4.35 | .070 | 4.10 | .112 | 4.50 | .063 | 4.55 | .070 | 4.39 | .038 |
| Ecological conditions | 3.40 | .085 | 3.53 | .126 | 3.61 | .099 | 3.06 | .125 | 3.40 | .053 |
| Wind energy | 4.11 | .074 | 3.78 | .120 | 4.24 | .086 | 3.63 | .122 | 3.98 | .049 |
| Hydro energy | 3.77 | .071 | 3.71 | .116 | 4.19 | .078 | 3.78 | .100 | 3.87 | .044 |
| Small hydro energy | 3.79 | .075 | 3.66 | .120 | 4.05 | .089 | 3.79 | .110 | 3.84 | .048 |
| Solar energy | 4.24 | .066 | 4.24 | .111 | 4.52 | .059 | 4.24 | .091 | 4.31 | .039 |
| Co-production | 3.61 | .068 | 3.61 | .107 | 3.82 | .076 | 3.62 | .099 | 3.67 | .042 |
| Intensity in agriculture | 3.28 | .078 | 3.64 | .117 | 3.71 | .077 | 2.81 | .096 | 3.35 | .047 |
| Chemical means | 3.04 | .098 | 3.39 | .137 | 3.60 | .080 | 2.55 | .123 | 3.13 | .056 |
| Energy from agriculture | 3.69 | .072 | 3.69 | .126 | 3.70 | .092 | 3.39 | .095 | 3.63 | .046 |
| Food for energy | 3.35 | .080 | 3.52 | .131 | 3.59 | .103 | 2.79 | .115 | 3.31 | .053 |
| Biomass | 3.48 | .070 | 3.80 | .126 | 4.01 | .079 | 3.11 | .094 | 3.59 | .046 |
| Geothermal energy | 3.57 | .071 | 3.76 | .109 | 4.15 | .071 | 3.41 | .092 | 3.72 | .043 |
| Fuel cells | 3.00 | .088 | 3.23 | .142 | 3.21 | .098 | 2.75 | .130 | 3.03 | .055 |
| Subsidies | 3.18 | .084 | 3.40 | .119 | 2.94 | .093 | 2.88 | .113 | 3.09 | .050 |
| Awareness on RSE | 3.23 | .092 | 3.63 | .117 | 3.21 | .093 | 2.80 | .122 | 3.19 | .054 |
| Consciousness | 3.32 | .087 | 3.41 | .139 | 2.81 | .095 | 2.35 | .111 | 2.98 | .055 |
| Promotion | 3.50 | .079 | 3.57 | .114 | 3.31 | .092 | 3.01 | .103 | 3.35 | .048 |
| Education | 3.76 | .078 | 3.98 | .111 | 4.07 | .085 | 3.89 | .098 | 3.91 | .046 |

SEE – standard error of estimate. RSE – renewable sources of energy.

Source: Survey results.

The mean values of the individual variables are the highest for transport, solar energy, wind energy, education, hydro electricity plants, and small hydro electricity plants. The modest mean values are find for fossil fuels, geothermal energy, nuclear energy, co-production of energy, energy from agriculture, biomass, feasibility of 25% of renewable sources of energy, ecological conditions, sufficiency of 25% of renewable sources of energy, promotion, intensity in agriculture, and food for energy. The lowest mean values are found for variables awareness, chemical means, subsidies, fuel cells, and consciousness. The results confirm high expectations regarding renewable sources of energy with support of education activities, but less with support mechanisms. By professional education, the social science, electro-energy, and energy management groups see as the most important alternative sources of energy in solar and wind energy. The latter is less important for the natural science group. Moreover, the social science group gives greater importance to conventional fossil sources of energy, whereas the electrical energy group to large and small hydro-electricity plants, whereas the energy management and natural sciences groups to education. Whereas for the natural science group there is important the feasibility of 25% of renewable sources of energy by 2020, for the electrical energy group they are the most sceptical about the feasibility of this objective. The low values for new technologies as for example fuel cells indicate that the new development opportunities on alternative sources of energy are not well known by the public outside the electro energy group. This calls for appropriate information and promotion on progresses in new advanced technologies, their positive impacts on environment to establish consensuses with the public on a long-term strategy and instruments for implementation of potentials and obligations about 25% reduction of gas emissions by 2020.

*Robust tests of equality of mean values*

The test of homogeneity of variances is analysed by using the Leven test of homogeneity of variances and the analysis of variance (ANOVA) by using the F test, while the robust test of equality of the arithmetic means is analysed by using the Welch test for comparison of the arithmetic values of more independent samples.

With the Leven-test of homogeneity of variances we investigate the equality of variance of analyzed groups for all analyzed variables with

testing the null hypothesis $H_0 : \sigma_1^2 = \sigma_2^2 = ... = \sigma_4^2$ that variances for the analysed variable by the four fields of education are equal and alternative hypotheses $H_1$ that at least one variance for the analysed variable by the fields of education is different.

The variables values differentials by fields of education are tested to investigate the equality of mean values of an independent sample or with ANOVA. The F-test is used to investigate the null hypothesis $H_0$ that mean values for observed variables are equal for all fields of education and the alternative hypothesis $H_1$ that at least one mean value of variable by the field of education is different.

Table 4 presents different tests of homogeneity of variances by individual variables for sources of energy and renewable sources of energy. The results indicate similarities and differences by variables.
On the basis of the Leven test of homogeneity of variances, the $H_0$ on equality of variances is accepted that variances are equal by the field of education at the statistical level less than 5% for the following variables: sufficiency 25%, small hydro energy, intensity in agriculture, energy from agriculture, food for energy, subsidies, consciousness, promotion, and education. For the other analysed variables the $H_0$ is rejected.

Table 4: *Test of homogeneity of variances for sources of energy and renewable sources of energy*

| | Test of Homogeneity of Variances | | ANOVA | | Robust Tests of Equality of Means | |
|---|---|---|---|---|---|---|
| | Leven Statistic | Sig. | F | Sig. | Welch Statistic | Sig. |
| Fossil fuels | 6.021 | .000 | | | 20.557 | .000 |
| Feasibility 25% | 5.440 | .001 | | | 15.381 | .000 |
| Sufficiency 25% | 2.106 | .098 | 5.656 | .001 | | |
| Nuclear energy | 14.576 | .000 | | | 17.083 | .000 |
| Transport | 7.277 | .000 | | | 4.715 | .003 |
| Ecological conditions | 2.667 | .047 | | | 4.238 | .006 |
| Wind energy | 10.362 | .000 | | | 7.339 | .000 |
| Hydro energy | 3.452 | .016 | | | 7.085 | .000 |
| Small hydro energy | 2.128 | .096 | 2.718 | .044 | | |
| Solar energy | 5.770 | .001 | | | 4.586 | .004 |
| Co-production | 3.152 | .025 | | | 1.657 | .177 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Intensity in agriculture | .728 | .536 | 19.303 | .000 | | |
| Chemical means | 5.700 | .001 | | | 18.985 | .000 |
| Energy from agriculture | 1.029 | .379 | 2.535 | .056 | | |
| Food for energy | 1.250 | .291 | 11.396 | .000 | | |
| Biomass | 3.186 | .024 | | | 19.893 | .000 |
| Geothermal energy | 3.391 | .018 | | | 17.401 | .000 |
| Fuel cells | 5.788 | .001 | | | 3.211 | .024 |
| Subsidies | 1.097 | .350 | 4.593 | .003 | | |
| Awareness on RSE | 2.915 | .034 | | | 7.858 | .000 |
| Consciousness | 1.311 | .270 | 20.730 | .000 | | |
| Promotion | .286 | .836 | 6.271 | .000 | | |
| Education | 1.784 | .149 | 2.613 | .051 | | |

Source: Authors' calculations.

The results of the ANOVA show that at acceptable degree of risk for most of the analysed variables the $H_0$ of equality variance is rejected and accepted the $H_1$ that the variances between fields of education (social sciences, natural sciences, electrical energy, and energy management) for the following variables are significantly different: sufficiency 25%, small hydro energy, intensity in agriculture, food for energy, subsidies, consciousness, and promotion. For the other analysed variables – energy from agriculture and education – the $H_0$ cannot be rejected at the 5% statistical level.

The Welch robust tests of equality of the arithmetic means indicate that the $H_0$ on equality of the arithmetic means by the field of education can be rejected for the following variables (Sig. < 0.050): fossil fuels, feasibility 25%, nuclear energy, transport, ecological conditions, wind energy, hydro energy, solar energy, co-production, chemical means, biomass, geothermal energy, fuel cells, and awareness on renewable sources of energy. Except for co-production, the Welch robust tests of equality of the arithmetic means confirmed their statistical significance that $H_0$ can be rejected and accepted $H_1$ that the field of education statistically significantly differently affects the evaluation for these variables.

## Conclusion

The percentage of alternative and nuclear energy in total energy use vary between European countries. In Slovenia it is above the EU average as well as above the world levels, but it is lower than in France and it is at a similar level as in the Slovak Republic. The major source of energy consumption in European countries and in the world is fossil fuel energy. In Slovenia this share is lower than in the EU or as it is the world average as well as it is a slightly lower than for the Slovak Republic, but higher than in France. By electricity price for households, Slovenia has experienced price levels below the EU-27 average.

The survey results have confirmed the importance of production of renewable sources of energy from different sources. Empirical tests of homogeneity of variances by using the Leven test, analysis of ANOVA by using the F test, robust test of equality of means using Welch test for comparison of average values of more independent samples confirmed significant differences in the perceptions on sustainable energy development by the studied educational groups by the field of education. This has implications for education and promotion of rationalization of energy supply and use of the renewable sources of energy towards more underlined environmental protection and the sustainable energy and economic development.

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# SUSTAINABLE DEVELOPMENT IN TERMS OF NEXT GENERATIONS OF RESEARCHERS

Krisztina SZONTÁGH* and Zsófia DUGA*

*The issue of the next generations of researchers is an important problem in Hungary and in countries that have similar qualities. In these countries, a significant number of researchers choose another country to continue their academic career after finishing their research and PhD training because of the more advantageous infrastructure and remuneration perspectives. The present study is aimed at examining what might be a theoretical solution to this problem. The solution that will be recommended includes a new financing system and interactive research collaboration. The sustainability of new generations of researchers is of great importance, because the innovation output of a country largely depends on the number of its researchers and their effectiveness. Sustainability also involves doctoral training as basic research training and research-creative activities. Being absorbed in research and acquiring extra knowledge via research and creative activities are the fundamental goals of doctoral training. A researcher can create socially utilizable work, which is considered to be innovation. PhD training, therefore, has an innovation potential, which is different in each discipline. The study also reveals that besides researchers' training, the Hungarian development of researchers' productive career should also be emphasized.*

**Keywords:** Regions, virtual space, universities, research and development, doctoral schools and research collaboration

**JEL code:** I21

## 1. Introduction

The goal of the final research is to find further possibilities of increasing the labour market chances of researchers who take part in PhD training or have PhD qualification and to eliminate regional differences by using the tools of Web 2.0 and through a short, theoretical review of a potential research community site. This can be implemented by getting acquainted with the system and participants of the system and analyzing their possible problems in detail. A fundamental purpose of the final research is to identify possible problems and issues to be solved in connection with each topic area.

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A research community site may create new labour market chances for member researchers if its research profile may provide a potential innovation supply between companies joining the virtual space, doctoral schools of universities, other research institutions and the state. In this study, the research supply of institutionalized doctoral schools is considered to be equal with the supply of potential innovative collaborations. It would contribute to the creation of new generations of researchers if researchers' labour market chances could increase in Hungary and their PhD qualification represented real value added in their future lives.

It seems to be a typical phenomenon in PhD training that participants, mostly full-time students at the end of their second year, often have doubts about how they could continue and in which market segment they will be employed with their future qualification. This issue turned more crucial when layoffs and hiring freezes became everyday phenomena, which resulted in persistent employment problems for researchers, who have started to realize that the labour-absorption potential of universities has decreased.

Teaching regional aspects and regional sciences requires the special attention of doctoral schools and doctoral training. Researchers' career and labour market chances are different in each region, which is one of the hypotheses of the final research.

## 2. Innovation supply of doctoral schools

Doctoral training cannot be considered a traditional training form. The essence of this training is to prepare and support research and creative work. In reality, the three-year preparatory training is followed by more active research and creative activities. Ideally, the final dissertation is based on– either intellectual or physical – work which provides some academic novelty and can be adapted and utilized socially. Therefore, teachers and students participating in the training conduct innovative activities in doctoral schools (Finánczy 2005, 2007).

"On the basis of Parker and Zilberman's (1993) approach, university knowledge transfer can be defined as a process, in which basic correla-

tions, information and innovations flow from universities to companies of the private sector. The knowledge flows which are maintained by the relation networks of university and corporate researchers might be extremely important. Some parts of these relations are organized by the market, such as joined research, university researchers' consultation work, and jobs for graduate students or PhD students' temporary work in industrial laboratories. However, the interactions which function on a personal and informal basis (relations maintained by professional organizations, conferences, academic seminars or circles of friends and colleagues) are typical vehicles of "pure" knowledge leakage." (Varga, 2006) However, doctoral training is often criticized for conveying mostly theoretical knowledge, which cannot be utilized in practice. These opinions could be changed by the communicative activities of higher educational institutions. Communicative activities and the resulting cooperation possibilities should be reinforced towards companies and other research-development institutions.

### 3. The issue of financing

In Hungary, the costs of training together with the costs of research tend to be extremely high. If the majority of students move to a foreign country and stay there, their training is not utilized in Hungary and their training costs are not returned at the nation-state level, which causes immense loss. Nowadays, the views stating that graduates can improve the opportunities of their home country when they return home after conducting research in foreign countries having more developed technologies do not seem to be realistic. Experience has revealed that better opportunities make researchers continue to stay in foreign countries and the number of researchers returning to Hungary is low.

"In Hungary, it is a general phenomenon that medical doctors who have taken part in training programs financed by the state can find employment abroad immediately after they have acquired their degrees, and they can earn five or six times as much as they would make in Hungary as beginners. That is why the state which financed their training cannot lose the costs of the training, and the healthcare system does not benefit from new medical doctors." (EU, 2011b)

Governments strive to take measures in order to increase the number of researchers who are willing to return home; however, they have not managed to raise this number significantly. This problem might be solved only after the main reasons that cause it have been understood.

*A low technological level*

Doctoral training requires high expenses in disciplines where research is capital intensive due to expensive equipment. It is primarily the state that finances such research. Supplementary resources, which may be national and/or foreign corporate financing and/or resources from foreign tenders, can also finance expensive research. Such high-cost research is conducted in various regions of the country. However, the amount of money that can be spent on research is sometimes fragmented. Theoretically, the current situation might be solved if research requiring high technology and high expenses is concentrated in a given region where research that might meet international standards can be conducted. Furthermore, it would open up an opportunity for researchers to join international research collaborations, which are based on high technological standards. All these can also create additional job opportunities for young researchers. If costs of innovation decrease due to the positive and negative agglomerative effects, this, as the result of a cumulative and positive feedback process, (if everything else is unaltered) would lead to the concentration of industrial research in points of space where the costs of innovation are the lowest (Varga, 2005 a, b, c). Research based on high technological standards as a positive externality could create a research agglomeration zone, which might generate further job opportunities.

*3.1. Lack of job opportunities*

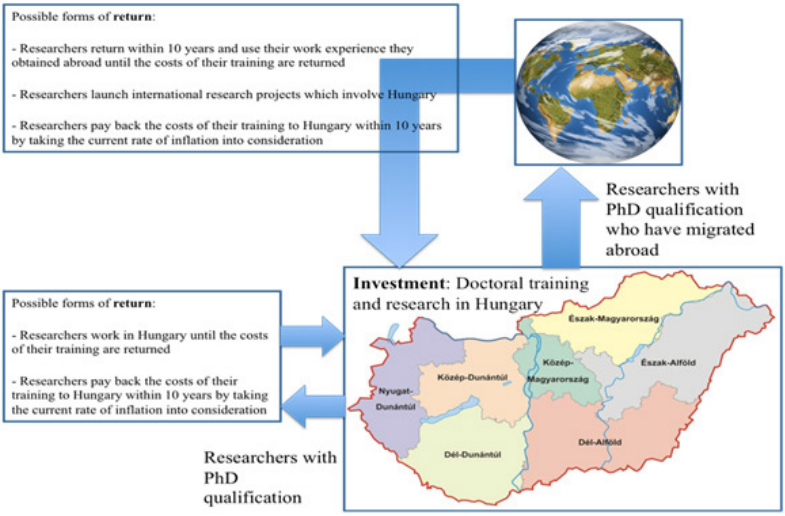
Lack of job opportunities is caused by several factors. The absorption capacity of universities is decreasing since hiring freezes have been ordered at several universities in the current economic environment. Consequently, migration seems to be the solution for young researchers who have just acquired PhD qualifications. Most of them immediately take foreign opportunities into consideration when they have to change their place of residence and do not consider the – usually limited number of – job offers in Hungary. The majority of the above-mentioned international research collaborations of high technological standard are not

financed by the state. Resources related to corporate and international tenders are also available. Such resources create positions for researchers which are not financed by the state and are not university statuses. These jobs function as temporary projects, which is disadvantageous for researchers.

*3.2. "Free" high costs of training and research*

The highest proportion of the training and research costs is financed by the Hungarian state; therefore, researchers who move to foreign countries after they have finished their training generate loss for Hungary. The only exception is when they return and use their technological experience in their work in Hungary or launch international research, which involves Hungary as well. Students do not pay the costs of state financed training and they are not obliged to refund the amount and/or they are not compelled to work in Hungary for years.

Figure 1: *Theoretically possible returns on financing PhD training and research in Hungary*



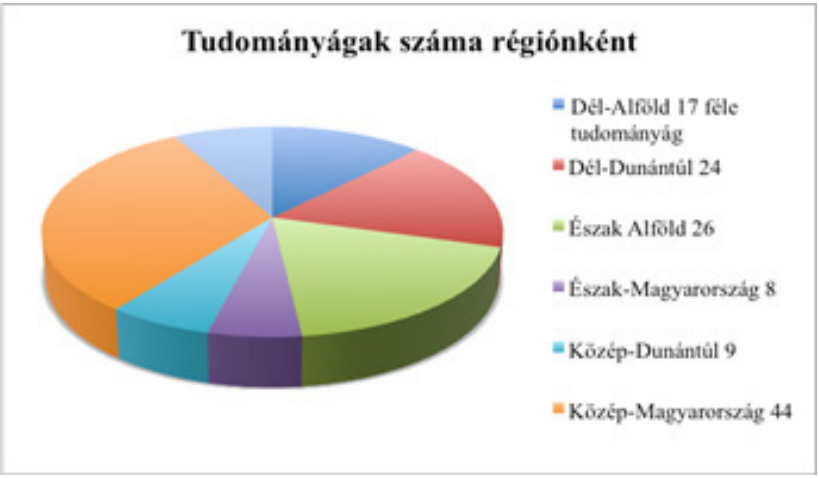

Source: Edited by the authors, 2011

A possible theoretical solution to this is shown in the figure 1. The state expenditure on training and research would call for return. In Hungary, it is a typical tendency that the state is trying to withdraw from financing the costs of training and research and it is attempting to transform state-financed universities into fee-paying institutions. In Figure 1, solutions, which are also possible returns on investments, for example, graduates' obligation to refund or their obligation to work in Hungary might mean theoretical relief concerning the creation of fee-paying institutions. Therefore, if financing is still possible, and it is the return which causes problems, the ideas illustrated in the figure might mean theoretical solutions. The theoretical possibilities outlined in the figure, however, may not be solutions to fee-paying intentions due to lack of resources.

## 4. Regional supply of innovation

Topic elaboration in the study follows the new trend of economics, which claims that space is also an essential factor. *Krugman* (1995) reveals that, for example, the textbook *Economics* by *Joseph Stiglitz* does not contain the terms "location" or "spatial economics" and the word "town" only occurs once. The new trend adds the question of where to how economics tries to explain how the system of economy answers the questions of what, how and for whom. Therefore, it is important to understand in which segments of space higher educational institutions operate (Varga, 2006). In this study, the dimensions of space are completed with the visualization of virtual space as the category of "where".

Figure 2: *The rate of discipline supply by regions*[1]

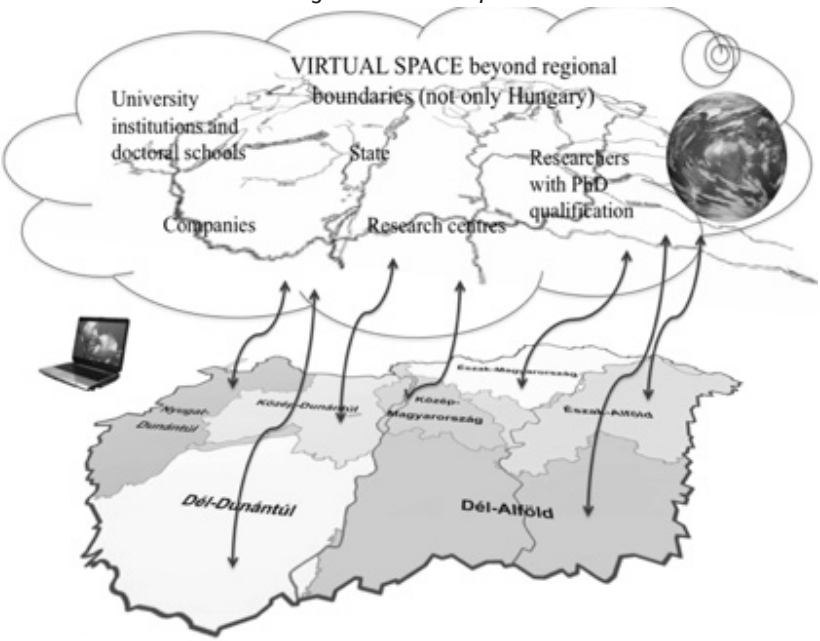



Source: Edited by the author, 2010. On the basis of the statistics of HAC

The analysis of the spatial distribution of academic fields can reveal exactly what kind of research collaborations may be implemented in a given region. Figure 2 presents how many disciplines doctoral schools conduct research in; therefore, it shows the quantity of innovation supply by regional breakdown. The illustrated data derive from the statistics of HAC (Hungarian Accreditation Committee) concerning doctoral schools whose accreditation is valid in Hungary in 2011. The figure shows that the highest value of the diversity of disciplines can be seen in the Central-Hungary Region, which also supports the implications of previous figures.

[1] Dél-Alföld- Southern Great Plain, 17 féle tudományág- 17 disciplines, Dél-Dunántúl - Southern Transdanubia, Észak Alföld - Northern Great Plain, Észak-Magyarország - Northern Hungary, Közép-Dunántúl - Central Transdanubia, Közép-Magyarország - Central Hungary

Figure 3: *Virtual space*




Source: Edited by the author, 2011

## 5. Virtual space

A theoretical possibility, which is illustrated in Figure 3, has been elaborated to solve problems deriving from the above-mentioned regional differences. The basic requirement of researcher reinforcement is that a sufficient number of students should apply to the PhD system and acquire their qualification successfully. Enrolment marketing can facilitate this (Kuráth, 2005, 2007); furthermore, it is also extremely important that a PhD qualification should represent value added for applicants. A type of value added is that people with PhD qualification should be able to find a job with appropriate payment.

Therefore, the goal of the illustrated virtual space is the creation of a high quality and active community, which is concerned with and interested in doctoral training. This community would be based on the devel-

opment of virtual and real systems of relationships with several service backgrounds which would be aimed at solving problems of regional differences. Collaborations in the virtual space can create further job opportunities, representing value added for people with PhD qualification, which can facilitate the creation of new generations of researchers.

## 6. Summary

In Hungary and in countries that have similar qualities, new generations of researchers may be supported if the causes of the current situation have been analyzed and understood. The study offers theoretical solutions to problems like the return on the amounts spent on PhD training and research, problems of labour market and eliminating the differences of spatial structure. The illustrated researcher collaboration may resolve the differences of labour market opportunities, which developed in the regional space, and this way, the situation of new generations of researchers can also be improved. In the virtual space illustrated for the elimination of regional spatial differences, there may be several possibilities for researcher collaboration, opportunities for publications and finding labour market opportunities if members of the community and the concerned topics are continuously up-to-date and active. In the regional space, the real spatial concentration of technology-based disciplines is of great importance, whereas in the virtual space, these concentrations, which are independent of the differences of the regional space, refer to given communities because of the continuous activity of research communities.

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# A POSSIBLE CORPORATE COMMUNICATION MODEL OF SUSTAINABLE ENTREPRENEURIAL UNIVERSITIES

Szilvia DEÉS*, Vanda PAPP** and Erika GARAJ***

*The paper attempts to introduce a communication model used by universities in their knowledge-marketing activity. This activity targets a single group: companies, the actors of the economic life. We also examine the social utilization of knowledge, a phenomenon which is gaining importance for universities, economic organizations, government and civil organizations. The question is: can we set up a communication model, which supports the most effective flow of knowledge for Third Generation Universities? Can we set up a model which provides a unique mixture of business-to-business, non-business and social marketing?*

*According to Wissema (2009), 3GUs create new knowledge and education is subjugated to the process. Thorp and Goldstein (2010) describe 3GUs as institutions and claim that without implementation there is no innovation. Nowadays a new mission should be undertaken by universities: the mission of indirect contribution to social development (Izvercianu et al., 2010). Considering these, 3GUs can be regarded as "sustainable entrepreneurial universities".*

*The research is based on a series of in-depth-interviews with Hungarian and foreign specialists who know the university-environment well, and on a company survey of 432 samples.*

*Considering the conditions of the other market players (state and society) and the immediate micro-environment as well as the macro-environmental conditions that cannot be influenced, we can set up a communication model which supports the most effective flow of knowledge, while the new generation aims are considered too.*

**Keywords:** higher education, knowledge, communication, economic development
**JEL codes:** D83, I23, I25, M53

## 1. Introduction

Even today, but in the future definitely, we will have to face and fight social and environmental (natural) problems which direct attention from technical solutions to developments that are required by society. The

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development processes of third generation universities (3GUs) will be complemented by social and economic innovation processes, making the model more and more society-oriented.
To achieve this, traditional universities need to be oriented more in technical development, because this provides transparency to society. This new approach of the universities makes the society accept the active economic and social innovative role which universities wish to play in the future. At the moment first line Hungarian universities are at the stage of utilizing technical innovations. Technology Transfer Organizations are to serve this. These organizations are almost exclusively financed by government projects, thus indirectly generated and subsidized by the state.
In this altered and extended model that we would like to describe, state and social organizations should take a larger part both in financing and representing social problems. This way they can serve the society better. In this new model companies are not suppressed either, because new prospects open for them if they apply new technical developments, create a new corporate social responsibility image. All these can generate profits in the harsh economic competition.
In the present economic environment the society is experiencing radical changes and these changes are reflected in social organizations, too. Universities have always showed flexibility: first in developing the mission of education, then in adopting a knowledge-generating mission, later in adopting entrepreneurial attitude. Nowadays a new mission should be undertaken by higher educational institutions: the mission of indirect contribution to social development (Izvercianu *et al.*, 2010). Considering these, 3GUs can be regarded as "sustainable entrepreneurial universities".

## 2. Third generation universities

According to Wissema (2009), 3GUs create new knowledge and education is subjugated to this process. Their main task and mission is to convey the knowledge they generate to the society. Thorp and Goldstein (2010) describe 3GUs as institutions, which recognize that the trigger of innovation is liberal arts, they thrive on big social problems and claim that without implementation there is no innovation. They also state that culture is ahead of structure, and we should stimulate building relationship between universities and enterprises.

The main task, mission and peculiarity of 3GUs are to convey the knowledge they generate to the society.
The most important characteristic of these universities is that the most successful and most profitable areas of their activity are technical innovation and technological development. These areas provide a solid base to utilize the peripheries and to build relationship with industries, and, let us admit, the most spectacular, most rapid and most quantifiable results can be reached here. Still, the definitions given by Thorp and Goldstein (2010) and Wissema (2009) already indicate that we must advance technical and technological developments, universities must open to society. Both specialists describe a stage in the development process which, at present, is less popular. Mainly US universities follow this strategy. It is mostly a vision, but a well-outlined vision, which leads to a new generation university model by extending the characteristics of the entrepreneurial university. This "new generational" feature of universities is that they are society-oriented and sustainable.

## 3. Methodology

The article is based on primary research; references (page 15) are only used in definitions. A corporate survey was carried out in two Hungarian regions (Central Transdanubia and Central Hungary) in the spring of 2011. Research questions included business practices, innovation, acceptance and willingness to cooperate with the academic sector and the corporate side. The size, the entrepreneurial self-image of the company, the business environment and the development of the region were also asked. We also surveyed what kind of services companies expect and what acceptable forms of communication they can imagine from the academic side. Those business leaders and employees were questioned who have the insight in and control over the development activities of industrial enterprises. The research is based on a series of *in-depth-interviews with Hungarian and foreign specialists* who know the university-environment well, and it is also based on a company *survey of 432 samples*.
Companies of 0-9 employees are slightly underrepresented, while medium-sized and large companies are over-represented. The reason is that the research objectives included business communication which can be surveyed mainly at larger companies.

## 4. Obstacles of building relationships at universities

At present the flow of knowledge generated at universities is one-way. Universities try to find market for their research results, but there is no demand for theoretical or practical researches which are not sophisticated and do not offer solution to definite problems of companies. However, the disadvantage of research contracts between the university and a company is that the results usually cannot be published, and although these researches generate profit in the short term, in the long run they do not improve the scientific reputation of the university. As market competition is getting fiercer and fiercer, the situation for universities and knowledge-marketing is also getting harder.

### *4.1. Obstacles generated by outer environment*

Even though there are substantial changes in the structure of researches in Hungary, some basic characteristics can be outlined. Basic or discovering researches are long term investments. They are part of a continuous process. These types of researches have their own institutions worldwide and in Hungary too. These are as follows:

- a group of universities with long term traditions
- academic institutions
- company research institutions.

As higher education specialists see it, cooperation is mostly present in areas where applied researches are essential for operating the company – mainly for production. Regional university relationships can be formed with these researches. The primary areas of cooperation are technical, but medical and pharmaceutical fields can also be mentioned. A new direction in agriculture and food industry can also be detected.

The first conflict between the actors of knowledge-market is generated when the companies expect results that can be applied immediately. According to the academic side, there are no immediately applicable researches. There is a natural research process with several problems and conflicts during the development process. The academic side maintains the right to fail to find a solution for a certain problem. They also claim that they might find a solution for a different problem accidentally.

The society and mainly the economic sector are impatient. They would like to have the solutions to their daily problems promptly. In addition, the fact the world is expanding, and the number of problems to be solved

is growing every day, puts increasing pressure on research. There are methods, such as organization structures, financing, and the mobility of research forces which can improve these research processes and make them more effective and more intensive. In Hungary, the amount spent on R&D is rather small, both the academic and the university system needs improvement as well as human attitude and culture.
Another reason for the lack of effectiveness is that there is a large amount of "soft" money in the system (e.g. innovation contribution). Companies lose financial resources without return (it is not important where the money goes) while universities do not produce any value. They do try to integrate this money in their operation instead. Valueless is given for valueless, thus the output does not produce any added value in the system.
The transition process in Hungary is slowed down by government policy; there are no years of peace, although effective research requires peace and relatively stable frame conditions.

*4.2. Communication obstacles*

In the cooperation between universities and companies there are two players and for both we can define the deficiencies and obstacles that hinder the flow of knowledge. Hungarian enterprises in general do not fall into the category of "innovative companies". Specialists highlighted the responsibility and potential universities have in developing and strengthening the willingness for innovation. Universities can build a supportive atmosphere which can involve companies in innovation processes because they are able to work for less than the market price, and can resist the pressure of being profitable. They can do so because they have a state financed background, suitable knowledge, modern devices which can be financed by different projects. And the business sector considers these researches prestigious.
When mentioning the prestige of the universities we must stop for a second. Even the universities themselves recognized – with respectable self-criticism – that they are surrounded with a mixture of inapproachability and fear from the business sector. (However, they do not do anything about it). This fear is generated by the insecurity of companies. They do not know what can be asked and how the questions might be asked and whether they get answers or not. In case of larger companies this is made even more complicated by the authorization processes and the conflict

of interests between the different departments. Universities do not possess customer service systems where companies can turn to with their problems. At the same time, companies do not have a person responsible for university relations whose task would be to manage problems which universities can solve. Partners do not understand each other. Companies expect universities to behave like a supplier. They do not see what a university think tank can be used for. The main problems companies have to face are the failure of meeting deadlines and the problem of not clear solutions. Universities do not have enough human capacity which can be spent on research activities exclusively. Since education and teaching play an outstanding role in universities, instructors will prioritize teaching to company researches. The two sides do not respect each other's needs and their operational and behavioural characteristics.

*4.3. Structural obstacles*

With globalization in higher education and by multi-disciplinarization of research topics, the departmental approach is phasing out, even becoming harmful. In today's market environment the complexity of problems require cooperation between the departments, there are no questions that can be fully answered on the basis of the knowledge at a single department.

In addition to this, universities do not know their own system fully and completely, there are parallel structures and lack of trust on each level. To solve this problem, first a survey of potential data bases should be conducted; then knowledge maps should be created. The younger generation of researchers seems to be open for this.

A central, coordination unit should be created, which organizes and manages internal research activities and which is able to embrace the different university areas (mainly in thinking, not necessarily in directing). It would also know the operation processes and behaviour of the university. This unit should be able to "translate" the company questions to the language of the academia, should delegate tasks, and set deadlines. With this new organization, the university can enter the market as a market player. Characteristically, at universities these units are set up from project resources, but they do not fulfil their role completely. Their task should be to build the image of the university. However, in many cases these units choose the easier way: they fulfil research requests by

delegating the work to the already existing departments or by inviting external specialists.

*4.4. Obstacles deriving from university autonomy*

The traditional attempts for autonomy of the academia (the autonomy of instructors, researchers, departments, etc.) hinder coordination and strategy-formulating processes. The members of the academia require autonomy as researchers. They contact companies as an individual or in the best case as a member of a research team, and offer their individual knowledge, pushing the all-university interests behind. If a company is approached by many autonomous researchers, these researchers do not strengthen each other in a synergy, but can destroy their own and the university's reputation as well.

The question of autonomy raises another problem too: the problem of grey economy, or in other words, that of the black spin-off enterprises that surround universities and create negative effects. A set of private spin-off enterprises operates at universities. These institutions run by individuals or research groups and can accept company orders well below the price the universities can offer. Everybody is aware of this, it is taken granted. University researchers can offer lower prices because they do their researches during their working hours using the university's equipments and capacity (in many cases students also contribute to it to gain experience). This is similar to the socialist phenomenon of Company Economic Work-teams, with the only negative difference that CEWs could only operate after work.

To solve this, mainly changes in culture, approach and value judgment are necessary. New rules, structures and systems of interests should also be created. (Lately due to the new taxation system, the decrease in personal income tax makes people be interested in doing researches through the university, because they will get more income after tax if they do not pay taxes as a company. In addition, organizing the research activity is more convenient and they can use the equipment of the university legally.)

This creates income for the university, but, at the same time, the maintenance of the equipments is still a problem, because it causes an increasing budget deficit. Maintenance costs are covered by the central budget of the university (in optimal cases these equipments should serve

students' needs), but this way – although unintentionally – government resources are restructured to the private sector.

It is difficult for universities to set realistic prices, because they do not know real costs, hourly prices of machines, laboratories and human work, nor do they know the costs of amortization or maintenance. Prices for measurement, teaching or researching are not defined either. All these might make prices for university services higher. This could be offset if higher educational institutions would not charge for amortization, and would not re-sell the results of researches sponsored from government resources to a new target group, now at market prices. The academia has more advantageous conditions in applying for resources. Systems for re-financing researches do not work, amortization is not calculated in the price, and infrastructure cannot be renewed.

New systems of interests should be developed, which use the extra resources for precompetitive researches and for investing in new equipments instead of spending the whole amount on autonomous researches. While the opinion of the surveyed companies stated that giving a research project to a university instead of a private enterprise means 30-35% extra costs in general, universities claim that they deduct 5-10% from the price they charge. The researcher benefits from the project anyway: even if the order goes to the university, prices are set by the researcher and they calculate with prices from which they get the same amount as if they had done the research as private entrepreneurs. Centralized pricing is essential from this respect too. The reason for the company to give the order to a university and to pay higher prices is the reputation and prestige of the institution. But competition is getting stronger from this respect too: successful private enterprises operate on the market for a long time, provide quality work. These companies are gaining higher and higher reputation on the market.

## 5. Possible solutions

Insisting to the above mentioned autonomies and operating R&D activities by nepotism are deeply rooted in university culture, so to institutionalize research activities takes a lot of time and can only be implemented in small steps.

• The first step is to create a unit that is under central direction and whose task is to survey and understand the processes inside the university. This unit should arrange the research results and competencies into a logical order. It also should attempt to introduce these results to the public and build the image of the institution. The most effective method to this is the so-called "blue ocean" strategy that builds on strong PR activities and highlights those news, information and positive affiliations that stress the USPs of the institution in question.
• Corporate communication with small and large enterprises must be distinguished. With small companies communication should be maintained at a lower level, in cooperation with SMEs and individual inventors (this is served by the classical technology transfer activities).
However, this lower level communication does not mean negligence. Even though these small companies divide the capacity of the university, there is innovative potential in them and long term cooperation can be flourishing for both partners.

According to specialists, there is another target group that should not be neglected: the former students of the institution who mean important but unexploited resources; still, they do not receive enough attention (Vitéz and Papp, 2011). This is because Hungarian students do not consider important that they belong to a university community.

Table 1: *Activities important for university knowledge transfer, as specialists see it (on the scale of 1-5, 5 being the best)*

| Activities | Average mark |
|---|---|
| supporting new student enterprises | 4,82 |
| maintaining alumni relationships | 4,73 |
| dealing with distinguished company partners (identifying strategic markets, state and research institutions, handling contracts and keeping contacts) | 4,64 |
| promoting technology transfer services (services connected to innovation, patents, counseling) | 4,64 |
| general marketing (websites, brochures, events, etc.) | 4,36 |
| getting the best researchers | 4,36 |

| | |
|---|---|
| managing university infrastructure | 4,09 |
| getting the best students | 3,73 |
| incubator services for newly established enterprises | 3,64 |
| promoting not knowledge-intensive university services (conference-organizing, leasing rooms, language courses, etc) | 3,09 |
| providing different forms of company financing | 3,00 |
| increasing the number of students admitted | 2,73 |

Source: own collection

The other area that is considered important, but needs improvement is the encouragement of spin-out enterprises. In the background of this we can detect the lack of product-oriented approach, according to which creative ideas should be sold and utilized. It is the university's task to support this and to create the necessary conditions for this.

## 6. Forms of company communication

In this new market situation when universities should enter the knowledge-provider market as a new player, the size of companies, their openness and willingness for innovation determine the methods of communication universities should use. Long term relationship in each case is based on personal contact and on finding the relevant common interests (financial, ethical or scientific). Relationship based on personal contact can be classified as

- **bottom-to-top** – e.g. company-university or company-alumni – relationships (former
students, interns can sell the services)
- **top-to-bottom** – top-management level relationships (definite, usable offers, specially tailored to companies, or offers developed together with the company, but not already existing services or training courses)
- **mid-level**, relationship between instructors/researchers and the company (involving companies into education, e.g. consultation for and evaluating theses, guest instructors, and selling services, offering research activities)

- **the multi-dimensional mixture** of all these (e.g. at top-management level, but supported from the bottom)
- **indirect**, through trade and civil organizations. 3GUs, due to their mission, should involve civil organizations into relationship-building. Each university cooperates with different foundations and civil organizations to enhance competitiveness and improve the level of services at the university. These foundations can bring strategic relations to universities.
- these ways of relationship-building are complemented by **"cold" contacts,** through professionals whose job is to find the relevant contact person and to map demand, as well as to handle any unexpected company requests.

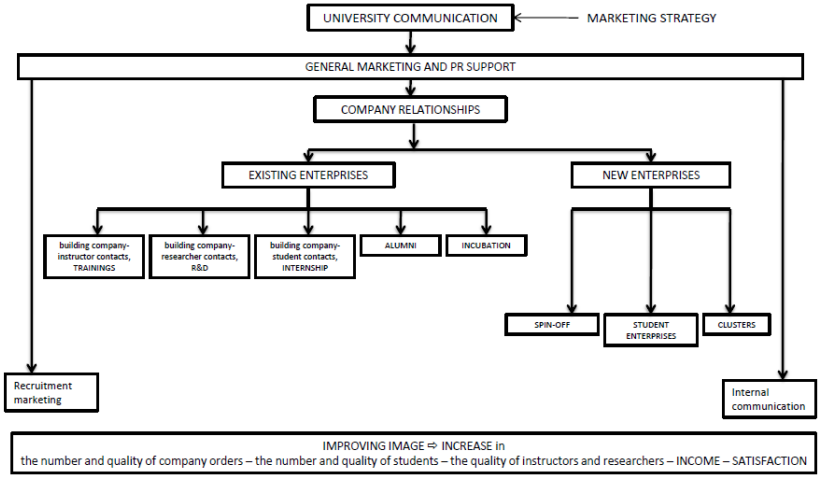
Since the whole team of instructors, researchers, employees, and students of the university is involved in relationship-building, it is fundamental to form a single, unified institutional image. It is also essential to establish an internal information-providing and coordinating unit. A technology transfer office would be the most suitable for this role. Its task would be to collect and single-channel all company contacts through a massive sales system (CRM). To deal with the most important clients there should be a key account manager. By establishing this position, a key player would be integrated into the system, someone who is aware of all activities, coordinates and even supports relationship-building at lower levels. However, it must be noted that the unit responsible for communication can only operate effectively if it is backed by service and research teams; competencies and networks of partners also help out.
This kind of network provides stability for the university in the field of finance, research and education. When new members (researchers, managers) enter, this network expands, which makes the system sustainable.

The main aims of relationship-building should be supported by general, extensive marketing communication activities. These activities include operating the website, harmonizing brochures, building press contacts, generating, coordinating and timing news. Handling the most important partners, image-building coordinating roles and participation in micro-regional events are also parts of marketing communication activities. This coordination activity should be able to utilize the synergy of institutional news for PR purposes.

This extensive general communication can only be a success if it gets support from every area involved. This means that the content of the website, the brochures, the flow of information, etc. can only be accurate if institutional communication is based on excellent internal communication.

Recruitment campaigns play a significant role in the communication of Hungarian universities, but as a result of long term relationship building these campaigns will lose their strategic importance and will merge into general marketing. However, for survival, at present there is a need for short term campaigns.

Figure 1: *Third Generation University Communication model*




Source: Authors' collection.

*This new form of university communication* is based on a relationship with already existing companies which are present on the market and are committed to the university. It should be combined with a general communication function and backed by effective internal communication. It also should be complemented with a new approach from the employees' side. Then it will be able to improve the reputation of the institution. This increase in reputation will result in increasing the value of company

orders, the quality and knowledge-content of company contacts. This way the number and quality of students applying for the institution and the quality and level of commitment of instructors and researchers will also increase. All these will lead to increasing income, decreasing government influence, thus to increasing independence and growing stakeholder satisfaction (Figure 1).

## 7. Implementation of the model

The first step towards conscientious university communication is to build a marketing information system. The formulation of a marketing strategy and making strategic decisions depend on the knowledge (quality and quantity) offered by the university and on the willingness of companies to receive it. A complex marketing strategy should be created at all-university level, which would provide a solid base for general PR, communication activities and image-building. It would also stress well-planned recruitment activities and improve internal communication.

Later the answers to the question of WHAT, WHO, HOW, WHEN (and from what budget) can lead to the formulation and implementation of institutional communication with companies (Table 2).

Obviously, the process is affected by external factors of the knowledge-market: regulations, company expectations and behaviour, social demands, and the behaviour and interests of the other participants of the market all influence it.

The result of the process will be realized in company orders, co-operations and in innovative solutions. As a feedback, the controlling of the communication activity will verify the effectiveness of the work, its long- and short term results.

Table 2: *Implementation of 3GUs communication model to companies*

| IMPLEMENTATION TASKS | SUB-TASKS |
|---|---|
| Analysis of environmental effects | Analysis of external environmental factors: legal, political, economic background, global effects, regional peculiarities, corporate behaviour |
| | Analysis of internal factors: competitors, partners, networks, resources |
| Strategy-formulating | Strategic decisions concerning communication with companies: offers, university portfolio, STDP, USP, ESP<br>managerial commitment, approach |
| Organization development | Establishing a responsible unit, inserting it into the structure, under the supervision of a manager (technology transfer)<br>- defining tasks, effects and responsibilities<br>o general image-building (promoting science, innovation and university image – pr)<br>o increase the number of orders (sales, key account manager)<br>- connecting to and cooperation with the university marketing unit, sharing tasks, internal coordination (university marketing, career, alumni, service units, faculties/institutions)<br>- providing specialists, internal training, remuneration |

Source: Authors' collection.

## 8. Conclusion

Establishing a strong organizational frame and a relatively stable network of relations means stability and reliability for university researchers. It does not split the energy of the university. Researchers will be willing to give up their own, risky researches for the less risky, but also profitable university orders. For the university this model will also be worth applying, because it can accumulate more and more knowledge and can improve the university's image.

In higher education a flexible structure should be formed which is suitable for receiving economic, technological and social innovations. In Europe those higher educational institutions are successful which enhance rapid technological changes in close cooperation and communication with regional economies (Rechnitzer, 2010). Under the present structure, effective connections between industries and universities and successful integration of the third mission cannot be imagined. This long term marketing activity relies on relationships with companies. Technology Transfer Organization could be responsible for developing relationships with companies and for increasing orders (in quality, quantity and value). The university can get into close contact with companies through its knowledge-transfer activities, creating a bridge between the two sectors.

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# LEADERS ARE NOT BORN BUT MADE

Judit KÁRPÁTI-DARÓCZI* and Judit VÁGÁNY**

*The title of our study is taken from Goleman (2003)'s book 'Primal Leadership'. The message of this quote is still very relevant and our study is examining this idea. According to the Hungarian Central Statistical Office (KSH), 99.9% of the Hungarian enterprises are SMEs, so our study is dealing with them. The future of SMEs will very much depend on how and how quickly they can react to the changing circumstances. The crisis could lead to the resegmentation of the whole market, so the enterprises that react promptly and appropriately to the changes could reach a winning position, while the slower ones might be forced into a losing position. Our study is looking into the leaders' answers to the changes, the speed of their reactions, the measures taken to promote the implementation of the successful strategy and the development of the self-education practice to enhance leadership skills.*

**Keywords:** leader, SMEs, crisis, strategy, development
**JEL code:** M00

## Introduction

Since small and medium enterprises (SME) play an important role in the economy, in our study we aim to find out what tools the SME leaders resort to in order to stay competitive in the current, more and more turbulent environment. Before the analysis of the SME leaders' managerial attitude, innovative skills, reactions to the changes and the promptness of their answers, it is worth defining what SMEs are. Only after that can we move on to the analysis of the leaders' self-education habits.

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## Material and method

Our study is the result of secondary research carried out for several years. During our research we constantly studied and processed the statistics (KSH, Eurostat) and the findings of the latest publications, journal articles and reports on the topic; furthermore, the collection of secondary data and information included the studying and processing of the relevant literature, too.

## Results

The plight of small and medium enterprises has a fundamental impact on the state of the whole economy, as their number accounts for the 99.9% of the enterprises (Table 1). The SME sector is dominated by micro enterprises. The SMEs' superiority in numbers has a fundamental effect on their income producing capability, their role in the production of gross value added, in employment and development. They account for the 50% of the enterprises' net income and investments. Their activities characteristically demand less capital and more labour force, thus their role in employment is more considerable, they provide work for almost 70% of all employees. Besides, they play an important role in stimulating the competition: if they want to distinguish themselves from the other competitors in a strong competition, they must be new or innovative in something (Vágány-Kárpáti, 2011).

Table 1: *Distribution of the main indicators describing the plight of the enterprises according to size in 2007 (%)*

| | 0-1 person | 2-9 persons | 10-49 persons | 50-249 persons | SME altogether | bigger than 250 persons | Total |
|---|---|---|---|---|---|---|---|
| Number of enterprises* | 75,9 | 19,6 | 3,7 | 0,7 | 99,9 | 0,1 | 100 |
| Employees* | 6,7 | 21,4 | 21,8 | 19,7 | 69,6 | 30,4 | 100 |
| Income | 8,7 | 14,6 | 18,9 | 20,5 | 62,8 | 37,2 | 100 |
| Export | 6,2 | 6,0 | 10,1 | 14,8 | 37,1 | 62,9 | 100 |
| Value added | 9,5 | 11,3 | 16,0 | 19,1 | 55,8 | 44,2 | 100 |
| Own capital | 10,8 | 9 | 16,2 | 19,2 | 55,1 | 44,9 | 100 |

*The indicators of number of enterprises and employees include financial sector.
The indicators of income, export, own capital, gross value added do not include financial sector.
Source: NFGM, 2008

The economic role of SMEs is therefore unquestioned; however, the crisis tolerance capability of the players is different as well as their answers to the crisis. According to the history of economics, global crisis is survived only by companies that take care of both business and training. Beside the improvement of expertise, the crisis may require the development of situation awareness, co-operational, stress-management and communication skills. We must be aware of the aim of the training we require, and we must know what results we expect from it (Szoboszlai, 2009). Ernst & Young and Economist Intelligence Unit (EIU) asked 876 top managers worldwide about the most important measures that could facilitate the successful realization of the strategy.

The following aspects are considered the most important by companies performing well even in crisis:

- Operational flexibility optimization
- Market access optimization
- Faster decision-making and execution
- Enhancement of managerial skills

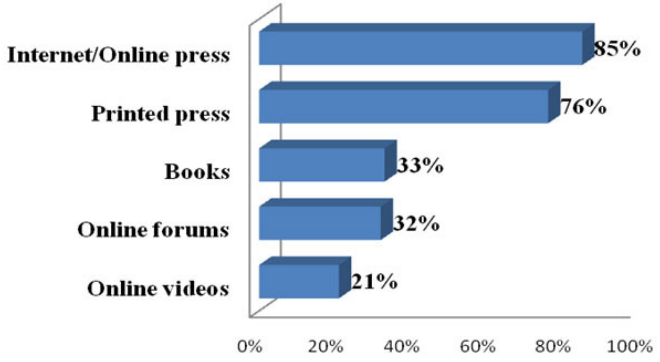
In our study, we put the emphasis on the last of the above mentioned aspects since managerial skills directly influence the performance of the company (Wimmer and Zoltay, 2006). Professional knowledge and problem-solving skills play a particularly important role in the case of leaders of successful companies; they are also better in the field of communication skills, representation of ideas, organisational skills, IT skills and analytical skills than the ones lagging behind. Companies run by the more prepared leaders are better at reacting more effectively to the changes (more proactive) and their performance is better than the average.
There is a significant connection between managerial competence development, increase in professional knowledge of all workers, and the effectiveness of the company. That is why it is particularly important to constantly develop the knowledge both of workers and leaders.

Learning can take place in formal ways (in schools, trainings), in form of gathering experience at workplace (learning-by-doing) and in informal ways.
It is not only formal learning and lifelong learning that plays an increasing role, but also state-accredited professional trainings that do not provide a qualification but still are essential for employers (Bakos, *et al.*, 2011).
The complementary survey to the labour force survey of KSH in 2009 examined how prevalent the participation of the adult population in such trainings was. According to the findings, in 2008 9.9% of the adult (25-64 years) population took part in non-formal trainings. Conferences, seminars (4.3%) and professional courses that do not provide professional qualification (3.5%) proved to be most popular training forms (Bakos, *et al.*, 2011).
Non-formal trainings were attended by higher education graduates in a higher than average proportion: one in five graduates took part in some kind of further training. (One of the reasons for it is that in certain professions it is obligatory to attend further trainings.)

Despite the aforementioned, there are a number of shortcomings in the field of workforce development methods for competitive advantage, both among Hungarian and European companies. According to the study of Forrester Consulting, although the majority of companies (90%) believe that trainings are vitally important for maintaining competitive advantage, one third of them do not have such programmes (Consultation Magazin, 2009). The 2010 survey of KPMG-BME Akadémia analysed the self-education habits of top managers. According to the findings, company executives prefer reading short contents and attending trainings (Figure 1).
They tend to discuss their managerial problems in person, directly with their fellow manager colleagues, subordinates, family members and in rarer cases with their bosses. Some executives turn to coaches, but since it would be too expensive for SME leaders, they do not choose to turn to coaches for help (Figure 2).
Risk-taking is part of the top managers' everyday life. However, according to the survey, small enterprise leaders are more open to novelties than the leaders of medium enterprises. 76% of the respondents are proactive and 58% of them are not satisfied with the currently available information.

The majority of executives (89%) tend to set development goals for themselves, but only half of them contemplate about whether they are good leaders. Most executives think that they are responsible for their own career, that is why motivation for self-education would have been assumed, but executives actually do not consider managerial development necessary for career promotion.
In the case of the majority of executives, the most important aspect of self-education is that information should be short and easily accessible, but should not require immersion or activity from the reader.

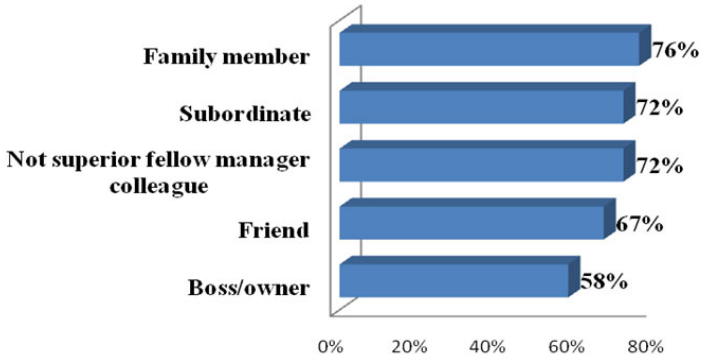
Figure 1: *Distribution of frequency of information sources on managerial topics in percentage of managers responding*




Source: Adapted from Cservenyák and Pusztai (2010)

Leaders of small businesses proportionately read more in managerial topics: books, journals/magazines, articles of Internet portals, blogs and forums. They are more active in online chatting than the leaders of medium businesses; moreover, they more frequently consult their fellow manager acquaintances and experts.

Figure 2: *Distribution of the frequency of people helping solve managerial problems in percentage of managers responding*




Source: Adapted from Cservenyák and Pusztai (2010)

According to the research, the most motivating aspects of the managers' self-education are:

- expansion of the management toolkit
- curiosity for new things, and
- desire for acquisition of greater confidence in leadership.

And the main obstacles to self-education named by executives are:

- the priority of daily routines
- lack of time, and
- lack of proper form of self-education.

This survey shows that companies do not maximize the possibility of competitive advantage offered by trainings (Cservenyák and Pusztai, 2010).

## Conclusions

Considering the self-education habits of executives, there is need for professional trainings that can meet the demand for quickly and easily

accessible, smaller units of professional contents. Intranet leadership forums and internal blogs would be able to provide an opportunity to share short, specific contents. Experts and current leaders would be able to share their knowledge via these channels, and to start a relevant dialogue that is closely related to their own corporate reality, promoting knowledge sharing and collective reflection. In order to achieve this goals, it would be inevitable to reduce the lack of confidence and to enhance willingness to co-operate (Vágány and Kárpáti, 2011), as well as to motivate managers to actively participate in learning.

"The management has, no other choice but to prepare for the future, attempt to shape it, and to strike a balance between long and short term plans ...
The desired future will not come true only by wishing it strongly. It requires decisions – now. It requires risk-taking – as soon as possible. It requires actions – immediately. It requires the distribution of resources and, above all, that of human resources – urgently. And it requires work – without delay." (Drucker, 1974)

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CHALLENGES AND TRENDS
IN HIGHER EDUCATION

# TIME-TO-DEGREE FOR MANAGEMENT PH.D – A HUNGARIAN CASE STUDY

Imre FERTŐ*

*We investigate the production process of Ph.D. programme in Management at the Corvinus University of Budapest. We find that that attrition rate is somewhat better as in Economics Programme in U.S. The completion time is relatively long due to some procedural rules. The students' and supervisors' characteristics are good predictor for the completion time and the quality of dissertations. The empirical results do provide some guidance about how to improve completion rates and quality of dissertation in our Ph.D. programme.*

**Keywords:** time-to degree, Ph.D. programme in Management, Corvinus University of Budapest, econometrics of time to degree
**JEL codes:** I21, I23, C41

## Introduction

There is a slowly increasing literature on Ph.D. programme in economics. However, only limited research is available on Management programme. In addition, majority of the papers focuses on U.S. experience. Until know there is no study on new member states experiences. This paper tries to fill this gap using dataset for the Management Ph.D. programme at the Corvinus University of Budapest (CUB). We focus on two specific issues: completion time and the summa cum laude degree. First issue is an important aspect of evaluation of any Ph.D. programme. The main goal of Ph.D. programs is to produce new PhDs. Efficiency is higher if they graduate as quickly as possible (keeping the quality standards). The target time-to-degree at most PhD programs is usually five years which is many times as an indicator for public evaluation. Summa cum laude degree is a clear measure for the quality of the Ph.D. The paper is organised as follows. First, we briefly review empirical research on Ph.D. programmes. Then we outline major characteristics of our programme. This is followed by the empirical analysis. Final section concludes.

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## Literature review

Ehrenberg and Mavros (1995) analyse the factors of completion time and attrition PhD programs in economics using competing risk ''duration" or "hazard function". They find that completion rates, and the mean durations of their times-to-completion and to dropout are all sensitive to the types of financial support the students received. Students who receive fellowships or research assistantships have higher completion rates and shorter times-to-degree than students who receive teaching assistantships or tuition waivers, or who are totally self-supporting. The impact of financial support patterns on the fraction of students who complete programs is much larger than its impact on mean durations of times-to-degree or to dropout.

Van Ours and Ridder (2003) investigate PhDs in economics in The Netherlands. Their results are consistent with the incentives that the actors in this process face. Universities succeed in making students who are unlikely to graduate or will need a long time to graduate quit the program. Estimations suggest that supervisors who are active researchers have higher graduation and lower dropout rates. However, this effect is due to the fact that supervisors with a good research record have better students. Interestingly, there is no evidence of an independent effect of having a supervisor who is an active researcher.

Groen *et al.* (2003) analyse the impact the Graduate Education Initiative (GEI) on the quality of graduate programs for social sciences in United States including a 10-year period 54 departments at 10 major research universities. They find the GEI had modest impacts on student outcomes in the expected directions: reducing attrition rates, reducing time to-degree, and increasing completion rates. The impacts of the GEI appear to have been driven in part by reductions in entering cohort size, increases in financial support, and increases in student quality.

Athey *et al.* (2007) examine performance of Ph.D. students using a rich dataset on 1,029 economics graduate students who enrolled at Harvard University, Massachusetts Institute of Technology, Princeton University, Stanford University, or the University of Chicago in the 1990s. Their results suggest that students' grades in required core courses are highly correlated across subjects. The Ph.D. admissions committee's evaluation of a student predicts first year grades and Ph.D. completion, but not job placement. First-year performance is a strong explanatory variable of Ph.D. completion.

Siegfried and Stock (2001) analyse Ph.D. programmes in United States using a survey of new Ph.D. economists in 1996-97. Calculations indicate that students supported by fellowships, and those holding a prior Master's degree finish faster. Americans, those who take jobs before completing their degree and those with children take longer. Kids slow the progress of women, but not men. The only difference among fields is more time required for industrial organization and international economics. There is no difference in time-to-degree between men and women, married and single students, older and younger students, and those enrolled in larger or smaller Ph.D. programs.

In a subsequent study Stock *et al.* (2009ab) investigate the graduate school outcomes for students who entered economics Ph.D. programs in fall 2002. They find that students in Top-15 ranked programs and those with higher verbal and quantitative GRE scores are less likely to have dropped out, but no more likely to have graduated. Those with undergraduate degrees from Top-60 U.S. liberal arts colleges and from foreign universities have lower attrition and higher completion probabilities. There are important differences in the characteristics associated with retention and completion probabilities between U.S. citizens and non-citizens and between men and women.

In sum, previous studies identified some potential factors explaining attrition and completion time including quality of supervisor, cohort size, financial support, demographic characteristics, type of undergraduate institution and graduate program characteristics. However, research also outline that there are relatively few successful objective predictors of student success.

## Characteristics of the Ph.D. programme[2]

We briefly describe the main characteristics of Ph.D programme in Management Sciences at the Corvinus University of Budapest between 1993 and 2010. Majority of applications are former CUB students. The number of registered students is 377 between 1993 and 2010, 44 per cent of students have obtained a scholarship and 37.9 per cent of registered students have received the Ph.D. degree (Table 1). This ratio is relatively good comparing to previous studies for Economics programme in Unites States. Stock et al (2009a) show that the completion ratio was 27 per cent in average for United States ranging from 16 and 33 percent.

Mean completion time is 69 months at Ph.D programme in Management of Corvinus University of Budapest, similar number in U.S. is 5.5 years. Mean time of submission of dissertation is 57.4 months. The share of students completed within 5 years is 27 per cent. Proportion of students with summa cum laude is 43 per cent. The number of completed students drastically decreases which still serious issue is taking into account that we do not have completed students who enter in 2006. However, mean time of completion declines suggesting the student finishing their studies got their degree within relatively short time. However, late coming student will increase the completion in these cohorts.

Table 1: *Characteristics of Ph.D students by entry year*

| Entry year | Number of completed students | Mean completion time (year) | summa cum laude (SCL) | Ratio of SCL (%) | Share of completion (%) |
|---|---|---|---|---|---|
| 1993 | 12 | 7.75 | 3 | 25.0 | 92.3 |
| 1994 | 9 | 7.2 | 1 | 11.1 | 47.4 |
| 1995 | 18 | 7.5 | 10 | 55.6 | 85.7 |
| 1996 | 15 | 7.3 | 3 | 20.0 | 75.0 |
| 1997 | 15 | 7 | 6 | 40.0 | 78.9 |
| 1998 | 14 | 7.4 | 8 | 57.1 | 82.4 |
| 1999 | 12 | 6.5 | 5 | 41.7 | 63.2 |
| 2000 | 12 | 7 | 6 | 50.0 | 66.7 |
| 2001 | 6 | 6.7 | 3 | 50.0 | 28.6 |
| 2002 | 17 | 6 | 12 | 70.6 | 65.4 |
| 2003 | 2 | 6 | 1 | 50.0 | 8.7 |
| 2004 | 5 | 4.8 | 3 | 60.0 | 19.2 |
| 2005 | 5 | 3.8 | 1 | 20.0 | 20.0 |
| 2007 | 1 | 3 | 0 | 0.0 | 7.1 |
| total | 143 | 6.8 | 62 | 43.4 | 37.9 |

Source: own estimations based on data from Ph.D. programme office.

Previous studies identify five years as an optimal and/or still appropriate period for finishing of Ph.D. programme. Table 2 provides some additional information on students' and supervisors' attributes and procedural characteristics. The majority of students (81 per cent) receive their Ph.D. degree more than five years with 14 years maximum. How-

ever, this fact can be explained by some procedural rules. For example, mean time between thesis submission and degree is 14 months.[3]

This long time partly arises from the time of degree award ceremony which is usually organised twice a year. Other important factor is the long time to receive the referee report. In addition, we introduce foreign examiners to participate in the final defence in 2000. The role of foreign referee is sometimes also subject to criticism due to long time for preparation of referee report. However, contrary to our expectation the mean time of preparation of referee report from foreign colleagues is around five months ranging from one month to two years.
The mean entry age is about 29 years, 48 per cent of students are women, and 63 per cent of them received scholarship. The role of supervisor is crucial in every Ph.D. programme. We measure the quality of supervisor by two indicators: whether do they have a Doctor of Science (DSc) degree from the Hungarian Academy of Sciences, and do they have publication in a journal including Web of Sciences database in last five years during their supervision period. The 32 per cent of supervisor published a paper in a journal including Web of Science and 20 per cent of them have Doctor of Science degree.

Table 2: *Characteristics of completed students, their supervisor, procedure*

| | N | mean | St.dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| Completion time (year) | 143 | 6.8 | 2.0 | 2 | 14 |
| Share of completion over 5 years | 143 | 81% | 0.39 | 0 | 1 |
| Entry age (year) | 143 | 28.6 | 7.65 | 22 | 57 |
| woman | 143 | 48% | 0.50 | 0 | 1 |
| scholarship | 143 | 63% | 0.48 | 0 | 1 |
| Web of Science (WOS) | 143 | 32% | 0.47 | 0 | 1 |
| Doctor of Science degree | 143 | 20% | 0.40 | 0 | 1 |
| Time of foreign referee (month) | 113 | 4.9 | 4.20 | 1 | 24 |
| Submission time (month) | 113 | 57.4 | 18.1 | 4 | 94 |
| Time between submission and degree (month) | 113 | 14.5 | 10.61 | 6 | 70 |

Source: own estimations based on data from Ph.D. programme office

Completed students had 50 supervisors. The students are very concentrated regarding to supervisors. Top four supervisors have 31 per cent of completed students and managed 34 per cent of them with summa cum laude degree. The similar numbers for top eight supervisors are 45 per cent for completed students and 42 per cent for students with summa cum laude degree. These facts suggest that Ph.D. programme is based on some school leader supervisors. Table 3 shows positive but medium size correlations among supervisor characteristics. ANOVA estimations reveal that completion time is not differing across supervisor characteristics.

Table 3: *Correlations for supervisor characteristics*

| | WOS | DSc | Top supervisor |
|---|---|---|---|
| WOS | 1.0000 | | |
| DSc | 0.4718 | 1.0000 | |
| Top supervisor | 0.4037 | 0.4447 | 1.0000 |

Source: own estimations based on data from Ph.D. programme office.

## Completion within five years

Econometrics of time to degree literature usually employs duration models and binary models. Because our dependent variables are binary, variables, we estimated various binary models. The binary models are typically estimated by maximum likelihood after imposing distributional assumptions of error term. However, semi parametric literature emphasise that parametric estimators of discrete choice models are known to be sensitive to departure from distributional assumptions. Various estimators have been developed for correcting this restrictive nature of parametric models. In this paper we apply the semi-nonparametric approach of Gallant and Nychka (1987) and the semi parametric maximum likelihood approach of Klein and Spady (1993). We report only latter models which perform better.

Dependent variable is a binary variable takes value one if students received Ph.D. degree within five years, otherwise zero. Independent variables are based on previous literature and procedural speciality of our programme. First group of variables are capturing to demographic attri-

butes of students including dummy variables for the women, having scholarship and summa cum laude degree and age when they enter into the programme. Second group of variables measure the quality of supervisor based on publication in a journal of the Web of Science, having Doctor of Science Degree and being top supervisor. Finally we focus on a special procedural rule, namely the time of introduction of foreign referees.

Stock et al. (2009a) point out that the potential endogeneity of financial aid may produce inconsistent estimates of completion. They propose the use of biprobit model. However, because biprobit models have no semi-parametric and semi-non parametric version we address this issue by estimating our models with and without financial aid variable.

Table 4: *SML models for completion within five years*

| | Completion within five years | | | |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| Entry age | 0.308*** | 0.898*** | 0.962*** | 0.668*** |
| Women | -0.617** | -1.095*** | -2.786*** | -0.708** |
| Summa cum laude | | | 7.149*** | 7.452*** |
| Scholarship | 0.811** | | 3.664*** | |
| WOS | -1.914** | -8.506*** | -6.327*** | -4.458*** |
| Doctor of Science degree | 1.698** | 6.453*** | 2.594*** | 3.917*** |
| Top supervisors | 1.844*** | -0.367 | -0.213 | -0.744*** |
| Foreign referee | 1.603** | -1.979*** | 3.811*** | 6.27[8]*** |
| N | 143 | 143 | 143 | 143 |
| Wald test (p value) | 0.0279 | 0.0077 | 0.0093 | 0.0036 |

Source: own estimations based on data from Ph.D. programme office.

Table 4 shows our estimations using different specifications. The entry age positively and significantly influences the completion of Ph.D. within five years in all models. In other words, younger students finish earlier their studies comparing to older colleagues. The negative and significant coefficients of Women suggest that the probability to finish the study within five years decreases for women students. Interestingly, the higher quality of dissertation (summa cum laude degree) increases the probability of completion within five years. Positive and significant

coefficient of Scholarship variable implies that financial support help to student to finish their study within five years.
The various aspects of supervisor qualities have different impact on the completion time. Supervisors publishing in journal of the Web of Science have negative effect, and having Doctor of Science degree have the opposite impact on the time to degree. Recall that correlation coefficients are positive between two variables. We can argue that supervisors with high quality research performance expect more from the students. On the other hand, supervisors with Doctor of Science degree are powerful enough that they may help their students through official procedural rules. For example, they may exercise informal pressure for foreign examiners to finish their referee report as soon as possible. The role top supervisors is rather ambiguous, the coefficients of this variables have opposite signs in various specifications and insignificant in two models. Contrary to a priori expectations, the introduction of foreign referee decreases the completion time except one specification.
Finally, we take into account the possible endogeneity of financial support, thus we estimate our models with and without scholarship variable. The majority of results remain the same except top supervisors and foreign referees.

### Summa cum laude degree

We estimate similar models for summa cum laude degree using the same explanatory variables. To deal with potential endogeneity issue of financial support we estimate our models with and without scholarship variable (Table 5). Surprisingly, the entry age has negative and significant impact on the summa cum laude degree that is older student write better quality thesis. Being women negatively influences the summa cum laude degree, although coefficient is significant only specification without scholarship. In line with our expectations, foreign referees have negative impact on summa cum laude degree. This implies that foreign examiners have higher quality standard comparing to Hungarian colleagues.

Table 5: *SML models for summa cum laude - A*

| | summa cum laude | |
|---|---|---|
| | Model 1 | Model 2 |
| Entry age | -0.097** | -0.158*** |
| Women | -0.406 | -3.141*** |
| Foreign referee | -2.058*** | -7.100*** |
| WOS | 0.956** | 0.911*** |
| Doctor of Science degree | -0.253 | -3.362*** |
| Top supervisors | -0.841** | 5.495*** |
| Scholarship | -1.546** | |
| N | 143 | 143 |
| Wald test (p value) | 0.0220 | 0.0057 |

Source: own estimations based on data from Ph.D. programme office.

Similarly to completion time two features of supervisors have different impact on summa cum laude degree. As we expected, supervisors with international publications positively influence the quality of dissertations. However, supervisors with Doctor of Sciences degree have negative effect on summa cum laude degree. Unlikely, the top supervisors have again ambiguous role on the quality of thesis with opposite signs in different specifications. Our results may suggest that professor with high prestige and many students supervise students with different qualities. Surprisingly, scholarship negatively influences summa cum laude degree. Models with and without scholarship variables produce similar results, except for variable of top supervisors.

Table 6: *SML models for summa cum laude - B*

| | summa cum laude | |
|---|---|---|
| | Model 1 | Model 2 |
| Entry age | -0.661*** | -0.593*** |
| Women | 7.360*** | 1.062*** |
| Completion within five years | 9.965*** | 6.586*** |
| Foreign referee | -17.410*** | -10.074*** |
| WOS | 7.530*** | 3.965*** |
| Doctor of Science degree | -18.050*** | -9.946*** |
| Top supervisors | 4.342*** | 4.457*** |

| | | |
|---|---|---|
| Scholarship | | -2.951*** |
| N | 143 | 143 |
| Wald test (p value) | 0.0001 | 0.0079 |

Source: own estimations based on data from Ph.D. programme office.

Now, we try to assess the speed of completion on the quality of thesis. Thus, we re-estimate our models adding a new variable, namely completion within five years. Majority of our results remain qualitatively the same (Table 6.). Entry age, supervisor with Doctor of Science degree and scholarship have negative and significant impact on summa cum laude degree. Whilst, supervisors having international reputation positively influence the quality of thesis. Surprisingly, the sign of women has changed, now it has also positive impact on summa cum laude degree. In these specifications, top supervisors unambiguously support the quality of thesis. Finally, the speed of completion has positive impact on summa cum laude degree. In other words, producing high quality thesis is not necessarily implies long gestation period.

## Conclusions

The attrition, completion time and quality of theses are important features of every Ph.D. programme. The aim of the paper is to analyse the factors explaining long completion time and the quality of the thesis in the Management Ph.D. Programme at the Corvinus University of Budapest for the period of 1993 and 2010. The main findings are following. The attrition rate is relatively reasonable comparing to international experiences. The long completion time can be explained partly by some rigid procedural rules. The majority of students are concentrated for some supervisors. This concentration does not lead to higher quality of dissertations in terms of summa cum laude degree.

Econometric estimations suggest that Students and supervisor characteristics are matter for completion within 5 year. More specifically, entry age, summa cum laude, foreign referee and supervisors with Doctor of Science degree has positive impact, whilst women, supervisor with publications in Web of Sciences, top supervisor has negative influence on the completion time. Regarding to the quality of dissertation, students and supervisor characteristics and procedural rules play important role matter for summa cum laude.

The empirical results reported here do provide some guidance about how to improve completion rates and quality of dissertation in our Ph.D. programme.

## Notes

[1] I thank for comments on earlier draft of the paper to Erzsébet Czakó and Ágnes Zsóka.

[2] I thank for the help of data collection to Zsuzsa Krista and Szilvia Nárai.

[3] We have data for this variable after the introduction of foreign referee.

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# IMPACT OF THE INSTITUTIONAL-FINANCIAL SYSTEM OF HUNGARIAN PUBLIC EDUCATION ON EQUAL OPPORTUNITIES AND ITS POTENTIAL CHANGES

Eszter KOVÁCS*

*In theory, education could contribute greatly to the close-up of disadvantaged children, thereby decreasing inequalities concerning their opportunities in labour market. The current public education system of Hungary cannot perform the task efficiently. As a consequence of the different financial abilities and competencies of local governments, the quality of education is very low, mainly in the most disadvantaged areas of small settlements - in areas, where it would be necessary for the society. It is possible that the new public education act will decrease heterogeneity via central funding and by a standardized outer professional control system. However, the enforcement of integrated regional approach in the institutional system is still an open issue.*

**Keywords:** disadvantaged areas, new Act on Public Education, equal opportunities
**JEL codes:** I22, I24, R59

## Introduction

Only a few people argue that with knowledge-based society and the tercierisation of the economy, the significance of knowledge and other competencies in connection with work have increased (Kok, 2004). However, opinions are very different about the roles of education. One extreme is that education is only a knowledge transfer on a high level, while the other is that education includes the close-up of disadvantaged people, intermediation of culture, strengthening of local societies, and possibility of self-realization and the transfer of competencies. Some people think of education as a service, which should be offered at market price. Others think that education is "investment in human capital" at state level.

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We prefer the latter wider interpretation, but - due to world trends - we have to emphasize the significance of the transfer of useful knowledge because of global trends, and its contribution to the equality of opportunities. The former aspect has not been argued very often since the "Human Capital Theory" of T. W. Schultz (1983). Moreover, adequate structure of education could be suitable when managing structural and regional unemployment. Equality of opportunities means that someone's origin should not be a decisive factor - in other words, everyone should get the chance to change his life. We use the phrase in its broad sense, and in the study we focus on the regional aspect, and within this, primarily on the different opportunities of the inhabitants of small villages - contrary to the text of the Basic law and the law about equal treatment and promotion of equal opportunities; they do not emphasize this aspect (Act CXXV of 2003 on equal treatment and the promotion of equal opportunities) (Act XX of 1949 on the Constitution of the Republic of Hungary).

According to the majority of group status studies (Andorka, 1982; Róbert, 1986; Szivós and Tóth, 2004), cultural mobility - and within it, education - plays a determining (but not exclusive[1]) role in social mobility and equality of opportunities, as it is able to reduce social disadvantages caused by one's origin and because free public education can transfer a certain amount of cultural capital even to the poorest children. Paying attention to own interviews (Sayed-Mohammed, 2009) and literary sources, we concluded that education itself *is not able to reduce adequately* the disadvantage in chances of disadvantaged children and it does not always mean the transfer of useful knowledge.

## 2. Past, present and problems of the schools of small settlements

### *2.1. Vicious circle of disadvantaged regions and their education affairs*

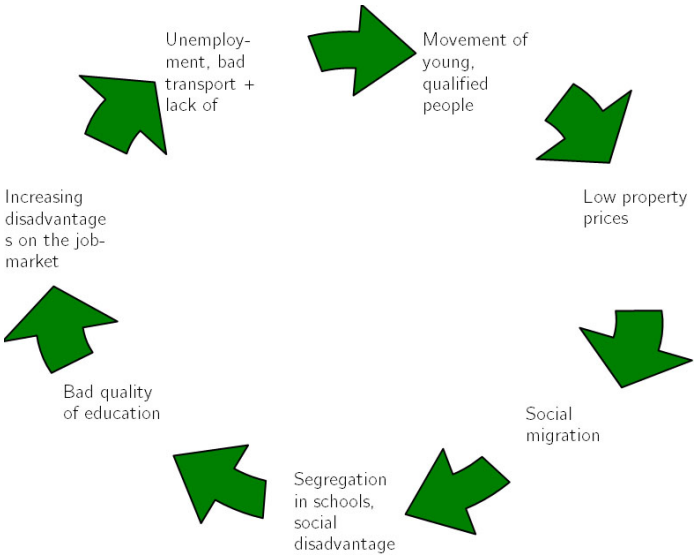
Under "Hungarian public education" we mean elementary and secondary education. One of its spatial features is that even in settlements having small population elementary and secondary schools are operating (former ones even in settlements having less than 1000 inhabitants, latter ones in settlements having 4-5000 inhabitants). Therefore, the problems of disadvantaged areas with small villages combine with the awkwardnesses of education in some regions of Hungary. The effects of these

two strengthen each other throughout institutional-financial system of education and social-economic situation of students.

In multiply disadvantaged areas like the micro-region of Sásd, the problem is not only the fragmented spatial structure of the settlements, the heavy accessibility resulting from this and the poor institutional background. It is a significant problem, too, that these regions are very far from the country's development axis and also far from urban agglomeration. As a result of the economic underdevelopment, significant number of people is unemployed in these areas and many of them are totally eliminated from labour market. Younger, better-skilled people move to other regions in quite a big ratio, their properties become undervalued and often bought by impoverished persons being on the periphery of the society. Therefore - mainly resulting from children's disadvantages in socialization -, a kind of segregation has developed in case of some village schools. A part of this new generation has parents being dropped from labour market - making child poverty and deviant behaviour (gambling addiction, alcoholism etc.) a common phenomena. This reference group (family and urban environments) has negative effects considering the socialization of children. The school performance of such a child reduces and his behaviour becomes worse, thereby forcing teachers to work even harder. In Hungary, such disadvantaged areas consisting of small settlements can mainly be found in the Northern Hills (North-Hungarian region) and in South-Transdanubia (Beluszky and Sikos, 2007).

According to the interviews made in Sásd micro-region, this phenomenon is particularly frequent among Roma families, but we can experience it in other (usually deprived) families, too. The problem is further intensified by the demographic features - different from mainstream society - of the Roma families: early family formation and high number of children. These disadvantages in chances *could only be compensated by a perfect elementary and secondary education structure*, but - considering competency tests (e.g. Bodor, 2006) - it is not common in such regions. It leads to further disadvantages on labour market, causing permanent unemployment - and the "vicious circle" is closed (Figure 1).

Figure 1: *Vicious circle of disadvantaged small settlements*




Source: Own construction.

*2.2. The institutional system of Hungarian Public Education in the past 60 years*

After the political system had changed, primary and secondary schools were handed over mainly by municipalities. This institutional-financial answer was just the opposite of the socialist, monolithic, centrally and dictatorially managed education system. Moreover, it was a total denial of that. Between the Council Act of 1951 and the end of the 1980s, education system in Hungary had the following nature: it was managed by units created mainly by political and not by territorial aspects and it was directed centrally uniformly from single county and district areas. Unified education management and control from counties or districts had a big role in it, as well as the compulsory "directive curriculum" of the Ministry of Public Education which reduced the differences between schools concerning education quality - thereby contributing to equal opportunities. But, according to a big proportion of professionals, this was exaggerated, so they prevented the schools from local initiatives and from flexible adaptation to local features.

Professional focus of the developments in upper grades was on the extension of vocational education system which meant a big step forward. Regional policy preferred the district education canters according to the Nationwide Network of Settlements Development Concept (1971) and for "function-deficient" settlements (mainly for small villages and settlements), development of public services - involving education - was prohibited. As a result, a lot of schools had to be closed in the 1970s and 1980s. The concept required an increase in professional and cost efficiency (Faragó, 2005), since the concentration of settlement functions according to the number of recipients can develop naturally, too (as a result of a process caused by economic rationality). Centralization appeared not only in socialist ideology but, for example, in Christaller's famous "theory of central places". Main disadvantages of the programme was that it did not ensure the availability of public services for the inhabitants of smaller settlements; it made not or just hardly possible for children to attend district central or urban schools. The same was true concerning the availability of working places. It has led to a really fast rural-to-urban migration or movement from rural places to bigger settlements concerning young families having child/children - parallel to it, smaller settlements has become deserted or inhabited mainly by elder people.

However, district central schools and urban schools had bigger possibilities to develop the quality of education than the small schools of little settlements having combined grades, educating only a few students, and being in lack of basic tools and infrastructure (e.g. no gym in the building).
As a result of socialist ideology and homogeneous quality, education system contributed to equal opportunities in principle. However, in practice, worker- and peasant-born children became preferred and parallel to these interests of children growing in smaller settlements were not dealt with. The situation was also Janus-faced concerning the Romas. Although, the ideology emphasized the integration and equal rights of Romas and significant steps were made to increase their living standards and opportunities (mainly by eliminating gypsy sites and moving Romas into villages, and by giving them - because of their qualifications, mainly physical - jobs within the frames of full employment), in schools, they were segregated very often from other children (Virág, 2010).

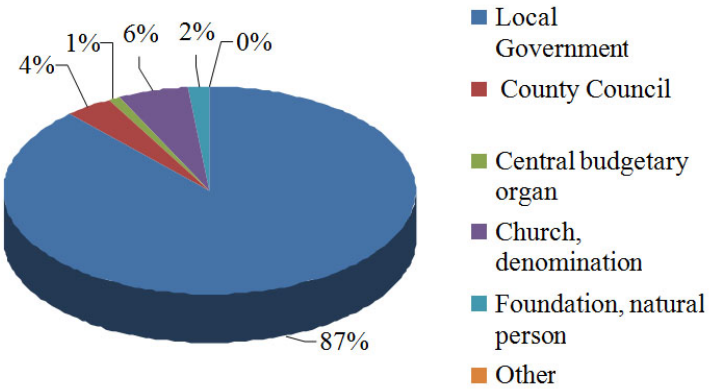
After the adoption of the 'Act LXV of 1990 On Local Governments', "renaissance of local initiatives and self-management" started in elementary education. Lots of majors regarded the opening of schools as a boosting power in local community life and as a factor that strengthens identity (and sometimes their own prestige, of course). Moreover, they thought it was a chance to reborn their settlements and they blamed the socialist school closures for their disadvantageous position which was not the only cause in some cases. Local autonomy concerning education in the new act became also attractive to local intellectuals and municipal leaders. This - coupled with a relative abundance of resources - led to an enthusiastic, creative working attitude in education in a number of small settlements (Reisz, 2005).
However, much of these re-opened schools closed in the mid-1990s and the end of the 2000s or they continued as members of jointly managed institutions in frame of task-performing associations as a result of uneconomical operation (caused by their small sizes), lack of municipal resources and shrinking budgetary resources. In Hungary, it is typically true that these associations were not built from the bottom. Instead, funding constraints created them solely (economies of scale or association normative stimulated them to be born).

*2.3. Actual problems of maintaining and operating of schools in disadvantaged settlements*

Nowadays, the biggest part of elementary and secondary schools are operated by the municipalities as budgetary institutions (Figure 2), therefore having incomes from two main sources: normative state subventions - about the same amount of money per student - and municipal support depending strongly on the financial situation - amount of incomes and expenditures - of the local government in the given settlement (Local Government Act, 1990). Moreover, in certain cases the poorest local governments regroup a part of the normative subvention to other (not educational) objectives (Varga, 2009). In principle, expenditures consist of operational (e.g. salaries of teachers, tool procurement) and accumulative (e.g. institutional enlargement) costs. However, the lack of monetary resources make it possible for poorer local governments to cover only *operational expenses* or only *part of these* in many cases. Sometimes sources can be completed with the help of application funds, but liquidity of schools are also destroyed by the fact that these

sources are usually post-financed, and very often local governments do not have enough resources to ensure their own contribution. One-time assistance is not a solution if the local government remains unable to ensure the operation and maintenance of the institutions.

Figure 2: *Distribution of places performing primary school tasks according to their maintainers in the region of South-Transdanubia (2010)*




Source: Own construction according to 2011 KSH (Central Statistical Office) data

So, financial problems occur in regions which are mostly in need of good-quality education, in order to compensate the disadvantages coming from socialization - thereby making close-up possible. Available resources here are not only less in absolute value than in areas having a better social composition, but the extent of differences is even bigger "relatively" if considering the duties which should be performed.
There are schools with combined grades (mainly the lower grades in small settlements) even today. They have basic infrastructural problems as well. The more the children in these classes are, the less the concentration on each of them is.

Financial problems mentioned above implies that teachers in the primary schools of segregated regions get the lowest salaries in comparison with their colleagues (however, teachers earn a relatively low amount of money in comparison with other graduate salaries, too). Therefore,

contra-selection is typical in the teachers' board. The close-up of disadvantaged students, however, would require serious educational work, as well as attention and professional competencies. Another common phenomenon is that small settlements do not have enough resident teachers or if they have, they employ other ones, commuting from other settlements. As a result, teachers cannot play an important role in young people's lives, they do not take part in organizing afternoon projects or other cultural programs - all in all, they are not boosting factors in the life of the community. So, these small schools - very often - does not play role in "strengthening the local identity" (in spite of the fact that this is mentioned to be their biggest advantage) by which they could help to grow the ability of their settlements to retain their populations. If concerning ghetto schools, we often see that local leaders - e.g. the major -, who insist on the existence of a given ghetto school, send their kids to other institutions, e.g. to sub-regional central schools (Kovács and Somlyódyné Pfeil, 2008).

Current management approach of the municipalities causes another technical problem, by which active and passive accruals are impossible to be made. Thereby, it cannot help in realistic assessment. Moreover, depreciation cannot be enforced, making it impossible to evaluate realistically and to validate controlling approach. Local self-government finance is not equal to task funding, rather to managing institutions - which, however, does not stimulate efficient operation and management (resources are not assigned to tasks to be performed, but to the institutions performing them.)
Professional considerations are often retarded by the fact that *council board members* in case of schools financed by local governments exert influence on control (e.g. employers' rights, appointment of institutional leaders, supervision of actions, right to force people report and right to give instructions) (Law on financial bodies, 2008). However, time capacity of this organ is not always enough to complete tasks like these and in certain cases, the lack of competences is also a problem.
So, in present system, decision-making powers, responsibilities and finance are separated. Local professorates can make decisions - with the approval of the city council - in professional issues, and certain decisions are made by the city council itself. Parallel to this, maintaining the schools is the responsibility of the municipalities according to the Local

Government Act and financial issues are solved partly from central budget and partly from local ones. Central and local resources are distributed in a proportion of 50-50% concerning the national average, but in case of smaller settlements, use of central resources is much higher in proportion. We can conclude that financial and professional bases are insufficient for this huge municipal task. Moreover, separation (mentioned above) often leads to conflict of interests in some schools.

Fragmentation of the institutional system and the mentioned social and financial inequalities lead to a high-level heterogeneity of educational standards. It is aggravated by the fact that there is no systematic, uniform, outer professional evaluation and control. The profession is about to standardize neither the educational methods, nor the contents of the subjects. This is illustrated by the example of quality assurance: though, it has been compulsory to operate some kind of quality management system since 2000, the type of this system is various in the different institutions. Therefore, we cannot speak about a unified quality assurance system. It often occurs in practice that the main points of quality management approach do not prevail. These points are assessment, optimization, control and if needed, correction (feedback mechanism) of resources needed in the workflow – as we see, it does not mean documentation (creating records) only (Bardócz and Tódor, 2001).

Interviews made in the micro-region of Sásd show that behavioural problems of students often occur as well as the fact that teachers in such situations "do not have word", since parents and school leaders do not co-operate with them. According to the data of the public education development plan of Sásd micro-region (Bodor, 2006), results of competency tests in the given school move together with the ratio of disadvantaged students, from which we can conclude that socialization is mainly determined by the family - children spend little part of the time in schools, and that is why education cannot play determinately role in close-up. During the interviews it was repeatedly stated that relationship between disadvantaged situation and Roma origin is frequent, which seems to be strengthened by local data showing that social securities and origins of the inhabitants in the micro-region move together. However, the subjects emphasized that these problems are specific not only in Roma families and that "no Roma issue but poverty exists" in Hungary.

*2.4. Limits of cooperation concerning small schools modelled by prisoner's dilemma*

In our opinion, the biggest problem in the past 20 years' Hungarian education has been the lack of collaboration and the lack of territorially complex thinking. Educational collaboration, association between settlements can usually be realized only if each of the given settlements becomes unable to finance their schools. Leaders of the settlements are often reluctant to relinquish the school maintenance, mainly because of their own prestige and of the difficulties concerning children's admittance. It often leads to poor conditions (buildings not been renewed, classrooms without heating, lack of equipments), low quality (e.g. combined grades, homogeneous social composition of students) and to the indebtedness of the given settlement (borrowing, bond issue). In this underfunded status, it seems that the recipient settlement is not interested in maintaining a combined school because per capita funding cannot cover per capita costs - so they have to use a certain amount of local resources as complementary ones, even spending on children commuting from other settlements.

The cause why we do not think it "fashionable" to speak about the possible advantages of school mergers can be the socialist history itself. However, collaborating settlements could reach better cost-effectiveness and professional standards in areas of small settlements even today, because in case of school mergers, maintenance of classes and facilities become more economical, working time of teachers become better utilized, their salaries can be paid more easily, thereby attracting better-qualified teachers to the institute. The bigger the area is in which the collaboration happens, the more heterogeneous the social-ethnic composition of students is. E.g. in some areas of Baranya county, "Roma" and "not Roma" settlements are located in a mosaic-like position, and the social composition of smaller towns, bigger settlements is better than the ones in the most disadvantaged small settlements[2]. In education, school class community (which is a reference group) is very important concerning its socialization effects on disadvantaged children. Prohibition of segregation is included in the "Act CXXV of 2003 on equal treatment and the promotion of equal opportunities", too. Even so, sociologists say that Hungarian education system is one of the most segregated ones in Europe (Virág, 2010). Free choice of school also contrib-

utes to this, since the well-favoured families living in disadvantaged settlements send their children to nearby schools located in a city or in a bigger settlement, having better social composition and higher education quality. It deteriorates the situation of schools in disadvantaged areas. Above all, segregation of Romas and poor children often happens (even today) in primary and secondary schools having more classes in a grade (in case of Miskolc, damning court order has been born).

**Table 1:** ***The pattern of prisoner's dilemma***

| | | Second criminal | |
|---|---|---|---|
| | | Confess | Deny |
| First criminal | Confess | -5, -5 | 0, -10 |
| | Deny | -10, 0 | -1, -1 |

Source: Own construction.

Back to the possibility of educational associations, concerning leaders' aspects: the situation is well illustrated by the pattern of prisoner's dilemma known from game theory (Table 1). This is a non-zero sum game, in which the most positive (least negative) result occurs if each of the two criminals collaborate (deny). According to the example, the two collaborators had committed an offense together, and after it, they were interrogated separately. None of them could know if the other had confessed but in case of confession, the one giving the information to the police can expect the reduction of his penalty. Numbers in the table indicates the amount of time spent in jail, with a "negative-sign" (-), because the utility is negative. If both confess, they will be given 5-5 years. If none of them confess, they will be given 1-1 year, because their crime cannot be proved. If one of them confesses while the other one does not, the first one will not be punished, while the second one will get 10 years. The possibility of non-confession is useless, because individually it is much better to speak (because the number of years given will be less, whatever the other one does). We must translate it to a situation of two majors, each of them having a school operating uneconomically. Co-operation ("deny") means that they agree on the maintenance of a commonly operated school. But the question is: which of them should forego the "prestige profit" (and the per capita funding, that can be partly rearranged)?

Collaboration of small settlements is often prevented by personal or political contrasts of the leaders and, in many times, by their past grievances.

### 3. The main changes of the new Public Education Act and their expectable effects on the equal opportunities

Government has accepted the concept of the new Public Education Act (so-called "National Public Education Act") on 31st August, 2011. It will be a framework law, further concretized by government regulations, other laws and by changes in the law. However, it contains significant changes in connection with institutional-financial questions discussed in this study and there are ones, which directly or indirectly have affects on the realization of equal opportunities.

The most important change is that central government will take over operation and finance of primary and secondary schools of municipalities. Thereby, controlling of the sector will strengthen as well as the role of the Office of Education and, later on, professional management-controlling role of district offices created in accordance with the new Local Government Act will also increase. (Although, local governments of settlements having more than 2000 inhabitants can take back the operation of the institutions with fixed-term contracts.) Education of children in the kindergarten would remain the task of the municipalities, and it should be organized in each settlement where at least 8 parents ask for the operation for a kindergarten. Teachers' salary and the contributions (which mean 85% of the total costs concerning Hungarian schools) would be paid by the central budget in case of municipal, church and private schools, too. However, the framework law does not contain the principles, by which central resources should be shared among schools, mainly operated by municipalities in the past (National Public Education Act, 2011). However, it is likely that the shortage of funds will be reduced in disadvantaged areas, daily operation of schools will not be in danger directly, thereby making it possible (in the long run) for teachers to do their jobs on a higher level. The lives of municipalities that take back control over schools will be changed by the new Local Government Act, which contains the conversion from institutional to

task funding - resulting a more effective task performing economically (T/4864, 2011). Changes in the finance of local self-governments will have a bigger impact on the tasks of kindergartens which, however, remain compulsory tasks for the municipalities and which have determining role in personality development and in subsequent school results.
Concerning concrete professional issues of public education, professional task performing roles and responsibilities of school boards will grow in cases where municipal board had to approve the decisions earlier (e.g. educational program, acceptance of organizational and operational rules). In our point of view, these measurements increase professionalism. However, significance of local curriculum will be reduced (10%) and, in return the central framework curriculum will be the compulsory one, with a bigger role (90%). Adapting to local conditions will be harder but, in exchange the more standardized curriculum will contribute to the unification of knowledge, thereby reducing the disadvantages occurring in the labour market or during entrance exams. Shortening the textbook list is a similar measurement, too.

In connection with quality assurance, it seems a good step forward that professional work in schools will be checked in every five years by an outer committee consisting of three members, applying uniform criteria. It is another important issue whether quality standards can be forced to each school or not. For us, real sanctions are not clear in case of non-compliance; we do not know, whether it could lead to closures, mergers or not. First of all, we think of the case of "ghetto schools". The law does not contain the closure of small schools with combined classes and/or with small number of children. Moreover, government rhetoric supports their operation and restart; operating lower grades will be compulsory in settlements where parents of at least 8 children ask for it. It is not a problem itself if not leading to the destruction of quality and if taking rational regional task organizing and integrated approach into account (e.g. organizing the admittance into the micro-regional school by a commonly bus; use of inefficiently operating, closed school buildings for nursery purposes etc.). Although the concept contains county-level development and planning of public education (instead of present regional concepts with different efficiencies) we do not know, how big its practical role will be. District offices endowed with professional management roles will have deconcentrated tasks instead of decentralised ones.

Concerning equal opportunities and the compensation of disadvantages descending from family background, it is welcomed that educational function of schools became highly ranked in the concept. In this spirit, compulsory all day education on lower and (except the case of parental request) upper grades became an element of the concept (although, discussions are held about it). Moreover, the intention of strengthening day-care centres and of increasing the number of dormitory accommodations is also emphasized.

We are afraid, that if the detailed elaboration of the framework law and its introduction delays, or it does not take the interests of inhabitants living in disadvantaged areas into consideration with adequate emphasis, or it does not apply as complex, integrated approach territorially and socially as possible - with the mobilization of as much participants as it can -, then breakaway trends began will grow into unstoppable, self-excitation processes.

## Notes

[1] According to Halsey (1972), school qualifications of children are largely determined by the social status of their parents. Thus, education is not the only status-determining factor it only mediates the preferable social status. Moreover, according to Bourdieu (1978), the required behaviour in French schools in the era was equal to the culture of the privileged classes, therefore, their children became in a better position. So, education system further perpetuates social differences.

[2] For example, in Sásd micro-region - in Baranyajenő - a school was closed in September 2008. In this school, the rate of disadvantaged students was 86% and within it 50% was multiply disadvantaged - which caused a significant fall in the quality of education. Even before the school of Baranyajenő was closed, well-to-do parents had sent their children to the elementary school of Sásd, which is the centre of the micro-region and is just 5 kilometers far from Baranyajenő.

## Acknowledgement

This study was supported by TÁMOP 4.2.2/B-10/1-2010-0029.

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# BEST PRACTICES OF HIGHER EDUCATION TALENT SUPPORT, GRADUATE FOLLOW-UP SYSTEM AT THE UNIVERSITY OF PÉCS

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and Norbert SIPOPS***

*We are focusing in this paper on talent management and human capital management, particularly as observed in the 'Graduate Follow-up Programme' of the University of Pécs (UP). We examine the topic from two perspectives. The first is the connection between the management of an institution of Higher Education (HE) and the business world (e.g. via a career office) and the second relates to the transition from HE to the labour market (a particular phase in talent management). Our database, which we used in our practice-oriented, empirical research, consists of two main parts: the Graduate Follow-Up System (GFS) and the UP questionnaire regarding students' professional practice. The multilateral approach helps us to achieve a realistic picture of which processes and peculiarities characterise a student's (pre- and post-graduation) placement in the labour market. We draw conclusions and formulate recommendations based on criteria for the most significant factors relating to new recruits from both corporate and HE perspectives. After presenting the results of empirical research we give brief overview of the Hungarian and the Romanian situation of higher education on the basis of criteria for the European Higher Education Area and Bologna Process. Subsequently, we formulate our recommendations, which are primarily formulated based on the experience of professional practice (in Hungary is also unique). The system of professional practice serves as a highly effective feedback, and this shows that removal of the conventional knowledge fetish. Secondly, there is a demand for bipolar system of knowledge and skill-application (that manifested in competence-principle).*

**Keywords:** Higher Education, Graduate Follow-Up System, Talent management, Human capital, Labour-market skills
**JEL codes:** I21, I23, J24

## Introduction

The study presents a research carried out among students of one of the most successful university faculties of Hungary: University of Pécs Faculty of Business and Economics (UP FBE or 'Pécsi Közgáz').

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The most important aspect is the way the skills of students are able to meet the needs of corporate and labour market. Our conclusion is that employers are not expected to focus on creativity. In employing of a new staff member is more important the fast integration, adaptation, diligent and precise work. On this basis it is formulated that the key to success for the students in the labour market is matching the needs of companies. If the personality and competence of the entrant is similar to the characteristics of the optimal worker imagined by the employers they prefer to employ. We can imagine this relationship as a balance, where in one of the pans there are the business expectations and on the other side the competencies of the job candidate. Cooperation will be successful if the two-pan are in balance: it is a mismatch if an entrant wants to find a job with too many powerful features and it is also not acceptable if they do not have the necessary skills for that job.

The results of our research show that the employers want to apply primarily appropriate staff in the corporate culture (Nunes and Breene, 2011). The UP FBE students have developed emotional intelligence (EQ), which facilitates better integration.

The concept of EQ includes own thoughts, feelings and knowledge and its use to manage their own behaviour (Neale *et al*, 2010). The four components of EQ: emotional literacy (knowledge of their own emotions and functioning), physical fitness (endurance, flexibility), depth (intensity, emotion differentiation), and alchemy (the emotions of the creative use) (Cooper and Sawaf, 1996).

Beside the Faculty's own research even the experience of the Graduate Follow-up System (GFS) under circumstances of acute competition among HE institutions are highly important, since the results are part of performance measurement. Competitiveness in HE is a complex and strategic concept (Barakonyi, 2009), and we deal with one element, namely the consistency between the student output of HE institutions and labour market requirements. The information on graduates entering the labour market provides serious feedback for the training-provider institutions. If students from an institution consistently find jobs sooner than those from another, this means that the first institution is more competitive, and, probably, that its students are more likely to meet the needs of the labour market. The converse is not necessarily true, in the sense that the career opportunities for a student are not necessarily linked to the degree classification. The aim of the GFS research (Garai,

2010; Kuráth *et al.*, 2011) is to measure information on the career, status, working conditions and income of new graduates, and to provide feedback for their institutions of education. In our study we discuss the methods and techniques used at the UP FBE to study and manage the career of talented students before turning to the latest data and analysing of the students of the Faculty to draw our conclusions.
The study also aims to illustrate the current situation of higher education in Hungary and the factors affecting the competitiveness of the education example of UP FBE. We focus on the relationship between higher education institutions and labour market. We examined the transition period of students to the labour market. Connecting to this there is the present of the talent management approach of UP FBE. The data used for empirical analysis are provided by the results of questionnaires which were filled by students and companies during professional practice and the results of the GFS. Further, we examine the specific processes embedded in the European Higher Education Area and the Bologna process.

## 1. Professional practice – The success of the students in the labour market

Faculty of Business and Economics considers the comprehensive understanding of the connections of students with the labour market an important task. Accordingly, it carried out researches of the characteristics of internship work during the professional practice, and it collects the experiences of the alumni organization, the social-senate, training, teaching (guest speakers), career days, business projects, case study competitions, student academic conferences, scholarships, too. It is very important, because we can draw a conclusion from the labour market and the integration of expectations of students and employers. It should be noted that many students after graduation were applied at the company, where they worked previously as trainee.

## 2. The practice of talent development on the UP FBE

The concept of talent management involves a broader perspective than basic professional practice. It can, in fact, be described as an inspirational concept at the UP FBE for MA (master's degree) students, as every tool is regarded as a talent management tool which seeks to develop talent. However, what should also be borne in mind is the mandatory nature of professional practice in respect of a number of majors – as laid down in Act. CXXXIX. of 2005: "in practice-oriented undergraduate courses it is obligatory to organise a one semester-long period of professional practice." In other words, the mandatory nature of the scheme applies only to professional practice.
An examination of a students' career between Higher Education and the labour market should be approached with caution, and as a complex question, since feedback has a significant role to play in talent management and in professional practice. Utilising the information obtained will give us a more complete picture of the results of the Graduate Follow-Up System. Our analysis of the student-life and labour market-related section is supported by two systems at the Faculty – by feedback from questionnaires relating to the professional practice system, and by the Graduate Follow-Up System.

## 3. Research among students with completed professional practice

The first examined research field is based on the GFS (Graduate Follow-up System) survey. Every HE institution has to develop its own system which allows it to keep track of its graduates. GFS creates a bridge between the worlds of HE and labour. This means that the results should be comparable whilst, at the same time, they need to be useful in making strategic decisions related to improving educational structures and goals. To achieve this, each year we need to question those who graduated 1 and 3 years earlier. It is accepted that the graduate labour-market situation does not change significantly in 1 or 3 years and should, rather, be examined only every 5 years, although in the start-up phase, important information can emerge. In the long term, maintaining continuous contact may well increase the willingness to complete the questionnaires.

The University of Pécs joined the GFS nationwide research programme in 2010 and contacted approximately 8 000 graduates (with at least a pre-degree certificate) from 2007 and 2009. The 21.7% response rate exceeded the initial expectations and so high quality estimates allow us to draw reliable conclusions from the sample and from the materials could be evaluated.

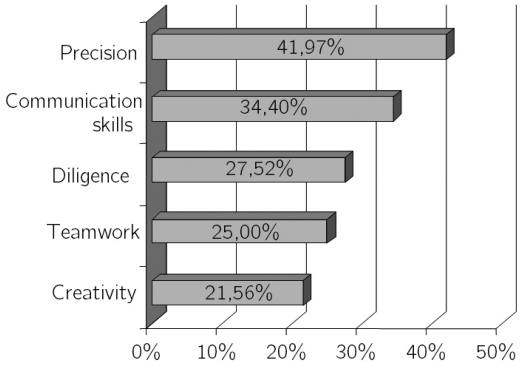
The second methodological research field is based – due to considerable overlap in the above sample – on the professional practice surveys. One of the main tasks the Faculty was to offer professional practice opportunities to their students throughout the year to further strengthen the relationships between students, the institutions and the business sphere. The organisation, Total Quality Assurance and the documentation relating to professional practice were the responsibilities of different Faculty organisations (Relationships Directorate and the Careers Consulting Office (CCO)).

In the 'old', undivided education system, with the approval of the Faculty Council, we launched in 2004 the Professional and Working Practice course to provide a credit- and grade-based evaluation system for professional practice, to come into effect from the autumn of the 2006/2007 academic year. This is a unique opportunity for FBE students, since they can have closer contact with players in the labour market in their two last years before graduation. To complete this course it is mandatory to complete the student and corporate surveys and so we have a 100% sample for drawing conclusions. From autumn 2005 until spring 2010 we received completed questionnaires from 463 students[1] involved in the integrated education system – in fact, 3[2] from each, which represents a total number of 1,389 questionnaires. To this we added 333 questionnaires relating to BA students' 3rd year mandatory practice. In our research we studied the reactions of both students and companies, and concluded that it would be profitable to continue to provide MA students with opportunities for professional practice throughout the year on a credit-based system, although it would also be necessary to employ a teacher and full-time administrator to handle this.

## 4. The experiences of the optional professional practice (related to the undivided education)

As a result of our research we surveyed the preferences of students and companies related to professional practice. By the exploration of students' prior expectations related to professional practice we establish that the students primarily think the precision as the basic competence for the successful internship, followed by communication skills, and third place in the nearly same level of teamwork, diligence and creativity as well. The following chart displays the details (Figure 1).

Figure 1: *The most important skills for performance of the trainee's work according to the students before the internship (proportion of mentions, %, N=463)*

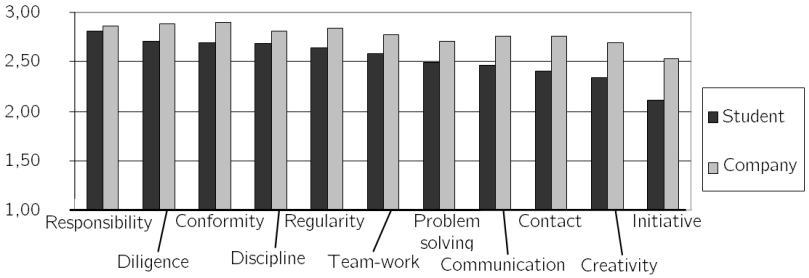



Source: Authors' research

After practice completed questionnaires show that students' previous expectations have proved true to a great extent, and the earlier fears were groundless. Most of the students had the opportunity to understand the organization, work processes and thus they came to know the specifics in the relevant area (for example financial, logistics, accounting specifics etc.). The practical application of skills and knowledge is in the first place among the expectations. This characteristic achieved 40% rate in the opinion of the examined statistical population, and the conclusion is that the students are fully able to fit into the staff (integration). In addition, the students also experienced skill-development, and they could work together with colleagues very well.

From employers' perspective the students were characterized by accuracy in most cases, which reflects the students' appraisal of the competencies required for work before the internship. Diligence as a typical student property is the second on the list. Interest, confidence, good attitude, cooperation, creativity and communication skills among the criteria of the companies reached about the same level.
The opinions manifested by companies cover not only students but also the work done by students. Based on the context of our analysis we established that the 'Pécsi Közgáz' students have the speciality: their emotional intelligence is better than average, namely they can be easily integrated into the community, are cooperative, and show empathy. Also they were reliable, worked usefully and they are characterized by diligence, independence, expertise.
The companies' feedback is clearly positive, according to them the students perform their tasks reliably and their work was really useful. Diligent work, integration, independent tasks and the good cooperation stand approximately on the same level. Negative opinions of the majority of cases are not framed in the corporate respondents, but rather praised the work of trainees.
The evaluation of students was completed by the companies on the basis of pre-defined skills, which the students also conducted their own self-assessment exercise. A comparison of the two ranking is presented in the following figure in descending order of the student-evaluation (Figure 2).

**Figure 2:** ***Comparison of student and corporate ratings (N=463)***




Explanation: From 1 to 3 scale, where 1 = unsatisfactory, 2 = adequate and 3 = very good

Source: Authors' research

From this figure we can see that the students underestimated their each skill in relation to the companies' assessments. That shows the relationship of students' self-image to external evaluators' perceptions. The hierarchy set up by the two parties, i.e. the sequence of skills is similar. The responsibility, diligence and the adaptation has received the best assessment both on the students' and corporate side. Analyzing the relationship between the central region (including capital, Budapest) and the other regions an important question is raised: what methods can help to teach the students in Pécs for successful appearances, for the appreciative attention using the emotional intelligence and for self-presentation on the labour market. We must mention that not only the skills of employees but the HR functions may have differences in regional and international comparison (Farkas *et al*, 2010).

## 5. The results of the Graduate Follow-up System

In the GFS research, 152 students completed the questionnaire, of whom 60% are female and 40% male. After work placement, roughly the same proportions work in business (46%) and in the public sector (47%), while 7% found jobs in the civil sector. In terms of company size, 58% of graduates work for SMEs and 42% for large companies. Of the respondents, 27% are managers (one-third of whom took correspondence courses) while 73% are employees (of whom only one-sixth were correspondence course students). The quick change in technology and finance established new operating models and financial products with untraceable complexity (Bélyácz, 2010).

Almost half of the graduates (49%) said that it was not difficult to find a job, one fifth (21%) thought it moderately difficult and 30% considered it difficult (22% reported a very difficult labour market integration). The graduates evaluated an average of 3.22 for the job placement experience (on a 1-5 scale where 1 is very difficult and 5 is very easy) – in other words, a little easier than average. From the regional perspective, 24% of new entrants to the labour market migrated to the capital city. In fact, only 2.6% of these lived there on a permanent basis at the age of 14 (74% in other towns or cities, 21% in villages and the rest abroad), and so ten times more went to Budapest as left. This trend clearly shows the talent migration from the provinces and the concentration of the skilled

workforce in the capital, which greatly affects regional competitiveness (Horváth, 2001; Lengyel, 2000). One of the major reasons for the migration to Budapest is that a job is easier to find there - and also starting salaries are higher.

Average net earnings in Budapest were 161,869 HUF in the third quarter of 2010, while in South Transdanubia (in the same period) they were only 114,364 HUF (KSH[3], 2011). In the approach and methodology used by the KSH – during the collection and categorisation of the data – the employment rate is the lowest in the South Transdanubia (46%) and in recent years incomes have also been lower than the national average.

In the sample, the average monthly net total income[4] (main and ancillary activities together) is 159,000 HUF. Gender does not show a statistically significant difference. The graduates working abroad earn most (234,000 HUF) followed by Somogy county (180,000 HUF) and Pest county (178,000 HUF). In Baranya County the monthly average net income is 162,000 HUF. We shall discuss later the relationship network's impact on incomes. These tendencies also confirmed by the research of AIESEC (Nagy and Kunsay, 2010).

We also surveyed satisfaction with the current job and other factors, and results suggest that 74% were satisfied with the professional content of the job (40% absolutely), 19% moderately satisfied and only 7% dissatisfied, and so for the most part graduates are satisfied. This can be explained by two factors: they have a meaningful and interesting job (also professionally), or they assessed their abilities realistically and had no exaggerated expectations. Job content proved to be most satisfactory overall, which is evidenced by the fact that the 88% of the graduates think that their work is "largely" related to their qualification (54% opted for "very largely").

We have similar results applying to personal circumstances (66% satisfied, 18% moderately satisfied, and 16% dissatisfied). With their physical environment 58%, professional prestige 47%, professional development and prestige 46% are satisfied, whilst they are less content with income and bonus levels. Here, 44% are "satisfied" (9.2% of who are "fully satisfied"); the dissatisfied proportion is 31% (of whom 15% are "not satisfied at all"). There is, therefore a noticeable difference (30%) between their evaluation of the professional factor and that of their income in the case of the new entrants to the labour market. It is possible that they perceive themselves as under-valued in terms of remuneration due to excessive

pre-expectations. Further analysis shows that women – even though they do not earn less – are less satisfied with their income than are men and the managers valued the satisfaction level of the content of the job - and the income – more highly than did the employee-level graduates. In regional terms, comparing workers in Pest and Baranya counties, the first are more satisfied with these factors. Interestingly, full-time students are more satisfied with their income then their correspondent colleagues. Using factor analysis[5] we examined these characteristics and identified two different groups, the results being summarised in Table 1.

The main statements of Herzberg's motivators and hygiene factors model are visible among the graduates. In essence, his theory declares that only motivators generate the satisfaction, whilst hygiene factors eliminate dissatisfaction but do not motivate workers to exert more effort (Herzberg, 2003). Overall, based on the feedbacks, the graduates would not object to the job, but, nevertheless, they can become demotivated, due to the lower-than-expected income, and so their performance may be lower than their potential performance capacity.

Table 1: *Herzberg's motivators and hygiene factors within the Pécsi Közgáz graduates*

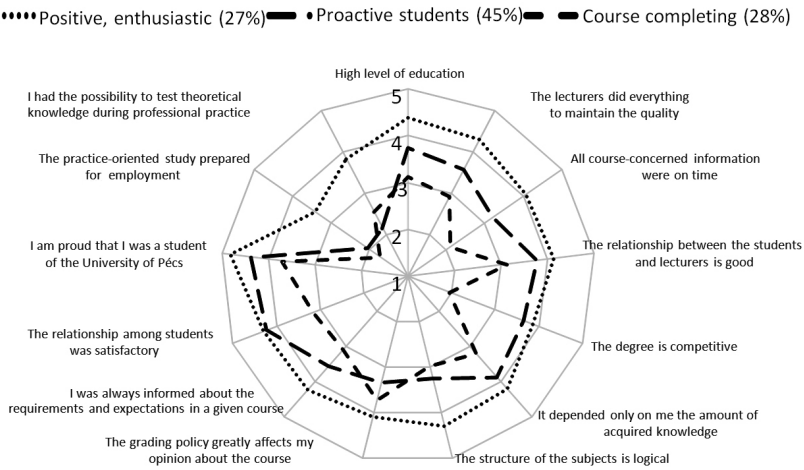
| FACTORS | THE JOB CHARACTERISTICS | FACTOR WEIGHTS |
|---|---|---|
| Motivators | The professional content of the job | 0,85 |
| | The professional development, career | 0,85 |
| | Professional prestige | 0,77 |
| Hygiene factors | Income, bonuses | 0,69 |
| | Personal circumstances | 0,77 |
| | Physical environment | 0,81 |

Source: Authors' research

In the relationship capital analysis we showed that graduates keep in touch first of all with course-mates (92%). By nature these are friendly (94% of the graduates chose this option), and, in addition, 30% also maintain professional relationships.

In addition, we observed professional relationships in respect of the CCO (64%) and teachers 59%). To determine the intensity of these, we formed two categories based on their existing number: the first group contains those who have a maximum of 2 connections and the second those who have 3 or more. We saw that the salaries of graduates with fewer relationships are statistically significantly lower (150,000 HUF on average) than those with 3 or more (180,000 HUF on average). The net wage gap of 30,000 HUF is relatively high and, further, it is interesting that the major part of the latter category works in the business sector.
It also emerges that language examinations were now given first priority. They had been well aware of this during their student years also, since language skills were ranked first in both cases. Professional practice is ranked second – in both instances – and so it is quite clear that, among 'Pécsi Közgáz' students, it is widely accepted that professional practice increases the chances of finding a satisfactory job, something which is even more highly evaluated by graduates than by undergraduates. The following preferences of students are foreign scholarships, other employment, academic and student activities and individual participation in student organisations. Overall, it is totally clear that, apart from foreign scholarships, they ranked activities in the same order. Further, each was recommended to be undertaken even more intensively by future graduates, since, in their view, these can significantly facilitate the process of entering the labour market.
To explore issues of education and other related factors, we asked 14 x 5-grade Likert scale questions. Pride in having studied at the University is extremely high (4.4), and very close to 4 is the satisfactory level of relationships among students (4.0) and the perception of high-quality in the education provided (3.9). Graduates, therefore, have a very high opinion of UP and of the Faculty also. On the lower end of the scale, with values below 3.5, are the information flow (3.3), the competitiveness of the degree (3.3), the opportunities to test theoretical knowledge during professional practice (3.0) and the practice-oriented study as preparation for employment (2.6). These show that, based on their labour market experience, they think that their university years did not prepare them well enough for the world of work.
For a deeper examination we formed 3 homogeneous graduate groups by K-Means Cluster analysis.

Figure 3: *The clusters based on the education's characteristics*




Source: Authors' research

The characteristics of the groups delineated are:

- *Positive and enthusiastic*: essentially agree with each issue, the perceived value of the practice-oriented education compared to the other two groups.
- *Proactive students*: they strive to acquire usable knowledge and want to receive all qualification-related information, although they do not think that their education is practice-oriented. In addition, environmental factors and good and positive relationships both with the lectures and the students are important.
- *Degree-oriented*: the least satisfied group, they gave a low evaluation to the questions in almost every area. Those completing the course-related questions which depend on individual performance are relatively high, but the objective values, especially course- related information are low. They do not want to achieve high skills, but only to complete the course and to take a degree.

We also looked for relationships between some of the groups and our previous results. We could not explain why the average wage (180,000 HUF) of those less satisfied with the University is 40,000 HUF more than that of the positive, enthusiastic group. For a complete picture we

decomposed our results to full-time and correspondent students, and we found that there is an increasing difference among full-time students, but positive, enthusiastic correspondent students have a significantly higher average wage (250,000 HUF), probably due to the fact that they were already working before they started their theoretical training.

Matching the above clusters with the Herzberg factors, the proactive students correlate with the motivators and the course-completing and positive, enthusiastic students correlate with the hygiene factors. It is easy to understand if we consider the findings concerning the correspondent students, since graduating has a relationship with a higher wage.

When examining the competencies necessary for the job, we found that employers expect greater autonomy from graduates after their university careers, although these often face conflict situations and, due to their many responsibilities, they need a high working capacity. It is interesting that, among job skills, language knowledge ranks relatively low compared to its value among the recommendations. It may be the case that a language certificate is required to enter most organisations although not used during everyday work.

These conclusions fully support the results of our faculty research concerning professional practice (Farkasné *et al.*, 2010, 2011a, b), in which the dominant factors are the precise work, diligence, responsibility and cooperation skills, whilst creativity, knowledge of foreign languages and innovative skills are relegated to the background. Based on this it can be argued that, during professional practice, students were able to develop self-knowledge and to understanding of labour market expectations. It is not by chance that 'Pécsi Közgáz' students are aware of the advantages of professional practice and its related benefits. We see from the general GFS report of the University of Pécs, Faculty of Business and Economics that a high level of significance and importance was accorded to the CCO by the graduates of 2007, 2009. Whilst the other Faculties of the University (10 in total, including FBE) showed an average of 3.7% of contacts maintained with the CCO, at FBE this figure was 12.5%.

Universities have an important role in student 'well-being', and in this context in the achievement and maintenance of the student's commitment, satisfaction and motivation. The appropriate learning form for individuals and a practice-oriented knowledge creation process allow students to develop their potential, to become more motivated and satisfied. If they feel well – and in this context much of the responsibility is their own – they

will be active, ready for different relations, willing to learn, and strongly success-oriented compared to graduates who are part of 'the herd'.

## 6. The Hungarian higher education in the European Higher Education Area

The main aim of the Bologna Process is the development of European Higher Education Area (EHEA) and the following sub-objectives linked to this: easily understandable and comparable education system, cascading training cycle, credit system creation, supporting mobility, European cooperation in quality assurance, supporting the European dimension of higher education (Szolár, 2009; Polónyi, 2010).
The objectives of the Bologna Process were adopted in 1999 and in 2009 followed the evaluations. On this base it can be argued that all participating countries have created the basic conditions of the higher education reform, and the process was successful in this context. The countries introduced the changes applying several methods and different depths, and still many open questions have to be resolved in the planning stage to 2020.
The new education system started in 2006 implementing the most important aims of the Bologna Process, namely promoting student mobility, European diversity and multicultural character, getting to know each other. A paradoxical effect can be observed in this field: the introduction of the new system reduced the number of students with foreign scholarship. There are several reasons, the first reason is the novelty effect, the other is that the education period was shortened, and a Bachelor's three-year and Master's two-year is too short period to planning about study abroad. Linked to this even the lack of language skills, labour market trends, and the fact that the students do not use either a foreign internship opportunities. However the mobility of students means not only strictly learning "delegation" and mission, but also includes professional practices carried out abroad.
Despite the strong students' desire the participation of Hungarian students on the international mobility is low. Mainly students from institutions of higher education in Budapest travel abroad, respective students in business and economics and liberal arts education field (Kasza, 2010). Among the Hungarian students the most popular destination countries are Germany, France, Finland, Italy, United Kingdom, the Netherlands, Russia, Belgium, Austria and Spain. Among the Hungarian universities

UP FBE is located in top ten in the faculty-level rankings from point of view of students' mobility.
The mass higher education is the inevitable consequence of Bologna Process (Polónyi, 2010). In the two-level system in Bachelor (BA) the students learn wide and not very deep knowledge and they start with relatively generally graduates to the labour market. While the narrower range of education "up shifting" to Master level (MA). This also shows that the obligatory six-month work experience of BA 7th semester is key because of the distinction of student mass. So the students can differentiate themselves, they can acquire practical knowledge in a specific field, sector.
A unified higher education strategy was not developed in spite of Hungarian accession to EHEA in 1999. Later in Higher Education Act in 2005 had shown the reference to EU and the need for improving competitiveness. The Hungarian higher education continues to lack a comprehensive strategy and objectives that is currently sail without a compass (Barakonyi, 2009). The competitive situation must be measured to ourselves, however it is connected also to the macro-regions, Europe and the world, and the Bologna Process thus to influence higher education. In this competition Hungary's primary interest is to maintain and develop the correct position of higher education with its institutions and persons (Krisztián, 2009). The competitiveness has several affecting factors (capabilities of students, the finance of higher education, the efficiency of resource use etc.). In this study the most important factors are the knowledge behind the degree, skill development, creative environment, practice-oriented education, in brief the issue of students matching to Hungarian and European labour market requirements.

Previously, unemployment was explained by low qualification because few people could afford to obtain a university degree. It has changed by now; the reason for the problem is not the lack of the adequate qualifications, but the inappropriate structure of the education. "Their knowledge is not up-to-date enough and its level is irregular" (Falusné, 2001, p. 962). Focusing on advanced vocational training can mean a solution to this problem. Further problems are caused by the fact that often graduates can only find a job, for which they are overqualified, which results in a kind of hidden unemployment (Bilik, 2004). This poses the problem that employers set higher and higher qualification requirements. By doing so, they take away job opportunities from people with lower

qualifications, and cause unemployment on that level (Falusné, 2001). The salary of graduates working at a lower level is less than that of employees in a position that suits their qualification (Galasi, 2004). This leads to tension on the labour market. The Bologna Process may bring an improvement to the structure of Hungarian higher education. When modernizing the higher education system is important to maintain national characteristics, to respond to the latest challenges and to strengthen the competitiveness of the whole European Economic Area and higher education (Barakonyi, 2004).

## 7. Conclusions

The actual Hungarian processes in higher education are similar to the Romanian higher education, at least as regards the administration of justice. Romania joined to the Bologna Process in 1999 and promised democratization by the reform, and had placed the focus on quality improvement (Kozma and Juhász, 2008; Kozma and Rébay, 2008). Since the millennium this system was mostly characterized by coherencelesness, so there is no consensus in society and the political parties, which way should preceed (Mandel, 2004).
The question is whether the new regulation is promoting consensus. In Romania the new Law of Higher Education (Legea Educatiei Nationale = National Education Art) came into force in February 2011. This law would be fully complied the requirements of the Bologna Process. Peculiarity is that while a number of matters of university autonomy debate are taking place, while the settlement of the situation of Hungarian minority can be assessed positively (Székely, 2011). The new law achieves long desired changes, but there is still lack of political consensus behind it, which would ensure the long-term employability (Pap, 2011).

The creation of new Higher Education Act is taking place today in Hungary, and under the schedule of Hungarian Government the new Act on public education and higher education system shall come into force and become operational in 2012 September 1. The Kalman Szell-plan called "reform package" establish that the biggest problem of Hungarian higher education is that the educational system is far from the requirements of economy and labour market, the structure of education is wrong. The

main aim of the plan is to establish a system which returns the social cost for education. It creates more thoughtful and planned structure, improves quality and thus contributes to economic growth and the reduction of currently very high public debt. The Hungarian public education reform is still in planning period, but it is certain that after discussing the concepts changes are coming to the Hungarian higher education, which will affect the quality of the issued students, competitiveness of higher education and the relationship between labour market and education. An additional best practice is the method of Partium Christian University, because it gives also special attention for students with practical training, and resulting of this, there are several cooperative arrangements with companies (e.g. OTP Bank Romania, Sanofi-Aventis, etc.), in which students perform professional practice, they can also obtain work experience, and might as well get a job.

## Notes

[1] Since the sample comprises 4th and 5th year students from the earlier, integrated system, the sample is not affected by the mandatory professional practice of the Bologna system.

[2] Student surveys before and after the practice and a corporate survey.

[3] KSH is the acronym of the Hungarian Central Statistical Office.

[4] The net income gives more information about the workers' financial potential since, on one hand, it also includes non-taxable income, and, on the other hand, comparing gross amounts is complicated due to the changing taxation rules.

[5] Factor analysis was carried out with SPSS software. This method is used to reduce the number of variables in few new and independent large groups (factors) by multivariate statistical analysis (Sajtos and Mitev, 2007).

## Acknowledgement

This paper was written with the support of project 'TÁMOP-4.2.2/B-10/1-2010-0029 – Tudományos képzés műhelyeinek támogatása a Pécsi Tudományegyetemen' (SROP-4.2.2/B-10/1-2010-0029).

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# STUDENT MOBILITY – A PANORAMA OF THE SITUATION IN HUNGARY

Zsófia DUGA* and Krisztina SZONTÁGH*

*In the past few decades significant changes have occurred in the domestic and international educational market. In the second half of the 20th century the process of internationalization began in education as well. Higher education is definitely the most significant and most dynamically increasing sector of the 21st century information society. At present, approximately 130 million students, including 2.8 million students with foreign status – only 1.3 million in 1995 –, study in the tertiary education sector worldwide. According to forecasts the number of foreign students will increase more dynamically in European countries than that of national students. The number of students in higher education in 2020 is estimated to be 250 million, and 8 million students are expected to have foreign status. Nowadays students with Hungarian citizenship can also study in the higher education system of any country in the world, acquire a degree and take part in short or long training programmes in the country they choose. In addition, foreign students can decide to conduct their university studies in Hungary. We examined student mobility in our study. The analysis of student mobility can be fully comprehensive if both the characteristics (foreign scholarships, preferred target countries and average time spent abroad) of the mobility of Hungarian students and the mobility motivation of foreign students, who wish to conduct studies in Hungary, are analyzed.*

**Keywords:** higher educational market, mobility, foreign language training, Erasmus, knowledge export
**JEL code:** I21

## 1. Introduction

In the past few decades, the international higher educational market has changed significantly. In the 20th century, the process of internationalization began in education, too. Higher education is definitely the most significant and most dynamically increasing sector of the 21st century information society. The Bologna Process started one of the most important educational reform processes in Europe – and also in Hungary. The Sorbonne Declaration signed in 1998 emphasized the necessity of creating the European Higher Education Area (EHEA), which can be a key factor in the general development of European countries and facilita-

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tion of citizens' mobility and employment. Ministers met in Bologna a year later and drafted concrete measures, one of which was the introduction of a training system based on two main sequential training phases (so-called cycles). The signatories of the Declaration claimed that with these measures the potential of student mobility - between training programs, institutions and countries – would increase significantly; on the other hand, students' chances of employment in the European labour force market could improve since the recognition of certificates would be considerably easier.

This raises the question of what mobility means in education. Both *Hatos* (2005) and *Rédei* (2008) define higher educational mobility in the same way: it is physical mobility from a given country to a foreign country or from a foreign country to a given country with the purpose of arranged or individual participation in organized programmes of higher education, training or research related to training. On the basis of this definition, mobility includes studying in a foreign country with the purpose of acquiring a degree, which can be financed by students themselves, by scholarships or by student loan systems. Financing organizations can be national, international and higher education (inter-university) institutions or companies. Mobility activities with the purpose of corporate internal training do not belong to this category of mobility but to labour market mobility. Academic-technological-innovative collaborations do not belong to it either, because they are based on completely separate organizational, financial and institutional structures. Three types of mobility are distinguished within educational mobility (Hatos, 2005):

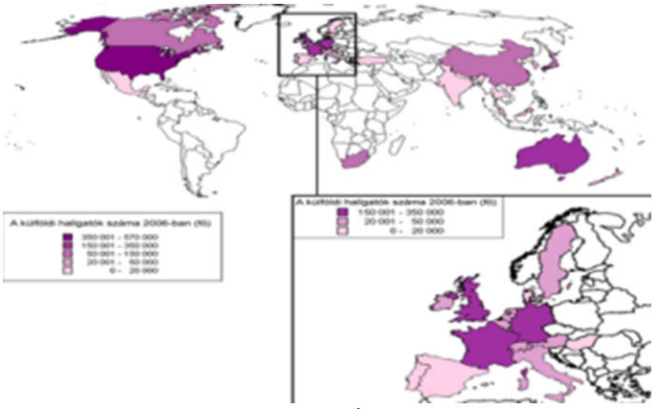
1. *degree-mobility*: its aim is to acquire qualification in a higher education institution of another country
2. *credit-mobility*: conducting sub-studies abroad which conform to the participants' domestic training
3. *programme-mobility*: it is a typical form of scholarship mobility and means a short stay abroad for the purpose of studies or research.

The roots of international higher education mobility go back to the Middle Ages when the first universities were established. However, this mobility became a "mass and widely prevalent phenomenon" only in the 80s of the 20$^{th}$ century. Owing to the different possibilities and requirements of the past years, governmental bodies of countries and the managements of higher education institutions have developed different mobility strategies (Vincent-Lancrin, 2004).

## 2. Student mobility – international tendencies

Research has revealed that the number of foreign students studying in OECD countries has doubled in the past twenty-five years. However, approximately 85% of students studying abroad come from these countries. On the basis of UNESCO data, about 2.7 million students conduct studies abroad, which is 60% higher than the data published in 1999. In case of students' mobility for the purpose of studies (Figure 1), the USA can be considered the most preferred target (22% of foreign students choose the USA), the second one is the United Kingdom (14%), followed by Germany (10%), France (10%), Australia (7%), China (6%) and Japan (5%) (Berács, 2010). Approximately two-thirds of the foreign students arriving in North America come from Asia. Rédei's research has revealed that 60% of the student migrants of the world came from the countries of Asia and Africa in 2007 and 3 million students of these countries conducted higher educational studies in a foreign country (Rédei, 2008). The number of foreign students has also increased in Europe. Nearly half of the students streaming into Europe come from Europe, 17 % arrive from Africa, 20% from Asia, 8% from America and 1% from Australia (Eurostat, 2006). Germany can be considered to be the largest sending country of the European Union. Hungary's share in foreign students is about 0.6%, which is higher than its share in the production of the global GDP (Berács, 2010).

Figure 1: *Receivers of students in the world*



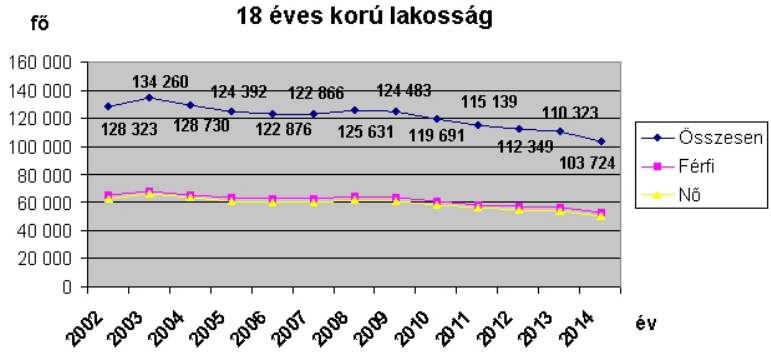
Source: Rédei (2011)

## 3. Foreign students in Hungary

Nowadays, in Hungary there are 72 higher education institutions with 170 faculties, which either belong to the government, to a church or to a foundation. Hungary, as a member state of the European Union, has joined the Bologna Process, the main purpose of which is to create the European Higher Education Area. Therefore, the three main elements of the Bologna Process: the three-cycle training structure, the credit transfer system and Europass, the standardization of degrees, have been introduced in Hungary.

Hungarian higher education institutions are facing several problems such as population decrease and financial and structural problems. The demographic fall already influences the public education (Figure 2); moreover, the traditional enrolment basis of higher education is also decreasing (Rudas, 2007).

Figure 2: *Expected changes of the number of population aged 18 in Hungary*[1]




Source: Rudas (2008)

The other tendency, which is intensifying is that the government is trying to reduce its role in financing the higher education. This is revealed by the continuously decreasing number of students who can be admitted

[1] (18 éves lakosság = Population aged 18, Összesen – Total, Férfi – Male, Nő – Female, Fő – Number)

to state-financed training programmes and the changing structure of state finance. The quota for new students in the fields of informatics, technical science and natural sciences has been increasing whereas the student quota of training programmes in the fields of humanities and economics is expected to decrease in the next few years. Higher education institutions should provide for the replacement of their lost revenue so that they can conduct their operations smoothly. That is why the importance of the service and business features of universities have increased. Higher education has become a valuable commodity; furthermore, a worldwide competition has started for students. Hungarian higher education institutions have also launched training programmes, which adapt to the requirements of the labour force market, and foreign language training programmes. Hungarian universities are competing with each other for students within the country for the time being, and only a few of these institutions have entered the international higher education market with their training supply.

One of the most noticeable signs of the internationalization of universities is that foreign students have appeared in the country. The first foreign language training programmes were launched by medical schools and technical universities in Hungary in the 1980s. The rate of foreign students was 4.9 % in 2010 (Berács, 2011), and even though this proportion is high compared with the average rate of Central European countries, it is still significantly lower than the European Union average.

Table 1: *Number of foreign students in the Hungarian higher education*

| | 2001/2002 | 2005/2006 | 2007/2008 | 2009/2010 |
|---|---|---|---|---|
| Total number of students | 349,301 | 424,161 | 397,704 | 370,331 |
| Number of foreign students | 11,783 | 14,491 | 15,459 | 18,154 |
| **Foreign students %** | **3.4** | **3.3** | **3.9** | **4.9** |

Source: Berács (2011)

It is clearly shown in the Table 1 that the number of foreign students studying in Hungary has been increasing continuously in the past ten years. "In Hungary, higher educational mobility can be described as the aggregation of governmental, institutional and individual strategies". The "knowledge development" approach has been dominating the higher educational mobility policies in the past 15 years" (Hatos, 2005).

In the international market, the competition is intensifying for students who participate in postgraduate training programmes. Why? Because most students, who have studied abroad, do not return home after they have finished their studies successfully, but they settle down in the receiving country and find employment there. The United States can be regarded as the biggest "knowledge exporter" country in the world. It is extremely important for the USA that talented students should not only take part in basic training but also in doctoral training and research.

Table 2: *Foreign students in some higher education institutions 2009/2010*

| Higher education institutions | Number of foreign students | Foreign PhD students |
|---|---|---|
| Corvinus University of Budapest | 1,248 | 11 |
| Budapest Univ. of Technology and Econ. | 1,016 | 31 |
| Eötvös Lóránd University | 995 | 85 |
| **Semmelweis University** | **2,463** | **18** |
| **University of Debrecen** | **2,800** | **83** |
| **University of Pécs** | **1,619** | **34** |
| **University of Szeged** | **1,812** | **69** |
| University of Miskolc | 182 | 4 |
| Pannon University | 119 | 8 |
| Szent István University | 906 | 7 |

Source: Berács (2011)

In the academic year 2007-2008, most students arrived from 1 India, 2 China, 3 South-Korea and 4 Japan to the United States to study. If this data is compared to the ranking list which shows the dominance of foreign researchers working in the USA, considerable overlap is the result: 1 China, 2 South-Korea, 3 India and 4 Japan. This undoubtedly justifies the fact that foreign student recruitment can be really successful if foreign students also have the possibility to take part in research and academic work conducted in the receiving country after they have finished their graduate training (Berács, 2010).

Table 3: *Distribution of foreign PhD students*

| Receiving Country | Foreign PhD Students | | Europeans | Women |
|---|---|---|---|---|
| | Total | Proportion of all PhD students % | % | % |
| USA | 78,884 | 26.3 | n.a. | n.a. |
| United Kingdom | 22,824 | 26.8 | 31.1 | 39.0 |
| Spain | 8,677 | 13.2 | 16.6 | 45.7 |
| Australia | 8,033 | 24.0 | n.a. | 41.7 |
| Switzerland | 5,359 | 38.7 | 68.7 | 37.9 |
| Canada | 4,655 | 17.3 | 18.7 | 35.2 |
| Sweden | 3,147 | 14.9 | 35.7 | 43.1 |
| Austria | 2,705 | 17.6 | 45.3 | 40.4 |
| Belgium | 1,990 | 31.3 | 28.7 | 31.4 |
| Czech Republic | 1,367 | 7.1 | 8.6 | 35.8 |
| Finland | 1,990 | 6.4 | 25.2 | 37.5 |
| Denmark | 1,350 | 18.8 | 22.4 | 36.0 |
| Norway | 872 | 15.4 | 36.3 | 38.9 |
| Portugal | 727 | 6.1 | 13.4 | 47.2 |
| Korea | 649 | 1.9 | 0.2 | 34.7 |
| Hungary | 496 | 7.1 | 3.8 | n.a. |

Source: Rédei (2011)

At present, the number of foreign students taking part in PhD training programmes in Hungary is quite low, which is revealed by the data of Tables 3 and 4. The main reason for this is that in Hungary, approximately 98 % of the PhD training programmes are conducted in Hungarian. The only exceptions can be found in the fields of medicine, economics and engineering where postgraduate training programmes are also provided.

Table 4: *Foreign students in the Hungarian higher education by country groups in 2009-2010*

| Neighbouring countries | Number | Europe | Number | Other Continent | Number |
|---|---|---|---|---|---|
| **1.Romania** | 3,005 | **1.Germany** | 1,972 | **1.Iran** | **848** |
| 2. Slovakia | 2,512 | 2. Norway | 736 | 2. Israel | 808 |
| 3. Ukraine | 1,482 | 3. Sweden | 436 | **3. Nigeria** | 339 |
| 4. Serbia | 1,385 | 4. Cyprus | 266 | **4. Turkey** | 323 |
| 5. Croatia | 136 | 5. Greece | 193 | 5. USA | 300 |
| 6. Austria | 123 | 6. Russia | 192 | **6. China** | **260** |
| | | 7. Ireland | 183 | **7. Vietnam** | **185** |
| | | 8. France | 159 | 8. Canada | 180 |
| **Total** | **8,643** | **Total** | **3,264** | **Total** | **3,243** |
| Country group % | 47.6 | Country group % | 24.5 | Country group % | 20.3 |

Source: Berács (2011)

The proportion of foreign students studying in Hungary in the academic year 2009-2010 was 4.9% of the total number of students (18,154 students). The vast majority of foreign students – approximately 60 % - come from the neighbouring countries – they are native Hungarians – and take part in training programmes held in Hungarian. The rest of the students mostly come from Germany, Norway and Sweden and join foreign language training programmes (Table 4).

This raises the question why higher education institutions launch foreign language training programmes? In Western Europe, universities wish to become attractive for foreign students and, on the other hand, they would like to prepare national students for the challenges of the international and global labour force market with their foreign language training programmes. Research conducted by experts has revealed that higher education institutions in Central and Eastern Europe mostly want to increase their profitability with their tuition fees. Those who are not Hungarian citizens can study in Hungarian higher education institutions only by paying tuition fees. Those foreign citizens who are entitled to receive either a Hungarian state scholarship or a European Union (Erasmus) scholarship are exceptions to this rule. This situation has not

changed since Hungary joined the European Union in 2004, because tuition-free training programmes held in Hungarian are not accessible to European Union citizens who cannot speak Hungarian properly. Hungarian higher education institutions are facing chronic lack of resources. Moreover, their mobility strategy, which may produce revenue, can be implemented by their foreign language training programmes, which cannot be financed directly by the state. On the grounds of acts in force, foreign students are entitled to receive state scholarship if they participate in training programmes conducted in Hungarian.
In Hungary, a significant number of foreign students are concentrated in a few training programmes at a few higher educational institutions (Table 2). The analysis of foreign students' choice of disciplines has revealed that the highest proportion of foreign students (22.5%) study in medical and health care (Table 5) training programmes (Szemerszki, 2005).

## 4. A special situation – Foreign students in the Hungarian Medical Training

In Hungary there are medical schools at four universities: the Semmelweis University in Budapest, the University of Debrecen, the University of Szeged and the University of Pécs. All four training institutes offer foreign language (English and German) training programme(s) besides their Hungarian programmes (Szél and Girasek, 2010).
At the Semmelweis University, German medical training was launched in the academic year 1983-84, and the university started English medical, dentist and pharmacist training programmes in the academic year 1987-88, then it introduced its German pharmacist training in September 2011. The University of Debrecen exclusively offers English training programmes in the fields of general medical science (1987), science of dentistry (2000) and pharmaceutical science (1987). At the medical school of the University of Pécs, English medical training started in 1984 and German medical training was launched in 2004. Afterwards, the training supply was expanded by German and English dentist training programmes in 2006 and the English pharmacist training started in 2009. The University of Szeged launched its English medical training in 1984 and English pharmacist training in 1986. The German medical training started in 1999 and English dentist training began in 2004.

Foreign students can apply to PhD programs at all four training institutes. Besides this, a new programme, a medical biotechnology master training in English, was launched in Pécs and Debrecen in the 2010 academic year (Ivády, 2010).

Table 5: *Number of foreign students at medical schools in the academic year 2007-2008*

| University | Number of foreign students | Number of foreign students in medical training | Rate of foreign students in medical training |
|---|---|---|---|
| University of Szeged | 1,993 | 1,753 | 88.0 |
| University of Debrecen | 1,873 | 1,363 | 72.8 |
| University of Pécs | 1,234 | 881 | 71.4 |
| Szent Istvan University | 1,461 | 764 | 50.9 |
| **Total** | **6,561** | **4,741** | **72.3** |

Source: Berács et al. (2009)

Statistical data has justified that the majority of foreign students studying in Hungary take part in graduate medical training (Table 5). According to the data of the 2007-2008 academic year, 4,741 students studied in medical training, and this number made up 31% of the total number of foreign students studying in Hungary that year (Berács *et al.*, 2009). The data in the Table 5 clearly reveals that 88% of all foreign students at the Semmelweis University took part in medical training; furthermore, the majority of foreign students also study medicine at the other three large universities.

Hungarian degrees, which have been obtained from medical training held in English or German, are considered significantly prestigious all over the world. European Union citizens can practice medicine without taking any extra examinations in any of the member states of the Union since the Hungarian medical degree has licence value. Students from the USA and Israel have to take a licence examination. The number of candidates who apply to Hungarian medical training programmes is much higher than the university quota, although almost 70 Central European universities offer such medical training programmes for foreign students where the language of study is English or German. What is the reason why

Hungarian medical training is so popular among foreign students? In Germany, there has been a limit on the number of students who can take part in medical training since 2004, and a lot more people would like to study to become a medical doctor than possible. The number of students from Sweden, who are interested in studying in Hungary, has been on the increase as well, because the Swedish government considers the development of Swedish medical schools to be much more expensive than financially supporting Swedish students to study medicine abroad. Norway also supports Norwegian students who study abroad with scholarships and loans with low interest rate. The main motivation for American students is that the tuition fee and costs of living in Hungary are significantly lower than in the USA. The number of Asian (Chinese and Korean) students in medical training in Hungary has been increasing in the past two years. The training programmes held in Hungarian and the ones held in a foreign language are all based on the same curricula and the same training standards. The vast majority of foreign students leave Hungary and return to their home countries after they have graduated in Hungary. A few foreign students studying here stay in Hungary after their graduation. Some of them join a doctoral training program, while others found a family.

## 5. Hungarian students' foreign studies

Students studying at Hungarian higher educational institutions have the opportunity to spend a longer or shorter period of time abroad in order to study, practice and obtain experience. A lot of students take part in different, organized mobility programs whereas only a few students seek foreign institutions, programs or suitable scholarships themselves. Organized mobility programs may be based on regional, bilateral or institutional level agreements or may be connected to various projects. The state scholarships, which belong to the competence of the Hungarian Scholarship Committee, the Socrates/Erasmus and Leonardo da Vinci Programmes of the European Commission and the Central European Exchange Programs for University Studies (CEEPUS) are the most important frameworks for the arrangement of Hungarian students' foreign partial training and professional practice (Tót, 2005). The Erasmus Programme seems to be the most popular with Hungarian

students. The Erasmus Programme is available for students of all types of higher educational institutions at every level and specialization. The higher educational institutions which would like to join the Erasmus Programme have to have an approved Erasmus University Charter, which can be acquired by submitting an application to the European Commission. In 2009, 48 of the 73 higher educational institutions in Hungary could participate in the Erasmus Programme.

Hungarian students have been able to participate in the Erasmus Programme since the middle of the 1990s and the number of students travelling abroad in the framework of the programme has been increasing continuously for the past 20 years and the number of foreign partner institutions also grows every year. On the basis of the data of 2009, Hungary has approximately 4,000 bilateral partner agreements. Students can apply for study trips and professional practices. Every student is entitled to use a study scholarship and a professional practice scholarship during their higher educational studies.

Table 6: *Summarizing statistics of the Erasmus mobility applications in 2009*

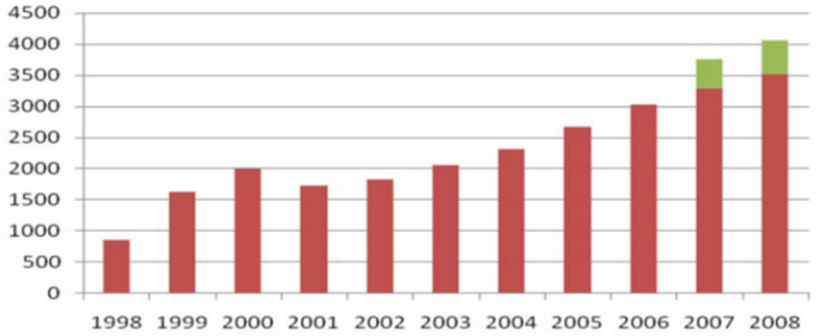
| Application types | Number of applicant institutions | Planned number of trips | Approved number of trips |
|---|---|---|---|
| Student mobility | **48** | 3,746 student | 3,353 student |
| Professional practices | **36** | 847 student | 581 student |
| Teacher mobility | **48** | 1,019 teacher | 639 teacher |
| Personnel mobility | **45** | 330 person | 133 person |
| Mobility arrangement | **45** | n.d. | n.d. |

Source: Csernus (2010, p. 37)

In Europe, the Erasmus student mobility grew by 8.7% in the academic year 2008-2009, and the number of students taking part in professional practices increased by 51,9 % (Csernus, 2010). The main sending countries are France, Germany, Spain and the United Kingdom. Interestingly, the main receiving countries in Europe are Spain, the United Kingdom, Germany and France.

On the basis of the Hungarian data, it can be stated that 3,518 students took part in foreign study trips and 539 students participated in professional practice in the academic year 2008/2009 (Figure 3). This can be considered a significant increase, since "only" 798 students could participate in foreign study trips in 1998. An average foreign study trip lasts 5 months (Csernus, 2010).

**Figure 3:** *Number of Erasmus students travelling abroad between 1998 and 2009*




* The green parts of the columns show the number of students taking part in a professional practice.

Source: Csernus (2010, p.39)

Germany, France, Italy and Finland can be considered the most popular target countries among Hungarian students. There is a tendency that several receiving countries require applicants to be able to communicate not only in English but also in the native language of the receiving country. Interestingly, this does not hinder students from travelling, and they start to learn the language of the target country several months before their trips. They are supported by the Erasmus intensive language training program, for which students whose applications for travelling have been accepted can apply.

Social Studies, Business and Law are the most popular academic disciplines among students who travelled abroad in the framework of the Erasmus Programme.

It is interesting that although the number of foreign students is quite significant, fewer Hungarian students, who study in Hungarian medical

training, take part in foreign study trips than, for example, students who major in humanities. What is the reason for this? The main reason is that students in medical training opt for foreign study trips to do their professional practice. Besides the Erasmus Programme, other programmes also offer foreign exchange practices. A good example of this is the SCOPE (Standing Committee on Professional Exchange) programme, which provides opportunity for accomplishing the necessary practice in foreign hospitals. Within the framework of the SCORE (Standing Committee on Research Exchange) programme, medical students can join the research of a foreign research team which they can choose freely. Students in their third, fourth, fifth and sixth year can apply for exchange practices and students can apply for the exchange programme of Students' Academic Circle after their second year. In both cases, the applicant is required to be enrolled in any of the four Hungarian medical schools. The list of the target countries changes every year; however, approximately 50 people (per training institute) can travel to one of the 20 countries (on average) in Europe and outside Europe.

Why do Hungarian students apply for foreign exchange practices and study trips? The main reason is that they would like to improve their language competence and increase their professional and academic relationships. In Hungary, people who have just earned their university degrees can have significant advantages in the labour force market if they participated in long or short foreign exchange practices during their university years. What hinders travelling abroad? First of all, low financial support does. In the framework of the Erasmus Programme, students receive €200 per month on average. On the basis of surveys and experience, it can be concluded that students' families have to be willing to provide considerable financial support.

## 6. Summary

The issue of student mobility became an important question in the 1990s. Several European programs supporting mobility, including the Erasmus Programme, which can be considered the most significant programme, were launched at the time. Hungary was able to join these programmes in 1998. The initial purpose of the Erasmus Programme

was to enable at least 10% of the students in higher education to conduct their studies in a foreign country for some time. By the end of the 1990s, programmes (e.g. the Erasmus Programme and the Comenius Sub-Programme) supported by the European Union became the fundamental bases of student mobility. However, the real breakthrough was the launch of the Bologna Process, and it has become the key element of the mobility reform and the creation of the European Higher Education Area (EHEA) since 1999. Actors of higher education have been emphasizing that participation in foreign study trips and training programmes brings about social, economic and cultural advantages and that mobility may be beneficial in terms of the individual, the institution and the nation (Csernus, 2010).

The majority of foreign students studying in Hungary participate in graduate training and they leave Hungary after they have graduated. In the global education market, the competition for foreign students in graduate, master and PhD training programmes has intensified. Even though the number of foreign students studying in Hungary has been increasing rapidly, their proportion is still lower than the European Union average. On the basis of the data available, it can be concluded that the majority of foreign students who study in Hungary participate in medical training.

The number of foreign students who travel to Hungary to take part in partial training in the framework of the Erasmus Programme increases every year. In 2009, this number was 2,100. Most foreign students come from Germany, France, Spain, Italy and Finland. However, foreign students' target areas are concentrated regionally. Most students study at a few large universities and only a few of them choose smaller universities in the country. Although the number of foreign students has been increasing dynamically in the past years, Hungary is still considered to be a sending country and not a receiving country (Csernus, 2010).

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# CONSIDERATIONS RELATED TO THE LEVEL OF ENGLISH LANGUAGE PROFICIENCY OF FRESHMEN SPECIALIZING IN ECONOMY OF COMMERCE, TOURISM AND SERVICES AT THE PARTIUM CHRISTIAN UNIVERSITY

**Hajnalka IZSÁK***

*ITourism plays an important role worldwide being a steadily growing economic sector. In the competitive and constantly changing tourism industry, the optimal and continuous development of customer contact and communication has become a great challenge. In this respect, the foreign language skill is invaluable as it acts as a cross-cultural interface between tourism enterprises and visitors. Besides outlining the importance of foreign language skills in the tourism sector the purpose of this paper is to give an overall picture of students' level of English language proficiency when starting their studies at our university.*

**Keywords:** English language proficiency, tourism, Partium Christian University
**JEL code:** I25

## Why should we learn a foreign language?

It is almost impossible to over-emphasize the importance of learning a second or a third language. With the growth of the Internet and travel industries we are interacting more and more with people of different cultures and languages and we can no longer afford to remain monolingual. Thus, learning a new language is no longer a pastime, being necessary for a number of personal, cultural, educational, political and economic reasons and purposes, such as:

- to develop our personality
- to communicate effectively with people of many cultures
- to be able to study or work abroad
- to be able to get a certificate
- to have an advantage when applying for a job
- to have the accomplishing feeling of having learnt another foreign language (second, third, fourth language)
- to gain new horizons and reinforce our own identity and self-confidence at the same time
- to expand our opportunities for meaningful leisure activities (such as travel, reading foreign language books, watching foreign language films and TV programmes)

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In the competitive and constantly changing tourism industry, the optimal and continuous development of customer contact and communication has become a great challenge. 'Tourism specialists must possess good communication skills and a high level of intercultural competence as they have to use language in different socio-cultural contexts.' (Luka, 2009). In this respect, the foreign language skill is invaluable as it acts as a cross-cultural interface between tourism enterprises and visitors. 'Languages, then, are seen as embedded in the contexts and processes of intercultural communication that operate within tourism.' (Phipps, 2007) From this point of view, besides the above-mentioned reasons, we can say that learning a foreign language is vital to be able to communicate directly with your customers and to have the chance to compete globally for tourist markets.

> The motivations for the tourism industry – for the hosting destination – are relatively clear. A smoother linguistic process, a warmer, easier, accommodating welcome – so the logic goes – will help develop the destination, help increase the profits. Smooth processing of large numbers of people helps keep the tourism industry efficient. (*ibid.*)

In a globalised economy it is essential to take advantage of every potential market available, thus many employers hire someone simply because they are multilingual, and because as business owners, they want to reach as many people as possible to become their future clients. Language plays an utmost role in business being particularly important in the tourism industry 'when international customers may be unable to communicate directly with service providers in the receiving country'. (Thitthongkam & Walsh, 2011)

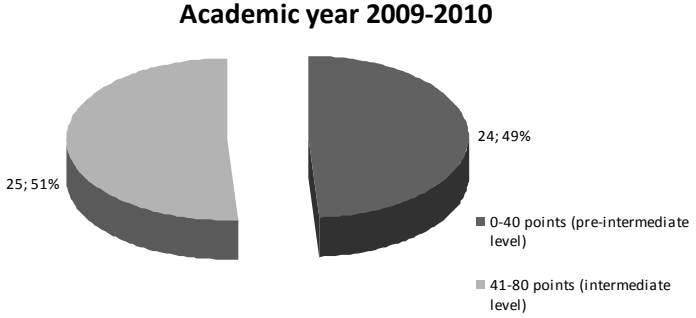
## Aim of study and methodology

The main aim of the present study was the evaluation of first-year students' level of English language proficiency when starting their studies at our university. Data sources include freshmen from different educational backgrounds, specializing in Economy of commerce, tourism and services at the Partium Christian University of Oradea, who were given a test designed by Longman Publishing Company. They had to fill in 80 sentences by choosing the correct one from the four answers given. According to this test, students who achieve between 0 and 40 points are pre-intermediate and those between 41 and 80 are intermediate.

## Results

As Figure 1 shows, in the academic year 2009-2010 we had the largest number of first-year students sitting the placement test in English (49 students). There were 24 pre-intermediate, and 25 intermediate students 6 of whom achieved very poor performance and 8 outstanding performance.

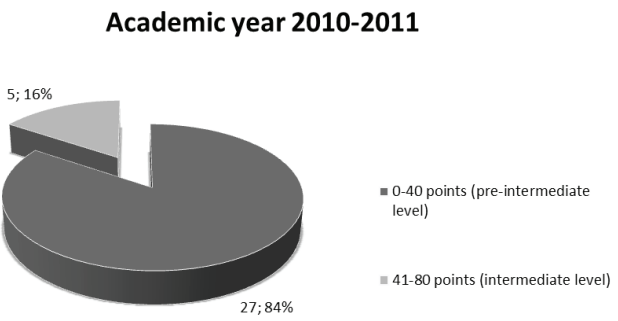
Figure 1: *Distribution of the number of freshmen according to their level of English language proficiency*




Source: Own data collection.

In the academic year 2010-2011 (Figure 2) there was a sharp fall in the number of students sitting the placement test (only 32 students). There were 27 pre-intermediate and 5 intermediate students, among whom 11 students with very weak and only 2 students with outstanding performance (between 60 and 80 points).

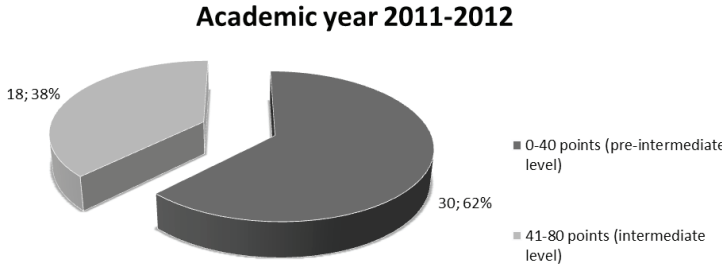
Figure 2: *Distribution of the number of freshmen according to their level of English language proficiency*




Source: Own data collection.

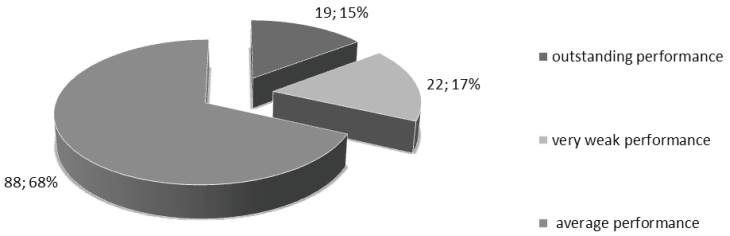
Compared to the previous academic year, in the academic year 2010-2011 (Figure 3), there was an increase in the number of first-year students sitting the placement test in English (48 students). There were 30 pre-intermediate and 18 intermediate students, 5 of them with very weak and 9 with outstanding performance.

Figure 3: *Distribution of the number of freshmen according to their level of English language proficiency*




Source: Own data collection.

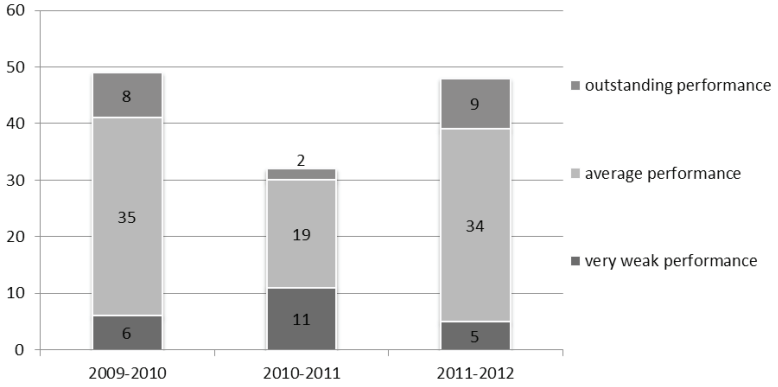
Figure 4: *Numbers and rates of freshmen according to their performance for all three academic years*




Source: Own data collection.

In the course of the three academic years (2009-2010, 2010-2011, 2011-2012) there was a total of 129 freshmen sitting the placement test. Figure 4 shows the numbers and rates of freshmen according to their performance for all three academic years. As we can see there were 19 students displaying outstanding and 22 displaying very weak performance. We had the worst proportion in the academic year 2010-2011 (Figure 5) as far as English language proficiency and performance is concerned, i.e. there were 27 pre-intermediate and 5 intermediate students, among whom 11 students with very weak and only 2 students with outstanding performance (between 60 and 80 points).

Figure 5: *Distribution of the number of freshmen according to their performance for all three academic years*




Source: Own data collection.

## Conclusions

Evaluation of first-year students' level of English language proficiency can help us build up a picture of the current state of the art of language teaching in primary and secondary education. Present results may help language teachers realise that there is a need for rethinking their teaching methods in order to be more efficient and to achieve better results and should make both students and colleagues understand the importance of foreign language learning. For students specializing in Economy of Commerce, Tourism and Services knowing at least one foreign language is a must. In Miller's words (2010)

> The world is shrinking. The increasingly global perspective of economics and politics reinforces this viewpoint every day. At no time has it been more important to be able to communicate with the rest of our ,'global village.' And how is that accomplished? Learn a second (or third) language.

Speaking a language other than our mother tongue and the official language of the state we live in is an integral part of this modern day society. Besides its role of removing the barrier of misunderstanding amongst individuals, the impact of globalization has also seen the relevance of learning a foreign language. Countries enter into business agreements and businesses flourish through this indispensable tool we call language. While economic interactions are important, foreign language proficiency would also lay the foundations of a greater and more effective scientific collaboration.

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# SOME ASPECTS OF RESEARCH OF THE E-LEARNING

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*There is an online Club for e-Learning researcher-educators in Hungary. Members of the Club are lecturers in different Universities and Colleges. Their aim is to explore applying different research methods some aspects of e-Learning together since more than three years.*
*First chapter shows coherency of lifelong and life-wide learning – formal and/or informal sides of e-Learning. Second chapter exhibits life-tailored learning – principles of the new methodology, – competence-oriented methods and culture using of info-communication technology and virtual classrooms.*
*Third chapter demonstrates progress of technological environment of e-Learning – how did electronics turn from subject and tool of education to scene of education? Fourth chapter presents method of the experience pedagogy in e-Learning – motivation for learning, commitments, attitudes, personalities, interactive teaching materials and learning by enjoying.*
*Fifth chapter shows application of software robots in e-Learning – searching robots, translating robots, text recognition robots, speech recognition robots, plagiarism-recognition robots, simulators, tutor robots. Sixth chapter illustrates some e-learning methods for mathematic teaching.*
*Seventh chapter presents first experiences of a virtual laboratory for PhD students. Eighth chapter summarizes possibilities of Learning, Teaching and Researching models of János Bolyai in 21st century.*

**Keywords:** cloud learning, lifelong learning, life-wide learning, life-tailored learning, experience pedagogy, software robots, teaching mathematics, virtual laboratory
**JEL codes:** A20, I29

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## Introduction

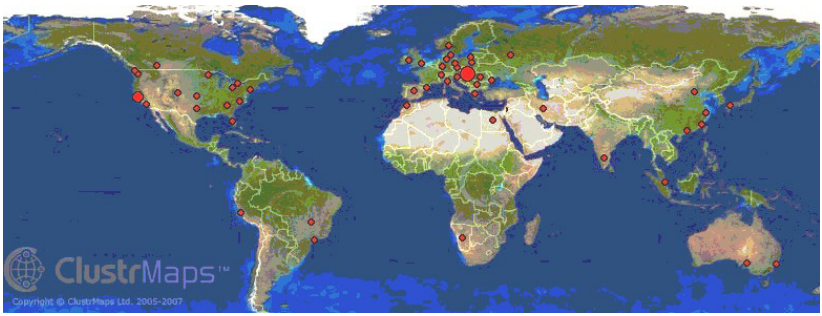
There is an online SysAdminLess Club for e-Learning researcher-educators in Hungary. Permanent members of the Club are lecturers in different Hungarian Universities or Colleges. This paper is written by these authors. We have been exploring some aspects of e-Learning for more than three years:

- coherency of lifelong and life-wide learning;
- progress of technological environment of e-Learning;
- method of the experience pedagogy in e-Learning;
- life-tailored learning;
- opportunity of application of software robots in e-Learning.

*Short story of the Club*

A doctoral topic – „*Use of e-Learning and distance learning in military higher education*" – and a curriculum – „*IT bases of interactive e-Learning and d-learning*" – has been called at PhD School on Military Technology of Zrinyi Miklos National Defence University (ZMNDU) in 2007. Because the 10 years old personal homepage[1] was unable for interactive distance learning, that's why a new Drupal engine based Web 2.0 portal has been created – named E-TEACHER[2]. The new portal has been discovered by great searching providers without any advertisement, and many – more than 6000 – quests were directed by them to the portal from the entire world (Figure 1).

Figure 1: *Visitors' map of our portal*




Source: Authors' compilation.

A distance e-Learning course has been called on the new portal by called curriculum *"ITC bases of interactive e-Learning and d-Learning"*. Many people begun the course – and some of them have successfully performed it. Three persons from them applied to PhD School on Military Technology of ZMNDU for doctoral student successfully.
A researcher team of ten people came into being as an outcome of the course. All of us are lecturers in different Hungarian Universities or Colleges. All of us have individual personal homepage and professional educational portal without system administrators. That's why we established SysAdminLess Club and the portal was altered to blog form[3].
Permanent members of the club meet weekly on Skype, on WiZiQ or other virtual classroom among the Clouds. A lot of individual and common publications, lectures at scientific conferences, applications and awards and six individual educational Moodle portals[4] were born as a result of our meetings.
And we learn so much from one another.

*Research topics*

Members of the Club research some aspects of e-Learning since more than three years. One of the members is studying coherency of lifelong and life-wide learning – formal and/or informal sides of e-Learning. Another member of our team explores life-tailored learning – principles of the new methodology, – competence-oriented methods and culture using of info-communication technology and virtual classrooms.
The third member scans progress of technological environment of e-Learning – how did electronics turn from subject and tool of education to scene of education? The fourth direction of our studies is focusing on the method of the experience pedagogy in e-Learning – motivation for learning, commitments, attitudes, personalities, interactive teaching materials and learning by enjoying.
The fifth line of our research topic is directed to application of software robots in e-Learning – searching robots, translating robots, text recognition robots, speech recognition robots, plagiarism-recognition robots, simulators, tutor robots. The sixth range is e-learning method for mathematics teaching.
The seventh member of the team works up the first experiences of a virtual laboratory for PhD students and the eighth one summarizes possibilities of Learning, Teaching and Researching models of János Bolyai in 21st century. What our results are in these topics?

## 1. Life-wide learning lifelong

### *1.1. Change of factors of learning*

*Technical development*
However strange it may seem, but if we research on the development and the appearance of distance learning, we have to search for its roots in the correspondence course. According to some researchers, the founder of the correspondent education was St. Paul, (Tiffin and Rajasingam, 1995, p. 8) who has made his clerks write his doctrines and made his messengers spread his teachings.

*Changes in the needs of society*
*"In the second half of the 20th century*, however, not only *science, technology,* but *society*, and the economy have *also begun a fast development, and because of this, the knowledge that we obtain in the schools become obsolete in our active life many times, so that we have to start to learn again and again if we want to save our competitiveness on the labor market. At the end of the 20th century, it has been born the concept of 'lifelong learning'*[5] (Seres *et al.*, 2008). Development of infocommunication technology (ICT) and significantly changing social needs have effected on the attitude of the people to the knowledge and learning in the third part of the last century.

### *1.2. Changes in the methodology of education*

*The eLearning*
The modern ICT supported education has been developed from the end of the 1980th – that formed eLearning, what can change the learning process and the methodology of teaching fundamentally.
The opportunities, giving by eLearning, make today's pedagogical practices wider and more colourful. More and more elements of it are displayed and continuously incorporated into the training attendance (joint learning, blended learning), as well as in a large part of the distance learning. In the regular training and in non-formal education systems both, the application of it spread quickly. Today's N-generation, or digital generation, who has already increased by up to life was not in a section, when you do not have a computer, internet, take for granted

and require the application of modern techniques, technologies in the field of education too.

*The networked learning*

However, the networked learning not only means the structure of the curriculum, but the possibility (and need) to advance knowledge can be reached, not only from the syllabus but with the using of additional resources (which are attached to it), and which are found somewhere in the virtual space. A virtual learning environment, closed, or the World Wide Web can be the stage or incarnate of this network.

*The cloud-learning*

From education-technical point of view, I see the importance of it that can allow eliminating the space and time limits and the lack of the presence of personal trainers in the educational system. Virtual consultations, virtual conferences, can be created by the Internet service providers. Thus, the learning support will be not only modern, but also interactive. The services of the cloud support not only the learning of individual student, but it also give thumbs up the teacher and student exchanges. In addition to the individual learning, group learning can also be taking shape.

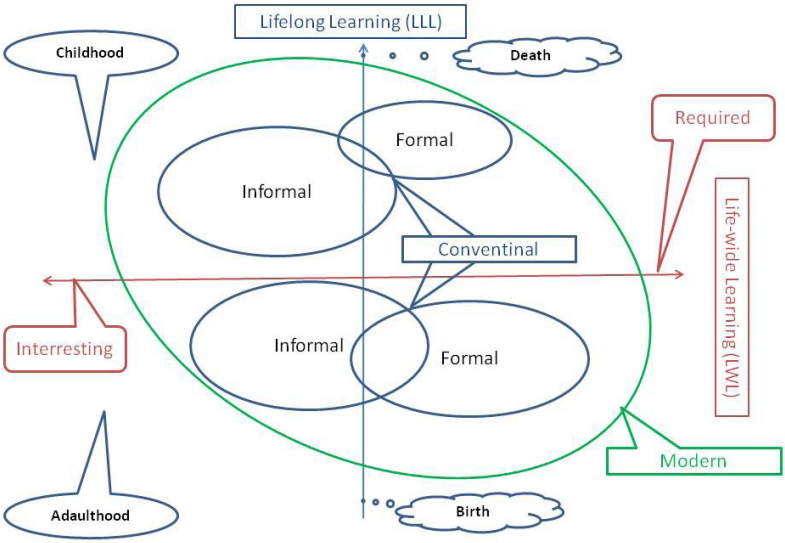
*The networked Learning in a connectivity way*

The fundamental principle of connectives means that we view the knowledge, as a network, the minimum elements of which are the nodes in our network. These could be the conceptual definitions, phrases, definitions, any elementary knowledge. The extremes among them are those relationships, with which we connect the nodes. In this sense, learning may mean two things: new nodes to be connected to the fabric and reordering the net connections.

### *1.3. Life-wide learning*

In the 21st century there is more and more knowledge. This is increasingly more difficult to make the process of reception and processing of the user. However, the knowledge becomes the very quickly obsolete, so the renewal time of the knowledge is less and less. We want to know more and more in less time. In a specific field of knowledge "up-to-date", complex way, however, many-to-know knowledge applied, which means the significantly increased the length of time in learning (Figure 2).

Figure 2: *The whole life-wide learning model*




Source: Authors' compilation.

## 2. Life-Tailored Learning

Life-Tailored Learning (Gerő, 2008) is one of the educational methodologies available for adults to support their learning (Figure 3). It is a sequence of methods and instructions (a practical guideline) to help with planning, organizing, carrying out, evaluating as well as governing knowledge acquisition and its transfer. It is a learning-teaching technology, which describes the learning process step by step, starting by assessing the learning needs, identifying whether entrance requirements / criteria are met through developing the professional content, structuring the learning content into modules as well as defining the roles of the student, teacher, consultant, tutor, mentor, all leading up to the closing evaluation (exam).

Figure 3: *Logo of the life-tailored learning*

Source: Authors' compilation.

Adult learners usually learn with a more specific goal in mind. Further characteristic is that there are big differences between certain learners' recognitions and circumstances. Besides the adult students' learning patterns are also different: they differ from one another's and from the patterns which can be observed in case of children. In other words: people with different existing knowledge and motivation, living in different circumstances have to achieve particular learning aims.

Life-Tailored Learning is a learning technology developed for cases, where the exclusive aim of learning is to reach the adult learners own, measurable goals. The fundamental idea of the methodology is that by knowing the goal of learning it is possible to reveal the necessary studies for the given student (to expand his/her preliminary knowledge, studies, and existing competences). With the help of this information we can choose (considering the given student's situation, possibilities, schedule etc.), from the huge number of known means, methods and sources, the ones that are the most effective in case of a given learner. The student, guided by the adequate teacher, goes through the planned learning process.
The "learning with a more specific goal and expectation" is considered to be a learning in order to get new and expand existing competencies.

From the various interpretations of competency we use the one that also includes the motive system that serves the given function beyond the ability to apply. Regarding to the final tests and assessments the question naturally arises whether legitimacy and entitlement should be included, but they are not strongly connected to pedagogy so in terms of the methodology we do not consider them as part of the concept definition.

*The principles of the methodology and the course by the methodology of Life-Tailored Learning*

The methodology of Life-Tailored Learning is a practical guideline proceeded from the above mentioned. Its structure is defined in the following way (Gerő and Seres, 2010.)

- The process should be divided into different steps that are connected to the
  individually defined parts of the learning aim.
- Entry and completion requirements should be defined to each step.
- The specialized material (the content of learning: the gap between the entrance
  and completion conditions of the given step) and the learning material (the
  specification of the learning devices and methods) should be separated.
- The development process should be divided into steps so that we do not advance to the next without having cleared the preconditions, and if we make a mistake we should only take one step backward. That is to say every step includes the supervision of the previous step (we should only be able to complete each step
  successfully, if we proved that we successfully finished the previous step).

Within this: the methodology chooses from the methods and devices from the point of view of practicality, leaving place to possible additions in the future.

## 3. Cloud Learning

*Tool of education last century – how did electronics turn from subject and tool of education to scene of education?*

Start of Public Radio and TV broadcast made the electronics new important *subject* of education in 20th and 30th of the last century. Spreading of schools' broadcast and the school televisions' made the electronics *tool of public education* in 40th, 50th and 60th.

Electronics became *tool of education in schools* when audio and video recorders' and PCs' price turned into one which can be reached in 70th and 80th.But the wide-ranging application of the internet and the fast internet availability leads to a big breakthrough in the 90th and in the 1st decade of the new millennium. Any kind of curriculum became accessible for *anybody, anywhere and anytime under real time* with help of digital audio or video recording and broadband data transfer on the internet (Foster, 2002). So, the building of eLearning, the Internet has been built. There is the situation, when electronics turned from subject and tool of education to *scene of education*.

*Cluster-, Grid-, and Cloud computing in education*

Running of increasingly more complicated application programs, transfer and storage of increasingly more data files and more speed of data transfer or processing make ore hardware and software demand on users and providers. We can be aware that grid computing, cluster computing and cloud computing are all terms closely interrelated with each other.

The *e-Learning cluster* in general has the goal of researching and advancing the state of the art in learning techniques on the application, and use, of semantic technologies with particular emphasis. Sometimes schools are establishing a collaborative and innovative learning community that engages learners in inquiry and cutting edge pedagogy through meaningful participation and contribution in their global community, like Eastern Block e-Learning cluster (Baker *et al.*, 2002).

From the early 2000's the *grid computing* became a popular term, and the application has started in the e-Learning. This technology has been applied to computationally intensive scientific, mathematical, and academic problems through solving large-scale and data intensive computing applications. E-Learning grid allows information and learning contents to be shared or retained as proprietary materials for the individual

school. It allows all users to interact and grow with the learning community, sharing ideas and ways to manage learning and project work (Naghshineh *et al.*, 2009).
In 2007 after floating "Blue Cloud computing" planes IBM expand its leading a joint research initiative of 13 European partners to develop technologies that help automate the fluctuating demand for IT resources in a *cloud computing* environment. In 2008 cloud computing started gaining popularity and became emerging approach to shared infrastructure in which large pools of systems are linked together to provide IT services. We must to get acquainted with a new concept at begin of the 10th of the new millennium – it is the Cloud Computing (Joint *et al.*, 2009). Modern interactive education in our time can be up-to-date and cost effective if it takes up special educational Cloud Computing services and Community portals.

*Cloud computing services tested by SysAdminless Club*
Cloud Learning is a side of Cloud Computing technology which includes services of learning software, platform or infrastructure free or pay for use between the didactic organizations and the attendees. Our SysAdminless Club is a Hungarian community, which goal is to use Cloud Learning technology to providing free services to students, which include email, contact lists, calendars, document storage, creation and sharing documents, presentations, virtual classrooms etc. and support the effective lifelong learning. There are various services like this, which are tested by our team (Seres *et al.*, 2010)
.
Storage and share of the most often-used curriculums – *documents* – can be realized by a lot of service provider on the internet. Most widespread are *Google Docs* and the *Windows Office Live of Microsoft*. Both of them are able for individual and shared editing various documents online with chat among editors. Storage and share of audio-visual curriculums – *pictures and videos* – is the oldest service of Cloud Computing after search providers. Most popular is *Picasa* and *Youtube*, but *Vimeo* and *Flickr* portals are used by a lot of users too. By our experiences the authorSTREAM portal warrants the most authenticable show of *presentations* like *PowerPoint*, but *Slideshare* and *Scribd* portals are popular in this service of Cloud Computing too. Interesting and scenic presentations can be created by a new portal *Prezi* – which is bring into being by Hungarian developer.

Special services of *WiZiQ* and *DimDim* portals provide more lifelike feasibility for lectures which meets condition of *virtual classroom*. Posts on the most popular blog providers *Blogger* and *Wordpress* are text with pictures and links mostly. Service of the *Wallwisher* portal can be used as a bulletin board of a class, because its editing is very simple. More of provider of Cloud Learning offers tools for creating *tests* and *self test*. Online *questionnaires* can be created with *Google Docs*, which are appreciable in common table after submitting. More of virtual classroom services and LMS contain a lot of testing tools too. Effective, interesting and scenic tests can be created with special software – like free *Hot Potatoes* and *Quandary*.
We have tested these Cloud Learning services by creating individual subdomains at above providers (Figure 4).

**Figure 4:** *Cloud Learning*


Source: Authors' compilation.

## 4. Four Levels of E-Course books

Educating in the virtual environment may only be fruitful, if we create high quality learning curriculum, following the differences in the individual cognitive styles and learning habits of the students, when relying on such learning methods, which will keep the students' interest alive, will motivate them for learning.
Moreover, the teaching/learning process, itself, has to follow the pedagogic principle of forming personalities in an appropriate way and developing abilities in an adequate way. Thus, the process is to aim at providing a convertible knowledge, a problem solving way of thinking in addition to the quantity of knowledge to be gained.
A set of e-books (Accounting of Subsidies, Introduction to the Accountancy, General Accounting, Taxation) having been compiled (Figure 5) on the basis of the above principle is available (in Hungarian language) on the Moodle-portal of the author's home page[6].

Figure 5: *E-books of Piroska Sz. Lengyel*


Source: Authors' compilation.

The methodology of the e-books are being relied, on the one hand, on the appropriate aspects of the knowledge management, the learning management, and on the aim at assisting students in finding and devel-

oping their own learning style, in order to obtain real knowledge, through a self-relied learning activity.
The e-books, on the other hand, are to present how to increase the students' motivation for learning, to develop their commitments, their positive attitudes, and their personalities by using state-of-the-art interactive teaching curriculum, by acknowledging their results performed and by rewarding them.
Furthermore, the e-books are inducing the students to accomplish a self-organised learning, supported by the Internet; however they are obliged to follow a disciplined and linear progress in the learning material. Due to the specificities of the learning material, the students, for the sake of the successful accomplishment, have to respect the offered order of a four-level progress:

- Level one – TO READ TO PREPARE YOURSELF,
- Level two – TO DISCOVER THE ESSENCE OF THE ISSUES,
- Level three – TO DEBATE TO CHECK YOUR KNOWLEDGE,
- Level four – TO PERFORME TO FEEL THE SUCCESS.

The e-coursebook, also, contain a set of practical works of different difficulty level. The opportunity of a random choice among them increases the probability of the successful problem solving, as well, which influences the competence sensation advantageously, while the successful solution of the works strengthens the self-confidence of the student/user, which is extremely important for both the intellectual health and the learning success, as well. A built-in program of the module evaluates the student/user's results promptly, thus the immediate feedback can contribute to confirm himself in his personality and to respect himself for his result achieved. From learning efficiency's point of view, it is exceptionally important for the student/user to release his own negative attitudes against himself, to have a healthy self-confidence and to realize, he is a valuable man.

*Four levels of progress*

*Level one,* i. e. the level of acquiring information, serves for a self-relied acquisition of the knowledge for the student, thus learning on his own. The module uses passive and active elements, supported by multimedia devices, for presenting the topics, illustrated by pictures, figures.

*Level two* of deepening the knowledge is for learning with interaction and learning with teacher's cooperation. The lectures presented are fundamentally being relied on an illustrative-explanatory method.
*Level three,* the "Practice" module, serves to measure the level of acquisition of the knowledge. Both the teacher and the student/user receive a feedback on how and to what extent the latter has managed to acquire the learning material.
*Level four,* could also be called the Stage (the acting level) emphasizes the importance of "the acting school" (AEBLI, 1984) the view that the "acting" is inevitable both for developing the thinking and for maintaining the interest. It gives an opportunity to the students to try how they can apply their knowledge in practice. The students/users choose a case study out of the "Practices", they prepare its script, then they present it, they "play the story" and show its possible solution.

*Successes of author's home page*
The individual home page of author[17] has been developed and used for the purposes of college and university education for the last three semesters. Despite the relatively short time elapsed, the number of visits exceeded 19 000. The overwhelming part of users is students of Zsigmond Király Főiskola (King Zsigmond College) in Budapest. The acknowledgments received from students/users have been proving the successes of the above presented four level interactive learning curriculum and distance learning method, which combines the state-of-the-art online teaching with the most valuable characters of the traditional education.

## 5. Softbots in E-Learning

The software robots can be any kind of programs which replace human activities. Repetitive tasks can be solved by such speed which can't be done by humans. The word robot or bot has a bit wider meaning on the internet. It means mostly a program which is looking for any information on the Web.
I would like to highlight a few examples for software robots which can be used in higher education.

- *Searching robots* – such as Google, Bing and Yahoo – can tra-

verse the Web automatically to build a big searchable database. Already they are indispensable for network-generation in learning.
- *Translator robots* – such as Google Translate, Morphologic or Babylon – can translate web pages, mails or any texts. They are able to learn, if once they get an advice so that they can make better translation next time.
- Speech to text and text to speech robots for deaf or lightless students.
- Simulators for training in dangerous or expensive situations.
- Plagiary-checking robots can compare texts and find the similarities between homework and course book.
- Chatting or talking robots with artificial intelligence for tutoring students 7 day a week and 24 hours a day.

e-Learning is the most democratic learning method of the world but there is a problem between the tutor and the students. e-Students need permanently consultations but tutor has limited working time for it. This is much bigger problem if they live in different time-zones. It can happen often in any e-Learning practice.

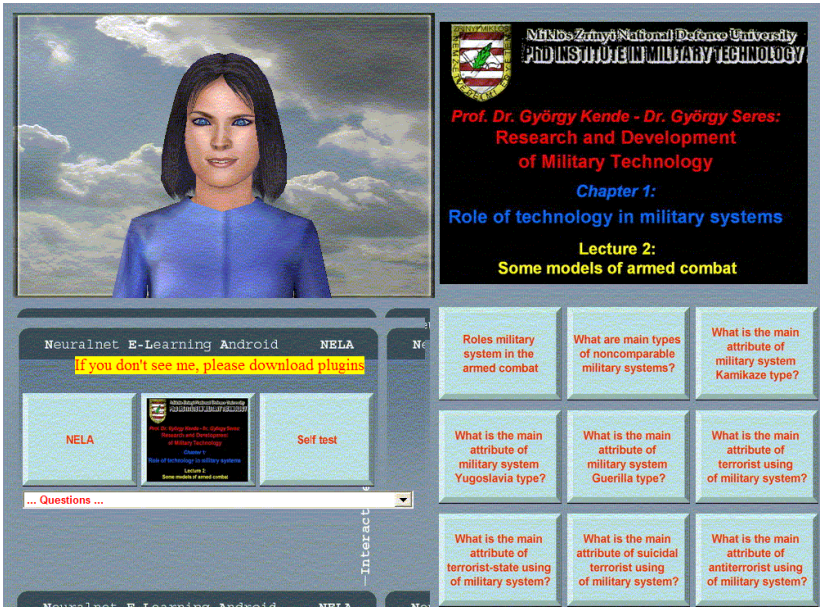
The robots used by e-Learning systems contain unique object program and this is the most modern type of education. The use of multimedia school-work, even teaching and the virtual lessons are managed by an interactive talking software robot aided by artificial intelligence. The knowledge base of the robot of course can be expanded by any topic. In multilevel test systems the both can provide time limited assessment, control and communication.

- There is a virtual university in Hagen, Germany. The system contains all functions of the university, including the curriculum and the administration, moreover a user-friendly and effective communication environment such as peer learning or group work, video conference, billboard and usage of the library.
- The Carnegie Learning program[7] which was realized in the Carnegie Mellon University was made to help students in learning mathematics. The system is aided by artificial intelligence and help pupils to solve their personal problems and give instructions to solve their tasks. The system is able to notice if there is any difficulty and help if it is needed. This system is used in more than 1700 high school in mathematics education at the USA.
- Claude Frasson[8] and his firm called uMind[9] integrated artificial

intelligence in computer aided education system. uMind has already designed courses for such organizations as the Department of National Defence and the Montreal Transit Corporation.

- An experimental robot assistant Nela[10] helps students of subject "R&D in Military Technology" in ZMNDU (Kende and Seres, 2008)

Figure 6: *Robot assistant Nela*[11]




Source: Authors' compilation.

Of course there are lots of other systems aided by artificial intelligence to help education so that we can write about this topic only without the claim to entirety. The virtual tutors have very important role in the future of education because they are independent from human activity, residence and time. They are very effective in education, learning, controlling and rating, too.

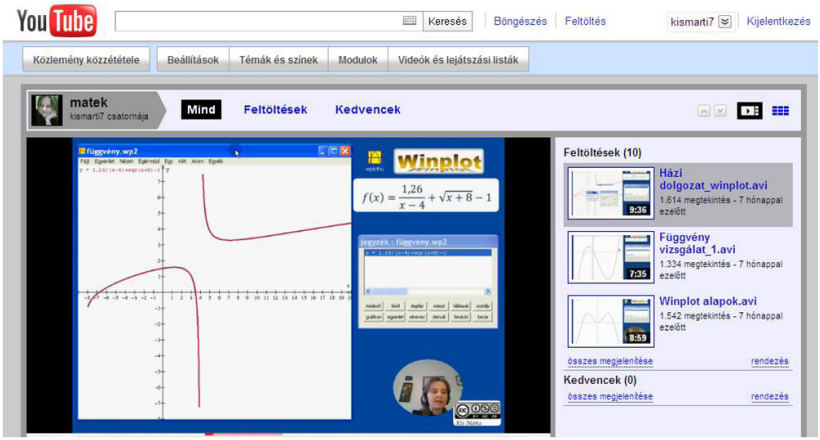
The intelligent tutoring systems are any kind of computer systems that can provide directly customized instructions or feedback to students,

without any intervention of human beings, If the system can be available across internet in that case the system will be reachable apart from residence and time.

## 6. Some E-Learning methods for mathematics teaching

Computer applications have growing importance in the education of economic Mathematics beyond the traditional knowledge transfer. Both the analysis of the functions and the calculations are performed on computers, which doesn't only make the operations quicker, but also helps the understanding due to the representation. We devote an important role to individual task solving, to which we have prepared educational materials in video-format in the recent years.
According to our experience, our students can use the teaching aids supplemented with videos in a much more effected way, this is why we have been looking for solutions by means of what we can create tutorials ourselves, and publish them instantly.

Figure 7: *Virtual lectures on Youtube*




Source: Authors' compilation.

The main point of this technique used is that by means of a microphone, a webcam and a screenshot capturing program we record the teachers' explanations, and then we publish them on a public video-sharing site. For this we use the following three programs that are available for free: Winplot - function analysis program, CAMStudio - screenshot capturing program, and YouTube - video sharing site.

*WINPLOT*[12]
It is an easy-to-use software for graphing and analysing functions. It's free of charge. Other programs can be used instead of Winplot, e.g.: Geogebra, Matlab, Derive, Maple, etc.

*CAMStudio*
It's a screenshot recording program. It's free of charge. We can also record voices and the image of the webcam attached to the computer can also be shown. In this way we can make a recording more lifelike, because the teacher is visible while they explain the material. By means of the various layers provided by the program shapes and text boxes can be placed on the screen, which can be switched on and off during recording. We can set whether the full screen should be recorded, or just a part of it. The mouse pointer can be highlighted by different colours to make it be clearly visible to which part of the screen to focus our attention. We can set different settings depending on the quality and size of the file we want to create. The recording can be saved in AVI format at the end of the recording.

*YouTube*
There are more options to publish the completed educational video materials: they can be pasted in e-learning curriculum, we can upload them as an individual files to our e-learning frame system (CooSpace, Moodle), and we can use free video sharing sites (e.g. YouTube)
Since the biggest problem of sharing videos may be caused by the size of the video, we can save ourselves much annoyance, if we decide to use online video sharing sites. After the registration via email, we can decide how we want to manage our videos: to whom do we allow seeing our uploaded files, do we allow the viewers to share their opinion, to ask questions on the page in question, and how long the material should be seen. Not to mention that after uploading, the program automatically

converts the videos, so we don't have to deal with the compression. We can keep track of how many people watch the finished tutorials, what kind of questions, opinions do they have about them, and if we want, we can also respond to them.
Another advantage of the YouTube video sharing site is that if we want to share our work with others it is enough to send the address of the page where the video can be found, there is no need to move large files. If we want we can easily copy and paste the movies stored by means of a link to our web2 applications, electronic portfolio, website, we can post them to our wall on Facebook, or we can show the on our blog.

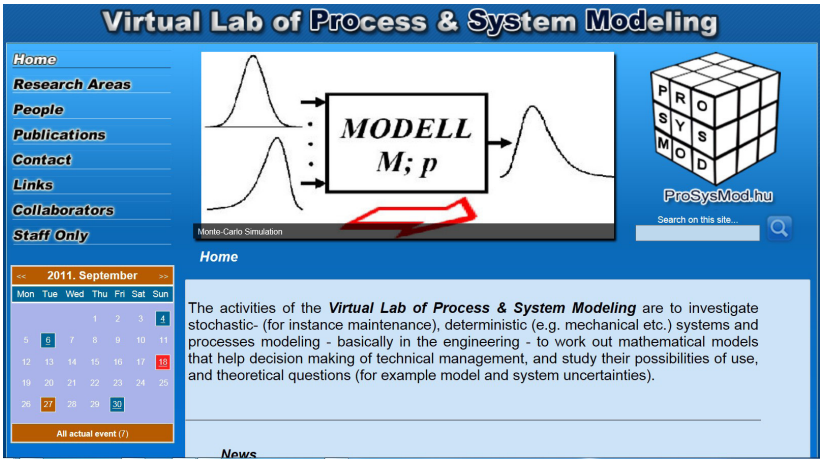
The teaching aids produced by means of the method mentioned above are warmly welcomed by the students. Our experience shows that there is an increase in the interest in Mathematics, the results in the tests are better, and the dropout rate has reduced. The most significant improvement was experienced in case of the correspondence students for whom the teaching aids mentioned above are an even greater help. In the future we plan to develop additional teaching aids, by means of new tools, with what we would like to aim primarily the students of correspondence education.

## 7. Initial Experiences of a Virtual Laboratory

The portal of the Virtual Lab of Process & System Modeling[13] has been founded in 2011. The activities of the Lab (Schlageter *et al.*, 1996) are to investigate stochastic (for instance maintenance) and deterministic (e.g. mechanical etc.) systems and processes modelling, basically in the engineering, to work out mathematical models that help decision making of technical management, and study their possibilities of use, and theoretical questions (for example model and system uncertainties).
The Virtual Lab has four members actually. The head of Lab – author of this chapter – and the three members are his PhD students. They can do their scientific studies using the Virtual Lab without face to face meeting in the clouds. It is very useful, because one of students lives in Germany, and the other one is abroad several times by any scholarships. At this time in the Lab seven research areas are investigated to achieve the goals mentioned above. These research areas are: Investigation of

Model Uncertainty (1), Application of Fuzzy Set Theory for Decision Making of Technical Management (2), Stochastic Modelling of Maintenance Processes (3), Deterministic Modelling of Technical Systems (4), Fuzzy Set Theory based Risk Assessment Methods (5), Quality Assurance, Using Fuzzy Sets (6), and Modelling of Business Intelligence (7).

Figure 8: *FrontPage of the Virtual Lab portal*




Source: Authors' compilation.

The Virtual Lab helps its members to collaborate with themselves and with other experts have similar scientific interest. The visitors can cognize the members, research areas, actual news of the Lab (e.g. conferences), and publications of Lab members.
A common folder system helps the members to work for the scientific areas mentioned above, to exchange programs, date and files. In the future we plan to use cloud technologies for inner and outer co-operations.

## 8. Possibilities of learning, teaching and researching models of János Bolyai in the 21st century

Hungarian scientist – creator of the non-Euclidean geometry – János Bolyai was not only a great mathematician in the 19st century. He has been created a *Salvation doctrine* in which he described a new model for cognition of natural, social and cultural environment. Scientific researches of 21st century – firstly cognitive sciences – authenticated that his brain-model mirrors, moreover points beyond our present reality eyesight. In his model recognition of reality does not happen in an order like that it is teach in schools. But it is realized simultaneously in interactional *observer*, *thinking* and *intuitive* process. In this process the unit of mental efficiencies: *to can, to feel and to want* directs creating of formation of thoughts. Bolyai's thoughts originate from modelling of own thinking when he wrote his capital work: *Appendix the Theory of Space*. He prepared his mind for this at the time of its writing, but he started to write the *Salvation doctrine* in Hungarian after the appearance of his work with 10 years only. He's dead before he would have finished the writing of the *Salvation doctrine,* and he entrusted his manuscript to his followers. He hoped that his methodology serves universal knowledge of the humanity.

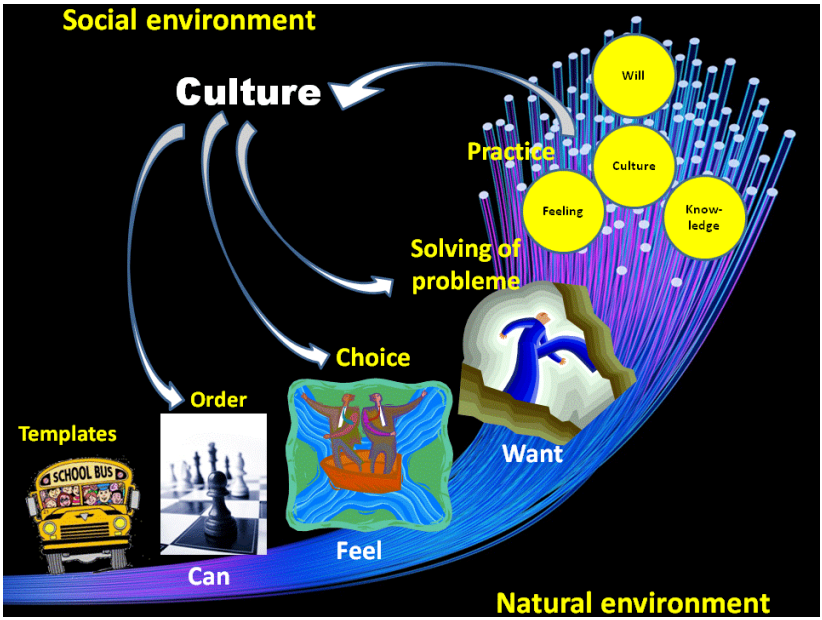
Human is born into the cultural environment. We have elementary comprehension of *learning, feeling* and *wanting* at birth. Patterns of *can, feel and want* are in possession about oneself and environment of us. The concept of the samples indicates it, that we have got memories about social and natural environment, about oneself from our ancestry by parents, school, friends or media. Besides our physical body reorganizes itself from elements and energy fields of material world several times in the course of life.
The purpose of the knowledge based society and the lifelong learning make it possible that methodology of János Bolyai's *Appendix* should be turning into a common property of humanity. Our SysAdminLess group research overall methodology of e-learning by modelling method of Bolyai's *Salvation doctrine* (Figure 9).
On the figure the school-bus presents knowledge samples from external and internal knowledge storages which start information processing of the mind by conscious cognition of signals from environment. Internal storage is memory of mind; the external ones are knowledge networks of society and nature.

Does a not sample supply information for action of mind automatically. First memories and samples must be marked out for generating and maintenance of *can, feel* and *want* processes. If isn't sample, doesn't cognition come into being. Figure 9 illustrates three stage of e-learning: getting of knowledge – pick rules up, confirmation of learned rules – freedom of choice by samples, and based on samples skill develops into problem-solving ability.

These three stages feature onto all process of e-learning and its elements. It shows that the culture dispose all moments of learning.

Ultimate conclusion of Figure 9 is: using of learned knowledge, expertise and skills means whole Bolyai's particular spirituality. Namely, e-learning is a new system which is suitable onto development of student's knowledge, emotions and will. That's why student can admit and use culture of his/her environment and he/she can contribute to progress of culture by his/her work.

Figure 9: *The stages of e-learning*



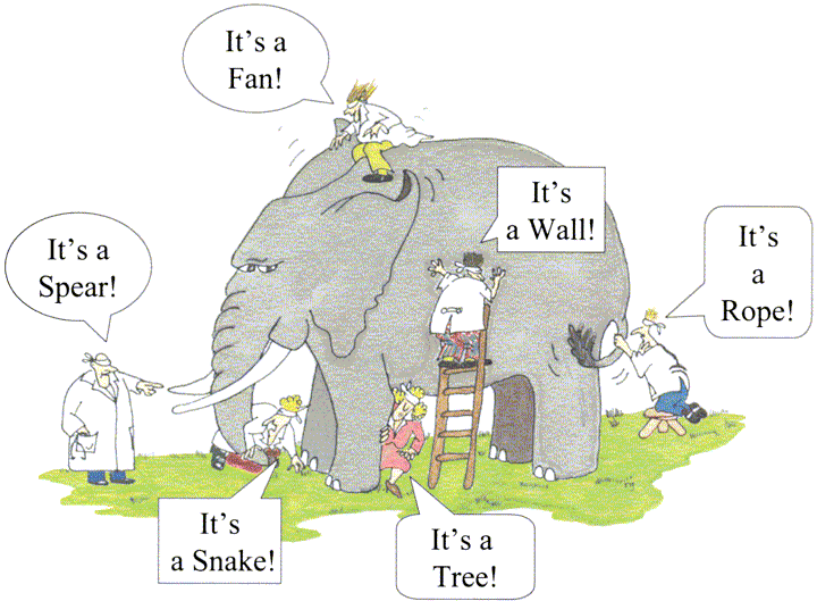

Source: Authors' compilation.

Just we started using of Bolyai's methodology, but we know the contour of the system already – than Figure 9 shows it. We hope that we will have strength and opportunity to pass this way.

## Conclusion

After reading the paper one can ask: what is the research topic of the authors? There are five different research profiles. No, there is one topic only – it is the e-Learning. We can flash this statement with a story (see Figure 10):

Figure 10: *What kind of animal is presented in the picture?*




Source: Authors' compilation.

*Six lightless people met with an elephant in Zoo Park. They research it with their ear and hand, then they ask caretaker:* "A what kind of animal is it?" *Caretaker said:* "It is an elephant."

*In the evening they tell their friends:* 'We were in the Zoo and we met an elephant."
*Friends ask:* "And what kind of animal is elephant?"
*First answer:* "Elephant is like a Spear!"
*Second answer:* "Elephant is like a Snake!"
*Third answer:* "Elephant is like a Tree!"
*Fourth answer:* "Elephant is like a Wall!"
*Fifth answer:* "Elephant is like a Rope!
*Sixth answer:* "Elephant is like a Fan!"

The picture highlights the authors' research objectives. We all met e-Learning in the world of education. One of us sees it so, that e-Learning is the best method of the life-wide learning lifelong. Other one thinks so, that e-Learning can be more effective, if it is life-tailored.
A member of our Club observes accelerated progress of technological environment of the e-Learning in the last century. Experience is the key of success of e-Learning process, by one of our researchers.
Software robots can provide an efficient support for learners and teachers in monotonous, expensive and dangerous e-Learning tasks – in opinion of our other colleague.
As a summary we can see that all of members of the SysAdminLess Club explore different sides of the same topic – different aspects of the e-Learning.

## Notes

[1] http://drseres.com
[2] http://drseres.com/elearning
[3] http://drseres.com/elearning
[4] http://miskolczi.net/moodle, http://forika.hu/moodle, http://www.lengyelpiroska.hu/moodle, http://www.geropeter.hu/moodle, http://bolyai-kavezo.hu, http://drseres.com/moodle
[5] Translated by author.
[6] http://www.lengyelpiroska.hu/elkonyv.html
[7] http://online.carnegielearning.com/
[8] http://www.umindsoft.com/En/About/Frasson.html
[9] http://www.umindsoft.com/
[10] http://www.drseres.com/shahin/

[11] http://www.drseres.com/shahin/index0.htm
[12] http://math.exeter.edu/rparris/winplot.html
[13] http://www.prosysmod.hu/

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# NEW POSSIBILITIES IN TEACHING MATH IN ECONOMIC HIGHER EDUCATION

# FACTORS DETERMINING MATHEMATICAL EFFECTIVENESS

Nóémi SZABÓ-THALMEINER*

*Learning effectiveness is not influenced only by the amount of knowledge acquired, but also by the different overlapping cognitive and affective factors. That is also true for learning mathematics. Thus the question arises whether we can identify the personality factors that closely correlate with mathematical performance. There have been several researches that have tried to answer the question. That is why we are narrowing down the scope of the present research to five areas, namely, the degree in which attention, creativity, motivation, attitude to mathematics and reading comprehension ability influence mathematical performance. The first part of the paper presents the concepts in focus in the research, as well as their relation to mathematics, while the second part presents the empirical research. The research results could provide practicing teachers with a basis for raising the mathematical performance level of their students, as well as for identifying the abilities that need to be developed and the network of pedagogical means they could use while working with an array of different students.*

**Keywords:** pedagogy of mathematics, mathematics skills, learning motivation
**JEL code:** I21

## 1. Theoretical framework

Previous literature (Krüll, 2000, Kiss, 2001) teaches us that mathematical performance is influenced by several factors: background (family, peer group, teacher, and school), intelligence (verbal and performance oriented factors), perception, (observation of senses and numbers), cognitive processes (remembering, focusing, observing, thinking, formation of ideas, imagination, speaking), and affective factors (perseverance, motivation).

Efficiency is the result of several personality and background influences, as can be seen from the performance factors. Let us now look at some of them more closely and examine the connection of motivation, attention, creativity and text comprehension to mathematics learning.

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*1.1.'Mathematics? Ugh! ...'*

Their attitude to the subject mathematics is the reason why the children going to school will fall into two parties: one group likes it a lot, looks forward to the lesson, is happy to do mathematics homework, while the other can hardly bear the sheer sound of the name of it and will express their feeling accordingly: 'I hate maths! Ugh!'

Is that right? Learning mathematics helps people develop their personality in many different ways, it develops their problem solving skills, attention, creativity, decision making ability, logical thinking, and the enumeration could continue... In what kind of a disadvantaged position do those students put themselves who will decide from early childhood that they do not like mathematics, which will allow them subsequently not to learn it, and not to care about it any longer? In order to avoid such an attitude, primary school is able to do a lot. The question arises: what? Furthermore, is it so important for children to love mathematics? Is it so important to develop in children positive motivation towards the subject of mathematics? The answer is certainly yes. That is what constitutes the starting point in case of learning, as we are willing to deal with and learn, whatever interests us, whatever we like or arouses our curiosity, without feeling it a burden, that is what makes us move and triggers action. A learning process that they enjoy is less tiring for pupils than compulsory learning, learning out of fear or learning reluctantly (Oroszlány, 1994). When enjoying it, pupils do not feel that they are learning any more, they will simply know.

Consequently, the first task while teaching mathematics would be to make it popular with the pupils, raising their interest in the subject and increasing their willingness to learn it. How can be that achieved? Specialists in the pedagogy of mathematics, based on the laws of developmental and general psychology, have established different pedagogical trends during the last century (Klein, 1980), that present the following basic principles: popularizing its practical usefulness (e.g. through solving different measurements or solving real problems), generalising experiential cognition while developing mathematical concepts (based on research done by Piaget and Inhelder), related to this, the use of different mathematical tools while learning mathematics (see Montessori tools at the beginning of the 20$^{th}$ century, the box of logic blocks of professor Dienes), the use of games for sustaining interest, for understanding complicated abstractions (see mathematical tools and games

developed by professor Dienes), introducing the theory of sets while developing the basic concepts (based on the findings of Gestalt psychology), providing opportunity for pupils' action and self-management while solving mathematical problems (see complex mathematics teaching research by Sándor Klein in 1969-1970).
The list of basic concepts would not be complete without motivation development. According to Rényi Alfréd 'true mathematics ... in the most noble of its meanings is an exciting, enthralling adventure of the intellect.'(Rényi, 1960, cited in Klein, 1980), and that can only be achieved if teachers, rather than basing their success on authority, will rely on the prestige of work done together, will take into consideration the age and personal characteristics of every individual (including individual work pace), rather than focusing on extrinsic motivation will focus on developing intrinsic motivation in pupils (they should not solve the task to get a good mark, but because they, themselves consider it an intellectual challenge and want to solve it), and they use the word MUST only rarely along the learning process. (Klein, 1980)

### *1.2. 'Pay attention!'*

Attention is a cognitive process that consists of three phenomena: firstly, it is a *selective process*, following which we select and grasp certain pieces of information, while overlooking other pieces; secondly, it is a *process of effort making*, while using our will we focus on a given thing or task, thus its every detail reaching our cognition, and, lastly, but not less importantly, a *process that keeps us vigilant*, that makes it possible to be alert, wakeful to be able to receive information (Kollár and Szabó, 2004).
The definition easily guides us to the idea that there is no learning without attention. One of the basic conditions for learning is to focus our attention on the material to be learnt while actively participating in the learning process in order to sustain our attention. How does attention influence learning mathematics? What happens if we cannot focus our attention as necessary? That can have prolonged causes (e.g. attention distraction) or it can happen temporarily (e.g. emotional storm, inadequate environmental effects influencing focusing ability).
Attention disorder or underdevelopment can manifest itself in different ways: the pupil does not pay attention to the right details, consequently making mistakes while trying to solve the tasks, the exercises (e.g.

doing subtraction instead of addition, or vice versa), the pupil is not organised, persevering, has problems with sustaining attention (e.g. starts solving a task but does not finish it, for becoming bored, getting tired, or having their attention diverted), or there are cases when attention is fluctuating, one day pupils perform very well, the next very badly (László, 1997) .
Teachers meet these phenomena day by day, and often tell the pupils: '*Next time, pay more attention, will you!*' Nevertheless, progress in developing focusing ability remains the responsibility of the pupil. The question arises to what extent lasting attention, level of focusing ability and monotony tolerance, can influence mathematical performance?

*1.3. Creativity*
When attempting to reform the teaching of mathematics it became of key importance to bring forward education for autonomous, flexible thinking ahead of routine like, boring repetition of rules. According to Rényi Alfréd (1973, cited in Klein 1980) the biggest mistake in the mathematics curriculum is that 'the stress is laid on the routine like application of rules learnt by rote, not on comprehension and autonomous thinking', which could, probably, be the reason why pupils get bored, do not like it, consider learning mathematics tiring and useless. With the change in perspective the importance of divergent thinking is brought forward to complement convergent thinking, thus acting together to benefit learning.
In the words of Kalmár Magda, the many facets of thinking, the co-occurrence of convergent thinking and divergent, problem solving thinking can be noticed in creative personalities, nevertheless, she considers it important to stress that creativity needs not only the creative personality, but also the product of creation, as well as the creative process itself. (Lexicon of Pedagogy) In the 1950s Guilford and Torrance connected creativity mainly to divergent thinking, consequently, that is what their creativity test measures. When appraising test results they were looking for three constituents: the fluency of thinking, its originality and its flexibility.
From the point of view of learning mathematics it could be interesting for us to consider the extent of divergent thinking in the process, as well as to see the connection between certain creativity indices and problem solving thinking. Are pupils with better results in tests measuring creativity performing better in mathematics?

*1.4.'Do I understand it? No, I don't.'*

Most international surveys have repeatedly drawn attention on the fact that pupils in year IV and year VIII have problems in reading comprehension. The question arises how that affects mathematical performance? Reading comprehension ability most probably influences mathematical performance, especially in the case of solving text-based exercises. In case the pupils do not understand the text of the exercise, are not able to analyse its meaning, cannot make the logical connections between the details, cannot establish the relation between its particular items, they could not be expected to solve the given task correctly. Thus, when facing bad results in mathematical performance, we must analyse the causes that lie behind, we must find out whether it is the weakness of the reading comprehension ability, or it is the pupils' mathematical reasoning that is not appropriate for the task.

## 2. The presentation of the research

Based on empirical data, we can state that many pupils are having a hard time while learning mathematics, they do not understand it, are not able to follow its logical reasoning, will fail again and again, which results in losing their motivation to learn and will pursue 'survival' only, trying not to fail their exams. For teaching mathematics, teachers can use an array of methods and techniques to help pupils learn, but what happens if all that is not enough?

According to learning methodology, successful learning is determined by several psychological factors, the lack of which can have a negative influence on school performance. The question arises whether we can improve learning results developing those psychological factors?

In the framework of the present research we are measuring the extent in which *attention, creativity, reading comprehension ability and level of motivation is connected to mathematical performance, to the results achieved in tests measuring the level of mathematical knowledge level.* The aim of this enterprise is to be able to formulate suggestions concerning what ability developing exercises could be done, what attitude should we have to develop pupils' personality that would lead to better mathematical performance, should we find its relation to the studied factors.

We formulated certain suppositions before starting the research that lead to the following *hypotheses*:

- Particularities of attention determine the results achieved on the tests measuring mathematical knowledge level.
- Reading comprehension influences the results achieved at solving the text-based tasks.
- Creative children achieve better results while measuring mathematics knowledge level.
- Pupils' with intrinsic motivation achieve better results while measuring mathematics knowledge level.

The research has a *diagnostic aspect*, focusing on the analysis of the relationships that occur in practice, as well as, its aim is informative, as following the results a decision can be taken whether it would be worth broadening its scope on a larger population.

The survey population was selected from among the pupils of the Hám János School Centre in Satu Mare, its 4th year primary school pupils from classes IV A and IV B, a total number of 47 pupils (Table 1).

Table 1: *Number of pupils according to class and gender*

| | IV. A. | IV. B. | Total |
|---|---|---|---|
| Boys | 12 | 16 | 28 |
| Girls | 10 | 9 | 19 |
| Total | 22 | 25 | 47 |

Source: Author's compilation.

The survey was done on the 19th-20th of October 2011, with the help of the primary school teachers (the helped with elaborating and applying the tests measuring reading comprehension and mathematical knowledge level). Through the research several *diagnostic methods* were used in order to collect the necessary data: knowledge level measuring tests, elaborated by the author of the present paper and the primary school teachers, based on the mathematics text books used at school, measured the mathematical knowledge of the students, followed by a reading comprehension subject test elaborated by the Pedagogical Institute of Tolna County (1986). The attention and creativity of the pupils was measured with psychological tests: the Pieron-Toulouse test for the measuring of attention and the repeated figures, circles Torrance test

for measuring creativity. We have elaborated a questionnaire with 16 items for measuring the motivation level, the attitude to the subject of mathematics of the pupils, and had the pupils fill it in writing, thus used the method of written questionnaires for the survey.
While evaluating the research data different *descriptive mathematical and statistical methods* were used: frequency examination, correlation and significance measuring.

### *2.1. Presentation of the data*

The first question we tried to answer was *whether there was a connection between the particular characteristics of attention and mathematical performance*. To answer that question we calculated the correlation between the results achieved at the mathematical knowledge level test and the results achieved at the test measuring attention. We have found that the results of the attention test are in positive correlation with the results achieved at the tasks requiring the use of algorithms (multiplication, missing factor computing, simple transformation, number forming with given figures), but there is no correlation with the results achieved at the text-based tasks, or those requiring mostly logical reasoning. While analysing the data we have also found that those children who have missed less items in the course of solving the tasks in the attention tests, that is they worked more accurately, were more focused during the test, have achieved better results on the knowledge level measuring test as well. In conclusion, responsible, accurate work makes focusing possible, and as a result, pupils achieve better learning results.

Our second question concerned the relation between *reading comprehension and mathematical performance*. We assumed that the level of reading comprehension influences the results achieved by the pupils while solving text-based exercises, as we doubted that they would be able to solve those exercises in case they did not understand the meaning of their texts in the first place. Nevertheless, on evaluating the data we did not find significant correlation between the two, which could prove our assumptions. However, looking more closely to the detailed results, in case of the girls our assumptions gained support. A final answer cannot yet be stated, there is need for more research to support this assumption, with a probable change of the tests used for examining reading comprehension.

The third field of research was examination of the *relation between creativity and mathematical performance*. We applied the Torrance test of repeated circles for measuring creativity. The pupils had to complete the given empty circles in 8 minutes so that they would form as a result a picture representing an object or an animate being. They were allowed to draw parts of drawings outside or inside the circles, and they could draw one or more circles to form their pictures. In order to evaluate the tests we looked at five aspects to describe the level of creativity of the pupils: originality (how original the answers were), flexibility (how easily pupils switched from one logical category to another one while trying to figure out their answers), fluency (how many drawings could they make in the given time period), average flexibility and average originality, that related flexibility and originality of thinking to fluency.

Our hypothesis that creativity influences mathematical performance gained support only partially. Flexibility of thinking, the extent of flexibility has significant correlation with the correctness of the solutions given to text-based tasks, as well as with the results achieved in the mistakes identification tasks. Nevertheless, we could not find any correlation between the aspects of creativity and the solving of algorithms based, transformation and logical tasks (?!).

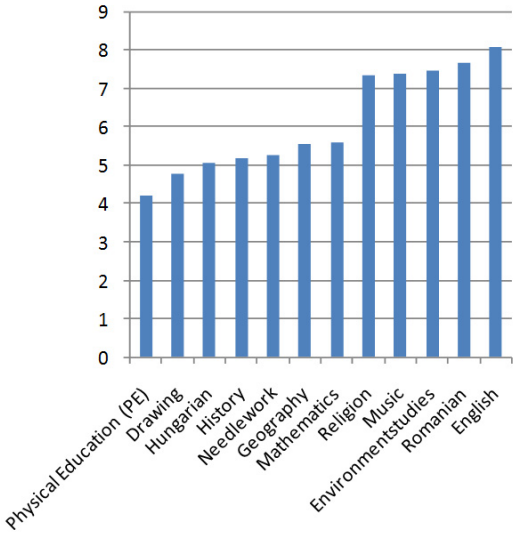
Table 2: ***Ranking of subjects***

| Rank | Subject | Average |
|---|---|---|
| 1 | Physical Education (PE) | 4.19 |
| 2 | Drawing | 4.79 |
| 3 | Mother tongue (Hungarian ) | 5.04 |
| 4 | History | 5.20 |
| 5 | Needlework | 5.25 |
| 6 | Geography | 5.53 |
| 7 | Mathematics | 5.60 |
| 8 | Religion | 7.36 |
| 9 | Music | 7.37 |
| 10 | Environment studies | 7.46 |
| 11 | Romanian language | 7.67 |
| 12 | English | 8.06 |

Source: Author's compilation.

The fourth hypothesis looked at the *influence of the attitude to mathematics on mathematical performance, as well as at the presence of different forms of motivation*. While examining the question we first looked at subject preferences, the pupils having to rank the school subjects according to how much they liked them. As shown in Table 2, Mathematics ranks seventh, which means an average acceptance by pupils, as there is only slight difference among the top seven subjects as compared to the last five (see Figure 1).

**Figure 1:** *Ranking of subjects*

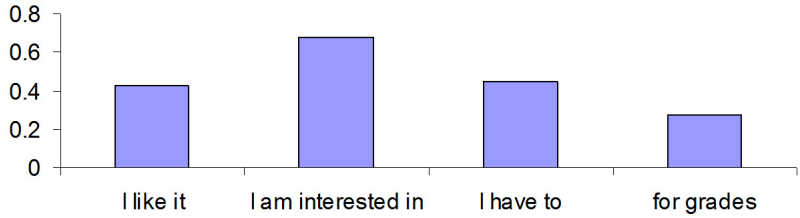



Source: Author's representation.

However, several factors influenced answers in the survey: those pupils who like mathematics ranked Mathematics first, mainly (the average in their case is 2.78), while those who admitted not to like it ranked Mathematics last (average rank 10 in their case).
Attitude to mathematics varies also according to class. While in class IV A Mathematics ranks seventh (average 6.22) in class IV B pupils ranked Mathematics fourth (average 5.04).

Attraction to mathematics also varies with gender. While boys ranked it second (average 5.03), girls ranked it only seventh (average 6.42).
In the questionnaire we asked the pupils why they learn mathematics, what motivates them for learning it. Two of the answers given relate to intrinsic motivation (because they like it, because they are interested in it), and two relate to extrinsic motivation (because they have to, for good grades)
It is good to have found that the majority of the pupils in the survey are intrinsically motivated to learn Mathematics, but many mentioned extrinsic motivational answers as well (Figure 2).

Figure 2: *Why do you learn Mathematics?*




Source: Author's representation.

As far as the other questions are concerned, while looking for relations among the answers we have found that those who like mathematics and are interested in it have few problems while learning it, would happily have more lessons per week in their timetable, are aware of its practical usefulness, like attending mathematics subject contests and achieve better results at the mathematics knowledge test. These findings allow us to conclude that positive, intrinsic motivation has good influence on mathematical performance. There is a logical loop, nevertheless, as those who like it will enjoy learning mathematics, dealing with it, so they would perform well and feel much satisfaction. That is why it is very important to provide opportunities for feeling satisfaction to all the pupils. And that could be done with designing personalised tasks, with individualised teaching practice.

## 3. Conclusions and suggestions

Through our research we have gained proof that it would be worth to continue researching the topic, as mathematical performance is in some respect influenced by level of attention, creativity (especially flexible thinking), level of reading comprehension (though this aspect definitely needs further research) as well as attitude to the subject and type of motivation. In order to be able to generalise our findings to be true for the entire population of the 4$^{th}$ year pupils, we need to continue our research, widen its scope to include a larger sample, as well as change the type of test for measuring reading comprehension.

Nevertheless, based on the data from the research, there are some conclusions that can be already formulated, that could help improve the quality of mathematics teaching:

- Make mathematics lessons more colourful using exercises that develop attention and creativity! Thus we do not develop only those abilities, but also their positive attitude to mathematics.
- Be demanding: ask for thorough, accurate work from the pupils – thus they will need to focus more and make fewer mistakes owing to lack of attention!
- Be supportive of the authentic ideas of the pupils -listen to their original solutions, thus letting their creativity manifest itself!
- Do interesting, colourful lessons, using a variety of methods that rely mostly on active participation of the pupils!
- Make pupils aware of the usefulness of mathematics in everyday life, providing them with familiar everyday life contexts in which to solve their tasks they would need to rely on mathematical knowledge!
- Provide pupils with opportunities for feeling satisfaction in using mathematical knowledge, with a stress on positive reinforcement and the development of intrinsic motivation, as they should not learn and deal with mathematics out of fear or for the pursuit of recognition, but because they are interested in it!

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# THE MATHEMATICAL PROFICIENCY TESTS

Ileana MATE*

*As in other countries of the European Union a teaching based on proficiency is employed in Romania as well. While teaching the curriculum the teachers are struggling to make their students be able to apply their knowledge, experience and talents in different fields of life.*
*Starting in primary school and throughout middle school the goal is not only that the students have a lexical knowledge, but that they should posses of such knowledge that makes possible for them to learn skills that will enable them to use in their surrounding environment.*
*The theme of the presentation is an experiment which was applied in a rural school to the students of 8th degree where the mathematical exercises developed in the students the ability of solving the exercises, the understanding of the task, and the adaptation to the new types of problems.*
*While the experiment took place the students solved tasks related to everyday life. So that firstly they tried to understand the text of the problem then using arithmetical and algebraic methods they solved the task and eventually they compared the result with the text of the task.*
*The effectiveness of the test is shown not only by the test which followed the experiment but also by the results of the students obtained at the National Tests.*

**Keywords:** teaching methodology, mathematical problem, proficiency test.
**JEL code:** C00

## 1. Introduction

As in other countries of the European Union a teaching based on proficiency is employed in Romania as well. While teaching the curriculum the teachers are struggling to make their students be able to apply their knowledge, experience and talents in different fields of life. The acquisition of the competences is measured in the National Assessment. This assessment involves the students who have completed the eighth grade and are 14-15 years old. At the National Assessment the students give proficiency test in Romanian language and literature, mathematics, and, those who have studied in another language than Romanian, also have a proficiency test in their native language and literature.

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The Mathematics proficiency test verifies the aquirement of 15 competences, out of which the 12th is as follows: 'The transposition of a problem situation into the language of mathematics'(www.edu.ro). Before a competence-based education was given in Romania, the tasks in the national tests in Mathematics started like this:

- Calculate ....
- Verify ....
- Work out ....
- The result of the calculation is ....

For two years, since the education is based on competence development, the tasks given at The National Test have been based on real life:

- 'A cyclist on a slope ... ..
- The results of a class of students in mathematics at the end of the semestre are ...
- In a bag there are some candies ....
- On one of the shelves of a bookcase .... ' (http://subiecte2010.edu.ro)

Because of the formulation of the tasks in a test, it is more and more important that the students have acquired the above-mentioned competencies. It is very difficult for students to solve such text-based problems, while in the National Assessment given this year, 46% of the overall tasks were text-based tasks (http://subiecte2011.edu.ro) because:

- many students have difficulties in reading, that is they are functional illiterates, thus although they can read the text they have no idea about what they read,
- those who understands the text, often complain that, by the time they come to the end, they do not remember the beginning, especially with longer and more complex texts,
- and, finally, it is very often that even though the students do understand the text and do remember the whole text, they don't find the correct way to solve the problem.

In the school year 2010/2011, an experiment took place at class 8D of the Lower-Secondary School of Diosig in Romania. The goal of the experiment was the improvement of the above mentioned competence.

## 2. The basis of the experiment

Previous researches show that verbal information is better retained if a relevant visual information is related to it. This multiple encoding can be used in the understanding and solving the problems based on a text (Sternberg and Ben-Zeev, 1998).
In order to be successful in solving the problem, there are a few facts to consider in solving the problem:

- a high level of activity and attainability for keeping in memory the known data, the unknown data of a problem, and the steps to the correct solution.
- the suppression of the irrelevant and distracting information
- a controlled attention is required for the steps of the solution and the integration of the partial tasks. (Baddeley and Logie, 1999).

## 3. The environment, the participants and the purpose of the experiment

The experiment took place in a large village in Romania, in the Lower-School of Diosig. In this school there are about 900 children, from the first grade in which students are 6-7 year-olds to eight grade in which they are 14-15 years old. In the school, there are Romanian, Hungarian and Romany-speaking pupils. The Hungarian and Romany children learn in Hungarian and the Romanian children in their native tongue. There were 5 classes of eighth grade in that school year.

Table 1: *The characteristics of the students in the 8th class*

| | 8. A. | 8. B. | 8. C. | 8. D. | 8. E. |
|---|---|---|---|---|---|
| Native tongue | Romanian | Romanian | Hungarian | Hungarian | Romany |
| The language used in school | Romanian | Romanian | Hungarian | Hungarian | Hungarian |
| The number of students | 21 | 18 | 23 | 23 | 18 |

Source: Author's compilation.

The experiment was conducted in class 8D where the students were well-behaved, well-educated, but they were of an average ability, and they were not selected.

The aim of the experiment was to measure the students' reading comprehension skills, the competence of solving text-based problems, and then, using the findings of the modern brain research, to develop the competence of understanding the task and of solving the problems by using text-based exercises.
In the experiment the main question was: *Can the students competences of understanding the task be developed*, such that the the text of the tasks to be solved can be analysed better. So that they could make a difference between the relevant details and the negligibile ones which from the point of view of the problems the irrelevant ones, and the writing of the key moments of the problem. Another major question was whether *the skills of solving a text-based problem can be developed* by putting down the key moments of the problem during the solving process.

## 4. The steps of the experiment

The experiment was conducted in May 2011, when students had acquired the entire curriculum and only the systematizing revision part was left. The experiment was conducted over nine lessons, of which during the first one a pre-test and during the last one a post-test was given to the students.

Pre-test

1) I thought at a number. By adding 12 to its threefold I get number that is smaller by 2 than if I substract 3 of the fourfold of the original number.
2) 12 I get a number smaller twice than the original , as if from its fourfold I would have deducted 3. At what number was I thinking?
3) A father will be twice as old as his son in 3 years. 7 years ago, the father was three times his son's age. How old are they now?

Table 2: *The outcome of pre-test experiment*

| The number of the task | The number of students giving the correct solution | The number of students giving a partial solution | The number of students giving a wrong solution |
|---|---|---|---|
| 1. | 0 | 8 | 15 |
| 2. | 1 | 7 | 15 |

Source: Author's compilation based on experiment results.

From the 23 pupils there was only one student who obtained the good result at one of the text-baset tasks, but he did not write down the solving process (Table 2). At a subsequent question P.N. said, ' I played with the numbers, until I came out with a good result'.
Those who gave a partial solution made calculation mistakes or did not reach a final solution. The wrong solution column is that of the students who did not even try to solve the task or gave a completely wrong solution.
In the pre-test it can be seen that the solving of text-based tasks caused major difficulties to the students. For the next seven lessons, the students solved text-based tasks. Each time the tasks were built around a certain theme.

*Lesson 1: Think backwards*
The first task: On a trip to Paris, Réka and Árpi took a lot of photos. On Wednesday, the half of the pictures were taken at the Eiffel Tower, two thirds of the rest at the Notre Dame, and the remaining 8 photos were taken at the Arc de Triomphe. What is the total number of photos taken on Wednesday? (Csordas, 2010)
All the students received the text. They had ten minutes to read, understand and try to solve it. The first idea came from K.J. who solved the problem in this manner:

$$\overset{3)}{\frac{1}{2}}+\overset{2)}{\frac{2}{3}}+\overset{6)}{\frac{8}{1}}=x$$

$$\frac{3}{6}+\frac{4}{6}+\frac{48}{6}=\frac{55}{6}$$

Then he added 'So the results is 55/6.'
Then T.A. said: 'The number of pictures can't be a rational number'

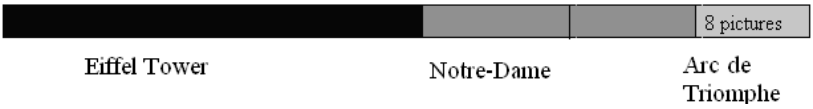
The next solution came from B. M.: '1 quarter = 8; then the half = 2 · 8 = 16. 8 + 8 +16 = 32'
B.M. said: 'They took 32 photos'

Then the teacher asked him to check the result by comparing it to the text of the task

> 'At The Eiffel Tower half of the photos = 16 photos'
> At the Notre Dame two thirds of the rest, that is 2/3 of 16 ....
> But this is not a natural number. This is not a good solution.'

The teacher suggests: 'Let's assume that they used a traditional camera, and let's draw the film strip on which they took the negatives.'

Then K.A. solved the task in this way:

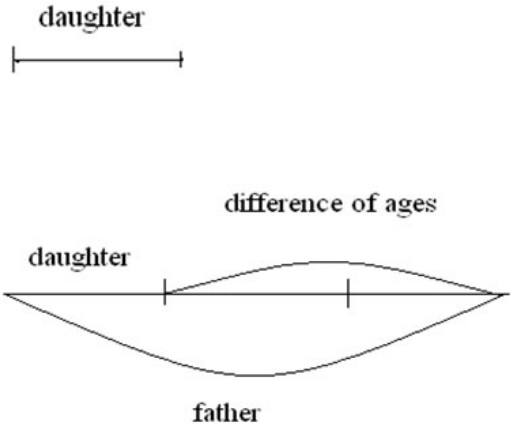



If they took 8 photos at the Arc de Triomphe, then at the Notre-Dame they took twice as many at the Notre Dame, that is 16 photos. At the Eiffel Tower they took as many pictures as that at the Arc de Triomphe and at The Notre Dame together, that is 8 +16 = 24 photos.
Total: 8 +16 +24 = 48 photos taken.

The students also described in their notebooks the steps of the solving process, so that this could help them remember when they revise.

*Lessons 2 and 3: How old are they?*
A father is 45 years old, his daughter is 19. How old was the daughter when her father was three times older than she was? (Jakab, 2010)
Because the students had difficulties in solving the first task by themselves, the teacher asked them to try to determine how many points of time there are in the task, and to try to solve the task by drawing a disgram (Figure 1).
The solving of the task:
In the present the father is 45 years old and his daughter is 19 years old. The past differences of ages are summarised in Figure 1.

Figure 1: *The drivung up of time horizons*




Source: Author's compilation.

The problem was solved by P.N., who realised rapidly, using the diagram, that the difference in age between the two people is always constant, and hence he easily calculated:

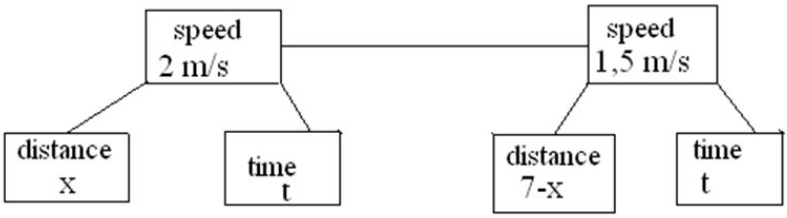
Difference in age : 45-19 = 26
The girl's age: 26: 2 = 13 years old
The father's age 13 +26 = 39 years old

*Lesson 4: Movement tasks*

During the fourth hour the focus was on tasks that were linked to some sort of movement. One of them was the following: during a Phisycs experiment, two small car are launched simultaneously from the two ends of a straight 7 m long path. The speed of the cars is of 7.2 km/h and 5.4 km/h. Let's express the speed of the cars in m/s. When will the two cars crash one into another? (Jakab, 2010)

The first part of the task was very easily carried out independently by the students, and they calculated that 7.2 km/h = 2 m/s, and 5.4 km/h = 1,5 m/s. The second part of the task was a bit harder for the students, some teacher guidance was needed. The teacher asked the students to try to represent the movement of two cars. The following diagram was made by B.M. on the board (Figure 2):

Figure 2: *The movement of two cars*




1st car 2nd car

Source: Edited by a student (B.M.) in the class.

After B.M. draw this on the blackboard, M.G. wrote the operation related to it

M.G.: 'Because we know that the period of time is equal for both cars, we can write:

$$\textbf{1}^{\textbf{st}}\ \textbf{car}\ x = 2 \cdot t$$
$$\textbf{2}^{\textbf{nd}}\ \textbf{car}\ 7 - x = 1{,}5 \cdot t.'$$

M.G.: 'That is' $\textbf{2}^{\textbf{nd}}\ \textbf{car}\ x = 7 - 1{,}5 \cdot t$

M.G.: 'From here, if we equalize the equations we can calculate the value of **t**.'

M.G.: ' $2 \cdot t = 7 - 1{,}5 \cdot t$ '

M.G.: ' $3{,}5 \cdot t = 7$'

M.G.: ' t = 2s. The two cars will crash one into another after 2 seconds.'

*Lesson 6: Working Together*

During this hour the students tried to solve task in which two people or machines, worked simultaneously and they had to find out the duration of the operation and the quantity of it.

One type of task was the following: in the courtyard there is a pile of wood. If Tibi carries it alone, he performs the work in 24 minutes. If his brother Zoltán carries the wood alone, he finishes the work in 16 minutes. How long does it take for them to finish the work if they carry the wood together? (Jakab, 2010)

After the students got time for understanding and solving the task, unfortunately no one had any idea. At the suggestion of the teacher,

T.A. made the following table on the blackboard, in which he wrote the details of the task.

Table 3: *The details of task*

| | If he works alone, he finishes the work in this time | In 1 minute he carries this quantity of wood | In x minute he carries this quantity of wood |
|---|---|---|---|
| Tibi | 24 minutes | $\frac{1}{24}$ | $\frac{x}{24}$ |
| Zoli | 16 minutes | $\frac{1}{16}$ | $\frac{x}{16}$ |

Source: Author's compilation.

TA, 'Let's mark with x the time it takes them to finish the work together, then'

$$\overset{2)}{\frac{x}{24}} + \overset{3)}{\frac{x}{16}} = 1$$

$$\frac{5x}{48} = 1$$

$$x = \frac{48}{5} = 9{,}6$$

T.A.:" Together they finished the work in 9,6 minutes, that is 9 minutes and 36 seconds.
Once this task was completed the next task of this type was easily solved by the students on their own.

*Lesson 7: Revision*
The post-test

1. A snail makes the distance of 3 meters in 2 hours and 30 minutes. How many meters does it make in :
   a) 1 hour
   b) 15 minutes
   c) 4 hours and 45 minutes
2. A father will be twice his son's age in 3 years. Seven years ago, the father was three times older than his son. How old are they now?

3. I thought at a two-digit number, in which the sum of the figures is 10. If I reverse the digits of the number, I get a number that is smaller by one than twice the original number. What number was I thinking at?
4. A section of an underground tunnel is drilled by one machine alone in 12 days, and by another machine alone in 15 days. How long does it take the the two machines to meet if they start from the two opposite ends of the future tunnel? (Jakab, 2010)

When the post-test was analysed one of the most evident changes as compared to the text-based tasks of the pre test was that the students dared to try. While at the first test not even the best students dared to try to solve the test, here even the poorer students tried. Of course, the way they started to solve the test was not always correct, but 7 hours are not enough time to expect better results.

**Table 4:** ***The results of post-test assesment***

| The number of the task | The number of students who found the correct solution | The number of students who found a partial solution | The number of students who did not give any solution |
|---|---|---|---|
| 1.a. | 6 | 10 | 6 |
| 1.b. | 6 | 10 | 6 |
| 1.c. | 5 | 11 | 6 |
| 2. | 2 | 11 | 9 |
| 3. | 6 | 9 | 7 |
| 4. | 4 | 10 | 8 |

Source: Author's compilation.

The results of the post-test assesment suggest that we should place more emphasis on text-based tasks. Beside the results of this post-test, a more persuasive argument can be seen in the results of the National Test written in 2011. From this school 100 students participated in the test.

If we analyze the 10 best results considering that the highest attainable score was 100 points, than the results can be summarized in the following table (Table 5).

Table 5: *The resutls of solving the post-test assesment*

| Number | Points | 8. A. | 8. B. | 8. C. | 8. D. | 8. E. |
|---|---|---|---|---|---|---|
| 1. | 83 points | - | - | - | 1 | - |
| 2. | 82.5 points | - | - | - | 1 | - |
| 3. | 81 points | - | - | - | 1 | - |
| 4. | 80 points | - | 1 | - | - | - |
| 5. | 79 points | - | 1 | - | - | - |
| 6. | 78 points | 1 | - | - | 1 | - |
| 7. | 77 points | - | 1 | - | - | - |
| 8. | 76 points | - | 1 | - | 1 | - |
| 9. | 72 points | - | - | 1 | 1 | - |
| 10. | 70 points | 3 | 1 | - | - | - |
| | Total | **4** | **5** | **1** | **6** | **0** |

Source: Author's compilation.

Class 8D was the one that was involved in the experiment,and the best three scores were in this classroom. From the 16 students who obtained the best 10 scores, six are from this class (Table 5).

## 5. Conclusions

This experiment helped to achieve the goal, because the students' competence of understanding a text has improved, and they acquired some knowledge of such problem-solving methods that made the writing of the equations and the algebraic solutions easier for them.

An essential point of view was that, during the experiment, the students' visual and phonetic storage were put to work in parallel with the aim of an easier and a more successful task solving.

One fact that can be learned from this experiment is that seven such lessons of problem solving are not enough, instead the students have to solve text-based tasks continuously during the entire four years of preparation for the National Test. We should not focus on the algebrical

solution only, but the students must be given the posibility to also use an arithmetical solution, then the students should be encouraged to write the equation related to the task.

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# GEOGEBRA IN TEACHING CALCULUS AT KAPOSVÁR UNIVERSITY

Anna KLINGNÉ TAKÁCS*

*Traditionally, in our university, we begin with courses in Mathematics with Calculus in the first semester. Our experience is that acquiring basic elements of this subject presents several difficulties to students. Thus, often we recommend an optional course to students. It is called Learning Mathematics Supperted by Computer. This course goes in parallel with the Mathematics I. (Calculus). The subject has a threefold aim: the development and conditioning of the basic mathematical skills, to link it closely with higher mathematics, and to link it with the use of computers. We have positive experiences introducing the subject. Students' attitude towards mathematics changed positively, they are able to solve more complex problems with the help of the computer.*

*This is the first year when we teach Calculus for students of Economics in post-secondary vocational training. In the autumn term we experienced that we have to review the proposed curriculum because of the unpreparedness of our students. Thus, in the spring semester, we continued teaching the basics for Calculus utilising computer-aided lessons.*

*According to Bruner's (2004) representational theory and to our experiences, introducing computer-aided lessons makes the solution of Calculus problems more efficient. We have positive experiences about this with our first-year BSc students of Finance and Accounting as we believe that we widened their knowledge in Excel and Geogebra within the framework of an optional course. This was one of the reasons why we applied computerized methods in post-secondary vocational training as well. Excel and Geogebra proved to be efficient both in the illustration of the material and in problem solving, besides the traditional paper-pencil method. We used GeoGebra to determine approximate sums, areas bounded by curves. Our experiences in the process of teaching-learning are shown in this article.*

**Keywords:** mathematical education using computer, representaton levels, calculus, cognitives objectives of mathamatics-teaching, GeoGebra

**JEL codes:** C02, C88, C65

## Introduction

It was in school-year 2010/2011 when we first announced six kinds of post-secondary vocational training in economic area. As we expected, the number of students increased, tripled, and thus 72 students started

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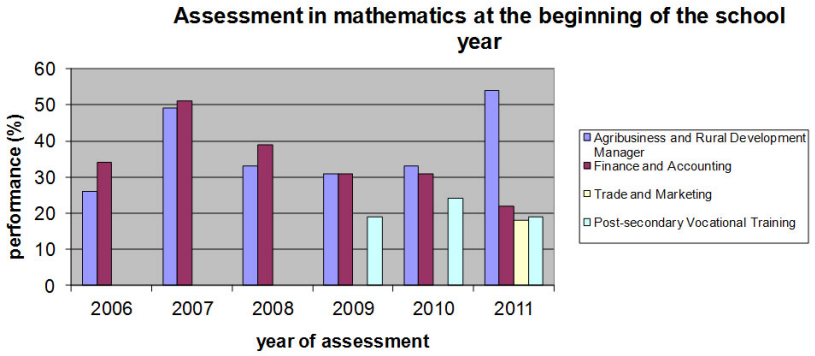
their studies in this kind of training at our university. This year's school year started a Bachelor of Science in Trade and Marketing study programs our Faculty.
We assumed the students' intention to make further studies, so the curriculum included Calculus taught for BSc students of Finance and Accounting in the first semester, extended with some economic application. Post-secondary vocational training is a two-semester course.
We made our traditional survey of our students' knowledge, the results of which can be seen in the diagram below, for years retrospectively.

Figure 1: *Results of level assessment in Economic Science of Kaposvár University*




Source: own editing based on the survey of Kaposvári Egyetem listeners (2011)

Students starting their post-secondary vocational training were more prepared than last year's, still, their level was just a bit over pass grade of high school graduation (Figure 1). At the end of the test there was a question about their intention for further study. Five out of the 72 students answered that they wanted to go on with their studies, 35 were uncertain, and 32 did not intend to study further. Keeping this in mind, we restructured Calculus curricula of the two semesters. In the autumn term we made a revision of logarithmic and exponential functions, formulae, then established the bases of one-variable differential calculus. The spring term curriculum contained the determination of local minima/maxima of two-variable functions, the bases of integral calculus, and, in the framework of this, power functions, as applications.

It can be seen that the level of knowledge of our students is getting lower due to the introduction of the Bologna system of education. Our experience is that acquiring the basics of this subject presents difficulties to students, especially drawing the graph of a function after having it analyzed. To make our work efficient, it is essential that we get to know the methodological aspects of teaching Mathematics and get informed about the psychological background of mathematical thinking.

## Literature review

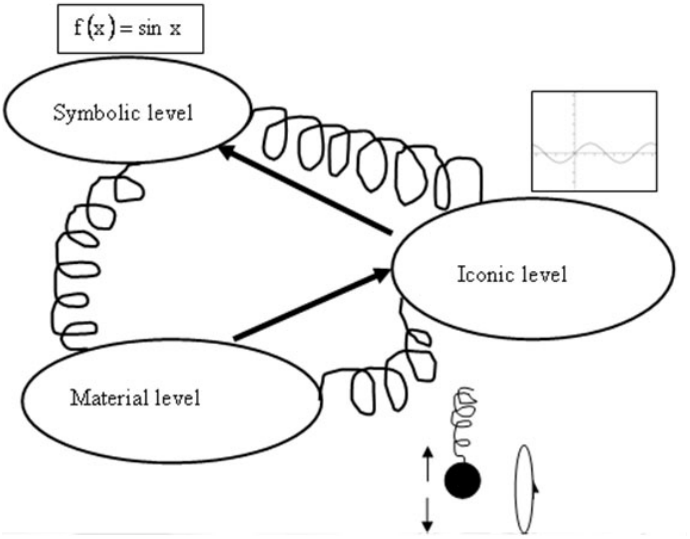
The models of theory of teaching connected to knowledge and competence arise from different sources. Both the theories determining research trends and the way of thinking about the daily routine of teaching are blended with views claiming that several present-day disciplines have a common origin, and also, that they were derived from other disciplines. From this point of view, the effects of philosophy and psychology are the most important, but in the last decade, the effects of some branches of sociology, information technology, cognitive science and economy on the research of teaching are considerable as well. Philosophical roots can be found in the cognitive pedagogical views up to this day.

The development of view about competence is affected by more psychological trends. Out of these, there are three, which are worth emphasizing, because their continuously developing theories and research results still take effect on researches in school teaching: these are psychometrics, Piaget school, and cognitive psychology. Psychometrics (the psychology of individual differences) is primarily engaged in the quantitative characteristics of abilities. Piaget and his followers thought that the quintessence of human sensibility is operational thinking. According to their theory the development of intelligence starts from pre-operational schemes, goes through operational thinking, and leads to formal thinking. Cognitive psychology appears as a trend describing cognition as information processing (Csapó, 2001, pp. 271-273).

Bruner (2004) examined how people represent and store the information arriving from the external world. According to his view there are three levels of mental representation of human thinking.

- Material (enactive) level (the acquisition of knowledge happens through specific material activities, manipulations)
- Iconic level (the acquisition of knowledge happens through expressive graphs, figures and imagined situations. E.g. tree diagrams, geometric illustrations of algebraic problems)
- Symbolic level (the acquisition of knowledge happens through mathematical symbols and the language).

Figure 2: *The transition between the different levels of mental representation helps developing problem solving skills*




Source: Klingné (2010)

The three representation methods were involved in each phase of the teaching process (Figure 1). The transition from one level to another increases flexibility and the efficiency of problem solving. The iconic level (illustration) is throughout present in Mathematics teaching (Ambrus, 2004).

Since the cognitive revolution of the nineties, the theories about the nature of human mind have been being modified. These theories arose

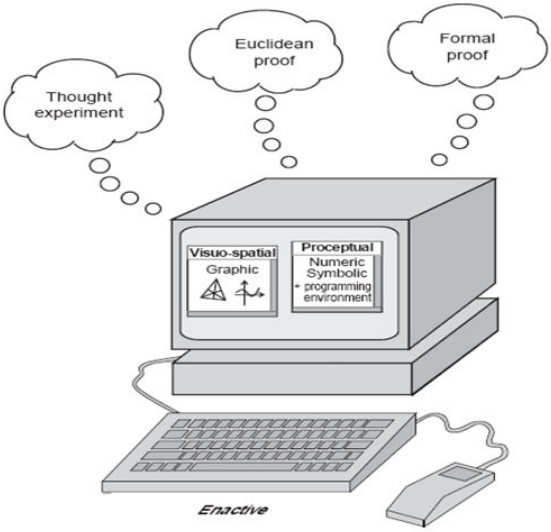
from two strikingly different ideas about cognitive function. One is the assumption that human mind can be imagined as a computational structure. According to the other, human culture is a component of mind, and also, human mind materializes in the course of the use of human culture.
The first, computational view deals with information processing, namely the work of a computational structure which ingrains, filters, stores, connects, restores and generally handles a piece of finite, encoded and unique information. Information is taken as it is, as something which is impregnated in some already existing, regulated code which covers the state of the world (Bruner, 2004, p.14).

The inspiration of the other approach is culturalism, that is, the evolutional fact, that human mind could not exist if there was no culture. The evolution of anthropoid mind is connected to such a way of life, where reality is represented by a set of symbols, which is known by every member of the given cultural community. This set of symbols is both the organizer and the establisher of technical-social life in this community (Bruner, 2004, p.15).
The narrative theorem: what kind of thoughts and feelings can help children or anyone to create such a version of the world, in which they can count on their future place: is this their own world? According to Bruner (2004), storytelling and narration are needed to reach this. Narration appears as a vehicle between way of thinking and coinage of meaning. He thinks that humans handle and organize their knowledge of the world, structure their experiences in two ways. One is rather for handling physical "things", the other is for handling people and their states. The terminology for the first is logical-scientific-, for the other is narrative thinking. They are both present in any culture, but different cultures prefer one or the other variously (Bruner, 2004, pp.47-48).

*Computers in Mathematics teaching*

Lectures at last years' conferences were held about the importance of computers in Mathematics teaching and their positive effect on students' attitude to Mathematics.

Figure 3: *The use of computers can improve flexibility in the transition between the representation levels*




Source: Tall (1994)

Hungarian mathematics didactical researches showed that the visual features, numerical calculation abilities and also the tools for symbolic calculations of CAS and CAD systems help the accommodation of new concepts, abilities such as drawing analogies, comparison and generalisation can be developed with their aid. They play a primary role in developing abstraction skills (Perjésiné, 2003).

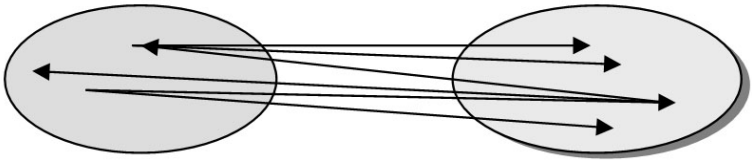
## Research material and methods

*Galois-graphs*

The research method was developed at Darmstadt University of Technology – School of Lattice Theory – by Rudolf Wille and Bernard Ganter, constructors of Formal Concept Analysis, namely it means to make a mathematical model for the hierarchy of concepts. Its application areas are for example the grouping of cars according to the sort of their drive or the presence of famous buildings of Forum Romanum in different guide books.

There are many types of Galois-graphs, depending on the area of the pedagogical work they are used at: objects and their properties; individual graphs - either concerning a specialized branch of science or a pupil's graph; collective graphs - pupil-task graph; sociometric graphs; and graphs characterizing research applications.

**Figure 4:** *How are Galois-graphs made?*



Source: Klingné (2011)

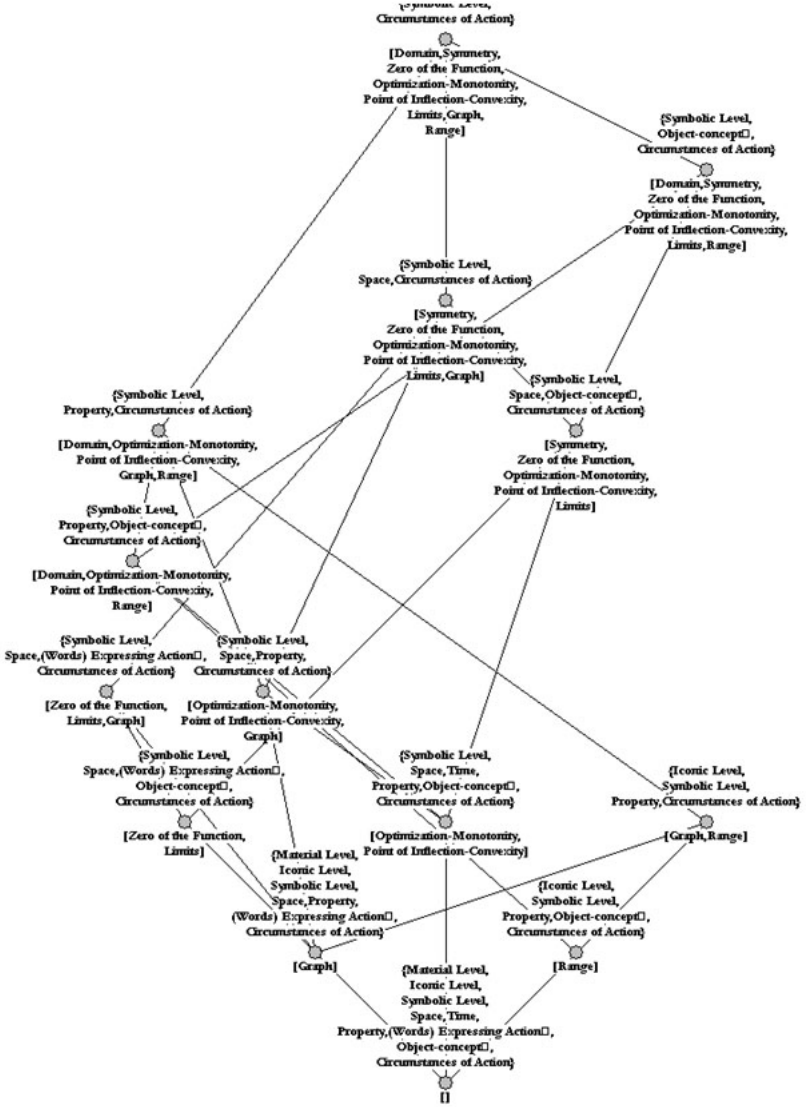
There are two basic sets, between the elements of which there is a many-to-many relationship. However, between the elements of the subsets of the first and second sets it is possible to create a one-to-one correspondence. A subset with this property is closed, if the number of its elements cannot be increased without decreasing the number of elements of the second set, and the same is true for the other subset. If there is a two-valued relation between the element-pairs of the two basic sets, the use of Galois-graphs can be thought of.
The application of Galois-graphs is one out of the several methods of Formal Concept Analysis at pedagogical areas (Takács, 2000).
The steps of drawing the graph: Let the vertices of the graph be the closed subset-pairs. The vertices are to be drawn above each other, depending on the number of their elements. Thus there will be one-element vertices placed next to each other, two-element vertices above the one-element ones and so on. The different levels are called the storeys of the graph.
The rule of connection: choose an arbitrary vertex, and connect this to each vertex below it which is its greatest subset. Do this procedure to every vertex. Drawing the graph by hand is quite laborious, that is why we used the Galois-graph plotting program developed by Márton Szigeti (2010).

Last year we made a research in which we examined the solution of textual mathematical problems linguistically and in mathematical respect (Klingné and Nemesné, 2009). The chosen age groups were students out of the upper forms of the eight-year general school. Our several years' teaching experiences have shown that solving textual mathematical problems presents difficulties to students. Looking for the reasons we tried to answer the question whether the vernacular language skills and the mathematical ones are in correspondence with each other in the given age-group. The results of the survey were evaluated with the help of Galois-graphs. We compared the science graphs of the two subjects in the given problem-types, constructed the students' knowledge graphs, and then compared these to the examined subject structures. The universal categories defined by us were the following:

- Space (orientation, below, above)
- Time (succession)
- Properties (words expressing quantity)
- Words expressing action
- Object-concepts (knowledge and use of terminology)
- Circumstances of action (method, accuracy of problem solving)

The above categories proved to be appropriate to analyze students' knowledge from both linguistic and mathematical points of views.
Galois-graphs were also suitable for evaluation in the analysis; the obtained levels were in accordance with the students' numerical results, marks (Klingné and Szigeti, 2009).
Hereafter we are going to make an analysis in respect of the above defined universal cognitive categories, regarding one of the elementary problems of Calculus, connecting Bruner's (2004) representational levels to it, because these levels are present throughout the whole process of teaching and education.
The relation-system of categories and levels are represented by Galois-graphs.
The elements of the first set are the followings: material-, iconic-, symbolic levels, space, time, properties, words expressing action, object-concepts, and circumstances of action. Let the other set contain the "sequences of steps" used in function-analysis, such as: domain, symmetry, root (zero) of a function, local minima-maxima – monotony, points of inflection – convexity, limits, plotting and range.

Figure 5: *Galois-graph of function analysis*




Source: Klingné (2011)

After making the relation-table of the connection between the elements of the sets, the Galois-graph was drawn (Figure 5). The graph has 9 levels; at the top there is one vertex, which shows that the symbolic level is present throughout the whole process of function analysis, just as the accuracy of problem-solving in the circumstances of action. The previous category and the failure in working with symbols cause the lack of success in the course of learning the subject. The object-concept category appears one level below, which needs the knowledge of terminology and the characteristics of the special subject. At the next level, space, as a general category occurs in 6 part-tasks, which calls our attention to the importance of getting familiar with the structure of our surrounding world, and shows that childhood experiences make it easier to orientate in space. The concepts of space and property appear with the same importance at the following level. Property emphasises the importance of cognitive processes and the acquisition of concepts belonging to them. Category expressing action can be found at lower levels of the graph. It is located here because students are urged to think and solve problems. This is one of the essential points in mathematics teaching because last years' experiences show that students do not prefer these kinds of solutions. They solve problems with greater accuracy if they are requested for some factual action, e.g. "determine", "calculate" or "draw" something. In case of these types of tasks they are informed which operations they have to perform, but we have to be careful with the problem definition here as well. I am going to show this through an example below.

The student's task was to draw the graph of a function given by its mapping formula. The student performed the task – he thought, well – still unsuccessfully. When he was asked how he had solved the problem his answer was: "I substituted some points and plotted the function. I was satisfied because until then I had not been able to draw a function like this." The student performed the task but he was not aware of the fact that graph plotting is only possible after having the function analysed. In this example the importance of 'time' can be observed, this is why it got among the examined categories. When determining local extremities and points of inflection time plays a role because these are successive tasks. This is why it is placed at the last two levels of the Galois-graph, because it is only during the completion of the task when it must be paid attention to: at first, the first derivative has to be cal-

culated, and then the second, these two steps cannot be interchanged. We think that finding the range of the function is easier after plotting the graph of the function, when we can rely on observation. That is why these two part-tasks are at the lowest level of the graph, as these are the steps where function analysis is finished. The lowest vertex is the root of the graph (the categories here are in relation with the empty set); the graph-plotting program draws this in every case.

Galois-graphs and the universal categories make it possible to enlighten function-analysis from another point of view. We have to strengthen students' proficiency at the symbolic level, as this is present throughout the solution of the task, but to achieve this, according to Bruner's (2004) theory, they have to be able to manage material and iconic levels; transition between the levels makes problem solving easier. Computers can be a tool of this. They are suitable to be drawn into the work process at the lower levels of the graph, after the occurrence of the category expressing action; computers execute commands, operations, this is the reason for introducing them here.

According to Varga's cognitive target system of mathematics teaching, it is also the last phase where computers are reasonable to be drawn in. This is helped by applying GeoGebra, because students can use it to check the accuracy of derivation. In cases when the cognitive category 'space' is injured, the use of computers can come at an earlier stage (illustration), the deficiencies experienced during surveying the circumstances of action also call attention to this. Within the frame of an optional course we teach our students the use Excel to eliminate deficiencies by making value-tables and diagrams based on them. To apply these program-elements correctly, students have to acquire the knowledge of concepts, operations of Calculus because this knowledge is needed to find the suitable intervals for the value-tables and diagrams. They can understand the concept of continuity, which is the base of Excel application. If students still cannot plot the graph of the function, GeoGebra can be a possible help. (It was important to find such programs which are accessible for everyone; the use of GeoGebra is free of charge.)

By introducing the optional course Computer-aided Mathematics Methodology we gained positive experiences, the number of students who were successful at the examination increased by the fifth of them, and also their attitude to the subject changed in a positive way.

*Calculus with Geogebra*

During the spring term we had an opportunity to use computers on seminars. Thus we could include new topics in the curriculum: analysing sequences, determining limits, finding threshold indices with the help of Excel. We used the program GeoGebra to have integral calculus acquired. We applied frontal class work, as well as group work on the lessons. 25 students of my group took part in the survey; as the lessons were in classrooms provided with computers, every student had a computer. Classroom material was always put up to Coospace so that students could study the solved problems at home. My survey intended to compare the traditional method with the solution using GeoGebra. The test was first a paper-based one, and then the same problems had to be solved with the help of GeoGebra.

The questions were the following:

1. Integrate the following functions.

a) $\int\left(x^2-\frac{3}{x}+7\right)dx$

b) $\int\left(\frac{2x+4\sqrt{x}-5}{x}\right)dx$

c) $\int\frac{2x^5-5^{-x}}{x^5\cdot 5^{-x}}dx$

d) $\int\frac{3x-2x^2+x^3}{5x^2}$

e) $\int(5x-7)^2dx$

f) $\int(2x^3-7x+2)(8-3x^2)dx$

2. Evaluate the following integral.

$$\int_1^4\left(\frac{3}{x}-5x+3\sqrt{x}\right)dx$$

3. Calculate the mean value of function $f(x)= 3x- 4\sin x$ on interval $[-\pi; \pi]$.

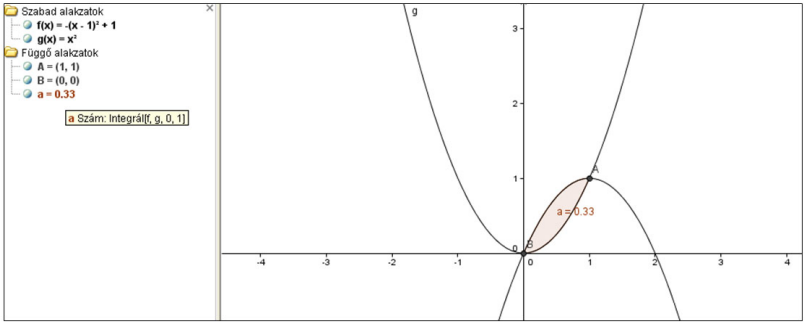
4. Draw the graphs of the following functions then find the area between the two curves. Determine the necessary data by calculation.

$f(x)= -(x-1)^2 + 1$ and $g(x)=x^2$

5. Find the volume generated by the complete rotation of curve

$f(x)= \sqrt{2x-5}$ about the $x$ axis on interval $[3; 6]$.

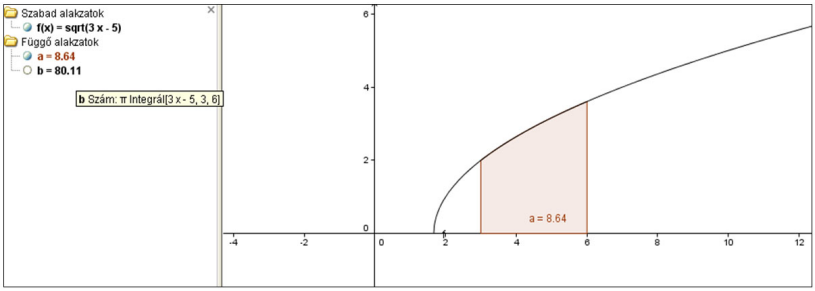
**Figure 6:** *Solution of question 4 with GeoGebra*




Source: own editing with GeoGebra program (2011)

When solving problem 4 with GeoGebra, the plots of the two functions have to be illustrated (just as traditionally) then the integration limits are to be determined with the drop-down tab "Intersect Two Objects", and the command "determining area between curves" has to be chosen from the applications of definite integral. After this the result appears both in the algebraic and geometric windows (Figure 6).

Figure 7: *Solution of question 5 with GeoGebra*



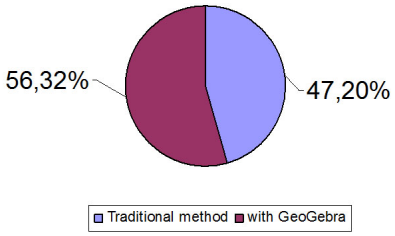

Source: own editing with GeoGebra program (2011)

Thus the processes of the traditional and the GeoGebra- solution are the same. The solution with GeoGebra is based on the correct recognition of space as a cognitive category; that is they have to "see" which function is above the other, they have to be able to orient themselves in the coordinate system (Figure 7).

## Results and consequences

Figure 8 shows the comparison of the two methods. The number of correct solutions is 10% higher. This was to be expected, as students readily use computers to solve problems. According to our experiences they have more courage to solve harder problems, and the computer-aided method is more efficient, if they work in pairs or in small groups.

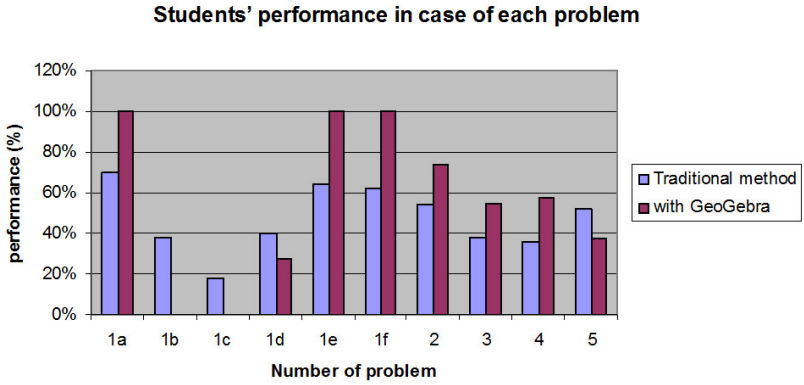
Figure 8: *Students' achievement in integral calculus*




Source: own editing based on the survey of Kaposvári Egyetem listeners (2011)

It is interesting to compare the correct solutions in the cases of the two methods, problem by problem. According to figure 5, there was no such problem which was solved correctly by every student with the traditional method, while with GeoGebra there were 3. At the same time, they could not solve problems 1b and 1c at all with GeoGebra, because algebraic transformations were to be done previously, which shows that the use of symbols is not complete yet, creative thinking is not present in every case.

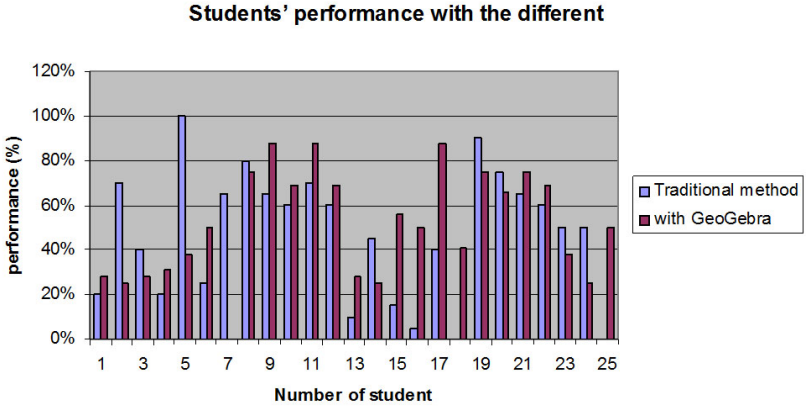
Figure 9: *Comparison of the two methods for each problem*




Source: own editing based on the survey of Kaposvári Egyetem listeners (2011)

The use of GeoGebra presumes proficiency in the symbolic level mathematics, because of the linear way of writing. There can be cases, where the checking of the correct solution can only be done after algebraic transformations. The right application of the commands also needs the knowledge of cognitive categories of space and time, that is, the orientation in the coordinate system, as well as the correct use of the adverbs "below" and "above". "Time" also appears, problem 4 can only be solved successfully if commands are executed in the right order.

Figure 10: *Students' achievements with the comparison of the two methods*




Source: own editing based on the survey of Kaposvári Egyetem listeners (2011)

According to figure 6, there are 10 students out of the 25, who reached a better result with the traditional method; it can be noticed that these students are of better abilities (better students can be identified by observing their results in using the traditional methods; students are only represented by numbers in the figure), while for those, who are of weaker ability, solution with GeoGebra was easier. From this, the conclusion can be drawn, that computers may obstruct creative thinking in some cases. Students of weaker ability prefer problems that do not need much thinking, this means, that for them the cognitive category "specific actions" is dominant, they solve typical problems successfully with GeoGebra in a larger proportion. This also explains the use of computers at this level of teaching.

There are pros and cons of computational methods. The right way is strongly influenced by the individual culture. Considering this the adequate method has to be decided.

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# TEACHING MATHEMATICAL ANALYSIS BASED ON EXAMPLES TAKEN FROM ECONOMICS

**Edith DEBRENTI***

*In the higher education the main subjects are based on the knowledge acquired in the high school. The researches show that the students arrive at universities with different levels of basic knowledge.*
*While teaching the analysis we experienced a decrease in interest in this subject, not only in high schools but at the universities, too. As a teacher I realized that the students meet in an abstract way the mathematical concepts and subjects, and we should get them closer to these during the seminars through practice, thus making them understand the theory and the mathematical background. While solving the exercises it should be very important to help them understand the mechanism of it instead of letting them to solve mechanically the exercises, because otherwise it is useless and they will quickly forget it.*
*The theme of the presentation is the problem-based teaching of two chapter of mathematical analysis. I tried an approach from economics in order to get a prompt through practice for the theoretical side. The aim was to make easier the understanding of the subject and to allow more space to individual work. The first year students could use group work, experiments, calculations, etc.*

**Keywords:** teaching methodology, mathematical analysis, problem- based learning, cooperation learning, Economics
**JEL codes:** C00, C02, C60

## 1. Introduction

*"A great discovery solves a great problem, but there is a grain of discovery in the solution of any problem. Your problem may be modest, but if it challenges your curiosity and brings into play your inventive faculties, and if you solve it by your own means, you may experience the tension and enjoy the triumph of discovery."* (George Pólya)

The teaching of mathematics is important not only for the application of the acquired knowledge, but for the development of the logical and rational way of thinking of the students of economical studies. The secondary school teaching plays an important role in the development

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of the problem solving skills and of the knowledge needed to acquire these skills. It also has a great influence upon the ability of acquiring specific knowledge required in the high education (at the university) of subjects at the Faculty of Economics such as economic mathematics, economic statistics, calculation of probability, accounting, etc. (Kánnai *et al.,* 2010).

The theme of this paper is the problem-based teaching of a chapter of mathematical analysis. I tried an approach from economics in order to get a prompt through practice for the theoretical side.

The aim is to introduce certain concepts used in the mathematical analysis through a different way, that is through a practical approach.

In the first part we compare interest schemes and this comparison serves us the features and the basis of the proof. The features gain a strong intuitive meaning and explanation on one hand; on the other hand the study gains motivation as the main question in each case is the same: which is the most profitable investment? (András *et al.,* 2010)

The second part deals with the use of the differential coefficient in the economics introducing the concepts of profit limit, expense limit and income limit (Vármonostory, 2008).

## 2. Interest schemes

*2.1 Financial concepts*

**Interest:** the difference between the future and present sum of money.

**Interest rate:** the rate between the interest and the capital within a certain time (for example one year)

**Simple interest:** just the initial capital brings interest; we do not add the interests to the initial capital. After a certain time the capital grows with the multiple between the initial capital and the interest rate.

**Compound interest:** during each *period* of time the current capital brings interest, and we add the interest to the actual capital.

**Capitalization:** means the addition of the interest to the initial capital. So in the case of simple interest there is no capitalization. In the case of the compound interest we capitalize at the end of each period of time.

*Exercise 1:* Let's say we lay a deposit of RON 1000 with a simple interest (we reinvest at the end of each year). The annual interest rate is 10%. How much money can we take out after

a) 1 year?
b) 2 years?
c) 3 years?
d) 10 years?
e) 20 years?

What have you noticed? Formulate a general conclusion.

*Result*: We have after

a) 1 year: 1000+1000·0.10=1100
b) 2 years: 1100+1000·0.10=1200
c) 3 years: 1200+1000·0.10=1300
d) 10 years: 1000+10 ·1000·0.10=2000
e) 20 years: 1000+20 ·1000·0.10=3000.

So the simple interest is linear, if the invested sum is **S** and the interest rate is **p,** then in **n** years the sum that can be withdrawn is

$S_n = S(1 + np)$

*Exercise 2:* Up to which amount will an initial capital of RON 500 000 grow in 7 months on the conditions of a 6.8% interest rate using simple interest?

*Result*: $500\,000\left(1 + 0.068\frac{7}{12}\right) = 519\,833.(3)$

*Exercise 3*: How much does it earn now a capital of RON 70,800 expected within 4 months if the interest rate each month is 4.5% and we use simple interest?

*Result:* $70\,800 = S(1 + 0{,}045 \cdot 4)$, $S = \frac{70\,800}{(1+0{,}045\cdot 4)} = 60\,000$

*Exercise 4:* How many months does a capital of RON 400,000 need to get to RON 568,000 using simple interest if the interest rate each month is 5%?

*Result:* $568\,000 = 400\,000 \cdot (1 + 0{,}05n)$, results that **n=8.4**.

*2.3 Compound interest*

*Exercise 5:* Let's say we lay a deposit of RON 1000 with a compound interest (we reinvest at the end of each year). The interest rate per year is 10%. How much money can we take out after:

a) 1 year
b) 2 years
c) 3 years
d) 10 years
e) 20 years?

What have you noticed? Formulate a general conclusion.

*Result:* We have

*a) after 1 year:* $1000 + 1000 \cdot 0{,}10 = 1000(1 + 0{,}1) = 1100$

*b) after 2 years:* $1100 + 1100 \cdot 0{,}10 = 1100(1 + 0{,}1) = 1000(1 + 0{,}1)(1 + 0{,}1) = 1000(1 + 0{,}1)^2 = 1210$

c) *after 3 years:* $1000(1 + 0{,}1)^3 = 1331$

d) *after 10 years:* $1000(1 + 0{,}1)^{10} = 2586$

e) *after 20 years:* $1000(1 + 0{,}1)^{20} = 6686$

*So in the case of the compound interest, if the invested sum is* **S**, *the interest rate per year is* **p**, *after a number of* **n** *years the sum of money that can be retrieved is* $S_n = S(1 + p)$

*Exercise 6*: Compare exercise 1 and 5. What have you noticed?
*Result*: In the case of the same interest, it is more profitable to deposit with compound interest.

*Exercise 7*: How much interest does a capital of RON 160,000 brings within 6 years if we use a 10% annual interest rate and compound interest?

*Result*: $S_n = 160\,000(1 + 0{,}1)^6 = 283\,449{,}76$

So the interest is $283\,449{,}76 - 160\,000 = 123\,449{,}76$ RON

*Exercise 8*: Which is the annual interest rate if a capital of RON 320,000 rises to 559,682 within 4 years using compound interest?

*Result*: $559\,682 = 320\,000(1 + p)^4$, it results that p = 15%.

*Exercise 9*: To which sum can an initial capital of RON 55 000 raise within 16 years with a 5.3% annual interest rate if we use compound interest?

*Result*: $S_n = 55\,000(1 + 0{,}053)^{16} = 125\,665{,}61$

*2.4 Comparison*

*Exercise 10*: Find out how will the invested capital change within the following 10 years if the annual interest rate is 10% and there is no capitalization or if the interest rate is 7% and there is capitalization at the end of each year.

*Result:*

If, in the case of simple interest, the interest rate is bigger than in the case of compound interest, it means that it is better to invest with simple interest for a short period whereas for a longer period it is better to invest with compound interest.

**Figure 1:** ***Comparison***

| **year** | **p=10%, no capitalization (simple interest)** | **p=7%, annual capitalization (compound interest)** |
|---|---|---|
| 1 | 100+100·0.10=110 | $100(1+0{,}07)^1 = 107$ |
| 2 | 100+2 ·100·0,10=120 | $100(1+0{,}07)^2 = 114{,}49$ |
| 3 | 100+3 ·100·0,10=130 | $100(1+0{,}07)^3 = 122{,}5$ |
| 4 | 100+4 ·100·0,10=140 | $100(1+0{,}07)^4 = 131{,}7$ |
| 5 | 100+5 ·100·0,10=150 | $100(1+0{,}07)^5 = 140{,}25$ |
| 6 | 100+6 ·100·0,10=160 | $100(1+0{,}07)^6 = 150{,}07$ |
| 7 | 100+7 ·100·0,10=170 | $100(1+0{,}07)^7 = 160{,}57$ |
| 8 | 100+8 ·100·0,10=180 | $100(1+0{,}07)^8 = 171{,}81$ |
| 9 | 100+9 ·100·0,10=190 | $100(1+0{,}07)^9 = 183{,}84$ |
| 10 | 100+ 10·100·0,10=200 | $100(1+0{,}07)^{10} = 196{,}71$ |
| 11 | 100+ 11·100·0,10=210 | $100(1+0{,}07)^{11} = 210{,}48$ |
| 12 | 100+ 12·100·0,10=220 | $100(1+0{,}07)^{12} = 225{,}21$ |

Source: Author's calculations.

*2.5 Mixed interest*

In the everyday life we often encounter investments with interests given for a period shorter than a year, which means that a frequent capitalization is made possible. In this case we always calculate the interest rate for the given period of time and we use that one. We did some empirical calculations: we laid on deposit the same sum of money making capitalizations at different periods of time in each case that is at the end of each week / month / 3 months/ 6 months. Finally we compared the different interests.

The conclusion: the interest differs according to:

- the initial capital
- the interest rate
- the number of capitalizations and their rate.

*Exercise 11*: To which amount will grow a capital of € 1000 with a 12.5% annual interest rate within 8 years and 3 months?

*Result*: $S_n = 1\,000(1+0{,}125)^8 \cdot \left(1+0{,}125\frac{3}{12}\right) = 2\,645{,}965$ EUR

*Exercise 12*: Which is the initial capital that rises to RON 1,000,000 within 6 and half years with a 14.5 % interest rate?

*Result:* $1\,000\,000 = S(1+0{,}145)^6\left(1+0{,}145\frac{6}{12}\right)$, resulting that **S = 473778.44** RON.

*Exercise 13*: An initial capital of RON 100,000 will get to which amount within 5 years and 10 months with an 8 % interest rate?

*Result*: $S_n = 100\,000(1+0{,}08)^5 \cdot \left(1+0{,}08\frac{10}{12}\right) = 156\,725{,}32$ RON

*Exercise 14*: An initial capital of HUF 25 000 got to HUF 50 000 within 5 years with monthly interest. Which was the annual interest?

*Result*: $50\,000 = 25\,000 \cdot \left(1+\frac{p}{100\cdot 12}\right)^{12\cdot 5}$, resulting p=13.9.

*Exercise 15*: How many years do a HUF 13 000 initial capital need to get to HUF 19 927 using a 9.5% *weekly nominal interest?*

*Result*: $19\,927 = 13\,000 \cdot \left(1+0{,}095\frac{1}{52}\right)^{52\cdot t}$, where *t* is the number of years and t=4.5.

*Exercise 16:* Let's say that our money carries interest each month and the annual nominal interest rate is 10 %. If we have an initial capital of HUF 650,000, what will be the final amount of money after 3 years? Which is the real annual interest rate?

*Result*: $S_n = 650\,000\left(1+0{,}1\cdot\frac{1}{12}\right)^{3\cdot 12} = 876\,318$ is the amount of money we will have after 3 years. The real interest rate is

$$p = 100\left(1+0{,}1\frac{1}{12}\right)^{12} - 100 = 10{,}47$$

*2.6 Analyzing the monotonity of sequences*

*Experience*: Let's lay on deposit one monetary unit in a bank with a 100% interest rate and capitalize it *n* times per year, at regular and equal periods of time, so that the last capitalization should be at the end of the year. How much money will we have after a year on our account?

What can you notice?

**Figure 2:** ***Monotonity***

| **Number of capitalization*: n*** | **The sum of money we will have on our account after a year** |
|---|---|
| *n=1* | $\left(1+\frac{1}{1}\right)^1 = 2$ |
| *n=2* | $\left(1+\frac{1}{2}\right)^2 = 2{,}25$ |
| *n=3* | $\left(1+\frac{1}{3}\right)^3 = 2{,}37$ |
| *n=4* | $\left(1+\frac{1}{4}\right)^4 = 2{,}44$ |
| *n=5* | $\left(1+\frac{1}{5}\right)^5 = 2{,}48$ |
| *n=6* | $\left(1+\frac{1}{6}\right)^6 = 2{,}52$ |
| *n=k* | $\left(1+\frac{1}{k}\right)^k$ |
| *n* | $\left(1+\frac{1}{n}\right)^n$ |

Source: Author's calculations.

We have noticed that after repeated capitalization we have a bigger amount of money, that is $\left(1+\frac{1}{n}\right)^n < \left(1+\frac{1}{n+1}\right)^{n+1}$

We can prove that experience by mathematical induction method.

The exercise in fact was to study the monotonity of the sequence $e_n = \left(1+\frac{1}{n}\right)^n$ but we analyzed it with intuition then we proved it. (András *et al.*, 2010)

*2.7 Studying the boundedness of sequences*

*Experiment:* Let's compare two different interest patterns starting from the same sum of money, i.e. one monetary unit, but in one situation having an interest rate of 100% and an *n* number of capitalizations while in the second situation a 200% simple interest rate. How much money will we have after a year on our account? What can you notice? How much money can we gain within a year by growing the number of capitalizations?

**Figure 3:** ***Boundedness***

| **Time** | **p=100%, an *n* number of capitalization (compound interest)** | **p=200%, no capitalization (simple interest)** |
|---|---|---|
| $\frac{1}{n}$ | $\left(1+\frac{1}{n}\right)^1=\left(1+\frac{1}{n}\right)$ | $1+2\frac{1}{n}=1+\frac{2}{n}$ |
| $\frac{2}{n}$ | $\left(1+\frac{1}{n}\right)^2$ | $1+2\frac{2}{n}=1+\frac{4}{n}$ |
| $\frac{3}{n}$ | $\left(1+\frac{1}{n}\right)^3$ | $1+2\frac{3}{n}=1+\frac{6}{n}$ |
| $\frac{4}{n}$ | $\left(1+\frac{1}{n}\right)^4$ | $1+2\frac{4}{n}=1+\frac{8}{n}$ |
| $\frac{5}{n}$ | $\left(1+\frac{1}{n}\right)^5$ | $1+2\frac{5}{n}=1+\frac{10}{n}$ |
| … | | |
| $\frac{k}{n}$ | $\left(1+\frac{1}{n}\right)^k$ | $1+2\frac{k}{n}=1+\frac{2k}{n}$ |
| … | | |
| $\frac{n}{n}=1$ | $\left(1+\frac{1}{n}\right)^n$ | $1+2\frac{n}{n}=1+2=3$ |

Source: Author's calculations.

We can notice that:

$\left(1+\frac{1}{n}\right)<1+\frac{2}{n}$ ,.$\left(1+\frac{1}{n}\right)^2<1+\frac{4}{n}$,.generalizing, using the mathematical induction method, we can prove that $\left(1+\frac{1}{n}\right)^n<3$

That means that the sequence $e_n=\left(1+\frac{1}{n}\right)^n$ is *bounded above (upper)*. Here the question of the boundedness of a sequence appeared

naturally as the main question was how much money we will have after a year if we grow the numbers of capitalizations. (András *et al.*, 2010)
We have seen that $e_n \geq e_1 = 2$ whatever $n \geq 1$ is. So the all the numbers of the sequences are between 2 and 3, which means that the sequence is bounded.
If we want to find out which is the maximum sum of money we can get within a year by constant capitalization starting from 1 monetary unit and considering a 100 % annual interest rate, we will get to the limit of the sequence.
If we calculate, using the computer, more and more elements of the sequence we will see the rapidity of convergence as well as a more precise estimation of the number *e*.

## 3. The differential coefficient from an economic approach

> *,,The first rule of discovery is to have brains and good luck. The second rule of discovery is to sit tight and wait till you get a bright idea.'' (George Pólya)*

Let's say that the budget function of a firm is $C(x) = x^2 + 360\,000$ where *x* is the amount of products to be produced and the income after selling the *x* amount of products is $R(x) = 500x$
So the profit is $P(x) = R(x) - C(x) = 500x - x^2 - 360\,000 = -x^2 + 500x - 360\,000$ The profit depends on *x* that is on the amount of products the firm produces.
The next question is: which is the value of *x* that gives the maximum profit?
If we produce *x+h* instead of *x* amount of products we have a profit growth:

$$P(x + h) - P(x)$$

The $\frac{P(x+h)-P(x)}{h}$ general increase of profit shows how much average increase of profit gets on one single product if we increase the production from *x* amount to *x+h* .
In this case the average increase of profit is:

$$\frac{P(x+h)-P(x)}{h} = [-(x+h)^2 + 500(x+h) - 360\,000 + x^2 - 500x + 360\,000] \cdot \frac{1}{h} = (-2xh + 500h - h^2) \cdot \frac{1}{h} = -2x + 500 - h$$

The *limit profit* $P'(x) = \lim_{h\to 0} \frac{P(x+h)-P(x)}{h} = -2x + 500$ estimates the change of profit in the situation when instead of an *x* amount of products we produce *x+1* amount. In other words *P'(x)* is the speed of change of profit.

If P'*(x)<0* we have to decrease the production because otherwise the growth of production will decrease the profit, while reducing the production we will increase the profit. On the other hand, if P'*(x)>0* then we have to increase the production. It means that we can get a maximum profit on an $x_0$ amount of production when $P'(x_0) = 0$ .

Considering our situation the maximum profit is when:

$P'(x_0) = -2x_0 + 500 = 0$ that is when $x_0 = 250$

The *expense limit* is: $C'(x) = \lim_{h\to 0} \frac{C(x+h)-C(x)}{h}$ . In our case that sum is $C'(x) = \lim_{h\to 0} \frac{C(x+h)-C(x)}{h} = \lim_{h\to 0} \frac{(2x+h)\cdot h}{h} = 2x$ which estimates the increase of expenses if the production grows from *x to x+1.*

The *income limit* is: $R'(x) = \lim_{h\to 0} \frac{R(x+h)-R(x)}{h}$ . In our case that is $R'(x) = \lim_{h\to 0} \frac{R(x+h)-R(x)}{h} = \lim_{h\to 0} \frac{500\cdot h}{h} = 500$, which estimates the increase of income if the production grows from *x* to *x+1*.

According to the basic rules of economics the profit can get to maximum only when the expense limit equals with the income limit.

*Example 1*: The expenses of an apiary to produce *x* kg of honey are: $C(x) = -0{,}015x^2 + 400x, (50 \le x \le 6000)$ RON

The income after selling *x* kg of honey is $R(x) = 800x$.

If the apiary produces *x=1600* kg of honey, then

a) What is the expense limit?
b) What is the profit limit?
c) What is the income limit?
d) Should we increase or decrease the production?

*Example 2:* An enterprise produces x tons of output on $C(x) = x^2 + 400, (200 \leq x \leq 700)$ RON expenses. After selling *x* tons of products its income is *R(x)*=1200*x*. Find out:

a) the expense limit
b) the profit limit
c) the income limit
d) The company produces 400 tons of products, but they gradually increase the production. Will the profit grow or decrease?
e) How many tons of products should the company produce to get the maximum profit?

## 4. Summary

While teaching the analysis we experienced a decrease in interest in this subject, not only in high schools but at the universities, too. As a teacher I realized that the students meet in an abstract way the mathematical concepts and subjects, and we should get them closer to these during the seminars through practice, thus making them understand the theory and the mathematical background. While solving the exercises it should be very important to help them understand the mechanism of it instead of letting them to solve mechanically the exercises, because otherwise it is useless and they will quickly forget it.
The students need to see more practical approach of the concepts. Modelling and the application of the theory should be part of the teaching material, although the main contents and the number of classes dedicated to them do not allow to thoroughly deepening into a type of application or modelling (Pólya, 2000).
To implement the theory into practice is important because it gets the students close to the main point and it raises interest on learning. The teacher can much more easily get the students make calculations on their own, make experiences or make speculations. They may relatively easily prove their speculations and this kind of inductive way of thinking is good to practice with the students (Skemp, 2005; Ambrus, 2004).
I strove to achieve a deeper understanding of mathematical concepts of students. I tried an approach from economics in order to get a prompt through practice for the theoretical side. The aim was to make easier

the understanding of the subject and to allow more space to individual work. In this article I summarize my research findings. I held these activities with the first year students in economics during the classes of economical mathematics. The first year students could use group work, experiments, calculations, etc.
My experience shows that they enjoyed the practical approach. It is very important to be able to apply directly the mathematical knowledge. I noticed that at the beginning they did not realize the fact that they had been using the theory recently taught to them, because they were not used to apply it in real situations. They treat separately the practical knowledge from the theoretical one. It is difficult for them to bind these two sides of knowledge or to see the relation between them.

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# BASIC KNOWLEDGE OF MATHEMATICS OF THE FIRST-YEAR STUDENTS

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*The main thesis of our research is whether first-year students of the Primary School and Kindergarten Teacher Training College at the Satu Mare extension of the BBU are equipped with adequate basic knowledge of mathematics. By using questionnaire survey and comparative analysis as research methods we answer the question whether the basic knowledge of the students is consistent with the level of knowledge that is necessary for teaching mathematics at kindergarten and primary school levels. Based on our research results, we formed recommendations so that mathematics education at universities may become more efficient.*

**Keywords:** basic knowledge of mathematics, higher education, mathematics education
**JEL code:** I23

## 1. Theoretical background

"Once you taste the joy of mathematics, you will not forget it very easily. If that happens, chances are that mathematics will be of some importance later in your life: your favourite pastime, good help in your job, the job itself, or even the main goal in your life." (Pólya, 1971, 12). In one of our earlier researches (Baranyai and Tempfli, 2010), in which we surveyed graduating students at the primary school and kindergarten teacher training college, we concluded that the students felt only partially prepared for the teaching of mathematics, as well as that mathematics was not among their favourite subjects. Thus the question arises: since the students are not keen on mathematics, how would they be able to teach it to their future pupils? We were also interested in finding out what the attitude of the first year students was to mathematics. During our research we measured the level of mathematical knowledge of the first year students and compared the results with the measured level of knowledge of the second year and graduating students, as well as with

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the knowledge of the students at the public administration department. "The main task of the teaching of mathematics: ... is strong skills development, developing the capacity of forming abstract notions, education for self-reliance, showing the connection between mathematics and reality ..." (Klein, 1980, 34).

During the primary school and kindergarten teacher training process, developing the mathematical skills of the students is a basic task, as the future teachers will teach mathematics both in kindergarten and primary school, thus it is their task to lay down the foundations of the mathematical knowledge of the pupils. Another important task is the development of an appropriate terminology of mathematics, whose acquisition may start at in kindergarten.(Olosz and Olosz, 1999)

In our research, we elaborated a survey for measuring the level of knowledge so that it would result in a realistic image of the mathematical knowledge of the students, their text comprehension and logical thinking (through the text based tasks), as well as of their being familiar with and able to use the language of mathematics accurately. (Skemp, 2005) Mathematics is a subject we use in our daily life; (Ambrus, 2004; Ambrus, 2007) that is why we consider that it is very important to use realistic tasks in practicing the mathematical operations. In one of out earlier research, in which we looked at the Hungarian language mathematics school books for the primary school), we came to the conclusion that the school books only meet that basic requirement in part (Baranyai and Stark, 2011).

Mathematics develops logical thinking and problem solving, that students will have to rely on heavily in their future. After Romania joined the European Union, some of the problems in teaching mathematics at school came to the foreground. "According to the 2007 Rochard report: Science Education Now suggests focussing on enquiry-based methods in the pedagogical practices, which is a problem-solving focussed approach." (András et al, 2010, 12). We have to let children get used to solving certain problems by themselves, using their knowledge and skills. This new approach must be taken into account in the teaching of mathematics in tertiary education as well.

## 2. Research presentation

### *2.1. The research subject*

The main subject matter of our research is the question whether first year students enrolling in the kindergarten and primary school teacher training program of the Satu Mare Branch of Babeş-Bolyai University possess appropriate basic mathematical knowledge or not. We have made a comparative research, comparing the level of basic mathematical knowledge of the first year students with that of the graduates, as well as with that of the students from the public administration department.

### *2.2. The research theses*

At the beginning of our research we have formulated the following theses:
1. Students consider the teaching of mathematics in secondary education of a medium quality.
2. Students consider that the final A level exam in mathematics is among the most difficult ones.
3. Primary school and kindergarten teacher training students are more likely to use arithmetical methods for problems solving than their peers at the public administration department.
4. Primary school and kindergarten teacher training students do not have appropriate knowledge/practice of mathematics for teaching it.
We have broken down the last hypothesis into several sub-hypotheses:
4.1. First year students achieve better results at the knowledge test than second year and graduating students.
4.2. Primary school and kindergarten teacher training students are more likely to use arithmetical than algebraic methods for solving text based tasks.
4.3. The surveyed students achieve the lowest marks when they have to use fractions in the operations.

*2.3. The research methods and means*

Our research is based on three methods. Using the method of documents surveying we have looked at the curricula used in primary school and kindergarten teacher training, as well as at the teaching programmes between the years 1999–2011, (from the first year of the tertiary level education in Satu Mare until the present). During the survey we looked at the number of classes and the position of the subjects Mathematics and Mathematics Methodology in the curricula.
Using questionnaire based surveying we looked at the attitude to mathematics and mathematics teaching of the students, as well as their motives for choosing teaching as a career (for lack of space we are not presenting these motives in the present paper). We used a survey elaborated by ourselves and measured the student's attitudes to mathematics and to the teaching of mathematics on a five grade scale.
With the help of a knowledge level measuring test we have examined whether the basic mathematics knowledge level of the students met the level necessary for the teaching of mathematics in kindergarten and primary school. The knowledge test consisted of five types of tasks. The first set of items measured the use in the correct order of the operations. The second set checked the basic knowledge in geometry through decisions of the truth value of logical statements. The third set dealt with the conversion of the measurement units. The fourth one consisted of text based tasks of different degrees of difficulty, which were to be solved using arithmetical methods. The last set of tasks dealt with fractions, first, students had to determine the fraction of a plane figure; then, they had to solve a string of operations that included fractions as well.
We compared the results of the knowledge tests with the results of the first year students at the public administration department, as well as with those of the second year and graduating students from the primary school and kindergarten teacher training college, so that we would receive as accurate a picture as possible of the level of mathematical knowledge of the first year students at the primary school and kindergarten teacher training college.
Following the results of the diagnostic research we can formulate our recommendations for making the teaching of mathematics at university more effective, in order to improve the level of mathematical knowledge of the students.

## 3. Data presentation and evaluation

### *3.1. Presentation of the results of the documents surveying: teaching mathematics in the mirror of the curriculum*

Since the first year in 1999 of the primary school and kindergarten teacher training college, the curriculum has been changed quite a few times, and that had an important impact on the teaching of mathematics. While in the first few years we taught mathematics and the methodology of mathematics in the first semester, with the implementation of the Bologna system, mathematics, together with the other specific subjects, have been postponed to the second half of the three year period. In addition, the number of classes has also been diminished. While in 1999 there were 182 taught hours in mathematics, in 2005 there were only 112, which is still the case at the present. Following the implementation of the Bologna system, lectures in mathematics and the methodology of teaching mathematics have been moved to the 5th semester. In 2011 a new change has occurred, mathematics lectures have been rearranged to be held in two semesters, (the 5th and the 6th), but the number of hours allotted has been kept the same.

### *3.2. Presentation and evaluation of the questionnaire based survey*

*The sample*

The main target sample of our research consisted of the first year students of the Primary School and Kindergarten Teacher Training College at the Satu Mare Branch of Babeş-Bolyai University; the control group was formed by the second year and graduating students of the same college, as well as the Hungarian first year students at the Public Administration department of the Satu Mare Branch. We asked all the students who attended the seminars held between 3rd and 17th of October, a total number of 95 students, out of which 81 (85.3%) students in teacher training and 14 (14.7%) students in public administration. The teacher training college students are 31 (38.3%) in the first year, 21 (25.9%) in the second year, and 29 (35.8%) in the third year. As far as the gender distribution is concerned, most of the students (91.5%) are women. 74.7% of the students in the sample are enrolled on the regular courses, while 25.3% are enrolled on distance learning programmes. There is no distance learning program at the public administration department.

As far as the previous educational experience is concerned 77.7% of the sample had an A level diploma after finishing a theoretical high school, 20.2% received a diploma at a teacher training high school, 1.1% graduated college and 1.1% graduated university. All the students in the sample from the public administration department finished a theoretical high school.

*The attitude of the students to mathematics and to the teaching of mathematics*

We looked at the mean and standard deviation (on the 5 grade scale) while studying the attitude of the students to mathematics. Based on the mean and the standard deviation found, we can state that the teaching of mathematics in high school is considered to be of a strong medium level (m =3.52). The use of mathematics learnt in high school in subsequent jobs in teaching or public administration is considered of a medium level (m=3.14), of a good level in using it in daily life (m=3.86), and, contrary to our presumption, A level final mathematics exams are considered of medium difficulty (m=3.06). The result could be interpreted as a consequence of the fact that a part of the students in the sample did not take a final exam in mathematics at all, thus the students who could have considered mathematics exams more difficult did not answer the questions concerning their difficulty level. The students' answers support the assumption that the level of knowledge of mathematics of the students finishing humanistic lines of study is lower than the level of knowledge of the students finishing a line of studies with a specialisation in sciences, as this statement has the smallest standard deviation (0.849, m=3.14).

Students agree only to a small degree with the statement that the primary school and kindergarten teacher training college students don't need higher level mathematics knowledge, for them being enough to remain at the level of the level of mathematics taught in kindergarten and primary school (m=2.74). Nevertheless, the knowledge tests reveal the fact that, although they consider it important to have higher level mathematics knowledge, in reality, while solving primary school mathematics problems, they achieve only medium level results.

Table 1 shows the comparative data of the first year students at the primary school and kindergarten teacher training college with the same data of those in the second and final years, as well as those of the first year students at the public administration department.

Table 1: *The attitude of the first year students to mathematics and to the teaching of mathematics*

| Statement | TTC* 1st year | TTC* 2nd year | TTC* 3rd year | PA** 1st year |
|---|---|---|---|---|
| 1. During secondary education students are well prepared in mathematics. | m=3.60 std=1.070 | m=3.38 std=0.921 | m=3.57 std=1.136 | m=3.57 std=1.284 |
| 2. Most of the mathematics knowledge acquired in secondary school cannot be used in my job. | m=2.97 std=1.497 | m=3.45 std=1.504 | m=3.07 std=1.359 | m=3.07 std=1.439 |
| 3. The knowledge of mathematics of the students finishing a humanistic line of studies in secondary education is of a lower level than that of the students finishing a line of study with a specialisation in sciences. | m=4.71 std=0.643 | m=4.76 std=0.539 | m=4.46 std=1.036 | m=4.43 std=1.158 |
| 4. The exam in mathematics was the most difficult among the ones for the A level final exam. | m=2.84 std=1.675 | m=3.57 std=1.505 | m=3.05 std=1.717 | m=2.86 std=1.864 |
| 5. It is easier to solve a problem with algebraic methods than with arithmetical ones. | m=3.48 std=1.235 | m=3.29 std=1.617 | m=3.32 std=1.362 | m=2.92 std=1.553 |
| 6. Mathematics can often be of help in everyday life. | m=4.27 std=0.944 | m=3.25 std=1.209 | m=3.82 std=1.124 | m=3.69 std=1.182 |
| 7. Primary school level knowledge of mathematics is enough for the students of the primary school and kindergarten teacher training college. | m=2.70 std=1.601 | m=2.60 std=1.501 | m=3.00 std=1.610 | m=2.64 std=1.692 |
| 8. There is no need for mathematics at the public administration department. | m=2.19 std=1.625 | m=2.25 std=1.446 | m=1.61 std=1.031 | m=2.29 std=1.490 |

Note: * TTC – Teacher Training College, ** PA – Public Administration, m –mean, std –standard deviation

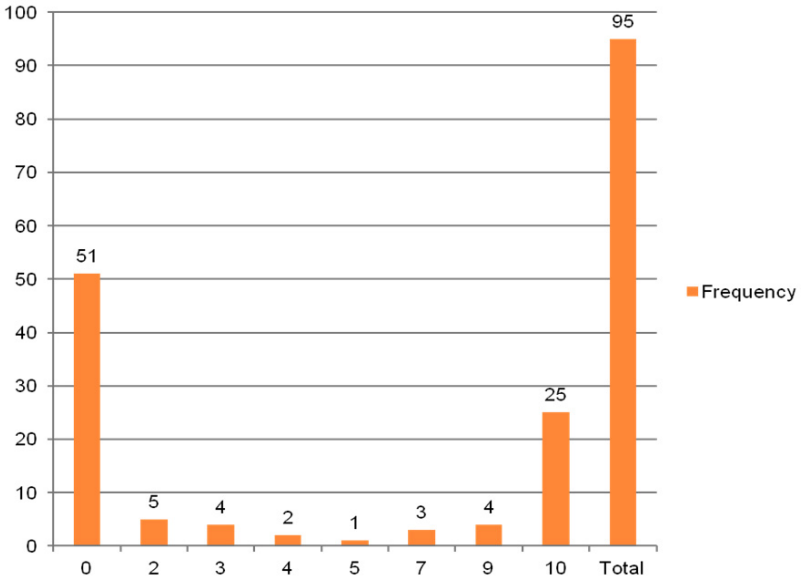
Source: Author's compilation.

There are differences in the attitudes of the first year students to mathematics. Students at the primary school and kindergarten teacher training college find mathematics helpful in everyday life to a larger extent (df=0.58), than those at the public administration department. Contrary to our suppositions, students at the public administration department consider it easier to use arithmetical methods than algebraic ones than the students at the primary school and kindergarten teacher training college (df=0.56). Although they will have to teach arithmetical methods in primary school, students at the primary school and kindergarten teacher training college find algebraic methods to be easier while solving text based problems. The finding is supported by the knowledge test, in which they also prefer using algebraic methods.
On comparing the data from the first year students with that of the second year and graduating students in teacher training we find that the former considered the final A level mathematics exam less difficult (m=2.84) than the latter (m=3.05, for 3rd year students and m=3.57 for 2nd year students). There is a difference between the second and third year students concerning the usefulness of mathematical knowledge acquired in secondary school. First year students consider it more useful than the second year students (df=0.48). First year students have a more positive attitude to mathematics than higher year students: not only do they consider the acquired knowledge more useful for their jobs, but also they consider mathematics helpful in everyday life (m=4.27). More third year students consider that primary school knowledge of mathematics is enough (m=3), than their first and second year peers (m=2.65). They consider primary school level knowledge of mathematics enough for themselves but, at the same time disagree with the statement that there is no need for mathematics in public administration (m=1.61)

*3.3. Presentation and evaluation of the knowledge level test*
The items of the knowledge level test were chosen taking into consideration the primary school curriculum of mathematics, the tasks not exceeding a medium level of difficulty.
Our goal was to measure the mathematical knowledge of the students in different areas of mathematics, like basic notions in geometry, operations with natural numbers and fractions, measurement units, arithmetical solutions to text-based tasks.

In the first item group (D.1.) the students had to solve an operation string, first defining the order of the operations they were going to use. 50.5% of the students answered the question about the right order of the operations correctly, somewhat more, 54.7%, solved it in the right way, the students at the public administration department being slightly more successful (2.8% variance).
The second item group (D.2.) was a geometry one. Students had to assess the logical truth value of statements concerning quadrilaterals. Only one of the students solved the problem correctly. Most of them, 34.7% assessed three statements correctly.
In the third item group (D.3.) students had to convert measurement units, each item containing a different measurement unit. Most difficult seemed to have been the conversion of $cm^2$ into $mm^2$, probably because in this case 100 is the conversion number, while in the other cases it was 10. A total number of 8 (8.42%) students solved the problem correctly, and 10 (10.53%) students didn't give any good answer to these items.
Item group D.4. consisted of 3 text-based tasks, the first being the easiest and the last being the most complex one. 49 students (51.57%) solved the first task correctly, 21 students (22.11%) wrote only the answer. As we have asked for an arithmetical solution in the text of the task, only those students received the maximum number of points who presented it in detail and supported it with arguments.
While evaluating the second task, we have found that the results of the first and third year students at the primary school and kindergarten teacher training college were better than those of the second year. While 25.8% of the first year students and 31% of the third year students had correct answers, only 9.5% of the second year did the same. If we look at the results of all the students,
44.4% of them did not get any points for the task.
In the third text-based task students had to use the reverse order method. We were interested to see the extent in which students were familiar with the reverse operation of the basic operations.

Figure 1: *Frequency of scores in D.4. c. problem*




Source: Authors' representation.

Again, the first and third year primary school and kindergarten teacher training students performed better than the second year students. While 45.2% of the first year and 31% of the third year students gave a correct answer, only 4.8% of the second year students did the same. If we take into consideration the whole of the sample of students, we can state that 53.68% of them did not solve the task or gave a totally erroneous answer and 25 students (26.32%) gave a correct answer and supported it with arguments, too. Our 4.1. hypothesis is partly supported, as the first year students performed better in the third text-based task of the knowledge test, but the third year students were better at the second task. At the same time, the second year students achieved poorer results at all the text-based tasks than either of the other two years.

The item group D.5. dealt with the notion of fractions: in the first task students had to determine fractions of plane figures and in the second task they had to solve a string of operations with fractions.

42.1% of the students did not achieve any point for the first task and 12.6% gave a good answer. Many of the students have mixed the numerator for the denominator, which leads to the conclusion that they haven't developed the notion of fractions. In this task the first year primary school and kindergarten teacher training students were the best, 41.9% of them getting 9 or 10 points, while in the case of the second year students only 10.3%, and in the case of the third year students 9.5% did well.
While solving the string of operations most of the errors arose from the fact that the students couldn't convert the decimal and the mixed fractions to real fraction forms. Two (2.11%) of the students solved the task correctly, 45 (47.36%) received 0 points for the task, either because they had errors or they did not even tackle the problem. In the case of this task, as with the previous ones the difference between the years is obvious, 61.9% of the second year students got 0 points for the task, while only 32.3% of the first year and 48.3% of the third year students did the same. Similarly more first year students achieved a maximum number of points, 6.5% got 10 points, 16.1% got 7 points, while in the case of the other two years of the primary school and kindergarten teacher training college the same figures are 4.8% getting 6 points, 9% getting 7 points, out of which 0% of the second year students and 13.8% of the third year ones.
Hypothesis 4.2. has not been proved, as while correcting the test papers we have found that most of the students from the public administration department used arithmetical methods for solving the text-based tasks, while the students from the primary school and kindergarten teacher training college used algebraic methods more often.
Hypothesis 4.3. has been partially proved, as 47.36% of the students got 0 points for that task, as well as for many others, e.g. in the case of the second text based task, 44.4%, and in the case of fractions, 42.1% of the students got 0 points.

## 4. Conclusions and recommendations

After processing the data of the survey we have come to the conclusion that the students consider the teaching of mathematics in secondary school of a strong medium level quality (m=3.52), thus our first hypothesis gaining proof.

Contrary to our hypothesis, mathematics is not considered to be among the most difficult final A level exams (only the second year students of the primary school and kindergarten teacher training college thought so), thus our second hypothesis is not proved. Similarly, there is no evidence to support our third hypothesis either, as contrary to our suppositions, more of the students of the public administration department use arithmetical methods to solve tasks, than students of the primary school and kindergarten teacher training college.

Following the processing of the data from the knowledge level measuring tests our fourth hypothesis has gained proof. Thus we can conclude that most of the students at the primary school and kindergarten teacher training college do not have adequate basic mathematical knowledge for the teaching of mathematics in kindergarten and in primary school. There has been a difference between the years, first year students performing better, in the case of most of the tasks, which is probably the consequence of the A level exam being more difficult this year, so those who passed it are better prepared in mathematics too. Unfortunately the students of the primary school and kindergarten teacher training college do not prefer arithmetical methods for solving the tasks, which is to be accounted for and taken care of during the seminars in mathematics they have at college. Hypothesis 4.3 has been partially proved, as for most of the students working with fractions proved to be difficult. Nevertheless, unfortunately many performed poorly in many of the tasks.

Based on the afore mentioned results of the diagnostic research we can put forward some recommendations for making the teaching of mathematics at the primary school and kindergarten teacher training college more effective, in order to improve the students' performance in mathematics.

We consider that the gaps in the basic mathematical knowledge of the students must be filled as soon as possible. This could be done with the introduction of an optional subject of mathematics in the curriculum, aimed at revising basic knowledge and laying the foundation for the science as early as in the first semester. At the same time we consider that mathematics should be taught in at least three semesters, lectures being spread along the college years. We recommend that arithmetic course should precede the methodology of teaching mathematics, and methodology precede the practice of teaching mathematics. We consider that the introduction of specific requirements for the teaching practice would also be necessary: only those students should be allowed to do mathe-

matics teaching practice who have passed both arithmetic and methodology exams. Thus situations in which students try to teach basic mathematical notions that they themselves do not understand could be avoided.
Furthermore, we recommend rethinking the methodology of teaching mathematics at college, and the use of interactive techniques in the seminars. Interactive methods could be more effective in making mathematics more appealing to our students.

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