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Contents

Session I. Insurance

Investment strategies of Romanian private pension funds

- *Maria Luiza Moș, Liliana Donath, Victoria Șeulean / 10*

An empirical analysis of the causality relationship between insurance and economic growth

- *Ana-Maria Burcă, Ștefan Daniel Armeanu, Meral Kagitci / 17*

Car insurance - engine for the Romanian insurance market

- *Gherasim Solovestru Domide, Alexandru Domide / 30*

Efficient market hypothesis in European emerging unit-linked insurance markets

- *Cristina Ciumaș, Diana-Maria Chiș / 38*

Developments in the insurance industry in Europe in economic and financial crisis

- *Viorel Crăciuneanu / 52*

Creation and operationalization of the national reserve fund in case of natural calamities in Romania – Alternative for post-disaster financing improvement

- *Gabriel Arthur Zelinschi, Gherasim Solovestru Domide, Adriana Rodica (Năstase) Vîrban / 61*

Session II. Corporate finance and investments

The role of international financial institutions (IFIS) and export credit agencies (ECAS) in supporting cross border public private partnership (PPP) in emerging markets: the challenging case of the Icelandic energy sector

- *Hilmar Þór Hilmarsson / 74*

Optimal management in the context of corporate governance

- *Nora Chiriță, Marcel Boloș, Ioana-Alexandra Bradea / 89*

The advantages, disadvantages and controversies of private equity funds

- *Florin Mavris / 102*

The choices between fair value and historical cost accounting for non-current real assets at Latvian, Lithuanian and Estonian listed companies during the reporting year of 2011

- *Justine Jaunzeme / 109*

The impact of corporate governance measures on the performance of enterprises

- *Ilie Vasile, Lavinia Mihaela Guțu, Adina Ionela Străchinaru / 114*

The domestic and foreign investors takeover bid decision: case of Romania

- *Laura Brad, Radu Ciobanu, Anca Munteanu, Florin Dobre / 131*

Changing of growth paradigm: from mergers and acquisition to balance sheet restructuring

- *Angela Mitu, Dalina Dumitrescu / 138*

Social responsibility and performance of financial institutions

- *Silvia Stănoiu / 147*

Session III. Public finance

Modelling the use of alternative channel allocation in granting benefits of social assistance

- *Adrian Vintilescu Belciug, Lăcrămioara Corcheș, Daniela Crețu, Adriana Lupu / 164*

Impact of public debt on the Romanian economy in conditions of economic crisis

- *Mirela Anca Postole, Marilena Ciobănașu / 168*

Measuring the dynamics of local revenues autonomy in Romania. An analysis of several financial decentralization and local autonomy indicators

- *Tatiana Moșteanu, Maria Letiția Brătulescu / 180*

Some aspects regarding the state aid in Romania- Member State of European Union

- *Daniela Lidia Roman / 197*

Public procurement awards in Romania

- *Attila Gyorgy / 207*

Determinants of underground economy in EU countries

- *Eugenia Ramona Mara, Diana - Claudia Sabău-Popa / 213*

The inheritance tax in Germany

- *Robert Păiușan, Valentin Ionuț Panea / 221*

Selected determinants on welfare enhancement. A theoretical and empirical view

- *Liliana Donath, Anca Brad (Gheorghioiu) / 226*

Vulnerabilities of the European versus Romanian tax system

- *Rodica Gherghina, Georgiana Camelia Crețan / 240*

Content analysis of an exploratory study regarding the communication of local administration in Western Romania

- *Florina Maria Bente, Corneliu Bente / 250*

Some means of avoiding of the international juridical double taxation used by Romania

- *Daniela Lidia Roman / 265*

Investigation on the perception of quality within European economic higher education

- *Emilia Câmpeanu, Viorica Chirilă, Georgiana Crețan / 274*

Session IV. Financial markets and institutions

Investigation of the profitability of moving average strategies on the Romanian stock market

- *Olivia Andreea Baci / 290*

The influence of financial derivatives in emerging capital markets

- *Felicia Ramona Birău / 299*

Adoption model for regulatory of financial markets

- *Mitică Pepi / 306*

Rationality versus irrationality on the Romanian capital market

- *Ion Stancu, Dumitra Stancu / 325*

Leniency policy for competitive activity

- *Ilie Moga / 333*

A simulation of agent-based models for high frequency trading on the stock exchange market

- *Diana Dezsi / 339*

Testing the random walk hypothesis and the long memory for the Romanian capital market

- *Ioana Sorina Mihuț, Mihaela Lutas, Andreea Pece / 357*

The performance of ROC on the BSE

- *Dan Gabriel Anghel / 373*

The propagation effects of financial crisis on Ljubljana Stock Exchange

- *Felicia Ramona Birău / 380*

Main results of analyses undertaken on the arbitrage pricing model

- *Andrei Stănculescu / 390*

Influence of regime switching to risk in port-modern portfolio management

- *Cristina Geambașu, Liviu Geambașu, Iulia Jianu / 392*

Market timing and selectivity within the Romanian balanced funds industry

- *Angela-Maria Filip, Maria Miruna Pochea, Mihaela-Daniela Morariu / 400*

Session V. Macroeconomic stability

Is the evolution of the exchange rate LEU/EURO still influenced by the shocks of interest rate on Romanian market?

- *Gabriela Preda / 414*

The impact of the global economic crisis on international business and macroeconomic aggregates BRICS countries and the Republic of Serbia

- *Jelena Tošković, Jasna Marković, Marija Gačić / 424*

Romania on the way of Euro adoption

- *Ionuț Dumitru, Ionela Jianu (Dumitru) / 431*

The regulation and deregulation of the financial markets - current tendencies and perspectives in the context of providing financial stability

- *Isac Borș / 444*

Early warning indicators of economic and financial instability indexes

- *Rodica Oana Ioniță, Ion Stancu / 455*

A study upon the Great Japanese Crisis

- *Marius Ioan Mihuț, Stanca Alexandra Pop / 468*

The long-term real convergence of Central and Eastern Europe economies to the Euro area – the sigma and beta convergence

- *Bogdan Andrei Dumitrescu / 477*

Inflation targeting and financial stability during the financial crisis

- *Livia Maria Rotaru / 489*

Competition: Classical versus Neoclassical view

- *Mihaela Cornelia Sandu / 505*

On the decline of middle class as an effect of globalization. Evidence from the developed and emergent countries

- *Monica Răileanu Szeles, Vlad Dumitrache / 510*

Session VI. Banking

Bridge bank and bad bank tools in EU. An efficiency assessment case study

- *Teodora Barbu, Iustina Boitan / 520*

Foreign banks appetite for liquidity risk and the banking system stability. Case study for Romania

- *Horățiu Lovin / 530*

Financial contagion and its transmission channels between PIIGS economies

- *Daniela Zapodeanu, Edina Kulcsar, Sorina Ioana Petriș / 538*

Basel III - issues and implications for the Romanian banking system

- *Daniela Dandara / 549*

Evaluating the impact of banking services quality on customer loyalty in Credit Europe Bank (Romania)

- *Corneliu Bente, Florina Maria Bente / 557*

Banks interest rate margins and financial deregulation in Mauritius

- *Kheswar Jankee / 563*

SESSION I
INSURANCE

INVESTMENT STRATEGIES OF ROMANIAN PRIVATE PENSION FUNDS

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Abstract. *The paper analyzes the investment strategies adopted by the private pension funds in Romania. The first part of the paper examines the main characteristics of the private pension fund system. Further, the financial instruments that have the greatest impact on the value of the fund unit are shown. In order to achieve that goal, information about the value of the fund unit and the structure of the investments made by these pension funds have been used. Government bonds, bank deposits, corporate bonds and shares have proven to have the most statistically significant impact on the value of the fund unit.*

Keywords: pension funds; investments; statistical analysis.

JEL Classification: J32, G32.

REL Classification: 11C.

Introduction

During the past decades, two correlative development shave led to the need for an alternative system to the public one, i.e.: an aging population and a declining birth rate. Both variables impacted on the active/inactive population ratio, inducing strong pressures on the active population and on the entire public pension system. Forecasts for the coming decades indicate further deterioration of this ratio. According to a study conducted in 2006 by the Department for Economic and Social Affairs of the UN, in 2020 the population aged over 65 will represent 17.5% of the entire population, and by 2050, the share of this category will be 30% of the population.

In order to meet the pressures set on the public system, many countries have decided to implement multi-pillar pension schemes. The average age of pension funds' share holders is 52.5. For each of the participants to the private pension fund, an individual account is opened in which the monthly contributions and the benefits are accumulated. Each participant joining a private fund under a contract of membership will benefit from an opened account in which the individual units are retained, under the constraint of not participating to several funds. To notice, that the assets held by any participant may not be warranted or sold and cannot be subject to enforcement.

On an international level, several diversified pension systems are noticeable, combining public and the private pillars. At the European Union level, there isn't a commonly used system of pensions available for all member states, but most of the member states have chosen the multi-pillar pension system proposed by the World Bank. In Romania, the pension system is, as well, structured according the pattern recommended by the World Bank:

- the public pension system, which represents the first pillar, monitored by the National House of Public Pensions;
- the private pension system, under the management of the Private Pension System Supervisory Commission, including two components:

- the second pillar, i.e. the privately managed compulsory component, introduced in May 2008;

- the third pillar, i.e. the privately managed optional component, introduced in May 2007.

The compulsory component of private pension triggers a series of discussions at international level since, under the economic crisis, certain governments have no longer complied with the initial pension reform model, such as the Central and Eastern Europe countries that have made certain adjustments to the pension second pillar.

1. Theoretical framework

One of the greatest challenges of the last decades was the administration of the public, redistribution based pension system. Its most important underlying deficiency is that it distorts the fundamental connection between the effort and the expected yield, namely, between the liability and the financial rights of the contributors to the pension system. This weakness of the traditional public pension system is aggravated under the strong double folded influence of increased life expectancy due to medical progress and the decrease of fertility. Consequently, a lower number of contributors support a greater number of pensioners. Under the constraint of retiring age ceiling and the impossibility to, constantly, increase the income tax, this system should lead to a decrease of pensions. Irrespective of the manner pensions are lowered, i.e. through inflation or by legislative measures, eventually, the outcome is the same for the active contributors: the anxiety concerning their financial security of their old age (Pinera, 1995).

Under these circumstances, viable solutions to build private pension schemes had to be found in order to guarantee the financial security of elderly people. Even the most developed countries, with well established traditional social security schemes, need to set up more sustainable redistributive pension schemes. Consequently, multi-pillar pension systems, consisting of a public pillar as well as a private pillar were set up. The latter is based on individual accounts of the insured, where the contributions are accumulated and the revenues distributed during the decumulation phase, each beneficiary receiving a replacement income that depends on the value of the individual contribution as well as on the profit secured by the investments of the pension funds.

The investments of a private pension fund should lead to the most adequate effective portfolio of financial assets. According to Swensen (2005), setting up a financial portfolio implies a subtle mix between science and art. Science supports the efficiency and principles attached to financial investments seeking for the highest profit. Art refers to the challenge to efficiently combine the individual specificities of each asset within the allocation process of resources.

Iikiw (2004) argues that the asset allocation process is responsible to reach the expected return of long term investments of pension funds. The author shows that the asset allocation stresses on the mathematically identified optimum portfolios based on domestic and foreign assets. Mathematically built portfolios are supported by certain hypothesis aiming to reach the best risk/return ratio. These portfolios are “no brainers” because no additional costs are included (Iikiw, 2004, p. 220).

Usually, the return of pension funds is measured in terms of profit rather than risk. Risks are considered during crisis when the possible losses of pension funds’ investments may lead to a depreciation of the accumulated funds.

Other authors (Ryan and Fabrozzi, 2003) show that after 2001 the default of pension funds in the USA rooted, rather, in the actuarial evaluating techniques the financial funds than in the losses of assets. According to Bader (2003) and McClurken (2006) the post retiring benefit plans that belong to the first pillar of a pension system should not invest in high risk financial assets because it would lead to moral hazard and “useless risk” evaluation problems.

More recently, Otranto and Trudda (2007) support the need to group pension funds according to various risk classes. They propose a cluster type analyses based on the GARCH volatility of the return rates. They also describe a working methodology to distinguish

between two types of risks of the pension funds, i.e. the constant and the time variable one. Though the method sustains a satisfactory ex post risk analyses, the great number of lags to obtain liable estimations diminishes its practicality when an immediate answer is needed.

Other authors, like Bikker, Broaders and Dreaw (2007) study the impact of the security market performance on the investment policy of the Dutch public funds and show that their conduct is determined by the cyclical performance of the share market. In addition, they emphasize that the pension funds respond asymmetrically to the shocks on the share market so that the portfolio restructuring is stronger after negative yields of the shares. They state that „pension funds react asymmetrically to stock market shocks. Equity reallocation is higher after underperformance of equity investments than after out performance. Thus pension fund strictly limit any decline in equity allocation in response to underperformance but they allow higher exposure to equities when these outperform other investments.”

2. Characteristics

Depending on their investments, each pension fund assumes a certain level of risk and expects to reach a satisfactory yield. Although the level of accepted risk depend son the investment strategy and risk aversion of each fund, the law enforces certain limits to ensure safety, quality, liquidity and profitability of investments made by mandatory pension funds. Thus, according to the legal provisions, a pension fund may invest in: money market instruments (ceiled to 20% of the assets' value), government bonds (up to 70% of the total assets), bonds or other securities issued by local authorities (up 30% of the total assets), securities traded on regulated and supervised markets (up to 50% of the total fund assets), government bonds and other securities issued by third countries (up15% of the total fund assets), bonds and other securities issued by local authorities of third countries (to a maximum 10% of the total assets) or by foreign non-governmental organizations, if the securities are listed on the stock market and they meet the required criteria for rating (5% of the total fund assets), other securities approved by the Supervisory Commission of Private Pension System.

The voluntary private pension system (pillar III is intended to support future pensioners, so they receive higher incomes over their retirement. The participants' contributions are invested by pension fund managers based on the risk profile of the funds. Actually, the monthly contributions of the participants become fund units in the participants' accounts. To calculate the amount existing in the account of each participant (or so-called personal assets), the number of fund units are multiplied by the unit value on a specific day. If by the age of 60, at least 90 monthly contributions were paid, one can benefit from voluntary pension, which would be paid by the pension fund managers. If one has not reached the age of 60 years, or has not paid at least 90 monthly contributions to the pension fund, then, according to the legislation, is not entitled to a voluntary pension, but only receives the existing amount in the account, either as a single payment or in installments over 5 years (Law no. 204/2006).

3. Method and results

Figure 1 shows the evolution of the accumulated assets by the pension funds alongside the evolution of the numbers of members. A sharp increase in the two variables can be noticed during May 2008 and December 2011. In the first month of analysis, the total assets of the mandatory pension fund mounted up to RON 86.6 million, accumulated from 4.1 million participants. At the end of the interval, the number of people that joined the second pillar reached 5.5 million, whereas the value of the assets increased to RON 6.14 billion.

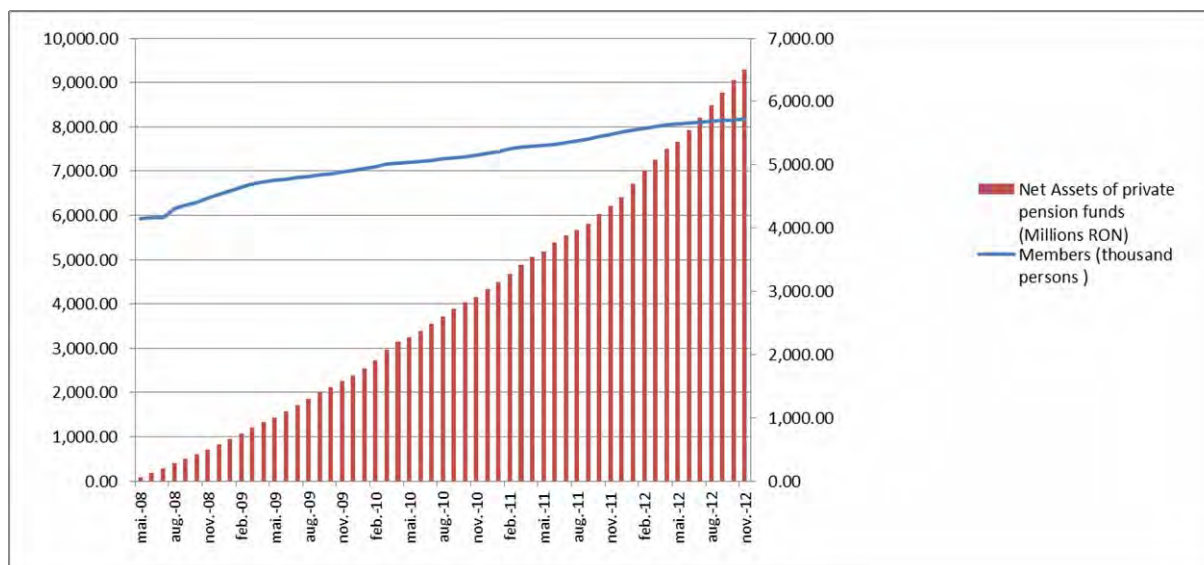


Figure 1. The evolution of assets and members of the second pillar

The results concerning the voluntary pension funds are shown below in Figure 2

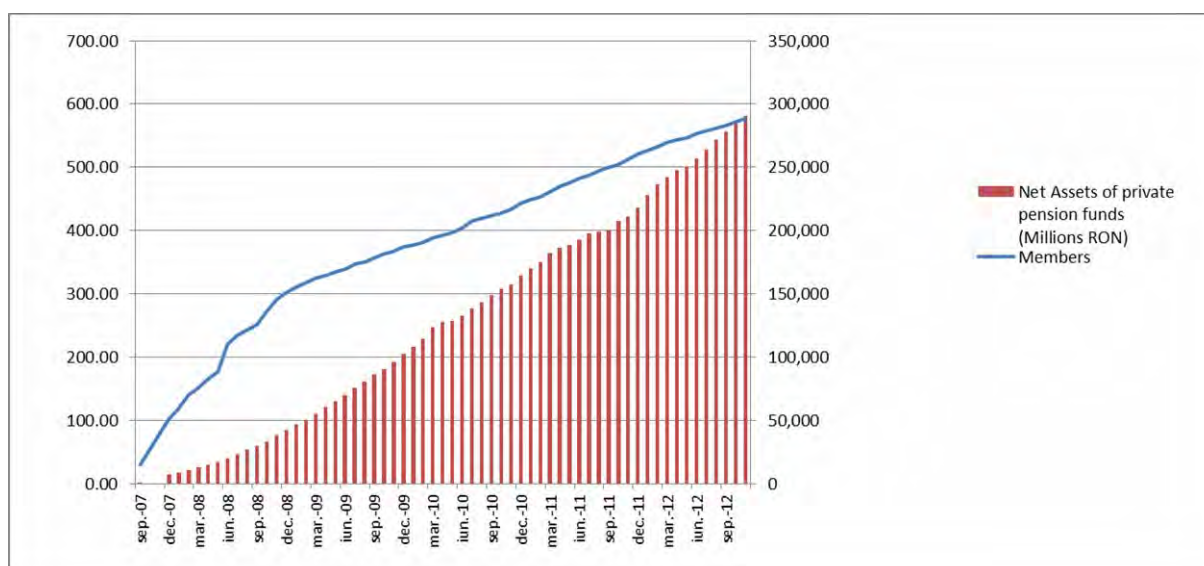


Figure 2. The evolution of assets and members of the third pillar

The similarities between the two figures are mainly given by the continuous increase in both the number of members that have joined the funds and the increased the value of the assets. In September 2007, there were 14543 members of the voluntary pension funds that have contributed a total amount of RON 1.86 million. The number of contributors to this type of fund sharply increased until the beginning of 2009, when the crisis negatively impacted on the savings. As a consequence, the number of contributors continued to increase, but at a lower pace, reaching 260392 individuals in December 2011. On the other hand, the value of the funds' assets reached RON 436.41 million.

Comparing the two pillars it can be noticed that there is a considerable gap between the analyzed variables. While the second pillar has 5.5 million members contributing RON 6.14 billion, the third one has merely 260392 members contributing RON 436.41 million. The main reason explaining the great difference between the two figures is the binding nature of the second pillar.

An in depth analysis of the fund unit value and the assets in which the voluntary private pensions have invested is based on the multiple regression models. This type of analysis is widely used for empirical analysis in economics. Likewise, the method of ordinary least squares is often used for estimating the parameters of the multiple regression model (Wooldridge, 2000). Before estimating the parameters of the model several basic assumptions have to be considered. The assumptions provided by the specialized literature are: i) Linear model with respect to the parameters; ii) random sampling; iii) zero conditional mean; iv) no perfect co linearity and homoscedasticity. The random sampling assumption implies that the sampling from the population has been done in a random manner. The third assumption implies that the error u has an expected value of zero, given any values of the independent variables. The fourth assumption states that in the sample (and therefore in the population) none of the independent variables is constant and there are no exact linear relationships among the independent variables. The less perfect co linearity assumption concerns only the independent variables but says nothing about the relationship between the u and the explanatory variables. It is important to note that this assumption allows the independent variables to be correlated, as long as they are not perfectly correlated. If no correlation were allowed between the independent variables, then the multiple regression models would not be very useful for economic analysis. The last assumption means that the variance in the error term u conditional on the explanatory variables is the same for all combinations of outcomes of the explanatory variables. A more detailed analysis of the relationship between the value of the fund unit and the assets in which the voluntary private pensions have invested is based on the multiple regression models.

The analysis has been used to determine the effects of the investments decisions made by pension funds, both mandatory and voluntary. In the first case the date used represented the value of the fund unit together with all the investments made by the funds. The data comprises nine pension funds, namely, Alico, Aripí, AZT Viitorul Tau, BCR, BRD, Eureka, ING, Pensia Viva and Vital and their activity during 30.06.2008 and 31.12.2011. The regression model that was used took into consideration the following:

$$FVU = \alpha + \beta_1 xGS + \beta_2 xMB + \beta_3 xCB + \beta_4 xSB + \beta_5 xUCITS + \epsilon \quad (1)$$

Where:

GS – Government securities,

MB – Municipal Bonds,

CB – Corporate bonds,

SB – Supranational bonds,

UCITS – Undertakings for Collective Investment in Transferable Securities.

The results of the estimation can be seen below:

Coefficients	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	8.825	1.042	8.466	2.82E-15	***
Government Securities	6.717	1.264	5.312	2.52E-07	***
Municipal Bonds	-26.345	3.124	-8.434	3.46E-15	***
Corporate Bonds	-4.094	1.232	-3.323	0.00103	**
Supranational Bonds	16.828	1.766	9.53	< 2e-16	***
UCITS	5.77	2.807	2.056	0.04093	*
			Adjusted R-squared: 0.5224		

$$FVU = 8.825 + 6.717xGS - 26.345xMB - 4.094xCB + 16.828xSB + 5.77xUCITS + \epsilon \quad (2)$$

The main conclusions following the above analyses are:

- Firstly, the investments made in bank deposits and mutual funds are not statistically significant,

- Investments made in supranational bonds are the most significant and a 1% increase in the percentage of assets invested in those financial instruments can increase the value of the fund unit by 16.828%,

- Investments made in municipal and corporate bonds have proven to have a negative effect on the performance of the portfolio

- The changes that might occur in the asset ratio that is invested, explain 52% of the change that occurs in the value of the fund unit.

When analyzing the investment portfolio of the voluntary pension funds, the data released by the five active pension funds, AZT Moderato, AZT Vivace, ING Activ, ING Optim and Pensia Mea, were considered. The data makes reference to the value of the fund unit and the structure of the investments made by these funds between September 2007 and December 2011. The same regression model was used and the following results were obtained:

Coefficients	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	1.5406	0.7862	1.96	0.0512	.
Bank deposits	7.4652	1.5063	4.956	1.39E-06	***
Government Securities	13.8503	0.9031	15.337	< 2e-16	***
Supranational Bonds	9.1284	4.0509	2.253	0.0252	*
Shares	15.5125	1.0381	14.944	< 2e-16	***
Adjusted R-squared: 0.6833					

$$FVU = 1.5406 + 13.8503 \times GS + 9.1284 \times SB + 7.4652 \times BD + 15.5125 \times SH + \varepsilon \quad (3)$$

It can be noticed that government securities are the most statistically significant followed by the investments made in shares. A 1% increase in the ratio of assets invested in government securities will cause a 13.85% increase in the value of the fund unit. Moreover, changes in the evolution of the four financial instruments, explain 68.3% of the change in the evolution of the value of the unit found.

Conclusions

The greater yields of the Romanian pension funds as compared to the yields achieved in other Central and Eastern European countries can be explained through several determinants which have acted on the domestic market, including, managers' risk avert behavior throughout this period and appropriate investment strategy. What should be understood is that the success of private pension funds, over a long period of time depends both on creating appropriate legal and institutional framework and an efficient management of fund and also the effective control exercised by the Supervisory Authority. To enhance the private pension system in Romania the IMF providers commendations regarding the rapid increase in the contributions, the improvement of the legal framework and the rejection of the inflation guarantee. If these recommendations are to be applied, the success of the private pension system in Romania can be sustainable in the future, making private pensions the most profitable investment.

The analysis shows that the interest in private pension funds is continuously increasing in Romania. Whereas in 2008, when the mandatory pension funds began to function, the assets totaled RON 86.6 million, accumulated from 4.1 million participants. At the end of the interval, the number of people that joined the second pillar reached 5.5 million, whereas the value of the assets increased to RON 6.14 billion. When considering the evolution of the voluntary pension funds, they started in September 2007 with 14543 members that contributed RON 1.86 million, and reached 260392 members contributing RON 436.41 million.

The investment strategies of the two pillars are similar, to a certain extent. The pension funds have invested a significant part of their assets in bank deposits, government securities, corporate bonds and share. All of these financial instruments have proven to be statistically significant in influencing the evolution of the value of fund unit. Pension funds activating in the second pillar have chosen a safer investment strategy, compared to the third pillar, and so investments made in municipal bonds have proven to be again, statistically significant. Conversely, investments made in supranational bonds have proven to be significant for the third pillar and have no statistical significance for the second pillar. Although the ratio of assets invested in shares does not exceed 13%, the financial crisis has affected the returns of the private pension funds.

Insurers and pension funds are very large investors in financial markets. The growing role of fully-funded pension systems worldwide will increase this trend. The long-term investment process of private pension funds is an element of stability on the financial system and funds operations increase the liquidity of financial markets. The funds are also a good tool of financial education of the public by valuing saving-investing behaviors and by improving one's skills of assessing risk-yield ratios.

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An empirical analysis of the causality relationship between insurance and economic growth

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Abstract. *Worldwide, the role of the insurance industry has grown in importance. A world without insurance would be much less developed and much less stable. Furthermore, a large number of economic activities would not take place without a reliable insurance mechanism. Therefore, insurance is an important prerequisite for stimulating economic growth. The purpose of this study is to empirically assess the causality relationship between insurance and economic growth in 5 developed countries where we can notice differences in the activity of the insurance market. The relationship between the insurance industry and economic growth is complex and country specific, depending on social, cultural, economic and legal factors.*

Keywords: insurance; economic growth; VAR model; causality relationship.

JEL Classification: G22, C32, O16.

REL Classification: 8E, 10B.

1. Introduction

The importance of the insurance industry within an economy was acknowledged in 1964 during the first conference of UNCTAD: “A sound national insurance and reinsurance market is an essential characteristic of economic growth”.

Usually, we don't have a complete picture of the contribution of an industry to economy well-being. The value added of the insurance industry is related to the fundamental role of insurance of protecting individuals from the consequences of extreme events, due to the fact that welfare is increased. The process of increasing welfare through insurance mechanism has limited additional economic effects in developing countries compared to industrialized countries.

A first effect of insurance on growth is represented by the creation of the value added which can be measured through employee compensation and industry profits. The second effect is generated by the role of the insurance companies that can be regarded as long-term investors. Insurance companies invest important amounts of money into the economy and thus promote the development of financial markets. Further, as financial intermediary, insurance improves capital allocation and capital productivity by increasing the amount of capital available to businesses. Therefore, insurance is contributing to the development of a modern and competitive financial market. Thirdly, in the business environment, by providing high levels of security, insurance companies allow a business to grow and to undertake a more efficient mix of activities. Therefore, insurance improves the financial soundness of companies. Also, insurance plays an important role in the process of freeing entrepreneurial spirit and investing in innovation.

Insurance, with its specialized role in risk transfer and mitigation, fosters a more efficient allocation of resources and long-run economic growth (Avram et al., 2010).

Another channel of fostering economic growth is represented by the fact that, through its price mechanism which reflects the risk undertaken, insurance acts as a precaution improver and encourages responsible and sustainable use of resources. The insurance sector is promoting modern social protection systems by guaranteeing a stable and lifelong level of revenue for pension, education and maternity. Furthermore, in several countries, insurers offer a high-quality social protection by compensation and rehabilitation imposed by accidents at work.

Given the growing importance of the insurance sector and the increasing number of interlinks to other financial sectors, the evolving role of insurance companies opposite of economic growth and stability should be of growing relevance for policy makers and supervisors (Hais and Sümegi, 2008).

Insurance companies offer products that are relevant to all aspects of life: house, liability, life, health and accident and credit. By covering all these important aspects of individuals' life, insurance acts as a pillar which secures the standard of living and sustains consumption, which is one of the main drivers of economic growth. A world without insurance would be much less developed and much less stable. We should be aware that a large number of economic activities would not take place without a reliable mechanism for mutualisation, pooling and transferring risk.

Taking in consideration the fact that life and non-life insurance offer protection for different kind of risks that affect the economic activity in different ways and also because life insurance companies are long-term investors, while non-life insurance companies are short-term investors, there is likely to be different effects on economic growth (Arena, 2008). Non-life insurance contributes to growth in both developing and developed countries, while life insurance makes a substantial contribution to growth in wealthier countries.

The evidence suggests there is substantial potential for insurance to make a greater contribution to economic growth and social welfare in many lower and middle income countries. Indeed, industry experts argue that insurance lags behind other financial services in the extent of globalization, providing substantial growth opportunities (Gibbons, 2007).

Taking in consideration the fact that economic growth increases insurable assets and thus the demand for insurance, we can also notice a reverse effect from GDP to insurance. The relationship between the insurance industry and economic growth is complex, because insurance is likely to be a driver of economic growth, but growth in the insurance industry is also driven by economic expansion itself.

Summarizing, the insurance industry can have effects such as promote financial stability, mobilize savings, facilitate trade and commerce, enable risk to be managed more efficiently, encourage loss mitigation, foster efficient capital allocation and also can be a substitute for and complement government security programs (Skipper, 2001).

2. Literature review

The existing empirical researches on the impact of insurance on economic growth are scarce. Among the first researches, Outreville (1990, 1996) succeeded to identify positive connections between the development of the insurance market and the financial development of an economy, by analyzing 55 developing countries, using the OLS method.

Ward and Zurbrugg (2000) extend Outreville's research by analyzing the causality linkages between insurance and the economic development of 9 developed countries for the period 1969-1996, in the context of the benefits provided by insurance. Regarding the risk transfer and indemnification, the capacity of the insurance sector to contribute to economic growth varies from country to country if we take into account the socio-cultural factors that determine the insurance products acquisition. Secondly, in light of the benefits provided as financial intermediary, there is an improvement of financial markets liquidity and in the process of capital accumulation. However, it is important to consider the cultural, legal and

regulatory environment, the importance of other financial intermediaries and moral hazard effects. All these important factors are different from one economy to another, affecting the form and the degree of causality between the insurance sector and economic growth. The empirical results obtained by applying the VAR methodology highlight that in some countries the causality relationship insurance-economic growth is unidirectional, bidirectional in other states, while in other countries this relationship is insignificant.

Adams et al. (2005) examined the dynamic relationship between banking, insurance and economic growth in Sweden for the period 1830-1998, highlighting that the banking sector has a dominant influence on economic growth and on demand for insurance products. By applying econometric tests for co integration and Granger causality, the empirical results indicate that, in Sweden, the relationship economic growth-insurance growth is stronger than the reverse one.

Kugler and Ofoghi (2005) analyze the relationship between the long-term insurance sector and economic growth and between the non-life insurance sector and economic growth in UK for the periods 1966-2003, respectively 1971-2003, using data for each line of business. By applying causality tests and Johansen co integration, they show that long-term causality relationships between insurance and economic growth exist for more lines of business compared to the short-term relationships. In addition, the authors noticed the existence of long-term bidirectional causality relationships for 3 lines of business, the ones from the economic growth direction having a stronger causality.

Webb et al. (2005) examine how banks and insurance companies, individually and collectively, influence economic growth in 55 countries during the period 1980-1996. By applying regressions, the authors show that the life insurance sector affects positively and significantly the economic growth, the relationship being mutual. They also note that, in the case of non-life insurance, there is no connection with economic growth.

Another important empirical study is performed by Arena (2008), who examined the linkage between insurance and economic growth in 56 developed and developing countries for the period 1976-2004, by applying the generalized method of moment for dynamic models of panel data. The author concludes that there are significant and positive effects of insurance on economic growth, but with certain differences. Therefore, the life insurance sector has a significant impact only in developed countries, while the non-life insurance sector has a substantial impact in both developed and developing countries.

Haiss and Sumegi (2008) examine the connections between insurance and economic growth in 29 European countries for the period 1992-2005. By using a regression model and panel data, the authors show that there is a significant and positive impact of life insurance on economic growth in EU-15 countries, Switzerland, Norway and Iceland, while the impact of non-life insurance is stronger in Central and Eastern Europe.

In his study concerning the economic growth in India for the period 1980-2006, Wadlamannati (2008) takes in consideration the effect of insurance growth and of the related reforms. By applying the ordinary least squares, co integration analysis and error correction models, the author highlights the positive impact of insurance on growth and the existence of a long-term balance between the variables considered.

Taking in consideration the fact that the insurance industry acquires an increasing importance in countries with transition economies, Ćurak et al. (2009) performed an empirical study on the impact of insurance on economic growth in 10 EU countries with transition economies for the period 1992-2007. With regard to methodology, the authors selected an OLS model and a 2SLS model. The research results show that the overall insurance sector and, individually, the life and non-life sectors foster economic growth.

Avram et al. (2010) examined the linkage between insurance and economic growth in 93 countries across the globe for periods between 1980-2006, by applying cross-sectional estimations and dynamic panel data techniques, identifying a significant positive relationship. Also, the results show that the quality of the legal system of a country and the protection of property rights are positively related to economic growth.

Hornig et al. (2011) examine the dynamic relationship between demand for insurance products, financial development and economic growth in Taiwan for the period 1961-2006, by applying a 3 variables VAR model. The research results show that there is a balance relationship among the 3 variables analyzed: in short term, economic growth fosters the demand for insurance products and financial development affects economic growth.

As far as concerns countries with transition economies, the empirical study performed by Kjosevski (2011) examines the impact of insurance on economic growth in the Republic of Macedonia for the period 1995-2010, by applying an OLS model. The research shows that the overall insurance sector and the non-life insurance sector have a positive impact on economic growth, while the life insurance sector negatively affects economic growth.

Omoke (2012) analyzes the impact of insurance on economic growth in Nigeria for the period 1970-2008, taking in consideration the inflation rate and the saving rate. By applying the Johansen co integration and vector error correction model, Omoke noted that the insurance industry does not have a significant and positive impact on economic growth, which was not surprisingly, due to the fact that in Nigeria the insurance industry is underdeveloped.

Guochen and ChiWei (2012) applied the bootstrap panel Granger causality in order to examine the linkages between life and non-life insurance and economic growth in 31 regions of China during 2006-2011. The authors found that the forms of interaction vary by income level. In regions with low income, non-life insurance had a stronger impact, while in high income regions, between the insurance sector and economic growth there is a mutual relationship.

3. Data and methodology

In order to test empirically whether the growth of the insurance sector fosters economic growth, we will use a VAR model, with the following hypothesis:

$$H_1 : GWP = f(GDP) \quad (1)$$

$$H_2 : GDP = f(GWP) \quad (2)$$

The VAR model allows symmetric treatment of the two variables considered.

Our VAR model comprises two equations:

$$GWP_t = \alpha_1 + \sum_{j=1}^k \beta_j \times GWP_{t-j} + \sum_{j=1}^k \chi_j \times GDP_{t-j} + \varepsilon_{1t} \quad (3)$$

$$GDP_t = \alpha_2 + \sum_{j=1}^k \delta_j \times GDP_{t-j} + \sum_{j=1}^k \phi_j \times GWP_{t-j} + \varepsilon_{2t} \quad (4)$$

where α_1, α_2 are the intercept terms, $\beta, \chi, \delta, \phi$ are the coefficients of the endogen variables and the ε are the stochastic error terms.

In this study, we've applied the VAR methodology in order to identify the causality relationship between the growth of the insurance industry and the economic growth in 5 OECD member states, namely France, Japan, Netherlands, Norway and UK. The motivation for choosing these countries is to analyze the causality relationship between insurance and economic growth in countries where we can notice differences in the activity of the insurance market. For the empirical study we've used the annual data series of real GDP and real gross written premiums for the period 1987-2011. Data were collected from OECD national accounts and the VAR model was built with Eviews 7.

Firstly, we applied the ADF test (Augmented Dickey-Fuller) to verify the stationary of both variables. From an economic perspective, a time series is stationary if a shock in the time series is temporary and it's absorbed in time. For all the time series considered, we've estimated the existence of a unit root for the original data and the absence of a unit root for the first-difference data. Therefore, the variables are integrated of order 1. Table 1 comprises the probabilities generated by the ADF test, both for I(0) and I(1). If the probability is higher than the significance level (1%, 5% and 10%), the variable is non-stationary.

Table 1

ADF Test

Countries	GDP		GWP	
	I(0)	I(1)	I(0)	I(1)
	H0: The time series has a unit root (non-stationary)			
France	0.9937	0.00001362	0.8565	0.0209*
Japan	0.6299	0.0025	0.8842	0.0144*
Netherlands	0.9821	0.0144*	0.7285	0.0004
Norway	0.9667	0.0002	0.9532	0.0001
UK	0.3232	0.0000003	0.5545	0.0012

Source: Own estimations with Eviews 7.

Observation: The values marked with * are stationary for the significance level of 5% and 10%

In order to verify if the past values of a variable X_1 contain information that helps predict a variable X_2 above and beyond the information contained in past values of X_2 alone, we applied the Pair wise Granger causality test. If the probability is higher than the significance level (1%, 5% and 10%), the null hypothesis is accepted. Otherwise, the null hypothesis is rejected.

Table 2

Pair wise Granger causality test

Countries	Null hypothesis	Probabilities
France	D_PRIME does not Granger Cause D_PIB	0.0835
	D_PIB does not Granger Cause D_PRIME	0.8687
Japan	D_PRIME does not Granger Cause D_PIB	0.5178
	D_PIB does not Granger Cause D_PRIME	0.0259
Netherlands	D_PRIME does not Granger Cause D_PIB	0.8685
	D_PIB does not Granger Cause D_PRIME	0.3728
Norway	D_PRIME does not Granger Cause D_PIB	0.4761
	D_PIB does not Granger Cause D_PRIME	0.2726
UK	D_PRIME does not Granger Cause D_PIB	0.0642
	D_PIB does not Granger Cause D_PRIME	0.0185

Source: Own estimations with Eviews 7.

Taking in consideration that first difference data became stationary and that the Pair wise Granger test highlights certain causality linkages, we built a 2 variables (real gross written premiums and real GDP) VAR model for each of the 5 countries. A VAR model is valid if it has an optimal number of lags, if it's stable and if its residuals have normal distribution, homoskedasticity and lack of autocorrelation.

The number of lags of a VAR model must capture the system dynamics without consuming too many degrees of freedom. In order to determine the optimal number of lags, we used the criteria provided by LR Sequential tests, Akaike Criterion, Schwarz and Hanna-Quinn Criterion tests.

Table 3

Estimation of the optimal number of lags

Countries	LR	FPE	AIC	SC	HQ	Chosen lag
France	2	2	2	1	2	2
Japan	3	3	3	1	3	3
Netherlands	1	2	2	1	2	2
Norway	1	2	2	1	2	2
UK	2	2	2	2	2	2

Source: Own estimations with Eviews 7.

According to the table above, 4 countries have a VAR model with 2 lags and one country has a VAR model with 3 lags.

In order to test the stability of each VAR model, we applied „AR Roots Table” test and noted that all roots are sub unitary, which means that the model is stable (Table 4).

Table 4

VAR model stability

Countries	Results	Roots modulus		
France	No root lies outside the unit circle. VAR satisfies the stability condition.	0.417295	0.363033	0.363033
Japan	No root lies outside the unit circle. VAR satisfies the stability condition.	0.976282	0.976282	0.818706
Netherlands	No root lies outside the unit circle. VAR satisfies the stability condition.	0.833103	0.833103	0.219060
Norway	No root lies outside the unit circle. VAR satisfies the stability condition.	0.875235	0.875235	0.311244
UK	No root lies outside the unit circle. VAR satisfies the stability condition.	0.631930	0.631930	0.390719

Source: Own estimations with Eviews 7.

Regarding the quality of residuals, we tested if they have normal distribution, homoskedasticity and lack of autocorrelation. If the probability is higher than the significance level (1%, 5% and 10%), the null hypothesis is accepted. Otherwise, the null hypothesis is rejected.

Table 5

Residuals tests

Countries	Autocorrelation LM test			Cholesky (Lutkepohl) Normality test			White Heteroskedasticity test
	H0 No serial correlation at lag order h			H0 Residuals are multivariate normal			H0 no heteroskedasticity
				Skewness	Kurtosis	Jarque-Bera	
France	Lag 1: 0.4676	Lag 2: 0.8439		0.3486	0.2741	0.3199	0.1363
Japan	Lag1:0.7869	Lag 2: 0.4532	Lag 3: 0.6075	0.2873	0.7414	0.5424	0.4487
Netherlands	Lag 1:0.0640	Lag 2:0.1206		0.0314	0.0152	0.0041	0.1243
Norway	Lag1:0.1710	Lag 2:0.2883		0.7985	0.4807	0.7514	0.4836
UK	Lag 1:0.2387	Lag 2 :0.4791		0.5533	0.8696	0.8332	0.0604

Source: Own estimations with Eviews 7.

We can notice that in the case of Netherlands, the residuals do not have a normal distribution for a 5% significance level, requiring a careful interpretation of the results.

The next important step is to estimate the VAR model (Tables 6, 7, 8, 9 and 10). Since the validity conditions are met, the VAR model can be defined as follows:

- for France, Netherlands, Norway and UK:

$$GWP_t = \alpha_1 + \beta \times GWP_{t-2} + \chi \times GDP_{t-2} + \varepsilon_{1t} \quad (5)$$

$$GDP_t = \alpha_2 + \delta \times GDP_{t-2} + \phi \times GWP_{t-2} + \varepsilon_{2t} \quad (6)$$

- for Japan

$$GWP_t = \alpha_1 + \beta \times GWP_{t-3} + \chi \times GDP_{t-3} + \varepsilon_{1t} \quad (7)$$

$$GDP_t = \alpha_2 + \delta \times GDP_{t-3} + \phi \times GWP_{t-3} + \varepsilon_{2t} \quad (8)$$

Table 6

VAR model for France

Vector Autoregression Estimates

Sample (adjusted): 1990 2011

	D_PIB	D_PRIME
D_PIB(-1)	0.429672 (0.23118) [1.85857]	-0.054550 (0.15547) [-0.35086]
D_PIB(-2)	-0.104875 (0.12093) [-0.86725]	0.038935 (0.08133) [0.47876]
D_PRIME(-1)	0.863106 (0.36821) [2.34407]	0.274849 (0.24762) [1.10994]
D_PRIME(-2)	-0.067042 (0.42642) [-0.15722]	0.011899 (0.28677) [0.04149]
C	48100.18 (21810.5) [2.20537]	10289.61 (14667.8) [0.70151]

Table 7

VAR model for Netherlands

Vector Autoregression Estimates

Sample (adjusted): 1990 2011

	D_PIB	D_PRIME
D_PIB(-1)	0.238282 (0.24153) [0.98656]	0.096411 (0.06717) [1.43531]
D_PIB(-2)	-0.058441 (0.19270) [-0.30328]	-0.020895 (0.05359) [-0.38989]
D_PRIME(-1)	-0.316598 (0.76725) [-0.41264]	0.181481 (0.21338) [0.85051]
D_PRIME(-2)	-0.234707 (1.01206) [-0.23191]	-0.653822 (0.28146) [-2.32295]
C	28306.07 (11574.1) [2.44563]	2488.502 (3218.87) [0.77310]

Table 8

VAR model for Norway

Vector Autoregression Estimates

Sample (adjusted): 1990 2011

	D_PIB	D_PRIME
D_PIB(-1)	0.008676 (0.32970) [0.02631]	-0.087807 (0.08486) [-1.03475]
D_PIB(-2)	0.109167 (0.30390) [0.35922]	0.111913 (0.07822) [1.43077]
D_PRIME(-1)	-0.514515 (1.17412) [-0.43821]	-0.491604 (0.30219) [-1.62679]
D_PRIME(-2)	-1.464363 (1.18202) [-1.23886]	-0.821425 (0.30423) [-2.70004]
C	19205.46 (9208.91) [2.08553]	2121.505 (2370.17) [0.89509]

Table 9

VAR model for UK

Vector Autoregression Estimates

Sample (adjusted): 1990 2011

	D_PIB	D_PRIME
D_PIB(-1)	0.387193 (0.25455) [1.52110]	1.032341 (0.32422) [3.18403]
D_PIB(-2)	0.044737 (0.10809) [0.41390]	0.008140 (0.13767) [0.05913]
D_PRIME(-1)	0.131508 (0.17272) [0.76141]	-0.409431 (0.21999) [-1.86112]
D_PRIME(-2)	-0.355584 (0.16919) [-2.10168]	-0.627815 (0.21550) [-2.91327]
C	66678.97 (34427.7) [1.93679]	-72738.47 (43851.3) [-1.65875]

Table 10

VAR model for Japan		
Vector Autoregression Estimates		
Sample (adjusted): 1991 2011		
	D_PIB	D_PRIME
D_PIB(-1)	0.076054 (0.28291) [0.26883]	0.186521 (0.09229) [2.02110]
D_PIB(-2)	-0.433032 (0.28549) [-1.51682]	-0.204415 (0.09313) [-2.19496]
D_PIB(-3)	0.383925 (0.46342) [0.82847]	0.531550 (0.15117) [3.51620]
D_PRIME(-1)	-0.865893 (0.67410) [-1.28452]	0.106836 (0.21990) [0.48584]
D_PRIME(-2)	0.687730 (0.71050) [0.96795]	0.184672 (0.23177) [0.79678]
D_PRIME(-3)	0.066574 (0.64756) [0.10281]	-0.307309 (0.21124) [-1.45477]
C	90244.61 (66080.4) [1.36568]	-45921.07 (21556.2) [-2.13029]

Source: Own estimations with Eviews 7.

The VAR models estimated above describe the autoregressive connections between the insurance industry and economic growth in each state. Based on the estimated models, we can determine the impulse-response functions that show the impact of a shock of the insurance industry on economic growth and vice-versa. In a VAR model, shocks represent the part of a variable that cannot be explained by its past (lagged) values or by other variables included in the model. Therefore, a shock takes the form of an error term (residual) of a given stochastic equation.

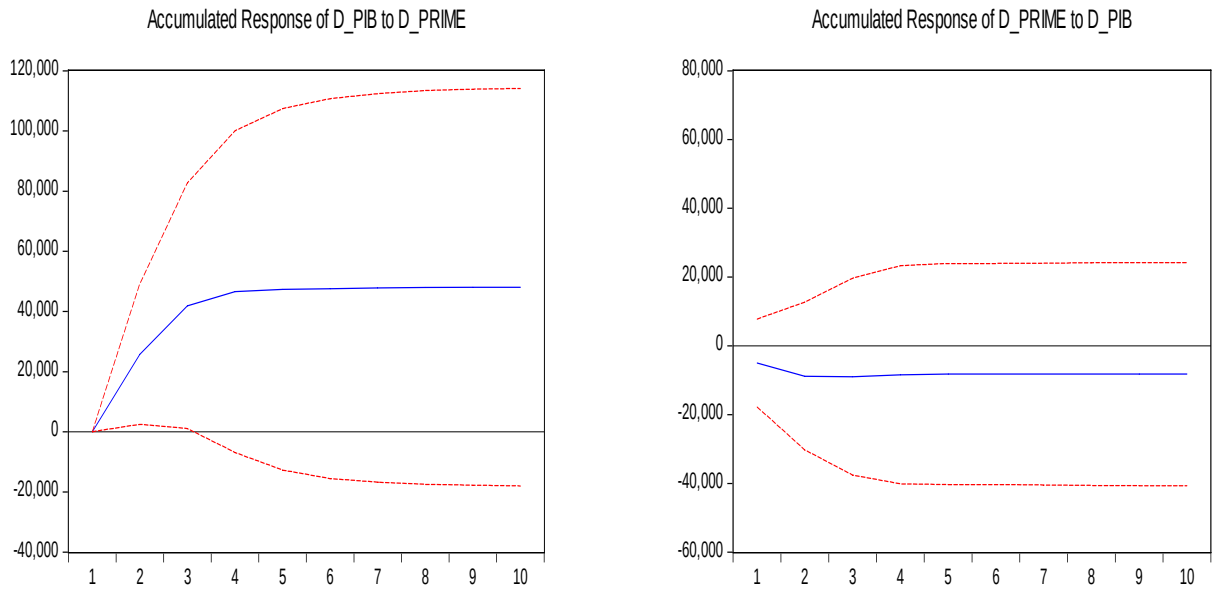


Figure 1. Impulse-response functions for France

In the case of France, we can notice that an increase in premiums generates a significant increase in GDP in sub periods 1-4, and then the effect is constant. Inversely, the GDP growth causes a constant contraction of premiums; the relationship between the two variables is negative.

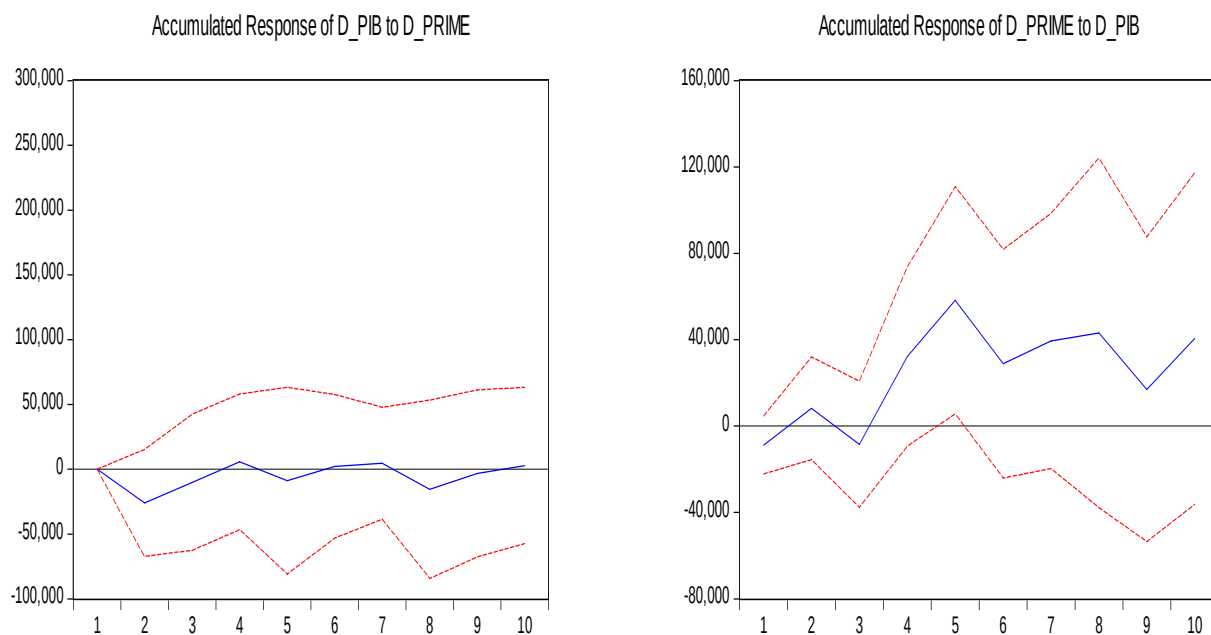


Figure 2. Impulse-response functions for Japan

In the case of Japan, the premiums growth generates the GDP contraction in most sub periods, with a significant decrease in sub period 2, and in the remaining sub periods, the effect is imperceptible. Inversely, the GDP growth causes the rise of premiums in most sub periods, with a peak in sub period 5, and in sub periods 1 and 3 it causes premiums contraction.

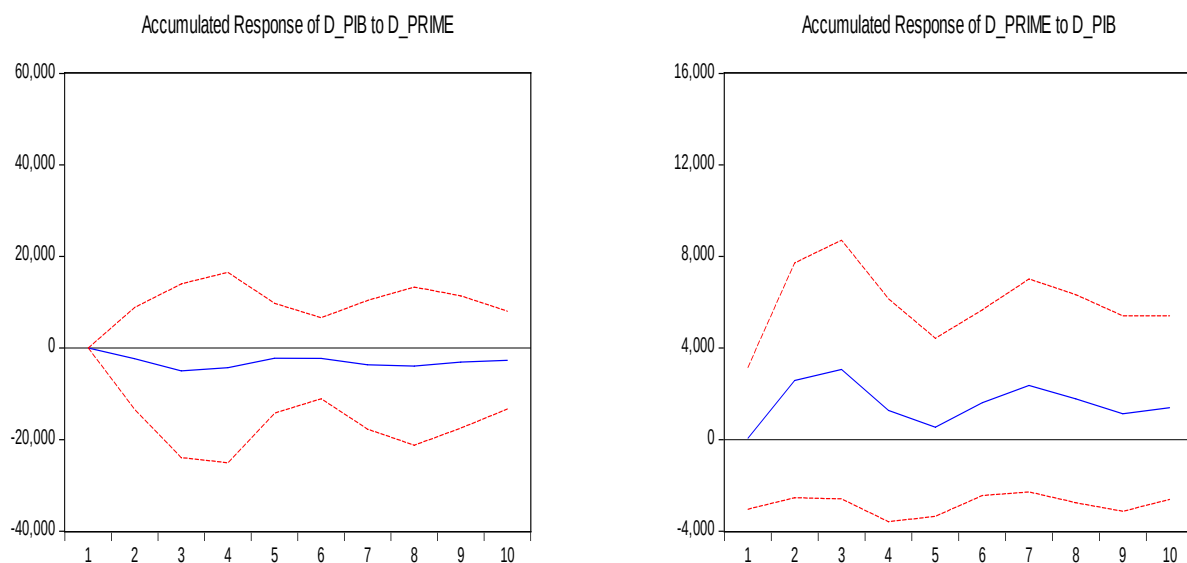


Figure 3. Impulse-response functions for Netherlands

In the case of the Netherlands, the premiums growth generates the GDP contraction during the entire period. Inversely, the GDP growth causes the premiums growth during the entire period, with a peak in sub period 3.

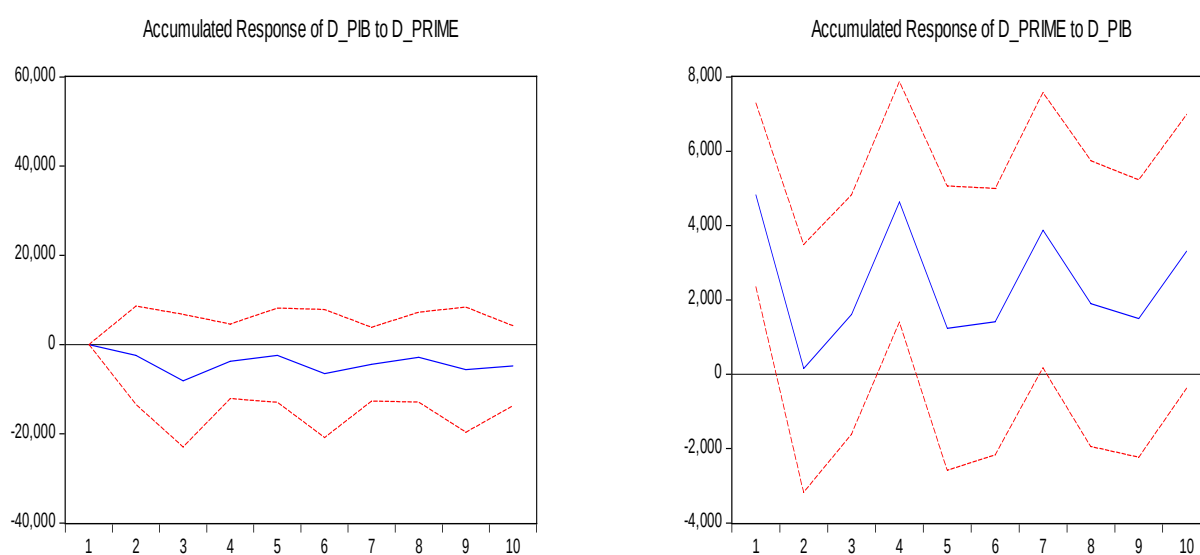


Figure 4. Impulse-response functions for Norway

In the case of Norway, an increase in premiums generates the contraction of GDP during the entire period, and the relationship between the 2 variables is negative. Inversely, an increase in GDP causes a strongly fluctuating increase of premiums, with peaks in sub periods 1 and 4.

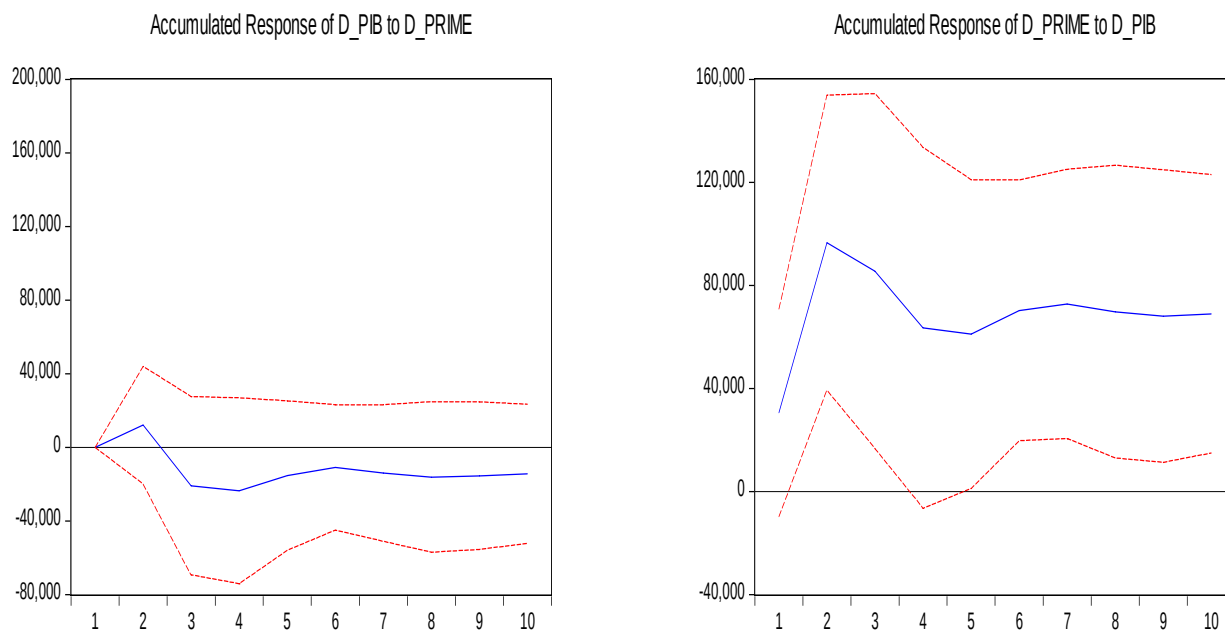


Figure 5. Impulse-response functions for UK

In the case of UK, an increase in premiums causes GDP growth only in sub periods 1 and 2, and in the remaining sub periods it causes its contraction, the effect being constant most of the time. Inversely, an increase in GDP causes a significant increase in premiums during the entire period, with a peak in sub period 2.

Conclusions

The causality relationship between the insurance industry and economic growth is complex, due to the fact that insurance is likely to be a driver of economic growth, but growth in the insurance industry is also driven by economic expansion itself.

Insurance is an important prerequisite for stimulating economic growth. The causality directions are different from state to state. This suggests that the insurance-economic growth relationship may be country specific.

By applying a VAR model to analyze the causality relationship between insurance and economic growth in developed countries where we can notice differences in the activity of the insurance market, we can observe that this relationship is bidirectional, and, in France, the insurance impact on economic growth is stronger than the reverse one, while in Japan, Netherlands, Norway and UK, the impact of economic growth on insurance is more powerful. According to these results, we can conclude that the causality relationship between insurance and economic growth varies from state to state, depending on specific factors of social, cultural, economic and legal nature.

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CAR INSURANCE – ENGINE FOR THE ROMANIAN INSURANCE MARKET

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Abstract. *The paper presents the evolution of risk underwriting for the general insurance and motor insurance by the insurance companies with insurance activity in Romania during 2007 until 2012. In the analyzed period we have noted an increase and then a decrease in the risk underwriting value for all the classes of general insurance. During this period, within the classes of general insurance, the car insurance are holding values above 50% of total subscriptions. This fact has a negative impact over the profitability of Romanian insurance market. Claims ratio is having the highest value recorded in the car insurance sector. These aspects are encountered in the Romanian insurance market. In other EU countries the share of car insurance is not so large within general insurance.*

Keywords: gross written premiums; auto insurance; claims.

JEL Classification: G22.

REL Classification: 11C.

1. Introduction

In the period of the six years after Romania's accession to the EU structures, the insurance market in our country has grown and strengthened.

The offer of insurance policies had diversified in all classes of general insurance. Throughout the period that was analyzing the auto insurance plays an important role in the portfolio of most of Romanian insurers. Auto insurance classes are those with a high claims ratio rate. This damage is the main responsible for the losses in the Romanian insurance market.

2. Status of research

On the Romanian insurance market in the period 2007-2012 were active between 42 and 46 general insurance, life insurance companies and composite ones. Of these 26 have subscribed risks covered by standard insurance policies and of these 16 companies Motor Hull were authorized for MTPL policies (Annual Report from 2007, 2008, 2009, 2010, 2011, Of The Romanian Insurance Supervisory Commission). These insurance policies as they are framed in the Insurance Supervisory Commission rules (Order No. 3/2001) are included in general insurance classes III and X. They are reported by insurers within the general insurance category. We analyzed the evolution of insurers underwriting for the period mentioned above. The analysis was done for general insurance and for the classes which include motor insurance. We looked over the value of life insurance claims that were paid in each year of subscription, and also the amount of claims paid each year for insurance policies that fall into the two classes mentioned, III and X, respectively Motor Hull and MTPL.

The synthesis of these data analysis is in the following information.

3. Cars and general insurance market in Romania. Market trends for the period 2007-2012

In the period proposed for analysis, after Romania became a member of the European Union, we are witnessing a consolidation of the insurance market and for the existing insurable potential. In the proposed period for analysis, since Romania became a member of the European Union, Romanian insurance market witnessing consolidation and potential existing insurable. Despite the fact that the growth rate of the market reduced in 2009, on the insurance market was recorded the highest values of gross written premiums for all classes of insurance. In 2009, the auto insurance class that we are analyzing had a lower growth than that of the general insurance market. Between 2010 and 2011 the decrease of the insurance market continued. In these two years, the largest decrease was recorded in motor insurance classes. Significant decrease in car sales due to decreasing lending activity of banks and leasing companies had direct effects in the auto insurance industry. The value of written premiums in the period 2007-2012 for the Romanian insurance market is shown in Table 1.

Table 1

Evolution of general insurance in Romania in 2007-2012

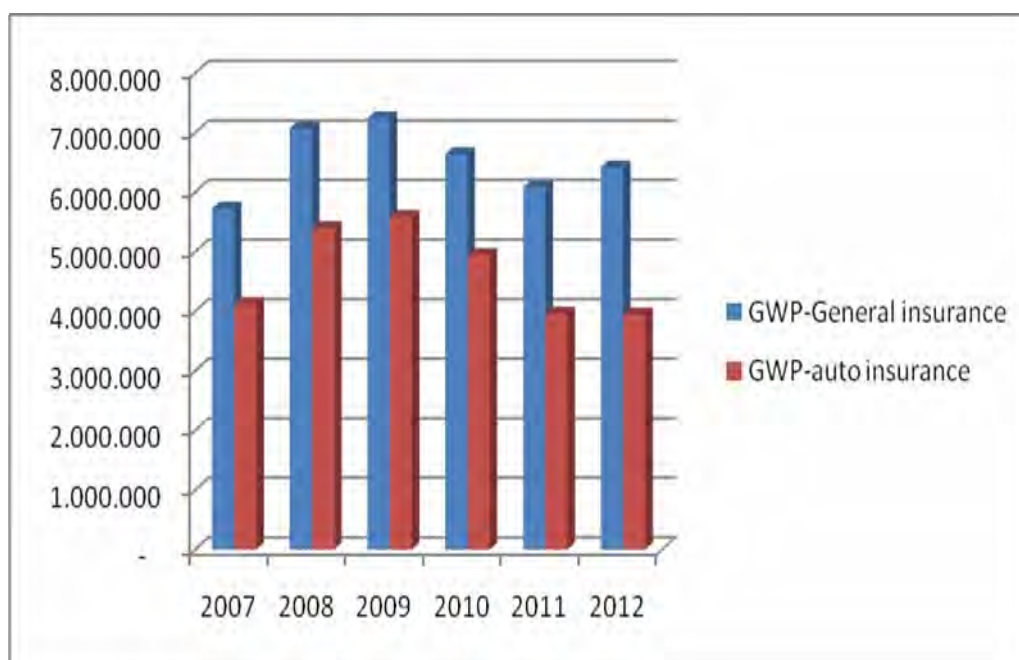
Year	2007	2008	2009	2010	2011	2012
Gross Written Premiums-General insurance (thousand Ron)	5726752	7068173	7241584	6639733	6083943	6654100
Gross Written Premiums-Auto insurance (thousand Ron)	4120191	5400859	5583054	4947736	3961491	4148710

Source: Authors procession based on information from annual Reports of ISC in 2007-2012.

The decrease of insurance market was influenced by tariff reduction for auto insurance. The average price of MTPL policies was in 2010 of 646 lei. This fell to 480 lei in 2011 and in 2012 was 444 lei. (Annual Report from 2007, 2008, 2009, 2010, 2011, Of The Romanian Insurance Supervisory Commission) Since 2010 the bonus-malus system was applied for the MTPL policies. By applying thus bonus, can generate discounts of up to 50% for the policy price. At the end of 2012 by applying successive reductions of the bonus it could get discounts of up to 30% of from the standard insurance premiums used by the insurers licensed to practice MTPL insurance.

Romanian insurance industry is also facing a harsh competition for market share. Mergers and acquisitions on the Romanian insurance market occurred both before and after the economic crisis started. To resolve the target market share some insurers have turned to underwriting auto insurance policies with unsustainable tariff. Comparing the price of MTPL insurance policies in several EU countries we have found that the average price for insurance policy in Romania is the lowest in Europe. (Zimolo, 2011) This aspect is shown in Figure 7.

Between the two classes of auto insurance there was always a significant gap subscription. Motor Hull insurance policies are optional contracts but accessories for financing the purchase of cars (with leasing or credit). MTPL insurance type is auto liability insurance for damages caused to third parties and is compulsory for all vehicles in circulation. The year 2010 is the first year of the analyzed period when values of subscriptions for MTPL insurance type have exceeded the Motor Hull insurance type (Figure 2).



Source: Authors procession based on information from annual Reports of ISC in 2007-2012.

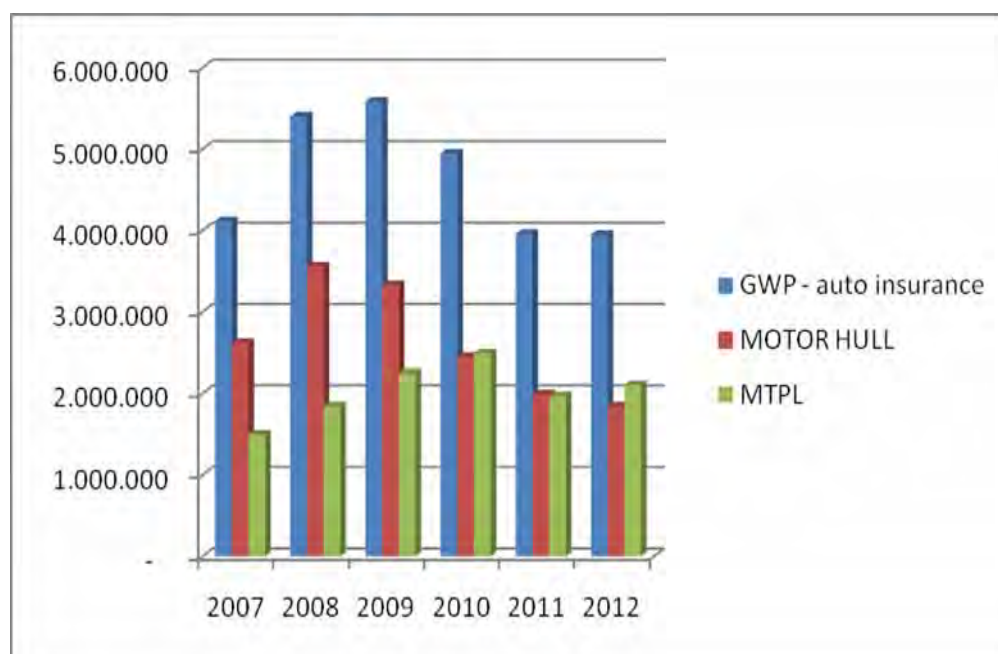
Figure 1. Evolution of auto and general insurance in Romania in 2007-2012

Table 2

Evolution of auto insurance in Romania in 2007-2012

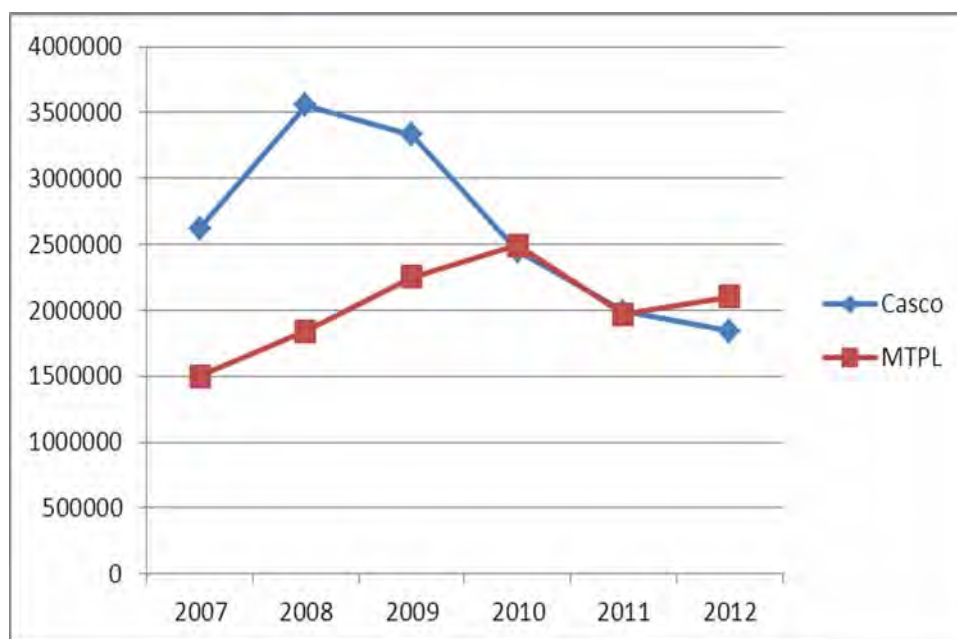
Year	2007	2008	2009	2010	2011	2012
GWP - auto insurance (Thousands Ron)	4120191	5400859	5583054	4947736	3961491	4148710
MOTOR HULL (Thousands Ron)	2619859	3557030	3330988	2453009	1990961	1989150
MTPL (Thousands Ron)	15000332	1843828	2252065	2494726	1970529	2159570

Source: Authors procession based on information from annual Reports of ISC in 2007-2012.



Source: Authors procession based on information from annual Reports of ISC in 2007-2012.

Figure 2. Evolution of auto insurance Motor Hull and MTPL in Romania in 2007-2012



Source: Authors procession based on information from annual Reports of ISC in 2007-2012.

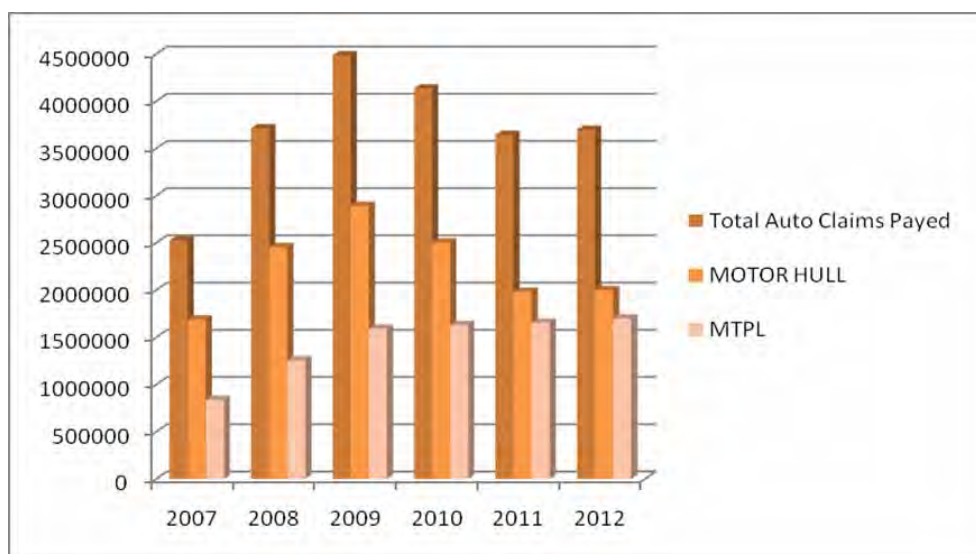
Figure 3. GWP for Motor Hull and MTPL in Romania in 2007-2012

Table 3

Total claims paid for auto insurances in Romania in 2007-2012

Year	2007	2008	2009	2010	2011	2012
Total Auto Claims Payed (Thousands Ron)	2.527.045	3.713.642	4.487.085	4.136.797	3.643.272	3.836.860
MOTOR HULL (Thousands Ron)	1.688.723	2.455.509	2.893.840	2.506.517	1.986.085	1.974.200
MTPL (Thousands Ron)	838.313	1.258.132	1.593.245	1.630.275	1.657.186	1.862.660

Source: Authors procession based on information from annual Reports of ISC in 2007-2012, and Insurance Profile magazine, 2007-2012 collection.



Source: Authors procession based on information from annual Reports of ISC in 2007-2012, and Insurance Profile magazine, 2007 - 2012 collection.

Figure 4. Evolution of damage value for Motor Hull and MTPL insurances in Romania in 2007-2012

4. Aspects of auto and general insurance market in European Union between 2007-2012

Vehicle insurance in the European Union countries own different percentages ranging of the total market as follows: 10% in Belgium, (<http://www.assuralia.be>) 25% in Hungary (www.mabisz.hu) and over 65% in Romania. (www.csa-isc.ro)

Since the beginning of the financial crisis, in Romania and Hungary the auto insurance market is declining, and in Belgium is growing. In Hungary, compared to Romania, auto insurance market has had a slower decrease approaching to the whole market average decline.

Belgian insurance market is ten times bigger than the Romanian and the number of insurance companies operating is 3 times lower. Written premiums for auto insurance classes are between 10 and 12% in the period 2007-2011. This market didn't have sudden evolution as the Romanian one experienced.

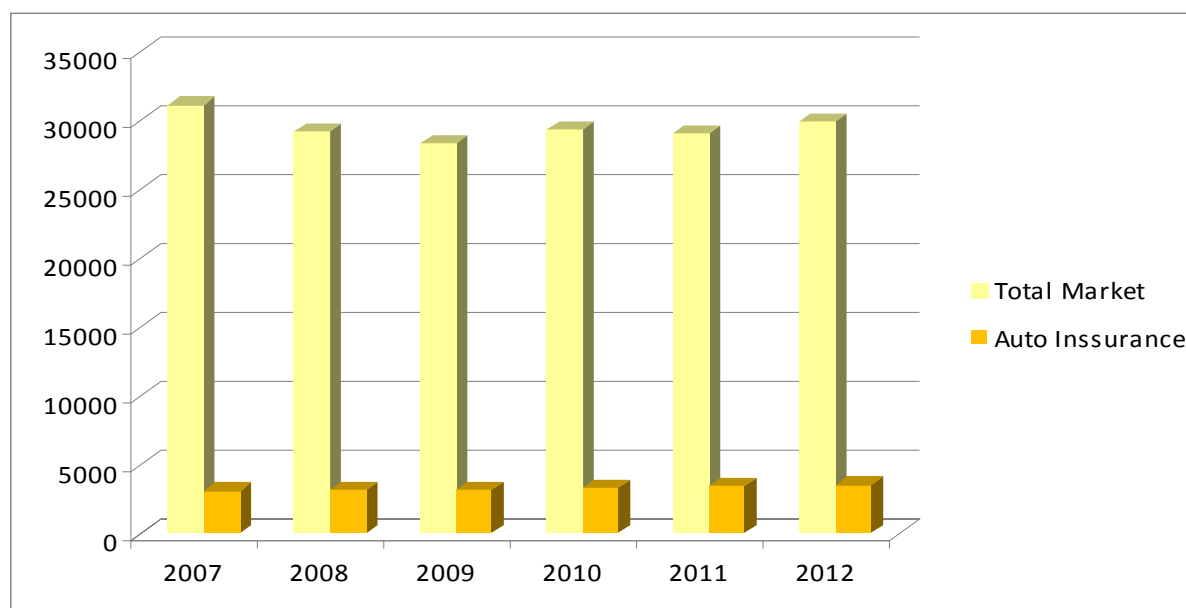
Hungarian insurance market registered written premium values double than the Romanian one, and the number of insurance companies operating is 30% lower. Global financial and economic crisis has influenced the Hungarian auto insurance market with a decrease of 10 percentages.

Table 4

Evolution of auto insurance in Belgium between 2007-2012

Year/Mil. Euro	2007	2008	2009	2010	2011	2012
Total Market	31192	29278	28385	29414	29141	30000
Auto Insurance	3088	3144	3206	3326	3451	3500

Source: Authors procession based on information from : <http://www.assuralia.be>



Source: authors procession based on information from annual Reports of ISC in 2007-2012, and Insurance Profile magazine, 2007-2012 collection.

Figure 5. Evolution of auto insurance in Belgium between 2007-2012

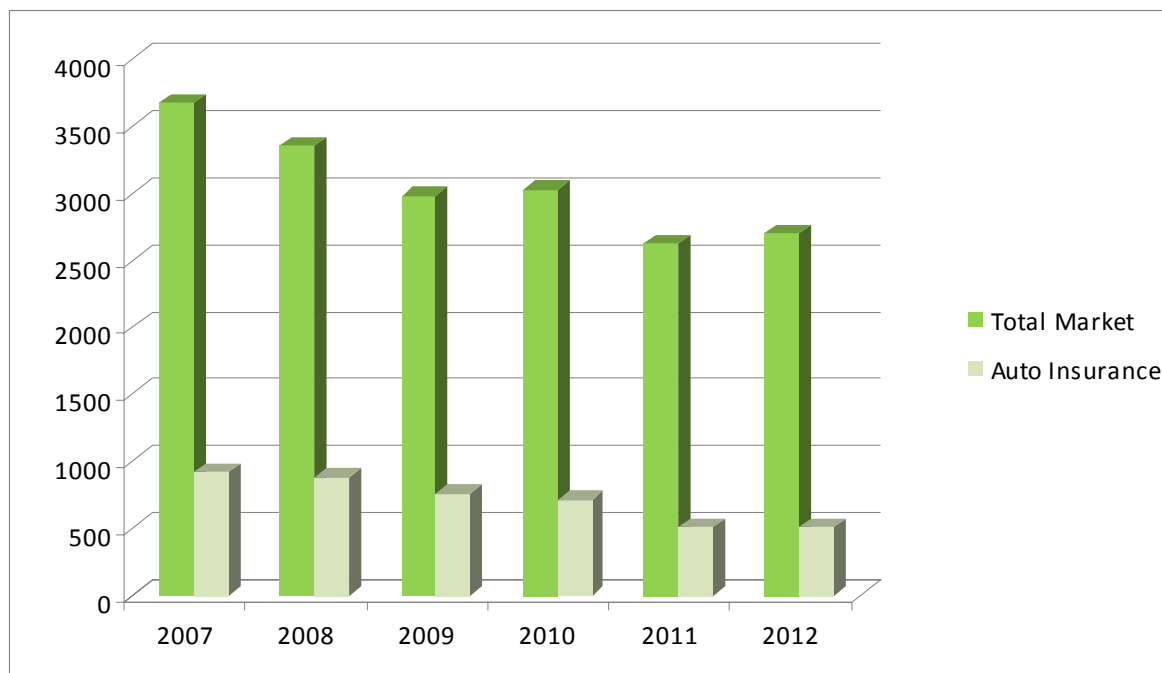
Table 5

Evolution of auto insurance in Hungary between 2007-2012

Year/mil euro	2007	2008	2009	2010	2011	2012*
Total Market	3672	3349	2978	3027	2621	2700
Auto Insurance	922	881	759	717	509	510

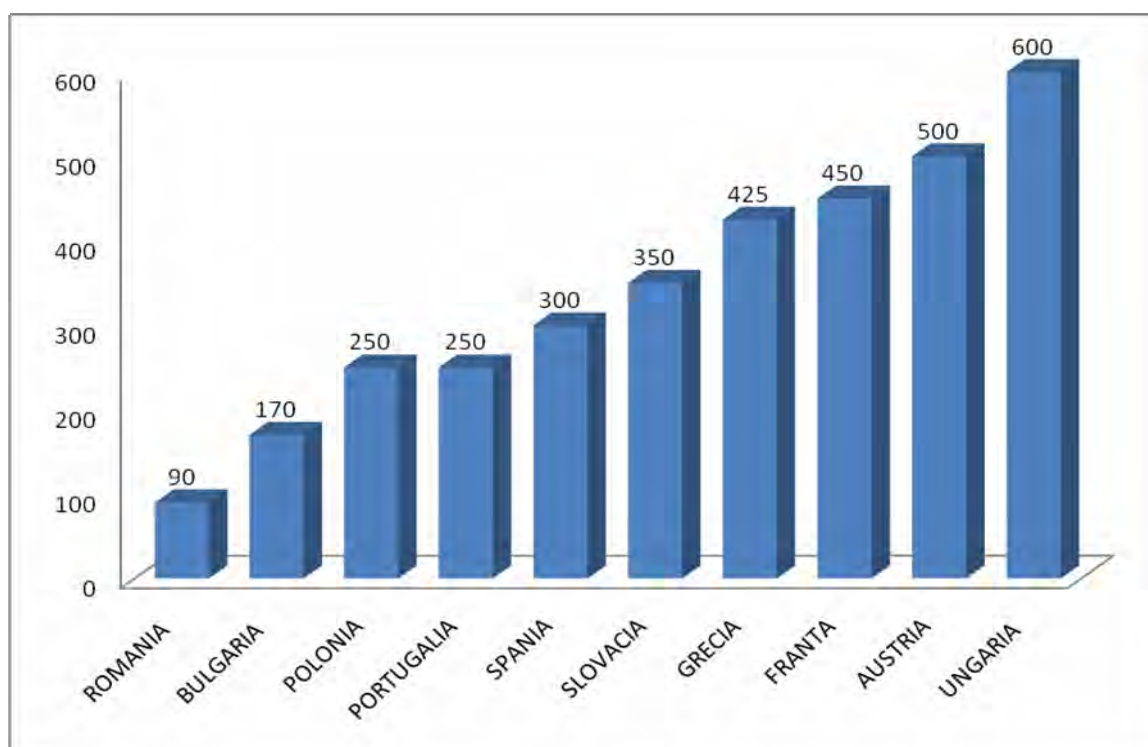
*For 2012, estimation.

Source: Authors procession based on information from: <http://www.pszaf.hu/en/>



Source: Authors procession based on information from: <http://www.pszaf.hu/en/>

Figure 6. Evolution of auto insurance in Hungary between 2007-2012



Source: Authors procession based on information from ISC at the 1a National Conference of Auto Insurance, Bucharest, October, 2012.

Figure 7. Average value of MTPL insurance premium in 2012 in some European Union Countries

Conclusions

Insurance market in Romania is an atypical one compared to other insurance markets in the region. Both in normal and economic crisis conditions the underwriting risk for auto insurance classes remains at a high level compared with other classes of general insurance.

Damage rate in auto insurance classes is much higher than in other classes. This increases the total claims ratio on the market and therefore generates the largest insurance market losses.

Analyzing the results of the insurance market in the period between 2007-2012 we have found that of all insurance subscriptions, over 50% are classes of car insurance. The subscription for this policy type is done both with own staff and by insurance intermediaries or insurance agents and brokers.

The work activity of insurance brokers increased year by year. In 2012 they had brokered a rate of about 40% of the Romanian insurance market subscription. They represent an effective sales channel. They are commissioned by the insurers to the value of insurance premiums mediated by differentiated classes. For auto insurance policies brokerage commissions are much lower compared to non-auto insurance. Given the collaboration insurers-brokers we consider a reasonable measure of the insurance companies, to increase the brokerage commissions for auto insurance policies intermediation proportional to the volume of non-auto classes

For the insurance market stability and subscriptions balance for every insurance classes is required the implementation of some fiscal and legislative measures. Therefore a limited deductibility for insurance premiums for homes and property for individuals or deductibility of employees insurance for the entities would produce a boost for the non-auto insurance subscriptions and the diversification of the insurance products from the insurance companies portfolio. It would be able to respect the provisions of law 32/2000 which states that insurance premiums are tax deductible.

The diversification for the general insurance portfolio in Romania will take a longer period of time. Until then, whatever are the increases and decreases, the car insurance remains the engine of the insurance market in Romania.

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EFFICIENT MARKET HYPOTHESIS IN EUROPEAN EMERGING UNIT-LINKED INSURANCE MARKETS

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Abstract. *This paper empirically investigates the effects of the recent global crisis on the degree of efficiency or return predictability of three CEE unit-linked insurance markets by testing the martingale difference hypothesis (MDH), applying the variance ratio tests using ranks and signs by Wright (2000), the automatic variance ratio (AVR) test of Kim (2009) and the automatic portmanteau (AQ) test of Escanciano and Lobato (2009), for entire, pre-crisis and crisis periods. The statistical findings show that the degree of the markets' inefficiency varies through time and surprisingly the empirical results suggest that the global crisis led to a decrease of predictability and hence to an improvement of relative efficiency for most of the nine ING funds.*

Keywords: market efficiency; global financial crisis; unit-linked insurance markets; variance ratio tests; automatic portmanteau test.

JEL Classification: G22, G14, C58, C87.

REL Classification: 11C.

1. Introduction

The efficient market hypothesis (Fama, 1965) can be viewed as the cornerstone of modern finance (Kim et al., 2011). Since the seminal papers of Samuelson (1965) and Fama (1965), the efficient market hypothesis (EMH thereafter) states that efficient market prices follow a random walk or a martingale, and always fully and instantaneously reflect all available and relevant information, where the information set consists of past prices and returns (Charles et al., 2010). When the market is efficient, all available information is fully and instantaneously reflected in price, and no market participant is able to make abnormal profit (Kim et al., 2011). As a consequence, future prices are purely unpredictable based on past price information and fluctuate only in response to the random flow of news (Fama, 1970, 1991). Moreover, since price adjustment to a new piece of information is instantaneous and accurate, returns cannot be predicted. This implies that historical prices cannot be used to form superior forecasts or to accomplish trading profits above the level justified by the risk assumed (Charles et al., 2010).

When the information set is limited to past price and return, the market is said to be weak-form efficient and the asset return is purely unpredictable from the past information (Kim et al., 2011). The weak-form market efficiency refers to the predictability in time series of prices on the basis of past information. Samuelson stated that the price generating process of a weak-form efficient market should only be affected by the arrival of new information. New information is expected to appear at random, so prices should follow a random walk. A simple random-walk process can be defined as (Otto, 2010):

$$P_t = P_{t-1} + u_t,$$

where: P_t – price at time t , u_t – error term for time t .

Most of the efficient market hypothesis (EMH) studies on financial markets are tested for the weak-form efficiency through the martingale difference hypothesis (MDH), where the current price is the best predictor of the future price and the returns are independent (or uncorrelated) with the past values. If the asset price follows a martingale difference sequence (MDS), then the market is weak-form efficient, and hence not predictable (Charles et al., 2010). A martingale is less restrictive than a random walk and is considered as a generalization of a random walk and is having mean-zero increments (Hong, 2009; Wicks, 1998). The Martingale Difference Hypothesis is called conditional mean independence in the statistical literature, and it means that past and current information are of no use to forecasting future values of a martingale difference sequence (Escanciano and Lobato, 2007).

Though the literature on the Global financial crisis is extensive and the efficient market theory and the random walk hypothesis have been major issues in financial literature for the past forty years, there are only few studies investigating the impact of the global financial crisis on the potential of predictability and implicitly on the degree of efficiency of financial markets, respectively of Central and Eastern European unit-linked insurance markets.

The global financial crisis has negatively affected the evolution of European financial markets, and implicitly the evolution of European unit-linked insurance market and unit-linked investment funds. Unit linked insurance are life insurance policies with investment component. The insurance premiums are invested into one or more investment funds, managed by the insurance company. The investment is divided into a share part named unit. Each investment fund has its own unit with individual prices. The insured persons select the investments – the funds and the allocation between them. These funds are available only for the insured people of the insurance company. Each time the insured persons want, they must modify the allocation of their investment. The protection part refers to the insured sum in case of death, and the investment one refers to the client's account. This account includes the present value of the units from the chosen investment funds. In case of unit-linked insurance policies the investment risks are on the insurance person's side, but the benefits of the investment depend on the investment funds' evolutions (Gavriletea, 2009).

Given the significant gap in extant literature, the objective of the present study is to empirically investigate the effects of the recent Global crisis on the degree of efficiency or return predictability of three Central and Eastern unit-linked insurance markets by testing the martingale difference hypothesis (MDH), using sign and rank tests of Wright (2000), the automatic variance ratio (AVR) test of Kim (2009) and the automatic portmanteau (AQ) test of Escanciano and Lobato (2009). This study contributes to the existing literature on EMH with several distinct features: this paper provides a systematic review of the weak-form market efficiency literature that examines return predictability from past price changes, with an exclusive focus on the unit-linked insurance markets. Moreover, the article aims at monitoring any improvement in the degree of efficiency in time and also examines the relative efficiency of markets in pre-crisis and crisis periods.

The structure of this paper is as follows: Section 2 discusses some previous research on the issue. Sections 3 and 4 describe the sample data and provide descriptive statistics and outline the methodology. Empirical results are presented in Section 5. Section 6 provides a summary of the main findings and some concluding remarks.

2. Literature review

Efficient market theory and the random walk hypothesis have been major issues in financial literature, for the past forty years. The validity of the random walk hypothesis has important implications for financial theories and investment strategies, and so this issue is relevant for academicians, investors and regulatory authorities. Academicians seek to understand the behavior of stock prices, and standard risk return models, such as the capital asset pricing model, depend of the hypotheses of normality or random walk behavior of prices. For investors, trading strategies have to be designed taking into account if the prices

are characterized by random walks or by persistence in the short run, and mean reversion in the long run. Finally, if a stock market is not efficient, the pricing mechanism does not ensure the efficient allocation of capital within an economy, with negative effects for the overall economy. Evidence of inefficiency may determine regulatory authorities to take the necessary steps and reforms to correct it (Borges, 2008).

According to Lo (2004), there is no consensus among finance academics and practitioners as to whether stock market is efficient. While most of finance professors believe the market is weak-form efficient (Doran, et al. 2009), there are critiques from the behavioural finance that support the idea of maximum predictability (DeBondt, Thaler, 1985, Barber, Ordean, 2001). Grossman and Stiglitz (1980) even argue that a perfectly efficient market is impossible. In response to these critics, Campbell et al. (1997) proposed the concept of relative efficiency, which departs from all-or-nothing view. With relative market efficiency, it is useful to measure the degree of efficiency or return predictability. It is now widely believed that the degree of market efficiency changes over time (Kim et al., 2011). The common concept of these studies is the fact that the rejection/acceptance of random walk (RW) hypothesis is equivalent to the hypothesis of inefficiency/efficiency. According to Lazar (2011), the main characteristic of most studies regarding absolute efficiency is represented by the fact that conclusions are drawn upon the entire studied sample, without taking into account possible variations of the degree of market efficiency in time. A rejection of the hypothesis of efficiency over the whole sample could either mask sub-periods of efficiency, or the fact that markets are becoming more efficient over time (Lazar, 2011).

The globalization of financial markets increased interest on the study of the efficient market theory and the random walk hypothesis in individual or regional markets from: Europe (Smith, Ryoo, 2003, Worthington, Higgs, 2004, Belaire-Franch et al., 2007, Smith, 2009, Charles et al., 2009), North America (Kim et al., 2011), Latin America (Urrutia, 1995, Grieb, Reyes, 1999), Africa (Smith et al., 2002, Magnusson, Wydick, 2002), Asia (Huang, 1995, Groenewold, Ariff, 1998, Buy, 2006, Lim et. al., 2007, Kim and Shamsuddin, 2008), Middle East (Abraham et al., 2002, Al-Khayali et al., 2007); several studies reporting unconformity with random walk behavior, especially in the case of emerging markets (Borges, 2008).

The martingale properties of financial returns have been studied previously by many authors leading to mixed conclusions: Escanciano and Velasco (2006), Escanciano and Lobato (2007, 2009), Charles et al. (2010), Kim et al. (2010), Dominguez and Lobato (2003), Kuan and Lee (2004), LeBaron (1999), Levich and Thomas (1993), Diebold and Nason (1990) etc. Notable recent contributions to the category of MDH tests, based on linear and nonlinear measures of dependence, include: the automatic portmanteau (AQ) test of Escanciano and Lobato (2009), automatic variance ratio (AVR) test of Kim (2009) extending the earlier work of Choi (1999), the generalized spectral (GS) test of Escanciano and Velasco (2006) and the consistent tests of Dominguez and Lobato (2003) etc. (Charles et al. 2010).

In literature there are few studies investigating the effects of a financial crisis on the potential of predictability and implicitly on the degree of efficiency of financial markets.

The majority of these studies are focused on the Asian crisis in 1997 (Lazar, 2011). The occurrence of a market crash or financial crisis is a possible contributing factor of market inefficiency. Motivated by this concern, Hoque et al. (2007) examined the weak-form efficiency of eight emerging Asian stock markets using variance ratio tests for the pre-crisis (1990–1997) and post-crisis (1998–2004) periods. Their statistics showed that the crisis had no significant effect on the degree of efficiency, with six of the Asian markets (Hong Kong, Indonesia, Malaysia, Philippines, Singapore and Thailand) remaining inefficient even after the crisis, while the opposite occurs for South Korea. Taiwan is the only market that records improved efficiency from the pre-crisis to post-crisis period (Lim, Brooks, 2011).

Lim et al. (2007) investigated the impact of the 1997 financial crisis on the efficiency of eight Asian stock markets, applying the rolling bivariate correlation test statistics for the three periods: pre-crisis, crisis, and post-crisis. The results showed that the crisis adversely affected

the efficiency of most Asian stock markets, with Hong Kong being the hardest hit, followed by the Philippines, Malaysia, Singapore, Thailand and Korea. However, in the post-crisis period most of these markets recovered in terms of improved market efficiency. Using new multiple variance ratio tests, Kim and Shamsuddin (2006) also found that the Asian crisis does not coincide with a significant change in the level of market efficiency (Lim et al., 2007). The three statistical tests consistently showed that the stock markets of Hong Kong, Japan and Taiwan remain efficient even after the 1997 financial crisis (Lim, Brooks, 2011). Using the rolling Hurst exponents proposed by Cajueiro and Tabak (2004), the authors reported that the highest inefficiency is during the crisis periods, followed by pre-crisis, post-crisis and USD pegged period.

Lazăr (2011) investigated the effects of the Global crisis on the relative efficiency of ten Central and Eastern European emerging stock markets (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Turkey), using the Generalized Spectral test of Escanciano and Velasco (2006) in a rolling window approach. Surprisingly, during the crisis period there has been registered a decrease of predictability and an improvement of the degree of efficiency in the case of seven markets out of ten (Lazăr, 2011).

3. The data and its properties

The data of the study consists of daily closing values of ING unit-linked funds for three Central and Eastern European unit-linked insurance markets, respectively: Czech Republic (Bond Fund, Junior Fund, Shares Fund), Romania (Bond Fund, Mixt25 Fund, Equity Fund) and Poland (Bonds Sub-Fund, Balanced Sub-Fund, Shares Sub-Fund). In brackets are indicated the funds considered representative for each of these markets. All three ING Bond fund portfolios invest 100% in domestic instruments with fixed income. The ING mixed funds (Junior Fund, Mixt 25 Fund, Balanced Sub-Fund) invest 15-50% in shares issued by companies from the European Union, in particular Romania, Hungary, Poland and the Czech Republic, and instruments with fixed income denominated in national currency. And the rest of ING fund portfolios invest up to 100% of accumulated assets in shares of companies listed on the stock exchanges in Central and Eastern Europe (especially on the stock exchanges in the Czech Republic, Poland, Romania and Hungary).

All the closing prices of these funds collected from ING database are denominated in their respective local currency units. The daily data is taken from August 1, 1999 to December 31, 2012, except for two ING funds, for which the time series begin in September 1, 2004 (Czech Fund Shares) and October 8, 2008 (Equity Fund).

Table 1 provides the descriptive statistics for the continuously compounded percentage returns, computed as $Y_t = 100 * \ln(P_t / P_{t-1})$, where P_t and P_{t-1} denote the closing price of the unit-linked fund on two consecutive trading days; the statistics are computed for pre-crisis and crisis periods. To address the impact of the Global financial crisis on market efficiency, one has to first identify the crisis period (Lim et al. 2007). The division in pre-crisis and crisis periods requires the identification of the date when the crisis started in each market (Lazar, 2011). The downward trend started in most cases in the middle of 2008.

Table 1

Descriptive statistics of returns for pre-crisis and crisis periods

Market	Period	Mean	St.Dev.	Skewness	Excess Kurtosis	Jarque-Bera
Pre-crisis period						
Czech Republic						
Bond	1/8/99-2/20/08	0.000104	0.001392	0.162368	6.075187	846.26
Junior	1/8/99-2/20/08	0.000170	0.002172	-0.491330	7.525333	1897.82
Shares	1/9/04-2/20/08	0.000445	0.010435	-0.919218	7.316839	781.53

Market	Period	Mean	St.Dev.	Skewness	Excess Kurtosis	Jarque-Bera
Romania						
Bond	1/8/99-10/7/08	0.000560	0.001576	6.571417	60.089050	479464.10
Mixt 25	1/8/99-10/7/08	0.000603	0.004414	2.298820	42.861400	224940.10
Equity	-	-	-	-	-	-
Poland						
Bond	1/8/99-2/4/08	0.000291	0.001617	0.279303	9.763442	4099.00
Balanced	1/8/99-2/4/08	0.000390	0.006533	-0.241130	5.569085	608.12
Shares	1/8/99-2/4/08	0.000550	0.011234	-0.160489	5.107991	404.65
Crisis period						
Czech Republic						
Bond	2/21/08-12/31/12	0.000145	0.002416	-1.188515	16.879890	9931.61
Junior	2/21/08-12/31/12	0.000009	0.002722	-1.063124	16.018500	8714.62
Shares	2/21/08-12/31/12	-0.000251	0.015470	-0.203455	8.918596	1781.77
Romania						
Bond	10/8/08-12/31/12	0.000236	0.000874	-2.942031	81.478360	337802.50
Mixt 25	10/8/08-12/31/12	0.000248	0.004028	-0.253382	8.495162	1660.99
Equity	10/8/08-12/31/12	0.000181	0.015023	-0.358691	11.441590	3905.76
Poland						
Bond	2/5/08-12/31/12	0.000265	0.001871	-0.428689	8.915119	1830.84
Balanced	2/5/08-12/31/12	0.000063	0.015602	0.288149	319.595500	5136942.00
Shares	2/5/08-12/31/12	-0.000134	0.013648	-0.360981	5.711723	403.58

Note: Test is performed by the authors using software Eviews.

The markets' performance has been deeply affected by the Global financial crisis, the highest decreases in prices were recorded for the Czech Fund Shares and Poland Sub-fund Shares. During the pre-crisis period there have occurred significant increases of the ING unit-linked funds prices, especially for Czech Fund Shares, Romanian Bond Fund and Romania Mixt25 Fund and Poland Sub-Fund Bonds. The Global financial crisis had a significant impact also on volatility, the standard deviation of returns series recording an increase from pre-crisis to crisis period. During the crisis period the highest increases of volatility are found in the case of Romanian Equity Fund, Poland Balanced Sub-Fund and Poland Shares Sub-Fund. In general, the daily returns are negatively skewed, which means that large negative returns are more probable than the higher positive returns. During the pre-crisis and crisis periods the excess kurtosis is positive for all funds, which indicates an increased number of returns around the average, comparative to the normal law. The Jarque-Bera test rejects the null hypothesis of returns' normality in pre-crisis and crisis periods for all ING unit-linked funds.

4. Methodology

The behavior of the return series of the unit-linked insurance funds is examined by first applying the variance ratio tests proposed by Wright (2000) and Kim (2009), and, then, by applying the automatic portmanteau test of Escanciano and Lobato (2009).

Since the seminal work of Lo and MacKinlay (1988, 1989) and Poterba and Summers (1988), the standard variance ratio test or its improved modifications have been widely used for testing market efficiency, including the multiple variance ratio test of Chow and Denning (1993), sign and rank tests of Wright (2000), wild bootstrap test of Kim (2006), power-transformed test of Chen and Deo (2006) and automatic wild bootstrap test of Kim (2009). The variance ratio test is based on the property that, if return is purely random, the variance of k -period return (or k -period differences), $y_t - y_{t-k}$, of the time series y_t , is k times the variance of the one-period return (or the first difference), $y_t - y_{t-1}$ (Charles et al., 2010). It assumes that, for a random walk series, the variance of its k -differences is k times the variance of its first difference (Belaire-Franch, Opong, 2005). The variance ratio test evaluates the

hypothesis that a given time series or its first difference (or return), $x_t = y_t - y_{t-1}$, is a collection of independent and identically distributed observations (i.i.d.) or that it follows a MDS. Define the VR of k -period return as:

$$V(k) = \frac{\text{Var}(x_t + x_{t-1} + \dots + x_{t-k+1})/k}{\text{Var}(x_t)} = \frac{\text{Var}(y_t - y_{t-k})/k}{\text{Var}(y_t - y_{t-1})} = 1 + 2 \sum_{i=1}^{k-1} \left(\frac{k-i}{k} \right) \rho_i$$

Where ρ_i is the i -th lag autocorrelation coefficient of x_t .

The central idea of the variance ratio test is based on the observation that when returns are uncorrelated over time, we should have: $\text{Var}(x_t + x_{t-1} + \dots + x_{t-k+1}) = k\text{Var}(x_t)$, i.e. $V(k) = 1$ (Charles et al., 2010).

Wright (2000) proposes the alternative non-parametric variance ratio tests using ranks and signs of return and demonstrates that they may have better power properties than other variance ratio tests. Wright (2000) indicates two potential advantages of ranks and signs based tests. First, it is relatively simple to calculate their exact distributions. Size distortions are not a concern due to no need to conform to any asymptotic approximation. Second, tests based on ranks and signs may be more powerful than other tests if the data are highly non-normal (Gradojević et al., 2010).

Given T observations of asset returns $\{y_1, \dots, y_T\}$, Wright's proposed R_1 and R_2 are defined as:

$$R_1 = \left(\frac{\frac{1}{Tk} \sum_{t=k}^T (r_{1t} + r_{1t-1} \dots + r_{1t-k+1})^2}{\frac{1}{T} \sum_{t=1}^T r_{1t}^2} - 1 \right) \times \left(\frac{2(2k-1)(k-1)}{3kT} \right)^{-1/2}$$

$$R_2 = \left(\frac{\frac{1}{Tk} \sum_{t=k}^T (r_{2t} + r_{2t-1} \dots + r_{2t-k+1})^2}{\frac{1}{T} \sum_{t=1}^T r_{2t}^2} - 1 \right) \times \left(\frac{2(2k-1)(k-1)}{3kT} \right)^{-1/2}$$

Where:

$$r_{1t} = \left(r(y_t) - \frac{T+1}{2} \right) / \sqrt{\frac{(T-1)(T+1)}{12}}$$

$$r_{2t} = \phi^{-1}(r(y_t)/(T+1))$$

$r(y_t)$ is the rank of y_t among $y_1, \dots, y_T$ and ϕ^{-1} is the inverse of the standard normal cumulative distribution function (Belaire-Franch and Opong, 2005).

Let $s_t = 2u(y_t, 0)$, where function $u(x_t, q) = 1(x_t > q) - 0.5$, the signed-based variance-ratio statistic using s_t is defined as:

$$S_1 = \left(\frac{\frac{1}{Tk} \sum_{t=k}^T (s_t + s_{t-1} \dots + s_{t-k+1})^2}{\frac{1}{T} \sum_{t=1}^T s_{1t}^2} - 1 \right) \times \left(\frac{2(2k-1)(k-1)}{3kT} \right)^{-1/2}$$

Notable recent contributions to the category of MDH tests, based on linear and nonlinear measures of dependence, include: the automatic variance ratio (AVR) test of Kim (2009) and the automatic portmanteau (AQ) test of Escanciano and Lobato (2009).

Kim (2009) finds that small sample properties of Choi's (1999) test can be substantially improved, by employing the wild bootstrap (Kim et al., 2011). When the return

Y_t is subject to conditional heteroscedasticity, Kim (2009) suggested to employ the wild bootstrap of Mammen (1993) to improve small sample properties, as in Kim (2006) who applied the wild bootstrap to the Lo-MacKinlay and Chow-Denning tests.

Kim's (2009) wild bootstrap AVR test is conducted in three stages as follows:

1. Form a bootstrap sample of T observations $Y_t^* = \eta_t Y_t, (t=1, \dots, T)$ where η_t is a random sequence with zero mean ($E(\eta_t) = 0$) and unit variance ($E(\eta_t^2) = 1$);
2. Calculate $AVR^*(\hat{k}^*)$, the AVR statistic obtained from $\{Y_t^*\}_{t=1}^T$;
3. Repeat stage 1 and stage 2 B times to form a bootstrap distribution $\{AVR^*(\hat{k}^*; j)\}_{j=1}^B$.

The $100(1-2\alpha)\%$ confidence interval for the AVR can be obtained as $\{AVR^*(\alpha), AVR^*(1-\alpha)\}$, where $AVR^*(\alpha)$ denotes the α th percentile of $\{AVR^*(\hat{k}^*; j)\}_{j=1}^B$ (Kim et al., 2011). The test for H_0 against the two-tailed alternative is conducted to using the p -value, which is estimated as the proportion of the absolute values of $\{AVR^*(\hat{k}^*; j)\}_{j=1}^B$ greater than the observed statistic $AVR(k^*)$.

Kim (2009) found that the wild bootstrap AVR significantly improves the size and power properties of the AVR test. Furthermore, this wild bootstrap AVR test compares favorably to the other alternatives such as the wild bootstrap Chow-Denning test of Kim (2006), the power-transformed test of Chen and Deo (2006) and the joint sign test of Kim and Shamsuddin (2008), where the choice of holding periods k is arbitrarily made (Charles et al. 2010).

Testing for serial correlation has held a central role in the statistical analysis of economic time series since its inception (Yule, 1926). Also Peter Robinson was early concerned with the limitations of traditional tests for serial correlation. In particular, Robinson highlighted the importance of establishing tests for serial correlation, which took into account two features of economic time series that were largely ignored before: the first feature regarded the existence of nonlinear dependence, especially present in financial time series in the form of conditional heteroskedasticity and the second feature regarded the existence of strong dependence present in many macroeconomic time series.

In econometrics one of the most popular approaches for testing for serial correlation employs the so-called Portmanteau Box-Pierce test. The basic Box-Pierce statistic has been slightly modified to improve its finite sample performance, see Davies et al. (1977), Ljung and Box (1978), Davies and Newbold (1979) or Li and McLeod (1981). However, it still presents two main limitations: first, from a theoretical point of view, the test was developed under the independence assumption; second, from a practical point of view, the selection of the employed number of autocorrelations p is arbitrary. The Box-Pierce takes this form:

$$Q_p = n \sum_{j=1}^p \hat{\rho}_j^2, \text{ which is commonly implemented via the Ljung and Box (1978)}$$

$$\text{modification } LB_p = n(n+2) \sum_{j=1}^p (n-j)^{-1} \hat{\rho}_j^2.$$

Deo (2000) proposes a serial correlation test that is robust to conditional heteroskedasticity. Deo's analysis employs the martingale difference sequence assumption with conditional heteroskedasticity, and so, it is suitable for many financial models. Deo's test statistic can be written in the time domain as:

$$D_n := \sum_{j=1}^{n-1} n \tilde{\rho}_j^2 \left(\frac{1}{j\pi} \right)^2$$

The robustified Portmanteau statistic takes the form:

$$Q_p^* = n \sum_{j=1}^p \tilde{\rho}_j^2 \text{ where } \tilde{\rho}_j^2 = \hat{\gamma}_j^2 / \hat{\tau}_j \text{ and } \hat{\tau}_j = \frac{1}{(n-j)} \sum_{t=1+j}^n (Y_t - \bar{Y})^2 (Y_{t-j} - \bar{Y})^2$$

Escanciano and Lobato (2009) proposed an automatic test to modify the robustified Portmanteau test statistic by allowing the data to automatically select the number of autocorrelations employed. In particular, the proposed test statistic is the maximized value of the robustified Portmanteau statistic corrected by a penalty term that is an increasing function of the included number of autocorrelations. In addition the test allows the data to select whether Akaike Information Criterion (AIC) or Bayesian Information Criterion (BIC) is employed as the penalty function. The ideal test procedure would employ the BIC when the evidence points to the null hypothesis (the autocorrelations appear to be small), and would employ the AIC when the evidence points to the alternative (there is some correlation that appears to be large).

Formally, the proposed test statistic takes the form:

$$AQ = Q_p^* \text{ where } \tilde{p} = \min\{p : 1 \leq p \leq d; L_p \geq L_h, h = 1, 2, \dots, d\}, L_p = Q_p^* - \pi(p, n, q)$$

d is a fixed upper bound and $\pi(p, n, q)$ is a penalty term that takes the form:

$$\pi(p, n, q) = \begin{cases} p \log n, & \text{if } \max_{1 \leq j \leq d} \sqrt{n} |\tilde{\rho}_j| \leq \sqrt{q \log n} \\ 2p, & \text{if } \max_{1 \leq j \leq d} \sqrt{n} |\tilde{\rho}_j| > \sqrt{q \log n} \end{cases} \text{ where } q \text{ is some fixed number, } q = 2.4.$$

The automatic Portmanteau test for serial correlation proposed by *Escanciano and Lobato (2009)* is very attractive compared to the existing ones. The implementation of this test is extremely simple for two reasons: first, the researcher does not need to specify the order of the autocorrelation tested, since the test automatically chooses this number; second, its asymptotic null distribution is chi-square with one degree of freedom, so there is no need of using a bootstrap procedure to estimate the critical values. In addition, the test is robust to the presence of conditional heteroskedasticity of unknown form. Finally, the proposed test presents higher power in simulations than the existing ones for models commonly employed in empirical finance (*Escanciano and Lobato, 2009*).

5. Empirical results

In this section we test the validity of the martingale null hypothesis for: ING Czech Republic Bond Fund, Junior Fund and Shares Fund, ING Romania Bond Fund, Mixt25 Fund and Equity Fund, and ING Poland Bonds Sub-Fund, Balanced Sub-Fund and Shares Sub-Fund, using sign and rank tests of *Wright (2000)*, the automatic variance ratio (AVR) test of *Kim (2009)* and the automatic portmanteau (AQ) test of *Escanciano and Lobato (2009)*.

Table 2 summarizes the *Wright's* test statistics, using ranks (R1 and R2) and signs (S1), for entire, pre-crisis and crisis periods. The test statistics R1, R2 and S1 are using the following k aggregation values: 2, 5, 10 and 30. Bold letters indicate significant value at a 5% level of significance.

The results show that over the entire period, the martingale hypothesis is clearly rejected a 5% level of significance on the vast majority of markets, except for: ING Czech Republic Junior Fund at the aggregation level of 2, using both R1 and S1 test statistics; ING Czech Republic Shares Fund for the aggregation levels 5 and 10, using both R1 and R2 and for the aggregation levels 2 and 5 using S1; ING Poland Balanced Sub-Fund at the aggregation levels of 5, 10 and 30 using R1 and at the aggregation levels of 2, 5, 10 and 30 using S1; and ING Poland Shares Sub-Fund for the aggregation levels 5, 10 and 30 using S1. The length and the occurrence frequency of sub-periods where the martingale hypothesis is rejected vary from one market to another, denoting significant differences between markets in terms of time varying inefficiency and predictability. The high degree of predictability and

implicitly of inefficiency of the CEE unit-linked insurance markets is observed also in the two sub periods for the majority of ING funds. In the crisis period Wright's test statistics suggest a surprising increase of the degree of efficiency except for ING Czech Republic Bond Fund for all aggregation levels.

Table 2

The Wright's test statistics for the entire, pre-crisis and crisis periods

	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period
Fund	ING Czech Republic Bond Fund			ING Czech Republic Junior Fund			ING Czech Republic Shares Fund		
R1									
k=2	9.7797	8.5129	5.0996	1.5695	0.8690	1.3447	2.0298	1.8206	1.3225
k=5	12.5038	9.2238	8.1369	2.0168	1.4288	1.2975	0.6959	0.9348	0.1022
k=10	12.4118	8.7384	8.3388	2.9464	2.4448	1.4563	0.8118	0.8225	0.1486
k=30	13.0109	9.4850	8.1211	4.8775	3.1313	3.3613	1.8961	0.5943	1.3087
R2									
k=2	9.8610	8.2801	5.4396	2.0769	0.3259	2.4873	2.8994	1.8215	2.2919
k=5	12.7870	9.2535	8.2621	2.8329	1.3527	2.4379	1.2537	1.2622	0.6546
k=10	12.4565	8.6058	8.2374	3.7302	2.4413	2.5071	1.0462	0.9188	0.4516
k=30	12.2209	9.1964	7.2612	5.5928	3.2307	4.1562	1.8795	0.4207	1.5067
S1									
k=2	6.2423	5.5343	2.9144	1.8033	1.9316	0.3751	0.8578	2.0225	-0.6314
k=5	8.3133	5.6901	6.1533	2.2604	2.4409	0.5268	1.0441	2.5034	-0.7231
k=10	8.4572	5.3339	6.7464	3.1635	3.0661	1.1503	2.2006	3.3606	0.0102
k=30	10.0345	6.2278	8.2845	4.0265	3.2018	2.3195	3.0979	2.9490	1.5372
	ING Romania Bond Fund			ING Romania Mixt25 Fund			ING Romania Equity Fund		
R1									
k=2	15.0243	16.6782	0.9633	6.7756	6.4648	2.6581	-	-	1.6375
k=5	11.6422	12.5602	0.4907	5.4677	4.7475	2.4934	-	-	1.4100
k=10	23.6755	24.4257	3.9097	5.1952	5.0286	1.6890	-	-	0.8323
k=30	49.0660	50.6560	8.9007	7.1263	6.5806	1.8745	-	-	1.2315
R2									
k=2	10.9274	13.1050	-0.8170	6.6011	5.9915	2.7060	-	-	1.8216
k=5	7.6655	8.2777	-1.3294	5.4503	4.6070	2.2662	-	-	1.4028
k=10	18.0265	18.6977	1.3879	5.3764	4.8564	1.7509	-	-	0.9570
k=30	39.4801	41.7015	4.8406	7.4023	6.0921	2.0796	-	-	1.2619
S1									
k=2	24.2828	21.7284	10.9494	14.9680	14.3359	5.1982	-	-	3.4602
k=5	28.5524	22.4463	17.7393	13.5141	13.0869	4.3313	-	-	2.6281
k=10	46.9775	37.9065	27.6076	19.6377	19.9058	4.8546	-	-	3.7861
k=30	87.4947	72.3988	47.9885	35.3423	35.8821	7.5417	-	-	7.1550
	ING Poland Bonds Sub-Fund			ING Poland Balanced Sub-Fund			ING Poland Shares Sub-Fund		
R1									
k=2	8.7663	9.2023	2.9049	3.6988	3.3002	1.8354	3.9675	3.2918	2.2965
k=5	7.8087	8.7619	1.9185	1.9969	2.7971	-0.1945	2.5309	2.9303	0.4238
k=10	8.2312	9.6179	1.6210	1.3991	2.4394	-0.7600	1.8732	2.6159	-0.3357
k=30	10.4182	12.1221	1.9560	1.7567	2.4505	-0.2885	2.4883	2.9278	0.1914
R2									
k=2	9.6147	9.7980	3.6302	4.5259	3.7308	2.5828	4.9981	3.8025	3.1544
k=5	8.7687	9.6756	2.4835	3.0980	4.0086	0.4449	3.7006	4.0614	1.0747

	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period
k=10	9.1356	10.3744	2.2735	2.3675	3.6951	-0.2845	2.8530	3.7869	0.0747
k=30	11.0525	12.6916	2.3928	2.4610	3.1731	0.1002	3.2171	3.5516	0.6105
S1									
k=2	7.9632	7.2068	3.6797	1.7926	1.2769	1.2266	2.0684	1.1903	1.9112
k=5	9.1952	8.9932	3.3747	0.0692	0.2371	-0.1875	0.7112	0.6480	0.3125
k=10	11.8720	12.0493	3.7460	0.1674	0.4987	-0.4140	0.3471	0.4679	-0.1707
k=30	18.1756	18.0312	6.1850	1.0231	1.6620	-0.5702	1.2963	1.8543	-0.3525

Note: Wright's test is performed by the authors using software R.

In crisis period the martingale null hypothesis is accepted at a 5% level of significance for: ING Czech Republic Junior Fund at the aggregation levels of 2, 5 and 10, using both R1 and S1 test statistics; ING Czech Republic Shares Fund for the aggregation levels 2, 5, 10 and 30, using both R1 and S1 and for the aggregation levels 5, 10 and 30 using R2; ING Romania Bond Fund for the aggregation levels 2 and 5 using R1 and for the aggregation levels 2, 5 and 10 using R2; ING Romania Mixt25 Fund for the aggregation level 10, using both R1 and R2; ING Romania Equity Fund for all the aggregation levels using R1 and for the aggregation levels 5, 10 and 30 using R2; ING Poland Bonds Sub-Fund for the aggregation level of 10 using R1; ING Poland Balanced Sub-Fund at all the aggregation using R1 and S1 and at the aggregation levels of 5, 10 and 30 using R2; and ING Poland Shares Sub-Fund for the aggregation levels 5, 10 and 30 using R1, R2 and S1 test statistics.

Table 3 summarizes the p values for the automatic wild bootstrap variance ratio of Kim (2009), for entire, pre-crisis and crisis periods. Bold letters indicate significant value at a 5% level of significance.

Table 3

The AVR test statistics for the entire, pre-crisis and crisis periods

	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period
	ING Czech Republic Bond Fund			ING Czech Republic Junior Fund			ING Czech Republic Shares Fund		
AVR Test.stat.	9.7269	7.3216	5.8145	2.7730	-0.3696	3.7513	1.5242	1.4218	0.9591
p-value	0	0	0	0.076	0.659	0.035	0.231	0.113	0.384
	ING Romania Bond Fund			ING Romania Mixt25 Fund			ING Romania Equity Fund		
AVR Test.stat.	5.4734	4.8729	-1.7140	3.7193	3.1708	1.1974	-	-	0.5235
p-value	0	0	0.448	0	0.001	0.264	-	-	0.641
	ING Poland Bonds Sub-Fund			ING Poland Balanced Sub-Fund			ING Poland Shares Sub-Fund		
AVR Test.stat.	10.7972	10.8967	3.9015	-8.4145	3.1641	-7.8250	3.9069	3.2538	1.8755
p-value	0	0	0.008	0.09	0	0.08	0	0	0.047

Note: AVR test is performed by the authors using software R.

Over the entire period, the test statistics show that the martingale hypothesis is clearly rejected on the vast majority of markets, except for ING Czech Republic Junior Fund, ING Czech Republic Shares Fund and ING Poland Balanced Sub-Fund, at 0.05 significant level. In general, the high degree of predictability and implicitly of inefficiency of the three CEE unit-linked insurance markets is observed also in the pre-crisis period, except for ING Czech

Republic Junior Fund and ING Czech Republic Shares Fund. Focusing on the issue of whether the Global crisis led to a change in the degree of efficiency of CEE markets, the empirical results suggest a surprising increase of the degree of efficiency in the crisis period, except for ING Czech Republic Bond Fund and ING Poland Bonds Sub-Fund.

The empirical p-values for AQ , Q_p^* ($p = 1, 5, 10, 15$ and 20) and D_n are reported in Table 4. The automatic Portmanteau (AQ) test of Escanciano and Lobato (2009) rejects the null hypothesis at 5% and overcomes the problem of the choice of p . Bold letters indicate significant value at a 5% level of significance.

Table 4

The p-values for the automatic portmanteau (AQ) test of Escanciano and Lobato (2009)

	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period
	ING Czech Republic Bond Fund			ING Czech Republic Junior Fund			ING Czech Republic Shares Fund		
AQ	0.0613	0.2046	0.0287	0.0016	0.0001	0.0142	0.0067	0.0063	0.0051
Q1	0.0613	0.2046	0.0287	0.0016	0.0001	0.0142	0.0067	0.0063	0.0051
Q5	0.1336	0.2379	0.1082	0.0053	0.0050	0.0216	0.0076	0.0071	0.0071
Q10	0.1360	0.2436	0.1154	0.0134	0.0554	0.0273	0.0082	0.0361	0.0082
Q15	0.1362	0.2803	0.1167	0.0137	0.0583	0.0279	0.0102	0.0376	0.0147
Q20	0.1449	0.2966	0.1253	0.0226	0.0635	0.0382	0.0198	0.0392	0.0334
Dn	0.0080	0.0215	0.0050	0.0003	0.0003	0.0017	0.0008	0.0009	0.0008
	ING Romania Bond Fund			ING Romania Mixt25 Fund			ING Romania Equity Fund		
AQ	0.0051	0.0157	0.0059	0.0124	0.0062	0.0032	-	-	0.0003
Q1	0.0051	0.0157	0.0059	0.0124	0.0062	0.0032	-	-	0.0003
Q5	1.3975	3.8941	0.0074	0.0134	0.0071	0.0057	-	-	0.0036
Q10	2.8007	6.2307	0.0530	0.0145	0.0086	0.0068	-	-	0.0055
Q15	4.0693	8.0849	0.1001	0.0215	0.0114	0.0366	-	-	0.0150
Q20	4.5945	9.3587	0.1102	0.0285	0.0138	0.0423	-	-	0.0158
Dn	0.0226	0.0555	0.0010	0.0013	0.0007	0.0006	-	-	0.0003
	ING Poland Bonds Sub-Fund			ING Poland Balanced Sub-Fund			ING Poland Shares Sub-Fund		
AQ	0.3279	0.4813	0.0462	0.0001	0.0310	0.0005	0.1145	0.0454	0.0806
Q1	0.3279	0.4813	0.0462	0.0001	0.0310	0.0005	0.1145	0.0454	0.0806
Q5	0.3396	0.5258	0.0475	0.0029	0.0385	0.0105	0.1156	0.0566	0.0831
Q10	0.3482	0.5539	0.0478	0.0043	0.0417	0.0142	0.1179	0.0606	0.0866
Q15	0.3635	0.6304	0.0570	0.0053	0.1064	0.0157	0.1286	0.1130	0.0872
Q20	0.3996	0.6734	0.0694	0.0055	0.1073	0.0169	0.1288	0.1134	0.0889
Dn	0.0335	0.0498	0.0049	0.0001	0.0033	0.0004	0.0117	0.0048	0.0084

Note: For automatic portmanteau test construction the authors made an implementation of algorithms that describe the whole process in C++ programming language.

The AQ test statistics show that over the entire period, the martingale hypothesis is clearly rejected on the vast majority of markets, except for ING Czech Republic Bond Fund, ING Poland Bonds Sub-Fund and ING Poland Shares Sub-Fund, at 0.05 significant level. For the ING Romania Bond Fund we observe that, although AQ test clearly rejects the null hypothesis, the robustified Box-Pierce test does not reject it at 5% when $p=5, 10, 15$ and 20 .

The high degree of predictability and implicitly of inefficiency of the three CEE unit-linked insurance markets is observed also in the two sub periods for the majority of ING funds. In pre-crisis period AQ test statistics show that ING Czech Republic Bond Fund and ING Poland Bonds Sub-Fund returns are serially uncorrelated. We observe conflicting results for the robustified Box-Pierce test for different values of p : for ING Czech Republic Junior Fund the test does not reject the null at 5% when $p=10, 15, 20$; for ING Romania Bond Fund the test does not reject the null at 5% when $p=5, 10, 15, 20$; for ING Poland Balanced Sub-Fund the test does not reject the null at 5% when $p=15, 20$ and for ING Poland Shares Sub-Fund the test does not reject the null at 5% when $p=5, 10, 15, 20$.

In crisis period, AQ and robustified Box-Pierce test statistics show that ING Poland Shares Sub-Fund returns are serially uncorrelated. We again observe conflicting results for the robustified Box-Pierce test for different values of p : for ING Czech Republic Bond Fund the test does not reject the null at 5% when $p=5, 10, 15, 20$; for ING Romania Bond Fund the test does not reject the null at 5% when $p=10, 15, 20$; and for ING Poland Bonds Sub-Fund the test does not reject the null at 5% when $p=15, 20$. In pre-crisis period Deo's test statistic D_n shows that ING Romania Bond Fund returns are serially uncorrelated.

6. Conclusions

The predictability of stock returns on the basis of past price changes has been extensively investigated given its direct implication on weak-form market efficiency. The vast majority of the literature implicitly assumes the level of market efficiency remains unchanged throughout the estimation period. However, the possibility of temporal instability in the underlying economic relations has received increasing attention from economists (Lim, Brooks, 2011). It is now widely believed that the degree of market efficiency changes over time (Kim et al., 2009). Also a rejection of the hypothesis of efficiency over the whole sample could either mask sub-periods of efficiency, or the fact that markets are becoming more efficient over time (Lazar, 2011). Most of the efficient market hypothesis (EMH) studies on financial markets are tested for the weak-form efficiency through the martingale difference hypothesis (MDH), where the current price is the best predictor of the future price and the returns are independent (or uncorrelated) with the past values. If the asset price follows a martingale difference sequence (MDS), then the market is weak-form efficient, and hence not predictable, and no market participant is able to make abnormal profit (Charles et al., 2010).

Though the literature on the Global financial crisis is extensive and the efficient market theory and the random walk hypothesis have been major issues in financial literature for the past forty years, this paper empirically investigates an issue which is surprisingly understudied in the literature: it tests the effects of the Global financial crisis on the relative efficiency or return predictability of three European emerging unit-linked insurance markets, using sign and rank tests of Wright (2000), the automatic variance ratio (AVR) test of Kim (2009) and the automatic portmanteau (AQ) test of Escanciano and Lobato (2009) for the entire, pre-crisis and crisis periods. Wright (2000) indicates two potential advantages of ranks and signs based tests: first, it is relatively simple to calculate their exact distributions; and second, tests based on ranks and signs may be more powerful than other tests if the data are highly non-normal (Gradojević et al., 2010). Kim (2009) found that the wild bootstrap AVR significantly improves the size and power properties of the AVR test (Charles et al. 2010). The automatic Portmanteau (AQ) test of Escanciano and Lobato (2009) is very attractive compared to the existing ones: first, the researcher does not need to specify the order of the autocorrelation tested, since the test automatically chooses this number; second, its asymptotic null distribution is chi-square with one degree of freedom, so there is no need of using a bootstrap procedure to estimate the critical values. In addition, the test is robust to the presence of conditional heteroskedasticity of unknown form (Escanciano and Lobato, 2009).

The tests statistical findings show that the degree of the markets' inefficiency varies through time. Only in the case of ING Czech Republic Junior Fund and ING Czech Republic

Shares Fund, the AVR test statistics accept the martingale null hypothesis for the entire period and for the two sub periods. In general the statistical findings suggest that the ING unit values that register an increase of predictability correspond to ING less risky funds that invest 50-100% in domestic instruments with fixed income. Table 5 summarizes the results of all the tests performed.

Table 5

Summary of test results: Martingale null hypothesis rejected?

	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period	The entire period	Pre-crisis period	Crisis period
	ING Czech Republic Bond Fund			ING Czech Republic Junior Fund			ING Czech Republic Shares Fund		
Wright	YES	YES	YES	YES	NO	NO	YES	NO	NO
AVR	YES	YES	NO	NO	NO	NO	NO	NO	NO
AQ	NO	NO	YES	YES	YES	YES	YES	YES	YES
	ING Romania Bond Fund			ING Romania Mixt25 Fund			ING Romania Equity Fund		
Wright	YES	YES	NO	YES	YES	NO	-	-	NO
AVR	YES	YES	NO	YES	YES	NO	-	-	NO
AQ	YES	YES	YES	YES	YES	YES	-	-	YES
	ING Poland Bonds Sub-Fund			ING Poland Balanced Sub-Fund			ING Poland Shares Sub-Fund		
Wright	YES	YES	YES	NO	YES	NO	YES	YES	NO
AVR	YES	YES	YES	NO	YES	NO	YES	YES	NO
AQ	NO	NO	YES	YES	YES	YES	NO	YES	NO

Although these empirical tests show mixed results due to the existence of linear and nonlinear dependence in financial time series, surprisingly the AVR and Wright's empirical results suggest that the Global crisis led to a decrease of predictability and hence to an improvement of relative efficiency for seven of the nine ING funds and AQ test results suggest that the Global crisis led to a decrease of predictability and hence to an improvement of relative efficiency for one of the nine ING funds. On the other hand, an opposite result, that of a decrease of efficiency's degree in the crisis period, was observed by Wright's test statistics for ING Czech Republic Bond Fund and ING Poland Bonds Sub-Fund, by AVR statistics for ING Czech Republic Bond Fund and ING Poland Bonds Sub-Fund, and the AQ statistics accept the martingale null hypothesis only in the case of ING Poland Shares Sub-Fund.

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DEVELOPMENTS IN THE INSURANCE INDUSTRY IN EUROPE IN ECONOMIC AND FINANCIAL CRISIS

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Abstract. *This paper analyzes the evolution of the insurance sector in Europe, focusing on the European Union member states, and considering the impact of economic and financial crisis on that sector. The European private insurance market is a developed market having an investment portfolio of 7740 billion Euro in 2011, an amount corresponding to 55% of the GDP of the 32 European markets members of Insurance Europe. Therefore, the importance of this sector as a long-term investor and major employer is obvious for the stability and growth of European economy. However, the insurance sector has been considerably affected since 2009 due to the global financial and economic crisis, which has had negative effects not only on the evolution of the value of insurance premiums underwritten, but also on the return on investment of the insurance companies.*

Keywords: insurance; gross premiums; household consumption expenditure; expenditure on insurance.

JEL Classification: G22.

REL Classification: 11C.

1. Introduction

With an investment portfolio of European insurers of 7740 billion euro in 2011, an amount corresponding to 55% of the GDP of the 32 European markets members of Insurance Europe (EIF, 2013), the private insurance industry has an obvious importance as a long-term investor and significant employer for the stability and economic growth in Europe. The insurance market in Europe is a developed market, including direct insurance companies and reinsurance companies, insurance and reinsurance companies, mutual associations, the Lloyd's syndicates, the insurance pools.

Insurance is especially important as it provides individuals and businesses safety, giving them the opportunity to live and work in a stable environment. They are designed to transfer risk and settle claims, and also to encourage savings, reduce potential losses, or efficiently allocate capital.

2. Overview of the insurance industry in Europe

According to Insurance Europe (EIKF, 2012), in 2011, the insurance industry in Europe faced slow economic growth, low interest rates and the need to reduce public and private spending. In this context, in 2011 total premiums underwritten amounted to 1072 billion euros, recording a decline of 3.2% as to the previous year, given that, in 2010, their value increased to 2.4 % over the previous year. Life insurance premiums, which represent 60% of total insurance premiums, fell by 7% in 2011 (633 billion Euro), after an increase of 2.7% in 2010 over the previous year. The main driver factor of this downward evolution is considered the economic crisis, which had a negative impact on the level of expenditure per household, causing consumers to invest in shorter-term savings products, especially those offered by banks.

At the same time, the value of insurance premiums increased by 2.7% in 2011, reaching 439 billion Euro; that increase was due mainly to the car insurance and health insurance sectors, which represent about 30% and, respectively, 25% of the general insurance market. Car insurance premiums reached 129 billion Euros in 2011, an increase of 4% over 2010, compared with an increase of only 1.2% in 2010 as to 2009. Health insurance premiums reached a record 112 billion Euros in 2011, an increase of 3% over the previous year; the main driver of that development was increased demand due to aging population and high medical costs. With a market share of 20%, property insurance also saw an increase of over 2% in 2011 compared to the previous year, reaching 86 billion euros (EIF, 2012).

Benefits and total compensation paid by European insurance companies increased by 7.5% in 2011 over the previous year, reaching 930 billion Euros. Benefits paid for life insurance rose by over 15% in 2011, to 619 billion Euros, while claims for general insurance, including health insurance benefits, increased by nearly 2%, reaching 310 billion Euros. Among the latter, health insurance benefits paid increased by over 5% in 2011 (88 billion Euros), car insurance claims paid fell by almost 2% (100 billion Euros), while damage to property insurance decreased by 4% (55 billion Euros).

On average in 2011, 1816 euro per person was spent on security in the European states member of Insurance Europe (2013), 68 Euros less than in 2010. Of that total sum, 1,072 euro was spent on life insurance in 2011, and out of the rest of 744 Euros spent on insurance, 190 Euros was spent on health insurance. Insurance penetration in Europe decreased from 8.2% in 2010 to 7.6% in 2011, given the nominal GDP growth of 3.7% and total insurance premiums decrease by 3.2% in 2011. A greater decrease was recorded, in the year 2011, in the rate of penetration of life insurance, from 5% in 2010 to 4.5% in 2011, while the penetration rate of general insurance fell to 3.1% (compared to 3.2% in 2010).

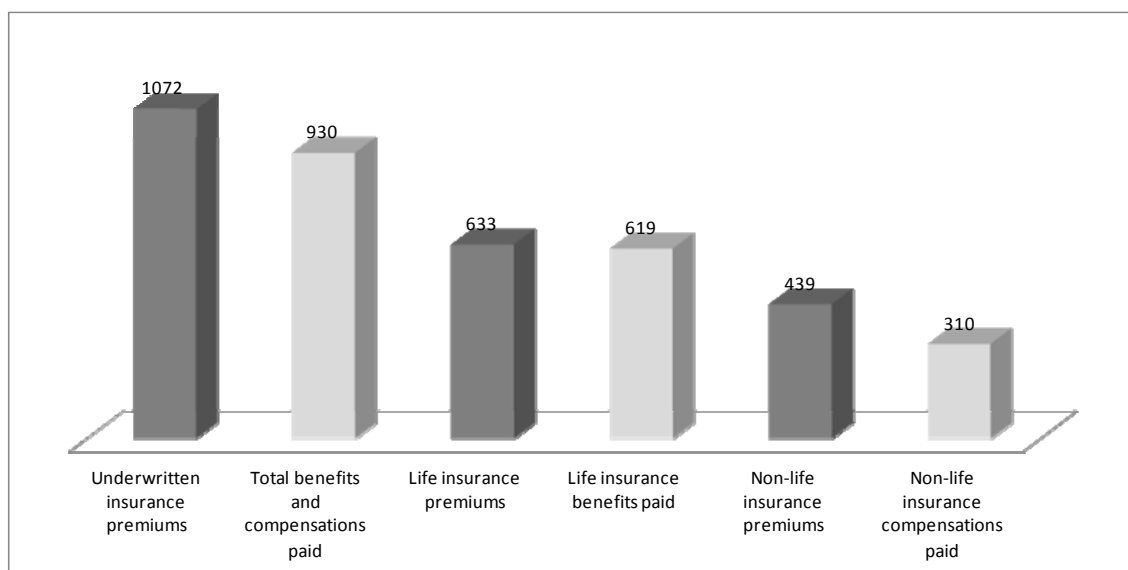
In spite of the difficulties faced by the insurance industry in 2011, the total value of the European insurers' investment portfolio increased by 2.6% in 2011, reaching 7740 billion Euros, which represents an increase of 18% compared to the value recorded in 2008 (EIF, 2013). As, in the year 2011, GDP grew faster than the total investment portfolio of the European insurers, the average rate of investment portfolio in GDP fell from 56% in 2010 to 55%.

As far as the number of companies active in the insurance market in Europe is concerned, in 2011 their number decreased by approximately 3% to nearly 5500, essentially as a result of the decrease in the number of insurance companies by nearly 8% in the UK, which is the largest market in Europe in this regard, with about 1200 insurance companies in 2011. Regarding the number of employees in the insurance industry, the European market was stable, with an estimated 960000 employees in 2010, compared with a decrease by 5% in 2009. In 2010, over 86% of those employees worked in the insurance industry full time, plus the approximately 1 million people employed as independent insurance intermediaries or outsourcing services (EIF, 2013).

3. Characteristic features of the European insurance market

A number of factors had a negative impact on the development of insurance industry in Europe in 2011, of which we should mention the following: restrictions on bank lending, which led to a reduction in credit in the real economy, the efforts by both public and private sectors to reduce debt in most European countries, which caused a decrease in total household expenditure, increasing the value of benefits and claims paid by insurers due to natural disasters, especially the floods in Europe, increased volatility in capital markets, particularly in the "Euro zone", which affected the investment environment (GIMAR, 2012).

According to the European Insurance (2013), the European insurance market represents 36% of the global market, followed by the North American market (29%) and the Asian market (28%), with a total of 1072 billion Euros underwritten insurance premiums, and 930 billion Euros benefits and total compensation paid in 2011, as shown in Figure 1.



Source: European insurance in figures, 2013.

Figure 1. Indicators insurance market in Europe in 2011 (billion Euros)

In the context of difficult economic conditions, the total value of the premiums underwritten decreased in 2011 by 3.2%, compared with a 2.4% increase in 2010 compared to the previous year. As shown in Table 1 (EIF, 2013), the downward 2011 trend of the total premiums written is due to the 6.9% decrease in the amount of total life insurance premiums, virtually cancelling the 2.7% increase in the value of the general insurance premiums.

Table 1

Evolution of European insurance market in 2009-2011

	Total premiums underwritten (billion Euros)			Nominal increase (current exchange rate, in %)		Nominal increase (constant exchange rate, in %)	
	2009	2010	2011	2009/10	2010/11	2009/10	2010/11
Life insurance	648	677	633	4.4	-6.5	2.6	-6.9
General insurance	413	427	439	3.4	2.9	2.0	2.7
Total	1061	1104	1072	4.0	-2.8	2.4	-3.2

Source: European insurance in figures, 2013.

Although the amount of the premiums underwritten decreased by 3.2% in 2011, the benefits and claims paid by insurers increased by 7.5%, reaching the figure of 930 billion euro. The largest increase, 15.4%, was recorded in the life insurance segment, while the value of benefits and claims paid on the general insurance segment increased by only 1.7%, as shown in Table 2.

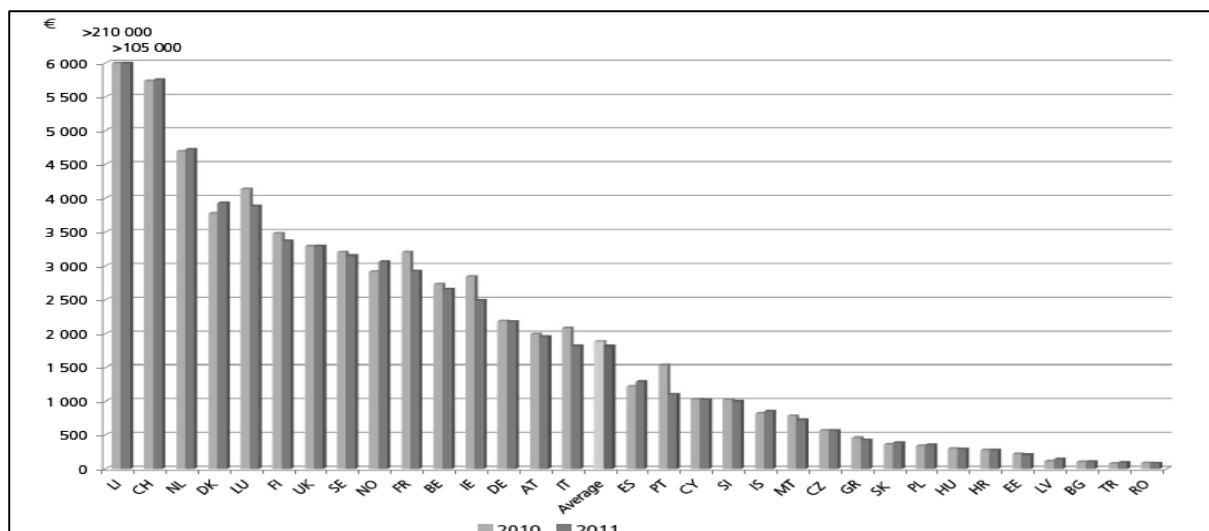
Table 2

Evolution of benefits and claims paid in Europe in 2009-2011

	Benefits and claims paid (billion Euros)			Nominal increase (current exchange rate, in %)		Nominal increase (constant exchange rate, in %)	
	2009	2010	2011	2009/10	2010/11	2009/10	2010/11
Life insurance	529	554	619	4.6	11.9	2.5	15.4
General insurance	292	310	310	6.0	0.1	4.5	1.7
Total	822	864	930	5.1	7.7	3.2	7.5

Source: European insurance in figures, 2013.

In terms of density, the average per capita expenditure for insurance was 1,816 Euros in Europe in 2011, including life insurance 1072 Euros and 744 Euros general insurance. However, insurance premiums vary considerably from country to country, the largest amount being in Liechtenstein, with 100000 euro per capita, and the lowest in Romania, with a premium of only 100 Euros per capita (Figure 2).

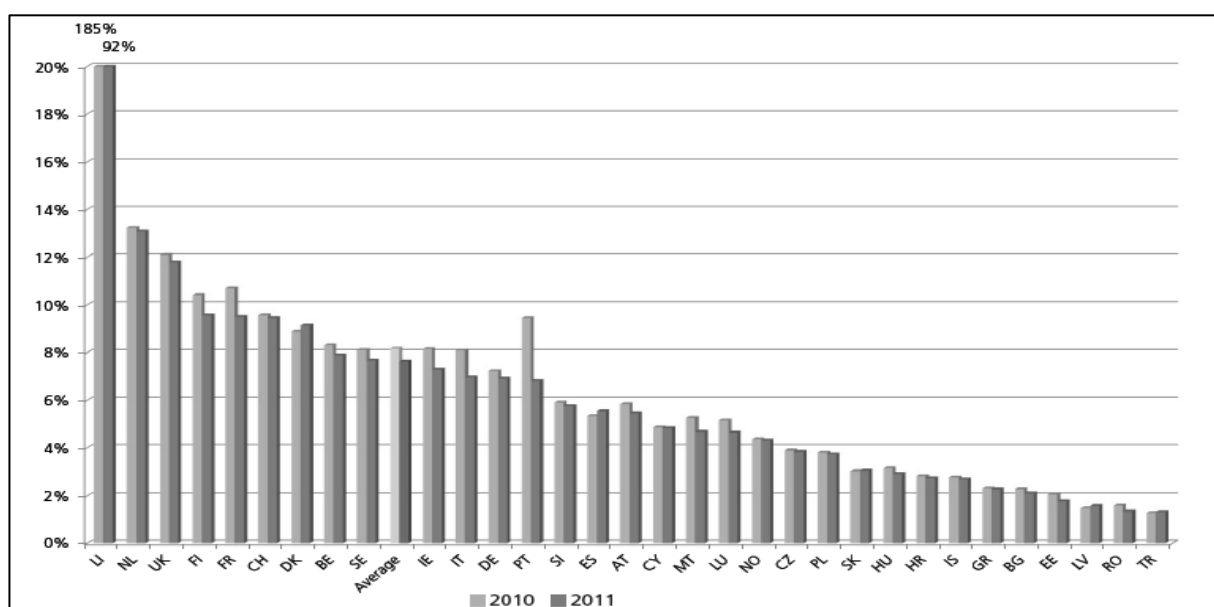


Source: European insurance in figures, 2013.

Figure 2. The insurance premiums per capita (in Euros, calculated at constant exchange rates)

In Western Europe it is the premiums paid for life insurance that preponderated, whereas in Central and Eastern Europe the expenses are directed primarily towards general insurance.

At a European level, the insurance penetration rate decreased from 8.2% in 2010 to 7.6% in 2011, with major differences from country to country. The highest penetration rate was recorded in 2011 in the Netherlands (13.1%), followed by the UK (11.8%), and the lowest rate was recorded in Turkey (1.3%), as shown in Figure 3.



Source: European insurance in figures, 2013.

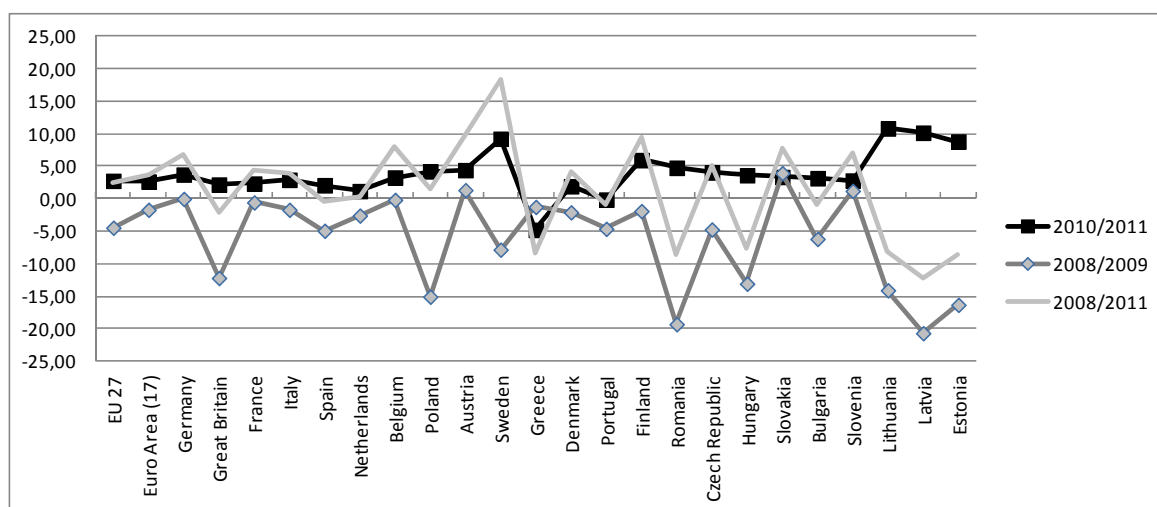
Figure 3. The ratio of total insurance premiums to GDP

In 2011, in the 32 member states of Insurance Europe (2013) 5500 insurance market insurance companies operated, 3% less than in the previous year. The largest decreases in the number of companies were recorded in 2011 in the Netherlands (14%, from 263 companies in 2010 to 227 in 2011), the UK (8%, from 1,314 in 2010 to 1,213 in 2011) and France (2%, from 441 in 2010 to 434 in 2011). On the other hand, the largest increase in the number of companies, 14%, was recorded in Bulgaria (from 367 in 2010 to 417 in 2011), though Bulgaria's share of total insurance premiums in Europe, is only 0.1%.

Regarding the number of employees in the insurance companies, the latest data available (from the year 2010) show that it remained stable at 960000 (a number that excludes the approximately one million employees working as intermediaries), after a decrease of 5% in 2009 compared to the previous year. Germany remained, in 2010 too, the country having the largest number of employees in the insurance sector (216400 people), followed by France (about 148000 employees) and the UK (about 120000 employees).

The main explanation for the fall in the value of insurance premiums per capita is certainly the impact of the economic and financial crisis on household consumption expenditure. Classical studies (Deaton, Muellbauer, 1980) show that, in times of recession, individuals tend to further reduce certain categories of expenditures that are not considered essential (for example, expenses on leisure or recreational activities), trying at the same time to maintain the comfort of home (e.g. utilities or food expenses). Other studies (Kamakura, Du, 2012) suggest that in times of economic crisis, some private spending, having lower "social-cultural visibility", are considered less essential, among them the cost of life insurance and general insurance (mainly car insurance).

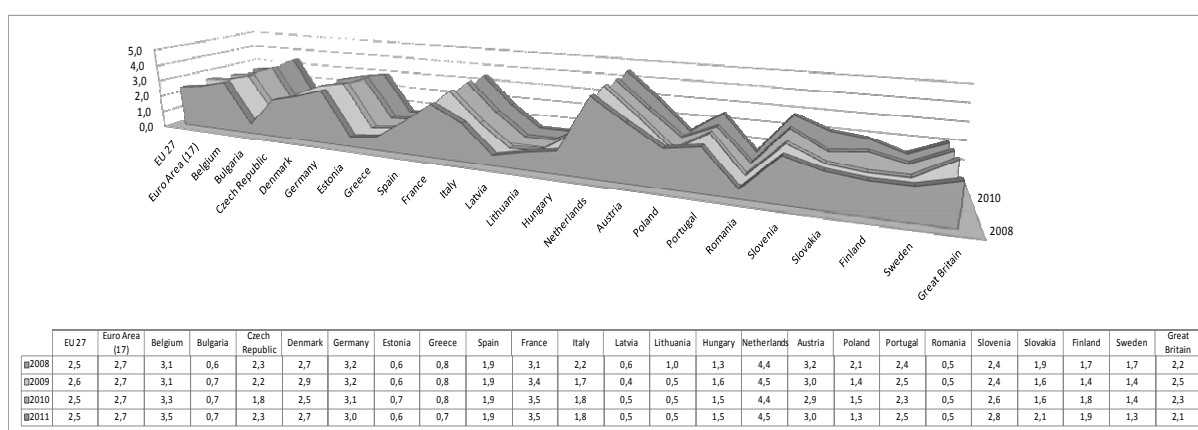
According to Eurostat data (2013), in the European Union the effects of the global economic and financial crisis caused a dramatic decrease in consumer spending per household in 2008-2011, and especially in 2009 compared with 2008 (Figure 4). In 2009, with a few exceptions (Austria with a 1.33% growth, Slovakia with 3.95%, and Slovenia with 1.22%), all EU countries suffered massive declines in household consumption expenditure in absolute figures (million Euros), the largest reductions being recorded in: Latvia (20.68%), Romania (19.31%), Estonia (16.32%), Lithuania (14.08%), Hungary (13.07%) and the UK (12.19%). While in 2011 the value of household consumption expenditure grew in most EU countries (except Greece and Portugal, where household consumption expenditure continued to decline by 4.79%, respectively 0.14% compared to 2010), the 2009 decrease was not fully recovered, and the differences between 2008 and 2011 are still significant in Latvia (12.35%), Estonia (8.74%), Romania (8.59%), Greece (8.42%), Lithuania (8.14%) and Hungary (7.56%).



Source: Eurostat, 2013.

Figure 4. Household consumption expenditure in the EU (million Euros)

In 2011, the average insurance expenses as a percentage of total household consumption expenditure remained relatively constant, rising to 2.5% in the EU-27, and 2.7% in the countries of the “Euro zone”. The largest percentage of total household consumption expenditure was spent for insurance in the Netherlands (4.4% in 2008 and 4.5% in 2011), France and Belgium (3.1% in 2008 and 3.5 % in 2011), Germany and Austria (3.2% in 2008 and 3.0% in 2011). In contrast, the lowest insurance expenses were recorded in 2011 in Romania, Latvia and Lithuania, with only 0.5% of the total consumption expenditure of households (Figure 5).



Note: For Bulgaria and Spain, the latest data are from 2010, and for Romania and Lithuania the latest data are from 2009.

Source: Eurostat, 2013 .

Figure 5. EU insurance expenses (% of total consumption expenditure per household)

The amounts of insurance expenses varied widely from country to country in the EU in 2008-2011 (Figure 6). For example, some countries recorded decreases in insurance expenses in 2011 as a percentage of the total consumption expenditure per household and as compared to the previous year, as well as compared to 2008: in Germany, spending fell by 0.1% compared to 2010 and to 0.2% by 2008; in Sweden, decreased 0.1% compared to 2010 and by 0.4% compared to 2008; in the UK fell by 0.2% compared to 2010 and by 0.1% compared to 2008. The largest decreases in insurance expenses were recorded in 2011 in Poland (falling by 0.8% compared to 2008), Lithuania (0.5% compared to 2008) and Italy (0.4% compared to 2008). At the other extreme, some countries saw increases in insurance expenses as a percentage of the total consumption expenditure of households (Belgium and Slovenia 0.2% more in 2011 than in 2010 and 0.4% more than in 2008, Slovakia 0.5% more in 2011 than in 2010 and 0.2% more than in 2008, the Czech Republic 0.5% more in 2011 than in 2010, and France 0.4% more in 2011 compared to 2008).

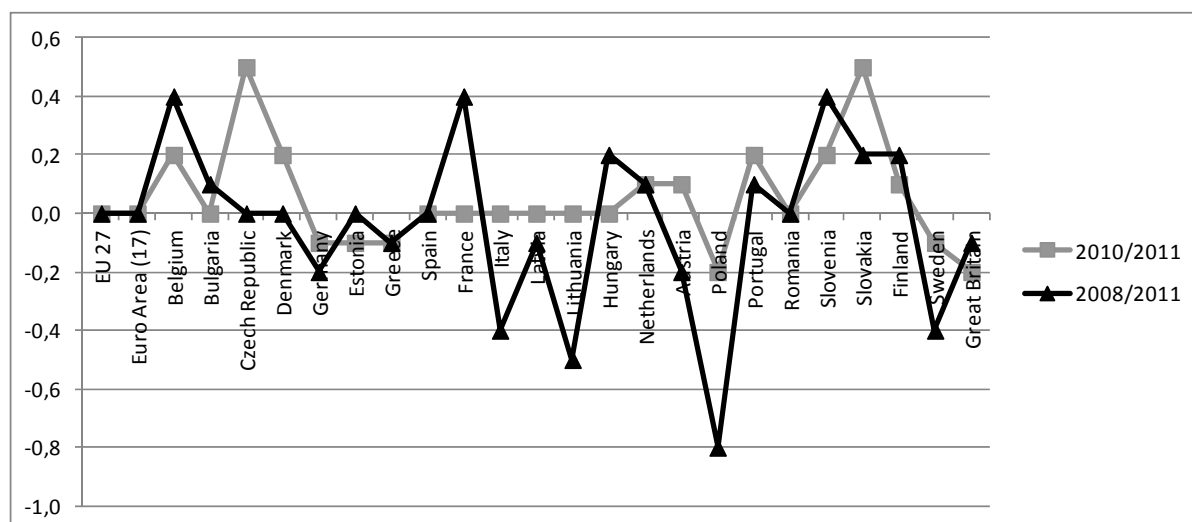
Evaluation of the insurance market in Europe is hampered by the significant differences in the levels of pricing similar insurances from one country to another. The price of an insurance policy directly determines the total amount of premiums and therefore the size of a market; the total revenue from premiums can be expressed through the following formula:

$$\sum P = n * p, \text{ where:}$$

$\sum P$ – total premium revenue;

n – number of the insured;

p – premium paid for each insured (insurance price).



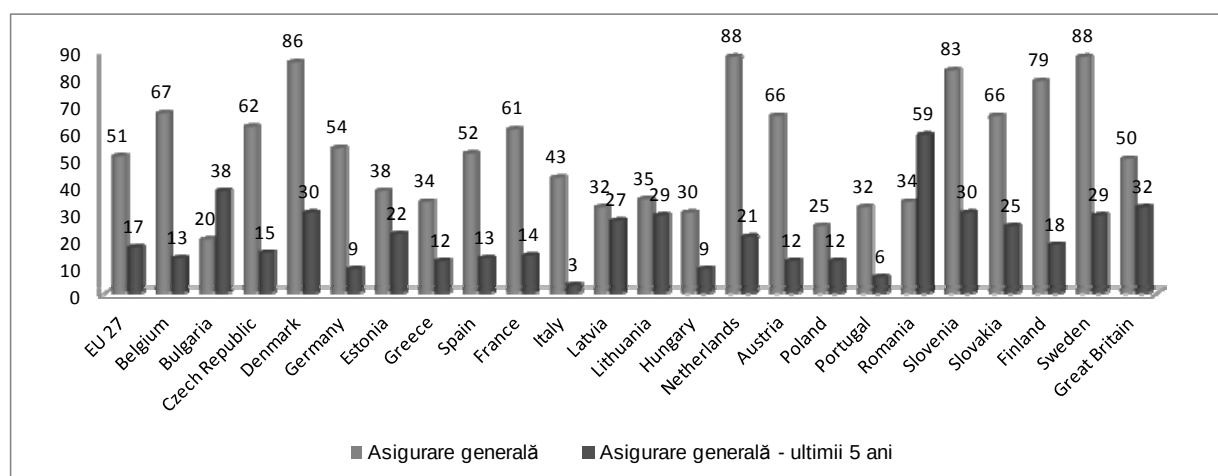
Note: For Bulgaria and Spain, the latest data are from 2010, and for Romania and Lithuania the latest data are from 2009.

Source: Eurostat, 2013.

Figure 6. Evolution of EU insurance expenses (% of total household consumption expenditure)

Although the data on the number of insured persons are not centralized, at EU level, according to the latest special Eurobarometer for Financial Services (2012), 31% of Europeans have a life insurance policy and 51% have a general insurance policy. In some Western countries, a remarkably large percentage of the population declared that, in 2011, they had a home insurance policy, a health or car insurance policy: in the Netherlands and in Sweden, the number was as high as 88% of all respondents, and in Denmark 86% of the respondents. In Bulgaria, however, only 20% of the respondents had a home insurance policy, a health or car insurance policy, while in Poland this percentage was 25% (Figure 7).

Most people who have a life insurance policy declare that such a product was not purchased within the last 5 years. At EU level, only 17% of respondents said that, in 2011, they purchased a life insurance in the previous five years, with significant differences between the country with the highest and the lowest number of people who purchased a life insurance in the previous 5 years (Romania, with 59%, and, respectively, Italy, with 3%).

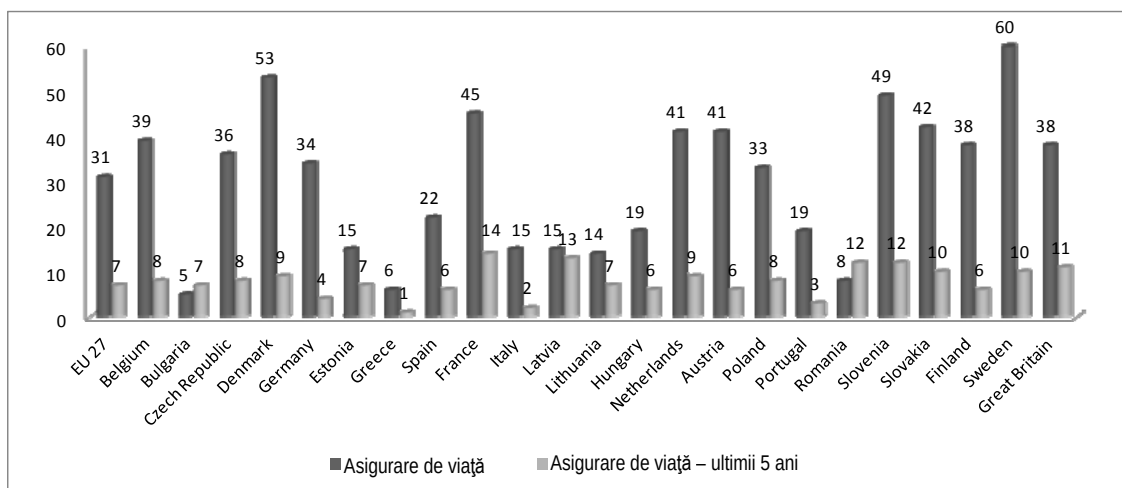


Source: Eurobarometer, 2012.

Figure 7. The number of people with a general insurance in EU countries (%)

The situation is similar as far as those having a life insurance are concerned (Figure 8). At least one third of the respondents in 16 member states had a life insurance policy in 2011;

Sweden and Denmark are the countries with the largest number of people who have a life insurance policy, with 60% and 53%, respectively. In three member states, however, the percentage of people with a life insurance was, in 2011, less than 10%: Bulgaria (5%), Greece (6%) and Romania (8%) (Euro barometer, 2012). Only 7% of the holders of a life insurance policy in the EU declared, in 2011, that they had purchased such a product in the previous five years. The lowest rate was recorded in countries most affected by the economic and financial crisis (Greece 1%, Portugal 3% and Italy 2%). Conversely, the countries with the highest number of people who purchased life insurance in the last 5 years are France (14%), Latvia (13%), Romania (12%) and Slovenia (12%).



Source: Eurobarometer, 2012.

Figure 8. The number of people with a life insurance in EU countries (%)

All these data show that the effects of the financial and economic crisis were deeply felt by the insurance industry in Europe in 2011, and in 2012 there was no significant recovery of the sector. A direct consequence of the decrease in consumption expenditure of households in most European countries from 2009 on was reducing the funds for insurance, although in some countries their value as a percentage of total expenditure remained constant. Household consumption expenditure increased in 2011, but in most European countries they have not yet reached the level of 2008, so that the pressure of reduced expenses continues to have a significant impact on household expenditure categories.

4. Forecasts for the insurance sector in 2013

The forecasts for the insurance industry in 2013 are not optimistic, given that insurers will continue to face the unstable economic environment in Europe, the need to reduce public and private spending, and also the need to implement additional European regulations (EIO 2012).

The European economic environment is characterized by uncertainty and instability; the Eurostat (2013) estimates on the evolution of EU GDP (in volume) show an increase of only 0.4% in 2013, with negative growth in the countries which were most affected by the crisis (Greece: 4.2%, Spain: 1.4%, Portugal: 1%, Italy: 0.5%, and Slovenia: 1.6%). Earnings remain modest; the estimates indicate only a gradual decline in the unemployment rate. In addition, the low interest rates as part of the monetary policy will be continued in 2013, which will lead to a reduction of investment performance. In 2012, the value of the insurance premiums continued to increase slightly, and this trend is expected to be maintained in 2013, without however compensating the losses caused by lower investment performance. The value of life insurance premiums was maintained in 2012 at the level of the year 2011, but estimates indicate a modest growth for 2013 (Karl et al., 2012).

Regarding the level of regulation, European insurers will be faced with major changes in 2013, due to EU regulations on increasing transparency of features and price of products, or risk management of the insurer and the insured (Solvency II Directive). The implementation of Solvency II Directive (2009) requires considerable changes in the insurance market operators, and, from this point of view, 2013 will be a year of preparation, of testing and development of implementation capabilities.

Against the backdrop of economic uncertainty, it is possible that European insurers could decide to raise the price of their insurance products, with a direct impact on consumer purchasing power in terms of number and type of products purchased. Given that in many European countries consumption expenditure of households have not yet returned to pre-crisis levels, it is likely for the number of newly acquired insurance products to significantly decrease, or for potential consumers to turn to cheaper products.

Another factor that could lead to increased insurance costs is the need to implement the new European regulations. For example, the additional costs resulting from mandatory reporting and monitoring data on the insurance sector will be most likely passed on to consumers, which will decrease the attractiveness of products. Therefore, insurance industry operators should focus on consumers, on their needs, trying to reconcile possible costs arising from the implementation of the new regulations and the level of consumer spending of the old and potential new customers (Langkjaer & Grella, 2012).

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CREATION AND OPERATIONALIZATION OF THE NATIONAL RESERVE FUND IN CASE OF NATURAL CALAMITIES IN ROMANIA – ALTERNATIVE FOR POST-DISASTER FINANCING IMPROVEMENT

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Abstract. *A catastrophic natural event can create, in Romania, significant imbalances at macroeconomic level since the task to cover the losses suffered by the public sector is exclusively of the government. Although at the central and local level funds for removing the effects of catastrophes are established, their efficiency is low because of the lack of correlation between annual resources allocation and the parameters of hazards specific to the region – earthquakes and floods. A solution to eliminate this inconvenient is to convert existing funds in a dedicated national reserve fund for calamities whose operating principles are presented within this article.*

Keywords: intervention fund; reserve fund; natural disaster; insurance; Romania.

JEL Classification: E6.

REL Classification: 10J; 11C; 13Z.

1. Introduction

Due to the increasing frequency of extreme natural phenomena occurrence in recent years, the risk of natural disaster increased too, with serious economic, social and environmental consequences on the affected communities. For example, at global level, between 2000 and 2012, as a result of natural disasters, 1.18 million people died, 2.83 billion were affected and the amount of damages totaled about 1.43 billion USD (www.emdat.be). The first five events with the most severe economic and social impact are presented in Table 1 (www.munichre.com).

Table 1

The most severe natural disasters from 2000-2012

Period	Natural event	Affected area	Fatalities	Overall losses (mil.USD)
12.01.2010	Earthquake	Haiti	222,570	8
26.12.2004	Earthquake, Tsunami	Sri Lanka, Indonesia, Thailand, India, Bangladesh, Myanmar, Maldives, Malaysia	220,000	10
2-5.05.2008	Cyclone Nargis	Myanmar	140,000	4
11.03.2011	Earthquake, Tsunami	Japan	15,840	210,000
25-30.08.2005	Hurricane Katrina	USA	1,322	125,000
17.01.1995	Earthquake	Japan	6,430	100,000

Source: the authors, based on Munich Re data.

By analyzing the data from Table 1 we can draw the following conclusions: (i) the social and economic impact is felt differently, depending on the development level of the affected country; thus, in weak developed states or developing ones, the social impact is prevailing, quantified by the particularly high number of people killed by disasters, while in developed countries the economic impact is prevailing, given by the significant volume of the recorded property damages; (ii) the most severe natural events that have occurred over the last 12 years have been earthquakes, often followed by tsunamis, and hurricanes; (iii) depending on the magnitude/severity of natural disaster, its effects can be felt both locally and at regional level.

In Romania, the main natural events with severe social and economic impact that occurred between 2000 and 2012 are the hydro-meteorological ones. Thus, during this period there were recorded 671 deaths, as follows: 420 due to extreme temperatures (62.60%), 222 due to flooding (33.08%) and 29 due to storms (4.32%) (www.emdat.be). In terms of economic losses, which amounted to 2.886 billion Euros, according to data provided by the European Commission, these have been caused by the floods that occurred in 2005, 2008 and 2010 (<http://ec.europa.eu>). An important aspect has to be mentioned in this case: taking into consideration the high number of people who died in Romania in the last years due to the extreme temperatures, we can assume that the level of poverty has increased (the inefficiency of the public health sector and the number of homeless has increased).

To reduce the negative impact of natural disasters and increasing the communities' resilience to natural disasters – a goal of national sustainable development strategies – regardless of their economic and social development level, in pre-disaster phase some measures to ensure risk reduction are necessary to be taken. These measures refer, primarily, to identifying, monitoring and reducing risk, as well as training of intervention forces, preparedness of economy and territory to address the consequences of natural disasters (IDB, 2000, p.13).

Although with all the taken prevention measures, even in the case of developed countries, the natural disaster risk can not be removed, because it includes an unmanaged component that can not be eliminated and for this, the response and recovery capacity must be maintained, called residual risk (www.unisdr.org). Therefore, in order to provide shelter for the severe consequences of the residual risk, in the same time with the measures of natural disaster prevention, the affected countries use funding and risk transfer, ensuring adequate protection of the fiscal balance, especially in the conditions for the occurrence of a natural event of great intensity. The risk transfer and/or natural disaster risk financing is made through insurance, catastrophe bonds, reinsurance or options (Cummins, Mahul, 2009, p. Glossary xxiii) and by creating funds for calamities, at national and local level (IDB, 2000, p. 13).

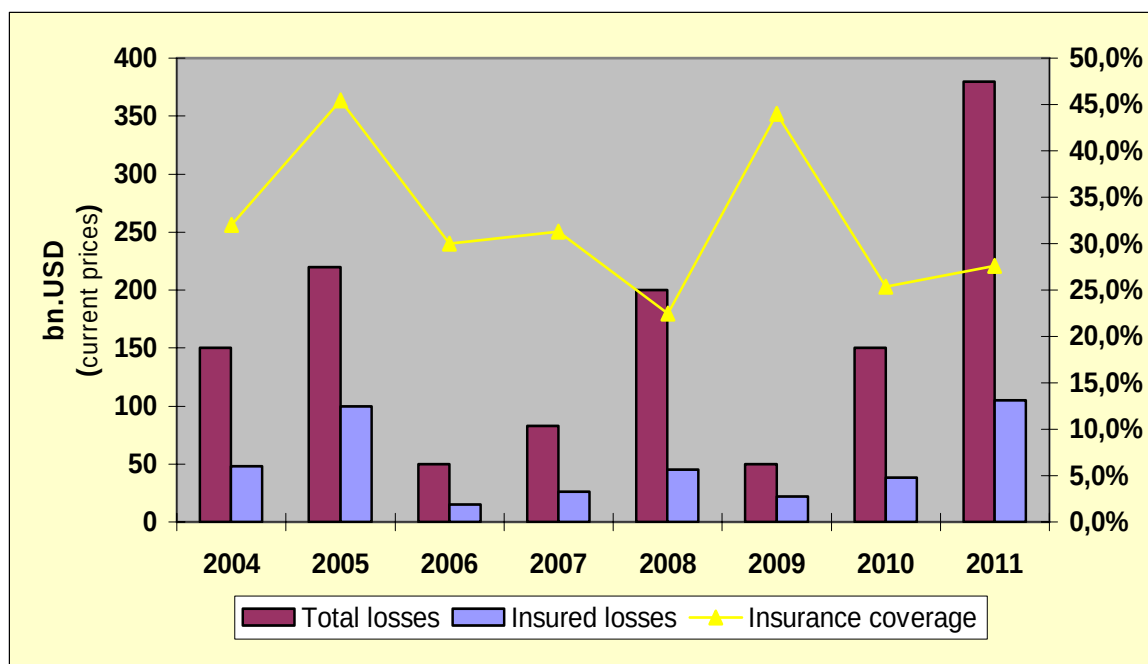
For implementation of the efficient disaster risk reduction, taking into consideration the country specific factors, the countries vulnerable to natural hazards must decide how much must be invested in disaster prevention and risk reduction measures and how much of it must be done in risk financing. Hochrainer, Mechler (2010, pp. 2-3) and Linnerooth-Bayer and Mechler (2007, p. 12), consider that in case of natural events with high rate of occurrence and with low to medium intensity, which cause low losses, is more cost effective prevention and risk reduction measures, because the prevention costs rise, in most cases, disproportionate to the severity of the consequences of disaster, on the one hand, and the population and the government can bear from its own resources (household savings and government reserve funds) losses caused by natural disasters, on the other hand.

As the intensity of natural phenomena increases, the losses caused by them increased too, in which case, in the authors' opinion, natural disaster risk financing through insurance, Cat Bond and contingent credit is less expensive than financing prevention and natural disaster risk reduction.

At the same time, Linnerooth-Bayer and Mechler believe that in case of a catastrophic event, whose occurrence rate is approximately once every 500 years, the financing measures and the prevention and reduction risk are ineffective, due to extremely high costs; in this

situation, the financial support of international community is particularly important because it complements other financial resources mobilized by the affected country, contributing to losses coverage and to finance post-disaster recovery and reconstruction process.

Currently, the most widely used means of catastrophe risk transfer worldwide is represented by the insurance. However, lately is recorded a gap between the high amount of damage caused by natural disasters and damages insured value, as shown by the data presented in Figure 1. As it can be seen, from 2004 to 2011, the level of insurance coverage varies globally in a range between 20% and 45%, registering a risk financing deficit with values between 55% and 80%.



Source: the authors, based on Munich Re data.

Figure 1. Total losses vs. insured losses from 2004-2011

Under these circumstances, one of the viable solution for covering the remaining financing deficit consist in using of alternative funding sources, such as: capital market resources (catastrophe bonds), household savings and small and medium enterprises savings, business private sector donations, financial support of international community etc.

More than, taking into consideration that, usually, insurance is not use for covering the losses from public sector and given the state's role as lender/insurer of last resort, the public financial resources provided under a *national calamities funds* can be used to complement the others existing funding sources, in order to fill in the financing deficit, avoiding, thus, the macroeconomic imbalances.

2. National funds in case of natural disasters existing in some European countries

The issue of creating the natural disasters national funds is not a novelty. In the vast majority of cases, the decision for the establishment of such funds, as an alternative source for post-disaster financing was preceded by producing of natural events of a high intensity, that caused very large damages, which could not be covered by the insurance and reinsurance companies, the government was forced to intervene with additional budgetary resources, in order to provide compensations to those affected by disaster. For example, the prerequisites for creating The Disaster Fund from Austria are given by the producing of the catastrophic avalanche in 1951 (Federal Ministry of Finance, 2007, pp. 1-5), the decision on creation of The National Snow and Landslide Fund from Iceland was made following the avalanches of

1995 (Johannesson, 2008, p. 131). The main features of national calamities funds which operate in some European countries are presented in Table 2.

Table 2

National calamities funds

Country	National Fund	Main objective	Fund manager	Resources	Beneficiaries
OECD Countries					
Austria	The Disaster Fund	To cover preventive measures and to compensate damage, beyond a given level of intensity	Federal Government (Federal Ministry of Finance)	Withholding a percentage of the revenues from certain taxes	Private sector and public infrastructure
Belgium	The National Calamities Fund	Post-disaster aid to repair damage caused by natural events of exceptional intensity to private property, mainly for risks which are difficult to insure	Government	Public financial resources: cash advances, credits and other post-disaster budget allocations	Private sector
Island	National Snow and Landslide Fund	Financing the costs relating to: research and drawing up risk maps, maintaining and building defence structures against these risks and expropriation and relocation of buildings at risk	Government (Ministry of Environment)	Various sources: an annual 3‰ rate on the insured value of assets covered against fire, an annual budget allocation, interest on loans granted to local authorities and other income	Public and private sectors
Norway	The Norwegian National Fund for natural damage assistance	Providing an aid in case of natural disaster and compensation damage to property for individuals and legal persons cannot be insured because they are excluded from mandatory coverage arrangements established by law	Government (Ministry of Agriculture and Food)	Budgetary allocations	Private sector
South-East European Countries					
Albania	Civil emergency fund Council of Ministers reserve fund (for emergencies)	Reducing, limiting and eliminating of the effects of natural disasters	Government Local administration	Annual appropriations, plus additional budgetary appropriations in case of an emergency	Public and private sectors

Country	National Fund	Main objective	Fund manager	Resources	Beneficiaries
	Ministries' reserve funds				
Croatia	Budget reserve	Reducing, limiting and eliminating of the effects of natural disasters	Government Local administration	Annual allocations	Public and private sectors
Bulgaria	Republican fund	Reducing, limiting and eliminating of the effects of natural disasters	Government Local administration	Depends on annual budgetary appropriation	Public and private sectors
Bosnia and Herzegovina	Budget Reserves	Reducing, limiting and eliminating of the effects of natural disasters	Government	0.5% of payroll taxes	Public and private sectors
Macedonia	State budget reserve The Solidarity Fund	Reducing, limiting and eliminating of the effects of natural disasters	Government	Annual budgetary allocations Donations	Public and private sectors
Romania	Intervention Fund Reserve budgetary fund	Reducing, limiting and eliminating of the effects of natural disasters	Government Local administration	Annual appropriations Annual local budget appropriations	Public and private sectors

Source: the authors, based on Consorcio de Compensacion de Seguros (2008: pp. 23-201) (OECD Countries) and Gurenko and Zakout (2008, pp. 11-12) (South-East European countries).

Other arguments for the creation of these funds were referring to the need to cover losses of public sector or finding solutions to indemnify for those who suffered due to natural disasters when certain risks are considered uninsurable by the insurers or for those that because of poverty, can not afford to purchase an insurance policy and there is no other way to be indemnified.

Analyzing the data from Table 2, it can be noticed that national calamities funds are established and operate both in developed countries, OECD members, and in the countries of South-Eastern Europe. However, another common feature of these calamities funds refers to the resources administration which is provided only by the government, directly or through subordinate ministries. In some South-east European countries, like Albania, Croatia, Bulgaria and Romania, the calamities funds are established at the local level, too.

In terms of the basic elements that distinguish them, they relate to the main objective of the fund, provenance and beneficiaries of these resources.

Therefore, *in terms of main objective*, national disaster funds are intended to finance: (i) exclusively preventive measures (Iceland), (ii) both, the preventive as well as the post-disaster measures (Austria), (iii) exclusively post-disaster measures (Belgium, Norway and the South-east European countries).

By the *provenance of resources*, national funds for natural disasters can be classified as: (i) funds exclusively supplied through public funds, such as: budget allocations (appropriations), withholding of a percentages from certain taxes, cash advances, credits and other budget allocations, (Austria, Belgium, Norway and the South-east European countries), (ii) funds supplied from other sources as follows: % of the insured value of assets in case of fire, interest on loans granted to local authorities, donations, % of payroll taxes (Iceland, Bosnia and Herzegovina, Macedonia);

By the *resources beneficiaries*, the national funds in case of natural disasters are used for: (i) coverage damages caused to private property, owned by individuals and companies;

(ii) coverage damages suffered by the public sector; (iii) financing research and measures for natural disaster prevention.

3. Research methodology

In Romania, in order to cover losses caused by natural disasters and to supply mutual help for people affected by calamities, two budget contingency funds has been established by law, as follows: Intervention Fund at government disposal, at central level, hereinafter the Intervention Fund, by the Law 500/2005 on public finance and the Reserve fund, at local level, by Law 273/2006 on local public finance.

Due to the fact that the annual allocation of budgetary resources is not based on a direct correlation between the base parameters of natural hazards (Probable Maximum Loss – PML, Average Annual Loss - AAL and RP - return period) for which the Romanian territory show a high vulnerability, namely floods and earthquakes, the efficiency of this financing source is low.

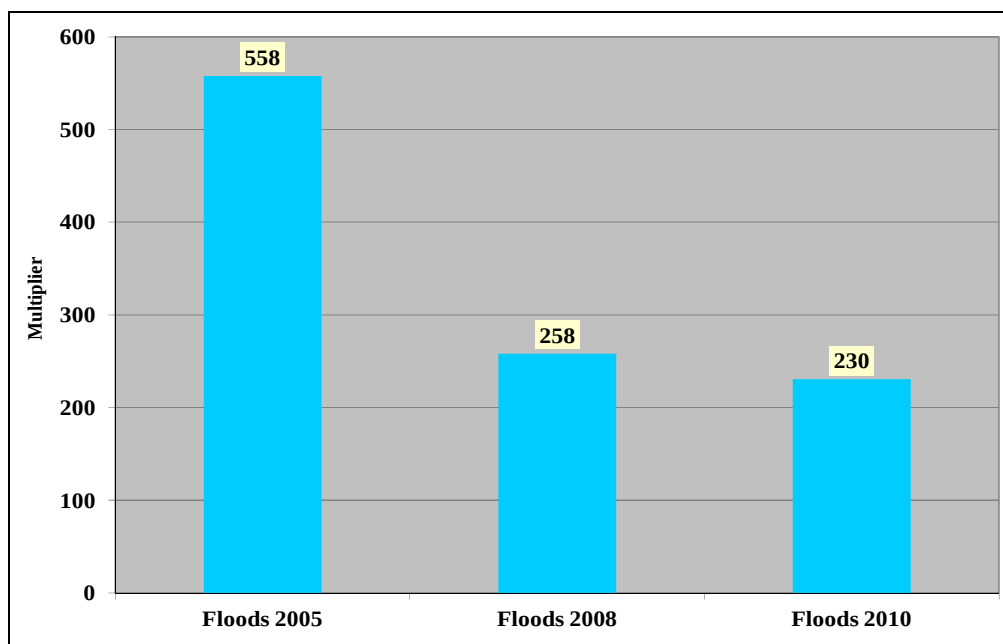
Considering this drawback, based on an analysis made over the functioning of these two existing contingency funds, within this article are developed proposals for improving of the post-disaster funding, evidenced in main principles of creation and operation of a dedicated natural catastrophe reserve fund which accumulates reserves over time - the National reserve fund in case of natural calamities in Romania (NRFNC). In developing of these proposals were taken into consideration the main features of natural calamities funds currently operating in some European countries with different levels of development, previously analyzed, as well as the limits of the financing sources usually used in Romania for covering losses from public sector.

4. The necessity of creation and operationalization of The National Reserve Fund in case of natural calamities in Romania (NRFNC)

To cover the significant losses suffered by the public sector in case of natural disaster in Romania are used, usually, public financial resources and the financial support received from the international community. These funding sources have two main limits: their insufficiency compared with the level of losses recorded and the lack of time availability. Given these limits, we can appreciate that the fiscal exposure of the government remains high, especially in case of a catastrophic natural event. In addition, without inclusion of public property into an insurance schema, the macroeconomic imbalances can not be avoided.

Referring to *the budgetary resources* limits, using the data from Figure 2 we can see that in the case of the flooding in 2005, the value of the multiplier 558 is greater than in the case of the 1977 earthquake, when economic damage volume was 547 times higher than the allocated budgetary resources (Gurenko, Zakout, 2008, p. 11).

This is because, according to the regulations on public finance, these funds are fed through annual budget appropriations without the possibility to achieve accumulations over years, in direct correlation with the recurrence period of the natural event taken into consideration. If these multi year accumulations would be possible, such a measure would reduce the financial burden on state and local budgets in the year in which a natural disaster occurs. Moreover, in case of a catastrophic event, when the damage is very large, from the state budget will make budgetary reallocations to supplement these funds, which could cause serious macroeconomic imbalances or it could affect the implementation of certain ongoing programs or projects. However, bureaucratic issues related to the development and approval of government decisions and/or decisions of local authorities (village, town, city or county) can cause a number of late payments. These delays can lead to an unjustified exacerbation of funds insufficiency (Dumitru, 2009, p. 1) or may affect the quality of the support and assistance measures that have to be taken immediately after the disaster occurrence.



Source: the authors, based on European Commission and Annual Budget Laws data.

Figure 2. The multiplier economic losses/intervention fund

The financial support of the international community in case of natural disaster can be materialized for Romania, as a member of European Union, in the form of amounts received from the European Union Solidarity Fund (EUSF). This funding source has two main drawbacks: (i) are compensated only losses suffered by the public sector, if the recorded damages volume is at least 3 billion Euros at rates of 2002 or at least 0.6% of GDP, whichever is the lower, in one year from the date on which the European Commission transferred the amounts to the recipient; (ii) the level of disbursements is insignificant compared with the level of economic losses recorded, as shown by the data presented in Table 3 which refers to the historical floods occurred in Romania in the latest years.

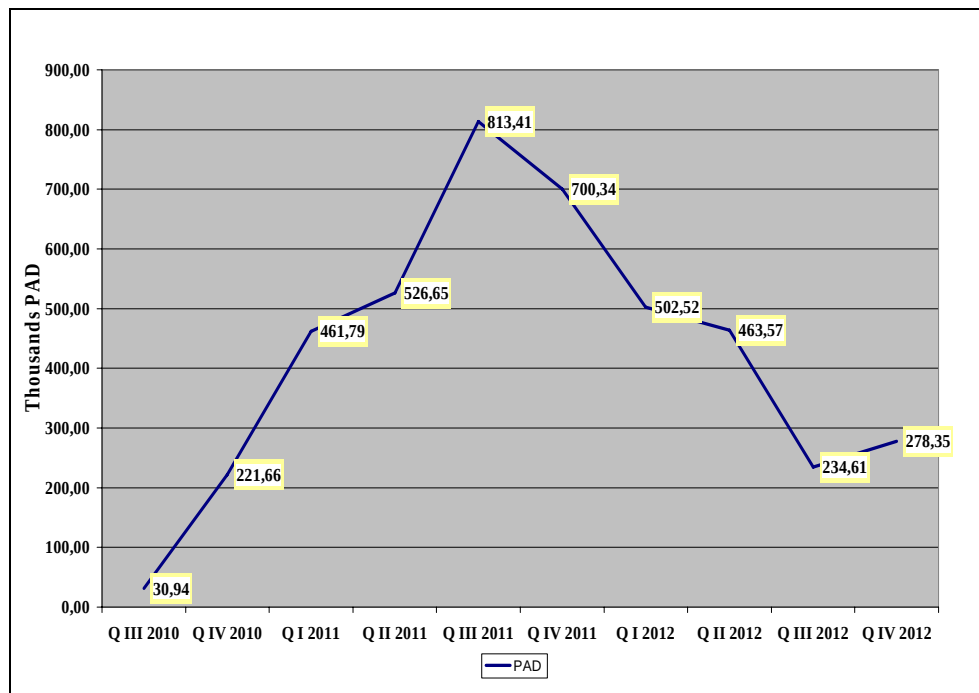
Table 3

Financial aid from EUSF in case of floods in Romania

Disaster date	Economic losses (mil. Euros)	Disbursements from EUSF (mil. Euro)	Coverage (%)
April 2005	489.0	18.8	3.84
July 2005	1,050.0	52.4	4.99
July 2008	471.0	11.8	2.51
June 2010	876.0	25.0	2.85
TOTAL	2,886.0	108.0	3.74

Source: the authors, based on European Commission data.

Catastrophe insurance, in Romania, is used in two forms: *voluntary insurance* in case of fire and other natural disasters (for losses incurred by the private sector) and *compulsory insurance* in case of floods, earthquakes and landslides (to cover only damages suffered by dwellings belonging to the private and public sector). Thus, with exception of dwellings belonging to public sector, the other public properties regulated by the Law No. 213/1998 are not insured. The trend of PAD policies is illustrated in Figure 3 on quarterly average.



Source: the authors, based on PAID data.

Figure 3. Quarterly average number of PAD in force from July 2010 - December 2012

Relating to the number of PAD compulsory insurance policies existing, issued both for private dwellings as well as for the public sector ones, it has been recorded a steady increase from July 2010 until the end of September 2011, when it reached the maximum peak, respectively 845509. Thereafter there was a sharp decline, so their number was at the end of 2012 of only 276597 policies (<https://www.paidromania.ro>). If we consider that the average number is about 8.5 million dwellings, we can estimate that the penetration of this type of insurance at national level decreased from 9.94% (30/09/2012) to 3.25% (31/12/2012). Due to the fact that the Romanian Natural Disasters Insurance Pool – PAID – has not provided data regarding the number of PAD issued separately for the both public and private sector, the penetration level for each of these sectors were not determined.

The main reason for PAD in force decline is the lack of responsiveness of the local authorities in terms of application of sanctions, on the one hand, and the legal possibility of every citizen, house owner, to apply for optional fire and other natural disasters insurance that guarantees the coverage of the compulsory insurance risks, on the other hand. At the same time, it was found that there is no risk dispersion for floods, earthquakes and landslides nationwide. For example, although there are areas/counties with higher exposure to seismic hazards, the subscription for this risk is below national average subscription (Domide et al., 2011, pp. 40-46).

It should be noted that, in addition to government and public administration, in Romania there are other entities seeking funding sources to cover losses: (i) households, for any direct damages produced on the houses or other properties, (ii) small and medium enterprises, to direct damages produced to their headquarters, fixed assets and production as well as indirect losses incurred due to business interruption; and (iii) insurance companies to guarantee compensation to policyholders.

Thus, in case of an event of great intensity, in addition to financial support for the public sector, when the value of the damages exceed the capacity of insurance and reinsurance companies to compensate the insured persons, the State, in its capacity as lender/insurer of last resort, must ensure unlimited warranty to the insurers in order to avoid their entry into bankruptcy or to compensate losses suffered by legal persons or entities in case of uninsurable risks considered by the insurance companies.

Considering the operational limits of the existing contingency funds - Intervention Fund and Reserve fund as well as the high vulnerability of the Romanian territory to floods and earthquakes with a long return period which can cause huge damages, especially in the public sector, rethinking of the budgetary resources management is necessary in order to ensure an effective natural disaster risk financing.

In this regard, one of solution is to dissolve the existing Intervention Fund and to create a new dedicated natural catastrophe reserve fund - The National reserve fund in case of natural calamities in Romania – NRFNC (Zelinschi, 2011, pp. 1127-1128), whose functioning will be based on a direct correlation between the level of annual budgetary allocations and the main parameters of the earthquakes and floods.

It is designed to help reduce the government's fiscal exposure and to avoid macroeconomic imbalances that could be generated by the huge losses from public sector in case of a catastrophic event. Therewith, it can provide direct financial support to those affected by disaster when there are no other ways to compensate them.

5. Basic principles for the creation and operationalization of The National Reserve Fund in case of Natural Calamities in Romania (NRFNC)

Overall objective: The NRFNC is established, by law, at national level, in order to ensure the necessary resources for:

- full coverage of direct damages caused by the natural disasters, regardless their intensity, to infrastructure, buildings and other public goods, component of the public domain belongs to the state and to the administrative-territorial units;
- payment of insurance premiums for public buildings, in the case of their inclusion into the mandatory insurance scheme;
- partial coverage of direct damages caused to dwellings by the events of a particular high intensity, in case that the resources of insurance companies and reinsurance companies are insufficient to indemnify the optional insurance policyholders, individuals or legal entities;
- full coverage of direct damages caused to dwellings in case of risk for natural events is considered uninsurable by the insurance companies;
- partial coverage of direct damages caused to property belongings to private business sector, in case of a natural event of a particularly high intensity, in case that the resources of insurance companies and reinsurance companies are insufficient to indemnify the private insurance policyholders or in case of risk for natural events is considered uninsurable by the insurance companies;
- providing financial aid for victims;
- financing, in some cases, of the prevention measures;
- financing of the post-disaster rehabilitation and reconstruction;
- providing loans to PAID, under the Law 260/2008, in order to ensure the financial resources necessary for payment of compensation if the damages exceed the maximum amount that can be covered by the PAID and reinsurance companies in the event of the insured risks are triggered.

Fund management: The NRFNC will be administered by a *national commission* - National Commission for NRFCN Administration – that will operate in direct subordination of the Romanian Government, in order to ensure full transparency in terms of management of fund's resources.

Fund resources: In order to achieve the purpose for which it was created, the main financing sources of the NRFNC are following:

- *Budgetary resources.* In order to maintain the same level of taxation, the budgetary allocations will be established through withholding of certain percentages from the fiscal revenues due to state budget and to local budgets based on the Annual Average Loss – AAL estimated for the risk taken into consideration. To ensure an adequate level of the NRFNC

resources, in correlation with the return period of the natural event considered, budgetary appropriations allocated annually and unused at the end of fiscal year will be accumulated over several financial years, being necessary, in this regard, the amendment of the existing legislation in public finance. Collected amounts at the local budgets and at the stat budget, due to the NRFNC, will be paid, quarterly, in a single account, managed by the National Commission for NRFNC Administration

- *Donations* received, under the law, from individuals and private business sector and from others international donors;
- *Interest* earned from the investment on the capital market, under the law, of the NRFNC resources and from the loans granted, in accordance with the law;
- *Other incomes*, determined in accordance with the law.

Beneficiary of Fund resources: The main beneficiary of the NRFNC resources is public sector, and in certain conditions, can receive financial support from this fund individuals and private business sector. Establishing and operation of the NRFNC are based on the solidarity principle, according to which, the fund resources are supplied by the all central and local public institutions, regardless the risk exposure, while the resources allocation on beneficiaries will be made by the National Commission for NRFNC Administration based on the real needs, determined according with the losses caused by the natural disasters.

The minimum conditions needed to use NRFNC resources:

In order to make payments from NRFNC it is mandatory the imposition of a state of emergency in areas affected by the Romanian President, in accordance with article 93 of the Romanian Constitution.

Once the NRFNC is operational, The Intervention Fund will be dissolved. Locally, the reserve fund will remain operational, without incurring expenditures for natural disaster risk financing.

NRFNC advantages and disadvantages:

Advantages:

- contribute to reduce the government's fiscal exposure in case of a natural event of great intensity;
- if the public buildings will be insured, contribute to reduce the financial effort of the state budget and local budgets, by paying insurance premiums for these buildings;
- does not affect the level of public debt or standard of living through increasing the taxation;
- ensures the necessary resources for post-disaster rehabilitation and reconstruction of buildings and public infrastructure, avoiding the macroeconomic imbalances that arise from the need to reallocate significant resources to the state budget and/or local budgets in order to mitigate and limit the consequences of the disaster;
- guarantees protection of individuals and private sector business in the case of natural event with high intensity. For these categories of beneficiaries, the NRFNC resources are used, usually, as a last resort, when other funds (savings, insurance, financial support from donors etc.) are proved to be insufficient;
- NRFNC resources can be used, in accordance with the law, for financing of prevention measures;
- ensures full transparency in terms of management of fund's resources due to the existing the National Commission for NRFNC Administration,
- establishment and using the Fund resources are based on solidarity principle;
- access to Fund resources is conditioned by the imposition of a state of emergency in areas affected by the Romanian President, avoiding the allocation of sums on the political or bureaucratic criteria;
- the costs of Fund resources using are smaller then in case of loans;

Disadvantages:

- establishment of the fund resources involves the relocation of certain part of revenues due to the state budget or local budgets to NRFNC;
- insufficiency of resources for the first years from the establishing of NRFNC;
- may lead to moral hazard;
- centralization of Fund resources, at a national level, into a single account may led to conflicts in the allocation amounts process on beneficiaries. This happen due to the fact that in order to receive bigger amounts from NRFNC, beneficiaries of resources will tend to overstate losses caused by natural disasters.

Conclusions

In case of Romania, the occurrence of a natural event of great intensity, such as a devastating earthquake similar to the one in 1977, could trigger major disruptions at national and local public finances, on short and medium term, due to the inefficiency and insufficiency of the existing budgetary contingency resources, because the annual resources allocation is not based on a direct correlation between Average Annual Loss - AAL of the main natural hazards that the Romanian territory show high vulnerability for - floods and earthquakes.

To remove this lack, one solution is to create, at national level, the dedicated National Reserve Fund in case of Natural Calamities in Romania (NRFNC) whose main purpose is to help reduce the government's fiscal exposure and local authorities in case of a major natural disaster and to provide direct financial aid to those affected by disaster, when there are no other ways to compensate them.

Considering its importance, especially to reduce the financial burden that should make the national budget to cover significant losses suffered by public sector, NRFNC will be included in the natural disaster risk financing strategy developed for Romania.

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SESSION II

CORPORATE FINANCE AND INVESTMENTS

THE ROLE OF INTERNATIONAL FINANCIAL INSTITUTIONS (IFIS) AND EXPORT CREDIT AGENCIES (ECAS) IN SUPPORTING CROSS BORDER PUBLIC PRIVATE PARTNERSHIP (PPP) IN EMERGING MARKETS: THE CHALLENGING CASE OF THE ICELANDIC ENERGY SECTOR

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Abstract. *As the world economy grows, so does the demand for energy. Investments in clean energy projects are increasingly important to meet these growing energy needs. A large part of clean energy sources in the world are located in emerging market economies. Investors in those markets often face higher risks than those investing in high income developed economies with a more favorable business climate. Higher risks in turn reduce capital flows to emerging markets. This is especially true during times of crisis. At the same time energy projects tend to be large, capital intensive with long repayment periods. Those projects also often require partnership between the public and the private sector i.e. public private partnerships (PPPs). Efficient allocation of risks among the different partners in PPPs is the key to success, and generally results in more profitable projects that are more likely to benefit each of the parties involved. This article will discuss public-private partnerships in the energy sector in emerging market economies. The focus will be on cross border investments for investors from small states where Iceland is discussed as a case. The characteristics of emerging markets will be discussed, the risk faced by investors and risk mitigation instruments offered by international financial institutions (IFIs) and export credit agencies (ECAs) to manage those risks. Nam Theun 2 is finally discussed to show how those instruments have been applied in practice.*

Keywords: public-private partnerships (PPPs); clean and renewable energy; emerging markets; international financial institutions (IFIs); export credit agencies (ECAs) and risks and risk mitigation instruments.

JEL Classification: F30, G20, G32, O22, Q20, Q40.

REL Classification: 11B; 11E.

Introduction

As the world economy grows, so does the demand for energy. Investments in clean energy projects are increasingly important to meet these growing energy needs. Those projects are also important for environmental reasons. A large part of clean energy sources in the world are located in emerging market economies. Investors in emerging markets are often faced with higher risks than those investing in high income developed economies. Higher risks in turn reduce capital flows to emerging markets. This is particularly true during times of economic and financial crisis. At the same time energy projects tend to be large and capital intensive with long repayment periods. Energy projects also often require partnership between the public and the private sector i.e. public private partnerships (PPPs). Efficient allocation of risks among the different partners in PPPs is the key to success and generally results in more profitable projects, and is more likely benefit each of the parties involved. This article will discuss public-private partnerships in the energy sector in emerging market economies. The focus will be on cross border investments for investors from small states where Iceland is selected as a case. The characteristics of emerging markets will be discussed, the risk faced by

investors and risk mitigation instruments offered by international and national institutions (IFIs) and export credit agencies (ECAs) to manage those risks. (1) The main research question is: How can companies from small countries like Iceland use the risk mitigation instruments of national and international organizations when investing in clean energy projects in emerging market economies?

The article argues that a small country like Iceland can make a contribution to the global transformation to clean energy and to the fight against climate change if IFIs offer flexible and affordable funding and risk mitigation instruments for private investors. Such risk mitigation could lower the risk profile of energy projects sufficiently to attract private sector funding. Guarantees from an Icelandic ECA could also be important when Icelandic companies provide services and/or equipment for cross border energy investments in emerging markets. The article does not attempt to judge how efficient PPPs are operationally in comparison with projects that are solely financed, built and operated by governments. Its focus is on the institutional aspects of PPPs, long-term infrastructure contracts, and risk mitigation in markets where the private sector normally hesitates to engage. The article also discusses how IFI instruments were applied in that case of Nam Theun 2 in Lao to attract private sector funding and make public private partnership possible.

Iceland and its transition to clean energy

Only a few decades ago most of Iceland's energy needs came from fossil fuel, coal and oil. Most electricity and space heating is now based on clean energy. Al Gore describes this transformation in his recent book "Our Choice" as follows: "Iceland responded to the oil shocks of the 1970s by converting to domestic resources, virtually every building in the entire country is heated by the hot water resources close to the surface of the tectonically active land" (Al Gore, 2009, p. 109). This transformation also meant that local capacity in geothermal energy utilization was developed. Several Icelandic companies and institutions now possess considerable experience in exploring geothermal sites and in constructing and operating geothermal power plants. There are also service providers and research and education institutions that can support geothermal energy projects in Iceland and potentially also participate in cross border investments (Table 1).

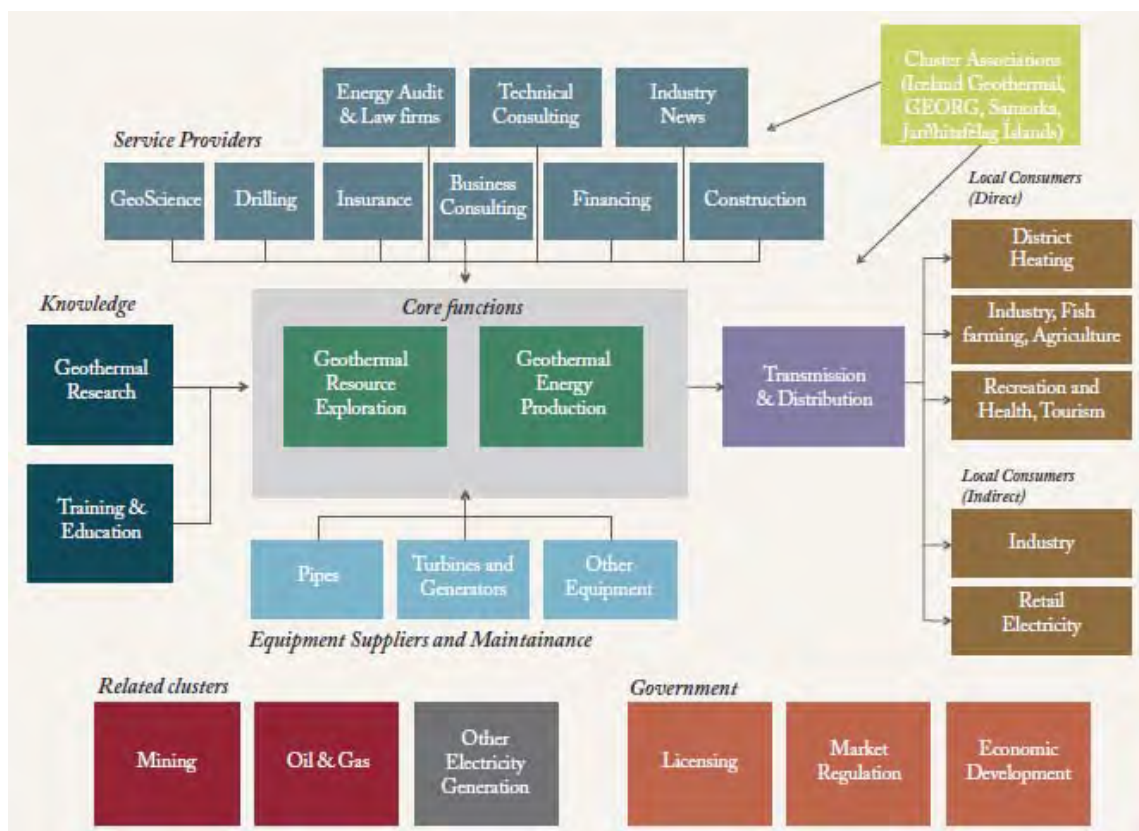
Table 1

Some Icelandic companies, service providers, research and education institutions in geothermal energy

GeoScience	ISOR, Mannvit, Vatnaskil
Technical Consulting	Mannvit, Verkís, Efla, Reykjavík Geothermal, Landsvirkjun Power, Reykjavík Energy Invest
Business Consulting	KPMG, Capacent Corporate Finance, Íslandsbanki
Drilling	Jarðboranir, Ræktunarsamband Flóa og Skeiða
Construction	ISTAK, ÍAV and Loftorka
Energy Audit & Law Firms	KPMG, Pricewaterhouse Coopers, Deloitte, Lex (law firm), Logos (law firm)
Financing	Arion banki, Íslandsbanki, Landsbankinn
Geothermal Research	ISOR, Mannvit, Vatnaskil, Utilities, Universities
Research Funding	Orkusjóður, Geothermal Research Group, Landsvirkjun's Energy Fund, Orkuveita Reykjavíkur Energy Fund, Rannís
Training and Education	University of Iceland, Reykjavík University, University of Akureyri, Reykjavík Energy Graduate School of Sustainable Systems, Keilir – Atlantic Center of Excellence, United Nations University – Geothermal Training Programme

This know-how has been developed during a few decades and one can say that there is now a proven capacity to construct and operate geothermal power plants in Iceland. Given this capacity a formation of a geothermal cluster, which could also engage in cross border energy

projects, is ongoing (Figure 1). See also Annex I listing companies supporting the Icelandic Geothermal Cluster.



Source: Geokon, 2012.

Figure 1. Iceland Geothermal Cluster Map

The vast clean energy resources in emerging market economies

Utilizing clean energy is not only a concern for Iceland. This is a global issue affecting both rich and poor countries. Many developing countries and emerging market economies in Africa, Asia and Latin America have large geothermal resources but are only in the early stages of development of using those resources. The future growth in demand for electricity is also likely to be strongest in those emerging regions (see for example Tooman 2004). Transformation to clean energy could be of great benefit to those countries and have global implications in the battle against climate change and thus also benefit developed countries. However, it is not sufficient to have the natural resources and potential growth in future demand. Funding is also needed and energy investments tend to be large, capital intensive and long-term. Developing countries also often have risky business and investment environments that limit private sector cross-border investment to those countries. Proper risk mitigation can thus be a major challenge.

Private sector cross border investments in emerging markets

Private sector funding and participation in clean energy projects can be a challenge for many reasons. One reason is that the host government is often the only buyer of the electricity or hot water produced i.e. it is the so called offtake purchaser (2). Many emerging countries with large clean energy potential have limited creditworthiness. They have low per capita income and are often going through an economic and a political transition. In such cases the sponsors (3) of a project could hesitate to fund the project because of the uncertainty with the income stream from the investment made. Lenders, including commercial investment banks, would also often hesitate to provide loans to such projects because of the uncertainty that the

project company, whose income stream is at risk, can service its loans. Being an investor from a small country like Iceland only adds to those risks. Small countries can only be expected to have a limited leverage in the event of dispute with a host government in an emerging country that can be a much larger country. A proper institutional framework with efficient and effective risk allocation and risk mitigation can help.

One possible institutional arrangement to address this situation is to form a Public-Private Partnership (PPP) and use the Build-Operate-Transfer (BOT) scheme. The PPP becomes a venue for the public and private sector to cooperate on a project that would traditionally have been in the public domain. The BOT arrangement means that the project is transferred back to the government when the concession (4) agreement ends. In this situation efficient and effective risk allocation is key to success and the international community can play a constructive role, e.g. through international financial institutions that can offer a variety of risk mitigation instruments. Among the remedies that small country investors can apply to manage risks is thus partnership with IFIs and/or participation in a consortium with stronger partners. National institutions such as ECAs, that support trade finance, can also play a constructive role in reducing the risks taken by private sector investors.

PPPs and efficient allocation of risks

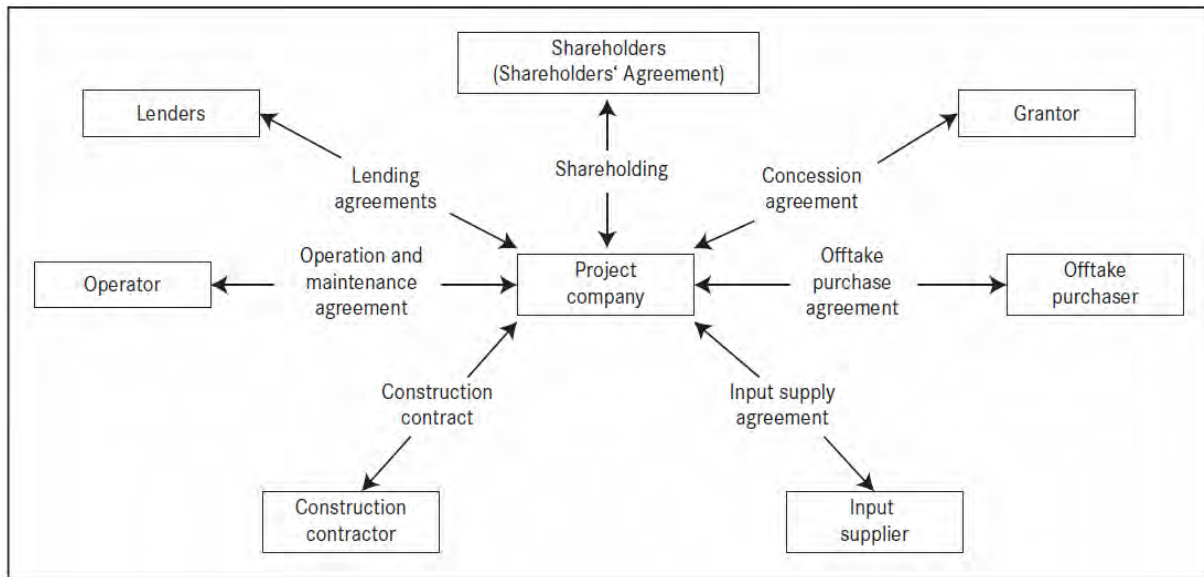
Public private partnerships can be a feasible venue to fund infrastructure development and to increase the efficiency of public sector service delivery. Infrastructure projects in the energy sector are often large, capital intensive and long-term. Repayment periods are also often long. It can take a private investor 10 to 25 years to recover the investment and the project returns.

The private sector is recognized as a significant financing source for meeting developing country investment requirements, but financial markets remain largely untapped for this purpose and have yet to live up to their potential (Asian Development Bank, 2006). PPPs are one venue worth considering for the private sector to engage in infrastructure projects. Private capital, donor support (including IFIs) and public funds can be combined in a PPP project. A well designed policy and institutional framework for PPPs offers the opportunity to leverage and combine all three sources of financing and expertise, without crowding out the private investment. By forming a PPP the public and the private sectors can share the risks and the rewards of infrastructure projects.

There are many different definitions for PPPs. One definition is “any public sector service provided partially or wholly by the private sector” (Delmon, 2009, 601). Another definition is a “co-operative institutional arrangements between public and private sector actors” (Hodge, Greve, 2009, p. 33). Yet another definition of a PPP is “the transfer to the private sector of investment projects that traditionally have been executed or financed by the public sector” (World Bank, 2008, p. 93).

To engage in cooperation, the public and the private sector can employ several different schemes (5) including the so called BOT, i.e. Build-Operate-Transfer (IMF, 2004). In BOT projects the private sector is responsible for financing, constructing and operating the project. Under this arrangement the host country grants a concession, i.e. the right to a private firm to undertake a public sector project and operate it over an agreed period of time. When the concession expires, the ownership of the project is transferred back to the party granting the concession. For a comprehensive discussion on BOTs see Jeffrey Delmon’s outstanding book on Private Sector Investment in Infrastructure (Delmon, 2009).

The partners typically involved in a BOT project are: the project company that undertakes the project, the host government (that can also be the offtake/power purchaser), the shareholders, the lenders, the grantor, the construction contractor, the operator, the offtake purchaser/power purchaser and the input supplier. Figure 2 below shows a typical PPP BOT contractual structure.



Source: Delmon, 2009.

Figure 2. Typical PPP BOT contractual structure

The project company uses the income stream from the project to service its debt from the project and to pay returns to its investors (i.e. the equity contributors to the project company). The lenders to a BOT project could, for example, be commercial investment banks, international financial institutions (IFIs) and bilateral agencies (BLAs). The IFIs and the ECAs could also serve as guarantors e.g. for payment to the lenders, including commercial investment banks. The lenders would be keen to manage their risks (i.e. only take measurable and measured risks) and would receive a fixed margin on their loan whereas the shareholders (i.e. the equity holders in the project company) maximize the profits on their equity investment. In addition to obtaining funding for the project, the project company procures the design and coordinates the construction and operation of the project in accordance with the requirements of the concession agreement. Project company shareholders often include firms with construction and operation experience, and with offtake purchase capabilities (Delmon, 2009, p. 98).

The offtake purchase agreement secures the project payment stream. The offtake purchaser will be looking for a guaranteed long-term output from the project. The credit risk associated with the offtake purchaser will be of particular concern to the project company and the lenders. This is where guarantees from the host governments or IFIs, including the World Bank, become important.

Critical to the design of PPPs is the way risks are allocated between the partners in the PPP. A general principle is that risk should fall on the party that is more able to do something about it. Risks in PPP tend to be allocated on the basis of commercial and negotiating strength. The stronger party will allocate risk that it does not want to bear to the weaker party. Efficient allocation of risk will generally result in a more successful and profitable project and will benefit each of the parties involved (Delmon, 2009).

In order to minimize the market risk from the project company and the project lenders an offtake purchase agreement, or in the case of a power project, a power purchase agreement may be made. This is to create a secure payment stream which will be an important basis for financing the project. The offtake purchaser may also be the grantor, or a government entity such as a public utility, in which case the offtake purchase agreement and the concession agreement may be one and the same document (Delmon, 2009).

The lenders will want the project risks to be allocated to project participants, i.e. the construction contractor and the operator and not the project company who is their debtor.

The project company will enter into a contract with the construction contractor in order to divest its obligations to the grantor to design, build, test and commission the project. Completion risk for the project should be allocated to the construction contractor. In the case of a turnkey project, completion and performance risk should be on the construction contractor.

If the main risks are associated with poor management of the service, shifting the risk to the operator could provide the right incentives to make sure that the project delivers. If the risks are related to changes in policies, then the government should bear the risk. This is because the project company will not generally be able to manage political risk. The project company will ask the government to bear those risks not necessarily to demand a compensation at a future date, but to pressure the government to avoid such risks and to minimize the probability that such risks will occur.

IFIs and risk mitigation in emerging market economies

Concerns about investment environments and perceptions of political risk often inhibit foreign investment, with the majority of flows going to a few countries leaving the world's poorest economies mostly ignored. This is especially true during times of economic and financial crisis. The limited number of investors engaging in risky environments might also be tempted to invest only when quick paybacks periods are possible. International financial institutions can have an important role to play here and responsibility to offer effective venues and viable risk mitigation instruments. This is especially true for long-term investments in energy infrastructure.

For large infrastructure projects investors must pay considerably more attention to political risk management issues. Risk reduction can reduce the cost of funding projects and facilitate longer loan periods. Political risk insurance, especially from multilateral agencies can act as an effective deterrent against host government interference with insured private investments.

Another typical problem in developing countries and emerging market economies is the limited scope for cost recovery. Customers often have a limited ability to pay for the services rendered and the government is in a weak position to force them to do so. This may result in a diminished interest from private investors.

One solution is for the host government to offer a guarantee to the private investor. But what should the government guarantee? Should it guarantee a minimum rate of return for the investment? Here the government needs to be careful as this guarantee represents a contingent liability and a poorly designed PPP can become a source of liability for the government. If the main risks are associated with poor management of infrastructure service, shifting the risk to the investor could provide better incentives to make sure that the project delivers. But this would not be accomplished if the government guarantees the revenue of the private sector.

Even if it makes sense for the government to provide a guarantee this guarantee may not be meaningful for the private sector if the government is not creditworthy. Here again international financial institutions can play an important role by providing insurance or a guarantee to the private investor (and in some cases using a host government guarantee as a counter guarantee).

IFIs offer a number of financial and risk management instruments that can be useful for Public-Private Partnerships. (6) Those include loans, equity investments and guarantees or insurance against political risk (non-commercial risk).

Among the IFIs active in this area are: (i) the World Bank Group <http://www.worldbank.org/>, (ii) the European Bank for Reconstruction and Development <http://www.ebrd.org/>, (iii) the Asian Development Bank <http://www.adb.org/>, (iv) Inter-American Development Bank <http://www.iadb.org/>, (v) the African Development Bank <http://www.afdb.org/>, (vi) the European Investment Bank <http://www.eib.org/>, and the Nordic Investment Bank, <http://www.nib.int/home/>. Iceland is not a member of the Asian

Development Bank, the Inter-American Development Bank and the African Development Bank. Icelandic companies do therefore not have access to the services of all the IFIs and have fewer options to form partnerships when investing in emerging markets than for example companies from the other Nordic countries who are members of all the above institutions.

Key risk issues can be categorized as: political, breach of contract by a government entity, market risk and default risk. (7) Risk mitigation products can attract new financing resources, reduce costs of capital, and extend maturities by providing coverage for risks that the market is unable or unwilling to bare (Delmon, 2009). Those products can attract more private capital to invest in infrastructure. Examples of guarantee products provided by the World Bank Group are IBRD/IDA partial risk guarantees (PRGs) and IBRD partial credit guarantees (PCGs), IFC partial credit guarantees and MIGA political risk insurance (Delmon 2009). Those risk mitigation instruments allow investors to be compensated in the case of certain adverse events and thus reduce the risk and thus the project costs. For an overview of risk mitigation products offered by the World Bank Group, see Annex I.

In the case of energy infrastructure projects World Bank guarantee products such as partial risk guarantees (PRG) and partial risk insurance (PRI) can be the key to success. According to the World Bank PRGs “cover commercial lenders for a private sector project against default arising from a government-owned entity failing to perform its obligations. PRGs can cover changes in law, failure to meet contractual obligations, expropriation and nationalization, currency transfer and convertibility, nonpayment of a termination amount, failure to issue licenses in a timely manner, other risk to the extent that they are covered by contractual obligations of a government entity, and noncompliance with an agreed dispute resolution clause. PRGs can be provided in both IBRD and IDA countries and require a government counter-guarantee” (World Bank, 2009, p. 10).

Regarding the IBRD/IDA PRGs the investor receives comfort, improved credit terms, and is not liable for loan repayment. Among the strengths of this instrument is increased government commitment to success of projects, accompanied with the benefits of an ongoing by policy dialogue between the World Bank and the host government. Among the weaknesses are sovereign guarantees required in all cases, cumbersome processing and high transaction costs. The demand for this instrument is mainly limited to PPPs and sectors with heavy government engagement (World Bank 2009, p. 74).

Among the five institutions of the World Bank Group is also the Multilateral Investment Guarantee Agency (MIGA). MIGA provides guarantees against political risks, i.e. non-commercial risks for investments in emerging markets. It also provides technical assistance and dispute mediation service. Developing countries would hesitate to take measures that would negatively affect projects that MIGA is involved with because of the concern that it could adversely affect their relationship with IDA and/or IBRD and possible credit or a loan (see for example West, 1999, pp. 29-30).

According to the World Bank, MIGA “offers PRI coverage to foreign direct investors for any combination of the following political risks: transfer restriction, expropriation, war and civil disturbance, and breach of contract. MIGA can insure direct equity, quasi-equity, nonequity direct, and other investments. To insure debt, however, it must have an equity link. MIGA guarantees cover new foreign-currency-denominated investments, including “new” investments to existing investments, investments by private for-profit and nonprofit organizations, and public owned investors and organizations that operate on commercial basis. MIGA can cover any freely usable currency, which may include local currency investments/loans. Under certain circumstances, MIGA can cover investments by local investors” (World Bank, 2009, p. 10).

Regarding the MIGA PRI the investor receives comfort, improved credit terms, mediation services and compensation in the event of loss. Among the strengths are flexible coverage of all PRI risks; main product for equity investments; dispute resolution; minimal time and processing. Among weaknesses are no comprehensive coverage (commercial risk

and political risk cover) and lengthy process to change Convention limitations (World Bank, 2009, p. 74).

Given the global needs for energy investments these instruments have not been used frequently and the amounts are still modest. IBRD/IDA PRG has been deployed for 13 projects with the commitment amount US\$ 1.2 billion and 92 percent for infrastructure projects. MIGA PRI has been deployed 566 projects with a commitment amount US\$ 16.6 billion and 24 percent for infrastructure projects (World Bank, 2009, p 68).

The Asian Development Bank (AsDB) and the other regional development banks also offer risk mitigation instruments that are important for private investors in emerging markets although they are not discussed in any detail here. AsDB risk mitigation instruments can for example cover breach of contract. For a power project such breach may result from failure by the government-owned entity to make payments in accordance with the power purchase agreement between the independent power producer and the user or distributor (Asian Development Bank, 2000, p. 2). Such insurance can be critical for the success of an energy infrastructure project. According to the AsDB the majority of the PRGs that AsDB has provided have been private sector-oriented, including PRGs for public-private partnerships (PPPs) (Asian Development Bank, 2006, p. 5).

IFIs and the effectiveness of their risk mitigation instruments

The effectiveness of the risk mitigation instruments offered by IFIs and the performance of those institutions must be under constant review and scrutiny. In 2009 the World Bank Group (WBG) issued a report titled: *The World Bank Group Guarantee Instruments 1990-2007 (An Independent Evaluation)*, World Bank, 2009). As part of the evaluation the Independent Evaluation Group (IEG) at the Bank conducted a survey in 2008 to solicit views among its staff about the use and effectiveness of guarantee instruments (World Bank, 2009). A survey questionnaire was sent to 363 staff and 206 responded.

Among the things that the survey revealed is that WBG staff are familiar with their own products but not with the guarantee products of other WBG institutions. (8) For example only one-fifth of IFC (9) staff were familiar with IBRD/IDA (10) products. In fact, IFC staff was not familiar with the products of IBRD, IDA or MIGA.

According to the survey more than 85 percent of WBG staff felt that the most critical benefits of the WBGs guarantee instruments were enhanced image of financial soundness and improved rates and tenors. Among other benefits include WBG's role as an honest broker and securing other investors (World Bank 2009).

It is also notable how few guarantees and insurances have been issued from an institution as large as the World Bank Group. A high proportion of staff felt that changes are needed to improve the WBG's guarantee instruments (World Bank, 2009). Interestingly enough most WBG staff felt that reducing time and cost of processing guarantees and improving marketing were important for improving WBG guarantee instruments. Furthermore staff reported that clients proceeding with the project without a guarantee and long processing time were the main reason for dropped guarantee projects. 80 percent of IFC staff reported the drop pages occurred because the cost of the guarantee was too high for the client (World Bank, 2009).

IBRD, IDA and MIGA staff reported that project sponsors/investors most frequently originated the request of guarantees. IFC staff reported that, host governments and staff of another WBG institution are least likely to originate its guarantees.

On May 7, 2008 the Committee on Development Effectiveness (CODE) at the World Bank considered the IEG independent evaluation. Several speakers called for greater collaboration among WBG institutions based on their comparative advantages, and strengthening the coherence of the products offered, including their pricing. They also called for more coordinated WBG efforts for marketing, increased staff knowledge of the guarantee products, and appropriate staff incentives (World Bank, 2009, p. xxviii). Comments were also

made about the need of the WBG to think about a “single Window” for guarantee products (World Bank, 2009, p. xxvi).

The ongoing debate about the role of international financial institutions increasingly recognizes the importance of making greater use of the risk mitigation potential inherent in their unique multilateral structure (Asian Development Bank 2006). The World Economic Forum (WEF) (11) has for example argued strongly for IFIs to better use guarantee and risk mitigation instruments and capabilities to attract increased commercial investment in development projects. In 2006 WEF issued a report titled *Building on the Monterrey Consensus: The Untapped Potential of Development Finance Institutions to Catalyze Private Investment*. In this report the Forum specifically asserted that: “...the weight of DFI (development finance institutions) activities should shift over time from direct lending to facilitating the mobilization of resources from the world’s large private savings pools – international and domestic – for development – oriented investment through: wider use of risk mitigation instruments to alleviate part of the risk faced by investors; and stronger direct support for capacity building to strengthen the enabling environment for investment.” (World Economic Forum, 2006, p. 9)

Furthermore the WEF argued that DFIs should “...adapt their services, culture and capital allocation to the imperative of “crowding in” domestic and foreign private investment by placing much more emphasis on such risk mitigation instruments as partial guarantees as transitional strategy and on capacity building” (World Economic Forum, 2006, p. 10) and that “an international consensus has emerged, embodied by the Monterrey Consensus, that a deeper partnership between the public and private sector is needed if we are to achieve common development objectives” (World Economic Forum, 2006, p. 10). In its final recommendations the WEF says: “The overwhelming majority of expert participants in the project recommended a major expansion of risk mitigation activity by DFIs...” (World Economic Forum, 2006, p. 15)

The WEF is thus sending a very clear signal to the international financial institutions and the IFIs are listening. In its report *Review of ADB’s Credit Enhancement Operations* the Asian Development Bank takes a clear note of WEF’s views and refers to their 2006 report several times (Asian Development Bank, 2006).

While there is a clear need for risk mitigation in emerging markets for sectors like the energy sector, it looks like the IFIs, including the WBG, have some way to go to make those instruments widely used. IFIs need to do a better job in coordinating risk mitigation activities within the institutions and spend more efforts to market those products and to make them more efficient and more cost effective for the private sector and shorten their processing time.

ECAs and their role in risk mitigation to support trade finance

In most developed countries there are export credit agencies (ECAs) that have been established by the home countries to help finance export of their national goods and services as well as cross border investments. These agencies can provide guarantees in connection with projects where there are deliveries of equipment and/or services to the project from the home country. This applies generally speaking to all ECAs supporting the export industry of their home country. In Iceland such an agency exists and is called *Tryggingardeild útflutnings* (TRÚ). ECAs can provide guarantees both against commercial and non-commercial risks in emerging markets and these instruments can be quite suitable to support overseas energy investments in developing countries and emerging markets, including for energy investments. TRÚ works in partnership with the Swedish export credit agency EKN which would assist the Icelandic agency to assess risks in host countries. According to Icelandic law TRÚ can provide guarantees and insurances up to 130 million SDR. This is a sizable amount of money. To make the story short TRÚ services have never been used by Icelandic exporters or cross border investors.

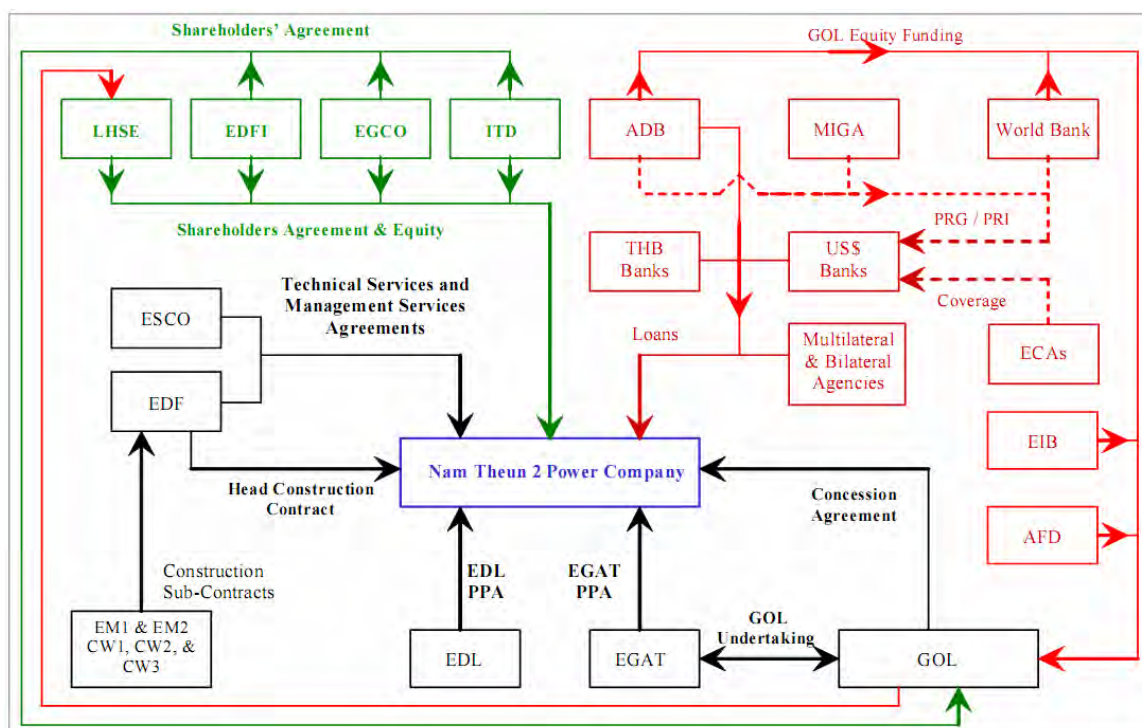
Emerging countries are increasingly important to Swedish exports and EKN is needed for expansion in these markets. From January to September 2011 the volume of guarantees issued by EKN amounted to SEK 40 billion. This is EKN's highest ever figure for guarantee-issuing in the period January-September, apart from the temporary solutions offered in 2009 and the first half of 2010. EKN issued new guarantees for 1163 transactions in 121 countries, compared with 1249 transactions (same number of countries) during the same period in 2010 (EKN 2011). In contrast Icelandic exporters and investors are not using the risk mitigation instruments that are available at TRÚ at all.

For more discussion about the role of ECAs in supporting cross border trade, including during times of crisis, as well as economic justifications for the existence of ECAs see Dinh and Hilmarsson (2012a, 2012b, 2012c).

The case of the Nam Theun 2 (NT2) hydropower project in the Lao PDR

There are cases that demonstrate that international financial institutions and export credit agencies can work with governments and the private sector to mobilize funding for clean energy projects in difficult business environments where the private sector would generally hesitate to engage. One of those cases is the Nam Theun 2 (NT2) a hydropower project in Lao PDR. Lao PDR is one of the poorest countries in South East Asia with weak human capacity, governance, institutions and physical infrastructure. NT2 is an excellent example how the public and the private sector can form a partnership and construct a major infrastructure project in the energy sector in a developing country with limited creditworthiness with the support from IFIs and ECAs.

Its estimated project costs were US\$1.25 billion at financial close (excluding contingencies), equity 28 percent (US\$350 million) and 72 per cent debt (US\$900 million). The NT2 hydropower project was implemented by the Nam Theun 2 Power Company Limited (NTPC). The shareholders (equity holders) of NTPC are: Electricite de France International (EDFI) of France (35%), Italian-Thai Development Public Company Limited (ITD) of Thailand (15%), Electricity Generating Public Company Limited (EGCO) of Thailand (25%) and Lao Holding State Enterprise (LHSE) (25%) see Figure 3 below.



Source: World Bank, 2005.

Figure 3. Nam Theun 2 contractual structure

This project is an excellent example of a successful leveraging of a multilateral guarantee mechanism in a difficult business and investment environment. The risk mitigation instruments used by the World Bank Group were IDA PRG and MIGA PRI. The Asian Development Bank (AsDB) also provided a guarantee.

Several IFIs provided loans to NTPC and/or guarantees to the private sector lenders: (i) Multilateral institutions including the World Bank Group's, IDA and MIGA, (ii) bilateral agencies, and (iii) export credit agencies (ECAs). A consortium of 16 commercial banks supported the project. (12)

The shareholders agreement (SA) signed by EDFI, GOL, EGCO, and ITD sets out the rights and obligations of the shareholders, provides for the objective, establishment, management, and operation of the project company, NTPC, and agrees on the Articles of Association of NTPC. The SA has duration of 45 years from signing (World Bank, 2005). In the concession agreement (CA) the Government of Lao granted NTPC a concession to develop, own, finance, construct, and operate the hydroelectric plant and related facilities, and to transfer the project to GOL at the end of the concession period, i.e. after 25 years (World Bank, 2005).

NT2 is the largest ever foreign investment in Lao and was the Asia Power Deal of the Year 2005. The project will be with an electric generating capacity of 1070 megawatts. 995 MW of the power will be for export to Thailand and 75 MW will be for domestic use in Lao. The power purchase agreements (PPA) are between NTPC and the Electricity Generating Authority of Thailand (EGAT), and NTPC and Electricite du Laos (EDL).

Head Construction Contract (HCC) was signed between NTPC and EDFI (the head contractor). It is a turnkey, price-capped engineering, procurement and construction contract (World Bank, 2005). The subcontractors are ITD of Thailand, Nishmatsu Contracting Company of Japan, General Electric of the USA and Mitsubishi-Sumitomo Electric of Japan. The head contractor and the subcontractors are all reputable international companies.

International financial institutions played an instrumental role in making this project possible. In fact, the international dollar lenders to the project informed the NTPC that without political risk mitigation they would not be able to lend to the project. The Government of Lao requested the World Bank Group to provide risk mitigation to support the international lending package (World Bank 2005). IFI guarantees were thus the key in lowering the project's risk profile sufficiently to attract the commercial financing needed.

Political risk guarantees were provided by MIGA (World Bank) and Asian Development Bank, AsDB). IDA (World Bank) also provided a partial risk guarantee (PRG). NT2 PRG is the first IDA guarantee to support hydropower development and is also the first project to use a mix of IDA, MIGA and AsDB guarantees. Debt guarantees were provided from IDA, MIGA and AsDB supporting about US\$126 million of private financing. Direct loans from IFIs were about US\$144 million provided to NTPC (World Bank, 2005).

Loans were also provided by AsDB, European Investment Bank (EIB), Nordic Investment Bank (NIB), Agence Francaise de Developpement (AFD), Proparco and the Export-Import Bank of Thailand. IDA and AFD also provided grants.

Nine International Commercial Banks and seven Thai commercial Banks helped fund the project. In addition to this the NT2 project received export credit agency (ECA) support from COFACE of France, Exportkreditnamnden (EKN) of Sweden and Guarantee Institute for Export Credits (GIEK) of Norway.

The Nam Theun 2 project can be viewed as a test case for infrastructure development in the developing world. It is an excellent demonstration of what is possible if the public and private sectors, supported by international financial institutions, team up and join their forces. The use of IFI risk mitigation instruments is particularly interesting as it demonstrates how a modest commitment through such instruments can help mobilize much larger amounts of private funding.

The NT2 project, which is the world's largest private sector cross-border power project financing, and the largest private sector hydropower project financing, would probably be too

large for participation from Icelandic firms, except if they provided technical assistance or advisory services, or maybe participated as sub-contractors. Lessons learned from this landmark project would nevertheless be a valuable study for all companies who intend to participate in infrastructure projects in developing and emerging market economies.

Conclusions

A small country like Iceland can play a constructive role in sharing its experience in transforming its economy from fossil fuel to clean energy and could be an example for other countries. Icelandic energy companies have a proven record in building and operating geothermal power plants. There are also several service providers, research and education institutions in geothermal energy that could contribute to the transition to geothermal energy in emerging market economies.

Most of the future increase in demand for electricity is likely to come from emerging market economies. This is also where most of the clean energy resources are located. This offers a tremendous opportunity for emerging market countries, but also is a challenge, including with funding. Sufficient private funds will not flow into those countries unless the risk profile energy projects can be reduced. This is especially true during times of financial and economic crisis.

To fill the tremendous energy infrastructure gap in emerging markets the public and private sector need to work in partnership, including via PPPs. Such partnerships can be supported by international financial institutions. For large energy projects partnerships, pooling public, private and donors funds should not crowd out the private sector, instead they offer the potential to crowd in private funds into risky markets that would not get private investment without proper risk mitigation.

The international financial institutions can be an important partner not only with direct funding, i.e. loans and equity investments, but also increasingly through risk mitigation instruments. IFIs need to provide instruments that are more flexible and more cost effective for the private sector and with shorter processing time. Better coordination between the World Bank Group institutions providing guarantees/insurances are needed and better marketing of the instruments.

Export credit agencies can also play a constructive role in supporting exporters of equipment and services to emerging markets by providing guarantees and insurances against commercial and non-commercial risk to facilitate longer-term lending and at more affordable costs.

The Nam Theun 2 project is an excellent example of a successful leveraging of a multilateral guarantee mechanism in a difficult business and investment environments. Export credit agencies also provided important support by using their instruments to facilitate cross border trade finance for Nam Theun 2.

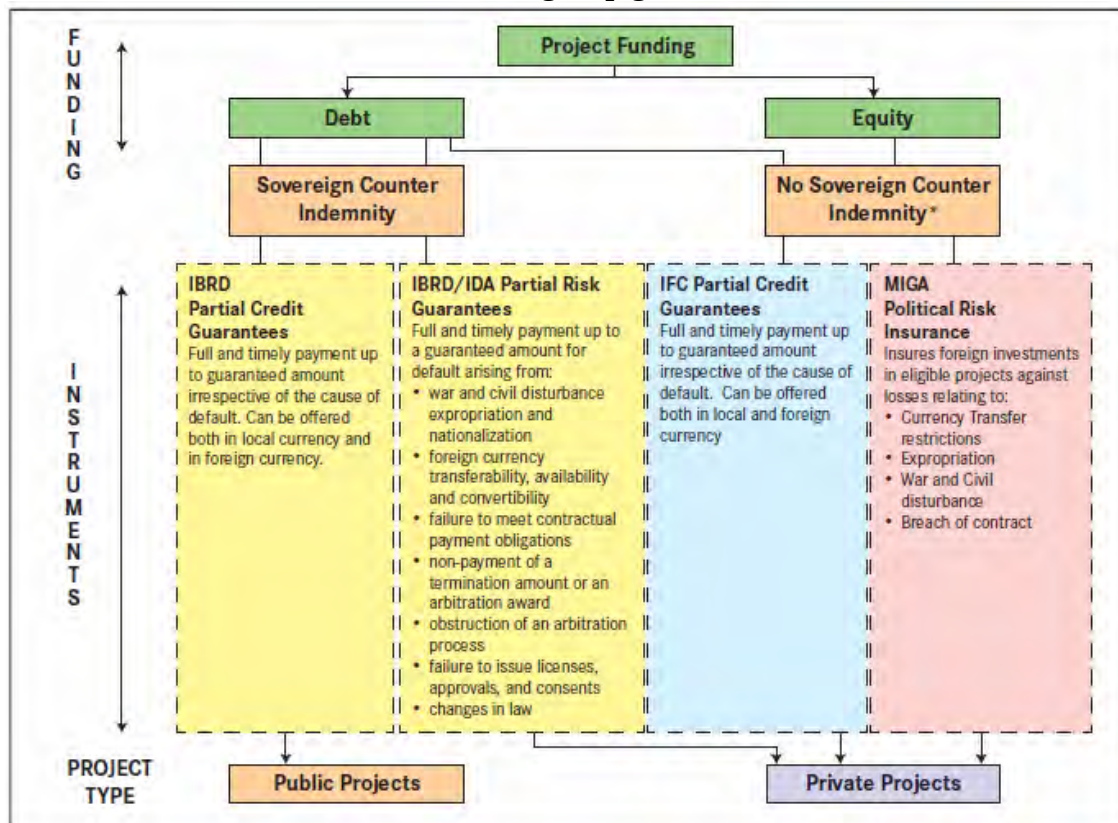
If Icelandic companies participate in energy projects as sponsors/investors in emerging market economies they should make serious efforts to develop a comprehensive risk identification and mitigation strategy before they engage. This could be done by forming an international consortium with participation of IFIs that Iceland is a member of and with support of the Icelandic ECA.

The government of Iceland should carry out feasibility studies that could help in the decision making process of applying for membership in the regional development banks. This could help strengthen the bargaining position of Icelandic companies vis-à-vis IFIs and enable them to select from a larger menu of financial and risk mitigation instruments in emerging markets than they presently can. Access to IFIs is also even more important for Icelandic companies than for companies from larger countries, as Iceland does not have wide representation in emerging markets through embassies and business representatives.

The government should also investigate why Icelandic companies are not using the services of the Icelandic export credit agency, TRÚ. The services of TRÚ can be an important export promotion tool for Icelandic exporters especially during times of crisis.

Annex I

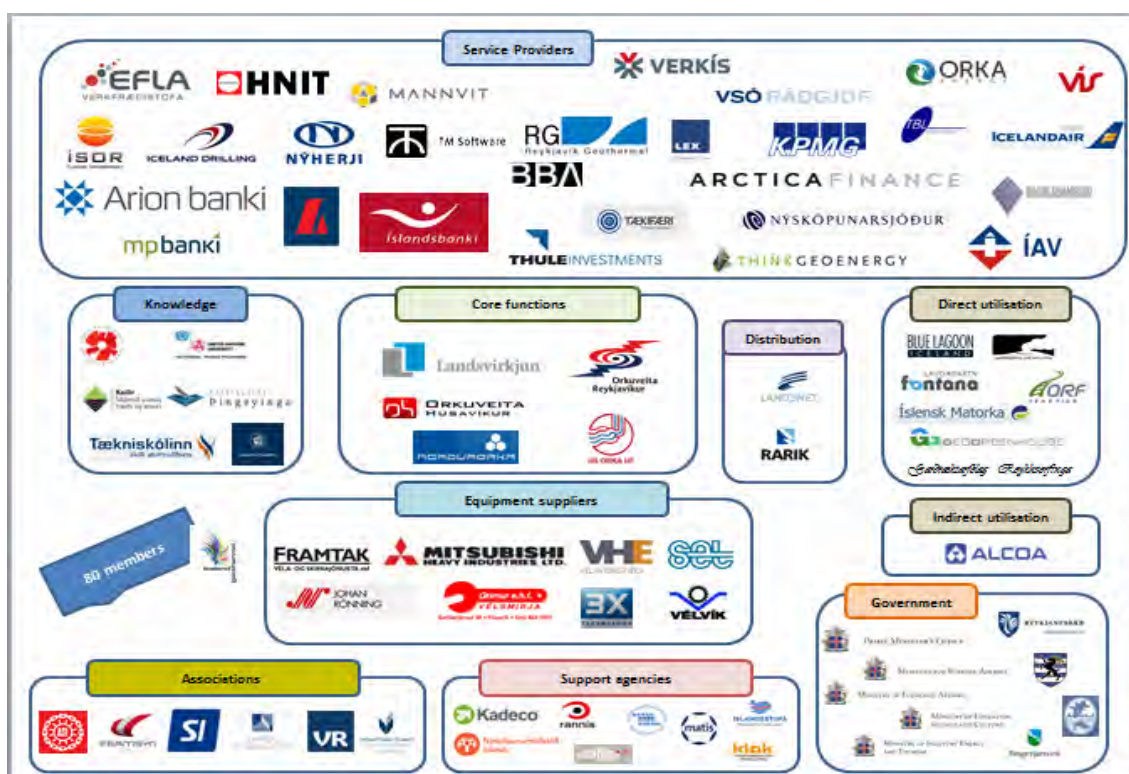
World Bank group guarantees



Source: Delmon, 2009.

Annex II

Companies supporting the Icelandic geothermal cluster



Source: Gekon, 2012.

Notes:

⁽¹⁾ The international institutions focused on are international financial institutions like the World Bank Group and the regional development banks, and the national institutions are export credit agencies (ECAs).

⁽²⁾ Offtake purchaser is the purchaser of the product produced by a project. In the case of a power project the product produced is the electricity generated.

⁽³⁾ A sponsor of a project is a party wishing to develop or undertake a project. A sponsor would normally provide financial support for the project e.g. early equity capital.

⁽⁴⁾ The concession is the right granted by the host government for a private company to undertake a public sector project and operate it over an agreed period of time.

⁽⁵⁾ Among PPP schemes and modalities in addition to Build-Operate-Transfer (BOT) are for example: Build-Own-Operate-Transfer (BOOT), Build-Rent-Own-Transfer (BROT), Build-Lease-Operate-Transfer (BLOT), Build-Transfer-Operate (BTO).

⁽⁶⁾ In addition to those services, IFIs often engage in a policy dialogue with the governments of emerging market economies to improve economic policy and management. This includes reforms to improve the business and investment climate for the private sector, to promote business activities, and to encourage foreign direct investment. IFIs also provide loans and credits to various government-led projects in developing countries and emerging markets that are subject to international competitive bidding. This allows private sector firms to participate in the bidding process and potentially to benefit from those public sector projects supported by the IFIs.

⁽⁷⁾ For an excellent overview of World Bank risk mitigation products, see Jeffrey Delmon Chapter 7 (Delmon 2009).

⁽⁸⁾ The World Bank Group represents five institutions. Those are: (i) the International Bank for Reconstruction and Development, IBRD, established in 1944, (ii) the International Development Association, IDA, established in 1960, (iii) the International Finance Corporation, IFC, established in 1956, (iv) the Multilateral Investment Guarantee Agency, MIGA, established in 1988, (v) International Centre for Settlement of Investment Disputes, ICSID, established in 1966. Four of those institutions issue insurances or guarantees, i.e.: IBRD, IDA, IFC and MIGA.

⁽⁹⁾ The International Finance Corporation, IFC, is the private sector arm of the World Bank Group, WBG.

⁽¹⁰⁾ The IBRD and the IDA are the public sector arms of the WBG.

⁽¹¹⁾ The World Economic Forum's Financing for Development Initiative comprises more than 200 global experts from financial institutions, corporations, governments, international organizations, universities, and nongovernmental organizations, who offer their views on improving the effectiveness of efforts to stimulate private sector investment in developing countries.

⁽¹²⁾ The international commercial banks were: ANZ Bank, BNP Paribas, Bank of Tokyo Mitsubishi, Calyon, Fortis Bank, ING, KBC, SG and Standard Chartered.

The Thai commercial banks were: Bangkok Bank, Bank of Ayudhya, KASIKORNBANK, Krung Thai Bank, Siam Ciry Bank, Siam Commercial Bank and Thai Military Bank.

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OPTIMAL MANAGEMENT IN THE CONTEXT OF CORPORATE GOVERNANCE

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Abstract. *The main objective of the paper is to discuss the importance of dynamic optimization models for an effective management of an enterprise. In introduction, there are presented some general ideas about Corporate Governance and its implementation in Romania. In the next section, there are exposed several definitions for Corporate Governance and the principles which must be followed for implementing it. In Section 3 is presented a dynamic model of enterprise management – The Lesourne-Leban model. In the last section we applied the model described above on a corporation in Romania, in order to maximize its market value and we built a dashboard to reflect the results we obtained. The paper ends with some conclusions and with the list of references.*

Keywords: corporate governance; stakeholders; management; performance; optimum value.

JEL Classification: G32, G34.

REL Classification: 11Z, 14A.

1. Introduction

The main objective of the paper is to discuss the importance of dynamic optimization models for an effective management of an enterprise. The purpose of this paper is to analyze how is the best to organize and manage an enterprise by using mathematical apparatus, focusing on optimal management. Enterprises differ among themselves in terms of field of activity and in terms of management. Due to these aspects it isn't possible to find a single optimization model to suit any business. This paper wants to present a model of maximizing the market value of an enterprise.

2. What is corporate governance

The economic crisis led to the identification of ways to improve corporate governance, which aims to continuously adapt to current economic demands, globalization and stakeholder's need to timely access the information.

Corporate governance is new for Romania, is a concept that aims to increase the performance of the company and to harmonize the stakeholder's interests. Corporate Governance envisages a set of rules adopted by the managers, whereby a large company is managed and controlled. Also, it provides to all the stakeholders an organized framework for governing their relationship.

The Organisation for Economic Co-operation and Development (OECD) developed some principles of Corporate Governance, which are respected all over the world. These are the followings (OECD, 2004, pp. 17-25):

- Ensuring the Basis for an Effective corporate governance framework

- Ensuring the rights of shareholders and key ownership functions
- The equitable treatment of shareholders
- The role of stakeholders in corporate governance
- Disclosure and transparency
- The responsibilities of the board.

In Romania, according to the Corporate Governance Code of the Bucharest Stock Exchange, any company that trades financial instruments on a regulated market must follow certain rules (Bucharest Stock Exchange, 2008). Companies that adopt Corporate Governance are required to perform accounting in accordance with International Financial Reporting Standards (IFRS) and other reporting standards (ESG - Environment, Social and Governance) and prepare the financial reports in English.

3. A dynamic model of enterprise management – The Lesourne-Leban model

A business activity can be analyzed dynamically. This is done taking into account:

- The three existing types of variables (input or control, status, output or outcome);
- The optimum criterion of the company;
- The assumptions established in the development of financial indicators.

Further is necessary to determine the development of the variables (for a finite period or not), the development's features and the optimal financial indicators. Through this approach, it is introduced an objective function, which measures the performance of the enterprise as a dynamic system along the trajectories generated by: *“the dynamic equations and economic constraints, the predictions made on corporate uncontrollable input variables: prices of factors and output - including the interest rate, the equity prices, the exchange rate and the government policy on taxes and subsidies”* (Oprescu, Andrei, Roman, Mitruț).

The objective function defines the purpose of the model and is a criterion by which we realize the optimization, while the decision variables illustrate the sizes you must choose to optimize the objective function (the unknown variables).

The dynamic analysis has both advantages and disadvantages. The main advantage is the use of mathematical apparatus that provides safety. Among the disadvantages of dynamic analysis are: the variables that describe the company and its development are identified very hard, the hypothesis describing the operation of the enterprise are established with weight and the difficulty with which is solved and analyzed the dynamic model, taking into account many factors.

Next, we will present the Lebane Lesourne model, in order to maximize the market value of a company. The purpose of the model is to maximize the dividends, based on control variables. So,

$$\max_{D,I,L} \int_1^{\infty} D_t * e^{ra*t} dt$$

is the objective function that this model aims to solve, where D represent the dividends distributed by the company, I represent the investment and L represent the number of employees. The variables used in solving this model are of three types:

- Control variables (dividends, investment and labor)
- State variables (fixed assets, current assets, liabilities)
- Variables outcome (turnover, staff costs, costs of materials and services, profit, interest on loans and amortization).

The model assumptions are:

1. $K(t) = Cpr(t) + Y(t)$; where: K = Total Capital, Cpr = Equity, Y = Debt
2. The company has a rate of return on assets denoted by ξ . We consider the total depreciation at time t_0 as:

$$A_a(t_0) = \frac{1}{\xi} K(t_0)$$

$$\Delta A_a = \frac{1}{\xi} K(t) - \frac{1}{\xi} K(t_0) = \frac{1}{\xi} K_{\Delta t}$$

3. The revenues depend on the volume of production obtained and sold:

$$VT = V(Q(t)) > 0$$

The properties of the production function are represented by a monotonically increasing function.

4. The costs are:

- Staff expenditures, denoted by $C_{m,s} = q * P_{m,s}(t)$, where q is the quantity and P the price;

- The wage costs are equal to $\bar{S} * L(t)$;

- The depreciation charges are equal to $a * K(t)$; where a is the depreciation rate;

- The interest cost is equal to the product: $r * y(t)$;

We can say that a company's total expenditure is given by the equation:

$$CT = q * P_{m,s}(t) + \bar{S} * L(t) + a * K(t) + r * y(t)$$

5. The gross profit is the difference between total revenues and total expenses and is given by the equation:

$$\Pi \text{ gross} = V(Q(t)) - [q * P_{m,s}(t) + \bar{S} * L(t) + a * K(t) + r * y(t)]$$

6. The net profit is equal to:

$$(1-T) [V(Q(t)) - [q * P_{m,s}(t) + \bar{S} * L(t) + a * K(t) + r * y(t)]]$$

7. Any bank in order to grant a loan to a company will make a leverage analysis, which can be calculated using the following formula:

$$Gr\hat{n} = \frac{Y(t)}{Cpr(t)} \leq k$$

So: $Y(t) = Cpr(t) * k$; But it is known that: $Y(t) = K(t) - Cpr(t)$

$$\Rightarrow K(t) = (1+k) * Cpr(t) \text{ and } Y(t) \leq K(t) \geq (1+k) * Cpr(t)$$

$$\Rightarrow Cpr(t) \leq Y(t) \leq (1+k) * Cpr(t), \text{ for any } k > 0.$$

8. The change in Equity is determined by the part of net profit which is allocated for training reserves after deduction of dividends.

$$\Delta Cpr(t) = (1-T) [V(Q(t)) - [q * P_{m,s}(t) + \bar{S} * L(t) + a * K(t) + r * y(t)]] - D(t)$$

9. The dividends at time t are:

$$0 \leq D(t) \leq D_{\max}$$

$$I_{\min} \leq I(t) \leq I_{\max}$$

The mathematical formulation of the problem

$$\bullet \dot{K}(t) = I(t) - a * K(t)$$

$$\begin{aligned} \bullet \dot{Cpr}(t) &= (1-T) [V(Q(t)) - q * P_{m,s} - \bar{S} * L(t) - a * K(t) - r * Y(t)] - D(t) \\ &= (1-T) [V(Q(t)) - q * P_{m,s} - \bar{S} * L(t) - a * K(t) - r * (K(t) - Cpr(t))] - D(t) \\ &= (1-T) [V(Q(t)) - q * P_{m,s} - w * L(t) - (r+a) * K(t) + r * Cpr(t)] - D(t) \end{aligned}$$

$$\bullet K(t) = Y(t) + Cpr(t)$$

The Pontryagin principle

We write the Hamiltonian of the problem according to the state variables ($K(t)$ and $Cpr(t)$) and to the multipliers attached to state variables (λ_1 and λ_2).

$$H(K(t), Cpr(t), \lambda_1(t), \lambda_2(t)) = D(t) + \lambda_1(t) * \{(1-T) * [V(Q(t)) - q * P_{m,s} - w * L(t) - (r+a) * K(t) + r * Cpr(t)] - D(t)\} + \lambda_2(t) [I(t) - a * K(t)]$$

This is the objective function plus multipliers attached, multiplied by state variables. We also write the Lagrangean of the problem, which is a function that depends on:

$$L(K(t), Cpr(t), D(t), I(t), L(t), \mu_1(t), \mu_2(t), \mu_3(t), \mu_4(t), v_1(t), v_2(t)) \\ = H(.) + \mu_1(t) D(t) + \mu_2(t) (D_{max} - D(t)) + \mu_3(t) (I(t) - I_{min}) + \mu_4(t) (I_{max} - I(t)) \\ + v_1(t) (K(t) - Cpr(t)) + v_2(t) ((1+k) Cpr(t) - K(t));$$

Where: $\mu_1(t)$, $\mu_2(t)$, $\mu_3(t)$, $\mu_4(t)$ are control variables multipliers and $v_1(t)$, $v_2(t)$ are state variables multipliers.

The Canon of the maximizing problem

We write the canonical system of the problem, which consists of dynamic equations of state variables.

$$\dot{Cpr}(t) = [V(Q(t)) - q * P_{ms} - w * L(t) - (r + a) * K(t) + r * Cpr(t)] - D(t) \quad (1-T)$$

$$\dot{K}(t) = I(t) - a * K(t)$$

The dynamic equations of multipliers attached to state variables are:

$$\dot{\lambda}_1(t) = i * \lambda_1(t) - \frac{\delta L(.)}{\delta Cpr(t)}$$

$$\dot{\lambda}_1(t) = i * \lambda_1(t) - \lambda_1(1-T) * r + v_1(t) - v_2(t) * (1+k)$$

$$\dot{\lambda}_2(t) = i * \lambda_2(t) - \frac{\delta L(.)}{\delta K(t)}$$

$$\dot{\lambda}_2(t) = i * \lambda_2(t) - \lambda_1(1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] + \lambda_2(t) * a - v_1(t) + v_2(t)$$

Because of economic reasons, but also to simplify the calculation are accepted the following conditions for the control variables:

$$D(t) > 0;$$

$$D_{max} - D(t) > 0;$$

$$I(t) > I_{min};$$

$$I_{max} > I(t).$$

Kuhn Tucker optimality conditions

These Kuhn Tucker optimality conditions are associated to the maximization problem of Lagrangean on the set of control variables. In Kuhn Tucker system, in addition to conditions required for optimal control variables, are added and equating to 0 the constraints imposed on state and control variables.

$$\frac{\delta L(.)}{\delta D(t)} = 1 - \lambda_1(t)(1-T) + \mu_1(t) - \mu_2(t)$$

$$\frac{\delta L(.)}{\delta I(t)} = \lambda_2(t) + \mu_3(t) - \mu_4(t)$$

$$\frac{\delta L(.)}{\delta L(t)} = \lambda_1(t)(1-T) \left[\frac{\delta V(Q(t))}{\delta L(t)} - w \right]$$

$$\mu_1(t) * D(t) = 0$$

$$\mu_2(t) (D_{max} - D(t)) = 0$$

$$\mu_3(t) (I(t) - I_{min}) = 0$$

$$\mu_4(t) (I_{max} - I(t)) = 0$$

$$v_1(t) (K(t) - Cpr(t)) = 0$$

$$v_2(t) ((1+k) Cpr(t) - K(t)) = 0$$

From these equations it follows that $\mu_2(t) = 0$; $\mu_3(t) = 0$; $\mu_4(t) = 0$.

$$\Rightarrow 1 - \lambda_1(t)(1-T) + \mu_1(t) = 0$$

$$\Rightarrow \lambda_1 = \frac{\mu_1(t)+1}{(1-T)} = \mu_1(t) + 1. \text{ as not considering the tax factors}$$

$$\Rightarrow \lambda_2 = 0$$

We know that the Lagrange multipliers: $\mu_1(t)$, $v_1(t)$, $v_2(t)$ are greater or equal to 0 and $\lambda_1(t)$ and $(1-T)$ are positive. Also it can be seen that marginal revenue equals marginal cost and is the average salary.

$$\frac{\partial V(Q(t))}{\partial L(t)} = w.$$

Basic trajectory analysis:

Each of the three multipliers ($\mu_1(t)$, $v_1(t)$, $v_2(t)$) are either equal to 0 or positive. Thus, we see that there are 2^3 basic trajectories. Trajectories for which: $\mu_1(t) > 0$; $v_1(t) > 0$; $v_2(t) > 0$ and $\mu_1(t) = 0$; $v_1(t) > 0$; $v_2(t) > 0$ are unacceptable! We can say this because of $\mu_1(t) > 0$, if we look at the equation $\mu_1(t) * D(t) = 0$, we deduce that $D(t) = 0$. The path is not possible, because the optimization problem is to maximize the dividends.

If $v_1(t) > 0$, from the condition: $v_1(t) * (K(t) - Cpr(t)) = 0$, it follows that $K(t) = Cpr(t)$. For $v_2(t) > 0$ and $v_2(t) * [(1+k) Cpr(t) - K(t)] = 0$, we obtain that $(1+k) Cpr(t) - K(t) = 0$. It was demonstrated before that $K(t) = Cpr(t)$, so the equation becomes the following $(1+k) Cpr(t) - Cpr(t) = 0$. If we disentangle the bracket it follows that $k * Cpr(t) = 0$, which is impossible since both terms are different from 0.

The possible trajectories for optimization problem are in number of 6 and are presented in the following table.

Table 1

Possible trajectories to maximize dividends

Trajectory no.	$\mu_1(t)$	$v_1(t)$	$v_2(t)$
1.	0	+	0
2.	0	0	+
3.	0	0	0
4.	+	+	0
5.	+	0	+
6.	+	0	0

Source: Dorin Mitruț, „Gestiunea integrată a firmei – Modele dinamice de firmă”, ASE Publishing, Bucharest, <http://www.biblioteca-digitala.ase.ro/biblioteca/pagina2.asp?id=cap3>

Where $\mu_1(t) = 0$, on the trajectories 1, 2, 3, it results that: $\lambda_1(t) = \mu_1(t) + 1$ and so $\lambda_1(t) = 1$. From the canonical system, from dynamic equations of multipliers attached to state variables we know that:

$$\begin{aligned} \dot{\lambda}_1(t) &= i * \lambda_1(t) - \lambda_1(1-T) * r + v_1(t) - v_2(t) * (1+k) \\ \Rightarrow \dot{\lambda}_1(t) &= i - (1-T) * r + v_1(t) - v_2(t) * (1+k), \text{ and } \dot{\lambda}_1(t) = 0 \\ \Rightarrow i - (1-T) * r &= v_2(t) * (1+k) - v_1(t) \end{aligned}$$

Knowing that $\lambda_2(t) = 0$, we obtain that:

$$\begin{aligned} \dot{\lambda}_2(t) &= i * \lambda_2(t) - \lambda_1(1-T) * \left[\frac{\partial V(Q(t))}{\partial K(t)} - (r+a) \right] + \lambda_2(t) * a - v_1(t) + v_2(t) \\ \Rightarrow -\lambda_1(1-T) * \left[\frac{\partial V(Q(t))}{\partial K(t)} - (r+a) \right] &= v_1(t) - v_2(t) \\ \Rightarrow (1-T) * \left[\frac{\partial V(Q(t))}{\partial K(t)} - (r+a) \right] &= v_2(t) - v_1(t) \end{aligned}$$

Trajectory 1: characterized by $\mu_1(t) = v_2(t)$ and $v_1(t) > 0$. From $v_1(t) > 0 \Rightarrow v_1(t) * (K(t) - Cpr(t)) = 0 \Rightarrow K(t) = Cpr(t)$. Thus, on this trajectory, the basic funding of the company is made by its own sources of income and depreciation. From $\mu_1(t) = 0 \Rightarrow \mu_1(t) * D(t) = 0 \Rightarrow D(t) > 0$. From this condition results that the company pays dividends, which is consistent with the model assumptions stated above. From $v_2(t) = 0 \Rightarrow i - (1-T) * r = (1+k) * v_2(t) - v_1(t) = -v_1(t)$. So, $v_1(t) = (1-T) * r - i$. It is known that $(1-T)$ is positive and

therefore also $(1-T) * r - i$ is strictly positive. This suggests that $(1-T) * r > i$. On this trajectory the shares of the company are cheaper than a credit and it is rational for the funding to be made with own sources. From the equation: $(1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r + a) \right] = v_2(t) - v_1(t)$ it

results that $\frac{\delta V(Q(t))}{\delta K(t)} - (r + a) = \frac{-v_1(t)}{(1-T)}$. Replacing the $v_1(t)$ cu $(1-T)*r - i$, we obtain that $\frac{\delta V(Q(t))}{\delta K(t)} = (r + a) + \frac{i - (1-T)*r}{(1-T)} = a + \frac{i}{(1-T)}$.

It follows a system of two equations:

$$\begin{cases} \frac{\delta V(Q(t))}{\delta K(t)} = a + \frac{i}{(1-T)} \\ \frac{\delta V(Q(t))}{\delta L(t)} = w \\ \begin{cases} K(t) = K_0 * e^{-t} + a + \frac{i}{1-T} \\ L(t) = L_0 * e^{-t} + w \end{cases} \end{cases}$$

Trajectory 2: characterized by $\mu_1(t) = v_1(t) = 0$; $v_2(t) > 0$. Because of the condition $v_2(t) > 0$, we obtain from the equation $v_2(t) * ((1+k) Cpr(t) - K(t)) = 0$ that $Cpr(t) = \frac{K(t)}{1+k}$.

On the trajectory number 2, the company uses both its own resources and borrowed sources. We have a mixed financing. Because $\mu_1(t) = 0 \Rightarrow \mu_1(t) * D(t) = 0 \Rightarrow D(t) > 0$. Hence, the company distributes dividends, even if not at the maximum level possible. From $v_1(t) = 0$, if we replace in equation $i - (1-T) * r = v_2(t) * (1+k) - v_1(t)$ results that $v_2(t) = \frac{i - (1-T)*r}{1+k}$. Since $v_2(t) > 0$, $i - (1-T) * r$ will also be strictly positive. Thus, this trajectory can see that $i > (1-T) * r$. Actions are more expensive than loans, that is why the financing will be achieved through loans.

From $(1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] = v_2(t)$, results that

$$\begin{aligned} \frac{\delta V(Q(t))}{\delta K(t)} &= (r+a) + \frac{i - (1-T)*r}{(1+k)*(1-T)} = r + a + \frac{(1-T)*(\frac{i}{1-T} - r)}{(1+k)*(1-T)} = \\ &= \frac{(r+a)(1+k) + (\frac{i}{1-T} - r)}{1+k} = \frac{r+a+k*r+a*k-r+\frac{i}{1-T}}{1+k} = \frac{a*(1+k)+k*r+\frac{i}{1-T}}{1+k} = \\ &= a + \frac{k*r}{1+k} + \frac{i}{(1-T)(1+k)} \end{aligned}$$

It follows a system of two equations:

$$\begin{cases} K(t) = K_0 * e^{-t} + a + \frac{k*r}{1+k} + \frac{i}{(1-T)(1+k)} \\ L(t) = L_0 * e^{-t} + w \end{cases}$$

Trajectory 3: $\mu_1(t) = v_1(t) = v_2(t) = 0$. Because $\mu_1(t) = 0 \Rightarrow \mu_1(t) * D(t) = 0 \Rightarrow D(t) > 0$. Company distributes dividends, which is consistent with the assumptions of the model analyzed in this paper. From $v_1(t)=0$ și $v_1(t)(K(t) - Cpr(t)) = 0 \Rightarrow K(t) > Cpr(t)$. This is true, the capital of the company consisting of equity and debt. We concluded that on this trajectory the company uses borrowed sources. Due to the condition $v_2(t) = 0$ we get the equation: $v_2(t) * ((1+k) Cpr(t) - K(t)) = 0$ that $Cpr(t) > (K(t)) / (1+k)$. On trajectory 3, the company also uses own resources and borrowed sources. Because $v_1(t) = v_2(t) = 0$, the equation $i - (1-T) * r = v_2(t) * (1+k) - v_1(t)$ reduces to $i = (1-T) * r$. It can be seen that actions are as expensive, costing as much as credits, which is rejected from the model assumptions. Therefore, trajectory number 3 cannot be accepted, because funding must have different costs.

Trajectory 4: $\mu_1(t) > 0$; $v_1(t) > 0$; $v_2(t) = 0$. From Kuhn Tucker system of equations we take the equation: $v_1(t) (K(t) - Cpr(t)) = 0$. Since $v_1(t) > 0$ it requires that $K(t) = Cpr(t)$ and such debt is zero, $Y(t) = 0$. On that trajectory funding is made only with own sources. From equation $i - (1-T) * r = v_2(t) * (1+k) - v_1(t)$, results that $i - (1-T) * r = -v_1(t)$. But, on this trajectory $v_1(t) > 0$, that is why $v_1(t) = (1-T) * r - i$.

$$\Rightarrow i - (1-T) * r < 0$$

$$\Rightarrow i < (1-T) * r$$

Action cost is lower than the interest rate, which verifies their funding sources. From equation:

$$(1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r + a) \right] = v_2(t) - v_1(t) \text{ results that}$$

$$\frac{\delta V(Q(t))}{\delta K(t)} - (r + a) = \frac{-v_1(t)}{(1-T)}.$$

Replacing $v_1(t)$ with $(1-T)*r - i$, we obtain that $\frac{\delta V(Q(t))}{\delta K(t)} = (r + a) + \frac{i - (1-T)*r}{(1-T)} = a + \frac{i}{(1-T)}.$

It follows a system of two equations:

$$\begin{cases} \frac{\delta V(Q(t))}{\delta K(t)} = a + \frac{i}{(1-T)} \\ \frac{\delta V(Q(t))}{\delta L(t)} = w \\ \begin{cases} K(t) = K_0 * e^{-rt} + a + \frac{i}{1-T} \\ L(t) = L_0 * e^{-rt} + w \end{cases} \end{cases}$$

Trajectory 5: $\mu_1(t) > 0$; $v_1(t) = 0$; $v_2(t) > 0$. Because of the condition $v_2(t) > 0$, we obtain from the equation $v_2(t) ((1+k) Cpr(t) - K(t)) = 0$ that $Cpr(t) = \frac{K(t)}{1+k}$.

On the trajectory number 5, the company uses both its own resources and borrowed sources. We have a mixed financing. Because $\mu_1(t) = 0 \Rightarrow \mu_1(t) * D(t) = 0 \Rightarrow D(t) > 0$. Hence, the company distributes dividends, even if not at the maximum level possible. From $v_1(t) = 0$, if we replace in equation $i - (1-T) * r = v_2(t) * (1+k) - v_1(t)$ results that $v_2(t) = \frac{i - (1-T)*r}{1+k}$. Since $v_2(t) > 0$, $i - (1-T) * r$ will also be strictly positive. Thus, this trajectory can see that $i > (1-T) * r$. Actions are more expensive than loans, which is why the financing will be achieved through loans.

From $(1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r + a) \right] = v_2(t)$, results that

$$\begin{aligned} \frac{\delta V(Q(t))}{\delta K(t)} &= (r + a) + \frac{i - (1-T)*r}{(1+k)*(1-T)} = r + a + \frac{(1-T)*(\frac{i}{1-T} - r)}{(1+k)*(1-T)} = \\ &= \frac{(r+a)(1+k) + (\frac{i}{1-T} - r)}{1+k} = \frac{r+a+k*r+a*k-r+\frac{i}{1-T}}{1+k} = \frac{a*(1+k)+k*r+\frac{i}{1-T}}{1+k} = \\ &= a + \frac{k*r}{1+k} + \frac{i}{(1-T)(1+k)} \end{aligned}$$

It follows a system of two equations:

$$\begin{cases} K(t) = K_0 * e^{-t} + a + \frac{k * r}{1+k} + \frac{i}{(1-T)(1+k)} \\ L(t) = L_0 * e^{-t} + w \end{cases}$$

Trajectory 6: $\mu_1(t) > 0$; $v_1(t) = 0$; $v_2(t) = 0$

Because $\mu_1(t) = 0 \Rightarrow \mu_1(t) * D(t) = 0 \Rightarrow D(t) > 0$. Company distributes dividends, which is consistent with the assumptions of the model analyzed in this paper. From $v_1(t) = 0$ and $v_1(t)(K(t) - Cpr(t)) = 0 \Rightarrow K(t) > Cpr(t)$. This is true, the capital of the company consisting of equity and debt. We concluded that on this trajectory the company uses borrowed sources. Due to the condition $v_2(t) = 0$ we get the equation: $v_2(t) * ((1+k) Cpr(t) - K(t)) = 0$ that $Cpr(t) > (K(t)) / (1+k)$. On trajectory 3, the company also uses own resources and borrowed sources. Because $v_1(t) = v_2(t) = 0$, the equation $i - (1-T) * r = v_2(t) * (1+k) - v_1(t)$ reduces to $i = (1-T) * r$. It can be seen that actions are as expensive, costing as much as credits, which is rejected from the model assumptions. Therefore, trajectory number 3 cannot be accepted, because funding must have different costs.

Highway trajectory analysis

There are two highway trajectories: in a single stage and in two stages. Highway trajectories in a single stage are characterized by the fact that it is used only one source of funding along the entire trajectory, either from its own resources or from borrowed sources. On the other hand, highway trajectories in two stages differ from the first in that after a certain period of time ($t-\tau$), the company changes its funding strategy: either go on using mixed sources of funding on a trajectory and continues with funding from a single source on another trajectory, or use only a funding source on a trajectory, then the financing strategy is made from two funding sources. In the highway trajectories is specific the existence of a concatenation point τ , which respect the derivability and continuity properties.

Highway trajectories in a single stage

The analysis will be performed according to the ratio between the share cost (i) and the credit cost $((1-T) * r)$, because it determines the performance and the admissibility or inadmissibility of the trajectories. There are two highway trajectories in a single stage: own sources of funding and loan sources of funding. The highway trajectory in a single stage: own sources of funding, is characterized by the fact that loans are more expensive than shares: $i < (1-T) * r$ and there has been a steady development of company indicators.

$$\begin{cases} y_t^* = 0 \\ K_{(t)}^* = K_0 * e^{-t} + a + \frac{i}{1-T} \\ I_{(t)}^* = I_0 - a * K_{Cpr(t)}^* \\ D_t^* = (1-T)[V(Q(t)) - q * P_{m,s} - w * L(t) - a * K_{Cpr(t)}^*] \\ \int_1^{10} e^{-it} * D^* * dt = \frac{D^*}{i} = D \text{ optim} \end{cases}$$

Where “*” is the optimum.

The highway trajectory in one stage: borrowed sources is characterized by the fact that actions are more expensive than loans: $i > (1-T) * r$ and $CPR(t) = (K(Yt)) / (1+k)$. The optimal trajectory is number 2 and there has been a steady development of company indicators.

$$\left\{ \begin{array}{l} y_t^* = \frac{1}{1+k} * K_y^* \\ K_{(t)}^* = K_0 * e^{-rt} + a + \frac{k * r}{1+k} + \frac{l}{(1-T)(1+k)} \\ I_{(t)}^* = I_0 - a * K_{Y(t)}^* \\ D_t^* = (1-T)[V(Q(t)) - q * P_{m,s} - w * L(t) - (a+r) * K_{Y(t)}^*] \\ \int_1^{10} e^{-it} * D^* * dt = \frac{D^*}{i} = D \text{ optim} \end{array} \right.$$

Highway trajectories in two stages

If loans are expensive $i < (1-T)*r$ and $K(0) \neq K_{Cpr}^*$, or if the shares are expensive $i > (1-T) * r$ and $K(0) \neq K_Y^*$, the final trajectories can't be the initial trajectory too. So, the company needs to evolve on one of the paths 4, 5, 6. For a switching from one trajectory to another to be admissible, it is necessary that all the solutions obtained by concatenation to satisfy the conditions of continuity and derivability. In the concatenation point of two basic trajectories must be satisfied the relations:

$$\left\{ \begin{array}{l} \lambda 1(\tau^-) = \lambda 1(\tau^+) + \eta 1(\tau) + \eta 2(\tau) \\ \lambda 2(\tau^-) = \lambda 2(\tau^+) + \eta 1(\tau) + (1+k) * \eta 2(\tau) \\ \eta 1(\tau) * [K(\tau) - Cpr(\tau)] = 0 \\ \eta 2(\tau) * [(1+k)Cpr(\tau) - K(\tau)] = 0 \\ \eta 1(\tau) \geq 0; \eta 2(\tau) \geq 0 \end{array} \right.$$

These are the specific equations of the concatenation point, which depend on the number of sources of funding and on the number of trajectories of funding.

$$\left\{ \begin{array}{l} \eta 1(\tau) + (1+k) * \eta 2(\tau) = 0 \\ \eta 1(\tau) = \eta 2(\tau) = 0 \\ \Rightarrow \lambda 1(\tau^-) = \lambda 1(\tau^+) \end{array} \right.$$

Thus in the concatenation points are respected the conditions of continuity.

$$\lambda 1(t) = \mu 1(t) + 1.$$

Since $\lambda 1(t)$ in the point τ is continuous, then the multiplier $\mu 1(t)$ is a continuous function. Since on the trajectories 1 and 2, the multiplier $\mu 1(t) = 0$, the trajectories that prior trajectories 1 and 2 must check that the multiplier $\mu 1(t) > 0$. Trajectories 1 and 2 are the final trajectories. This means that on the switching point τ the following conditions are checked:

$$\left\{ \begin{array}{l} \mu 1(t < \tau) > 0 \\ \mu 1(t = \tau) = 0 \\ \mu 1(t > \tau) < 0 \end{array} \right. \Rightarrow \left\{ \begin{array}{l} \mu 1(t < \tau) < 0 \\ \mu 1(t = \tau) = 0 \\ \mu 1(t > \tau) > 0 \end{array} \right.$$

It is known that $\lambda 1(t) = 1 + \mu 1(t)$, so $\dot{\lambda 1}(t) = \dot{\mu 1}(t)$.

Starting with the equation:

$$\dot{\lambda 1}(t) = i * \lambda 1(t) - \lambda 1(t) * (1-T) * r + v 1(t) - (1+k) * v 2(t),$$

if we factor common $\lambda 1(t)$ we obtain:

$$\dot{\lambda 1}(t) = \lambda 1(t) [i - (1-T) * r] + v 1(t) - (1+k) * v 2(t)$$

$$\dot{\mu 1}(t) = [1 + \mu 1(t)] * [i - (1-T) * r] + v 1(t) - (1+k) * v 2(t).$$

In order to identify which of the possible combinations verifies the conditions mentioned above, we will successively analyze the trajectories 4 and 5 to see what conditions

are preceding the final trajectories 1 and 2. We assume that trajectories number 4 and 5 are trajectories with mixed funding.

Trajectory 4: From $\mu_1'(t) = i - (1-T)r + v_1(t) < 0$, results that $i - (1-T)r < 0$. So, $i < (1-T)r$. The situation corresponds to expensive loans, so this trajectory is the final one for trajectory 1. From the optimal condition is shown that:

$$\Rightarrow -\lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] - v_1(t) + v_2(t) = 0$$

$$\Rightarrow v_1(t) = -\lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right]$$

$$\text{From: } \mu_1'(t) = [1 + \mu_1(t)] * [i - (1-T)r] - \lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right]$$

$$\lambda_1(t) = 1 + \mu_1(t) = 1 + 0 = 1$$

$$\mu_1'(t) = [1 + \mu_1(t)] * [i - (1-T)r] - (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right]$$

$$\mu_1'(t) = [1 + \mu_1(t)] * (1-T) * \left[\frac{i}{1-T} - r - \frac{\delta V(Q(t))}{\delta K(t)} + r + a \right]$$

$$\text{But } \mu_1(t) < 0$$

$$\Rightarrow \frac{i}{1-T} - \frac{\delta V(Q(t))}{\delta K(t)} - a < 0$$

$$\Rightarrow -\frac{\delta V(Q(t))}{\delta K(t)} - a < -\frac{i}{1-T}$$

$$\Rightarrow \frac{\delta V(Q(t))}{\delta K(t)} + a < \frac{i}{1-T}$$

$K(t) = K_{Cpr}^*$ is specific for final trajectory 1. On the trajectory number 4 is known that optimal capital is $K(t) = K_{YCpr}^*$ and in terms of expensive credits, so in case of an own sources funding and for an initial value of the company capital $K_0 < K_{YCpr}^*$, the firm will start the strategy funding on trajectory 4 and will continue this funding strategy until $K(0) = K_{YCpr}^*$, when the company will make the switching on the final trajectory number 1.

Trajectory 5: From $v_1(t) = 0$:

$$\Rightarrow -\lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] - v_1(t) + v_2(t) = 0$$

$$\Rightarrow v_2(t) = \lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right]$$

$$\Rightarrow \mu_1'(t) = [1 + \mu_1(t)] * [i - (1-T)r] - (1+k) * \left\{ \lambda_1(t) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] \right\}$$

$$\Rightarrow \mu_1'(t) = [1 + \mu_1(t)] * [i - (1-T)r] - (1+k) * \left\{ (1 + \mu_1(t)) * (1-T) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] \right\}$$

$$\Rightarrow \mu_1'(t) = [1 + \mu_1(t)] * (1-T) * \left[\frac{i}{1-T} - r - (1+k) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] \right]$$

$$\Rightarrow \frac{i}{1-T} - r - (1+k) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right] < 0$$

$$\Rightarrow \frac{i}{1-T} - r < (1+k) * \left[\frac{\delta V(Q(t))}{\delta K(t)} - (r+a) \right]$$

$$\Rightarrow \frac{\delta V(Q(t))}{\delta K(t)} > \frac{i}{(1-T)*(1+k)} - \frac{r}{1+k} + r + a.$$

1) Applying the Lesourne-Leban model on a listed company

In this chapter we applied the model described above on a corporation in Romania, in order to maximize its market value. This company has as object of activity the gas

transport, international transit for gas, gas dispatching and research-design gas transport. Based on the company's financial statements, we obtained using the discount factor,

$$Fa = \frac{1}{(1+ra)^i},$$

the update data of the company in the last 3 years, where “i” is the year and “ra” the inflation base. Next, we estimated the model parameters based on financial information, we had established the mathematical model and on the basic trajectory analysis phase we obtained that the funding of the company is done through loans, because the cost of the action is greater than the cost of borrowed resources. That is why the company may choose the trajectory number two or five.

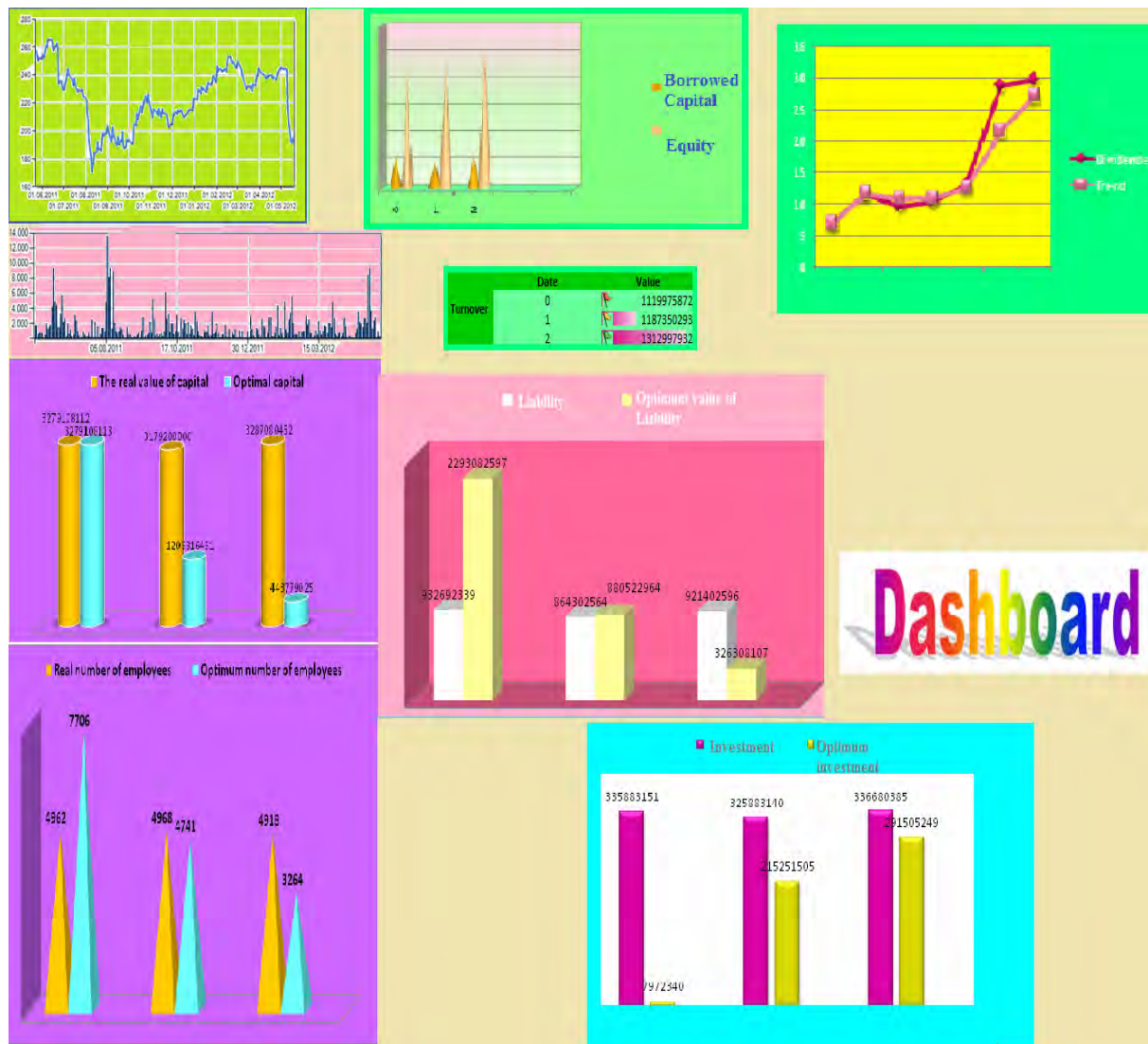


For the reference year, the difference between the value of capital and the optimum is one monetary unit, the company must increase the capital in order to equal the optimal one. Regarding the number of employees, the difference between the optimal and the reality is huge. The company works with less than 2788 people that should have. This is beneficial, because can express high productivity. For next year, the situation changes, the company have the capital too big than the optimal one. Regarding workforce this year the company have worked with 243 more people than should have. We can say that the business productivity decreases. In the last year, the company worked with more than 1032 employees than needed. The difference from optimal increased from last year. The same trend is recorded for capital, which is nearly 3 billion higher than it should have. This difference so great is unjustified and will affect the company's results in the future.

Analyzing the highway trajectories in two stages, we demonstrated that trajectory 5 will switch with trajectory 2, since on trajectory 2 the funding is done by credits, the shares being more expensive than loans. Trajectory no. 5 is coupled with trajectory 2 and becomes the second trajectory highway in two stages. Trajectory no. 5 will be the initial trajectory and trajectory no. 2 will be final one.

Further, we will present the main indicators of the company which we studied, according to the Lesourne-Leban model. In order to do this we will build a dashboard. The main goal of an efficient dashboard is to display all of the required information on a single screen, clearly and without distraction, in order to be understood by everybody. Most dashboards are created in Excel. It is estimates that 40 percent of the top corporations use dashboards with their Business Intelligence initiatives. The dashboard puts the managers in touch with the business in real-time. The CEO of Verizon Communications said that „The

more eyes that see the results we're obtaining every day, the higher the quality of the decisions we can make" (Person, 2009, p. 108).



Regarding the company's debt, in the reference year they represented only 40% of the optimal value and the investments made this year were 42 higher than optimum. In the reference year the optimal dividend is negative, so we conclude that this year the company should have not paid dividends to shareholders. This is due to excessively high initial capital that the company owns.

In the following year, the company increased debt to 98% of the optimal value. Thus, we can say that the company does not use the loans that are cheaper in the proportion needed. This year would have been optimal to pay shareholders higher dividends than the profit made by the company. So, the company could record a higher net profit if it were run effectively. This is because the initial investment is higher than optimal and the value of debt is less than optimal.

In the last year studied, the total debt was higher than the optimum, the company was indebted to three times more than it should have. The same trend was recorded for investments made. This year the company should have recorded a higher profit as dividend optimal is higher than the net profit. This is due to an excessive indebtedness and an unreasonably high capital.

Conclusions

Using dynamic models provide shareholders and management the data needed to guide future business strategy. Basic trajectory analysis provides information on the type of funding (own funds or credits) that the company uses. Regarding company analyzed, the basic trajectories that can be used are those with number 2 and 5, as the cost of the action is greater than the cost of borrowed resources. There are two types of highway trajectories: in a single stage and in two stages. The trajectory in one stage is characterized by the fact that it is used only one source of funding along the entire trajectory.

On the other hand, highway trajectories in two stages differ from the first one in that after a certain period of time the company changed its financing strategy. It is important not to forget that the optimization models not say what will happen in a given situation, but indicate what to be done to get the best situation. The company analyzed would have to modify the management because its financial and economic indicators are far from the optimum values.

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THE ADVANTAGES, DISADVANTAGES AND CONTROVERSIES OF PRIVATE EQUITY FUNDS

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Abstract. *This article presents the investment scheme known as a private equity fund, the special characteristics that they have compared to general investment funds and also restrictions and practices regarding them that can be tolerated or not depending on the legislation. New terms associated with investment are introduced at a steady rate and some of them can be tricky because they have a specific meaning in a specific region and the purpose of the article is to clarify them. There is also a model presented to evaluate these investments, which is similar to the ones used for investment funds, but has specific elements associated with private equity funds.*

Keywords: investment fund; private equity fund; collective investment scheme; hurdle rate; carried interest.

JEL Classification: D82; G19; G39.

REL Classification: 11B; 11E.

A collective investment vehicle is a way of investing money alongside other investors in order to benefit from the inherent advantages of working as part of a group. These advantages include the ability to hire a professional investment manager, benefit from economies of scale – cost sharing among others and diversify more than would be feasible for most individual investors which reduces risk. Collective investment vehicles are often referred to as mutual funds, investment funds, managed funds, or simply funds.

An open-end fund is equitably divided into shares which vary in price in direct proportion to the variation in value of the fund's net asset value. Every time money is invested, new shares or units are created to match the prevailing share price; each time shares are redeemed, the assets sold match the prevailing share price. In this way there is no supply or demand created for shares and they remain a direct reflection of the underlying assets.

A closed-end fund issues a limited number of shares (or units) in an initial public offering (or IPO) or through private placement. If shares are issued through an IPO, they are then traded on an exchange or directly through the fund manager to create a secondary market subject to market forces. If demand for the shares is high, they may trade at a premium to net asset value. If demand is low they may trade at a discount to net asset value. Further share (or unit) offerings may be made by the vehicle if demand is high although this may affect the share price.

In Romania exists the Association of Fund Administration, an institution containing 19 companies that administer investments that in turn administer 54 open funds and 19 closed funds of investments. This institution is affiliated to EFAMA (European Fund and Asset Management Association) and contributes to the formation and development of the organizational, legal and professional infrastructure that must contribute to the improvement of the member's activity.

The investment funds can be classified under the criteria of the financial instruments that make up the portfolio of investment: monetary funds (Certinvest Monetar, Fortuna Gold), bond funds (BCR Obligatiuni), diversified funds (BCR Dinamic, Omnitrust), stock funds (Active Dinamic, OTP Avantisro) and other funds (OTP Euro Bond).

A private equity fund is a collective investment scheme used for making investments in various equity (and to a lesser extent debt) securities according to one of the investment strategies associated with private equity. Private equity funds are typically limited partnerships with a fixed term of 10 years, often with possible annual extensions. Private equity fund investment is for investors who can afford to have capital locked up for long periods and who can risk losing significant amounts of money. These disadvantages are offset by the potential benefits of annual returns, which may range up to 30% for successful funds.

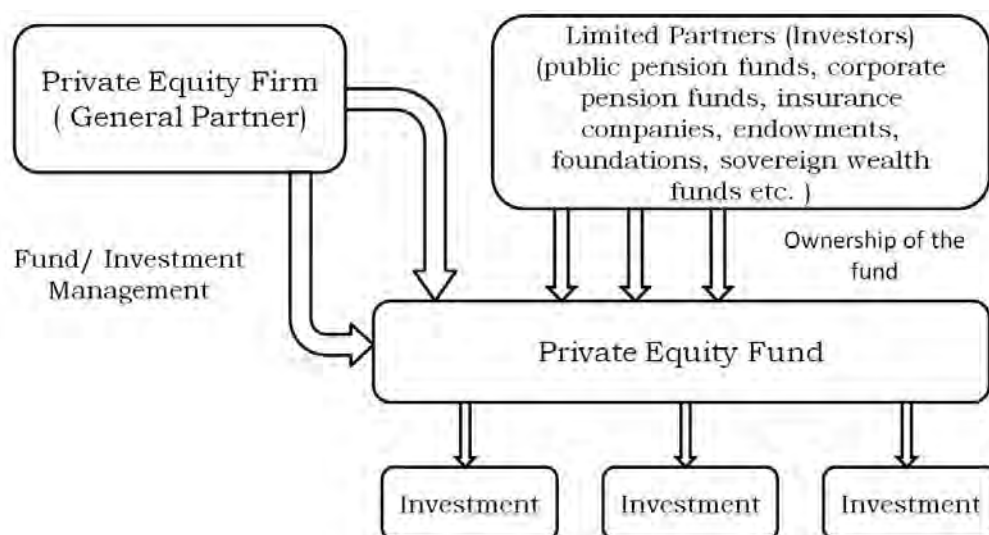


Figure 1

The fees set forth in the partnership agreement are:

- 1) Management fees, an annual payment made by the investors in the fund to the fund's manager to pay for the private equity firm's investment operations, typically 1 to 2% of the committed capital of the fund. The management fee is meant primarily to cover the costs of investing and managing the fund rather than for meaningful wealth creation for the manager.
- 2) Hurdle rate, a minimum rate of return, for example 8-12%, which must be achieved before the fund manager can receive any carried interest payments.
- 3) Carried interest, a share of the profits of the fund's investments, typically up to 20%, paid to the private equity fund's management company as a performance incentive.

The majority of private equity investments on the Romanian market are made by non-Romanian private equity funds and Romanian funds have a limited presence. Funding sources are mostly institutional like the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC) or other financial institutions and pension funds rather than private.

In the first half of 2011, the Romanian aggregate M&A (mergers and acquisitions) market decreased by 33%, with only 87 transactions being recorded. The value of M&A transactions in Romania during the same period was EUR 538 million. The outlook for transactional activity in 2012 is relatively optimistic. Having resisted the crisis, Romanian entrepreneurs are now more interested in attracting investments from private equity and Romania is seen as an attractive investment destination compared with other CEE countries.

The vast majority of private equity funds (PEF) are organized as limited partnerships. Their investors are principally institutional investors, such as endowments, pension funds, insurance companies, and banks. These investors, called limited partners (LPs), commit a certain amount of capital to private equity funds, which are run by general partners (GPs). In general, when a GP identifies an investment opportunity it withdraws money from its LPs up to the amount committed, and it can do so at any point in time until the liquidation of the fund.

Despite the high values reported for investments the estimates can be optimistic, because additional costs incurred by investors are not deducted because of data access constraints. Certain investors hire funds of funds when investing in private equity and thus pay supplementary fees. In addition, investors face transaction costs when “cashing” stock distributions made by funds.

Interestingly, in order to assess the added value of private equity fund managers, the calculated performance gross of fees can be found to be greatly diminished. Assuming a conservative fee structure of 2% of committed capital throughout the fund's life plus a 20 percent carried interest (8 percent hurdle rate), an average gross of fees alpha (return in compensation to the risk borne) is found to be at about 4 percent a year. This typical 2-20 fee structure, which seems innocuous at first sight, results in very high fees in practice, of 7 % a year. David Swensen (2000), estimated even higher fees, about 12 % a year.

The finding of high gross of fees performance shows that GPs might add value (the final conclusion will depend on how much risk they take) and that the typical fee structure has a large impact on performance. These results also indicate that the total fees captured by private equity funds are probably excessive and is probably behind the counterintuitive result of low net of fees performance.

A potential explanation for the low performance of private equity funds is that the objective of limited partners may not be to maximize returns. Ljungqvist and Richardson (2003) argue that investments in private equity funds can be caused by the desire to establish a commercial relationship with GPs and obtain services and side benefits. These side benefits include advisory work and underwriting securities (both debt and equity). A recent study by Hellmann, Lindsey and Puri (2005) is in agreement with this view. It argued that banks are strategic investors in the venture capital market because they use their venture capital investments to build relationships for their lending activities.

There is a worrying conspiracy theory about why money flows despite poor performance. Thanks to the use of stale residual values which underestimate beta (the correlated volatility of an asset in relation to the volatility of the benchmark that asset is being compared to) and overestimate alpha mechanically, the showing of both average IRRs (internal rate of revenue) which are misleadingly high and multiples, the reported alpha of this asset class is exaggerated but credible for a unknowledgeable person. Hence, the theory goes as follows. The person in charge of managing the private equity portfolio of an investment company (the LP) is glad to receive from the GP a misleadingly high alpha. This misleading figure enables him/her to receive a commensurably exaggerated salary. The GP is obviously glad, too, because it can receive higher fees than otherwise. For certain investment companies, the whole company may even be fine with such practices because it enables the company to display good records. Such might be the case for endowments and pension funds, the main investors in private equity, because they are not the ultimate claimants. Trustees are the ones who should intervene, but for some reason they seem silent. If such a theory is verified and practices do not change, the sustainability of this industry will be unnecessarily threatened.

Restrictions on transparency

There is a possibility that the information regarding fund performance may not be publicly available. It is possible that the IRR and other performance indicators to be shown without explaining the way in which they were computed and without a performance benchmark. Also regarding fees, the information refers to an aggregate level per fund, fact that shows that both displayed costs and hidden costs can exist.

This state of the world is surprising to financial economists, because in general, hiding information is not optimal. GPs have to pay for secrecy by offering superior performance in equilibrium, and the benefits for the GPs are not obvious. One can imagine that an unskilled GP wants to hide, but why would the good GPs? Why are the good GPs not posting their track records on their websites? It is difficult to imagine that this disclosure would harm their future competitiveness. These questions are as intriguing as they are unsolved. A question that can

be asked is why are not the past performances advertized to increase the fees in a justifiable way? The explanation that is offered is that if these firms increase their fees and have bad luck, investors would not want continuing the collaboration. But this explanation applies only to management fees and not to the carry rate, that is given to the manager only after he fulfilled the obligations toward his investors. Another plausible explanation is that they don't want to increase the displayed costs, because the investment fund can obtain through hidden costs a large amount of the returns.

Restrictions on tradability

The stakes of LPs in a given fund are not readily transferable. This feature might be related to the desire to not give any information about funds. Indeed, to sell a stake, an LP would have to tell prospective investors about current performance and investments of a fund. Obviously, a feasible and supposedly cheap option is to sell the stake to the investors that are already in the fund. There have been some such rare cases, and the practice has been that other LPs buy the stake at cost. It is surprising to financial economists, but this rule seems to be customary.

When asked, GPs typically say that they want to avoid stakes ending up in the hands of unsophisticated investors without a long-term commitment to the asset class. In addition, if the stakes were freely traded, the fund would be taxed at the GP level as well as the LP level, which would be especially detrimental because many investors in private equity funds are tax-exempt entities. However, it is generally believed that the level of control over transfer constraints imposed in most partnership agreements is far in excess of what would be required to comply with securities and tax laws, but this is an open research question.

The problem of non-transferability of stakes hit a high in 2001 when most banks decided to reduce their exposures to private equity and could not readily do so. Famous examples include that of JP Morgan and Deutsche Bank. In 2000, JP Morgan sold \$1 billion on the secondary market with a large discount and sold an extra \$0.5 billion via securitization in 2001-2002.

Stakes are transferable in practice, therefore, but it is not widespread, and GPs appear to do their best to prevent the transferability of partnership stakes. GPs want to avoid asking outside investors for money because they would have to pay "lemon" premium. The market does not know whether the need for money is because current investors are not recommitting enough as a result of a liquidity shock or because the fund is a lemon, meaning its performance is low. To avoid this discount in future fund raising, GPs decide to have investors that are as liquid as possible, even if the GPs have to pay a cost associated with non-tradability.

The restrictions to the limited partners' ability to transfer funds are less common in funds without a lot of asymmetric information and with shorter investment cycles. Also, funds specializing in biotechnology investments have more transfer constraints, whereas those focused on software and the Internet have fewer constraints.

The fee structure contains two main components: management fees and a carry. The details are quite complex and extensive and can have a large effect on the final bill—particularly those details related to the calculation and payment timing of the carry. The fee agreements are available in fund-raising prospectuses, and several studies have used such data sources to study the level of fees and its determinants.

Note that management fees are standard at first examination; they are set around 2 percent, which is the rate for mutual funds and less than that of most hedge funds. However, fees are typically charged on the amount committed at inception (sometimes only the first five years, sometimes for the entire fund's life), which results in high fees; Ljungqvist and Richardson (2003) report that 16 percent of committed capital is invested at the end of the first year, and that after five years, only 80 percent of capital committed is invested. The fee payment at the end of the first year is thus as high as 12.5 percent of the amount invested for example. This policy is also intriguing because GPs have an incentive to ask for as much capital as possible to collect high management fees, but can avoid low performance because of too much money under management by simply not investing the excess capital. Sometimes

the carry contains a hurdle rate based on capital committed, which limits this incentive, or restrictions are in place to require full investment of committed capital.

Capital contributions

In most cases, capital contributions are heavily concentrated in the first few years of a fund's life. After the initial burst of investment activity, contributions to a fund are made at a declining rate as fewer new investments are made and follow-on investments and fees are spread out over a number of years. As shown below, capital contributions are calculated by multiplying the rate of contribution by the remaining capital commitment, or the initial capital commitment minus the sum of the paid in capital.

$$C_t = RC_t \cdot (IC - PIC_t)$$

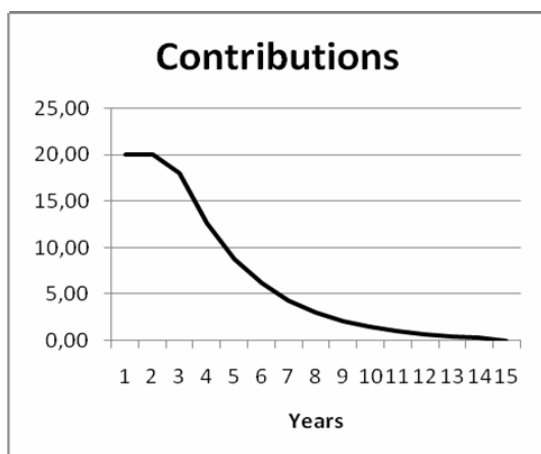


Figure 2

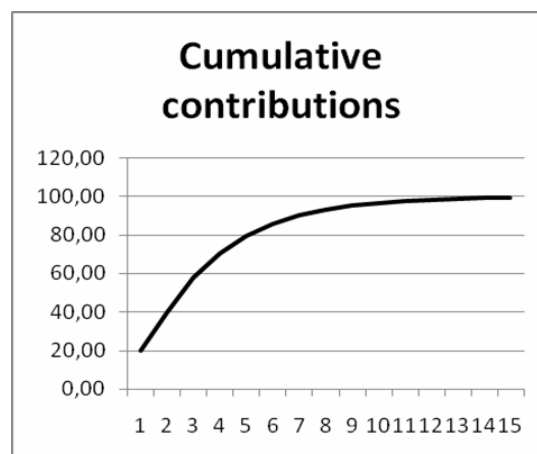


Figure 3

Distributions

Distributions vary with the different stages of a fund's life. In the early years of a fund, distributions tend to be minimal as investments have not had time to be harvested. The middle years of a fund tend to have the most distributions as investments come to fruition. Later years are marked by a steady decline in distributions as fewer investments are left to be harvested.

Recognizing that the size and timing of distributions are based on the performance of the fund, we established a distribution formula based on a rate of distribution and the net asset value with the management fee subtracted) as shown below.

$$D_t = RD \cdot [NAV_{t-1} \cdot (1 + G) - MF_t]$$

For asset types like venture capital, the distribution rate can be written like:

$$RD = \left(\frac{t}{L}\right)^B$$

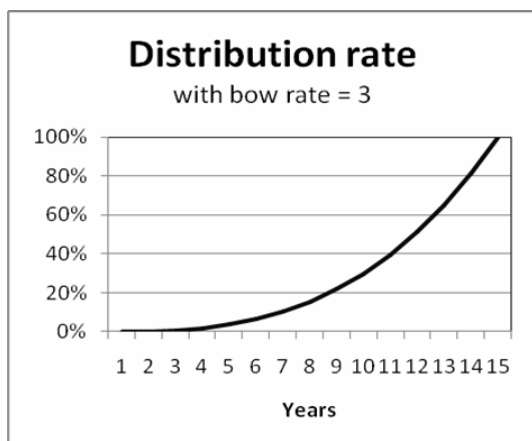


Figure 4

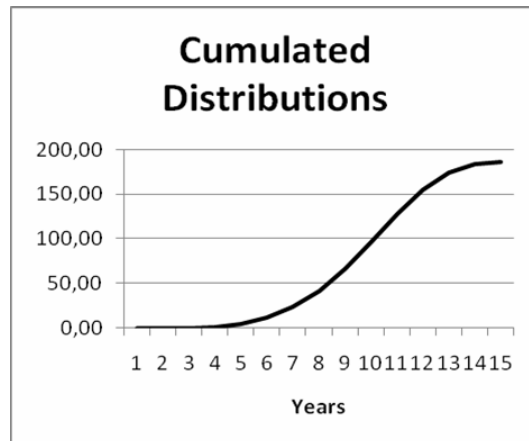


Figure 5

In the last year of the fund, when time (t) equals the Life (L), the distribution rate reaches a peak as 100% of the remaining asset value gets distributed. Despite the high distribution rate, the amount of the final distribution typically will be fairly small as the net asset value has declined significantly in the later years of a fund.

The bow (B) controls the rate at which the distribution rate changes over time. As shown in the charts below, the higher the bow, the slower the initial increase of the distribution rate and the faster the later acceleration.

Net Asset Value

Partnership values are affected by three variables: investment performance, capital inflows, and capital outflows. In the model, as shown below, the net asset value (NAV) is calculated by multiplying the previous year's net asset value by the projected growth rate (G), subtracting management fees (MF), adding contributions (C), and subtracting distributions (D).

$$NAV_t = NAV_{t-1} \cdot (1 + G) - MF_t + C_t - D_t$$

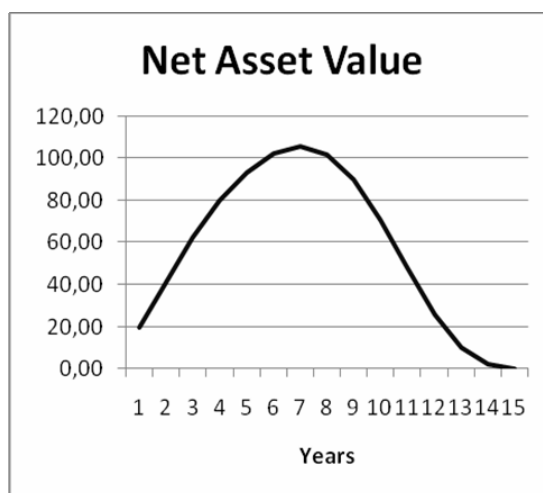


Figure 6

Catch-up clause

The catch-up clause is a percentage that, after the principal hurdle rate has been paid back to the investors, shows how soon the manager can earn the carry rate. It usually is set at around 80-100%.

Table 1

Year	Distribution rate	Contributions	Cumulated contributions	Distributions	Cumulated distributions	NAV
1	0.000296	20.000000	20.000000	0.000000	0.000000	19.600000
2	0.002370	20.000000	40.000000	0.052034	0.052034	41.101862
3	0.008	18.000000	58.000000	0.368273	0.420307	62.515093
4	0.018962	12.600000	70.600000	1.327728	1.748035	79.903952
5	0.037037	8.820000	79.420000	3.314534	5.062569	93.468321
6	0.064	6.174000	85.594000	6.69809	11.762379	102.556391
7	0.101629	4.321800	89.915800	11.673500	23.435879	105.895904
8	0.151703	3.025260	92.941060	17.992577	41.428456	102.059264
9	0.216	2.117682	95.058742	24.690177	66.118633	90.243359
10	0.296296	1.482377	96.541119	29.947426	96.066059	71.248787
11	0.394370	1.037664	97.578784	31.470220	127.536279	48.184154
12	0.512	0.726365	98.305149	27.630721	155.167000	26.102438
13	0.650962	0.508455	98.813604	19.030727	174.197726	10.022667
14	0.813037	0.355919	99.169523	9.126655	183.324382	2.083830
15	1	0.000000	99.169523	2.333889	185.658271	0.000000

We consider a model with growth rate of 12% and life of 15 years. The contributions in the first year will be 20%, in the second year 25% and in the third and all subsequent years 30%. The initial capital commitment is 100 mil. \$. The distribution has a bow rate of 3. The management fee is 2% of subscribed capital per year. The carry rate is 20% and the hurdle rate is 8%.

When the cumulated distributions reach 108 mil. \$ then the manager has returned the principal plus hurdle rate so he is entitled to receive 20% of future distributions.

For example in year 11, the cumulated distributions are 127,53 mil \$, and the distributions in excess of 108 are 19,53 mil. Because of the 100% catch-up provision the first 2 mil. of these will go to the GP and after that the remaining 17, 53 mil are split between GP and LP, the GP taking 3,51 mil. and the LP receiving 14,02 mil.

In order to illustrate the reasoning behind the catch-up provision let's say that in year 11 the cumulated distributions were 108 mil, and in the next year the distributions only for that year were 2 mil. with a catch-up provision of 80%. Then even if the manager deserves 20% because of the carry rate, he will only take 80% or 1,6 mil.

Suppose that the distributions in the following year are still 2 mil. \$. The calculations here are a bit more complicated, and the use of a spreadsheet is indicated. The profits are 12 mil. \$, the manager is entitled to 2,4 mil. \$ but has only 1,6 mil. \$. Then the manager will take 80% of the difference between what he is entitled and what he has meaning 0, 64 mil \$. He will still earn 20% of the profits, but it will accumulate more slowly.

Conclusions

With the diversification of investment opportunities such as investment funds, hedge funds, private equity funds and more, institutional investors have an incentive to find ways of projecting future asset values and cash flows for funds. These collective investment schemes have to be given a proper legal and organizational background that can take time to implement depending on the country.

These new financial instruments come with new challenges of their own, because before investors can be knowledgeable enough with all the courses of actions they have at their disposal, they must be on the lookout for hidden costs and question the data provided to them to see if is accurate, because the managers can look for a loophole that is in their benefit, if proper regulations are not in place.

When evaluating private equity funds, mere mathematical models will not be sufficient to give a detailed and thorough look on reality, because investor psychology and personality traits must also be taken into consideration. The identification and the implementation of the psychological factors in the model forms a intriguing premise from which future research may be conducted.

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THE CHOICES BETWEEN FAIR VALUE AND HISTORICAL COST ACCOUNTING FOR NON-CURRENT REAL ASSETS AT LATVIAN, LITHUANIAN AND ESTONIAN LISTED COMPANIES DURING THE REPORTING YEAR OF 2011

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Abstract. *Stock investors require financial statements of listed companies for their investment decision-making. J. Gassen and K. Schwedler (2008) have empirically proved that EU investors who use financial statements prefer reported assets' fair values over historical costs. The purpose of this study is to test whether the Latvian, Lithuanian and Estonian listed companies set accounting policies for their non-current real assets in favor of EU investors who prefer fair values over historical costs.*

The results of this study indicate that the EU investors' needs for fair value reporting are not met at most Latvian, Lithuanian and Estonian listed companies.

Keywords: fair value; non-current assets; real assets; listed companies; Latvia; Lithuania; Estonia.

JEL Classification: G11, G39.

REL Classification: 11B.

Presentation of the research issue and its design

IFRS requirement for listed EU companies

Since 2005, all companies that are listed on EU regulated markets must prepare their consolidated financial statements according to the International Financial Reporting Standards (further in the text – IFRS) [Jaunzeme].

Since 1 May 2004, the three Baltic states, Lithuania, Latvia and Estonia, are all members of the EU. The shares of Latvian, Lithuanian and Estonian listed companies are quoted on the NASDAQ OMX Baltic market. Those Latvian, Lithuanian, and Estonian companies whose shares are registered on the Official list of the NASDAQ OMX Baltic market prepare their financial statements according to the IFRS following a compulsory requirement (www.nasdaqomxbaltic.com).

Accounting policy choices between fair value and historical cost accounting under IFRS for non-current real assets

Companies that prepared their financial statements for the reporting year of 2011 according to IFRS faced accounting policy choices regarding the adoption of fair value accounting versus historical cost accounting (Jaunzeme).

According to International Accounting Standard 1 “Presentation of Financial Statements” an entity shall classify an asset as current when:

- ✓ it expects to realize the asset, or intends to sell or consume it, in its normal operating cycle;
- ✓ it holds the asset primarily for the purpose of trading;
- ✓ it expects to realize the asset within twelve months after the reporting period; or
- ✓ the asset is cash or a cash equivalent (as defined in IAS 7) unless the asset is restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period (TAS1, 1997).

All other assets shall be classified as non-current (TAS1, 1997).

Non-financial assets are referred to as real assets. The main subgroups of non-current real assets are intangible assets, property, plant and equipment, investment properties and biological assets.

Choices between fair value and historical cost accounting policies for non-current real assets under the IFRS in 2011 were the following:

- ✓ the choice between application of cost model versus revaluation model for balance sheet measurement of intangible assets,
- ✓ the choice between application of cost model versus revaluation model for balance sheet measurement of property, plant and equipment,
- ✓ the choice between application of cost model versus fair value model for balance sheet measurement of investment property (IAS16, 1993, IAS38, 1998, IAS40, 2000).

The aim of research

Stock investors use financial statements of listed companies for their investment decision-making. Gassen and Schwedler (2008) studied the EU investors' attitudes towards fair value accounting empirically. Their research indicated that investors prefer fair value accounting over reporting historical costs (Gassen, Schwedler, 2008).

The intent of this study is to test whether the Latvian, Lithuanian and Estonian listed companies set accounting policies for their non-current real assets in favor of EU investors who prefer fair values over historical costs.

Research design

According to the IFRS, companies shall disclose their fair value accounting policies in the notes to the financial statements (IAS1, 1997). Therefore, in order to complete the research, the author studies the notes to the financial statements of listed Latvian, Lithuanian and Estonian companies that have been prepared under IFRS for the reporting year of 2011.

The notes to the financial statements of five Latvian companies, 13 Estonian companies and 17 Lithuanian companies whose shares are registered on the Official list of the NASDAQ OMX Baltic market are selected for study. In total, the financial statements of 35 Baltic listed companies are subject to this study.

The relevant reporting year for four Latvian companies, 16 Lithuanian companies and 12 Estonian companies subject to the study lasts from 1 January 2011 until 31 December 2011. One Latvian company and one Lithuanian company prepared their relevant financial statements for the year ended 30 June 2012, and one Estonian company chose the time period from one September 2010 until 31 December 2011 as its financial reporting period. The reporting periods of all Baltic companies selected for study thus either fully or partially coincide with the calendar year of 2011 (NASDAQ OMX Baltic market).

Research limitations

This study is limited to the fair value accounting policies applied for the reporting year of 2011 by Latvian, Lithuanian and Estonian companies whose shares are quoted on the Official list of the NASDAQ OMX Baltic market. This study does not encompass fair value accounting policies chosen under IFRS by other listed companies – those whose shares are being quoted on the Second list of the NASDAQ OMX Baltic market.

Research findings (NASDAQ OMX Baltic market)

Latvian listed companies' choices between fair value and historical cost accounting

As a result of this study, the author has found that no Latvian company has chosen revaluation model for its intangible assets and its property, plant and equipment.

Three out of five Latvian companies whose notes to the financial statements were studied carried investment properties. One out of three companies which had investment properties chose fair value model for reporting investment properties on the balance sheet.

Estonian listed companies' choices between fair value and historical cost accounting

Twenty out of thirteen Estonian companies studied did not choose revaluation model for their intangible assets. Only one Estonian company applied revaluation model for trademarks and licenses, though chose cost model for valuation of other intangible assets.

Eleven out of thirteen Estonian companies whose financial statements were studied did not apply revaluation model for their property, plant and equipment. One Estonian company studied chose revaluation model for its land and buildings and cost model for other property, plant and equipment items. Furthermore, one Estonian company applied revaluation model for its ships and cost model for the rest of the property, plant and equipment.

Eleven out of thirteen Estonian companies subject to this study carried investment properties on their balance sheets. Seven out of these eleven companies which had investment properties applied fair value model for measurement of their investment properties.

Lithuanian listed companies' choices between fair value and historical cost accounting

Sixteen out of seventeen Lithuanian companies subject to this study did not choose revaluation model for their intangible assets. One company chose revaluation model for emission rights, though cost model for other intangible assets.

Heretofore out of seventeen Lithuanian companies did not apply revaluation model for their property, plant and equipment. Two companies chose revaluation model for buildings, though cost model for other property, plant and equipment. One company chose revaluation model for land and buildings and cost model for other property, plant and equipment. One company applied revaluation model merely for some property, plant and equipment items and cost model for the rest of the property, plant and equipment.

Ten out of seventeen Lithuanian companies reported investment properties on their balance sheets. 4 out of these ten companies which reported investment properties chose fair value model for these properties.

The summary of research findings

Research findings are summarized in tables 1, 2 and 3.

The choices that Latvian, Lithuanian and Estonian listed companies have made between cost model and revaluation model for valuation of their intangible assets are presented in Table 1.

Table 1

Latvian, Lithuanian and Estonian listed companies' choices between cost model and revaluation model for valuation of their intangible assets in 2011

Accounting policies	Latvian listed companies		Lithuanian listed companies		Estonian listed companies		All Baltic listed companies	
	number	% of total	number	% of total	number	% of total	number	% of total
Revaluation model	0	0	0	0	0	0	0	0
Revaluation model for some items, cost model for others	0	0	1	6	1	8	2	6
Cost model (did not apply revaluation model)	5	100	16	94	12	92	33	94
Total	5	100	17	100	13	100	35	100

Table 1 clearly reflects the low preference for revaluation model as an intangible assets' measurement model at Baltic listed companies. According to table 1, all Latvian listed

companies and most of the Estonian and Lithuanian listed companies did not choose revaluation model for measurement of their intangible assets and applied cost model instead.

The choices that Latvian, Lithuanian and Estonian listed companies have made between cost model and revaluation model for valuation of their property, plant and equipment are summarized in Table 2.

Table 2

Latvian, Lithuanian and Estonian listed companies' choices between cost model and revaluation model for valuation of their property, plant and equipment in 2011

Accounting policies	Latvian listed companies		Lithuanian listed companies		Estonian listed companies		All Baltic listed companies	
	number	% of total	number	% of total	number	% of total	number	% of total
Revaluation model	0	0	0	0	0	0	0	0
Revaluation model for some items, cost model for others	0	0	4	24	2	15	6	17
Cost model (did not apply revaluation model)	5	100	13	76	11	85	29	83
Total	5	100	17	100	13	100	35	100

Table 2 demonstrates that revaluation model is not the preferred model for valuation of property, plant and equipment at Baltic listed companies. According to Table 2, all Latvian listed companies and the greatest part of the Estonian and Lithuanian listed companies did not apply revaluation model for measurement of their property, plant and equipment and chose cost model instead. The prevalence of revaluation model for valuation of property, plant and equipment is the highest among Lithuanian companies, with Estonian companies being the second.

In Table 3, the choices that Latvian, Lithuanian and Estonian listed companies have made between cost model and fair value model for valuation of their investment properties are summarized.

Table 3

Latvian, Lithuanian and Estonian listed companies' choices between cost model and fair value model for valuation of their investment properties in 2011

Accounting policies	Latvian listed companies		Lithuanian listed companies		Estonian listed companies		All Baltic listed companies	
	number	% of total	number	% of total	number	% of total	number	% of total
Fair value model	1	33	4	40	7	64	12	50
Cost model (did not apply fair value model)	2	67	6	60	4	36	12	50
Total companies with investment properties	3	100	10	100	11	100	24	100

According to Table 3, half of all Baltic listed companies which carried investment properties reported investment properties at their fair values on the balance sheet, while the other half measured investment properties at their historical costs. The prevalence of fair

model for valuation of investment properties is the highest among Estonian companies, with Lithuanian companies being the second and Latvian companies – the third.

The purpose of this study was to determine whether the Latvian, Lithuanian and Estonian listed companies set accounting policies for their non-current real assets in favor of EU investors who prefer fair values over historical costs. The results of the research, however, do not confirm that the EU investors' need for fair value reporting is fulfilled by Latvian, Lithuanian and Estonian listed companies. Instead, very few Baltic listed companies report the fair values of their intangible assets and property, plant and equipment on their balance sheets. The incidence of fair value reporting is higher for investment properties than for intangible assets and property, plant and equipment.

Conclusions

The results of the study indicate that most Latvian, Lithuanian and Estonian listed companies did not apply revaluation model for their intangible assets and property, plant and equipment in 2011 and chose cost model for the respective items instead. Half of all Baltic listed companies measured their investment properties according to fair value model, while the other half chose cost model for investment property items in 2011.

To conclude, the EU investors' requirement for reported assets' fair values is not fulfilled by most Latvian, Lithuanian and Estonian listed companies.

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THE IMPACT OF CORPORATE GOVERNANCE MEASURES ON THE PERFORMANCE OF ENTERPRISES

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Abstract. *The issue in the forefront of this research aims to find answers and solutions to questions of national and international interest, such as: to what extent does corporate governance affect managerial decisions regarding achieving performance in an enterprise? Could enterprise performance, defined based on information provided by financial statements, influence future management decisions? Is the application of corporate governance laws reflected in achieving performance within an enterprise?*

Moreover, this paper attempts not just to find answers for these questions, but also to bring arguments and evidence. To this purpose, an econometric model has been used, demonstrating the close relationship between financial motivation of human capital involved in activities of the most important companies from the Romanian pharmaceutical industry - matter reflected in financial statements by staff expenditure - and performance achieved – expressed through turnover.

Keywords: enterprise performance; financial performance; performance indicators; corporate governance; expenditure on employees.

JEL Classification: D22, G34, L21, L25.

REL Classification: 14K, 12C.

1. Introduction

The enterprise is the center of gravity of the economy, given its role in the production of goods and services with a view to meeting the consumer's needs. This entity transforms inputs into outputs by choosing the most favorable alternative combination of production factors and, therefore, as a last result, maximizing profits.

All results achieved by the company in hold activities are reflected in its performance. This it is not only about financial aspects. Non-financial aspects also have a major importance.

Corporate governance plays a key role in pursuing the activity of any undertaking, which is why special attention should be paid to how these management and control mechanisms are applied in the company.

In accordance with OECD principles (1999), corporate governance “specifies the distribution of rights and responsibilities among different participants in a company such as the board, managers, shareholders and other parties, and specifies the rules and procedures for making decisions relating to the affairs of the company”.

Corporate governance is the indispensable element in the work of companies and in people's lives, benefiting from services of the respective companies, as well as in solving

current issues which will never cease to disappear due to the fact that the world is in constant motion and transformation and people's needs are increasingly more diversified.

The present research aims at analyzing to what degree the investment in human resources, as capital involved in the pursuit of production within an enterprise (measure of corporate governance), influences a company's performance. From this perspective, a model is developed for the most important companies in the Romanian pharmaceutical sector.

This paper comprises eight sections. First four capture theoretical aspects of the concept of enterprise, the enterprise's role and performance. The following three sections describe the role of corporate governance, recall approaches in literature and explain how it manifests itself in Romania. Finally, the last section describes the research method and results obtained. The paper concludes by presenting research findings and future research directions.

2. Company and its role in economy

The enterprise, as it was stated in a recent paper by Gavrilă and Popescu (2007), represents the basic link of the economy and, as an organization, involves achieving objectives within a community of individuals working together according to a division of labor. François Perroux (1941) asserts that the company "is a form of organization where, in the same patrimony, there are combined the prices of various factors of production that are brought here by other agents than the company's owner in order to produce and sell on the market a good or a service for the purpose of obtaining monetary income resulting from the difference between the two series of prices". In current Romanian legislation, the words exposed by the French researcher decades ago were implemented in the following form: "the enterprise refers to any form of organizing an economic activity, autonomous patrimonial and authorized under applicable law to acts and deeds of trade, in order to obtain profit in competitive conditions, namely: companies, cooperative societies, individuals engaged in independent economic activities and family associations authorized under the laws in force" (Law on encouraging the establishment and development of small and medium sized enterprises). Therefore, the purpose of business is to make profit, which brings to mind a key term in finance - performance.

3. Enterprise performance

Since the 1980's many researchers have attempted to define performance, an essential concept in financial administration science.

In a broad way, the concept of performance has a meaningful semantic area with different significations depending on the sphere that uses it. Generally, it can be defined as the ability to achieve certain objectives established with a specific degree of accuracy. A more specific meaning, however, can be granted only in connection with certain references and by comparison. For this reason, performance evaluation can be equated with the concept of benchmarking.

In a narrow way, in the economic literature, the performance of an enterprise is the level up to which it achieves its assumed objectives and the level up to which it evolves and progresses from one period to another. Specifically, it may be, for example, about seizing a market share greater than the value held in an earlier period, reaching a turnover of a certain value, going up with a particular number of positions in a companies' hierarchy. These examples show the specific aspects (market share, turnover, position in the hierarchy) and references (internal or external to the company) resulting from comparison (with the value of a previous period, the results of competitors, a standard value, a statistical value like a national, regional, sector or market average, a statistical value which is the average of a homogeneous group, etc.), elements that define performance and were mentioned above. From this arises the need to measure performance, a fact that will be detailed below.

Another definition used by specialists in the field refers to value creation from the perspective of optimizing cost-value relationship. In regard to this aspect, Chirilă (2004) states

that the value can be an external one when the market value of the company exceeds the book value of its assets or an internal one when the business creates economic value added.

Finally, one last definition mentioned in the literature by Tabără and Horomnea (2007) considers that, at the microeconomic level, performance can be achieved if it is to take four key elements into account: efficiency of the production process, the company's ability to grow and develop, shareholders' satisfaction and the customer's satisfaction. This definition assigns performance three characteristics, namely: the economical aspect (acquirement of resources at the lowest cost), efficiency (maximizing the amount of goods or services obtained using a given quantity of resources; in takes the form of return - ratio between benefit obtained and capital invested - and the form of productivity - the ratio between the volume obtained and the volume consumed) and effectiveness (the extent to which the predicted aims are reached or exceeded by those actually carried out).

4. Financial and non-financial performance

The performance of a company has also different meanings depending on the users of financial information or the so-called stakeholders. While managers are concerned about the overall performance of the company, investors are interested not only in profit generated by investments made in the past, but in future development prospects as well. Also, providers are interested in the company's solvency, the consumers of its stability. Finally, employees want stability and benefits provided. Therefore, to measure performance, both financial information and non-financial information is necessary. All these together point a complete picture of the business.

Robu and Sandu (2006) state that the financial aspects of performance are conveyed using indicators such as return on equity, return on assets, leverage, capital efficiency, liquidity rates, cash flow, stock rotation rate, claims rotation rate, indicators of value creation (economic value added, total return of the shareholders). These indicators concern, in the vision of Robu and Vătui (2004), mainly the superior financial accounting results (profitability, financial balance, and ability to generate cash).

Non-financial aspects are highlighted, according to Robu and Sandu (2006), by criteria such as management quality, corporate culture, effectiveness of executive management remuneration policies, the quality of communication with shareholders system. Indicators used for this purpose are the number of customers, customer's satisfaction, number of sales points, rotation of employees, training costs per employee, the average age of employees, the average number of employees, number of days of training sessions, the percentage of employees with secondary education, the percentage of employees with higher education, the percentage of employees with over 3 years experience, operating result per square meter, costs per square meter, the percentage of new customers in a year, development costs in total administrative expenses, the percentage of employees aged under 40 years, the number of new registered ideas from employees.

The analysis of an enterprise's performance is a topic whose approach differs according to various experts. However, in general, referring strictly to financial matters, a simple analysis of performance is that when only information from the profit and loss account is taken into account. In contrast, a comprehensive analysis uses other sources of information as well. It refers to issues such as operating result, which requires a classification of expenses by function, profit sharing, part that determines the destinations of profit, amortization and adjustments for depreciation, which bring explanations on the evolution of value adjustments of all company assets, provisions, part that brings information about the evolution of different types of risk provisions.

Performance has been reduced to its financial size for a long period of time. This is why most studies conducted so far have been discussing mainly expressing performance with financial aspects. From this perspective, Tabără and Horomnea (2007) state that performance

consists in achieving the desired return to shareholders by turnover and by holding a market share that could lead to a long-term existence of the enterprise.

In the same vision, Russu (2003) states that cost and profit are the primary performance because they allow the identification of other indicators which faithfully reflect a firm's ability to provide consumer benefits. Also, according to the neoclassical theory, profit reflects effectiveness of the production activity, effectiveness of goods and services selling on market, resources allocation efficiency, the combination of production factors in relation to their prices, the extent to which a company has the ability to adjust to the structure of production and demand and the extent to which it has the ability to adopt an appropriate market behavior according to market dynamics.

However, seeing the company's efficiency only as the ability to make profit with the least and cheapest resources has been criticized. Present, gradually, at a global level, performance's approaches go from a financial representation to the approach that includes both a social and an environmental oriented dimension. Therefore, at this time, the viability of a company is not only related to the financial branch. How it is led became equally important. Tabără and Horomnea (2007) state that the responsibility of this type of entities integrates not only shareholders, but also includes customers, employees, purveyors, associations, unions, NGOs, local communities and so on. Therefore, it can be said that the company has a dual role in the economy. One, according to a recent work of Gavrilă and Pălău (2007), is economical as the firm attracts and combines factors of production, its purpose is the execution of goods and services and it distributes the income. The second is social and manifests itself particularly for employees and customers, but also for the local community, for example. Employees are an important part of the company and, as Gavrilă and Pălău (2007) show in the same study, due to time dedicated to working within it, they deserve favorable working conditions, optimal wages and benefits. Consumers are another category of stakeholders of a firm. To these economic entity must assume the responsibility to promote quality products and services, in accordance with requests and needs of the first.

Tabără and Horomnea (2007) also state that social responsibility needs to consider factors such as, for instance, compliance with legal obligations, the adoption of an ethical behavior in accordance with moral norms and expectations of the society in which the firm operates, philanthropy, voluntary activities, charitable acts in environmental problems and social issues, product's quality and safety.

Corporate governance intercedes in all these aspects. Since conflicts of interest occur frequently, such as those between employees and capital owners or those between shareholders and consumers, the firm is obliged to find the optimal driving and control strategy whose results satisfy the interests of all stakeholders equally. At least, now it is about the overall performance of the enterprise.

5. Overall performance of the enterprise

Regarding the results of a company, some experts use the concept of overall performance whereof Tabără and Horomnea (2007), state that "it is defined as the aggregation of economic, social and environmental performance or it is formed by bringing together not only financial performance, but social and societal performance as well." Here, the relationship between the non-financial aspects and business performance is also considered: "A firm that enhances societal responsibility on products or their manufacture can expect the increasing of the attractiveness of their products in the future, fact that leads to turnover growth. [...] Distinguished by their societal performances, enterprises can hope to achieve a long-term financial performance".

A conclusion of the two authors' study is that "overall performance appears as a regularity that allows different partners to increase awareness regarding concerns of sustainable development and to change individual interests orientation to the long-term common interest" and that "overall performance can be assimilated to a convention between

enterprise and its partners.”. Therefore, the idea of cooperation towards achieving a common goal that meets the interests of all participants occurs here.

Performance is not only perceived as a responsibility of company management. Now it becomes a task of all stakeholders. However, this task should not be regarded as an imposed aspect, but rather as a voluntary matter. For this reason, the word task does not fully reflect that concern for company’s results is the choice of each partner of the company. It is not something enforced from the outside. The voluntary aspect comes from the fact that each part wins. If all stakeholders work together for a common goal, consisting of firm’s high performance achieving, then everyone will benefit. The overall performance of the company extends individually to all stakeholders. Thus, employees will be better paid, will get more benefits and will have their job guaranteed for a long period of time. Creditors will be confident that the company will repay its loans and rely on a loyal customer. The local community will benefit from new jobs, other investments or charities and sponsorships. Customers will receive high quality products and a wider range of products. Local government will benefit from additional resources, as new funds raised from taxes. Here, the corporate governance has a considerable contribution.

6. Corporate governance and its role within the enterprises

If we were to define corporate governance, there would not be a general definition, which applies to capture all the meanings of the phrases. However, most definitions refer to a set of processes, laws and institutions that have a role in the management, administration and control of an enterprise. Corporate governance influence the way in which objectives of the enterprise are set and achieved, the manner in which risk is monitored and assessed and how performance is optimized.

Corporate governance creates the appropriate framework, in which the activity of any undertaking can be carried out properly, in accordance with the law. Thus, corporate governance helps establishing and clarifying the activities of an enterprise in terms of avoiding conflicts of interest. In other words, there is an amalgamation of both the interests of shareholders, investors, employees, managers and the public authorities in any company. These interests can support a common goal, namely, the performance of the enterprise, only with help from an appropriate normative framework, expressed through the principles of corporate governance.

Another argument, which comes to underline the fundamental role and the need of the application of corporate governance in any companies, consists in the capacity of measures and mechanisms of corporate governance to provide confidence and security to all partners, respectively: investors, who cannot effectively participate in the day-to-day administration of the enterprise, as well as managers and specialists who are personally in charge of its administration. Thus, their interests are aligned and the problem of the agent is avoided. In this regard, motivating employees, in order to ensure performance and reduce conflicts of interest, can be enhanced through appropriate wages. This is a decision that reflects a corporate governance measure.

On the other hand, in the absence of oversight and control measures and mechanisms, managers (for example) tend to put their own interests first. This fact is detrimental for members’ interests and can unleash crisis. These crises triggered by the weakness of corporate governance can, in turn, generate devastating effects on both enterprises and market undertakings, especially the stock market. In other words, if shareholders’ interests prevail, the performance of the enterprise tend to have an upward curve: “What is in the firm best interests, is in the owners best interests”.

Starting with this point, it is necessary to understand the close connection between the performance of the company and shareholders. Thus, corporate governance plays an essential role in order to protect the rights and property of the shareholders. This is why financial and organizational management must be based on some general principles of ethics, like: non-

involvement in fraudulent activities (otherwise it can be reached to the loss of the right to practice), denouncing fraud, loyalty to the employer, avoiding conflicts of interest, proper professional training in the field of activity in which it is engaged (law, tax, accounting standards) etc.

However, management can sometimes make decisions which run counter to the interests of the shareholders, for example:

- engaging in extravagant investment; in other words, shareholders's money is head to investment that does not contribute to the shareholders' profit;
- not enough effort is engaged; thus, the leadership is involved, often, in activities that do not bring contributions to the making of profit for shareholders;
- self dealing; hiring company's assets in the counterpart of the interest of management operations, activities falling between benign and illegal;
- stark choices as well as the manipulation of accountancy, acceptance of unprofitable business lines, etc.

7. Approaches in literature on the relationship corporate governance – performance of enterprise

There are many works in literature that make reference to the principles of corporate governance and the degree of applicability in countries with emerging economies, such as the case of Romania.

Corporate governance means the totality of processes, laws, moral and social development whereby a company is managed and controlled. Corporate governance has a strong impact in both countries with an independent economy and countries whose companies are part of a group or financial conglomerate. Thus, Khanna and Palepu (1999) emphasize the importance of group or conglomerate membership in terms of increasing economic performance in emerging economies, such as India and Chile. This can favor investors who acquire control of companies in the conglomerate, owning a major share of their actions.

The relationship between corporate governance and the performance of enterprises is found also with Klapper and Love (2004). Based on some tests, they have concluded that there is a strong correlation between corporate governance, operational performance and the market value. The authors also pointed out that, based on these results, businesses led by good quality corporate governance can cope and even offset a deficient regulatory framework.

There are studies (Jensen, 1986) in which the focus is on the impact of debt on corporate governance. Managers extend the business, power, prestige, being engaged in debts. This fact creates discipline because it reduces the costs of agency in favor of the interests of shareholders and managers.

Furthermore, Driffield (2005) showed, in his work, that higher levels of concentration are higher levels of indebtedness, case encountered among companies in Korea and Indonesia, on the basis of some studied samples.

There are also studies that have examined the relationship between corporate governance and enterprises' performance in the context of emerging economies. Thus, there are two models of corporate governance in developed countries: shareholder and stakeholder. The difference between the two models is the objective. The first one has the objective of maximizing value for shareholders. The second - stakeholder model - has the objective of defending the interest of all parties involved, in one way or another, in the company's life (employees, trading partners, managers, shareholders, etc.). Most of the times, in countries with emerging economies, organizations are motivated to act in an ethical manner only when considering interests such as resources, which is why the stakeholder model is more appropriate for these countries.

Thus, in order to achieve the performance of a company, a theory of collaboration between stakeholders was developed. The theory of collaboration between the company's stakeholders can be brought into management practice only if certain principles of corporate

governance exist and are met. These prevent the management from making decisions contrary to the interests of the various stakeholders. An important role is that of the salary motivation of any employee, regardless of the position they hold. Otherwise, faulty activities are frequently encountered in the economic reality that can be manifested by manipulating accounting information, hiring the company's assets in the counterpart of some operations exercised in the interests of management, engaging in illegal or high risk activities, engaging in activities that do not bring significant contributions to maximize profit for shareholders (what is happening, in part, due to insufficient effort made), involvement (unwittingly, due to lack of interest, due to precarious situation analysis or personal reasons) in investments which do not contribute to maximizing shareholder profits and many other situations.

Fabling and Grimes (2007) studied the elements that differentiate top companies from the usual ones. They concluded that, among other things, these elements include leadership, planning and organizing, focus on client, corporate social responsibility, appreciation of employees. The two authors also demonstrate that the relationship between performance and corporate governance does not depend on company size or sector of activity.

Therefore, fact also highlighted by Ertugrul and Hegde (2009), corporate governance has a significant impact on the performance of the enterprise. However, it is difficult to establish the amount of this impact because of the governance's quantifying difficulty. Despite of these, in the US, for example, some rating agencies (The Corporate Library, Institutional Shareholder Services, Governance Metrics International and Standard and Poor's) have tried to quantify the quality of corporate governance.

8. Corporate governance in Romania

The concept of corporate governance was published in Romania in the early 2000s. In order to understand the impact that corporate governance can have on business performance and, consequently, on the property of the shareholders (and vice versa) the legal framework in which the corporate financial activity takes place in Romania must be establish.

Corporate governance in Romania, in the context of the OECD principles (adopted in 1999 with the aim of helping the member countries' governments and the OECD non-members in pursuit of an adequate management on monitoring, evaluation, management and control of the large companies in the interest of shareholders), stresses out the importance of the following:

- Establishing the basis for a legal framework of corporate governance. The corporate governance framework should promote the transparency and efficiency of markets, consistency in rules and regulations. It also should establish the responsibilities of the various regulatory and supervisory authorities clearly.
- Ensuring the protection of shareholders' rights through corporate governance framework.
- Assuming a fair treatment of all shareholders, including minority and foreign ones, so that all shareholders should be able to get proper repairs in case of violation of their rights.
- Creating a corporate governance framework which recognizes the roles and rights of all those who have legitimate interests in firm (stakeholders), encouraging the active cooperation between companies and affiliated parties in creating wealth, jobs, and sustainable development of the organization.
- Ensuring transparency of information, information flow and prompt release. Thus, corporate governance framework should ensure that timely and accurate dissemination of information is done when necessary. This should happen in all organization's aspects, including its financial situation, performance, ownership, and management of the company.
- Fulfillment of the responsibilities of board of directors and executive management. Corporate governance framework should ensure the strategic orientation of the company, the effective monitoring of management by the board of directors and the responsibility of the board of directors to shareholders.

9. The impact of corporate governance on the performance of the company.

Case study: enterprise performance and corporate governance – human resources investments' influence on the results of the company in pharmaceutical industry

Although it is a subject of general interest, laws of corporate governance have not attracted very much attention until recently. Outstanding events - such as those of recent times like the Enron scandal (2001) or other failures - caused by the violation of the corporate governance laws and which contributed to the global financial crisis, whose consequences are still significantly today, brought back corporate governance among the most discussed topics of the moment. Recent events have highlighted the important role played by the corporate governance in the financial sector and the whole modern economy.

In Romania, one of the most important areas of activity (which is also an important source of economic welfare), is represented by companies in the pharmaceutical sector. Corporate governance is a key element in any financial system. Both the performance and the bankruptcy (which could lead to trigger, ultimately, a systemic risk and, by default, a global financial crisis) of the financial sector depend notably on that. Failure to comply with the laws of corporate governance both within the financial sector and the other sectors of the economy, as a whole, can result in serious consequences.

9.1. Human – indispensable business resource

Over the last few decades, in the management practice of multinational companies, but more recently, also in the smaller enterprises as well, the human - as a resource - has gained a major role among firm's capital. Thus, the role of human resources in the overall performance of the company has become indisputable.

Pfeffer (1998), in a paper on the role of human resources in business profitability, notes that a system which gain performance through people is considering several important dimensions, such as: the guarantee of jobs, the selective hiring of new staff, self-administration teams and decentralization of decision making, providing high compensations, detailed training, reducing status differences and barriers between employees, widespread distribution of financial and performance information throughout the organization. The introduction of these issues into organizational culture makes possible human valorizing, treating him as the key element that sets in motion a business.

Successful companies have begun to understand that the human being is not an asset just like other resources. Therefore, he should be treated as such. If the employer is able to discover his talents and assign him to a position corresponding to his talents where he may be able to implement the whole arsenal of skills, to appreciate and prize him at his true value, then the productivity of the firm has all chances to increase. Implicitly, its results will flourish.

For human resources, unlike the other components of firm's capital, a specific feature is represented by emotions, forces that dictate his actions and behavioral reactions. Emotions, as Coffman and Gonzalez-Molina (2002) show, have strong implications at work as they determine the highest goal setting (including attachment to the company and related work effort), they occur outside the rational and lead decision-making process.

Feelings are those elements that determine talented individuals to work with pleasure so that they maximize productivity and results. Individual productivity maximizing leads, subsequently, to productivity maximizing throughout the company. The performance existing at a cell level propagates in the whole organism. Thus, for the enterprise, understanding human behavior is an indispensable link in achieving high overall performance.

Coffman and Gonzalez-Molina (2002) also state that, generally, employees who use their natural talents produce more than ordinary workers. Employees who become emotionally involved form teams that reach exceptional results. Employees emotionally involved create emotional connections with customers, fact that leads, further, to the fidelity of the latter. All these lead to a sustained growth of the company.

9.2. Human resources management and performance

Equally important for a company wishing to take full advantage of human resources capabilities are issues such as providing long-term employment, adequate wages, higher compensation and training.

Companies, as mentioned above, must perceive employees as the most precious capital which, if fired, will be thrown into the hands of competition. From this point of view, it is important, according to Pfeffer (1998), that the company considers two essential matters. First, employees should not fear that, by increasing productivity, chances of losing their jobs could increase as well. Second, in difficult times they should not easily dispose strategic capital whose selection, training and development represented a significant cost in the past. Moreover, for the future, they should hire more carefully. Therefore, from the very beginning, it is necessary that the company recruits only people it needs. Pfeffer also says that long-term employment guarantee maintained over time determines building strong confidence between employees and employer and encourages people to build a long-term perspective on personal career and on organizational performance.

Mass redundancy effect, during tough times, has short-term benefits embodied in cost reducing with employees' salaries and long-term costs as productivity decreases. Moreover, at a future time new expenditures will be required for the selection of new employees.

Employee training also plays a very important role. High-performance management practices put emphasis on this side. Every respectable company will insert hours of instruction in the employees' work program. In his paper, "The Human Equation: Building profits by putting people first" (1998), Jeffrey Pfeffer says training is "an essential component of high performance systems because they rely on practical knowledge and on the initiative of valuable employees in order to identify and solve problems, to initiate changes in the working methods and to assume responsibility for quality. All these require a qualified and motivated workforce, that has the knowledge and ability to perform the tasks required".

Therefore, it can be concluded that there is a close connection between managing people and performance obtained by the enterprise. Organizational performance can be gained by appreciating people, by employing workers who fit the profile of the company, by training employees, by appropriate paying and by giving high incentives for their work. The direct consequence will be that people will work hard. They will be more involved in what they are doing and have a tighter control over their work. Also, they will make greater efforts so that the organizational performance improves.

It is very important to note that the company needs to spend significant amounts of money for this purpose. All the actions detailed above are materialized in costs, costs which, of course, in time, will be recovered through the results of the company.

9.3. The influence of amounts invested in people on the turnover in the economic reality

Further in this paper, based on concrete data of economic reality, the influence of the expenditure with employees on the results of the enterprise will be analyzed. Is organizational performance determined by expenditure on employees or not? And, if the answer is affirmative, to what extent is this happening? What kind of relationship is there between the two elements?

So, the analysis of the pharmaceutical sector in Romania is following. This approach of a single industry has an important advantage: a greater comparability between organizations, fact determined by economic conditions, high degree of detail and specificity.

9.3.1. The methodology and the data used

As was shown above, one of the most important factors, with major impact on enterprises' performance is represented by human resources and their motivation in generating wealth for enterprises. Moreover, the motivation of people involved in day-to-day activities is

needed. Thus, the data used refers to turnover and staff costs of the most important companies from the Romanian pharmaceutical sector. The information is provided by Bucharest Stock Exchange website through financial reporting and yearly financial results as well as by companies' websites through annual reports and financial reports (balance sheet, profit and loss account, economic and financial indicators).

Thus, the sample includes values of the most profitable pharmaceutical companies of different sizes, listed on the Bucharest Stock Exchange. The companies are: ANTIBIOTICE S.A., BIOFARM S.A. and ROPHARMA S.A. (Category I); FARMACEUTICA REMEDIA S.A. and ZENTIVA S.A. (Category II); FARMACEUTICA ARCATIM S.A. TIMIȘOARA, MEDIMFARM S.A. PLOIEȘTI, FITOTERAPIA S.A. BUCUREȘTI, MEDUMAN S.A. Vișeu de Sus and SINTOFARM S.A. BUCUREȘTI (Category III).

The analysis was carried out using the annual values (available on the Bucharest Stock Exchange website) registered for turnover (equivalent of the enterprise's performance) and staff costs of the most important companies in the pharmaceutical industry since 2003 and until 2011.

9.3.2. The estimation of indicators and interpretation of results

Next, we will see if a higher allocation of funds for salaries, stimulation, motivation, training, and other forms of appreciation has significant effects on the results of the company. In other words, the present study wants to find the answer to the question: is an increase in expenditure on staff reflected in an increase in turnover?

For this purpose, the analysis of the correlation between two essentials variables has been taken into account (without these, the existence of the company would no longer have sense): turnover and staff costs. Using the regression equation, the correlation between the dependent variable and the independent variable is shown. The dependent variable is the absolute value of turnover. The independent variable is the absolute value of expenditure on staff. The extent to which the exogenous variable affects endogenous variable is also considered.

The general form of the multiple regression equation is:

$$Y_t = b_0 + b_1 X_{1t} + b_2 X_{2t} + \dots + b_k X_{kt} + \varepsilon_t^{(1)},$$

however, in the present case, we are talking about a simple regression with one independent variable (the variable cause) and a dependent variable (the variable effect), as follows:

$$Y = b_0 + b_1 X_1 + \varepsilon,$$

where: Y is the dependent variable, representing the absolute value of the turnover of the leading companies in the pharmaceutical industry in Romania for the period 2003-2011; X is the explanatory variable (the independent one), which corresponds to the absolute value of personnel expenses for the same range companies and the same time span; b_0 (intercept) is the free term of the regression model.

Thus, it can be observed that a change by one percentage point in personnel expenses determines the modification in the same way with 6,867941 percentage points for turnover. In other words, parties involved in business activities will be more motivated to obtain performance for the enterprise if wages increase. This is also shown in the above equation which highlights the direct relationship between the two variables and the same way of evolving.

If the variable staff costs did not influence turnover in any way and its coefficient was zero, the volume of turnover would record a weight of – 16,73501 percentage points.

Dependent Variable: CIFRA_DE_AFACERI Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-16.73501	10.79967	-1.549585	0.1652
CH_DE_PERSONAL	6.867941	0.732472	9.376390	0.0000
R-squared	0.926251	Mean dependent var	80.44711	
Adjusted R-squared	0.915716	S.D. dependent var	31.35822	
S.E. of regression	9.103849	Akaike info criterion	7.448402	
Sum squared resid	580.1605	Schwarz criterion	7.492229	
Log likelihood	-31.51781	F-statistic	87.91669	
Durbin-Watson stat	0.833127	Prob(F-statistic)	0.000033	

Figure 1. The regression model

By estimating parameters, the following formula is obtained:

$$\hat{Y} = -16.73501 + 6.867941 \times X_1$$

According to estimates, the value of the intercept b_0 is equal to -16.73501 (the estimated average value of Y when X is equal to 0). In the current situation, we cannot speak of determining turnover in terms of null values for staff costs, because, from an economic point of view, it is not possible.

As we have mentioned above, expenditure on staff is a key element in delivering enterprise performance. The existence of a company is based on staff. Its employees operate so that the company obtains profit. However, profit cannot be explained only through employees' motivation. There are also other elements involved in the proper conducting of an enterprise's activities, in order to obtain profit, such as: used technology, climatic conditions, logistics and others. These cannot be easily quantified. Thus, according to the equation above, $-16,73501$ percentage points represent the proportion of turnover's estimated value which cannot be explained by personnel expenses.

In terms of the value of the slope b_1 , it is located at 6.867941 (the estimated value of Y when X changes by one percentage point). Thus, if personnel expenses increase by one percentage point, turnover will change, in the same way, with 6.867941 points. This result confirms the direct link between personnel expenses and turnover. In other words, the more personnel costs increase, the better are enterprise's results. Employees are more motivated to work for the benefit of the company. Thus, it is avoided the conflict of interest, an extent of corporate governance.

As a result, wages and benefits have the role to boost individual productivity which has considerable effects on the results of enterprise. High compensations shall not be a consequence of organizational success, as this problem is often perceived, but a generator for success. Financial benefits motivate employees to work harder and better. If they are paid poorly and do not receive some incentives to recognize their improved efforts, then they will desire to work for the competition. It can be observed in the economic reality that the quality of the workforce attracted depends on the level of wages.

9.3.3. Testing the significance of the regression model parameters

To test the significance of regression model parameters, a series of tests have been used. First, these tests appreciate if the parameters developed, based on the data retrieved and processed, are significant in economic terms. Second, they appreciate if the parameters coincide with economic reality (The student test, etc.). Contrary, the data used may not provide support in order to obtain pertinent conclusions and it is necessary to be reviewed.

Further, given that the parameters are significant in economic terms, between them there has to be an economical relationship and a correlation more or less close, but also between errors generated, in order to obtain some findings of the phenomena. The phenomenon is based on the interaction of two or more elements in a given sphere of activity. Here it is about the influence of personnel spending (measure of corporate governance in order to avoid conflict of interests) on individual performance and, implicitly, on company performance (ratio of determination, Durbin-Watson Test, White Test, etc.).

If the two conditions mentioned above are met, it has to be verified if the model which uses these parameters is invalid in economic terms and if the results obtained are relevant, so as to be able to draw up forecasts (*F Test*, *The Jarque-Bera Test*, etc.). Furthermore, the tests used are not limited only to capture one of these three conditions. On the contrary, some do manage to capture the conditions simultaneously.

A. The student test

In order to evaluate the influence of financial motivation on getting individual performance, and implicitly, on the whole company's performance, the status of the elements involved must be checked. Do exogenous variable (staff costs) and endogenous variable (turnover) have economic significance? Is there any connection between them? Thus, in terms of free term influence (the proportion of the company's profit that cannot be explained through staff), it can be said that the parameter has economic significance whereas the associated probability ($\text{Prob} = 0.1652 > 0.05$) exceeds the significance threshold of 5%⁽²⁾. In other words, there is enough evidence to accept the null hypothesis⁽³⁾. The parameter has economic significance because the costs of personnel cannot be null. Thus, by overcoming the trust level of 5%, it is confirmed, once again, that the model is correctly specified. Staff costs cannot be null and the evolution of the companies' performance in the Romanian pharmaceutical industry was considerably influenced by an important measure of corporate governance. This measure is about avoiding conflicts of interests by financial motivation of the employees.

Furthermore, the probability of the coefficient (b_1) of the independent variable falls within the confidence interval ($\text{Prob} = 0.0000 < 0.05$). This fact reinforces the idea that the explanatory variable significantly influences the variable explained. There is a direct and linear relationship here which reflects the economic reality. In other words, the motivation and the orientation of the parties involved in the company's activity to obtain enterprise-level performance are due in particular to wage increasing. This is reflected in the growth of expenditure on staff.

B. F test

To emphasize the staff costs impact on performance, it must be determined if there is at least one explanatory variable in the linear regression model. The explanatory variable justifies the behavior of the variable explained (turnover). For this purpose, the F Test is used.

In order to establish the validity of the model by using the F Test, it is observed that the probability of the F-statistic ($\text{Prob} = 0.000033 < 0.05$) fits in the limits of the confidence level. This fact suggests that the H_1 ⁽⁴⁾ hypothesis is respected and it is said, with a 95% probability, that the model is valid. So, there is at least one independent variable which may explain the variation in the dependent variable. The turnover's value in the Romanian pharmaceutical industry for the period 2003-2011 is influenced by exogenous variables such as personnel expenses. This test verifies that the regression model is correctly specified.

Report of determination

Another indicator that helps express the correlation between the two variables included in the model is the ratio of determination, R-squared, but also its derivative, Adjusted R-squared. According to the estimation of the variables, the ratio of determination records a value of 0.926251. Adjusted R-squared is 0.915716.

Taking these two indicators into account, the R-squared value is more relevant and shows that 92.6251% of the variance in percent of turnover is explained by the variation in

percent of personnel expenses. Thus, there is a strong economic relationship between the two variables. This relationship emphasizes the influence of the financial motivation for employees (expressed through staff costs), on obtaining performance for enterprises in the pharmaceutical sector (expressed through turnover).

Approximately 92.63% of recorded performance in the Romanian pharmaceutical industry for the period 2003-2011 was determined by the employees' individual performance, as a result of increasing their wages. The corporate governance measures achieved their purpose.

C. Autocorrelation hypothesis testing - Durbin-Watson test

Using the tests listed above, we were able to verify the extent to which staff costs influence the enterprises' performance, but also if they are significant in economic terms. However, this is not enough if the estimated errors in this model are considered. This is why the Durbin-Watson Test is needed further. Using it enables autocorrelation errors to be appreciated.

Hypothesis testing of autocorrelation involves using the following formula:

$$DW = 2 - 2 \hat{\rho}.$$

Taking into account the parameter ρ values, the value of the test statistic DW is included in the interval [0,4]. DW lower than 2 indicates a positive autocorrelation and DW greater than 2 indicates a negative autocorrelation. If the errors are not correlated, then the value of the DW will be around 2.

In the present case, the estimated amount with the help of the test DW is equal to 0.833127; so we reject the null hypothesis and say that there is a linear and positive correlation. Also, the errors are not independent. They are related. Therefore, the conclusions drawn, using this model, are pertinent.

In conclusion, through the autocorrelation hypothesis testing and by getting some related errors, it is confirmed, once again, that the model is valid. This means that a considerable part of the performance, achieved by companies from the Romanian pharmaceutical sector, was mainly obtained due to increases in personnel expenses, in the period 2003-2011.

D. Verification of the normality of the residue – Jarque-Bera Test

The Jarque-Bera Test also plays an important role in assessing the validity of the model and data used. It verifies if the empirical distribution can be approximated by a normal distribution. Therefore, the normality of the residuals is tested, starting from the assumption that the errors are normally distributed (the null hypothesis).

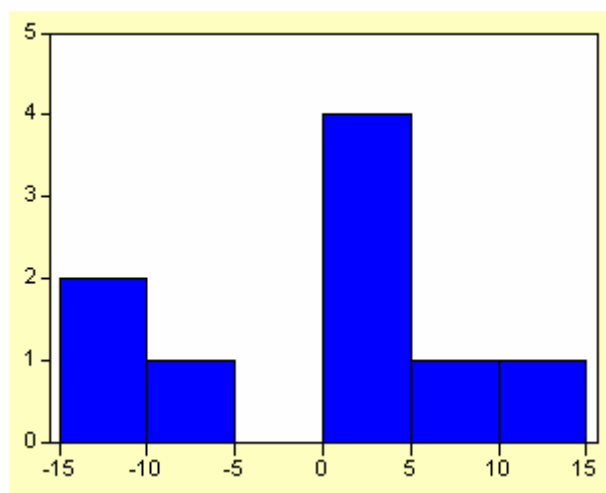


Figure 2. Jarque-Bera Test

The probability associated with the Jarque-Bera Test is $0.724698 > 0.05^{(5)}$, which indicates that the null hypothesis is accepted and the distribution's model can be approximated with a normal distribution (errors are normally distributed). The normal distribution of the errors is important, especially, when we want to make forecasts, based on estimated econometric equation.

In conclusion, this test highlights once again the fact that the model is valid. Managerial decisions regarding the implementation of this corporate governance measure can be oriented to maximize business performance, based on this model. Thus, this model has proved, that in the Romanian pharmaceutical industry, during the period 2003-2011, wage increases have affected, in the same sense, its performance. The econometric equation set out above shows that the higher staff costs are, the more individual performance will increase, in the future. High performance will be generated both at enterprise level and at the industry level.

E. Heteroskedasticity hypothesis testing - White test

One of the least squares method (used to estimate the parameters of the linear regression model) consequences which does not verify the hypothesis of homoskedasticity⁽⁶⁾ is the distortion of statistical tests quality. This is the reason why heteroskedasticity tracing is recommended first. Heteroskedasticity hypothesis⁽⁷⁾ testing using the White Test starts with the explanation of the residues series based on the explanatory variables in the regression model.

White Heteroskedasticity Test:

F-statistic	1.846187	Probability	0.237227
Obs*R-squared	3.428610	Probability	0.180089

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-230.6315	286.6428	-0.804596	0.4517
CH_DE_PERSONAL	35.84756	45.02885	0.796102	0.4563
CH_DE_PERSONAL^2	-0.975911	1.639050	-0.595413	0.5733

R-squared	0.380957	Mean dependent var	64.46228
Adjusted R-squared	0.174609	S.D. dependent var	68.92914
S.E. of regression	62.62284	Akaike info criterion	11.37334
Sum squared resid	23529.72	Schwarz criterion	11.43908
Log likelihood	-48.18002	F-statistic	1.846187
Durbin-Watson stat	2.412603	Prob(F-statistic)	0.237227

Figure 3. White test

The probability assigned to White Test is $0.237227 > 0.05$, which is why we can appreciate that the phenomenon of *heteroskedasticity* is not present in the residues. As a result, the hypothesis of homoskedasticity is verified. This is another argument for the validity of the model. Based on this, relevant managerial decisions may be drawn up.

The explanatory variable (the absolute value of expenditure on staff) significantly influences the explained variable (the absolute value of turnover). The performance in the Romanian pharmaceutical sector in the period 2003-2011 was determined by increasing wages and, implicitly, employee motivation in order to obtain individual performance.

In conclusion, these tests show that we can bring the necessary arguments to support the relationship between investments in employees and performance of the leading companies in the Romanian pharmaceutical industry.

10. Conclusions and future research directions

Given the company's key role in the economy, this study considers that performance analysis becomes indispensable in financial administration science. There are many factors that influence performance. One of them is corporate governance. This study showed how corporate governance measures can influence company's results.

When it comes to results, it is important to know that they are not only expressed through financial indicators, but also through non-financial indicators. Both types of indicators are equally important in defining performance.

Based on measurements of performance, the enterprise's overall performance can be defined as an aggregation of all activities' results, regardless their type (not only economic activities). From this perspective, the performance is also an assumed and voluntary responsibility for all stakeholders.

Corporate governance laws in Romania, but also those proposed on European level, must take into account a framework conducive to the development and organization of the management of all sectors in the economy.

Corporate governance and managerial decisions (which are based on corporate governance) made at the enterprise level influence both their profits and the welfare of activity sectors in which they arise. Implicitly, they influence the well-being of the overall economy.

The present paper managed to apprehend the proportion in which the changing in expenditure on staff (measure of corporate governance with the purpose to avoid conflicts of interests) of the most representative companies in the pharmaceutical industry influences the performance (expressed by turnover) in the same way. Econometric estimates have shown a strong correlation between the financial motivation of human capital involved in the activity of these companies and firm performance.

Obtaining business performance is a problem everywhere. It is a global issue. Therefore, the present research tried to define performance, to summarize the measuring ways and affecting factors. Because corporate governance plays a major role in results determining, we have shown that human capital proper management has significant effects on long-term performance.

Hence, the research has its usefulness in providing support and solutions that can help managers in future management decisions to maximize profit and, consequently, the performance of the enterprise. Sufficient harnessing of human capital leads, ultimately, in time, to results increasing.

There are numerous opportunities to expand the present research. The model developed in this study can be extended to a larger number of companies in the pharmaceutical sector or may be applicable in other sectors of activity. Moreover, an important direction for research may be that of establishing the impact on enterprise performance of other corporate governance measures. Also, a future study could find methods of quantification for corporate governance principles in order to develop a model which captures their influence on business performance.

Notes:

⁽¹⁾ Where $t = 1, 2, \dots, n$ observations in the sample; Y_t = t remark of the dependent variable (the variable effect); X_j = independent variables (variable factor-question); b_0 = constant (the free term of the equation); $b_1, \dots, b_k$ = coefficients independent variables; ε_t = error term of equation (the residual variable, that measure the influence of factors that are not found in the model).

⁽²⁾ 5% = the fixed significance threshold, for $\alpha=95\%$ (prob = $1 - \alpha = 0.95$), where prob = probability.

⁽³⁾ Assumptions: $H_0: c = 0$ (the null hypothesis); $H_1: c \neq 0$ (the alternative hypothesis).

⁽⁴⁾ The two assumptions of the test are:

$H_0: b_i = 0$ (the null hypothesis; the regression model is not correctly specified, mean that variable X_i do not influenced variable explained);

$H_1: b_i \neq 0$ (the alternative hypothesis; between the two variables, there is a significant linear dependence, mean that variable X_i influence variable explained).

⁽⁵⁾ The confidence level of 5%.

⁽⁶⁾ Homoskedasticity hypothesis = tests if the model parameters are equal to zero, or of the same kind, mean that, we say that each residual value is generated based on a distribution that has the same characteristics.

⁽⁷⁾ Heteroskedasticity hypothesis = each residual value is generated on the basis of a distribution which has different characteristics.

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THE DOMESTIC AND FOREIGN INVESTORS TAKEOVER BID DECISION: CASE OF ROMANIA

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Abstract. *The aim of this study is to identify whether foreign and domestic investors have different interests when it comes to acquiring a company. Our database consists of all takeover bids on the Romanian capital market made between 2004 and 2011. The results of our analysis show that while domestic investors look after a quick and profitable business, the foreigners search for long sustainability and long-term profitability elements that can influence the audited process and the way financing is obtained. Another main finding is that domestic investors focus their capital on companies in services or food and agriculture industries while the foreign investors are looking for obtaining profit by investing in companies from industry or construction areas.*

Keywords: takeover bid; domestic investor; foreign investor; performance.

JEL Classification: G32.

REL Classification: 11E.

1. Introduction

In the last two decades, the number of domestic and cross-border mergers and acquisition has grown in Eastern European countries due to an increasing political stability and a relatively friendly business environment. Both foreign and domestic investors have seen opportunities to expand their activity and to gain market share. In this way, the mergers and acquisitions (M & As) created a more competitive market which is the key to the economic development of a country.

The mergers and acquisition transactions have been, for a long time, an element that can affect the profitability of a company. As a fact, a takeover bid offer is a way that can point out the interest that the investors have in the target company. Different behaviors of the investors can be detected just looking on the way that the takeover bid was made. In our point of view, foreign and domestic investors have different interests in the company. In Romania, there are less foreign investors than domestic ones. One explication could be due to the fact that they have different priorities and different timely financed capacities.

Foreign investors were concerned about M&A Process as they could gain not only by low prices of mergers and acquisition transaction and low cost of labor force, but also by

obtaining higher performance in fields like construction and industry, or otherwise noted, in areas where long-term profitability is expected. The present research is trying to reveal that the Romanian investors prevail to the foreigner's one, and moreover they are interested in getting higher performance in short term after they have made a takeover bid offer. On the other side, foreigners focus their attention on business where no immediate profitability could be obtained, but where important development could be realized through a long period of time.

The remained paper is structured as it follows: the first part presents the main documentation for the mergers and acquisition process, followed by a description of the research methodology used. The second part is made from pointing out and discussing the results obtained, followed by conclusion and further research perspectives.

2. Literature review

In the main literature, the mergers and acquisition phenomena, the performance of them and the factors implication is frequently discussed. Moreover, several studies including a probit model were realized in order to reveal important elements that are connected with the mergers and acquisition process or with the takeover-bid offer. As a fact, Cummins and Xie (2008, pp. 30-55) point out that acquiring companies gain more efficiency than non-acquiring companies, while target entities receive a higher efficient allocation growth than the entities that were not target. Actually, they realised that using a probit model factors that can influence the performance and the takeover process could be identified.

Nonetheless, the influence of foreign investors was presented as different perspectives could be identified. Stiebale and Reize (2011, pp. 155-167) establish that innovation output would not be affected by foreign acquisition when a given amount of innovation is set. Hence, no important innovation success could be obtained if the borrower is a foreigner company. Jeon and Ryoo (2013, pp. 52-65) emphasis that foreign ownership in Korea, which could be obtained by a takeover bid offer, contribute to the increasing of foreigners in the board of directors, elements that could affect the companies perspective in the long run. Same conclusion could be extracted from the study realized by Chhaochharia et al. (2012, pp. 42-67) as they point out that local investors are more likely to introduce takeover bid than foreigner investors as their cost could be lower than the expenses that a foreigner investor could have.

Another important research was realized by Acharya and Hong (2008) who studied that companies tend to transfer the ownership to foreign investors when financial problems can be detected, flipping back to domestic investors when financial crisis abates.

Regarding the impact that foreigner investors could have upon mergers and acquisition and upon takeover bid offer, Ferreira et al. (2009, pp. 601-644) conclude that foreign institutional investors facilitate the international market, they reduce the cost transaction between companies, and, moreover, the cross-border merger and acquisition process promotes the development of financial elements. Such transaction could not have been realized unless a strong protection of domestic investors is assured as Rossi and Volpin (2004, pp. 277-304) demonstrated.

On the other hand, Feito-Ruiz and Menéndez-Requejo (2011, pp. 169-187) considered that the European bidder would undertake a cross-border rather than a domestic M&A as their investors and performance could be influenced by it.

Moreover, not only the financial problem is extremely interesting, but also the accounting perspective. As a fact, Rossi and Volpin (2004, pp. 277-304) determined that the volume of mergers and acquisition is higher countries with better accounting and audit standards and stronger shareholder protection. As a fact, the foreigner investors are interested to realize financing in countries where their interests are highly protected.

3. Database and methodology

The present study tries to develop an analysis upon the takeover-bid decision when a merger and acquisition process could be realized. As a fact, the home country of investors

could influence the attitude when investment facilities are analyzed. As a fact, there could be a different perspective when the takeover bid offer is realized.

The idea of the study is to point out why local investors prevailed upon foreigner one when takeover bid process is analyzed.

In order to realize these, values for all companies that had a takeover bid offer among 2004 and 2010 from the Romania market were realized. As a fact, data from 115 companies had been analyzed by considering elements connected with the company capitalization, the day of takeover bid offer, the type of industry where the company acts and, the performance obtained by it.

For developing the study, financial data was extracted for each company as the performance was measured using the return on equity ratio. This ratio was calculated not only for the year when the takeover bid offer was announced, but also for two time period after the announcement had been made. The formula used for calculating the return on equity was the net result obtained at the end of financial period divided to the own resources that the company had also in that year. The reason why this formula was used is that changes in capital could be realized after the takeover bid offer was announced, and consequently, the performance of the company had been influenced by it.

From the database extracted the companies which had a negative value of their own equity have been subtracted. It was considered that no performance could be achieved if a negative value would have been taken into consideration. Moreover, companies that report missing value as they were supposed to a financial dissolution or companies that do not report financial data for the period analyzed were omitted when the study was realized. As a fact, a total of 100 companies for which financial data was extracted was collected, but nonetheless, only 78 of the companies remained in the sample analyzed as the total effect upon Romanian market was encounter to be measured. Due to these elements, prior performance target for each category of investors could be identified as the foreigners generally are encounter to obtain long-term profitability. Considering this, the dependent variable was calculated as a dummy one, where with 1 was noted if the investor was from Romania or from abroad.

Regarding the independent variables that were used in the analyzed, besides the performance ratios, dummy variables representing the industry where the company through which the takeover offer was made were calculated. As a fact, the eight area through which company act were grouped in four categories. The first category that was formed represents the Food industry where areas like agriculture and food manufacturing were considered. The second category represents Services and it was formed from fields related with trade industry and the services one, the third category was the industry area, where domains like chemical industry, manufacturing, constructing machinery and equipment industries and the transport was considered. The last category was formed from elements that characterized the Construction Field as there are factors like real estate and construction that contribute to the final form.

Other mathematical trick that was made refers to the fact that the company total capitalization from the announcement date was logarithmic as otherwise higher and unreliable values would have been offer by the model developed.

As the dependent variable included in the analyzed has a dummy form being a qualitative and limited variable, no classical regression model was used as mistakes in estimated the adjusted values could be realized.

Consequently, a probit model was developed, where the dependent variable was if the investors are internal or not, while the independent one were the variables mentioned above. The justification comes from the fact that the dependent variable has a non-continuous character and using classical regression model confers inappropriate restrictions for the residuals. Moreover, when the model was constructed, not all the independent dummy variables were included, as the multicollinearity factor could not be avoided otherwise.

When mathematical part is encountered, the following formula had been estimated:

$$\beta_0 + \beta_1 \times \text{Log}_{\text{cap}} + \beta_2 \times \text{construction}_{\text{index}} + \beta_3 \times \text{food}_{\text{index}} + \beta_4 \times \text{ROE}_{N+1} + \beta_5 \times \text{services}_{\text{index}}$$

Where:

$$PR\left(\frac{1}{\text{investors' type}}\right)$$

is the probability of being an investor from Romania or from

Abroad

β_i are the estimation output

$$\phi(z) = \frac{1}{\sqrt{2\pi}} \times e^{-\frac{z^2}{2}}$$

Moreover, after the model had been estimated, the accuracy of predicting if a company would have a domestic investor or a foreign one was tested.

Actually, when a probit model is analyzed, the sign of the coefficients and the economic interpretation it's the most important problem to be solved.

4. Results and discussion

In order to point out the results obtained for the companies that had a takeover bid offer, firstly the entire sample had been considered as it can be seen in Table 1.

Table 1

The number of companies reported to their activity domain field

Industry Type	Number of companies
Real estate	10
Manufacturing	13
Trade	16
Construction	7
Food	13
Services	19
Constructing machinery and equipment	7
Chemical industry	3
Transport	4
Clothing	5
Agriculture	3

As it can be seen in Table 1, the fields where the takeover-bid offers had been are the Services and the Trade areas, followed by companies that act in the food, manufacturing and real estate industries.

Moreover, as Romania had to create a competitive environment with EU, a higher number of takeover bids had been realized before the Romania got into the European Union. Table number two, points out that more about 80% of the takeover bid offers that were on the Romanian Market were realized before 2007.

Table 2

The number of takeover bid offers between 2004 and 2011

Year	Number of companies
2004	37
2005	19
2006	14
2007	10
2008	8
2009	3
2010	7
2011	2

It has to be mentioned that before 2007 the audit process had a higher credibility among shareholders and investors, but after the economic crisis the reliability of the financial statement have been questioned. After that, the estimation correlation among variables was realized as this factor is important when interpretation is conferred to the econometric model. It has been discovered that no higher correlation between the independent variables exist, not either among the performance measured from one year to another. In fact, the correlation between the return of equity is actually insignificant as there are other elements that can affect the profitability of the company. What has to be pointed out is that higher correlation is calculated between constructed indexes, considering that investing in one field could influence the amount invested in other areas.

Regarding the probit model, the sign and the interpretation of the coefficients is very important as it could establish a behavior attitude regarding the investment expectations. The dependent variables had 17 cases where the investor was from abroad and 61 cases where the investors were domestic. As a fact, Table 3 reveals the data obtained by using the Eviews program.

Table 3

The results obtained for the probit model

Variable	Coefficient (z statistic)	Probability p value
Constant	3.0333 (2.0329)	0.0421
Log capitalization	-0.1863(-1.8401)	0.0657
Construction dummy index	0.6051 (1.0565)	0.2907
Food dummy index	1.4223(2.0042)	0.0450
ROE _{it-1}	0.6677(1.6214)	0.0949
Services dummy index	1.0734(2.3536)	0.0186

Table 3 reveals the values obtained for the model developed. Regarding the interpretation of the coefficients, firstly the significance of values obtained had to be discussed. As a fact, the construction dummy index is no relevant as the probability assimilated to it should be less than 5% but a risk of 10 % was assumed that the coefficient could not be significantly different from zero. From the previous results, it can be said that the services and the food dummy variable affects the increase the probability of the investors of being domestic when takeover bid offers upon the Romanian market in the proper sectors exist. From the economic point of view, the interpretation of the coefficients is complicated as no marginal effect upon the dependent variable could be measured. It could be said, however, that the increase in the number of takeover bid offers from the food domain increase with 1.42% the probability of being a local investor.

Considering the results presented above, it had to be said that the investors from Romania are more interested to finance business that are regarded with mergers and acquisition, but only from services and food industry. The justification can be found in the fact that they are interested in obtaining quickly a high degree of performance by allocating their capital into them. As it can be seen, there is a direct and positive relationship among the probability of being a foreigner or a local investor and the performance that the takeover bid company obtained. Consequently, the foreigners' investors are looking for obtaining a profitability of their capitals in the long run as they prefer to invest in constructions and industry field. It has to be mentioned that not only the sustainability of their funding is regarded, but also the fact that they allocate more capital than the Romanian investors do. The reason is that, on the first hand, those companies with foreigner's managers could adopt such strategy based on keeping upon the market performance and consequently lower profit is obtained. On the other side, bigger companies obtain in general a huge amount of profit and due to these aspects, they can afford to invest in projects that have profitability on the long run.

Not only has the assumption of one coefficient variable had to be testes, but also the assumption that all coefficients are significantly different from zero. As a fact, some creditworthiness elements are presented in Table 4.

The Mcfadden value is similar with the value of R-squared so it could be assumed that the independent variable point out about 31.58% of the probability that an investor could be Romanian or foreigner. The LR statistic is used to test the overall significance of the model, while the p value points out that the dependent variable is asymptotically distributed as hi-quared distribution.

Table 4

The creditworthiness elements for the probit model

Creditworthiness elements	Value
Mcfadden	0.3158 (31.58%)
LR statistic	25.8341 with p value of 0.000096

Moreover, the predicted ability of the model developed was measured as the cutoff could be established by user. Due to this aspect, the cutoff point was establish at 0.8, as there is a probability of being a Romanian investor of about 80%. The results obtained are presented in table number 5.

Table 5

The predicted ability of the probit model

Estimation Equation		Total
Dependent = 0	Dependent = 1	
Correct estimation 8.14 from 17 cases	Correct estimation 52.25 from 61 cases	Correct estimation 60.39 from 78 cases

It can be assumed that the model has a high degree of predictably as more than 77.42% of the investors attitude towards the investing decision could be made.

As a fact, it can be pointed out that Romanian investors are interested in realizing takeover bid offers upon the food and industry areas. Moreover, they are looking for obtaining short term profitability as the model implemented pointed out. The foreigners who can obtain easier financing capitals are inclined to invest in sectors like construction and industry as they aspect a profitability to be obtained on the long run, not on the short term period.

Conclusion

The mergers and acquisition process occupies an important area in the development process of a country. Moreover, as Brezeanu et al. (2010) point out, there is a high correlation between company ratings and country ratings. Also, the takeover bid offer realized upon a market can provide an image about the behavior of the investors.

The present research tried to point out how their attitude was upon the Romanian market. As a fact, the Romanian investors prefer to realize takeover bid offer upon companies that act in the food and in the services area, as these companies offer a high degree of performance. The Romanian investors are expected to gain profitability one year after they made the takeover bid offer and consequently are looking to obtain financial performance. On the other hand, the foreign investors are looking for realizing the takeover bid offer upon companies that act in the construction and in the industry area.

The model developed pointed out that upon the Romanian market, Romanian investors prevailed upon foreigners. An important element that can affect this behavior could be due to the investment possibilities and investment financial capital funds and the way they obtained them. The lags of the research were due to the fact that the number of companies that had a

takeover bid offer is still small reported to the period analyzed. Moreover, as the data were excluded from the sample, the dimension reduces considerably as no relevant financial information could be extracted. Moreover, information about the success of the takeover process has not been collected and consequently further research would aim to realize a connection between the success of merger and acquisition takeover bid offers, the type of investors and the performance obtained by each company.

Acknowledgements

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CHANGING OF GROWTH PARADIGM: FROM MERGERS AND ACQUISITION TO BALANCE SHEET RESTRUCTURING

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Abstract. *The paper reviews the research findings in corporate growth concept within the last 30 years. It focuses on growing concept evolution, during the boom period of world economy and the period after financial crisis, from aggressive mergers and acquisitions (M&A) to more conservative balance-sheet restructuring. The paper integrates the recent findings and previous research from M&A era and provides an overview of the recent status of researching. Additionally, it contributes to general topic by proposing new strategies for corporate growth within the post-crisis period.*

Keywords: growth, M&A, debt restructuring, balance-sheet restructuring, corporate restructuring.

JEL Classification: G30, O16.

REL Classification: 10Z.

1. Introduction

The ability of firms to properly react to the environment changing and the nature of these reaction are the major factors that affect the efficiency of the firm and furthermore the capacity to generate growth.

The corporate growth concept has been evolved within the last 30 years in different manner, which could be divided in three phases:

- 1970-1990 the first stage - the decade of aggressive growth through M&A especially, with unprecedented expansion of the corporate assets-in-place and profit opportunities but that has left behind high corporate indebtedness; consequently, at the peak of boom, the indebtedness, mainly from the bank loans had risen to over 70% of GDP up from 58% of GDP in 1995 in Europe for example (Jaeger, 2003);

- 1990-2007 the second stage - defined as period of corporate restructuring, business divesting and spin-offs, in order to reshape the corporate growth and stopped the indebtedness rising;

- 2007 to present the third stage - a new concept seems to be more and more present in the economists research papers; balance-sheet restructuring in order to create flexibility, to generate cash and finally, to put the firm on the sustainable growth pace.

The rest of the paper is organized as follows. Section II Underlying Theories covers the evolution of growth theory over the sample period. Section II Methodology highlights the sampling process, structure and overview. Section IV Topics for further research represents our contribution to the current topics. Section V References closes the paper.

2. Underlying theories

This section covers the growth theory evolution over the sample reviewed papers.

The paper reviews the researches outcomes and focuses on the changing of corporate growth paradigm from boom-period of world economy to the period after financial crisis, from aggressive M&A to more conservative approach through balance-sheet restructuring.

Plenty of literature has discussed the subject of corporate growth through golden age of market expansion and new territory capturing.

Kirchmier (2003) conducts a vast analysis on British and German non-financial firms over a long decade comprising both expansion period and crisis contraction. He resumes many firms in both countries are driven by the desire to specialize and internationalize and are primarily achieving this via “horizontal” mergers and acquisitions. Most of analyzed firms (over 250) used predominantly cross-border M&A due to fast track access to international market. Cross border M&As became more and more attractive way of growing because they provide firms with the fastest access to acquisition of proprietary assets in different countries. Simultaneously, those firms were able to restructure and adapt their internal operation in view of globalization, in this way to maximum exploit the synergies and obtain the strategic advantages.

Groh and Gottschalg (2011) capture the effect of leverage on cost of capital for buyout performances. Late 1970 buyout became an important assets class in US economy which conducted to the development of products and services portfolio diversification for US firms.

Myers (1977) analyzes the growth by connecting the assets acquisition with corporate borrowing, call option versus debt. He also argued how tax saving generated by debt do lead the firms to borrow enough money to sustain the growth and expansion strategy. In the same context, many years later, Goyal, Lehn and Racic (2002) highlighted the case of US defense industry and their fantastic growth during Regan administration and concluded the growth opportunity creates the premises for increasing the state debt and severely affect the structure of corporate debt. This was one of the thousand of warning signs rose by the economists that the extensively increase of private and public debts negatively affect the durable growth.

Korajczyk and Levy (2003) link the macroeconomic conditions by capital structure and financial constraints, with further implication on firm development and growth. They conclude the target leverage and assigned investment are counter-cyclical for unconstrained firms and opposite for constrained ones. Thus creates the differences in taking the growth opportunities for constrained and unconstrained firms and also in agency costs related to debt.

The last reviewed paper arguing the firm growth theory within the golden age period of globalization, put on the spot the success story of economic growth of ten African countries. Akinlo and Egbetunde (2010) debate one of the controversies of the economic literature, the question of whether strong economic performance is finance-led or growth driven. The countries analyses prove the economic performance of economy is growth driven, at least for the analyzed period.

Smoothly, the literature topics shift from aggressive growth and territory expansion to corporate restructuring which ensure the financial performances at different layers and premises for further possibility to undertake the big projects and sustainable growth. In the area of corporate restructuring, we select some case studies, considerate relevant for the current topic.

Restructuring of Japanese corporations during early 90s, proposed by Kang and Shivdasani (1997), outlines the measure implemented by large corporate in order to improve financial performances. Japanese corporations implement a number of downsizing measure (asset sales, plant closure, and employee layoffs) combined with several internal organizational transformations. Berger and Ofek (1996b) and Denis et al. (1997) document the firms that implement refocusing programs do so in presence of external forces pressure such as takeover attempts and block share purchasing. In both cases, the authors demonstrate, by analyzing the financial figures for a relevant period after restructuring implementation that the financial performances improved both in terms of profitability and liquidity creating the premises of further investment and growth.

US food retailing industry study (1980s) covers the period during and following the regulatory relaxation and huge leverage capital transformation of the 1990s, and proves the relationship between macroeconomic market conditions, regulatory regime and corporate

growth strategy. The case followed the period of geographical spread of regional food retailers and their milestones for surviving and the period of industry restructuring and consolidation after 1980s. Capital accumulation was seen as proxy for regional purchasing and transformation of the players into three corporate conglomerates that driven the market.

Completely different case was studied by Hunya (2002) on Romanian manufacturing, almost entire restructured via foreign direct investment. One of the important findings was the restructuring increase the export business of the firm, while financial performances significantly improved.

The last case of the sample studies the electric power energy firm in Korea (Won, 2007) a monopolistic-type structure firm. The paper evaluates the restructuring process of the company and analyses the financial outcomes based on return on equity. The results show the significant increase of indicator following the corporate restructuring process.

Recent development of the research studies reveals new concept of growth and growth premises creation, namely balance sheet restructuring. The empirical research has started with debt restructuring and refocusing of the debt to equity ratio and has gone to entire balance sheet restructuring in order to create premises for economic wellness.

Lowe and Shuetrim (1992) study for a vast period of time (1973-1990) the evolution of the balance sheet structure and provide the links between the financial standing and shape of the firm and macroeconomic factors. They snapshot the specific of each country and industry and determine the main characteristic of each cluster. Very important for the model relevancy is the generous sample period, that alternates booms and crises years worldwide.

More in-depth model provided Benito and Young (2002) when examined the financial policies of the firm and the necessary balance sheet adjustments. They conclude the high level of debt substantially affects the interest cost, cash flow and money available for investment and financing the growth. So, balance sheet adjustment are mandatory otherwise this process leads inevitably to default and company failure.

Bernanke and Gertler (1990) spotlight new concept of financial fragility of the firm. They define financial fragility as situation to be one in which potential borrowers (those with the greatest access to productive investment projects, or entrepreneurial skills) have low wealth relative to the project value. Generally, financial fragility occurred during recession period or in the early stage of economic development. In this case the balance sheet should be adjusted in this way to create equilibrium between investment spending and creditworthiness of the firm.

Again, the creation of premises for firm growth is linked by the capital and debt structure in the view of Rauh and Sufi (2008). Variation of debt structure determines the high or low quality of firms, the access to financing and furthermore to growth.

Not only economist researchers are preoccupied by the corporate balance sheet restructuring but also the international organization such as International Monetary Fund (IMF). Jaeger (2003) conducts the research for IMF on euro area corporate about the legacy of high debt, the effect on the investment and growth particularly if leverage exceeds the threshold and the need of balance sheet restructuring. He also tests if his findings are consistent with existing theoretical models of debt structure using more and complex variables. The conclusion is the actual level of leverage in euro area oversized the threshold and did not fit any previously theoretical model.

Mills, Morling and Tese (2011), from Reserve Bank of Australia, cover over a large decade the evolution of corporate balance sheet and investment. They argue as recovery picks up pace more firms inclined to expand their capital expenditure and less focus on balance sheet restructuring. Balance sheet volume enlarged within boom period and contracted and restructured during recession.

Other proposal for balance sheet restructuring comes from Huang and Zhang (2011) is to substitute the bank credit and trade credit. Their empirical research finds a counter-cyclical

relationship between trade credit and bank credit with respect the macroeconomic development (GDP). On the other hand, Bigelli and Sanchez-Vidal (2012) emphasizes the importance of cash holding, cash being associated with firm value creation and increase the shareholders welfare.

3. Methodology and sample overview

The sampling process was conducted following Newbert (2007). We search the databases: Web of Science SSCI (Social Science Citation Index), ISI Thomson and Elsevier. In order to ensure substance to review, we have limited the search to the journals with impact factor over 2.00 at the last review (2011). Papers are required to contain at least one of the key words in title or abstract: growth, M&A, balance sheet restructuring, corporate restructuring, debt restructuring, and crises. From this stage we have applied a multilevel filter such as: from the results we eliminate the duplicates; all remained abstracts are screened for subject relevancy, empirical research and contents, significance of the results. Finally the remained papers are subject to present review.

The sample contains 18 qualitative papers all considered relevant for current subject. Sample period covers a large decade of 30 years, divided in three stages: the decade of aggressive growth through M&A especially (1970-1990), period of corporate restructuring, business divesting and spin-offs (1990-2007) and the stage of new concepts (2007 to present).

Table 1

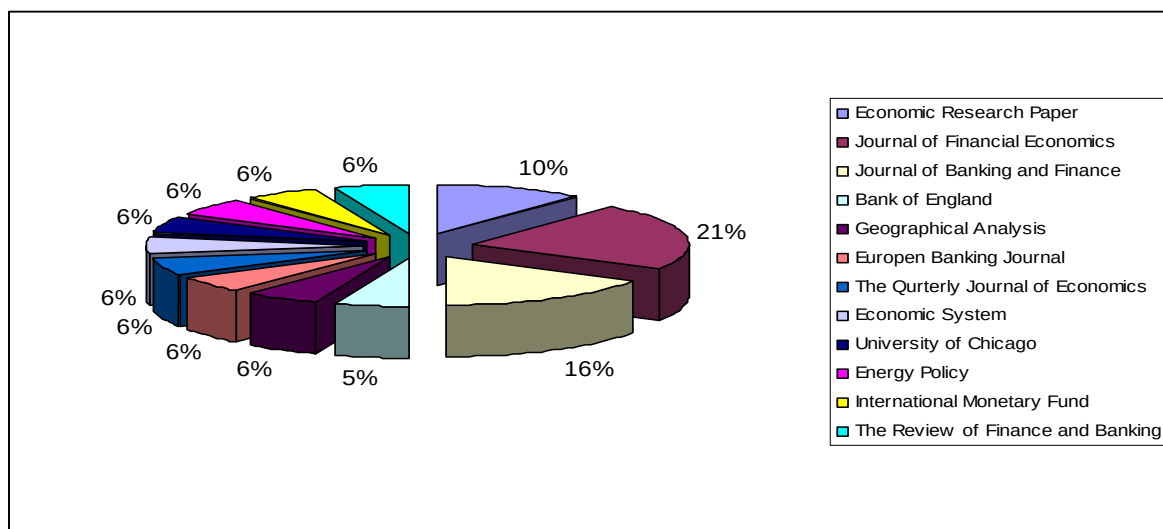
Overview of sample papers

	Article	Authors	Publisher	Subject and key concepts
1	The evolution of corporate financial structure: 1973-1990	Lowe P., Shuetrim G.	Economic Research Department, Reserve Bank of Australia, 1992	- assessment of corporate debts in different countries over 1973-1990 - evolution of balance sheet structure - provides the links between corporate financial structure and macro-economy
2	Determinants of corporate borrowing	Myers S.C.	Journal of Financial Economics, 1977	- corporate assets and finance policy, call options versus debt - corporate borrowing is inversely related to the market value of firm
3	Corporate restructuring during performance declines in Japan	Kang J.K., Shivdasani A.	Journal of Financial Economics, 1977	- corporate restructuring by downsizing measure such as assets sales, plant closure, employee layout and reorganisation of internal operations - improvement performances after restructuring - capital structure
4	Growth opportunities and corporate debt policy: the case of US defense industry	Goyal V.K., Lehn K., Racic S.	Journal of Financial Economics, 2002	- how changes in growth opportunities affect the level and structure of corporate debt - debt level increased when growth opportunity declined - growth opportunities create the premises for increasing of public debt

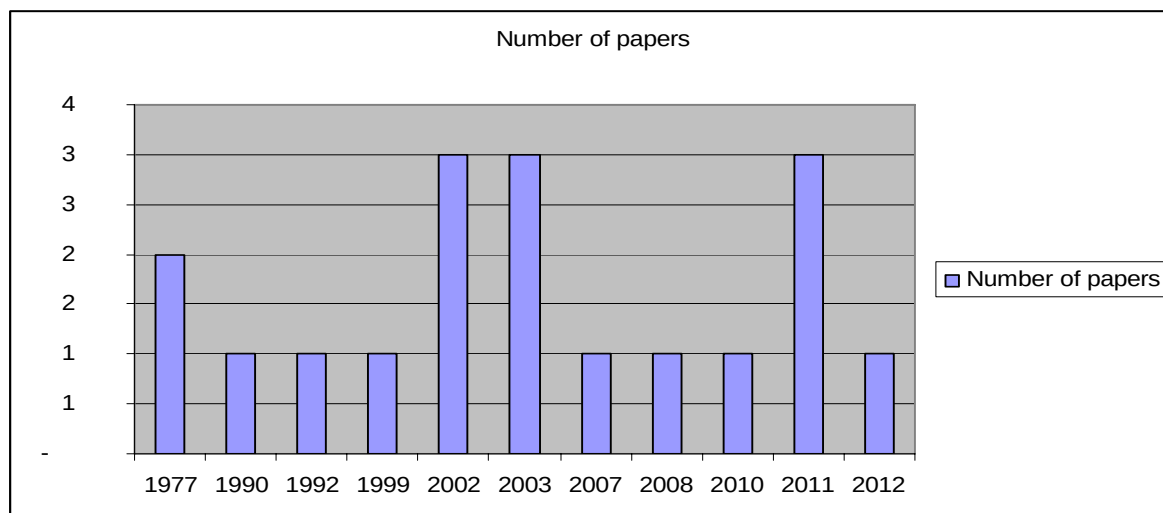
	Article	Authors	Publisher	Subject and key concepts
5	Financial pressure and balance sheet adjustment by UK firms	Benito A., Young G.	Bank of England, 2002	<ul style="list-style-type: none"> - the paper examines the financial policies and balance sheet adjustment of corporate; - it estimates the influence of dividends, equity issuance and investment relating to debt adjustment
6	The effect of leverage on the cost of capital of US buyouts	Groh A.P., Gottschalg O.	Journal of Banking and Finance, 2011	<ul style="list-style-type: none"> - the effect of leverage on cost of capital for buyout performance analysis - following late 1970 buyouts became an important assets class in US economy
7	Market rules and spatial outcome: insights from the corporate restructuring of US Food Retailing	Wrigley N.	Geographical Analysis, 1999	<ul style="list-style-type: none"> - effect of retail industry restructuring through the clustering firms with high level capital transformation during 1980s; - industry M&A and capital accumulation - borning of consolidated regional retail chains - consolidation strategy
8	Corporate Restructuring of British and German non-financial firms in the late 1990	Kirchmaier T.	European Management Journal, 2003	<ul style="list-style-type: none"> - changing of corporate growth strategy in the late 90s - many firms in both countries are driven by desire to specialise and internationalise through horizontal M&A - the second step was corporate restructuring in order to improve the competitiveness and profitability
9	Financial fragility and economic performance	Bernanke B., Gertler M.	The Quarterly Journal of Economics, 1990	<ul style="list-style-type: none"> - theoretical approach of financial stability/fragility at firm level - reliance of external finance that implies the agency costs - low net worth investment projects undertaking - ongoing debate about the excessive enlargements in corporate debt in the US
10	Restructuring through FDI in Romanian manufacturing	Hunya G.	Economic Systems, 2002	<ul style="list-style-type: none"> - large penetration of the manufacturing industry through FDI - country specificity drives the industry manufacturing
11	Capital structure and debt structure	Rauh J., Sufi A.	University of Chicago, 2008	<ul style="list-style-type: none"> - capital structure variation and debt heterogeneity - high and low credit quality firms and the access to financing and furthermore to growth - variation of debt structure

	Article	Authors	Publisher	Subject and key concepts
12	Electric power industry restructuring and ROE: the case of Korea Electric Power Corporation	Won G.H.	Energy Policy, 2007	<ul style="list-style-type: none"> - the case study of corporate restructuring and effect of profitability - implication of restructuring on financial outcome measured as ROE - efforts to reduce the debts
13	Capital structure choice: macroeconomic conditions and financial constraints	Korajczyk R.A., Levy A.	Journal of Financial Economics, 2003	<ul style="list-style-type: none"> - influence of macroeconomic conditions over the capital structure - target leverage is counter-cyclical for unconstrained firms and opposite for constrained firm - unconstrained firms time for opportunities
14	Corporate balance sheet restructuring and investment in the Euro area	Jaeger A.	IMF Working Paper, 2003	<ul style="list-style-type: none"> - legacy of high debt for Euro area firms - leverage effects on corporate investment and growth can be substantial and persistent particularly if leverage exceeds threshold values - more leverage corporate access to capital/lending is more costly than corporate with sounder financial position
15	Counter-cyclical substitution between trade credit and bank credit	Huang H., Shi X., Zhang S.	Journal of Banking and Finance, 2011	<ul style="list-style-type: none"> - counter-cyclical relationship between trade credit and bank credit - the substitution counter-cyclical behave with respect to GDP
16	Financial development and economic growth: the experience of 10 sub-Saharan African countries revisited	Akinlo A.E., Egbetunde T.	The Review of Finance and Banking, 2010	<ul style="list-style-type: none"> - causal relationship between financial development and economic growth - literature debate if the strong economic performance is finance-led or growth driven
17	Cash holdings in private firms	Bigelli M., Sanchez-Vidal J.	Journal of Banking and Finance, 2012	<ul style="list-style-type: none"> - cash holding firm with longer cash conversion cycle - cash holding associated with more dividends payment and both bank debt and net working capital represent cash substitute - cash holding is valuable buffer to meet unexpected contingencies or finance the investment projects and growth
18	Balance sheet restructuring and investment	Mills K., Morling S., Tese W.	Reserve Bank of Australia, 2011	<ul style="list-style-type: none"> - evolution of corporate balance sheet and investment over large decade - balance sheet improvement or repairing - as recovery picks up pace more firm inclined to expand their capital expenditure and less focus on financial restructuring

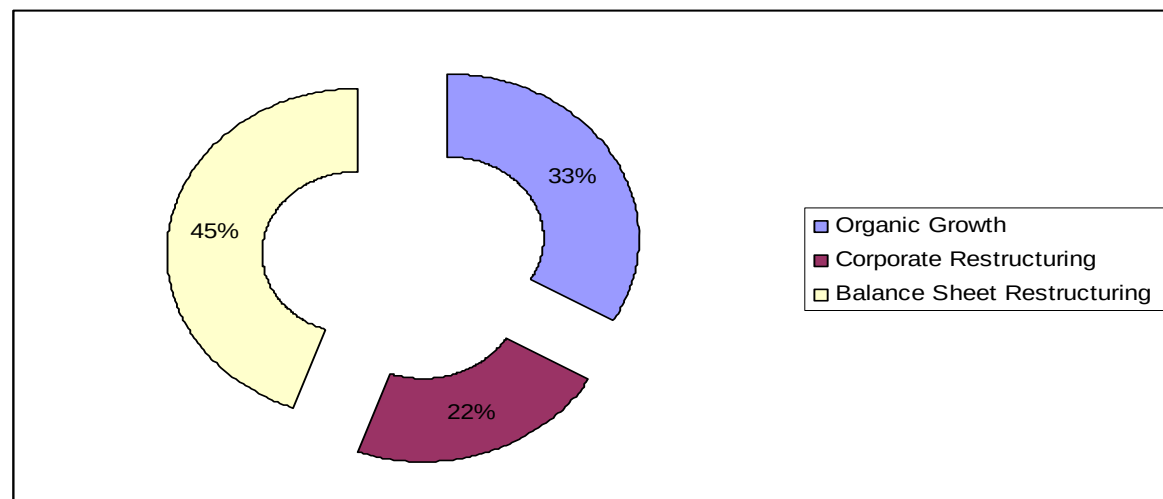
Distribution of sample papers by journals



Distribution of sampling papers by publishing year



Distribution of sampling papers by subject: organic growth (OG), corporate restructuring (CR) and balance sheet restructuring (BSR)

**Figure 1.** Distribution of sample papers

As Figure 1 shows, not surprisingly, the subject is attractive for corporate finance and banking journals firstly and also for international financial organizations and banks. Over the year, the economic growth preoccupied economic society with special focus after the crises periods: 2002-2003 followed multiple contraction decades, geographical spread, such as the Mexican crisis, Russian crises, Asian crises and others. In terms of topic researched, we propose to split the sample within three main subjects, the papers that treat the organic growth, corresponding to first stage of literature as described in the Introduction. Corporate restructuring process covers the second stage and finally the balance sheet restructuring comprising the last stage. All analyzed topics are different views of economic growth over sample decades. The sample distribution in this respect top ranks the concept of balance sheet restructuring as the premise for firm growth, proving the economists focus on economic stability and recovery after the turmoil periods.

4. Topics for further research

The proposed literature review aims to outlay the evolution of the corporate growth concept linked by macroeconomic factors. Thus the paradigm changing: we observe the firm growth defocuses from the aggressive M&A and shifts to create the equilibrium of quantitative factors. In terms of financial performances, we notice the scientific community sphere of interest enlarged after terrible recent crises.

The complex analyses of profitability indicators try to in-depth integrate profit and loss and balance sheet and capital structure. The recent financial downturn prove the oversized balance sheet, the debt exceeding the threshold and inadequacy of capital requirements affect the firm ability to generate liquidity and growth. In our opinion, future restructuring models should coverage to more advanced concepts such as flexible balance sheet. We define the balance sheet flexibility as financial structure that allows the firm to quickly adapt to the macroeconomic conditions. Consequently, the analyses should go further to balance sheet capacity to generate cash: to squeeze the cash drivers, to out-weigh the assets structure by unproductive and unperformed assets in place, to adjust the debt and the last but not the least to adapt the net worth structure to the business needs.

A flexible balance sheet, besides to ability to generate cash for growth should impact the firm outcome by decreasing the operational and agency costs. Moreover, the financial flexible firms should not be constrained in undertaking vast projects for market expansion. Further more, we intend to in-depth analyze how the restructuring strategies for creating balance sheet flexibility will influence the firms ability of generate growth. The research will be conducted on Romanian non-financial firms over a relevant period including pre and post crises years. We aim to contribute to the economic literature by creating a multiple variable model of growth used for upturn the business during and after turmoil period. The model will help the firms to choose the adequate restructuring policy for maximizing the probability to turn to growth, within the shortest period of time.

These could be the topics for further research and the future will demonstrate if the business environment understands the tough lesson of recent recession.

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SOCIAL RESPONSIBILITY AND PERFORMANCE OF FINANCIAL INSTITUTIONS

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Abstract. *The clients of the financial institutions, investors, employees, members of the community have high expectations regarding the corporate responsibility of the financial institutions. Therefore, the CSR performance assessment of a financial-banking institution is a complex undertaking which needs to take into account several aspects regarding the direct and indirect impact of the banks.*

The apparent conflict between corporate social responsibility and company objectives was noticed quite early by Nobel Prize winner Milton Friedman, who stated that any effort to use corporate resources to purely altruist ends could mean socialism. In fact, Friedman recommended the amendment of the law regarding corporations in order to discourage corporate social responsibility (Manne, 2006). And yet, more than 30 years after Friedman's statement, corporate social responsibility has become a norm.

Keywords: corporate social responsibility; social performance; financial performance.

JEL Classification: G30, G38, M14.

REL Classification: 11B, 11Z.

1. Introduction

Corporate social responsibility, as defined by the European Commission (2001), is a “concept by which companies integrate social and environmental issues in their business activities and in their interaction with the shareholders in a voluntary way”, seeking to raise awareness that a responsible behaviour leads to a sustainable success in business. Corporate social responsibility activities may include charitable contributions for the national and local organisations, fund raising, donations and presents, by reviving disadvantaged communities, claiming abandoned land and creating jobs. The numerous definitions issued by specialists for the concept of corporate social responsibility are reduced to the belief that, beyond the attempt to maximize corporation profit, corporate organisations play a major role in solving the problems of the society.

Reporting on CSR and sustainability is an important means for organizations to manage their impact on economic, social and environmental issues, as well as to increase transparency of non-financial issues. For all types of reporting presented above, the number of companies that report has constantly grown over the past years.

Corporate social responsibility raises several challenges for companies, including the need to define their responsibilities to the public sector, to establish their obligations in the supply chain and to decide up to what point they have to anticipate and plan the consequences of their activities, especially when using social resources. Pragmatism is essential for corporate social responsibility because, in spite of the many problems it can solve, corporate social responsibility has its limits and cannot be a substitute of the role of the government in enforcing international labor laws and standards.

Empirical researches conducted so far have led to mixed results regarding the relation of causality between CSR and financial performance. The fact that previous studies showed a generally positive relation between CSR and financial performance suggests that managers

are making an effort to define the needs of the interested parties. CSR must be understood as a set of activities which must be managed according to the priorities of the interested parties.

The study represents a contribution added to the existing works of other authors discussing the corporate social responsibility issues, such as Friedman, (2008), McGuire, (1988), Van Marrewijk and Verre (2003), Dacin (1997), Larsen (2000), Reign (2001), McWilliams and Siegel (2001). The study continues to examine different factors related to corporate social responsibility and the impact they have on profitability.

2. Data analysis

We used the data available in the Thomson Reuters databases as source, that is section ASSET 4.

For the analysis we used all the entities which had available data between 2005 and 2010 (the data for 2011 were not updated completely until the date of the elaboration of the study).

Table 1

Number of entities per year and continent of origin

	2005	2006	2007	2008	2009	2010
Africa			1	4	6	8
North America	32	34	39	55	61	65
South America			2	7	8	12
Asia	34	34	42	64	86	110
Europe	54	54	59	75	79	85
Australia	5	5	5	5	6	9
TOTAL	125	127	148	210	246	289

Source: Thomson Reuters, our calculation.

Therefore, if in 2005 there were data available for a number of 125 entities, an important growth can be noticed, so that in 2010 there were available data for a number of 289 entities. This is applicable both globally and for each continent or country.

Globally, the highest growth rhythm is recorded in 2008, in comparison with 2007, respectively 42%, which means almost the doubling of the number of entities. The growth is not yet uniform, we can observe a different rhythm of growth dependent on the continent. If in 2005 Europe had the highest number of entities, in 2010 Asia registers the highest number. Looking from the point of view of the origin country we notice that every year on the first three positions based on the number of entities are The United States of America, Japan and Italy. The result was predictable because the concept of social responsibility of the company (CSR) started in U.S.A., and in Japan the idea of “Keyosei” survived for centuries, in the purpose of cohabitation and working together for the well-being of the society. Taiwan and The Republic of China didn’t have any entities in 2005, but they occupied in 2010 the 4th and 5th place, leaving behind countries which initially had a higher number of entities.

Table 2

The number of entities depending on the country and the original continent

	2005	2006	2007	2008	2009	2010
United States	27	29	31	44	50	53
Japan	26	26	29	30	31	32
Italy	8	8	9	11	11	11
Taiwan					3	11
China			3	6	9	10
United Kingdom	8	8	9	9	9	9

	2005	2006	2007	2008	2009	2010
Canada	5	5	7	9	9	9
Australia	5	5	5	5	6	9
Spain	7	7	8	8	8	8
Poland				2	4	8
India			2	4	5	8
Brazil			2	6	6	8
Malaysia				3	3	8
Turkey				6	7	8
South Korea				3	7	7
Thailand				1	4	6
Greece	5	5	5	5	5	5
Hong Kong	5	5	5	5	5	5
Indonesia				3	5	5
Suedia	4	4	4	4	4	4
South Africa				3	3	4
Germany	3	3	3	4	4	4
Philippines					1	4
Switzerland	1	1	3	3	3	4
France	4	4	4	4	4	4
Israel					3	4
Portugal	3	3	3	3	3	3
Singapore	3	3	3	3	3	3
Russian Federation				2	3	3
Kuweit				3	3	3
Denmark	3	3	3	3	3	3
Mexico			1	2	2	3
Chile				1	1	3
Belgium	2	2	2	2	2	2
Egypt					1	2
Austria	2	2	2	2	2	2
Ireland	2	2	2	2	2	2
Norway	1	1	1	1	1	1
Colombia					1	1
Nigeria					1	1
Jordan				1	1	1
Qatar				1	1	1
Maroc			1	1	1	1
Czech Republic				1	1	1
Hungary				1	1	1
Saudi Arabia				1	1	1
Cyprus				1	1	1
Oman					1	1
Finland	1	1	1	1	1	1
Total	125	127	148	210	246	289

Source: Thomson Reuters, our calculation.

The first two hypotheses arise in the study.

Hypothesis 1. The purpose is to show that the number of entities from the six groups (continents) is significantly different.

The null hypothesis in this case is that the six groups of subjects are not significantly different.

The result of the application of Anova test is to be found in the below table.

Table 3

**Anova test – the number of entities from the six groups (continents)
is significantly different**

Anova: Single
Factor

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	23457.13542	5	4691.427	17.6463	1.24664E-07	2.586790086
Within Groups	6912.333333	26	265.859			
Total	30369.46875	31				

Source: Thomson Reuters, our calculation.

Therefore, we can validate the first hypothesis according to which the independent continent variable influences the number of entities.

The cultural and geographical factors have an extremely important role because CSR is different from a country to another, depending on the social issues and cultural conventions. Pederson (2006, pp. 137-163), defends the idea that in the evaluation of the relation between CSR and performance, the diversity and the specificity of every country should be considered regarding the priorities of the interested parties and the measurement method of the financial performance.

Table 4

**Studies which confirm the hypothesis that cultural and geographical factors
influence CSR**

Year	Author	Criteria
2001 ⁽¹⁾	Maignan	Argues that in the case of consumers from France and Germany the decision is based on the philanthropic activities of the provider more than in the case of those from USA. A firm which donates and performs charitable activities can be evaluated as more or less social responsible depending where the question is asked.
2005 ⁽²⁾	Pesqueux	Indicates that the European companies are based less on the legislative assessments in order to encourage the socially responsible behaviour in work negotiation and environmental issues than the companies from USA.

The differences in the perception of CSR stated for the interested parties in different regions of the world constitutes an obstacle in obtaining a common understanding of CSR on a long term (Fombrun, 2005, pp. 7-11).

The comparison between The United States and Great Britain could represent a specific chapter because, besides CSR, they have implications on the theories of the corporate governance systems.

Regarding the emerging countries, an important issue of CSR relies in the fact that the governments ignore the corporate irresponsibility or they refuse to include in the legislation, the norms regarding the protection of the working force or the environmental standards as an impulse for foreign investments (Aman, 2001). China, for example, legislated solid rights regarding the collective negotiations, but yet thousands of persons are imprisoned for trying to exercise these rights (Diamond, 2004). The governments of some of the emerging countries issue laws by which they request higher standards regarding an environmental or social responsible behaviour to be able to be competitive regarding institutional investments and foreign capital, besides the competition regarding the familiar issues such as contracts which refer to the rule of law and the law regarding the ownership, financial transparency, the protection of intellectual property and reduction of corruption at a governmental level (Hebb & Wojcik, 2004). The comparison of those legislative evolutions in different emergent economies is important to create the base of the future understanding of the relation between law and evolution and of the contribution of CSR to the economic development, if it is the case.

Hypothesis 2. The purpose is to see if the number of entities from the six groups (years) is significantly different.

The null hypothesis in this case is that the six groups of subjects are not significantly different.

The result of the application of Anova test is to be found in the below table.

Table 5

The number of entities from the six groups

Anova: Single Factor						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1975.802	5	395.1604167	0.361847	0.869849626	2.082182
Within Groups	28393.67	26	1092.064103			
Total	30369.47	31				

Source: Thomson Reuters, our calculation.

It follows that the independent variable year doesn't influence the number of entities.

Equal-Weighted Rating is an example of the way that the economic and extra economic well-being of a company can be estimated on the base of the information of the economic, environmental, social and ASSET4 corporate pillars of governance. This reflects a balanced view of the performance of the company in these four areas.

The tables below and the following graphics show the evolution in time of the aggregate score.

Table 6

The evolution in time of the aggregate score

	2005	2006	2007	2008	2009	2010
Africa			18.99	78.31	54.83	51.74
North America	56.59	55.47	53.28	44.82	43.88	44.28
South America			89.50	52.80	53.09	63.20
Asia	19.17	22.53	23.18	28.35	27.06	29.71
Europe	61.20	62.68	65.06	58.90	60.12	61.00
Australia	86.18	83.38	78.13	88.53	84.54	60.47
TOTAL	49.59	50.82	50.53	46.77	44.77	45.15

Source: Thomson Reuters, our calculation.

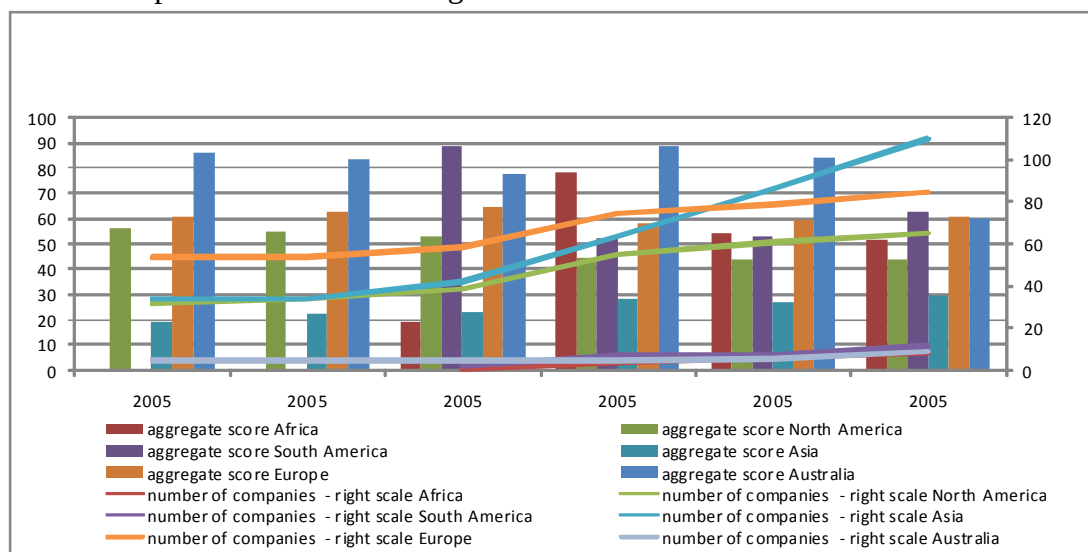
As we can be observed, between 2008 and 2009 there was a tendency of reduction followed in 2010 by a growth. This is not applicable in the case of the Australian region, where 2008 is the year with the highest score but in 2010 we have the most severe decrease (28%).

The reduction from 2008 could be explained by the fact that one of the most well known anti-crisis measures was the budget reduction or cut of all that involves the mixture of communication where we find the image campaigns and CSR.

From the analysis resulted that:

- A large number of entities which are reporting and an aggregate score at a high level (Europe, North America). The result was predictable because, as we stated, the concept of social responsibility of the company (CSE) appeared in USA, while in Europe its use is more recent but the concern is in a continuous growth.
- A large number of entities which are reporting but an aggregate score at a low level (Asia) which can be explained by the fact that the information dissemination is made due to the disclosure and lack of experience in preparing the reports.
- A small number of entities which are reporting but an aggregate score at a high level (Africa, Australia, South America) can be explained by the fact that the entities which are reporting are either very big and with an strong organizational culture or are correlated from the point of view of the shareholding or of the commercial relations with areas with a high level of CSR.

These aspects are outlined in Figure 1.



Source: Thomson Reuters, our calculation.

Figure 1. Aggregate score

Analyzing the Bonferroni post hoc tests through the media of differences indicates the existence of some significant differences between

- Asia and all the other regions, meaning that in this region we have the lowest score
- Europe has a superior score as against North America. This result is in accordance with the observation that the number of companies which make this report according to GRI is higher in Europe by comparison with North America.

The following table fundamentals exactly this, making multiple comparisons between all the pairs of two groups (Bonferroni test)

Table 7

Multiple comparisons						
(I) aggregate score	(J) aggregate score	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Asia	Africa	-30.10764*	7.03723	.000	-50.8070	-9.4083
	Europe	-34.79285*	2.15016	.000	-41.1173	-28.4683
	North America	-21.70136*	2.35544	.000	-28.6297	-14.7731
	Australia	-51.70095*	5.29050	.000	-67.2625	-36.1394
	South America	-33.26514*	5.76887	.000	-50.2337	-16.2965
Europe	Africa	4.68520	7.02197	1.000	-15.9693	25.3397
	Asia	34.79285*	2.15016	.000	28.4683	41.1173
	North America	13.09148*	2.30947	.000	6.2984	19.8846
	Australia	-16.90810*	5.27019	.021	-32.4099	-1.4063
	South America	1.52771	5.75025	1.000	-15.3861	18.4415
North America	Africa	-8.40628	7.08752	1.000	-29.2536	12.4410
	Asia	21.70136*	2.35544	.000	14.7731	28.6297
	Europe	-13.09148*	2.30947	.000	-19.8846	-6.2984
	Australia	-29.99959*	5.35722	.000	-45.7574	-14.2418
	South America	-11.56377	5.83012	.713	-28.7125	5.5850
*. The mean difference is significant at the 0.05 level.						

Source: Thomson Reuters, our calculation.

The comparative studies regarding CSR have implications in understanding the theories of corporate governance. The experts in the field of corporate governance made a gross division of the world in the Anglo-American system “from outside” versus the “initiated” continental European and Japanese systems division which suggested a mapping of the opinions of the shareholders versus the opinions of the interested parties regarding the company, as well as the mapping of different cognitive styles from the multitude of cultures (Licht, 2004). However, recent comparative studies of CSR are suggesting that these conceptual demarcations need a substantial calcification. In particular, a number of studies show that the legislative evolutions and the institutional context from Great Britain regarding CSR show similarities with Europe and disparities related to The United States, raising a question about a unified Anglo-American system of corporate governance.

The economical pillar measures the capacity of the company to generate a sustainable development and a high profit of the investment by using efficiently all its resources. It reflects the general well-being of the company and its capacity to create value for the shareholders by using the best management practice.

The table and the graphic below show the evolution in time of the score which quantifies the economic pillar.

Based on these we can easily drawn the following conclusions

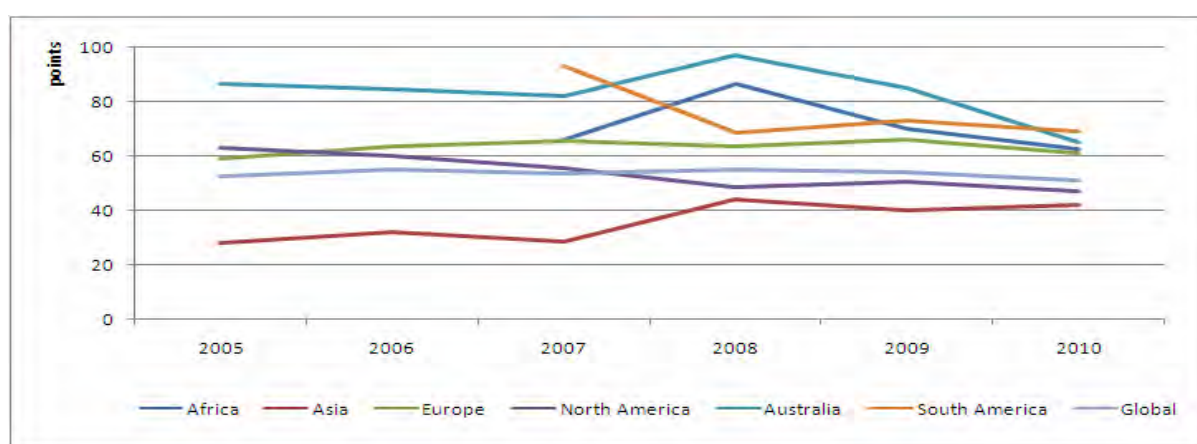
- Australia, Africa, South America and Europe report values above average on the entire analyzed period;
- Asia reports values below average on the entire analyzed period;
- North America reports values above media in 2005 and 2006, below media starting with 2007, which can be explained by the intensity of the crises from this region.

Table 8

The evolution in time of the score which quantifies the economic pillar

	2005	2006	2007	2008	2009	2010
Africa			65.95	86.80	70.34	62.62
Asia	27.99	31.84	28.31	43.93	40.10	42.13
Europe	58.91	63.34	65.73	63.58	66.12	61.05
North America	62.92	59.97	55.50	48.40	50.42	46.80
Australia	86.72	84.66	82.14	97.20	84.93	65.06
South America			93.25	68.46	73.05	69.15
Total	52.64	54.84	53.34	55.02	53.92	51.15

Source: Thomson Reuters, our calculation.



Source: Thomson Reuters, our calculation.

Figure 2. Evolution in time of the score which quantifies the economic pillar

The pillars of corporate governance (CGVOR) measure the systems and the procedures of a company, which ensures that the members of the board and the executives are acting for the well being of the shareholders on a long-term. It reflects the capacity of a company to direct and control using the best management practices, the rights and responsibilities by creating stimulants and verifies and balances to generate value for the shareholders on a long term.

Table 9

The corporate governance

	2005	2006	2007	2008	2009	2010
Africa			1.85	59.72	33.26	38.84
Asia	17.78	17.20	17.58	17.83	16.48	22.56
Europe	46.83	50.22	51.71	44.62	46.88	48.36
Americade Nord	76.47	74.78	72.11	65.91	62.49	65.05
Australia	72.40	74.54	75.52	77.15	86.47	72.59
South America			50.65	28.58	28.43	37.99
Total	47.54	48.91	47.85	42.56	40.16	42.36

Source: Thomson Reuters, our calculation.

The pillar of environmental protection (ENVSCOR) determines the impact of a company on the organic and inorganic systems, including air, earth and water, as well as the complete ecosystems. It reflects how well a company uses the best practices of management to avoid environmental risks and uses the environmental opportunities to generate value for the shareholders on a long term.

Table 10

The environmental protection

	2005	2006	2007	2008	2009	2010
Africa			13.04	60.55	45.70	44.87
Asia	32.04	31.75	31.69	32.95	33.07	33.09
Europe	58.22	59.07	62.57	56.06	56.74	59.60
North America	30.30	33.35	34.19	31.54	32.02	32.28
Australia	81.81	79.50	71.67	73.76	78.00	55.27
South America			82.04	54.14	44.73	60.25
Total	44.90	45.68	46.56	43.04	42.20	42.85

Source: Thomson Reuters, our calculation.

The social pillar (SOCSCOR) measures the capacity of a company to generate trust and locality to its work force, clients and society, using the best practices of management. It reflects the reputation of the company and the well being of its operating license, which are the key factors in determining its capacity to create value for the shareholders on a long term

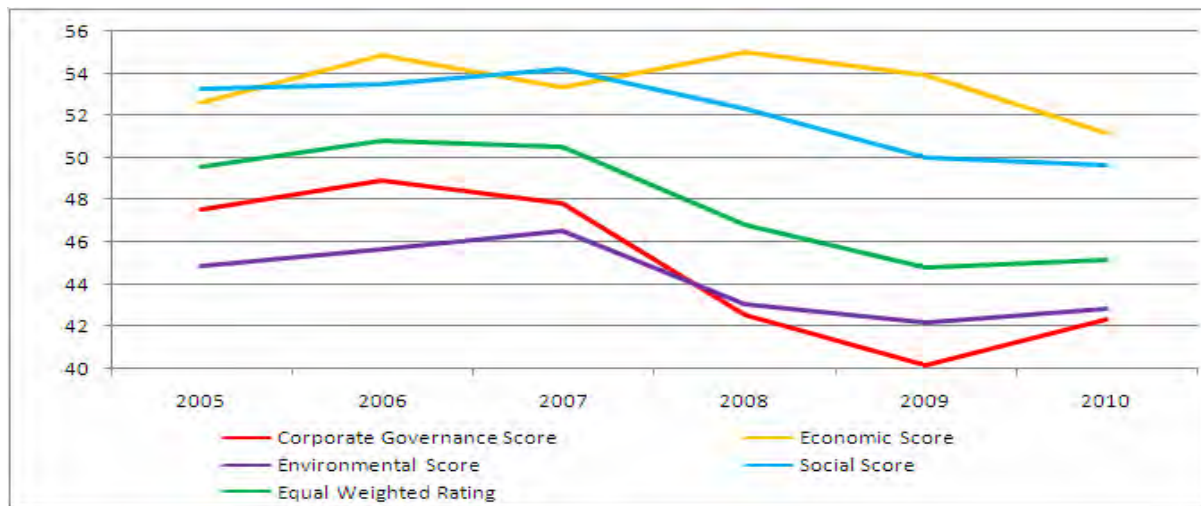
Table 11

The social pillar

	2005	2006	2007	2008	2009	2010
Africa			37.59	88.67	65.86	61.56
Asia	26.00	29.24	30.49	37.30	37.96	36.97
Europe	68.81	67.33	68.19	65.84	64.81	66.42
North America	50.79	50.73	54.10	44.59	41.79	42.53
Australia	86.95	87.42	76.26	84.06	77.48	56.13
South America			96.09	62.39	63.86	73.17
Total	53.28	53.48	54.22	52.33	50.02	49.66

Source: Thomson Reuters, our calculation.

As a synthesis on the things we have presented, we analyze the evolution at an aggregate level of the four pillars as well as the aggregate score.



Source: Thomson Reuters, our calculation.

Figure 3. The evolution on an aggregate level of the four pillars and the aggregate score

From the graphic we can see that:

- The score which quantifies the economic dimension and the one which quantifies the social dimension are above the one which quantifies the environmental performance and corporate governance;
- The ascending trend from 2005-2007 was replaced by a descendent one in 2008-2009 followed by a slight recovery of the ascending trend in 2010 excepting the dimension of corporate governance.

Table 12

The evolution at an aggregate level of the 4 pillars as well as the aggregate score

	2005	2006	2007	2008	2009	2010
Corporate governance	47.54	48.91	47.85	42.56	40.16	42.36
Economic	52.64	54.84	53.34	55.02	53.92	51.15
Mean	44.90	45.68	46.56	43.04	42.20	42.85
Social	53.28	53.48	54.22	52.33	50.02	49.66
Aggregate	49.59	50.82	50.53	46.77	44.77	45.15

Source: Thomson Reuters, our calculation.

3. Results

To analyze the connection between two variables we calculated the *Pearson coefficient of the linear correlation*. We have to mention that r_{xy} doesn't offer an explanation about the connection (in a physical sense) between x and y . It is possible that x influences from a physical point of view y or backwards but many times both of them result from some or many other processes (Wilks, 1995).

Table 13

Synthesis of the Pearson coefficient of the linear correlation

	CGVSCOR	ECNSCOR	ENVSCOR	SOCSCOR
CGVSCOR		.532	.447	.563
ECNSCOR	.532		.577	.748
ENVSCOR	.447	.577		.810
SOCSCOR	.563	.748	.810	

From the Pearson correlation analysis results that all the 12 possible correlations are significant from the statistic point of view

Therefore from the six possible correlations we have⁽³⁾

- Four moderate correlations, respectively
 - Between corporate governance performance and the other three directions of economic, social and environment analysis
 - Between social and environmental performance
- A strong correlation between: social and the economic performance
- A very strong correlation between: social and environmental performance

A strong and resistant alternative to the Pearson correlation coefficient is *the correlation coefficient of the Spearman rank*. This is in fact also a Pearson coefficient of linear correlation, but applied to the ranks of x and y values, instead of the initial values x , y . Therefore, the string of dates x and y are put into an ascending order. Then, to each value of the initial string the rank obtained in the ordered string is associated.

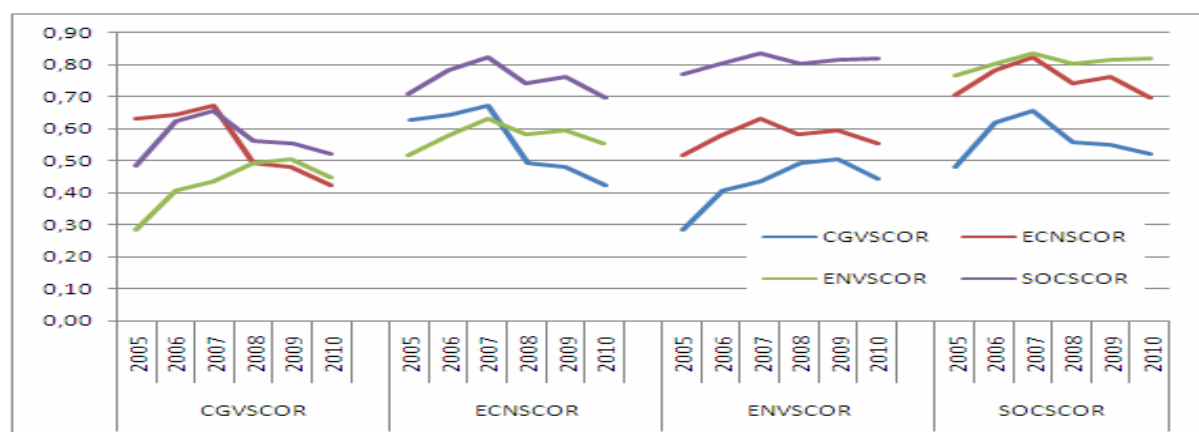
While the Pearson correlation coefficient reflects the intensity on the linear relation between two sets of dates, the correlation coefficient of the Pearson ranks reflect the intensity of the monotone dependence.

Therefore, from the six possible correlations we have⁽³⁾

- Three moderate correlations, respectively
 - Between corporate governance performance and the social and the economical performance,
 - Between economical and environmental performance
- Three strong correlations between: social performance and the other three directions of analysis corporate governance economical and environmental.

The next graphic presents amply the correlation between the four components for every year from the analyzed period.

As an evolution in time, we notice a growth of the intensity of the correlations followed by a decrease. It can also be noticed that the highest correlation is to be found between the environmental correlation and the social one.



Source: Thomson Reuters, our calculation.

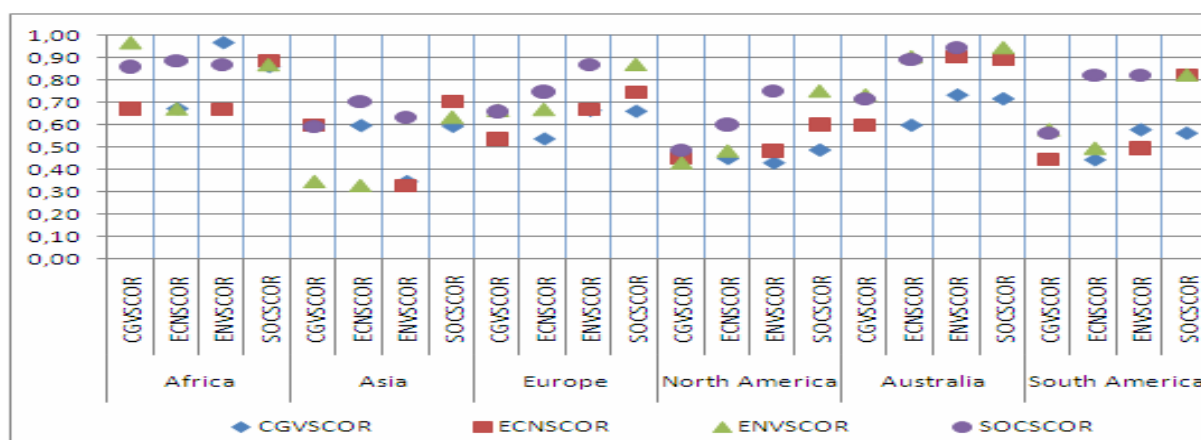
Figure 4. Pearson coefficient of the linear correlation

From the point of view of the correlations we can observe that:

- None of these is weak;
- Most of them are moderate (34) and strong (24);
- We also have 12 very strong correlations but which are not higher than 0.836.

The situation is similar when we perform the analysis on each continent. All the correlations are significant from a statistic point of view.

The following graphic presents these correlations in order to render a clear image.



Source: Thomson Reuters, our calculation.

Figure 5. Number of correlations

As a result of the previous evaluation of the correlations between the variables, we tested by regressions in what way they can explain the variables of corporate governance, environmental, social the economic performance. The regression allows the establishment of the determination relations which exist between the dependent variable and the totality of the factors which influence its evolution by using statistical data. This kind of relation is usually analyzed not isolated, but in a set of relations where the variables are influencing one another. The below tables synthesize the regression performed.

Table 14

Model of regression

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.761 ^a	.580	.578	20.84309	.580	524.317	3	1141	.000	1.959

a. Predictors: (Constant), SOCSCOR, CGVSCOR, ENVSCOR

b. Dependent Variable: ECNSCOR

The regression is characterized by a high value of the adjusted R-squared indicator (0,578), which means that 57.8% from the variation of the economic pillar can be explained with the help of the chosen variables. The $-p$ value is significant from the statistic point of view. Durbin Watson statistic (DW) is a statistic point of view which tests the serial correlation of the errors. The value of $DW^{(4)}$ is very close to 2, so we can state that errors are not correlated and that we have a valid model.

Table 15

The model of regressionCoefficients^a

Model	Unstandardized		Standardized	t	Sig.	95.0% Confidence Interval	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	11.882	1.230		9.662	.000	9.469	14.295
CGVSCOR	.166	.024	.161	6.946	.000	.119	.213
ENVSCOR	-.078	.032	-.080	-2.449	.014	-.140	-.015
SOCSCOR	.727	.036	.722	20.374	.000	.657	.797

Note: a. Dependent Variable: ECNSCOR.

The coefficients obtained after performing the regression are significant from a statistic point of view.

Conclusions

Empirical researches conducted so far have led to mixed results regarding the relation between CSR and financial performance. The fact that previous studies showed a generally positive relation between CSR and financial performance suggests that managers make efforts to establish the needs of the stakeholders. CSR must be understood as a set of activities which must be managed according to the priorities of the stakeholders.

Banking performance and its analysis is most useful to investors represented by shareholders, creditors, suppliers or clients, as well as to administrators, managers and employees, financial analysts, with a view to making the right decisions to lead to expected results. The question arises: how can the company make all this known to its stakeholders? Two approaches regarding the corporate social responsibility (CSR) and financial performance ratio were taken into consideration. The first approach concerns the type of correlation and there can be a negative, neutral or positive ratio between CSR and financial performance. The second approach takes into account the *cause-effect determination*. The changes in CSR performance can influence financial performance, or, on the contrary, the changes in financial performance can influence CSR performance.

The study on the promotion of sustainable development and of social responsibility and their impact on the performance of financial institutions represent the most ambitious part of the paper. Out of six possible correlations, the following group was identified:

- four moderate correlations, respectively:
 - between corporate governance performance and the other three directions of economic, social and environment analysis,
 - between social and environment performance
- a strong correlation between: social and economic performance
- a very strong correlation between: social and environment performance

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Notes:

⁽¹⁾ Maignan, I. (2001). "Consumers' perceptions of corporate social responsibilities: A cross-cultural comparison", *Journal of Business Ethics*, 30 (1), pp. 57-72.

⁽²⁾ Pesqueux, Y. (2005). 'An "Anglo-American" model of CSR?', in M. Bonnafous-Boucher and Y. Pesqueux (eds.), *Stakeholder Theory: A European Perspective*, Palgrave-Macmillan, Hampshire, UK, pp. 24-38.

⁽³⁾ $r \in [0; 0.2]$ very weak correlation; $r \in [0.2; 0.4]$ weak correlation; $r \in [0.4; 0.6]$ moderate correlation; $r \in [0.6; 0.8]$ strong correlation; $r \in [0.8; 1]$ very strong correlation.

⁽⁴⁾ Durbin Watson statistic (DW) is a statistical test which tests the serial correlation of the errors.

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SESSION III
PUBLIC FINANCE

MODELLING THE USE OF ALTERNATE CHANNEL ALLOCATION IN GRANTING SOCIAL ASSISTANCE BENEFITS

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Abstract. *The government program for 2013-2016 provides, as one of the main lines of action, the development of social services while reducing the volume of direct financial benefits granted and the development of a system based on the use of social vouchers.*

The present study is the corollary of a model designed by the authors, using the informational asymmetry in providing social programs.

It aims at a quantitative modeling of public policies, regarding the errors of over-or under-inclusion; also embodying an analysis of the option of allocating social benefits through alternate channels.

This model studies the balance of granting the benefits and allowances by means of vouchers that would allow buying goods cheaper, but it would introduce a certain „stigma” on its beneficiaries.

Keywords: quantitative methods; social assistance; agency theory; optimal allocation.

JEL Classification: D71, H55.

REL Classification: 13Z.

1. Introduction

The role of the state in social protection can be assessed in terms of effectiveness and efficiency criteria, respectively:

- Recording a net social benefit, in the context of budgetary allowances to beneficiaries on the basis of eligibility criteria, targeting errors being due to the informational asymmetry;

- Pareto-type optimal resource allocation;

- The concept of *social justice* (Hillman, 2003).

The classical approach to the problem of adverse selection followed by moral hazard belongs to Mirrlees (1971) and was developed in a series of theoretical and practical directions.

The allocation of social benefits can be regarded as a contract or as a sure promise, made by both parties, stating their obligations in every situation that might arise.

The party that proposed the contract (who makes the allocation and payment of benefits, i.e. the State or the communities) will be defined as primary decision maker or principal, and the party who accepted the contract is defined as agent (recipient of social benefits).

The agency theory assumes that nobody would like this transaction to any other purpose than to get the highest gains possible while complying with the rules.

We define as *labeler* a person who performs the process of inclusion in the class of social support on the basis of an attribute/criterion for eligibility.

In the following simplified model, the *labeler* will pay welfare benefits, therefore it will also have the position of *principal*. This case can be found in practice, for example, when the aid is granted directly by the payer of social security benefit.

The *agent* is the recipient of social benefits by means of a specific channel allocation.

2. The model

$$W = f(c, r, k) \quad (1)$$

We assume that the utility of an agent depends on its consumption of goods and services, its reputation within the community, a variable of integration in human behavior and social preferences (Akelhof, 1976).

$$W = f(c, r, k) \quad (1)$$

The agent gains because of the incorrect labelling w , except when the principal becomes aware of the situation and applies a penalty a . In other words, the beneficiary of assistance gains following an error of over-inclusion w , but it is aware that he can be fined by a fine a .

The agent has a level of income v , and the principal gains through this program the value o which would represent the efficiency of one specific public policy.

		x	1-x
		Government performs inspections	Government does not perform inspections
y	The agent declares its income incorrectly	$V - a, a - h$	$V + w, -w$
1-y	The agent declares correctly its income	$V, o - h$	V, o

Figure 1. The Model

The agent doesn't care if the income is labeled incorrectly (if he declares its income incorrectly) or not, therefore we come to this case:

$$y * (V - a) + (1-y) * (V + w) = y * (V) + (1 - y) * (V); \quad (2)$$

$$Y = w / (a + w) \quad (3)$$

For the agency providing/allocating the subsidies, the decision to control or not results from the ratio below:

$$X(a - h) - (1 - x)w = x(o - h) + (1 - x)o \quad X = 1 / (1 + a) \quad (4)$$

$$X = (a + w) / (w + o) \quad (5)$$

If we replace (1) by (3) we obtain a balance equation that defines the agent's reaction towards a certain channel of payment:

$$Y = f(c, r, k) / (a + f(c, r, k)) \quad (6)$$

The *labeler's* decision depends on the consumption of goods, its reputation in the community, a constant of integration, and if the sanction (a) and benefit (w) is obtained.

One can note that, at a low level of the fine, the *labeler* will permanently fraud; a high level of fine would tend to restrain such behaviour.

You might think that this model is valid only regarding the labeling error like the fraud or over-inclusion.

The present model is valid also for the under-inclusion error by extending the concept of fine (for a person with no income, the fine is given by the administrative costs required by filing an application).

Substituting (1) into (5), we obtain a model of the principal's reaction.

$$X = (a + f(c, r, k)) / (f(c, r, k) + o) \quad (7)$$

While keeping even the administration policy determined by x and the constant of the factor k , the principal aims to increase the utility o only by influencing the relationship between the stigma and the utility of the program.

$$(a + f(c_1, r_1, k)) / (f(c_1, r_1, k) + o_1) > (a + f(c_2, r_2, k)) / (f(c_2, r_2, k) + o_2) \quad (8)$$

Where $o_2 = o_1$ - distribution costs through another channel

We note $a/w = s$ the ratio between the fine and the gain of the agent

We note $o/w = t$ the ratio between the distribution costs and the gain obtained by the principal

Therefore, the relation (5) becomes:

$$x = (s + 1) / (t + 1) \quad (9)$$

Below is the graphical representation of the above function considering s between 1 and 2 and t between 5 and 10:

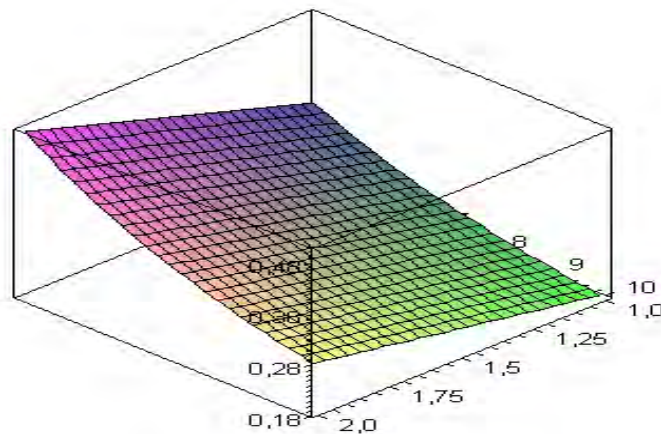


Figure 2. Allocation modelling

The graph in Figure 2 shows also the influence of the sanction imposed by the principal to the recipient (agent) as well as the influence on the balance towards a lower tendency to fraud of the agent.

However, fines may not be increased, they must be actually applied (the risk of insolvency increases) and that is why, besides the penalty levied on the poor, the agent's utility function due to stigma must be also influenced.

Choosing a new channel of allocation requires maintaining constant the x value, taking into account the change in the function f and the costs incurred by the new channel.

Taking into consideration a linear function for the utility of the agent, defined as „ $\alpha c + \beta r + k$ ” we may notice that using alternate channels such as vouchers has a different impact on various variables (the use of social vouchers has an impact also on consumption, the reputation variable as well as on the additional costs).

Let's suppose that for a social program applied “in kind/in cash”, the utility of the state is $o_1 = 100$ units.

This program provides also for the enforcement of a RON 15 fine in the case of fraud. We suppose that the utility function of the agent to this social program is of RON 10. We shall then simulate the use of a payment channel (while keeping unchanged the sanction policy) by means of vouchers that would cost the principal the amount of one monetary unit.

Thus the utility of the principal would become 99, but also the utility function of the global agent declines, because of a higher influence of the „stigma”.

We can notice a trend of refusal of the social vouchers, because the beneficiaries of such vouchers may be stigmatised.

Thus, the utility of the principal 02 would become 99, but the utility function of the global agent decreases due to the influence of stigma.

There is in fact a refusal of the beneficiary to get the vouchers because this would lead to stigma. When the benefit is paid in kind directly to the account of the beneficiary, such phenomenon is not met.

Let's suppose that as a consequence of the „stigma” component, the utility of the agent becomes RON 9. We shall look at these two versions:

- Version no. 1 (payments in kind/cash)

$$X = (15+10) / (10+100) = 0.227$$

- Version no. 2 (payments with vouchers)

$$X = (15+9) / (9+99) = 0.222$$

The second version, the payment with vouchers, might prove more effective for the principal (it presupposes less control needed). The trend of the agent to mislabel also declines, as follows:

- Version no. 1 (payments in cash/kind)

$$Y = w/(a+w) = 10/(15+10) = 0.4$$

- Version no. 2 (payments with vouchers)

$$Y = w/(a+w) = 9 / (9+15) = 0.375$$

According to the example above, even if there is a loss of utility of the principal, the funds allocated are used with a higher efficiency by cutting down the overinclusion error.

The model confirms the possibilities to subsidize low quality goods, starting from the idea that very poor people buy cheap low quality goods destined only to survival.

Conclusions

The quantitative model allows to the model the decision to allocate the social assistance benefits by means of alternate channels. Even if bringing additional costs, these allocation channels may result in reducing total costs because the benefits are targeted to people actually in need.

The future development of this study shall be directed towards the analysis of the „principal – agent” model, for multiple relationships (such as: beneficiary – doctor, beneficiary – social worker, social worker – mayor, mayor – state agency, a.s.o.)

Although it introduces additional administrative costs, these channels of allocation can reduce total costs by providing benefits to people who really are in need.

Further development of this research will focus on analyzing the main model – agent for multiple relationships (customer – physician, recipient - social worker, social worker – mayor, mayor – state agency).

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IMPACT OF PUBLIC DEBT ON THE ROMANIAN ECONOMY IN CONDITIONS OF ECONOMIC CRISIS

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Abstract. *The scientific approach of the authors is considering a review of the impact of public debt on the Romanian economy in conditions of economic crisis. Installation of global economic crisis caused major changes in economy all states including the Romanian economy. Issue debt, subject of increasingly debated today, not a recent phenomenon. Because of the many changes in political, economic and social development in the country, increased resource needs, especially financial ones, proved to be absolutely necessary for economic development.*

Accumulation of public debt in Romania and increased indebtedness today is the result of political regime change in early 1990.

Keywords: economy; debt; economic crisis.

JEL Classification: H00, H60, O10.

REL Classification: 14K.

1. Introduction

Due to the many political, economic and social changes in a country, increase in resource needs, especially the financial ones, proved to be absolutely necessary for the development of the key industries. Moreover, problems caused by the public debt management have become a priority for our country as well, being predominantly oriented towards public debt management.

In a broader context in terms of public policy, governments should ensure that both the level and rate of public debt growth are sustainable over time and can be maintained in the context in which the cost and risk objectives are achieved.

The public debt portfolio management is a priority for each government in order to reduce exposure to medium and long term risks.

The main objective in the management of public debt is represented by the provision of government financing needs in terms of minimizing long-term costs and restriction of the risk involved.

In our country, throughout the period proposed for analysis, a number of actions have been taken for continuous improvement of legal and institutional framework on public debt management. Financial and economic crisis disputes EU funds absorption in the context of the dramatic restriction of foreign loans and reducing in volume of foreign direct investment.

2. Legal and institutional framework of public debt management

The Romanian legal framework on sizing, structuring, contracting and monitoring public debt has seen many changes since 1993, the year when the first public debt law came into force.

Legislations regulating the concept of public debt were the following:

- Public Debt Law No. 91/1993, published in the Official Gazette No. 3 of January, the 10th 1994, which defined the terms and conditions under which the Romanian government may contract loans;
- Public Debt Law No. 81/1999, published in the Official Gazette No. 215 of May, the 17th 1999, which law was passed due to the appearance of capital market in our country;
- Public Debt Law No. 313/2004, published in the Official Gazette No. 172 of June, the 29th 2004, by which law it has been achieved the harmonization of Romanian legislation on public debt with the EU *acquis* and compliance with the commitments that Romania has undertaken during the negotiations for accession to the European Union;
- Emergency Ordinance No. 64/2007 on public debt, published in the Official Gazette no. 439 of June, the 28th 2007, as amended and supplemented by a series of amending documents (GEO No. 141/2007, Law No. 109/2008, Law No. 149/2008, GEO No. 34/2009).

Alongside these legislations, Government decisions were also adopted on approving the Methodological Norms for the enforcement of public debt laws.

Public Debt Law No. 81/1999 represented the legal framework for direct loans or for those guaranteed by the state in the financial markets during 2000-2004. Under this law, the state could contracted loans both for financing the budget deficit and to finance own projects or sub-loaned to line ministries, local government and economic operators. Also, the state issued guarantees for loans contracted abroad by the line ministries, local government and economic operators.

Given the difficulties occurred in managing government debt and recommendations made by the International Monetary Fund and the World Bank concerning the rationalization of legal and institutional framework related to government debt management, in early 2005 came into force a new public debt law, namely Public Debt Law No. 313/2004. This law created the legal framework for a more efficient management of public debt, the main objective being the prohibition of other entity, except the Ministry of Public Finance, to contract loans in the name and on behalf of the Romanian Government. Under this law, it was removed the possibility of ministries to contract loans based on state guarantee, also bringing a number of explanations regarding local public debt, by integrating it as part of public debt. Also, by this law was achieved the harmonization of Romanian public debt legislation with the European legislation and a number of issues were regulated, aiming at prohibition of direct financing of the state by the central bank and introducing the provision according to which administration of foreign currency reserves is fully subject to the competence of the Romanian National Bank.

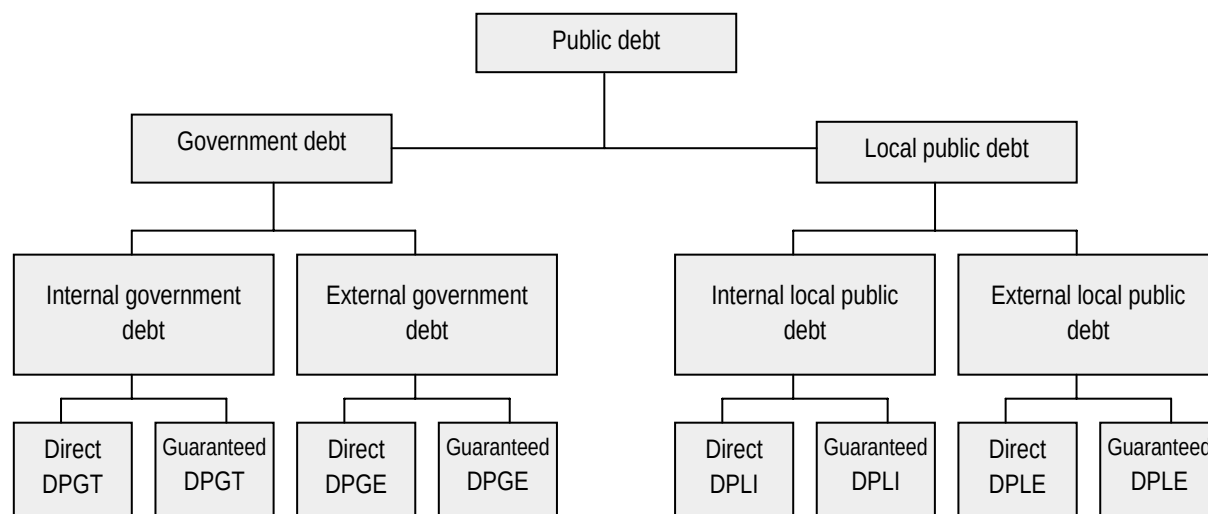
Following the problems arisen in the implementation of this law, it has been shown the need to improve the legal framework related to public debt management, being adopted the Government Emergency Ordinance No. 64/2007 on public debt, which also defines the structure of public debt in Romania (Figure 1).

At the macroeconomic level, the coordinates of the Romanian fiscal and budgetary policies aimed at maintaining the public debt within sustainable limits and providing resources necessary for the financing of budget deficits and public debt service payment at the lowest possible cost.

According to convergence criteria set by the Maastricht Treaty, public debt should not exceed 60% of GDP. Thus, every year, the controlled growth of public debt was taken into account.

Legislative amendments on public debt have influenced the evolution of indebtedness degree and brought a number of new items on public debt management, at the level of public debt management. Public debt management involves a number of operations on sizing, structuring, contracting and performing government debt, including its refinancing and

repayment, recording and reporting, as well as managing risks related to government debt and the set of operations for authorization and monitoring of local public debt.



Source: Prepared by the author in accordance with the Government Emergency Ordinance no. 64/2007 on public debt.

Figure 1. Structure of public debt in Romania

3. Analysis of public debt portfolio in Romania during 2003-2011

The last legislation defines public debt according to its manager, namely:

- *government debt*, which includes all state obligations at a certain time, in the form of directly contracted loans or state-guaranteed ones, through the Ministry of Public Finance;
- *local public debt*, which expresses all obligations of administrative and territorial units at a certain time, engaged from contracted loans, direct or guaranteed by them.

The evolution of public debt ratio to GDP, between 2003 and 2011 is as follows (Table 1 and Figure 2).

Degree of public indebtedness is situated on a downward trend (2003-2006) due to a sustained economic growth, reaching the value of 20% at the end of 2008. Period 2008-2011 was marked by a global financial and economic crisis, the degree of indebtedness reaching a historical maximum point, namely 38.5% at the end of 2011, approximately doubled as compared to 2007.

External financing in 2009 considered the issue of Eurobonds on foreign markets and marginally other external financing, including foreign loans already contracted (withdrawals from them) and new ones contracted from international financial institutions.

An inefficient use of foreign loans may cause a restriction of access on foreign market financing, even leading to a debt crisis (Gherghina, Crețan, 2012).

As far as the financial and economic crisis has shown its effects also on the national economy, the terms and conditions of the issuance of Eurobonds have become disadvantageous (both in terms of costs and maturities), the other available instruments, especially foreign financial package agreed with the IMF, EU and IBRD becoming essential in ensuring financing under as optimal as possible cost/risk conditions. As from 2010, for the purpose of improving public debt management and avoidance of seasonal pressures to ensure the financing of the budget deficit and government debt refinancing, the Ministry of Finance has decided to establish a currency financial reserve (buffer) equivalent to cover the needs for financing the budget deficit and public debt refinancing for approximately four months.

At the end of 2011, the registered debt had grown as compared to the end of 2006 due to contracting debt for covering budget deficit financing needs and assessment of foreign currency public debt, as a result of depreciation of national currency against major currencies, the euro and the US dollar, where the foreign currency public debt is denominated.

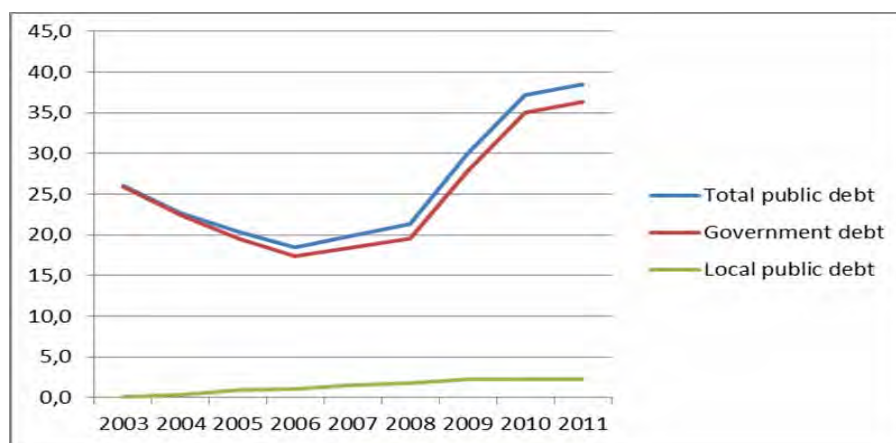
Table 1

Evolution of public debt ratio to GDP between 2003 and 2011

- % -

Years	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total public debt	26.0	22.7	20.4	18.4	19.9	21.3	30.0	37.2	38.5
Government debt	25.9	22.4	19.5	17.4	18.4	19.5	27.8	35.0	36.3
Local public debt	0.1	0.3	0.9	1.0	1.5	1.8	2.2	2.2	2.2

Source: Prepared by the author based on data collected from the Ministry of Public Finance.

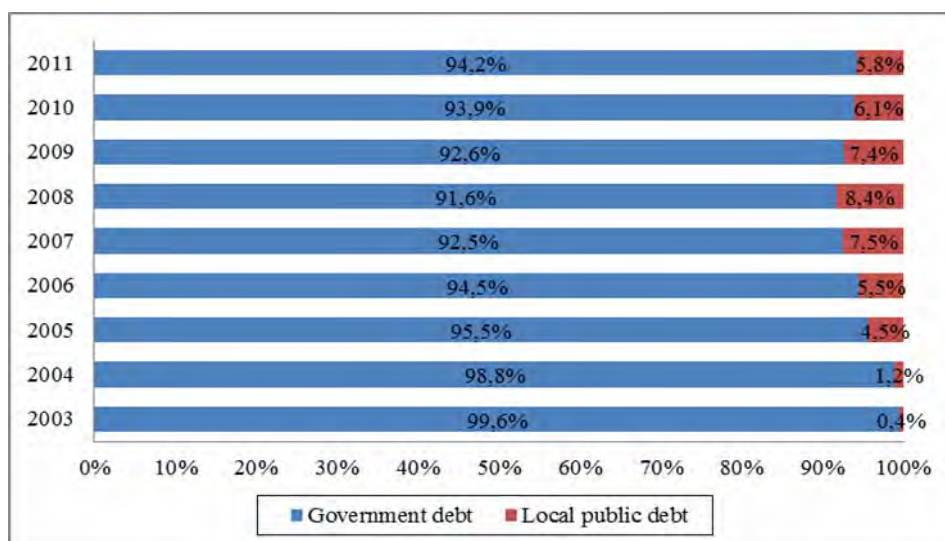


Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 2. Evolution of public debt ratio to GDP between 2003 and 2011

Another reason for the increase in the public debt is its reporting in accordance with the Government Emergency Ordinance No. 64/2007 on public debt, taking into account the new instruments of debt, contracted by the central and local governments, or finance leases, credit providers and promissory notes endorsed by the local government.

In the structure (Figure 3) public debt with its two components is as follows:



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 3. Public debt structure according to administrator

It can be noticed that in the structure, local public debt was non-existent in fact between 2003-2004, having been outlined since 2005, but still remaining insignificant as a percentage of total debt, below 10 percent at the end of the reporting period, i.e. 2011. However, the growth of local public debt was higher than the government debt.

Starting from the reality according to which public debt portfolio is very important for a state, its management process is a priority. Analyzing macroeconomic policies - fiscal, budgetary, monetary, exchange rate – we notice their continuous guidance in the public debt and budget deficit segments (Gherghina, Moșteanu, Lăcătuș, 2010).

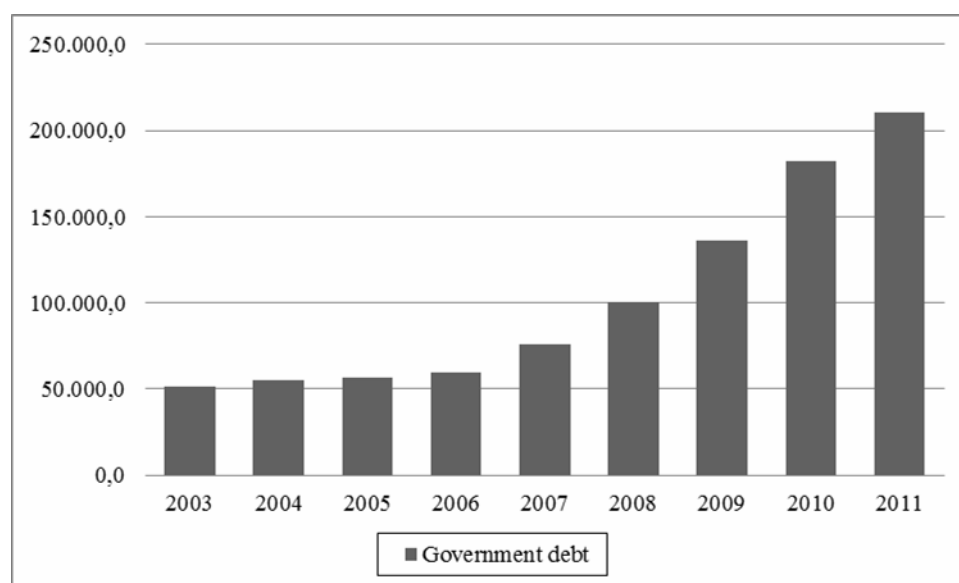
A very important issue as regards the government debt is the structure according to type of debt, namely contracted or guaranteed by the state. According to the latest legislation in force on public debt, direct debt also includes state- guaranteed loans contracted by the central government. The evolution of government debt, according to its type, direct and guaranteed, is presented in Table 2 and Figures 4 and 5.

Table 2

Government debt level between 2003 and 2011

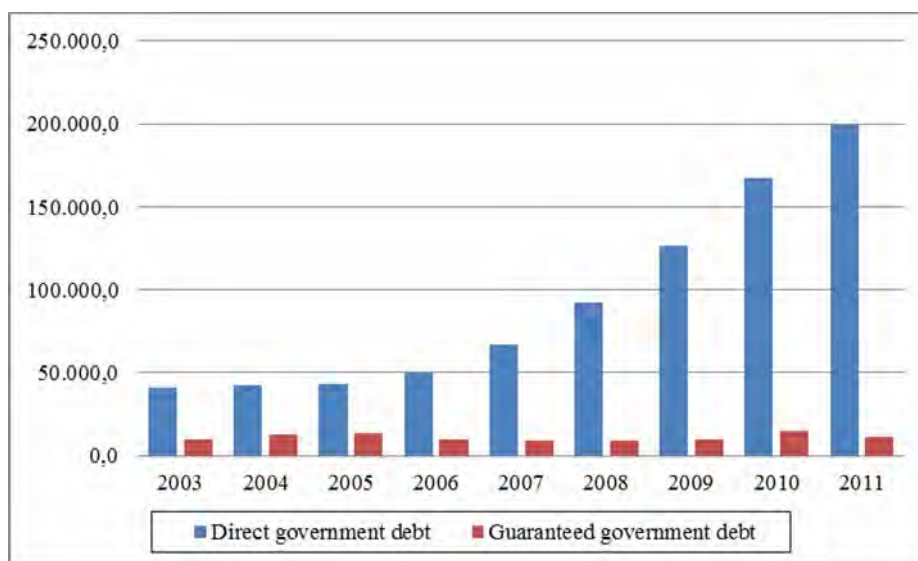
Years	Government debt		Direct government debt		Guaranteed government debt	
	mil. lei	%	mil. lei	%	mil. lei	%
2003	51136.6	100	41138.4	80.45	9998.2	19.55
2004	55147.3	100	42643.1	77.33	12504.1	22.67
2005	56381.8	100	43192.1	76.61	13189.7	23.39
2006	59868.5	100	50205.0	83.86	9663.5	16.14
2007	76149.6	100	67141.0	88.17	9008.7	11.83
2008	100556.4	100	91942.0	91.43	8614.4	8.57
2009	136493.8	100	126571.7	92.73	9922.1	7.27
2010	182510.3	100	167632.5	91.85	14877.8	8.15
2011	210388.6	100	199284.6	94.72	11104.0	5.28

Source: Prepared by the author based on data collected from the Ministry of Public Finance.



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 4. Evolution of government debt between 2003-2011 mill RON



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 5. Government debt according to debt type

During the reported period, government debt increased 4 times, from 51136.6 mill RON to 210388.6 mill RON, the higher growth occurring after 2005. State guarantees were granted for development (rehabilitation of water supply system in urban places in SOMES-TISA basin, co-financing UE-SAPARD European projects, investment projects or national programs, etc.) and also for consumption (domestic loans for fuel import, loans contracted by economic operators).

State guarantees and sub-loans are financial risk generators. Therefore, a risk fund shall be established, managed by the Ministry of Public Finance, by the general current account of the State Treasury.

Under these circumstances, at the end of 2011, direct debt represented 94.72% while guarantees represented only 5.28%. Guaranteed debt balance was made up of banking guarantees issued under special laws, loan guarantees for loans contracted by economic operators. Project financing shall be removed and only financing of budget deficit shall be made, but, as from 2009, the Ministry of Public Finance took over the management of state-guaranteed loans contracted by the line ministries.

We shall further review the structure of government debt according to its original maturity (Table 3 and Figure 6). This maturity is important to know in order to ensure a liquidity risk management, because the state can meet public debt service on time.

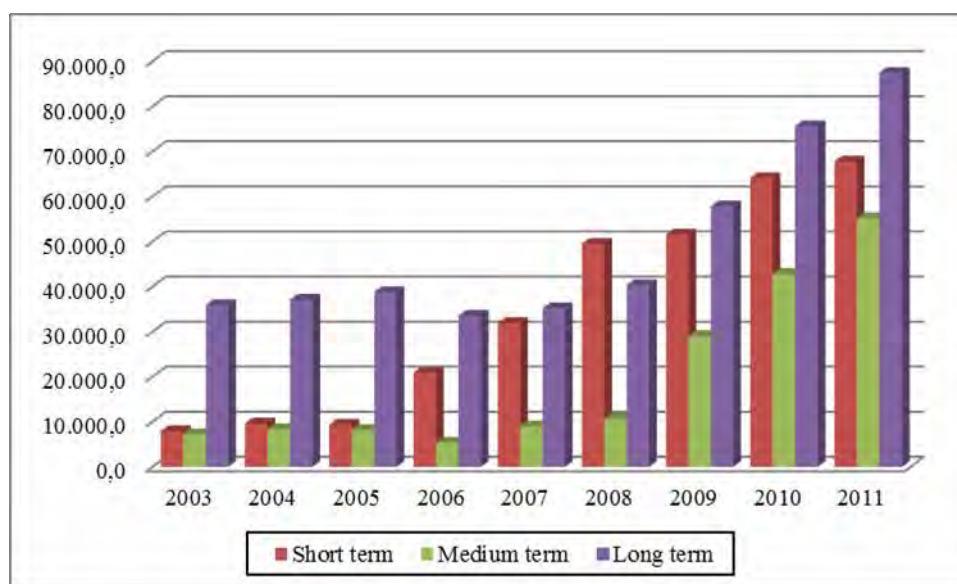
Table 3

Government debt level according to maturity

– mill RON –

Years	Government debt by maturity	Short	Medium	Long
2003	51136.8	7939.7	7259.5	35937.6
2004	55147.3	9657.1	8386.8	37103.4
2005	56381.8	9383.6	8198.5	38799.7
2006	59868.5	20951.3	5375.2	33542.0
2007	76149.6	31922.2	9011.9	35215.5
2008	100556.4	49526.6	10712.5	40317.3
2009	136493.8	51566.6	29096.1	57831.1
2010	182510.3	64095.9	42792.2	75622.1
2011	210388.6	67788.9	55152.1	87447.6

Source: Prepared by the author based on data collected from the Ministry of Public Finance.



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 6. Evolution of government debt according to maturity

Analyzing the structure of debt portfolio, according to its maturity, we notice that long-term debt, even if it is decreasing in percentage of total debt, from 70%, in 2003, to 41%, in 2011, is still a significant share of total government debt, due to loans contracted with international financial institutions, longer than 10, 15 years. Long-term debt doubled in 2011 compared to 2008, the year of starting the financial crisis in our country and short-term debt increased by 3 times between 2006-2011, both due to the issuance of titles released for financing budget deficit from internal sources, as well as financing budget deficits from previous years by loans contracted from the general current cash account of the State Treasury.

High short term debt share, although under a downward trend, yet emphasizes a high risk of refinancing the government debt portfolio, as a result of temporary financing from the general current cash account of the state treasury, but also of the prevailing issues of treasury certificates in 2009 and the first semester of 2010.

Deviation from the maturity structure established in the year 2008 (30% on short term and 70% on medium and long term) was mainly due to a change in the demand of investment environment, they directing their investments to low risk assets and short and medium-term maturities, especially for non-investment grade investments.

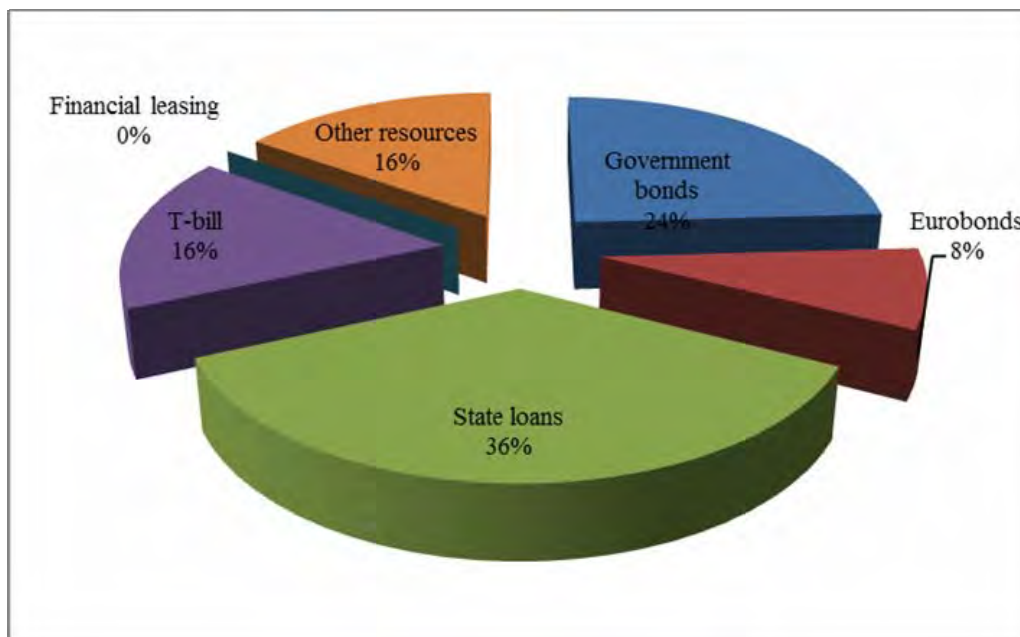
Next, we shall proceed to reviewing the structure on debt instruments in Figure 7.

The main instruments were represented by the treasury certificates, government bonds, Eurobonds and state loans. Between 2003 and 2004, treasury certificates represented the budget deficit financing source, in 2005 were extended maturities of government bonds issued on the domestic market. Government bonds have been issued with maturities ranging from 3-15 years. In 2006, no more government bonds were issued, but in 2007 benchmark type maturities were issued, with maturities ranging between 3 and 10 years.

State loans showed a downward trend in 2011, reaching 36% compared to 40% in 2010.

Debt instruments may bear a fixed interest rate or a variable rate. The fixed interest rate bonds are government bonds issued on the domestic and foreign market, loans contracted from commercial banks with fixed interest rates and loans contracted from the European Investment Bank, which sets the rate at the time of withdrawal of such amount. Due to low level of interest rates available on international capital markets compared to the interest rates on the domestic market, of improving country rating in the period 2004-2008, as well as

access to external financing, loans were contracted from the international financial institutions (IMF, IBRD, EBRD, CEB, IFAD) with a variable interest rate. External loans contracted in 2009 from IMF, EU and IRBD at very favorable interest rates are contributing to the achievement of objectives of minimizing costs related to medium and long-term debt and reducing refinancing risk by balancing maturities related to contracted debt without waiving at issuance of government bonds on the domestic market, taking into account the objectives of reducing currency risk and the development of government bond market.



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 7. Structure of government debt according to types of debt instruments by December the 31st 2011

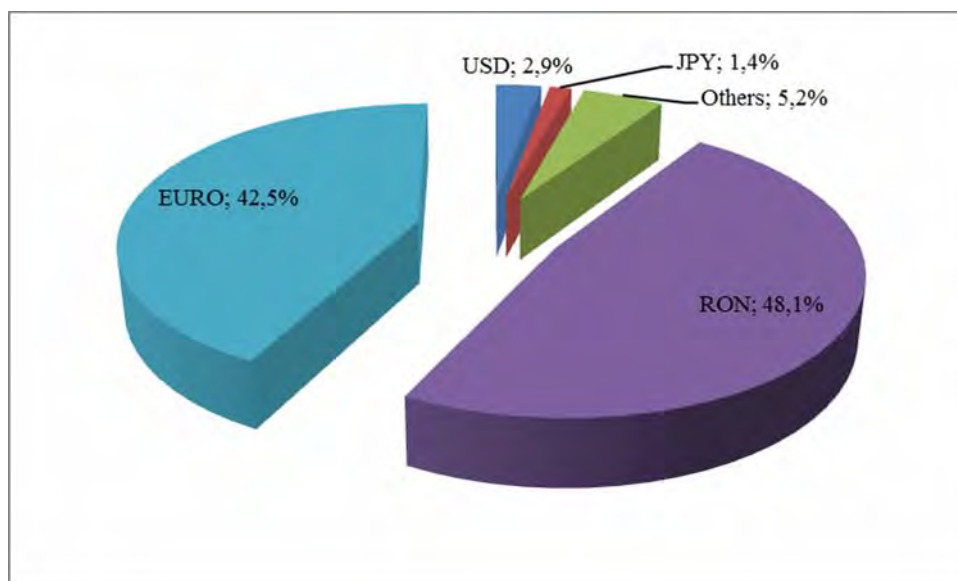
Public debt management decisions involve dealing with many instruments, techniques of issuance of government bonds and institutional agreements in order to reduce public debt service cost. When choosing an instrument, an exchange takes place between reducing costs and risk of public debt renewal, at significant interest rates. This option is based on: the mix between variable interest rate debt, indexed and fixed; mix between short term public debt instruments and the medium/long-term ones (Moșteanu, Câmpeanu, Cataramă, Miricescu, 2008, p. 133). After the Romanian capital account liberalization, currency structure of government debt has become very important.

Analyzing the currency structure of government debt during 2000-2011, we find that domestic debt increased from 27.19% in 2000 to 48.1% in 2011 in the total of government debt (debt in lei exceeding the currency one). Euro-denominated debt had a decreasing trend, from 42.17% in 2003 to 27.68% in 2008, the share of total government debt in 2011 being again at the 2003 level. The share of dollar debt had an emphatic decrease, falling from a level of 41.65% in 2000 to a level of 2.9% in 2011.

Dollar debt decrease was the effect of the strategy carried out by the Ministry of Public Finance to reduce currency risk and contracting, since 2006, loans in euro currency only, with a view to adopting the single currency in our country.

The share of debt denominated in other currencies also declined, from 20.75% in 2000, to 5.2% in 2011. This was due to the fact that several currencies have been converted into euro in 2002, once with the creation of the Euro area in the main EU countries. Currently, at the position "others", there are currencies such as Japanese yen, Swiss franc and pounds.

Local public debt has a small share in total public debt, but in recent years there has been a gradual increase in it, due to the increased need for funds at the local government level and providing guarantees for pre-financing some investments based on external non-reimbursable funds.



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 8. Structure of government debt on types of currencies by December, the 31st 2011

The evolution of local government debt, total and by type of debt, direct and guaranteed, is listed in Table 4 and in Figures 9 and 10.

Table 4

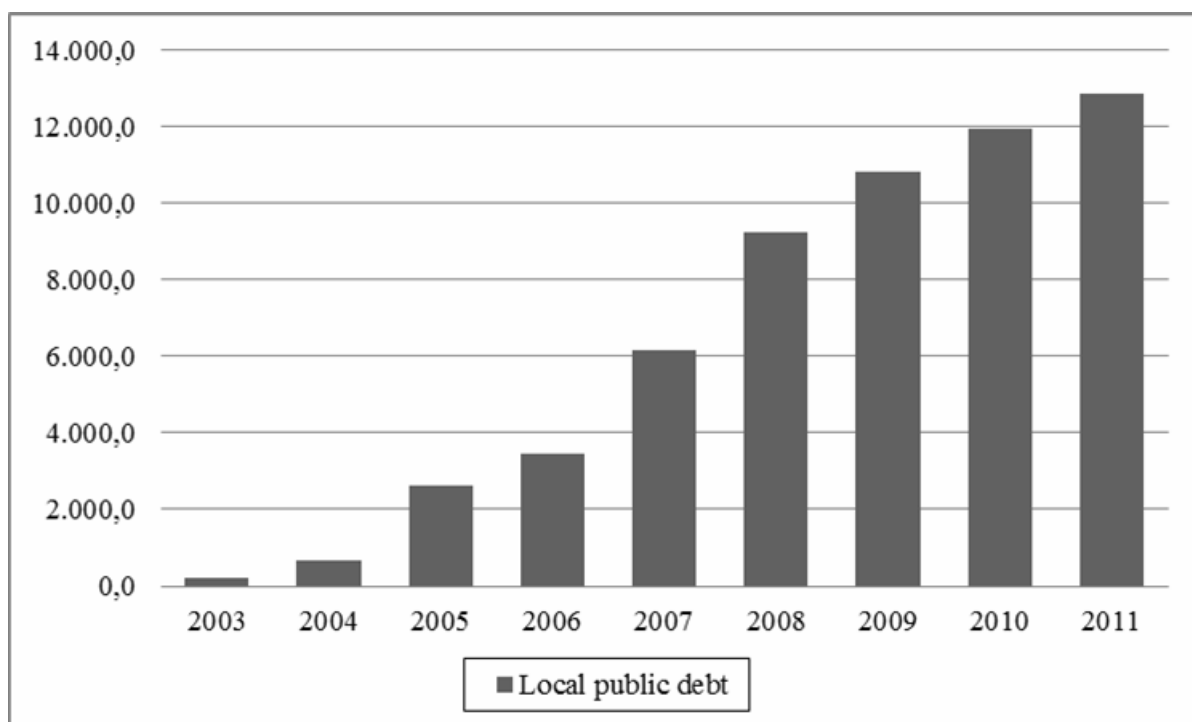
Local public debt level, between 2003 and 2011

Years	Local public debt		Direct local public debt		Guaranteed local public debt	
	mill. RON	%	mill. RON	%	mill. RON	%
2003	226.6	100	196.7	86.80	29.9	13.20
2004	672.4	100	341.0	50.71	331.4	49.29
2005	2629.1	100	2458.2	93.50	170.9	6.50
2006	3472.3	100	3189.0	91.84	283.3	8.16
2007	6174.7	100	5606.1	90.79	568.6	9.21
2008	9238.7	100	8530.8	92.34	707.9	7.66
2009	10835.2	100	10090.2	93.12	745.0	6.88
2010	11948.9	100	11065.8	92.61	883.1	7.39
2011	12866.6	100	12186.8	94.72	679.8	5.28

Source: Prepared by the author based on data collected from the Ministry of Public Finance.

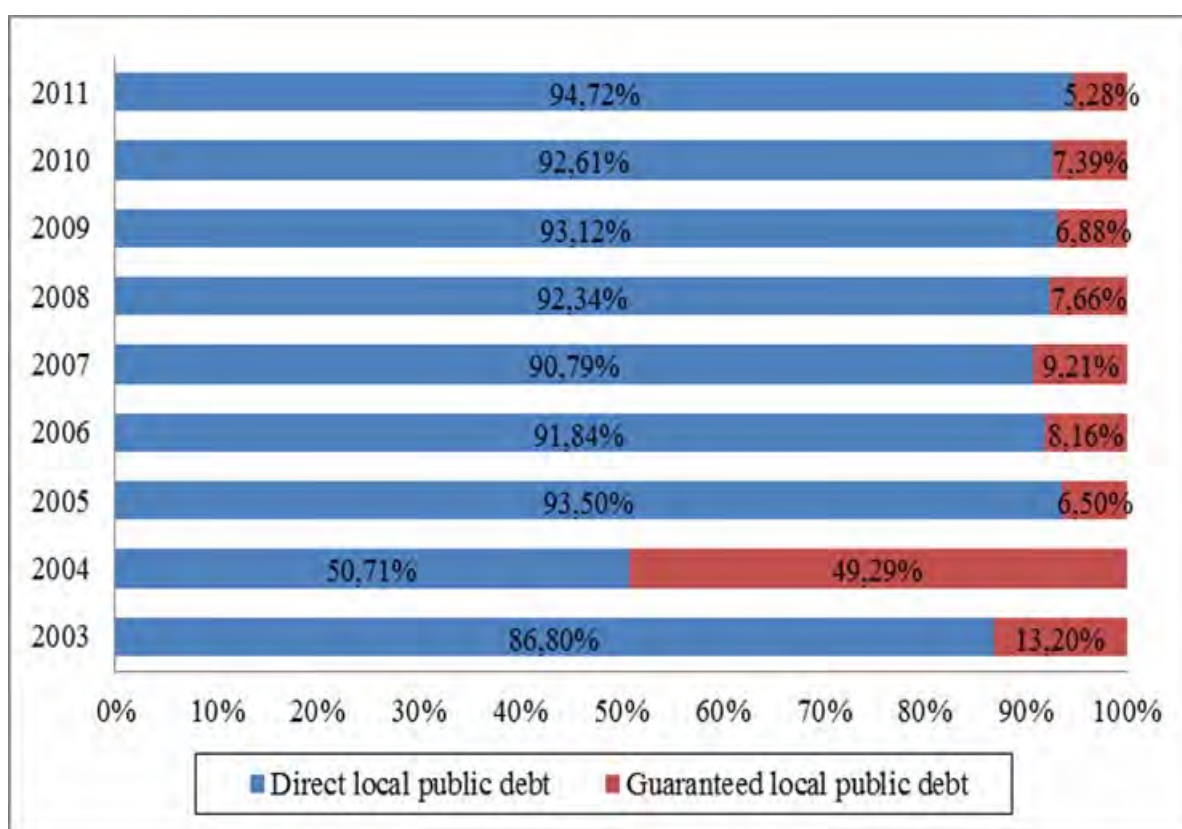
In the figure above, one may see the upward trend in local public debt, from 226.6 million in 2003 to 12866.6 million in 2011, with a significant increase since 2005.

According to the structure, depending on the type of debt, direct and guaranteed (Figure 10), during the reported period it is found out that the local public debt guarantees are extremely low. Year 2004 is an exception, when the collaterals were at the level of local public debt contracted directly by local authorities.



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 9. Evolution of local public debt, between 2003 and 2011



Source: Prepared by the author based on data collected from the Ministry of Public Finance.

Figure 10. Structure of local public debt according to the type of debt

Regarding the structure of local public debt according to maturity - over the reported period is prevailing the medium-term debt, because the long-term debt (more than 5 years or 10 years) was created no sooner than in 2002. Short-term debt has not been contracted by local government in Romania.

As regards the currency in which local public debt was contracted, its structure is only in Lei and Euro.

At the local public debt level, 2005 brought major changes in terms of its development, since that year showed the highest value of local public debt contracted on long term (approximately 75% of total local debt), and in terms of currency, approximately 75% of total local debt was contracted in Euros.

Conclusions

In a growing economy, it is important that fiscal, budget and monetary policy actions maintain constant the degree of indebtedness on long-term, so that the public debt volume might grow at the same rate as nominal GDP.

In the administration of government debt, one shall consider keeping government debt indicators at sustainable levels.

Although during the reported period, no slid-slips affecting macroeconomic balance are foreseen, however, the Ministry of Public Finance will monitor very closely the trend of government debt main indicators, so their dynamics fall within acceptable levels.

Main objectives of public debt management strategy will not modify following the change in the market conditions and macroeconomic framework. These will be: controlled growth and maintaining at a sustainable level of government debt, reducing costs of long-term government debt in terms of an acceptable level of risks related to the government debt portfolio and government bond market development.

Prudent government fiscal and budget policy, adequate monetary policy of the National Bank, visible positive effects of fiscal consolidation measures adopted by the Government, as well as anchor provided by the stand-by agreement with the IMF helped to mitigate the effects of the financial crisis locally, allowing at the same time recording a positive macroeconomic performance, with favorable effects on public debt refinancing costs and financing of the budget deficit.

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MEASURING THE DYNAMICS OF LOCAL REVENUES AUTONOMY IN ROMANIA. AN ANALYSIS OF SEVERAL FINANCIAL DECENTRALIZATION AND LOCAL AUTONOMY INDICATORS

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Abstract. *In the context of a larger economic liberalization, resulting in the withdrawal of a certain degree of state intervention, a reorientation of public funds took place, which, for local authorities, meant that they had to take over a larger share of responsibility regarding the economic policies. The article emphasizes whether the financial resources available for the local communities are sufficient and efficiently used in order to satisfy local needs. In this respect, the paper presents the dynamics and structure of local revenues in Romania and highlights several indicators to prove the sub-national government financial independence for the last 7-11 years.*

Keywords: sub-national government revenues; financial decentralization; local autonomy; own revenues; the Hunter index.

JEL Classification: H71, H72.

REL Classification: 13Z.

1. Introduction

One of the basic tasks of the local government representatives is to develop and track the execution of local budgets. In the local budgeting process, it is very important to have a rigorous and correct sizing of public revenue and expenditure, taking into account the economic background of that particular period: economic boom, upward or downward trend of the economy or even financial crisis. Generally speaking, the issue of reaching balance does not have to be reduced to a simple comparison between revenue and expenditure; it is the result of a complex of factors underlying the creation and use of financial resources and the social and economic conditions of the moment.

The multitude of relationships between the financial and monetary stability, on the one hand, and the economic equilibrium, on the other hand, as well as the complex economic and financial reality that influences the execution of local budgets requires a thorough analysis of all deviations from the predicted values. These deviations from the expected levels are recorded both for expenditures and revenues and these might be the result of the specific budgeting process. So, balance, deficits or surpluses may occur either in the process of developing local budgets or in the budget execution process due to deviations from the initial recorded values of expenditures. The basic requirement of budget balance is that of a full coverage of expenses with revenues. However, it is proved that expenditures maintain top position, regardless the size of revenues. Although issues like budget balance, sustainable tax policy, optimal tax systems were studied by many economists or politicians during the last years, there are still many unanswered questions regarding the causes of the unjustified continuous expenditure growth. Such increases of the expenditure values were recorded in Romania not only during economic booms, when political parties, public institutions,

commercial banks and even population should have adopted an “against cycle behaviour” (i.e. not to spend so much money and to encourage consumption by giving credit facilities, but to save money for the inevitable future collapses), but also during crisis when the need to supply financial resources to different public objectives together with the lack of budget revenues contributed to the increase of public deficits. It is still a matter of concern for the competent authorities, but also for the researchers, political class or citizens. Solutions are searched mainly on how to increase revenues, reduce arrears, provide financial resources and less on how to reduce budget expenses.

In Romania, local autonomy is a concept related to budget autonomy, although the latter does not imply financial autonomy because, in most cases, the available resources are unable to cover the demanded expenditures. In this respect, local budgets need to be correlated with the central budget as they provide to the sub-national government level balance transfers and subsidies or deducted amounts.

The sub-national revenues are generated from taxes or other revenues established by the legal framework; local budgets are responsible for financing the socio-cultural costs, maintenance and operating expenses of local government bodies, local economic objectives and other goals set by the law. A factor of influence in the delimitation and distribution of income and expenditure between central and local government structures is the degree of intervention of the central power at local level.

Starting from the ideas mentioned so far, the article points out the level of revenue available to answer the increasingly and sophisticated public needs. This research paper is divided into several sections. The first part offers a review of the specific literature and presents the research methodology used for the analysis. The second part is the largest one as it consists in a quite detailed study of several relevant sub-national government revenue indicators, highlighting, at the same time, the stage of decentralization and autonomy at local level in Romania and the strong connection between these processes and the indicators presented. A synthesis of the present work and some proposals for future studies are found in the last part, devoted to conclusions.

2. Literature review and research methodology

Taking into account that the economic analysis establishes decentralization as being useful, it is absolutely necessary to examine through which meanings is decentralization able to offer the best local production of goods and services. In choosing its own tax structure, local authorities face two specific constraints (Hoanță, 2000, pp. 268-271):

1) in a given unattractive tax structure area, certain taxpayers will find appropriate to “escape” from it; this is plausible even at national area, let alone at local level where it is not at all negligible;

2) strict rules imposed by central government to the local levels as guarantor of last resort to the local communities.

Under these circumstances, specific criteria were set to define what a suitable local tax is. These rules and criteria were characterized since the 80s: the revenues should be rigorously anticipated by the local administration, they should be provided for a reasonable manner, their management costs must be as low as possible and the amounts collected should be used for local purposes (Stanford, 1984). As literature presents, since the mid-1980s, both qualitative and quantitative indicators of local revenue autonomy have undergone a profound development. Virtually all approaches seek to capture the most transparent and straightforward direct legal constraints on revenue autonomy, namely the statutory rules of local taxation and the conditions of eligibility and use of intergovernmental grants (Beer-Tóth, 2009, pp. 107-110).

At the beginning of the 90s, two other economists attempted to define and characterize the various local revenues sources from the perspective of the freedom of municipalities to modify or influence them (Owens, Norregaard, 1991, pp. 3-54). They stated that even own

taxes, the highest ranking category of local revenue, are often subject to central government constraints in terms of rates and base. Table 1 presents the ranking of local revenues as it was established by the two economists in 1991.

Table 1

Ranking of local revenue sources by Owens and Norregaard

Local taxes (revenues)	The autonomy degree of local revenues
Own taxes	Base and rate under local control
Overlapping taxes (tax surcharge)	Nationwide tax base, but rates under local control
Non-tax revenues	Local government is able to determine the fee to be charged, although central government may specify whether such a charge can be levied
Shared taxes	Nationwide base and rates, but with local government able to influence either the proportion of revenues attributed to the local government sector or the amount that each level of local government receives
General purpose grants	Local government share is fixed by central government (usually with a redistributive element), but local government is free to determine how the funds should be spent
Specific grants	The amount of grant may be determined by central government or may depend upon the spending decisions of local government, but in either case central government specifies how the funds should be spent.

Source: adapted after Beer-Tóth, K., (2009), p. 108.

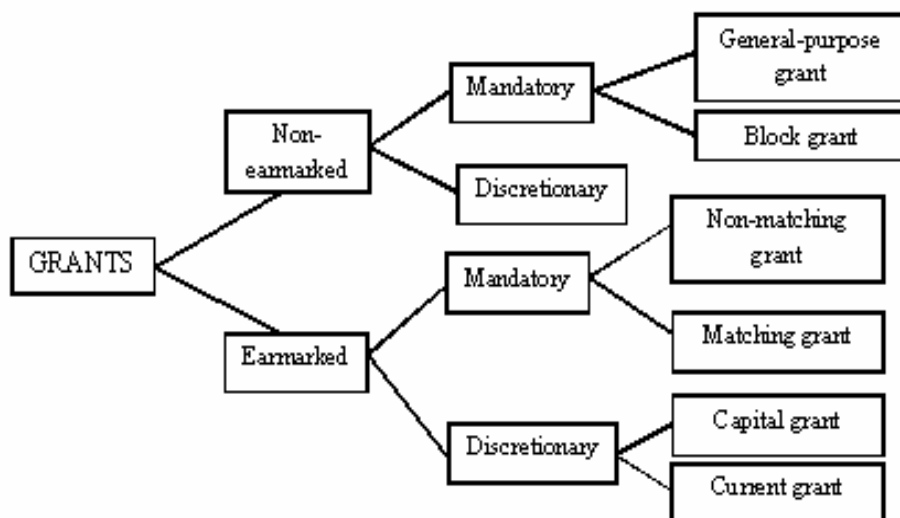
Besides this approach, the specific literature reveals other taxonomies of local revenues. The most relevant is the classification made by the OECD Committee on Fiscal Affairs developed in 1999. The main difference is that their description of autonomy is not organized around the tax types like in the previous case, but from the local governments' perspective: the ability to determine the percentage of the total amount of revenues over which the local governments have full, partial or no control at all. Such an approach allows the analysis of local taxing power according to this classification (OECD, 1999, p. 11):

- 1) sub-national government sets tax rate and tax base
- 2) sub-national government sets tax rate only
- 3) sub-national government sets tax base only
- 4) tax-sharing arrangements
 - 4.1) sub-national government determines revenue-split
 - 4.2) revenue-split can only be changed with consent of the sub-national government
 - 4.3) revenue-split fixed in legislation, may unilaterally be changed by central government
 - 4.4) revenue-split determined by central government as part of the annual budget process
- 5) central government sets rate and base of sub-national government tax.

In 2005 – 2006, OECD established also a new taxonomy of grants. The basic idea was that of separating the concept of mandatory grants from the discretionary ones, also called “entitlements”. For the former ones, both the size and the conditions of availability are laid down in a law or statute. Another difference is that they are often temporary in nature (e.g. grants offered in case of a natural catastrophe) and increase the room for maneuvers in a particular situation. However, since they are unpredictable, they are not so relevant from a fiscal point of view (Cigu, 2011, pp. 134-136).

Other economists introduced the concept of not-earmarked grants (Ebel, Yilmaz, 2002, Meloche et al., 2004) meaning a group or a block of grants that provide less freedom than general purpose grants; even though they are not earmarked for a specific expenditure program, they are tied to a specific purpose and the output might be regulated through

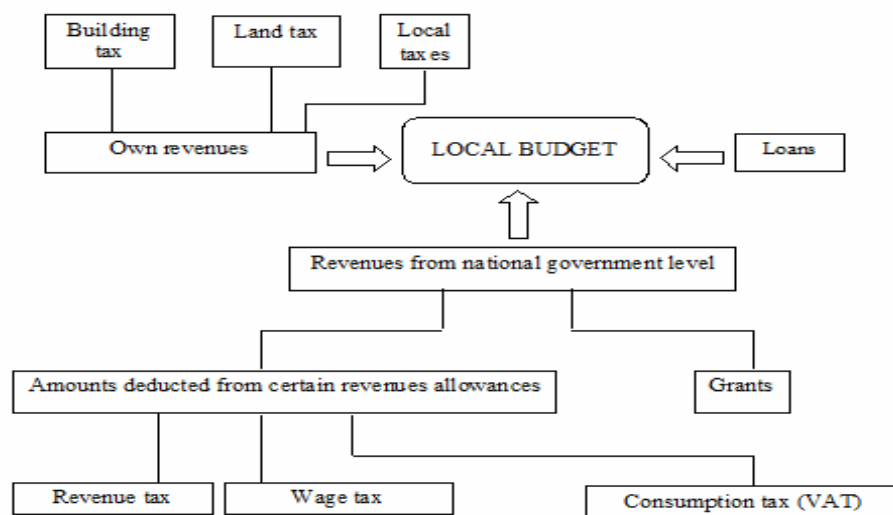
centrally defined minimum standards. A synthesis of the classification above can be found in Figure 1.



Source: adapted after Blöchliger, H. and King, D. (2006).

Figure 1. The OECD taxonomy of grants

Romanian literature offers a quite simple structure of the local revenues as Figure 2 presents. Local budgets mainly include local revenues and different resources received from the central level. In addition to these, another important source that can increase the local resources is represented by loans (Romanian Institute for Public Policies, 2001, p. 33).



Source: adapted after a study made by the Romanian Institute for Public Policies, *Local Budgets Between Theory and Practice*, 2001, p. 33.

Figure 2. The revenues of local budgets in Romania

The sub-national government's own tax is the revenue that is produced by local authorities. The level and the sources of origin are controlled and decided by local authorities, within the legal limits. One aspect that generally defines the local authorities' own revenues is that the sub-national level of administration has freedom in the way these taxes are spent.

The degree of local autonomy of a community highly depends on the proportion of own revenues in the total amount of local revenues as compared to other sources of revenues included in the local budget. Ideally, own revenues should be sufficient and wisely used to

cover the expenditures for local needs. In this context, local authorities' power should be closely connected to local budget revenues. In reality this rarely happens.

In Romania, the first profound change in the structure and financing of the local public administration occurred in 1991. After more than four decades of excessive centralization, the introduction of a new system of local taxes created the necessary background for the implementation of the democratic principles of a modern society. So, the Romanian Constitution (1991), the Law on Local Public Administration (1991) and the Law on Public Finances (2006) offer the proper framework for creating and providing the best public services, for giving the citizens the opportunity to express their opinion regarding major issues of local interest, for creating principles related to the eligibility of authorities or to the local self-government.

An important step towards a democratic society was the creation of the elected local government. As a consequence, in the coming years, the elected parties at local level started to manage themselves local issues, to solve the communities' problems, assume new responsibilities and generate the development of the city, municipality or region by attracting as many investors as possible. Further, it was intended to improve levers to finance local government activities by the delimitation of public assets owned by the municipalities' town halls from those owned by state, the creation and the use of the necessary administrative tools to assume duties and, of course, by improving legislation (Popeanga, 2002, p. 99).

The study of financial autonomy of the administrative-territorial units in Romania through the revenue perspective offers an interesting approach, rather complex, since there are a number of factors pretty difficult to quantify in practice. Taking into consideration the stage of research by revising the relevant literature, for reaching the purpose of this research and for deepen connections revealed in the case of Romania, we built a number of databases on revenue autonomy indicators. The analysis and processing of the statistical data, together with the trend graphics, allowed us to obtain reliable conclusions regarding the performance of public finance decentralization, the degree of autonomy and local development. Therefore, the paper aims to point out some results related to the local revenues taking into account the overall values of the local administrations of Romania, but also the values according to economic classification. The analysis has the following structure: specification of the indicators for the achievement analysis, identification of the right methodology to establish the values of the indicators, calculation of the value and interpretation of results, identification of influence and diagnosis. Besides this mathematical approach, the paper points out also the two main principles without which neither the revenue nor the expenditure autonomy is possible: the decentralization principle and the local autonomy principle.

The main resources used for the research are the revenues and expenditures budgets for the last years, the necessary data being retrieved from the websites of the Romanian National Institute of Statistics, the Ministry of Public Finance and from the Romanian Court of Accounts. For the European Union revenue indicators, the information available on Eurostat was used. The article focuses on the revenue part of the budget, as it is considered to be an extension of a previous article in which we considered the expenditure autonomy issue.

3. The principles of local autonomy and decentralization

The concept of local autonomy describes the right and the effective capacity of local authorities to develop and manage, on behalf and in the interest of local communities that they represent, a significant part of the public affairs. The authorities which are responsible for implementation are the local councils as deliberative authorities and the town halls as executive authorities (Vacarel et al., 2007, pp. 570-581).

Romania has signed the European Convention of local self-government on October 4th, 1994 and was ratified by the Romanian Parliament in 1997 (Law no. 197/17.11.1997). Local autonomy is supervised at local and national level, but, as a result of the phenomenon of

globalization, which brought about a strong interdependence between countries, local autonomy would not be fully recognised without an international guarantee.

In March 2009, the Council of European municipalities and regions adopted the European Charter on Local and Regional Services of General Interest, an instrument to guarantee the implementation of the principle of local autonomy, based on the idea that the European public needs require strong local and regional authorities to take decisions regarding local services which best satisfy the community's interest. The Charter stipulates that the principle of local and regional autonomy represents the foundation of local governance systems (European Charter on Local and Regional Services of General Interest, 2009).

In Romania, local autonomy is enshrined by the Constitution as a principle by which public administration is organised and functions (The Constitution of Romania, 2003).

In order to ensure local self-government, the local public administration authorities of villages, cities and counties have the right to draw up and approve the budgets of revenue and expenditure, having also the right to establish and collect local taxes.

Besides the positive effects, there are also some limits regarding local autonomy. The negative impact is perceived especially in those countries, where the national problem can become a source of ethnic conflicts. In such a context, the interest of finding out whether local autonomy is indeed absolutely necessary arose and, if so, why some national Governments apply restrictions instead to act freely.

The classical theories of fiscal federalism identified the benefits of the local autonomy. They are also called "the benefits of decentralization", suggesting that the true meaning of decentralization is given only when local autonomy is present (Oates, 1972, p. 11). The limits of Oates' analysis (who presented autonomy only from an economic point of view) have been taken and adapted by other authors also (Jones, Stewart, 1981, King, 1984, p. 20, Boadway, 2001, pp. 93-121) who have introduced some political arguments as well. The main ideas they developed are the following:

1. local autonomy answers to the different needs and preferences;
2. local autonomy offers different opportunities and measures the cost-efficiency ratio;
3. local autonomy improves citizens' participation and the democratic control in the decision-making process;
4. local autonomy offers background for innovation.

These four advantages of local autonomy make it effective. In other words, once decisions are taken as close as possible to the electorate, local authorities are more informed about the needs of that specific community, and, in turn, the citizens may exercise control easier, so that the needed public services and goods are offered to the public at the lowest price possible.

Nowadays, after Romania joined the European Union structure, the development of local autonomy should be based on the principles of the European Charter of Local Autonomy, ratified by Law No. 199/1997. The Charter requires that all signatories should apply the basic rules governing the political, administration's and local authorities' independence. The degree of autonomy enjoyed by the local authority can be seen as a touchstone for real democracy. Between decentralization and the strengthening of democracy there is a direct relationship as local autonomy and decentralization of public services are a guarantee of the stability of a functioning democracy (Roman, Mosteanu, 2011, pp. 154-155).

Decentralization is a system of administrative organization that allows communities to manage themselves, under the supervision of the state that grants them with legal personality, allows them to establish their own authorities and gives them the necessary resources. Decentralization is the transfer of the administrative decision from the "central" administration to the level of public authority within the administrative-territorial units.

For the countries that have gone through communism, decentralization is an option which can lead to a better supply of social services and to an increased economic efficiency.

The fact that decentralization enables the implementation of the principle of local autonomy is the result of its democratic effects, among which we mention:

- the participation of the local community (by election) to designate leaders underscores the spirit of initiative and responsibility and determines them to find solutions to the problems they face;

- in a system of administrative decentralization, local problems can be solved better and quicker because local authorities do not need any approvals or other documents from the "centre"; the material and financial resources may be used with greater efficiency and may respond to the priority needs that local authorities, as representatives of the people, know and "feel" better than the national public administration authorities;

- in terms of powers and duties, decentralization does not refer only to the transfer of responsibility from the government level to the local level, but also to the transfer of some responsibilities from the county level to the level of municipalities, towns and villages.

Even if we take into account only the aspects mentioned above, we can conclude that decentralization is likely to strengthen that level of local autonomy that communities have always aspired to.

4. Main characteristics of the sub-national revenue autonomy

The macroeconomic background of Romania has gone through multiple changes lately. In 2005, a fairly significant tax reform took place; it replaced the existing tax system (through progressive rates) with a new system using proportional rates, applied both for individuals and for businesses. The law introduced a flat tax set at 16% for all taxpayers in order to encourage the economic activity and attract direct investment into the country. The result was an increase in the size of GDP from 288,954.6 million RON in 2005 (about 79,750 million EUR) to 556,708.4 million RON (about 131,365 million EUR) in 2011 in current prices.

A similar trend is also seen for the public revenues of the sub-national governments which have increased significantly between 2001 and 2011, as it is to be observed in the following section of the paper. Basically, local budget revenues increased from 3% of GDP in 1991 to 6.8% in 2005. The same evolution is available also for the per capita local revenue, very high values being recorded since 1998 when the legal regulations on local tax collection improved. These improvements have been generally recognized as being the first form of fiscal decentralization in Romania, but also as being the reason why some regions have experienced higher development than others (Mosteanu, Lacatus, 2007, p. 53). Between 1991 and 1998, public services were funded and coordinated centrally as specialized services of the territorial directorates of the Ministry of Public Finances.

During the period 1999 - 2005, over 70% of the resources of several counties came as transfers from other budgets. This indicates the existence of a strong financial dependence due to the low purchasing power of the population. It is not fair to block the development of certain "rich" jurisdictions in terms of financial capacity to transfer funds only to the "poor" ones.

All these evolutions laid the ground for passing towards a more qualitative development and to a real modernization of the economy and society, including the issue of decentralization.

5. The structure and dynamics of local budget revenues

In Romania, the share of own revenues (SNGOR) in the total amount of revenues collected at the local budget level (SNGR) grew in the recent years because of the multiple changes that allowed decentralization of an increasingly number of revenues.

Since 2001, a comprehensive package of laws on civil service, decentralization of public services, local public finances, fight against corruption and the establishment of new institutions to prepare and implement reforms were adopted. Firstly, some new legal

provisions strengthened the control made by the central authorities to the functions fulfilled by the local government, while, secondly, other legal provisions acted towards decentralization.

In this context, the Government Ordinance no. 36/2002 on local taxes, provided a systematic consideration towards the creation of a single document for all the local taxes, gave decision-making power to local authorities in setting taxes in order to increase their level. The 2002 budget provided a further decentralization of four more areas, namely the protection of persons with disabilities, of the children in care institutions, of non-clergy staff and the reorganization of cultural institutions.

Since 2003, it is claimed by the state budget, the implementation of the constitutional principle of local autonomy. Consequently, in addition to their own revenues, the sub-national government authority beneficiaries from amounts deducted from wage taxes collected from its territory, quotas broken down from income tax and transfers from the state budget resources. In this way, local government institutions are able to contribute to the development of all economic activities undertaken.

Other relevant laws governing revenues, in addition to those presented so far, are the Law on Local Public Finances and the Decentralization Framework Law, both adopted in 2006. The social-economic development caused several changes to the Tax Code, the most important being those imposed by the Government Emergency Ordinance No. 63/2010. The document covers some ways to decrease spending, to strengthen financial discipline and to impose restrictions to arrears in the administrative - territorial units.

Under the decentralization process and the new laws, the structure of the local revenues changed from year to year. So, the analysis implies a general characterization of the main categories of incomes. The results are presented in Table 2.

Table 2

Execution of local budgets by categories of incomes and the degree of financial autonomy for 2005-2011

Indicators	2005	2006	2007	2008	2009	2010	2011
SNGR (million RON) ⁽²⁾	19480.9	27708.6	36805.2	43629.1	43526.1	43922.2	44803.9
SNGE (million RON) ⁽³⁾	18777	25392.8	33982.3	42210.2	42074.5	41207.1	44003.8
SNGOR 1 (million RON) ⁽⁴⁾	8696.7	11676.8	16605.4	19614	20191.1	20243.1	21162.7
The share of SNGOR 1 in SNGR (%)	44.64	42.14	45.12	44.96	46.39	46.09	47.23
The share of SNGOR 1 in SNGE (%)	46.32	45.98	48.86	46.47	47.99	49.13	48.09
Amounts broken down from income tax (million RON)	5147.7	7550	10855	13368	15310	14665.2	14813.9
SNGOR 2 (million RON) ⁽⁵⁾	3549	4126.8	5750.4	6246	4881.1	5577.9	6348.8
The share of SNGOR 2 in SNGR (%)	18.22	14.89	15.62	14.32	11.21	12.70	14.17
The share of SNGOR 2 in SNGE (%)	18.90	16.25	16.92	14.80	11.60	13.54	14.43
Amounts broken down from VAT (million RON)	9516.5	14539	14552.5	18644.8	17260.5	14993.7	13182.4
Amounts deducted from wage taxes (million RON)	2.9	: ⁽¹⁾	:	:	:	:	:
Samplings from the state budget (million RON)	:	476.4	869.8	1025.2	987.1	1145.6	1238.9
Grants (million RON)	1218.1			4345.1	4379.2	5294.7	5619.7

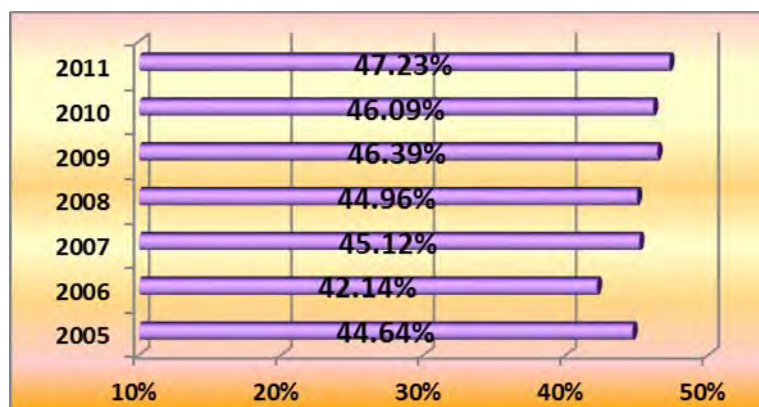
Indicators	2005	2006	2007	2008	2009	2010	2011
		1016.4	4777.5				
Donations and sponsorship (million RON)	23.5	:	:	:	:	:	:
Loans (million RON)	23.2	:	:	:	:	:	:

Source: the authors, based on data retrieved from the Romanian National Institute of Statistics.

The indicator that expresses the degree of covering SNGE through own revenues presented in Table 2 shows a very similar dynamic to that of the self-financing capacity indicator. Actually, the two indicators resemble a lot because the level of the local budget revenues is very close to that of the expenditures. The fact that new reforms were introduced generated the results presented in the table. Unfortunately, it is also a matter of budget creation, as these relatively high values are also the result of including into the category of current revenues the amounts broken down from the income tax. Since 2006 we can also find in the category of current revenues the total amounts broken down from VAT. In the first case, we included the amounts and quotas deducted from the income tax as being own revenues in nature – 1. while in the second case we excluded them – 2. In the first case, as the values show, both the weight of SNGOR in SNGR and the weight of SNGOR in SNGE are over 42%, while, in the second case, they are much lower. This proves that the financial freedom of local public administration from the central government is a low one, the results being of about 16-18% in 2005-2007 and even lower in the next years.

The level of own revenues influences the possibility of performing local public expenditure and, at the same time, reflects the degree of autonomy given by the relationship between revenues, transfers of funds and loans to balance local budgets. The higher the share of these revenues in the total local revenue sources, the higher freedom of the administrative-territorial unit to spend money for public goods and services according to their desire and expectations; this is translated into a wide financial autonomy.

Besides measuring the degree of financial autonomy, of a great importance is also the measurement of the degree of dependence of local authorities. The indicator shows the share of the rates and amounts broken down from the income tax, the amounts deducted from VAT and budget transfers received by local governments from the state budget or from other budgets in the volume of total local revenues. As expected, the degree of financial dependence is opposite to the self-financing degree indicator.



Source: the authors.

Figure 3. The degree of financial autonomy of the SNGR level for 2005-2011 (quotas and amounts broken down from the revenue tax included)

As Figure 3 shows, for 2005-2011, there are weak variations of the indicator, the lowest value being recorded in 2006 (42.14%) and the highest in the last year: 47.23%.

Unfortunately, if we exclude the amounts deducted from the income tax, the indicators prove that local public authorities' financial autonomy was very low. If we consider that income tax is part of the state budget and only afterwards is distributed according to the criteria prescribed by law, sub-national government dependence is extremely high: about 80-85%.

The evolution of own revenues can be also noticed by measuring the weight of this indicator in the national government budget revenues. The values presented in Table 3 indicate an upward trend until 2007, from 23.76% in 2005 to 33.90% in 2007. There is a slight drop in 2008 by 1.83 percentage points as compared to the year before, a new increase to 35.78% in 2009 and then, in the last two years, a decrease to 30.42%, respectively to 26.56%.

Table 3

SNG's ability to generate own revenues for 2005 - 2011

Indicators	2005	2006	2007	2008	2009	2010	2011
NGR (million RON) ⁽⁶⁾	36599.5	40698.1	48984.6	61151	56434.8	66546.5	79688
SNGOR 1 (million RON)	8696.7	11676.8	16605.4	19614	20191.1	20243.1	21162.7
The share of SNGOR 1 in NGR (%)	23.76	28.69	33.90	32.07	35.78	30.42	26.56

Source: the authors, based on data retrieved from the Romanian National Institute of Statistics.

It is necessary to study the dynamics of other local budget revenues as well. In this case, the analysis consists in capturing the weight of current revenues (SNGCR), fiscal revenues (SNGFR), capital revenues (SNGKR) and grants (SNGG) in the SNGR, as it is shown in Table 4. Local revenues level expressed in current prices follow an upward trend for the whole period of time. Only in 2009 the level decreased slightly as compared to the value recorded in 2008.

Table 4

Dynamics of the most relevant categories of local revenues in Romania for 2005-2011

Indicators	2005	2006	2007	2008	2009	2010	2011
SNGR (million RON)	19480.9	27708.6	36805.2	43629.1	43526.1	43922.2	44803.9
SNGCR (million RON) ⁽⁷⁾	3149.5	26172.4	31412.4	38641.3	38074.5	36090.5	35189.1
SNGFR (million RON) ⁽⁸⁾	2414.5	25236.8	30108.9	37346	36731.6	34543	33020
SNGKR (million RON) ⁽⁹⁾	397.5	518.8	615.1	639.3	361.1	288.8	392.9
SNGG (million RON) ⁽¹⁰⁾	1218.1	1016.4	4777.5	4345.1	4379.2	5294.7	5619.7
The share of SNGCR in SNGR (%)	16.17	94.46	85.35	88.57	87.48	82.17	78.54
The share of SNGFR in SNGR (%)	12.40	91.08	81.81	85.60	84.39	78.65	73.70
The share of SNGKR in SNGR (%)	2.04	1.87	1.67	1.47	0.83	0.66	0.88
The share of SNGG in SNGR (%)	6.25	3.67	12.98	9.96	10.06	12.05	12.54

Source: the authors, based on data retrieved from the Romanian National Institute of Statistics.

If by 2005 the revenue collected from the state budget was the main source of income of local budgets in Romania, since 2006, current revenues ranked most important, their weight being of over 94% in 2006, 88.57% in 2008 and 78.54% in 2011. It is necessary to emphasize

that since 2006, as it is presented on the website of the National Institute of Statistics, current revenues include amounts broken down from VAT and from income tax. That is the reason why such a big gap appears between 2005 and the other years. Grants are maintained at a relatively constant level in 2005 and 2006. However, in 2007 the value is higher and throughout the rest of the considered period remains at high rates (between 9.96% and 12.54%).

A relevant indicator for the research is the fiscal revenue. We are interested in determining the share of fiscal tax revenues of local budgets in fiscal revenues of the state budget. Overall, it is an unstable indicator, as it can be noticed from Table 5.

Table 5

The share of SNGFR in NGFR in Romania for 2005-2011

Indicators	2005	2006	2007	2008	2009	2010	2011
SNGFR (million RON)	2415.5	25236.8	30108.9	37346	36731.6	34543	33020
NGFR (million RON) ⁽¹¹⁾	34531.2	37900.2	44824.2	55133.6	48152.9	56304.7	69527.7
The share of SNGFR in NGFR (%)	7.00	66.59	67.17	67.74	76.28	61.35	47.49

Source: the authors, based on data retrieved from the Romanian National Institute of Statistics.

In 2005, the share is at a very low level of only 7%. As a result of the improvement of the legal framework towards decentralization and local autonomy that took place in 2006, a notable growth of current revenues occurred and, especially, a growth of the local fiscal revenues (direct taxes and indirect taxes) which reached a level of about 2/3 of the level recorded for the fiscal revenues mobilized at the national government level.

The introduction of a flat personal income tax of 16% in 2005 led to changes in the level of income transfers to local budgets from state funds, and mainly in the amounts deducted from the income tax. By reducing the tax rate on individuals' income and by maintaining the same percentage rates of income tax deducted from the administrative-territorial units, local authorities recorded smaller amounts of transfers. As a consequence, central government had to increase the quota broken down from taxes, as follows:

- 47% instead of 36% of the total amount of revenues collected by the local authorities of villages, towns and municipalities;
- 13% instead of 10% of the total amount of revenues collected by counties;
- 22% instead of 17% in terms of local budgets balance.

The fact that, in some years, the national government level deducted amounts and quotas from the income tax and VAT that represented lower percentages in the local revenues than it was scheduled to be deployed, might be perceived as a sign of a higher degree of independence of local governments and as an improved financial ability to meet local communities' requirements and needs. Whether this happens or not can be easily proved by using one of the most significant indicators for measuring the local financial decentralization: the Hunter index (H):

$$H = 1 - \frac{Rnc^{(12)}}{SNGR}$$

As the index is higher, closer to 1, the financial autonomy level is higher. The way this formula is presented in the financial literature reflects only the percentage of the incomes which are controlled by the local public administrations in the whole public local incomes. This is happening because, theoretically, a balanced budget supposes incomes equal to expenditures.

If we use the formula for our analysis and we include the category of quotas and amounts broken down from the income tax within own revenues and consider the amounts deducted from VAT as being the only ones not controlled by the local public administration, the results obtained as Hunter index 1 (Table 6) are between 0.4753 in 2006 and 0.7058 in 2011.

Table 6

Hunter index for 2005-2011

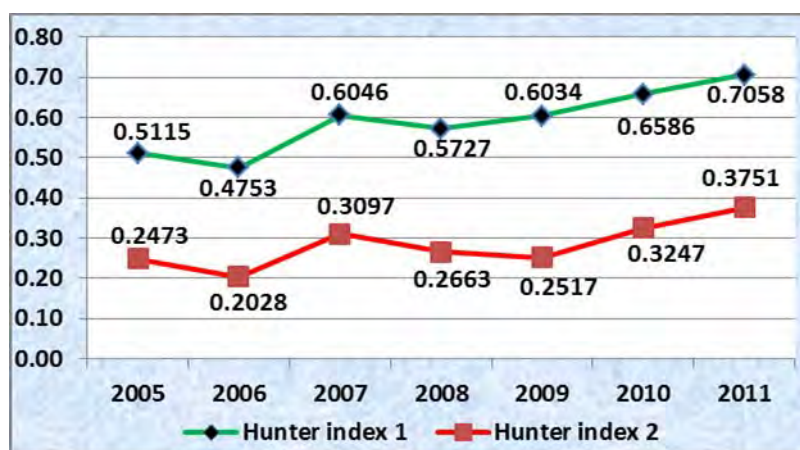
Indicators	2005	2006	2007	2008	2009	2010	2011
SNGR (million RON)	19480.9	27708.6	36805.2	43629.1	43526.1	43922.2	44803.9
Amounts broken down from VAT (million RON)	9516.5	14539	14552.5	18644.8	17260.5	14993.7	13182.4
Hunter index 1	0.5115	0.4753	0.6046	0.5727	0.6034	0.6586	0.7058
All quotas and amounts broken down from the state budget (income tax deductions included) (million RON)	14664.2	22089	25407.5	32012.8	32570.5	29658.9	27996.3
Hunter index 2	0.2473	0.2028	0.3097	0.2663	0.2517	0.3247	0.3751

Source: the authors, based on data retrieved from the Romanian National Institute of Statistics.

In 2010 and 2011 the index is higher than the previous years, reaching a maximum of over 0.70 in the last year of analysis. In 2006 the Hunter coefficient 1 had a lower value than in 2005 due to a higher rate of increase of the total amounts broken down from VAT (by 52.78%) as compared to the rate of increase of local budget revenues (by 42.23%). The degree of financial independence increases to some extent in 2007, but, in the next year, it decreases again, reaching a value of 0.5727.

In the event that we exclude from the analysis not only the amounts deducted from VAT, but also the other quotas and amounts broken down from other taxes (mainly the amounts broken down from the income tax), the coefficient has the values recorded in Table 6 as Hunter index 2.

Such an approach leads to lower results than the previous ones, the Hunter index varying from 0.2028 in 2006 to 0.3751 in 2011. In this case, as Figure 4 shows, the fluctuations are somehow less extensive as compared to the situation described before.



Source: the authors.

Figure 4. The Hunter index at SNG level in Romania for 2005-2011

A much more rigorous study of local government revenues requires analysing values corrected by the commodity price indices or the GDP deflator. Table 7 presents the absolute and relative change of the SNGR expressed in current prices and in constant prices for 2001-2011.

Table 7

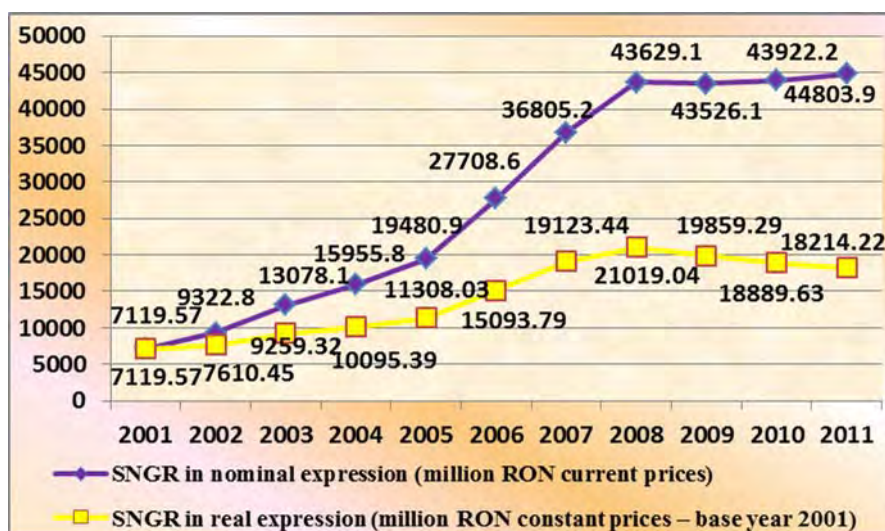
The absolute and relative change of the SNGR expressed in current prices and constant prices for 2001-2011

Year	SNGR in nominal expression (million RON current prices)	The absolute variation of SNGR in nominal expression in the current year as compared to the previous year (million RON current prices)	The relative variation of SNGR in nominal expression in the current year as compared to the previous year (%)	SNGR in real expression (million RON constant prices – base year 2001)	The absolute variation of SNGR in real expression in the current year as compared to the previous year (million RON constant prices)	The relative variation of SNGR in real expression in the current year as compared to the previous year (%)
2001	7119.57	-	-	7119.57	-	-
2002	9322.8	2203.23	30.95	7610.45	490.88	6.89%
2003	13078.1	3755.3	40.28	9259.32	1648.87	21.67%
2004	15955.8	2877.7	22.00	10095.39	836.07	9.03%
2005	19480.9	3525.1	22.09	11308.03	1212.64	12.01%
2006	27708.6	8227.7	42.23	15093.79	3785.76	33.48%
2007	36805.2	9096.6	32.83	19123.44	4029.65	26.70%
2008	43629.1	6823.9	18.54	21019.04	1895.60	9.91%
2009	43526.1	- 103	- 0.24	19859.29	-1159.75	- 5.52%
2010	43922.2	396.1	0.91	18889.63	- 969.66	- 4.88%
2011	44803.9	881.7	2.01	18214.22	- 675.41	- 3.58%

Source: the authors, based on data retrieved from Romanian National Institute of Statistics and Ministry of Public Finances.

Modified by the influence of inflation, local budget revenues follow the same upward trend until 2008 as the dynamics in current prices, but the increase recorded year after year is lower. If in nominal terms local public revenues grew by 30.95% in 2002 as compared to 2001, in real terms, the increase was of only 6.89%. The gap is obvious if we compare values of 2008 and 2001. So, as compared to the base year, in 2008, the current prices revenues grew over 512% (i.e. over 6 times). In terms of constant prices of the year 2001, revenues grew only by 195.23% (i.e. not even half of the nominal growth).

In 2009, a decrease of SNGR appears both in current prices, but also in constant prices. However, the evolution in nominal size is not significant (a decrease by 103 million RON or 0.24%). Taking into account the constant prices, the drop is quite severe (by almost 1,160 million RON, i.e. 5.50%). Although revenues recovered in nominal size in the last two years, the development is a negative one because the generalized increase in prices (inflation) replaced the upward trend. The situation created in the last three years is the result of the economic and financial crisis that involved, among other aspects, a drop of consumption, a cut of wages and reduced economic profits.



Source: the authors.

Figure 5. The dynamics of SNGR in current prices and constant prices for 2001-2011

Figure 5 emphasizes the upward trend of the two evolutions, as well as the decrease recorded in 2009 or the spectacular growth of the incomes in 2006 and 2007.

Eventually, a comparison between Romania and the average EU level should be developed. The appropriate approach is that of identifying the average public revenue per capita both in Romania and EU (Table 8).

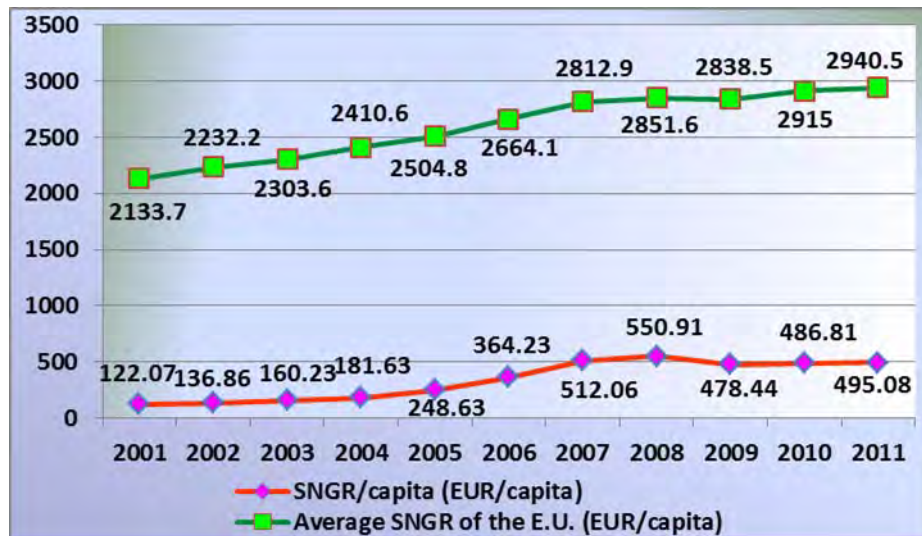
Table 8

Local budget revenues per capita in Romania as compared to the EU average for 2001-2011

Year	Population of Romania (inhabitants on 1 st of July)	SNGR Romania (million RON)	SNGR/capita (RON/capita)	Average annual exchange rate (RON/EUR)	SNGR/capita (EUR/capita)	Average SNGR of the EU (EUR/capita)
	(1)	(2)	(3) = (2) / (1)	(4)	(5) = (3) / (4)	(6)
2001	22408393	7119.57	317.72	2.6027	122.07	2133.7
2002	21794793	9322.8	427.75	3.1255	136.86	2232.2
2003	21733556	13078.1	601.75	3.7556	160.23	2303.6
2004	21673328	15955.8	736.20	4.0532	181.63	2410.6
2005	21623849	19480.9	900.90	3.6234	248.63	2504.8
2006	21584365	27708.6	1283.74	3.5245	364.23	2664.1
2007	21537563	36805.2	1708.88	3.3373	512.06	2812.9
2008	21504442	43629.1	2028.84	3.6827	550.91	2851.6
2009	21469959	43526.1	2027.30	4.2373	478.44	2838.5
2010	21431298	43922.2	2049.44	4.2099	486.81	2915
2011	21354396	44803.9	2098.11	4.2379	495.08	2940.5

Source: Romanian National Institute of Statistics, National Bank of Romania, EUROSTAT.

As expected, in Romania, the average public revenue per capita is lower than the EU average. In 2011, the local public income was about 495 EUR/capita (2,098 RON/capita), whereas the European Union's average level was six times higher (2,940.5 EUR/capita). The depreciation of the Romanian national currency in 2009 brought about a decrease of the sub-national government revenues expressed in Euro, even though the difference in lei is insignificant.



Source: the authors.

Figure 6. Local public revenue per capita in Romania as compared to EU for 2001-2011

Figure 6 shows the trend of the local public revenues per capita in Romania and EU. Although they resemble each other, the growth rate is different: in Romania SNGR increased in 2008 as compared to 2001 by 351.31% while the growth rate in the EU was moderate (33.65%). This doesn't necessarily have to be a positive phenomenon as it might be the result of a sharp decrease in the number of inhabitants of Romania. In just ten years, the population decreased by more than one million inhabitants, i.e. 4.70%. According to the data obtained from Eurostat, EU demographic evolution did not show a downward trend.

Conclusions

The administrative-territorial reform, together with its main tool, decentralization, are widely accepted and encouraged by the Romanian civil society, public authorities or researchers. Decentralization has a strong impact on local revenue collection. Also, the European experience showed that the regional level represents the most appropriate framework for nurturing the economic initiative and development and for the best response to the needs and initiatives of its inhabitants (Dinca, Dinca, 2009, pp. 103-104).

The budget law reports show that one important goal was to ensure the proper functioning of the local public administration for an accurate exercise of powers in the overall process of economic and social reform.

The same reports describe that the complex process of decentralization of public services, the strengthening of local autonomy, the changes regarding the social protection mechanisms for the deprived sections of population and the harmonization of the governmental policies with the local ones brought about the improvement of the system which is able to solve the issue of local financial needs and to assume local responsibility and full control over monitoring the standards and compositions of public local services.

As literature reveals, the degree of decentralization increased lately, several services being provided by the sub-national government level. However, decentralization doesn't necessarily bring social welfare. Criticisms refer in particular to the implementation of decentralization. Firstly, a preliminary assessment of the real economic and social situation is necessary in order to allow a better delimitation of the decentralized tasks and to establish the time required. Secondly, the financial resources are in most cases insufficient and a lot of time is wasted until the money transfer is made. All these represent constraints to public service delivery.

The existence of the sub-national government's own revenues is a key element for local performance. Nevertheless, these revenues give the opportunity for the local authority to borrow money for local investments.

All the indicators presented in this article show that, although the principles of autonomy and decentralization of public services are extremely important, the administrative-territorial units depend to a great extent on the quotas and amounts broken down from different taxes or from transfers made from the state budget. Local autonomy has a limited influence because local public administration's own revenues are insufficient. Unfortunately, local authorities have to cope with the lack of power of decision on how the local public funds are spent. Even so, with each passing year, financial autonomy and decentralization offer favourable and visible results.

All in all, the indicators and methods of decentralization and local autonomy measurement provide a multi-dimensional matrix that allows cross-country comparisons to be applied for future studies. The local financial indicators can be combined with some other non-financial indicators that characterize local administration in order to provide a much complex diagnosis (e.g. future articles might refer to the role and implications of the regions or counties, as levels of local government in Romania, upon strengthening local autonomy).

Notes:

- ⁽¹⁾ not available or no values recorded.
- ⁽²⁾ SNGR – sub-national government revenues.
- ⁽³⁾ SNGE – sub-national government expenditures.
- ⁽⁴⁾ SNGOR 1 – sub-national government own revenues (amounts deducted from income tax included).
- ⁽⁵⁾ SNGOR 2 – sub-national government own revenues (amounts deducted from income tax excluded).
- ⁽⁶⁾ NGR – national government revenues.
- ⁽⁷⁾ SNGCR – sub-national government current revenues.
- ⁽⁸⁾ SNGFR – sub-national government fiscal revenues.
- ⁽⁹⁾ SNGKR – sub-national government capital revenues.
- ⁽¹⁰⁾ SNGG – sub-national government grants.
- ⁽¹¹⁾ NGFR – national government fiscal revenues.
- ⁽¹²⁾ Rnc – revenues not controlled by the local public administration.

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SOME ASPECTS REGARDING THE STATE AID IN ROMANIA – MEMBER STATE OF EUROPEAN UNION

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Abstract. *State aid is an essential lever for governments. It is known that state aid policy is an integral part of competition policy, state aid being selective measures of public financial support granted to enterprises in certain geographical areas or sectors to achieve the objectives of general interest. Reasons for granting state aid may be different: concern to save in difficulty industries, preventing unemployment, promoting technological innovation. Support measures taken by the governments of the Member States, may fix market failures or given the current financial and economic crisis, can help some entrepreneurs in certain areas. Reliance on state aid in its various forms cause problems of coordination between governments. In this paper I present some aspects regarding the state aid in Romania during 2002-2011, its impact on economic activities. This paper is a part of a large research work and I will continue to analyze in particularly many others aspects of the state aids applied in some domains of economy.*

Keywords: state aid; sector objectives; horizontal objectives; regional aid; distortion of competition.

JEL Classification: D6, E62, F36, H 23, H25, H54, L52, R28.

REL Classification: 13Z, 20Z.

1. Introduction

Resorting to state aid means, first of all, prejudice to the principles of fair competition accordance with the rules of trade of World Trade Organization, respected rules by European Union too. Second, the aid granted by a Member State to support a firm operating in a competitive sector creates problems for the European Union's market and can generate an opposite effect in another Member State (by affecting competitiveness and employment). This interventional instrument can cause significant effects of distortion of competition and trade and, thus, affect the internal market.

EC Treaty establishes criteria which must be fulfilled by State aid, cumulatively, namely: favors the particular undertakings or production of certain goods; is granted by the State or from State resources; distorts or are threatening to distort competition; affect trade between Member States⁽¹⁾ – see the interpretation given by the European Commission and the European Court of Justice⁽²⁾.

“State aid could become a barrier to efforts to create a single European market. Was needed a process adapted Union economic conditions for the development of specific legislation on state aid and its inclusion in competition policy”⁽³⁾. According to European legislation are three fundamental criteria that restrict the concept of State aid⁽⁴⁾. Although aid measures which fulfill specified criteria⁽⁵⁾ are, in principle, incompatible with EU market rules, however, the principle of incompatibility does not mean for a total forbidding. It specified a number of cases⁽⁶⁾ in which state aid may be considered acceptable (so-called “exceptions”) and compatible aid. Existence of these exemptions justify verification by the European Commission of the draft of State aid measures, as provided in Article 88 of the Treaty⁽⁷⁾.

2. State aid in Romania in 2002-2006

State aid in Romania affecting revenues and expenditures in two ways: i) reducing resources by waiving some income due to the state: exemptions and reductions in tax obligations, exemptions and reductions to payment delay penalties, guarantees given by state in preferential terms for foreign and domestic loans, deferred payment of taxes, discounts price/tariffs for good/services supplied/provided by the state; ii) increasing budget expenditures through grants, allowances, bonuses, by subsidizing interest rates, by converting debt, by state equity participation, by other non-reimbursable amounts. The state aid by objectives in Romania in 2002-2006 is presented in Table 1.

Table 1

The evolution of the structure by objectives of state aid in Romania in 2002-2006

No. crt.	Indicators, objectives	2002	2003	2004	2005	2006
1	Total national state aid (N.S.A)-million Euro, current prices	859.30	918.40	1,606.90	639.30	691.80
2	Total N.S.A.-million lei, current prices of which: -%	2,685.80 100	3,449.20 100	6,513.50 100	2,316.40 100	2,438.20 100
3	- horizontal objectives - million lei, current prices and -% of Total N.S.A.:	1,811.40 67.44	2,040.40 59.16	4,156.80 63.82	1,723.60 74.41	1,963.20 80.52
4	- sector objectives- million lei, current prices and -% of Total N.S.A.:	637.30 23.73	1,214.60 35.22	2,106.60 32.34	516.00 22.28	392.60 16.10
5	- regional aid- million lei, current prices and -% of Total N.S.A.:	237.10 8.83	194.20 5.62	250.10 3.84	76.80 3.31	82.40 3.38
6	Share in GDP of N.S.A.	1.77	1.75	2.64	0.80	0.71

Source: Own calculations based on data from www.consiliulconcurentei.ro, Report aid State granted in Romania during 2004-2006, pp. 10, 20.

National State Aid shows in current prices presents a general decreasing trend, from 2.68 billion lei in 2002 (0.86 billion €) to 2.43 billion lei in 2006 (0.69 billion €) . Share of national state aid in GDP was a downward trend, from 1.77% in 2002 to 0.71% in 2006. In 2004 the highest recorded (2.64%) was due to intensification of restructuring and privatization process of state-owned companies at that period, and that was the last year the steel industry in Romania has received state aid.

This is reflected in the share of national state aid of aid granted in the form of exemptions and reductions in tax obligations for operators, respectively, of exemptions and reductions to payment delay penalties (tax benefits), granted in the privatization and restructuring process. Tend to align Romania's priorities in the "Action Plan" of the European Commission adopted in June 2005 is reflected in the objective analysis of state aid granted in 2004-2006. National state aid reduction in this period was due, mainly, prohibition on State aid to the steel sector and the considerable reduction of state aid for rescuing and restructuring of economic agents in difficulty.

Data analysis in the table shows that *horizontal objectives* in 2006 (research-development, environmental protection, SMEs, rescue - restructuring, unemployment, other objectives) represented 80.52% of the national state aid (except agriculture, fishing and transport), increase compared to 74.41% in 2005, 63.82% in 2004 and 67.44% in 2002. In 2006, *sector objectives* (steel, shipbuilding, automotive, wire and synthetic fibers, coal, tourism, financial services, media and culture) represented 16.10% of the national state aid (except agriculture, fishing and transport), as in decrease compared to 22.28% in 2005, 32.34

in 2004 and 23.73% in 2002. *Regional objectives* represented 3.38% of national state aid (except agriculture, fishing and transport), their share is relatively constant, but with higher values in 2003: 5.62% and 2002: 8.83%.

Analyzing the distribution of state aid objectives, Romania has embraced the general trend in the EU state aid orientation towards horizontal objectives (research - development, environmental protection, SMEs) and reduce state aid to the sensitive sectors competition (steel, shipbuilding, automotive).

Given the financial instruments used, the structure of state aid in Romania in 2002-2006 is presented in Table 2.

Table 2

State aid's structure in Romania in 2002-2006 according to financial instruments used

No. crt.	Financial instruments	2002	2003	2004	2005	2006
1	National state aid, total, of which (%):	100	100	100	100	100
2	Waiving some income, of which:	73.78	65.53	82.01	30.05	19.13
2.1	Exemptions and reductions in tax obligations	21.36	28.99	24.85	19.05	7.94
2.2	Exemptions and reductions to payment delay penalties	37.87	31.08	38.06	7.24	10.81
2.3	Guarantees given by state	14.55	5.46	19.10	3.76	0.38
3	Budget expenditures, of which:	26.22	34.47	17.99	69.95	80.87
3.1	Grants, allowances, bonuses, subsidized interest rates, other non-reimbursable amounts.	23.45	31.76	15.98	67.12	80.44
3.2	State equity participation, debt conversion	2.77	2.71	2.01	2.83	0.43

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro, Report on State aid granted in Romania in 2004-2006, pp.10, 20.

Data analysis in Table 2 shows that in the period 2002-2004 were used to a greater extent waiving income instruments: 73.78% of the total in 2002, 65.53% of the total in 2003 and 82.01% in 2004 instruments budgetary expenditure represents less than 35% of the total state aid. Since 2005 there has been a reversal in using these instruments: those based on income decreased from 82.01% in 2004 to 30.05% in 2005 and 19.13% in 2006, while those based on expenses increased from 17.99% in 2004 to 69.95% in 2005 and 80.87% in 2006. This distribution of national state aid on financial instruments was consistent with the requirements of the European Commission to reduce fiscal State aid because they had a negative impact on trade within the Community. That fiscal aid fell reflects the correct application of the EU *acquis* in compatibility support measures under Romanian law. In 2006 the State aid granted by the 27 EU Member States amounted to 48.7 billion €, representing 0.42% of GDP and new entrants last 12 countries have granted 3.89 billion €, representing 0.51% of GDP. State aid granted in Romania represented 0.56% of GDP (545 million €) value less than the EU average-12. The aid level was much higher in the years preceding accession, mainly due to massive restructuring and privatization process.

3. State aid in Romania during 2007-2010

Romania directly applied relevant Community legislation on State aid (Regulations, Communication, etc.). Also ECJ case law directly applies. Romania joined the European Union required efforts aimed at achieving the objectives set by the European Commission "Action Plan for State Aid", which envisages the granting of state aid less but better targeted. Because the objectives of the Lisbon Strategy, which aims by 2010 to make the EU economy

more dynamic and competitive global economy moved away thanks to the economic crisis, the European Commission has developed since 2009, and presented on March 3, 2010, a strategy for the next decade - Europe 2020, in order to strengthen the economy and society as a whole. Table 3 presents the evolution of national state aid granted in Romania between 2007 and 2010.

Table 3

Evolution of national state aid granted in Romania during 2007-2010

No. crt.	National State Aid (NSA)-million lei-/Sectors, Objectives	2007	2008	2009	2010
1.1	Agriculture	3,699.7	2,193.8	2,518.2	386.4
1.2	Fishing	-	-	-	-
2.1	Horizontal objectives, value and %	306.8; 36.05%	372.2; 38.39%	178.1, o.w.:SF:58.4;2 3.79%	174.8 o. w.: SF:110.8; 19.94%
2.2	Sector objective, value and %	480.8;- 56.49%	452.3;46.6 6%	391.1;52.24%	262.5; 29.94%
3	Regional aid, value and %	63.3; 7.43%	144.7; 14.92%	179.3, o. w.: SF:4,7; 23.95%	439.1, o.w.:SF:259.1;... 50.09%
4	Services of general economic interest (SGEI) [8]	1,474.9	1,316.6	1,404.9	1,273.1
5	Minimis aid [9]	127.5	114.5	112.9, o. w.:SF:30.2	318.2. o. w.:SF:228.3
6	Transport	1,968.3	2,085.6	1,852.2	1,959.1
7	Total Structural Funds			93.3	598.2
8	Total NSA (excluding agriculture, fishing, transport, services of general interest and the minimis aid)	850.5	969.3	748.6	876.5
9	Total NSA, million lei, constant prices, 2007	850.5	844.6	621.0	698.4
10	Total NSA-million €	254.8	264.4	176.0	208.2
11	Share of GDP of NSA	0.20	0.19	0.15	0,17

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro, Reports on state aid in Romania in 2006-2010, Annual statistical annexes.

Data analysis in Table 3 shows that State aid for horizontal objectives are down from 36.05% in 2007 to 19.94% in 2010; those for sector objectives decreased from 56.49% in 2007 to 29.94% in 2010, the regional aid is only for recording increases from 7.43% in 2007 to 50.09% in 2010. National state aid expressed in 2007 constant prices from 2007 to 2010 reflected a downward trend from 850.5 million in 2007 to 698.4 million in 2010. As a share of GDP of national state aid there is a trend of steady decline, from 0.20% in 2007 to 0.17% in 2010, due to the reduction of state aid granted by providers state aid for horizontal objectives (State aid for rescuing - restructuring firms in difficulty, State aid for environmental protection and aid granted for the creation of new jobs). National aid in euro has the same decreasing trend, registering values from 254.4 million € in 2007 to 208.2 million € in 2010, with a minimum of 176.0 million € in 2009. Increased state aid recorded in 2010, namely 876.5 million € to 748.6 million € in 2009 was due, particularly, the sharp rise in State aid for regional objectives and State aid for SMEs. Since 2009, in addition to the state budget amounts, the beneficiaries received State aid inside of sector operational programs in the form of grants from structural and the Cohesion funds, the European Regional Development Fund, European Social Fund and the European Agricultural Fund for Rural Development (Table 4).

Table 4

Evolution of State aid to Romania by EU funds in 2009-2010

Indicators	2009	2010
State aid granted from EU Funds expressed in million lei, current prices	95.48	598.21
State aid granted from EU Funds expressed in million €, current prices	22.53	142.09
State aid granted from EU Funds expressed in million lei, constant prices, 2009	95.48	584.18
Growth in 2010 compared to 2009 with	100%	511.83%
The share of state aid in GDP	0.02	0.12

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro

Data analysis in Table 4 shows that the value of state aid from European funds in 2010 was 598.20 million lei, compared to 2009 when there were only granted 95.48 million lei, thus registering an increase of 511, 83 percentage points. The amount collected from these funds were given in the form of grants, and the highest values were recorded in the aid schemes initiated for research, development and innovation, SMEs, for training and regional development. Table 5 is shown the state aid from Romania as objectives in 2009-2010 financed by EU funds.

Table 5

Evolution of state aid from Romania as objectives in 2009-2010 financed by EU funds

No. crt.	Indicators -% and million lei	2009	2010
1	Total horizontal objectives , of which:	61.14	18.51
2	Research, development and innovation	0	0.54
3	SMEs	61.14	16.77
4	Creating jobs	0	0.01
5	Training	0	1.2
6	Total regional objectives	5.22	43.32
7	Total minimis aid	33.63	38.17
8	Total state aid given from EU funds (million lei)	95.48	598.20

Source: Own calculations based on data from www.mfinante.ro, www.consiliulconcurentei.ro

Data analysis in Table 5 shows that in 2010, on the first place to State aid granted by EU funds stood the regional development, as provided by state aid schemes exempted from notification for consolidation and upgrading the productive sector for investments made by large enterprises, consolidation and modernization of productive investments of small and medium enterprises, initial investment in research, development and innovation, regional development by supporting investments in tourism, general and specific training "Money for training". Table 6 presents the evolution of the structure of national state aid per beneficiary areas in Romania between 2002 and 2010 – years selected.

Table 6

Evolution of national state aid per beneficiary areas in Romania between 2002 and 2010 – selected years –

No. crt.	Beneficiary areas	2002	2006	2007	2008	2009	2010
1	National state aid, of which:	100	100	100	100	100	100
2	Manufacturing industry	51.92	15.26	16.53	16.60	16.83	30.75
3	Coal industry	6.99	15.20	44.07	34.80	38.20	28.50
4	Research and development	0.99	4.27	17.5	24.47	15.07	15.31
5	Environmental protection	1.64	1.66	4.29	5.73	2.57	0
6	SMEs	3.63	2.63	0.05	0.005	1.96	2.86
7	Job creating	1.06	0.17	0	0	0	0
8	Media, Culture	0	0	2.56	3.05	3.59	1.46
9	Other objectives	33.77	60.81	15.0	15.345	21.78	21.12

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro

Data analysis in Table 6 shows that in 2010, the largest share is held by state aid for manufacturing (30.75%), followed by those given to the coal industry - coal extraction (28.50%) and those given to research, development and innovation that have made the weight at 15.31%. Inside of manufacturing, state aid increased from 16.53% as represented in 2007, to 30.75% in 2010 in total state aid. Amounts were destined to *stimulate economic growth through support for investments* (Renault Mecanique Roumanie Ltd. Arges, Renault Technology Roumanie Ltd. Ilfov, Pirelli Tyres Romania Ltd. Olt), for regional development (SC Ford Romania SA). This growth was achieved while the aid to companies primarily aimed *rescue and restructuring firms in difficulty were not granted in 2010*; in 2007 the state aid had a value of 101.05 million lei, and in 2008 to 54.80 million lei. Regarding *coal industry*, the state aid decreased to 28.50% in 2010 compared to 44.04% as represented in 2007. This was due to the reduction in state aid approved by the European Commission for National Coal Company, Petroșani, aimed at restructuring the coal industry, state aid for 2007-2010. State aid given to economic agents operating in *research, development and innovation* have registered increases from 26.5 million € in 2009 to 31.9 million € in 2010, amounts being intended for Partnerships, Innovation programs and the Sector Operational Program for economic competitiveness.

4. State aid in Romania compared to EU countries during 2007-2010

Each country in the 27 Member States contribute differently to the EU economy. Thus, the economies of most developed countries – Germany, France, Great Britain and Italy, contributes the most to the total GDP in the EU (cumulative, the four countries have 62.5% of total GDP at EU level) and countries that contribute less to the total GDP of the EU are Malta, Estonia, Latvia and Lithuania (cumulative, the four countries have 0.54% of total GDP at EU level). GDP per capita (adjusted Consumer Price Index) in the economy of the European Union was 24,400 € in 2010. Of the 27 countries, 13 were above the average, while the remaining 14 were below EU average. Romania is ranked 7 in terms of population in the European Union, is ranked 17 in the volume of GDP in the 27 countries and second lowest level of real GDP per capita (11,400 €/person) just ahead of Bulgaria (10,700 euro/person).

Table 7 presents the evolution of state aid granted in the European Union 2007-2010.

Table 7

Evolution of state aid granted in the European Union during 2007-2010

No. Crt. Rank	Countries/State aid; share of total state aid in the EU	2007 Million €; %	2008 Million €; %	2009 Million €; %	2010 Million €; %
1/1	Highest level, Germany	13,965million €; 27.43%	14,398 million €; 24.84%	14,801 million €; 24.37%	14,694 million €; 24.07%
2 (7-8)	EU average	1,885 million €	2,147 million €	2,249 million €	2,260 million €
3/11	Hungary	985 million €; 1.93%	1,913 million €; 3.30%	1,345 million €; 2.21%	1,907 million €; 3.12%
4/20	Romania	285 million €; 0.56%	249 million €; 0.43%	169 million €; 0.28%	205 million €; 0.34%
5/26	The lowest level Estonia	11 million €; 0.02%	14 million €; 0.03%	10 million €; 0.02%	14 million €; 0.02%
6/27	The lowest level Bulgaria	31 million €; 0.06%	16 million €; 0.03%	30 million €; 0.05%	13,92 million €; 0.02%
7	TOTAL	50,920 million €	57,972 million €	60,735 million €	61,038 million €

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro

Analyzing aid in the European Union in the period 2007-2010 shows that in 2010 the Romania were given state aid worth approx. 205 million €, about 10 times less than the EU-27 average, approx. 2.260 million €. State aid were given in 2010 in Romania represented 0.34% of total state aid across the EU. In Romania in the analyzed period state aid had a different evolution from that state aid granted in the European Union. Thus, located in the EU amount of State aid increased from year to year, and in Romania it has made an oscillatory evolution, decreasing in 2008 and 2009 and increased in 2010. Because Member States have different levels in terms of the size and of economic development, a method to observe the state aid granted in each country is to calculate their level (percentage) in GDP (Table 8).

Table 8

Evolution of GDP level of state aid granted by some states European Union during 2007-2010

No. crt./ Rank	Member State UE-27	2007 GDP in million €; % State aid in GDP	2008 GDP in million €; % State aid in GDP	2009 GDP in million €; % State aid in GDP	2010 GDP in million €; % State aid in GDP
1/1	Hungary	103,475 million €; 0.95%	104,274 million €; 1.83%	97,349 million €; 1.38%	98,445 million €; 1.94%
2 (15-16)	Average-UE-27	0.41%	0.46%	0.50%	0.50%
3/25	Romania	123,804 million €; 0.23%	132,892 million €; 0.19%	123,474million €; 0.14%	121,941 million €; 0.17%
4/26	Estonia	17,203 million €; 0.07%	16,329 million €; 0.09%	14,061 million €; 0.07%	14,500 million €; 0.10%
5/27	Bulgaria	35,842 million €; 0.09%	38,055 million €; 0.04%	35,975 million €; 0.08%	36,033 million €; 0.04%

Source: Own calculations based on data from www.mfinante.ro and www.consiliulconcurentei.ro

Corroborating data from Tables 7 and 8 are found in Hungary, a country with a GDP level below the Romanian GDP (€ 103.475 million compared to € 123,804 million) were granted in 2010 by 9,3 times more than state aid in Romania (€ 1,907 million compared with € 205 million). Bulgaria, a country that joined the European Union with Romania, initiated the fewest support measures in 2010 giving state aid amounting to only € 13.92 million (lowest of all EU Member States -27), which is about 15 times lower than in Romania. The share of state aid granted in Romania compared to other EU member states is small, only Bulgaria and Estonia with a smaller weight. Compared to the EU-27 the share of state aid in GDP of 0.50% both in 2009 and in 2010, in Romania, state aid represented 0.14% of GDP in 2009 and 0.17% of GDP in 2010.

5. Some aspects of the impact of state aid granted in Romania operators of free zones in the period 2003-2011

The following are some aspects of the impact of granting state aid aimed at regional development, the effects of such measures on economic - financial for potential beneficiaries and for the region in which they operate. The 28 analyzed companies have spent US \$ 14,225,891 for investments necessary to conduct business in free zones and eligible under the State aid rules in the area of the regional state aid. Most investments were represented by buildings built on land leased, the remaining costs summing machinery, equipment, land development infrastructure. Fields were: transport, storage, transport related activities (60.20%), services (21.86%), trade (12.28%), manufacturing (4.43%) and construction (1.23%). State aid was granted as full or partial exemption from the obligation to pay tax on profit to the state budget and, respectively, decrease an obligation to pay the royalties for the

concession contract concluded by economic agents with the Free Zone Administration in which they operated. Support measures are granted depending on the intensity state aid calculated as the ratio between the amount of state aid and value of investments made.

The total amount of state aid granted in the period 2003-2009 was US \$ 7,295,916, of which US \$ 6,501,439 is exempt from paying royalties (89.11%) and 794.477 USD - exemption from tax on profit (10.89%). The average intensity calculated as the ratio of total State aid and investments was 51.29%. On the turnover achieved of the companies analyzed, evolution was increasing during 2003 - 2007, followed by successive reductions, first, slight (10%, in 2008) and the second, major (45% - in 2009). 2008 was the start of the crisis in Romania, so there was a negative development companies. Period 2009-2010 was characterized by a relative stagnation in the level of total turnover, for example, 67% of companies have decreased the value of turnover in 2010 compared to that achieved in the first year of activity in the free zone. From 2003 until 2009 many companies have completed the financial years with positive results, but in 2010, 11 companies had negative results and 10 showed profits. In 2011, 12 companies completed the financial year with profit. Some of these companies have been paying *overdue* budgetary obligations, so in 2010, the *amounts outstanding* were below 1% for two of them; two companies recorded overdue of up to 6.5% of turnover in 2010, and the other two companies had a difficult situation on time unpaid amounts representing 383% on turnover of 2010 (Agrom Trade SRL), respectively, 3.846% on turnover of 2010 (Floret Soft SRL). In terms of number of employees, it was found that it decreased from year to year.

Conclusions

It had to be applied prior to the accession, the EU acquis in the areas of competition and state aid for Romanian companies adapt to new rules and prepare them to face competition in the European Single Market, as of January 1, 2007. Adaptation for accession has intensified that followed the restructuring and privatization of large state-owned companies and the cessation granting state aid in the steel sector from 1 January 2005. In 2005 and 2006 were noted two trends: national state aid reduction in absolute terms and as a share of GDP and directing state aid towards horizontal objectives less susceptible to distort competition and affect trade between Romania and Member States (research and development, SMEs). Amount of State aid granted in Romania is low compared to the amount of state aid granted by other Member States, for example, in 2010 the share of state aid granted in Romania GDP was only 0.17%, compared to EU average – 0.57%. Thus, Romania was ranked 20 out of 27 states, so state involvement in the economy through state aid mechanism is very small. We appreciate that the share of state aid granted for horizontal objectives and regional must increase at the expense of State aid for sector objectives.

The main objective for Member States is 2020 Europe Strategy and the fulfillment of the three priorities emerging from this strategy that the smart increasing of European economy, sustainable and inclusive growth (high rate of employment). Thus, for the next period, the authorities involved in initiating and state aid must consider the following issues:

- State aid for *research, development and innovation* should be designed so that distortions of competition and trade within the EU shall be minimized and the efficiency of public spending shall be high;

- The guidelines C.E. about the aid for *environmental protection* encourages Member States to support the production of *renewable energy and efficient cogeneration*, allowing this grant operating aid to renewable energy companies (combined heat and electrical);

- State aid for *environmental protection* may be state aid for rapid adaptation to EU standards, aid for conducting environmental studies, for central heating, for better energy saving, for waste management etc.

- Creation of new jobs, especially because the period 2007-2010 have not been granted state aid for this purpose, and developing employee skills through permanently training;

- In the tourism sector, central and local public authorities should promote aid schemes much more efficient, ways to finance various supporting agrotourism, ecotourism and small pensions during this period of economic crisis.

Notes:

⁽¹⁾ The concept of “state aid” began with the 1957 Treaty of Rome which were established the European Economic Communities, the EC Treaty, article 87, par. (1).

⁽²⁾ As interpreted by the European Commission and the European Court of Justice (ECJ), State aid is any public aid granted by the central authorities and that granted by local or regional authorities. The aid can also come from private organizations or other bodies (credit institutions, professional associations, holding or ordinary companies) on which the state, a public institution, a local or regional authority exercise directly or indirectly, a strong influence.

⁽³⁾ Florentina Cristina Bâldan, *Politica Europeană a Concurenței*, Editura Sitech, Craiova, 2011, pp. 113-116.

⁽⁴⁾ C1-The transfer of resources from the state: the transfer must have a negative impact on the public budget resources’ decreases as budget allocations and plus waiver state to collection of resources which would be due (aid tax). C2-Selectivity of aid: the state measure must offer benefits only a small number of entrepreneurs (territorial selectivity and type of activities). C3-Economic benefits: the state measure provides to an enterprise an economic or financial benefit that would not be achieved without this measure.

⁽⁵⁾ EC Treaty, Art. 87, para. (1).

⁽⁶⁾ EC-Treaty, art. 87, para. (2) and (3).

⁽⁷⁾ EU-level, the main legislation is the Articles 87-89 of the EC Treaty, the updated. Rules and their interpretation are set as ECJ case law and secondary Community law – Community framework, Directives, Communications and Instructions on how to apply the articles of the Treaty of different forms of aid (for example: fiscal measures) and different objectives for granting support. Certain rules refer to specific sectors (for example: special rules applicable automotive, shipbuilding, steel) or to state aid with “horizontal” objectives, not specific to a particular sector (for example: aid for research, development and innovation, for SMEs, training). Sector rules take precedence over horizontal, these adding restrictions. The Commission’s main role is to examine and decide what constitutes State aid. The Commission has the final say in all matters relating to state aid and has extensive powers to monitor, control and restrict the ways and levels of aid granted by Member States of their industries.

⁽⁸⁾ Services of General Economic Interest include services providing gas, electricity, telecommunications, public transport and so on.

⁽⁹⁾ Minimis aid is a measure of support to enterprises, regardless of size, not exceeding 200,000 Euro for a period of three fiscal years (100,000 Euro for any company operating in the transport sector).

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- www.consiliulconcurentei.ro

PUBLIC PROCUREMENT AWARDS IN ROMANIA

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Abstract. *Public procurement rules are vital for the efficiency of public money usage. The key issues are focused on assuring equally and non-discriminatorily treatment to economic operators by promoting transparency in each stage of this process. The case of Romania is not far away from the situation recorded in different EU member states. Our paper aims to reflect the situation using more than 130,000 payments that reflect the result of procurement process at almost 300 public institutions during 2011.*

Keywords: public procurement; payments; efficiency; Romania.

JEL Classification: H57.

REL Classification: 13Z.

1. Introduction

In order to obtain maximum of efficiency, in EU member states have been introduced public procurement laws which are harmonized with Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts. All the effort is focused on assuring equally and non-discriminatorily treatment to economic operators, as well as a transparent procedural environment. The main coordinates of transparency request an obligation to community-wide publicity and advertisement of public procurement contracts in the Official Journal of the European Communities (Blauberger, Krämer, 2010, p. 10).

The economic effects of public procurement regulations should be retrieved in a better usage of public resources and a better functioning of markets. The market is an activity organization which leads to efficiency (Vuță, Gherghina, 2006, p. 1). There has been considered that all EU economic operators to have equal conditions on the market. Purchases from operators outside the community are still differently judged, having priority those calculations which emphasize the mutual gains that can be obtained from liberalization. As Anderson and Kovacic (2009, p. 72) observed, much of the benefit (arguably, the main benefit) of international liberalisation actually accrues to the countries undergoing liberalisation.

Our paper looks to emphasize results obtained in Romania, on a sample of 133,960 payments made by 298 public institutions, during 2011, as a result of public procurement awarded to 12272 national economic operators. The analysis is focuses on the results obtained by a large scale of institutions after they applied public procurement legislation, as it was in use during 2011.

The aim of our study is to offer a financial perspective of procurement process on a sample which was build up from an important number of institutions in various domains. While procurement awarding process is important because could influence the public sector efficiency, the payment of procurements could affect public financial stability since payments should have assured enough liquidities.

2. Public procurements in Romania

Romanian public procurement regulations were adopted in the spirit of EU regulations, especially Directive 2004/18/EC on the coordination of procedures for the award of public

works contracts, public supply contracts and public service contracts. But, public procurement should be analysed in a larger context because numerous EU regulations applicable to the unique market or privatizations have effect also on public – private commercial transactions. The European Union has played a significant role in all EU countries in driving and in turn regulating the trend towards increasing liberalisation and marketisation of public services, especially since the adoption of the European Single Act in 1987 which paved the way for privatisation of many nationalised industries including telecommunications, railways, postal services and utilities (Grimshaw, Rubery, Marino, 2012, p. 67).

The success of public procurement is conditioned by several parameters which can be introduced as mandatory or only recommended. The main role is reserved for the legislation which has the role to offer a transparent and predictable procurement environment where both parties knew their rights and duties for each stage of the awarding process and afterwards. As a second parameter we propose the informatics infrastructure which can facilitate the access and a better acquaintance of the market. In public administration, a basic condition for full transparency in the public procurements requires the development of electronic bidding (Nistor et al., 2011, p. 222). On third level we should place the procurement environment in terms of the pressures that can be exercised in close correlation with corruption level specific to each economy. A distinct stage should be reserved for the experience, especially for the good practices. In many cases there are delays in the awarding process due to the lack of guides and good practices for the contracting authorities, adapted to the specific characteristics of the procurement (Zaman, Crsitea, 2011, p. 73).

While procurement values from EU funds are rising, this process enjoys a larger attention in Romania. One key element in the Romania's EU integration process, with impact on all other areas of interest for the communitarian acquit for internal market, was the development of a system of efficient and credible public procurement (Pascariu, 2010, p. 279).

3. The sample

The sample consists from 133,960 payments reported by public institutions. All these payments were made during 2011 to national economic operators which were selected in a procurement process. Our sample does not include payments made to abroad economic operators, authorized persons, individual enterprises or NGOs. As well, cash payments were excluded due the small value. The payments were reported by public institutions, based on banking statements.

The reporting institutions cover a large scale of domains in which they are operating (Table 1). More than a half (55%, respectively 164) are public institutions from central administration, while the rest are financed mainly throughout local budgets. The sample covers all the counties.

The large number of public institutions in the sample is justified by the current practice of organizing procurements in each public body, being no centralized public body which have tasks buy at least some categories of goods for the entire public system.

Table 1

Structure of public institutions in the sample

Administration	118
Social security	39
Education	31
Justice	29
Health	24
Environment	17
Economic activities	13

Sport and culture	13
Defense and public order	5
Research	3
Public services	3
Agriculture	3
TOTAL	298

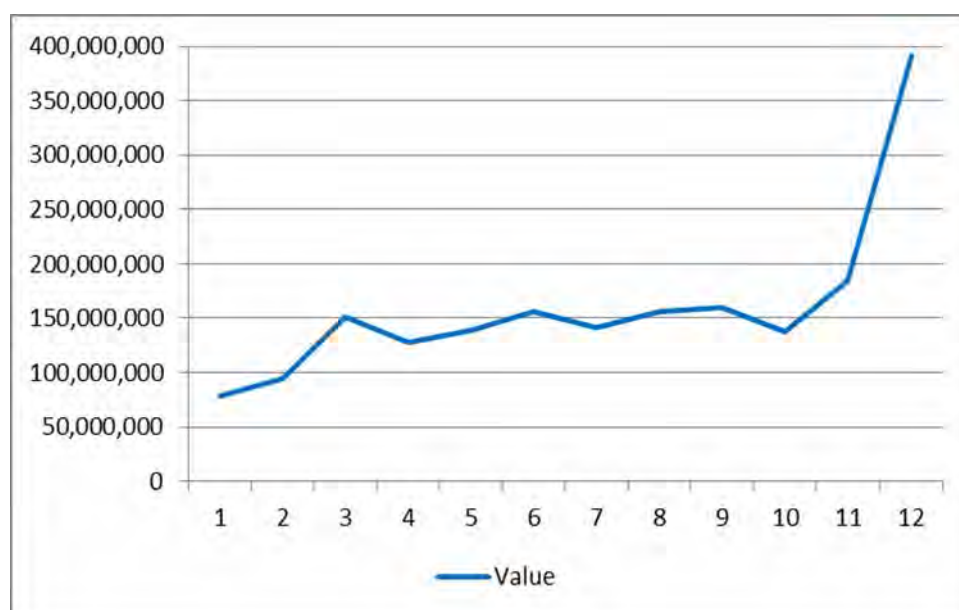
Source: Sample data.

The value of payments from the sample is summing up 1.9 billion lei which represent 0.35% of GDP and 0.93% of public expenditures in 2011 consolidated budget. The sample value corresponds to 3.58% of the public payments made to procurement of goods, services and investments.

4. Payments analysis

4.1. Payment frequency

The frequency of payments is strictly correlated to procurement process. In first quarters of the year the expected payments are those finalizing direct award or multi-annual contracts signed in previous years. Year beginning transactions are also restricted by administrative obstacles generated by the lack of liquidity and uncertainty of collecting taxes at consolidated budget. Year-end payment explosion is mainly explainable by the budgetary rules which oblige payments to be made in the limit of each year's budget or one twelfth of last year's budget if current is not approved. As often happens that the budget is not approved in time, public institutions make efforts to finish contracts before December 31st.

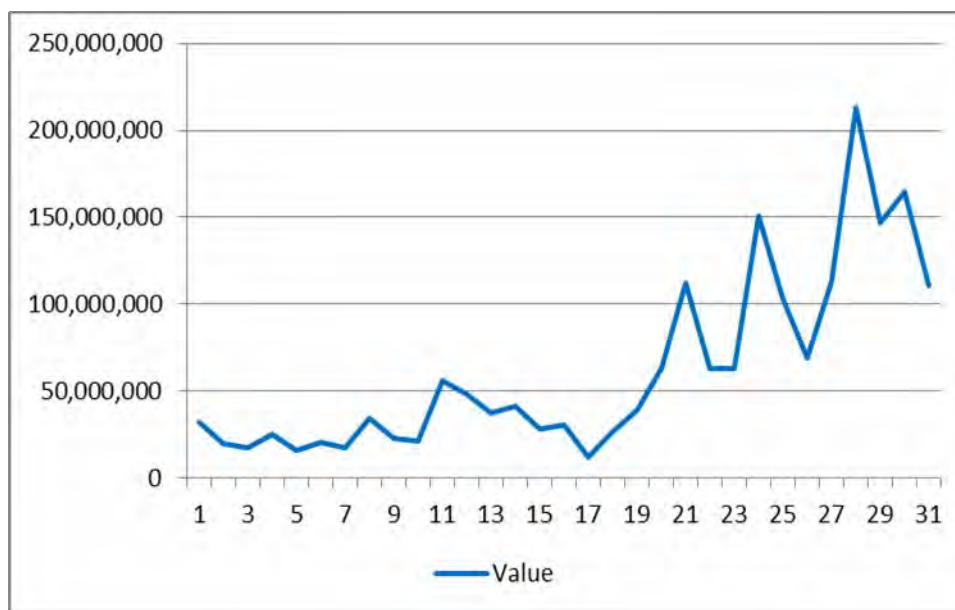


Source: Sample data.

Figure 1. Payments by months

As Figure 1 presents, the annual evolution of payments is deep irregular due the reasons presented above. If January payments not exceeded 79 billion lei, in December this value was five times bigger (391 billion lei). This value is the more surprizing as there is a regulation (Order 1203/2008) which restricts drastically procurement payments which exceed in a month two twelfths of approved budgetary value.

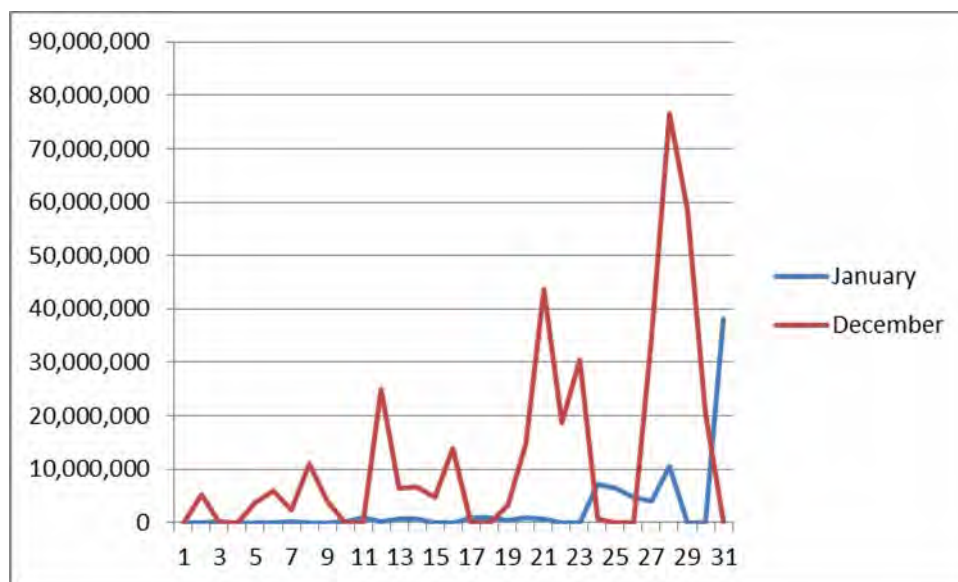
Fluctuations in payments are recorded also inside each month. This is explainable mainly due the restriction of concentrating payments after the date of 24 each month. The decision is applicable to almost all payments referring procurement. Exceptions are admitted for EU projects or business travels.



Source: Sample data.

Figure 2. Payments by days

As can be seen in the figure above, the payments are concentrated in the second half of the month, but the payments remain significant also in the first part of the month, especially in the second decade of the month.



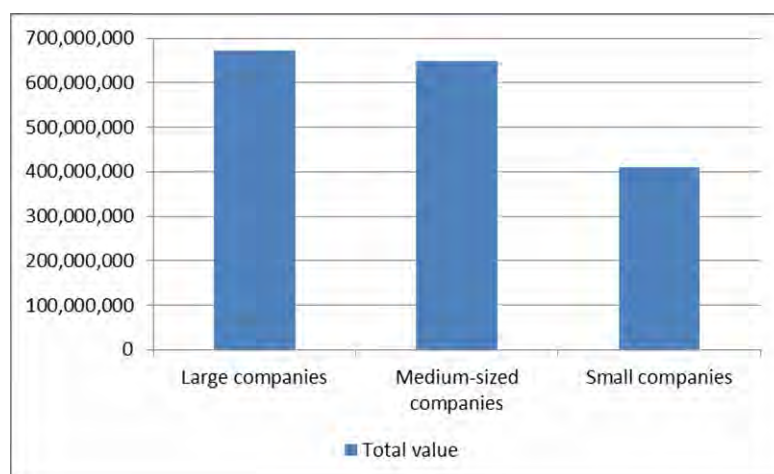
Source: Sample data.

Figure 3. Payments by days in January and December 2011

While the transaction value is higher, the payment day rule seems to be more frequently infringed. The case of December is the most special because the week between 24th and 31st is partly blocked due Christmas and year closing operations. Under these circumstances, the payments were made earlier.

4.2. Beneficiaries

Economic operators are free to offer their goods and services to public institutions. The contractual parties are chosen mainly after a series of factors such as price, proximity or personal relations. Our analysis is focused on emphasizing the size of economic operators and the value of transactions to each type. The size is established using the official classification in large companies, middle-sized companies and small companies. Each year, the list of these companies is published by the Ministry of Public Finance – National Agency for Fiscal Administration.

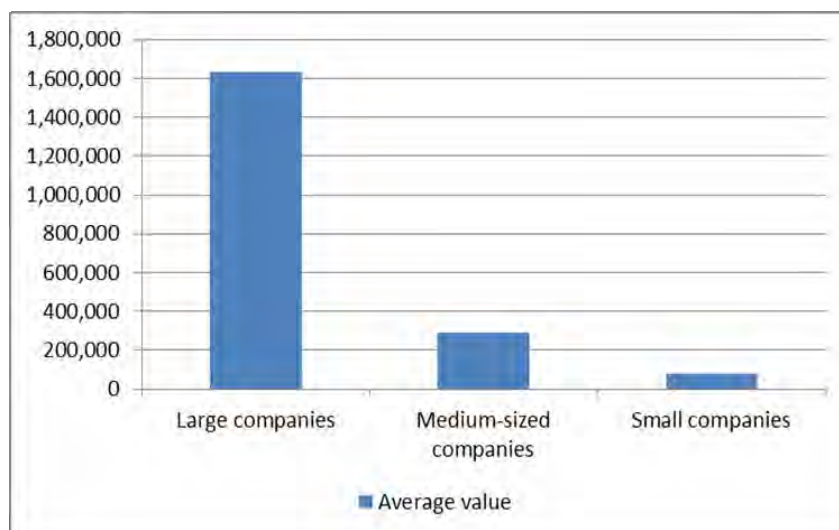


Source: Sample data.

Figure 4. Value of payments on company size

Our sample public institutions made payments to 12272 national economic operators from all over the country. Only 3% were large companies (412) and 18% medium-sized companies (2253). The rest were small companies, especially from the public institutions neighbourhood. Nevertheless, large companies offer goods and services to 7.47 public institutions, medium-sized companies to 2.05 public institutions and small companies to 1.39 public institutions.

The contracts awarded to large companies are more significant than those awarded to local small companies. In many cases, large companies refuses to enter in commercial relations for small projects, so they are more focused on large investments or provision of large quantities or for a long period of time.



Source: Sample data.

Figure 5. Average value of payments on company size

Average values show us that large company targets are significantly different from other economic operators. The average value is 20 times higher for large companies than for small companies. Some of these companies are targeting large scale projects, obtaining from the same public institution millions of lei which could represent tens of per cents from the turnover. Other companies, especially those offering general economic services like telecommunication, postal services, cable TV or fuels, can be identified on tens or hundreds of public institution's list of suppliers.

Conclusions

The effective way of transposing in practice the equally and non-discriminatorily treatment to economic operators and transparent procedural environment is shown by the payments made by public institutions to economic operators. The equally and non-discriminatorily treatment can be presumed only for those procurements which are not directly awarded. Transparency requirements are becoming more severe as the value of the procurement is higher.

In Romania, we can see a concentration of small acquisitions at the local market on which we can find a small number of economic operators, each of them limiting the collaboration in most cases to one or two public institutions. Medium-sized companies have a similar behaviour, but a slightly larger scale.

Large companies seem to be more selective preferring large projects all over the country. Thus, they are suppliers to several institutions (if they are offering general economic services, the number of clients easily pass hundreds).

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DETERMINANTS OF UNDERGROUND ECONOMY IN EU COUNTRIES

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Abstract. *This study tries to test the correlation between taxation and underground economy for the EU countries. In this regard based on panel data techniques (fixed and random effects) we use as fiscal determinants of underground economy the implicit tax rate on consumption, implicit tax rate on labour and the level of public expenditures. These variables reflect the level of tax burden. Also we use the unemployment rate and inflation as economic determinants of underground economy. The results confirm these variables as significant determinants of shadow economy.*

Keywords: underground economy, tax burden, labor taxation.

JEL Classification: H12, O17, O52.

REL Classification: 13I, 8K.

1. Introduction

The actual global financial crisis underlines the importance of fiscal receipts lost by the European Union member states due to the underground economy. The budget deficits of EU countries reached at the highest level starting from 2008 and this was a direct cause for increasing the public debt. In this context one way for reducing the budget deficit for EU countries is also limiting the shadow economy. In the last years many EU countries choose to increase the level of tax rates especially for VAT, but increasing the tax burden can be an important factor for stimulating tax evasion and underground economy. In this context we try to test if the fiscal burden can be a significant variable for increasing the shadow economy. For the EU countries the increasing VAT rates have an important contribution – a positive one on the tax receipts – and this influence is reflected by the figures from the budget revenue which indicate more receipts. Considering the impact of increasing the VAT rates on the shadow economy we don't have relevant data, but this influence can be tested through implicit tax rate on consumption.

An important part from the shadow economy is undeclared work which is due to the high level of salary tax and social contributions. In this regard our study is testing the influence of the labor force taxation on shadow economy using in the econometric model the implicit tax rate on labor.

The spread and real dimensions of underground economy are very difficult to be quantified and also their implications on the real economy. The purpose of this study is to reveals some causes of shadow economy expressed as fiscal variables. Between the EU countries the shadow economy level varies in 2012 from 7.6% of GDP in Austria until 31.9% of GDP in Bulgaria, according with the estimation realized by Schneider (2011).

Therefore, we carry out a study using annual data sets from the Eurostat (1999-2011) and from Schneider (2011) concerning the shadow economy level for 27 EU member states. The paper is organized as follows: section two reviews the related literature; section three details the methodology of the study and make a short descriptive analysis of the data; section four presents the results of the empirical modeling and last section highlights the main conclusions of the paper.

2. Literature review

Quantifying and estimating the underground economy is based on macroeconomic and microeconomic tools which are comprised by three methodologies of assessment, according with Schneider (2012):

- First category implies direct procedures at a micro level that aim at determining the size of the shadow economy at one particular point in time. An example is the survey method;
- Second category is based on the comparison of macroeconomic indicators in order to measure the development of the shadow economy over time. Most studies use macroeconomic aggregates like national accounts, electricity consumption, and cash transactions.
- Third category consists on statistical models that use statistical and econometrical tools to estimate the shadow economy as an “unobserved” variable.

A considerable number of studies address this issue of determinants of shadow economy. We will pay attention in this inquiry to the fiscal determinants of underground economy because this category of determinants it is considered the most important one. All the components activities of shadow economy whether they are legal or illegal activities have the effect avoiding taxation. In this context we can state that fiscal burden represents a major determinant of underground activities. Allingham and Sandmo (1972) have realized a theoretical approach based on which underground economy increases with tax burden. Theoretical studies which reveals the impact of tax burden of underground economy are realized by Schneider (1994, 1997, 1998), Schneider and Enste (2000), Johnson, Kaufmann and Zoido-Lobaton (1998).

Thießen (2010) underlines in his study the importance of fiscal variables as one of the most important group of determinants for shadow economy. This study was realized for OECD countries and revealed a positive correlation between fiscal burden measured through tax and social security burden and also indirect taxes. For both variables there is a positive correlation with the shadow economy, but for indirect taxation there isn't a significant sign because of limited possibilities to avoid these categories of taxes comparative with labor taxation.

3. Methodology and descriptive statistics

Starting from previous studies in which we can find the impact of fiscal burden on the shadow economy, this paper tries to test some hypothesis concerning this impact for EU member's states. In previous studies this impact is tested for OECD countries (Schneider, 2010, 2012) and the fiscal burden is measured as the share of tax receipts in GDP for all fiscal variables. Our hypotheses are based on a different way to measure the taxation impact through implicit tax rate for consumption and labor. The implicit tax rate on consumption is used as a proxy for indirect taxation and the implicit tax rate on labor is used to capture the impact of the wage income tax and contributions – both as a measure of tax burden on labor.

Implicit tax rates are indicators that measure actual or effective tax burden for each economic function (consumption, labor, capital). They are calculated as the ratio of total revenue from taxes and social contributions by economic function and a potential tax base.

The implicit tax rates are referring to an average or effective tax rate, calculated by dividing the revenues from taxes on consumption or labor by an appropriate corresponding aggregate tax base (consumption or salary incomes) from national accounts statistics.

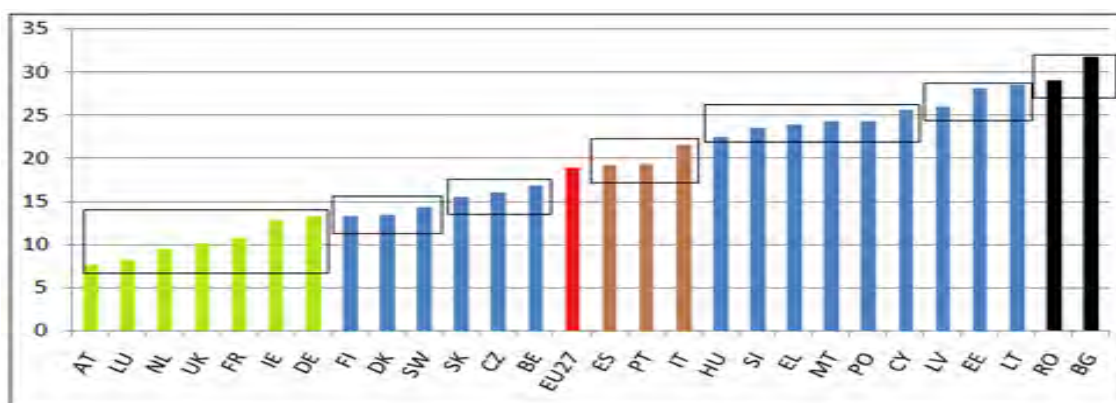
Heijmans and Acciari (2004) define implicit tax rate on employed labor as all direct and indirect taxes and employees' and employers' social contributions levied on employed labor income divided by the total compensation of employees working in the economic territory.

We realize this modelling for EU-27 member states and also for NMS 12 (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia) because we consider some specific particularities for this new member

states with a lower tax burden comparative with the EU average. In spite of this lower tax burden, the level of shadow economy is higher, but it is decreasing over time, also due to the decrease of level of tax burden. In these countries the high level of shadow economy is due to the ex-communist regimes with a higher level of corruption and bureaucracy.

Our methodology is based on a descriptive analysis of the evolution of the shadow economy and also on econometric analysis of correlation between shadow economy and other macroeconomic variables, considered as possible determinants of it like consumption tax, labor taxation, public expenditures, unemployment, and inflation. The study used annual data starting with 1999-2011 based on panel data techniques. In the next figure is presented the level of shadow economy for EU member states for 2012 and the countries are clustered based on this level of shadow economy. In this figure can be identified seven clusters:

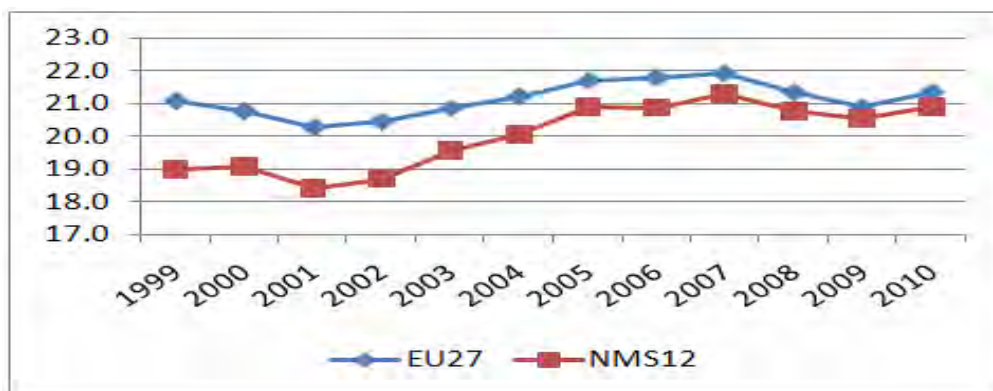
- first group is with the lowest level of underground economy: Germanic countries and also liberal countries (Ireland and United Kingdom);
- the next group includes Nordic countries with a level of shadow economy below 15% of GDP;
- the third group with a level below EU-27 average is Slovakia, Czech Republic and Belgium. Is quite unexpected that two new member states have a lower level of shadow economy than EU-27 average;
- another group with a higher level of underground economy compared with EU-27 average is the group of Mediterranean countries (Spain, Portugal and Italy). Greece was not included here because the level of shadow economy is higher.
- the next three groups are new member states, except Greece, and can be seen the similarities concerning the level of shadow economy in Baltic countries (higher than 25%) and the highest level of underground economy in Romania and Bulgaria.



Source: Schneider (2011), "Size and development of the Shadow Economy from 2003 to 2012: some new facts".

Figure 1. The level of shadow economy as % in GDP in 2012

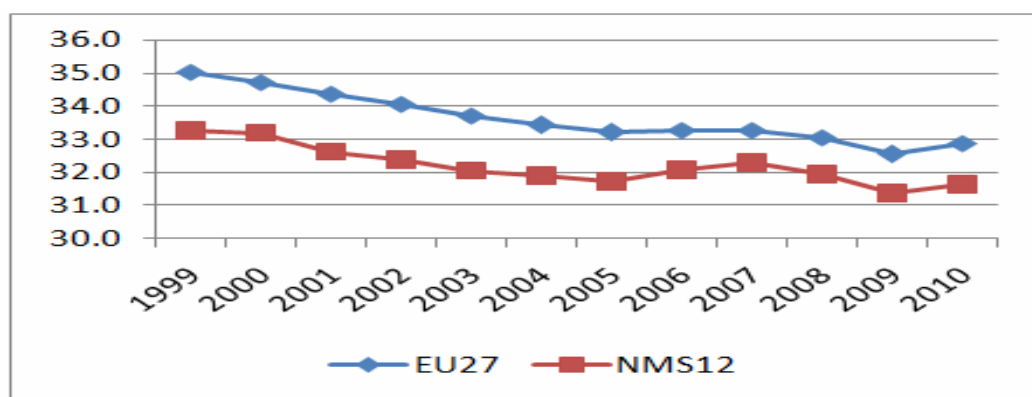
Concerning the evolution of independent variables we choose to reveal in the next figures two fiscal variables: implicit tax rate on consumption and implicit tax rate on labor. For consumption tax the tax burden is increasing until 2007 and as a result of the harmonization process tends to be very similar for the last years. Also the next figure reflects the increasing of VAT rates adopted by almost all the EU member states starting with 2010 in order to reduce the budget deficit.



Source: own computation based on Eurostat.

Figure 2. The evolution of implicit tax rate on consumption

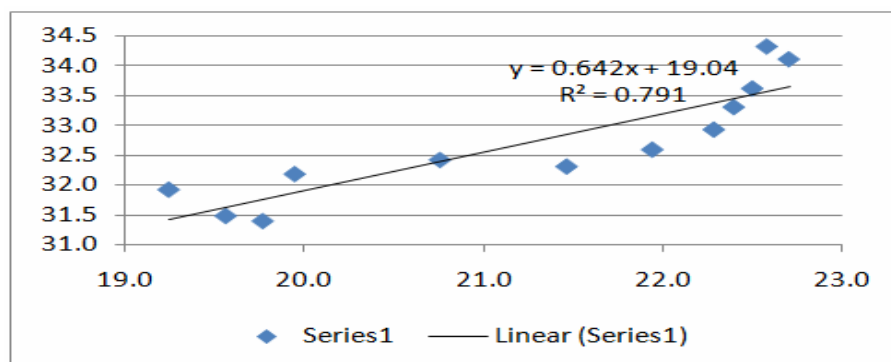
Analysis of the evolution of tax burden on labor reflects the decreasing trend predominant for the entire period for EU member states. This decreasing trend is due to introducing the flat tax rate for wage tax especially by new member states like Romania (2005) and Slovakia (2004). Also some countries choose to reduce the level of social contributions paid by employee and employer.



Source: own computation based on Eurostat.

Figure 3. The evolution of implicit tax rate on labor

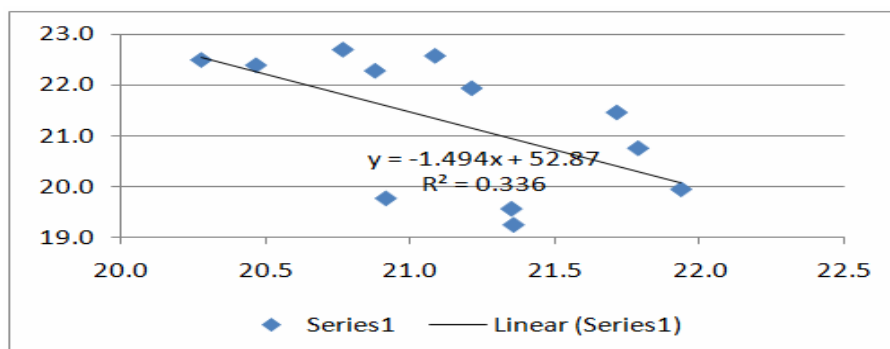
Before to make the estimations using the econometric model we try to test the correlation between the level of underground economy and fiscal variables. These correlations are tested for EU-27 computed as average for all member states starting with 1999 until 2010. Following the regression equation can be observed a direct correlation between the labor taxation and underground economy and this correlation is strong enough.



Source: own computation based on Eurostat.

Figure 4. Correlation between implicit tax rate on labor and shadow economy for EU-27

Concerning the impact of consumption tax on the level of shadow economy in this case there is an indirect correlation but not very strong for EU-27 average.



Source: own computation based on Eurostat.

Figure 5. Correlation between implicit tax rate on consumption and shadow economy for EU-27

The econometric analysis is based on panel data techniques and use fiscal determinants of underground economy and also as control variables, unemployment rate and inflation.

For testing the impact of the main determinants of the shadow economy level we use for panel ordinary least squares (OLS) estimations (following Wooldridge, 2002, p. 288). We specify the baseline equation:

$$SE_{it} = \alpha_0 + \alpha_1 * ITC_{it} + \alpha_2 * ITL_{it} + \alpha_3 UR_{it} + IP\alpha_{4it} + E\alpha_{5it} + \varepsilon_{it} . \quad (1)$$

In this baseline equation we introduce as the dependent variable the shadow economy and as regressors implicit tax rate on consumption, implicit tax rate on labor, unemployment rate, inflation and public expenditures (see Appendix 1 for data description).

For the beginning we estimate a model with fixed effects. Than we use fixed and random effects according with the result of Hausman test. Our estimates are for all EU-27 countries, but also for NMS12.

4. Empirical results

Concerning the estimation results are very similar with the other studies. Schneider (2012) estimates the impact of increasing salary tax and social security contributions as far the most important determinant of increase of shadow economy. According with this study the labor tax burden explains between 35-38% of the variance of shadow economy.

In Table 1 we find statistically significant positive coefficients on the labor taxation which is significant for all the estimations, fact due to the high share of undeclared work in total shadow economy. For the analysis period the labor taxation burden is decreasing and the impact on underground economy was reflected in a decreasing of underground economy, except for new member states, where for fixed effects there is an indirect correlation. The tax burden of consumption have a significant impact on underground economy, but indirect and this fact is explained because of reduced possibilities for avoiding this kind of taxation. As a result even if the level of indirect tax burden increase, especially from 2010 through VAT rates increase, the level of underground economy continually decreases.

The unemployment rate is also significant because if the unemployment increases the result is a higher undeclared work and an increase of underground economy, fact revealed by the coefficients from Table 1. The inflation has a significant and a direct impact on the level of underground economy. The model reveals a significant indirect correlation between public expenditures and the level of underground economy.

Table 1

Dependent variable: shadow economy

ESTIMATION	Method: Panel LS (Cross section fixed/random effects)			
Sample	EU27		NMS12	
Specifications	(FE)	(RE)	(FE)	(RE)
Constant	32.97 (2.86)	19.13 (1.98)	45.89 (3.60)	23.94 (1.57)
ITC	-0.26*** (0.08)	-0.12*** (0.05)	0.23 (0.15)	-0.19*** (0.04)
ITL	2.87E-05*** (0.06)	0.30*** (0.04)	-0.23*** (0.07)	0.29*** (0.03)
UR	0.59*** (0.09)	0.14*** (0.03)	0.17* (0.09)	0.11*** (0.02)
IP	0.42*** (5.95)	0.03** (0.02)	0.18*** (3.19)	0.04*** (0.01)
E	-0.28*** (0.06)	-0.16*** (0.024)	-0.44*** (0.088)	-0.09*** (0.02)
Observations	321	321	142	142
Hausman Test		0.01		0.08
R-squared	0.39	0.97	0.28	0.97

Notes: standard errors are in parentheses.

*, ** and *** – statistically significant at the 10, 5 and 1% level, respectively.

The data sample includes yearly observations for the EU-27 countries over the period 1999 to 2010.

Conclusions

This paper tries to provide new empirical evidence on the fiscal determinants of shadow economy based on different indicators of tax burden comparative with previous studies. We use the implicit tax rates for consumption and for labor as a proxy for effective tax rates. This study is made for EU-27 and also for NMS12 for revealing some specific characteristics of determinants of underground economy in the new member states. The level of underground economy in the new member states is significant higher even if the total tax burden is lower than in old member states.

The results show that the shadow economy is closely connected to its determinants with an $R^2 = 0.97$ in the panel with random effects, meaning that 97% of the variation of shadow economy can be explained with its determinants, even if in the case of fixed effect the correlation is lower.

This econometric analysis predicts similar results with other studies. Ruge (2010), using a model based on structural equation model, reveals the main determinants of the size of underground economy and the fact that lower taxes and social security payments reduce the level of shadow economy. In accordance with this result our study reveals the same impact on shadow economy for EU countries.

The implicit tax rate on consumption has an indirect impact on the level of underground economy because of in this case the tax burden is very difficult to be avoided through underground activities. The most important determinant of shadow economy is the labor tax burden measured as implicit tax tare.

Acknowledgements

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Appendix 1. Data description

Variable	Description	Unit	Source
SE	Size of shadow economy The size and development of the shadow economy is calculated with the MIMIC (Multiple Indicators and Multiple Courses) estimation procedure.	Percent in GDP	Schneider (2011)
ITC	Implicit tax rate on consumption is the ratio between all taxes on consumption and final consumption expenditure of households on the economic territory	Percent	Eurostat
ITL	Implicit tax rate on labour: Ratio of taxes and social security contributions on employed labour income to total compensation of employees. It is the sum of all direct and indirect taxes and employees' and employers' social contributions levied on employed labour income divided by the total compensation of employees working in the economic territory increased by taxes on wage bill and payroll.		Eurostat
IP	Inflation, average consumer prices Expressed in averages for the year, not end-of-period data. A consumer price index (CPI) measures changes in	Index	IMF - WEO

Variable	Description	Unit	Source
	the prices of goods and services that households consume		
Ur	Unemployment rate The OECD harmonized unemployment rate gives the number of unemployed persons as a percentage of the labour force (the total number of people employed plus unemployed).	Percent of total labour force	IMF - WEO
E	Total expenditure consists of total expense and the net acquisition of nonfinancial assets.	Percent of GDP	Eurostat

Appendix 2. Descriptive statistics for EU-27

	ITC	ITL	UR	IP	E
Mean	21.2	34.5	8.2	3.6	44.5
Median	20.2	35.3	7.5	2.5	44.6
Maximum	34.2	48.5	20.1	45.8	65.6
Minimum	11.1	20.2	2.3	-1.68	30.29
Std. Dev.	4.37	6.58	3.87	4.66	6.24
Skewness	0.78	-0.42	1.16	5.97	-0.01
Kurtosis	3.36	2.14	3.96	49.47	2.44
Jarque-Bera	34.00	19.20	84.09	30887.23	4.22
Probability	0.000	0.000	0.000	0.000	0.121
Observations	322	322	322	322	322

Appendix 3. Matrix correlation for EU-27

	ITC	ITL	UR	IP	E
ITC	1	0.34	-0.36	-0.13	0.39
ITL		1	0.12	-0.05	0.51
UR			1	0.05	-0.10
IP				1	-0.26
E					1

THE INHERITANCE TAX IN GERMANY

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Abstract. *The present article focuses on the procedures regarding the calculation of the inheritance tax in Germany with specific examples and some aspects regarding the double taxation. There is also explained in detail how the percentages are calculated after someone dies and how the inheritance will have to be shared among relatives.*

Keywords: inheritance tax; double taxation; inheritance order; testament; Civil Code.

JEL Classification: E62, H22, H27.

REL Classification: 13Z.

1. Introduction

The inheritance tax is one of the direct taxation, as to the personal taxation.

As with the income and corporation tax, we have a distinction at the inheritance tax between unlimited and limited liability. Unlimited tax liability arises if the decedent at the time of his death or the donor at the time of execution of the gift is resident. The residents are individuals who have domicile or habitual residence. In the case of unlimited tax liability, all assets including foreign assets at home is taxed. A tax liability is limited, if none of the persons involved at the inheritance or gift is a resident. Then, subject of the inheritance tax are only the domestic assets.

2. Double taxation

Since many countries have similar regulations in their inheritance tax law, it could lead to unpleasant double taxation.

It is not uncommon for an individual or a company who is resident in one country to make a taxable gain (earnings or profits) in another country. This specific person will find out that he is obliged by the domestic laws to pay the tax on that gain on local level and pay once again in the country in which the gain was originally made. Since this is inequitable, many national governments sign bilateral double taxation agreements with each other. Sometimes, this requires the tax will be paid in advance in the country of residence and will be exempt in the country in which it arises. In all the remaining cases, the country where the gain arises will cash in the taxation directly at source ("withholding tax") and the taxpayer will then obtain a compensating foreign tax credit in the country of residence to show that tax has previously been waged. In order to accomplish this, the taxpayer will have to declare himself in the foreign country as being non-resident over there. The second characteristic of the settlement is that the two taxation establishments exchange information about these kind of declarations, and so will inspect any irregularities that could designate an attempt of tax evasion.

All around inside of the European Union, all the member states have settled a multilateral treaty on information sharing. This means that the states will each report to their equivalents in each other authority a list of those people or companies who have requested

exception from local taxation because they were not a resident of the state where the income is paid. These people or companies should have acknowledged that specific external income in their own country of residence, so any dissimilarity advises an attempt of tax evasion. For a specific changeover period, some states have a distinct special procedure. They can propose to every non-resident fiscal account holder the choice of taxation schedules: either a clear release of information as stated above, or the deduction of resident tax on investments interest at basis as is the circumstance for actual residents.

If an alien citizen is in Germany for less than a appropriate 183-day period, so roughly six months, and is tax resident (*i.e.*, and paying the taxes on his or her salary and remunerations) somewhere else, then it may be conceivable to entitle tax liberation under a specific Double Tax Treaty. The pertinent period of 183 days means either 183 days from a normal calendar year or in any time of 12 months, depending upon the specific treaty in action.

So, as an example, the Double Tax Treaty with the United Kingdom targets a period of 183 days in the German tax year (which is the same as the calendar year); therefore, a national of the United Kingdom might work in Germany from 1 October through the following 31 April (7 months) and then claim to be immune to German tax (at the same time as still paying the English tax).

Here is one example: Sabine Dietrich in Neudorf/Luxembourg gives her apartment building in Freiburg/Germany to Elke, her daughter, who lives in Mulhouse/France.

This donation is due to pay taxes in three countries: Germany (domestic capital), Luxembourg (residence of the giver) and France (residence of the recipient).

On the basis of double taxation agreements, Germany has the primary right to tax.

In Luxembourg and France, the multi-family home exempt from gift tax and it is credited to the German tax.

According to German law, succession takes place by the rule of the law and by testament.

3. Inheritances of first order

Legal heirs are divided into hierarchies.

First, the next of kin relatives inherit (and the surviving spouse) and then the more distant relatives.

Heirs of first order are the descendants (children) of the decedent. Since children are equally close relatives, they inherit in equal shares.

If one of the children has already received some of the decedent's lifetime financial benefits, the amounts of money or property during the subsequent division of an estate will be compensated among the siblings.

The place of a deceased child will be taken by their children, or if they are deceased, in turn, their children, grandchildren and great grandchildren from the perspective of the deceased. Here is one example:

The deceased is a widowed father. He had two sons and a daughter. The second son already died. He had two daughters, one of which also no longer lives. Thus the son and the daughter of a deceased person inherit 1/3 each.

His surviving daughter, thus the granddaughter of the deceased will receive half of the one-third of the deceased son (one-sixth).

The proportion of deceased granddaughter (1/6) will be divided to her three sons, the great grandsons of the testator, distributed, so that each receives 1/18 of inheritance.

Are all the children, grandchildren, great grandchildren etc. of the testator already dead, or there are no children, because the testator has never become a father or mother, only heirs of second order will follow to the course.

4. Inheritances of second order

The heirs of second order are the parents of the deceased and their descendants, so the siblings of the deceased and their children and grandchildren. If both parents are living at the time of inheritance, they inherit it alone, and in equal parts. They do not include their children, so the siblings of the deceased and their descendants.

For inheritance, it is irrelevant whether the parents are divorced or if only one parent was transferred to the custody of the testator. The divorced father who has never cared about the son would inherit one-half.

If one parent of the testator died, his descendants will take its place, namely after the above principle, of the first order. Besides inheriting the bearded brothers of the deceased and the "semi-bearded" i.e., the half-siblings.

They are brothers and sisters, who are related by only one parent with the deceased.

Here is one example:

The mother of the deceased was married for the second time and she is already dead. She had two children from each of the marriages. One of the two daughters from his first marriage died. The father inherits half. The mother would have to get the other half.

Instead of her place, the three surviving children inherit in equal shares, so each will get exactly $1/6$. The bearded surviving daughter (from his first marriage), that is the sister of the testator has still the chance to receive some day half of the inheritance, what was inherited by her father. Fully bearded children are at an advantage over half-bearded children.

5. Inheritances of third order

The heirs of the third order are the grandparents of the deceased and their descendants. They only come into play, if no heirs of the previous two orders are alive. If both grandparents live, so they inherit in equal parts. Each grandparent obtains a quarter of the inheritance, and cancel all other descendants: uncles, aunts, cousins, nephews, nieces of the testator. If the grandparents are deceased, each of their descendants step in the inheritance, namely after the principles of first order.

Here is one example designed to clarify this rule:

The parents of the deceased died. A grandfather and two grandmothers are still alive. They receive each $1/4$. Instead of the deceased, his grandfather's daughter would inherit the amount. Since those are also deceased, her two sons interact in their place with half, so each receive $1/8$.

6. Inheritances of higher order

Heirs of fourth order are the grandparents of the deceased and their descendants. Since the case will be seldom that grandparents are still alive, the heirs of the great grand descendants will come into account, namely after the degree of the nearest relatives to the deceased. If there are several equally close relatives of the deceased, they inherit in equal shares.

Heirs of higher order are not limited to the Civil Code. One would have to follow each of the parents and grandparents turn to their parents and the corresponding derivatives.

Therefore, it can sometimes be tedious to determine the legal heirs, if someone has apparently died without relatives.

It may happen that there will have to search after heirs up to 5th or even 6th order.

The wealth established during the marriage is attributable to each spouse equally.

For the surviving spouse, there is a special regulation: legal heritage is the first quarter next to heir of the first order and half of the heirs of the second order.

Most couples live in the statutory matrimonial property regime of community gain. This property regime is provided as normal and as always occurs when the spouses have not agreed on marriage contract by the separate property or community property. Gain community means that each spouse keeps his assets at the beginning of the marriage. The wealth created

during the marriage (the so-called gain) is attributable to each spouse to half, regardless of who deserves or earned it.

The Probate court or Surrogate's court (*Nachlassgericht*), a division of the local municipal court (*Amtsgericht*), holds jurisdiction over wills and inheritance in Germany. In the event of an estate involving assets in two or more countries, German "conflict of law" rules stipulate that jurisdiction of an international estate is established by the laws of the country of citizenship of the deceased at the moment of death.

German estate, inheritance, and succession law falls under federal law and thus is applied uniformly across the country. State to state differences do not exist when it comes to the application of estate and probate law in Germany.

The EU civil law governs German estate, inheritance, and succession law. Inheritance laws in Germany distinguish between the rightful heirs (*Erben*) and any other beneficiary to the decedent (*Erblasser*), with concern to the estate (*Nachlass*).

Under German law, the rightful heir claims all the rights and responsibilities of the decedent immediately upon the decedent's death; there can be no interposition of a fiduciary or trustee. In order to win these rights and responsibilities, any other potential beneficiary would have to make a claim against the German heir or other bodies such as a joint "Tenancy in Common" of heirs (*Gesamthandsgemeinschaft* or *Erbengemeinschaft*). Claims can only be made against persons or groups of persons. They cannot be made against the inheritance itself because an estate is not a legal entity. This contrasts with US common law in which an estate is a legal entity (*Juristische Person*).

German forced heirship rules (*Pflichtteilsrecht*) limit the freedom governing testaments (*Testierfreiheit*) to a German decedent's surviving spouse and to the decedent's surviving children. Thus, this "Testatorship" is limited to the decedent's descendants of the first degree, as opposed the decedent's grandchildren or great grandchildren or any more remote kinship.

In effect this means that only a surviving spouse and surviving children qualify under the German forced heirship rules (*Pflichtteilsrecht*). This is especially important, should open debts be left as part of a testament.

7. Calculations and conclusions

Basically, the testator can turn the legal succession, inheritance and set other heirs by a will. Excluded heirs can claim the so-called compulsory part, which is half the legal inheritance. Compulsory portion guardians are only descendants, parents and spouses of the deceased. The surviving spouse may also refuse the inheritance, and require the exact balance of the gain and the compulsory portion. This is better, so if compensation claim more than 3/7 of the final wealth of the deceased spouse's accounts.

The base measures the enrichment of the acquirer in the amount of the assets less the assumed liabilities of the estate. To the estate liabilities are included the debt of the deceased, the debts and asserted duty parts and the cost of the funeral, which will be considered without proof in Germany 10,300 €. The inheritance tax to be paid is not deductible itself.

Valuation date is the date on which the tax started, i.e. the date of death of the decedent or the date of execution of the gift. The easiest way is to evaluate inheritances is in form of money. The assessment laws regulate property values.

In Germany, until the end of 2001 the property values for undeveloped and developed properties were determined differently. The value of undeveloped land is obtained by multiplying its base with 80% of his base benchmark. The ground values were determined by the expert committees of the municipalities under the Building Code on 01/01/1996 and is correct to six years now no longer the fair market value. The value of developed land value is calculated according to a generalized process yield. As income of the property is the average of the last three years achieved scheduled lease. This income is capitalized by the fact that it is multiplied by the multiplier. A multiplier of 12.5 thus assumes a return of 8% of the property.

The calculated output value is reduced according to the age of the house, and by 0.5% per year since the building for occupancy. For one- and two-family houses there is a value increase of 20%.

There is no estate tax in Germany. Instead inheritance tax (*Erbschaftssteuer*) will be raised for each individual heir or beneficiary and not on the entirety of a German estate. Allowances, exemptions, tax tables and inheritance tax rates will also not apply to the estate, but to each heir or beneficiary. Maximum tax rates for the inheritance tax may range from 17 to 50 percent, depending on the degree of kinship with the decedent of each heir or beneficiary.

Inheritance tax and gift tax are regulated in one law. Taxable is either a transfer by reason of death or a gift amongst livings. There are depreciations e.g. for family houses, families as well and for entrepreneurs (up to 100 %).

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SELECTED DETERMINANTS ON WELFARE ENHANCEMENT. A THEORETICAL AND EMPIRICAL VIEW

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Abstract. *The greatest challenge faced by modern economies is to find the appropriate tools to trigger and enhance welfare. The new sustainable economic development approach supports the replacement of the traditional growth objective with the welfare objective, including a set of values governing economic and social progress. Therefore, the paradigm focusing on economic development should be improved with new insights that may contribute to a new approach of welfare. The paper focuses on the effects of selected determinants on welfare - measured by the HDI, using a „pool data” model, for 29 countries, structured into five social-economic submodels, during 2000-2010.*

Keywords: HDI; welfare determinants; European sub-models; pool-data models.

JEL Classification: I31, C23, O15.

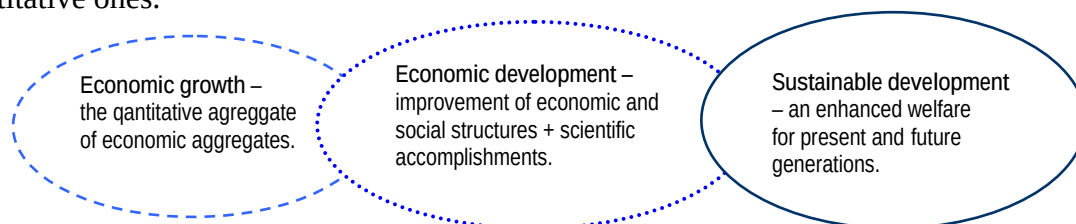
REL Classification: 7G.

1. Introduction

Traditionally, the main determinants of a high living standard are sustainable economic and social growth. The transition from economic growth to sustainable growth is triggered by the necessity to gain competitive advantage, on one hand, and enhanced welfare, on the other hand, requiring considerable investments in human capital. The approach is sustained by the fact that, presently, the economic pillars of growth should be accompanied by more detailed, often non-quantifiable determinants i.e. social, political, scientific, cultural, environmental, and human.

Almost three decades ago, Guillaumont (1985, p. 44) argued that beyond the basic determinants of growth development should be seen as “the general exchanges of mental structures and social behaviour allowing the increase of the real global added value that would lead from particular progress to a more generalised social progress”. Since then, the idea of progress was emphasised by the Sustainable development strategy launched in Goteborg in 2006 aiming for a continuous improvement of living standards for the future generations.

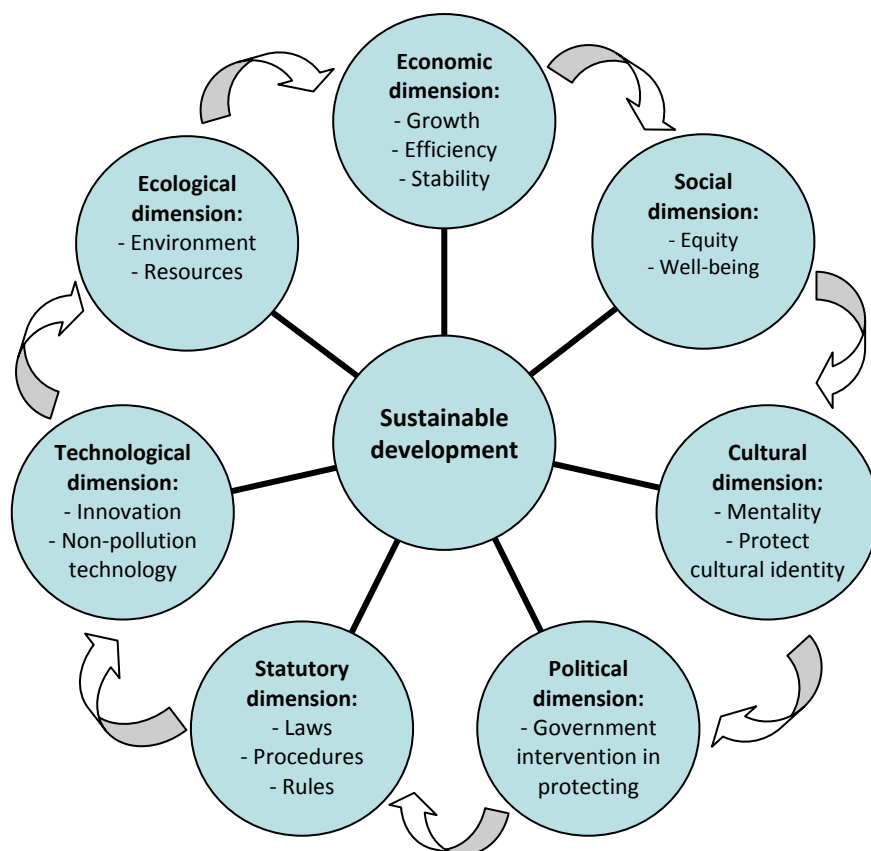
The success of this objective relies on the transition from an extensive economic growth to economic development and eventually to sustainable development. It means that decision makers will have to focus on the *qualitative* aspects of development rather than on quantitative ones.



Source: Authors representation.

Figure 1. *The transition from extensive economic development to sustainable development*

It means that a set of widely accepted economic, juridical, moral, cultural values should be built, leading to the *social capital* that is shaped by a community or society. The multidimensional structure of sustainable development is given in Figure 2.



Source: Authors representation.

Figure 2. The determinants of sustainable growth

Since the literature does not provide a single widely accepted indicator for economic development, the authors consider that innovation and human development are the main pillars of a higher productivity, competition and the cornerstones of a sustained development. They may also be treated as the missing link between economic growth and economic development. Undoubtedly, effective investments require a lower tax burden and allowances.

Public funds collected mainly through taxation are very complex and forceful financial categories in the process of public spending. When used as means of intervention, public spending may influence supply and demand, savings and investments, as well as economic equilibrium. As a financial lever, public spending is able to induce sustainable effects in the economy through economic stabilisers, strongly influencing economic decisions and behaviour. Therefore, the structure of the public spending system and the share allotted for education and research and development can be considered as one of the main determinants of economic development.

Welfare is a matter of concern for the government and politicians as decision makers, for the economic and social analysts that consider the determinants of welfare - looking upon it in an objective manner as well as for individuals that are most concerned about their own living standard (and having a subjective opinion on this issue). The methods used for assessing welfare follow the dual aspects of welfare (subjectivity and objectivity). Moreover, there are compound indicators such as human resource development indicators which seem to be balanced enough as to represent the semantic centre of the structure (Cohen, 2004).

Nevertheless, the welfare indicators may be fairly different for each group of European member states.

The present paper extends the literature that concerns the determinants of welfare. Starting from the fact that education and lifelong learning are the key determinants of a sustainable development alongside with R&D expenditures and are reflected in the level of employment, *ceteris paribus*, an empirical analysis is developed in order to reflect the causal relationship between welfare and its determinants. The authors decided to rely on these statements in order to select the welfare determinants.

Based on this understanding, the goal of the paper is to assess the relationship between Human Development Index – composite indicator that quantifies the welfare state and employment rate, research and development expenditure, participation rates in education and corruption, through a regressive “pool data” model.

The rest of the paper is organised as follows: Section 2 provides a literature review dealing with the welfare assessment. Section 3 provides an empirical data for the welfare sub-models is proposed. Section 4 presents the methodology. The results and discussion are presented in Section 5. The last section contains a short conclusion.

2. Literature review

The research results are based on well known contributions to assess the determinants of welfare. Starting with the paper of Esping-Andreson (1990) who introduced the three main types of welfare states (liberal, corporatist and social-democratic), Crafts (1997) analyzes the capacity of HDI of better measuring the welfare. Further, Bargain and Spadaro (2008) have applied the Esping-Anderson model in order to assess the degree of deco modification of seven European welfare systems. Socol et al. (2010) used the same model in order to assess the fiscal sustainability and social cohesion in EU sub-models.

Binder and Georgiadis (2011) have studied the economic development in a panel of 84 countries from 1970 to 2005, being focused on characterizing heterogeneities in the development effects of macroeconomic policies and on comparing the development process as measured by GDP to that measured by the Human Development Index (HDI).

Mutaşcu and Dănuleşiu (2010) used a regressive “pool data” model in order to estimate the relationship between the degree of wealth – as measured by the HDI, and the corruption in the EU-27. Based on estimates, they conclude that the limitation of corruption’s phenomena has the result of increasing of social welfare (maximizing HDI index).

Other models consider panel data to assess the influence of certain independent variables on welfare. For example, Mellens (1999) analysed the way determinants such as fertility, migration, etc. can be considered as socio economic characteristics for different European countries and Cohen (2004) consider the correlation between the human development and other variables like: the life expectancy, infancy survival rate, literacy, income, etc. Assar’s paper (1996) deals with the problem of full employment and its influences on the welfare state. Corrado (2006) estimates the US unemployment and welfare, in a structural VAR, using panel data.

3. Empirical data for the welfare sub-models

The literature concerning the welfare state describes three types of models, according to Esping-Anderson (1990, pp. 21-27): *a*) the liberal model which is focused on the individual needs, offering social benefits when market failure occurs (UK and Ireland); *b*) the corporate model, referring to the degree of participation on the labour market, the intervention of the government occurring only when the households have exhausted all means of self support (Germany, France, Belgium, Austria, Netherlands and Luxembourg); *c*) the social democratic model - taxpayers contribute supporting the welfare state while the high level of social services is provided to ensure the living standard (Norway, Denmark, Sweden, Finland and Iceland).

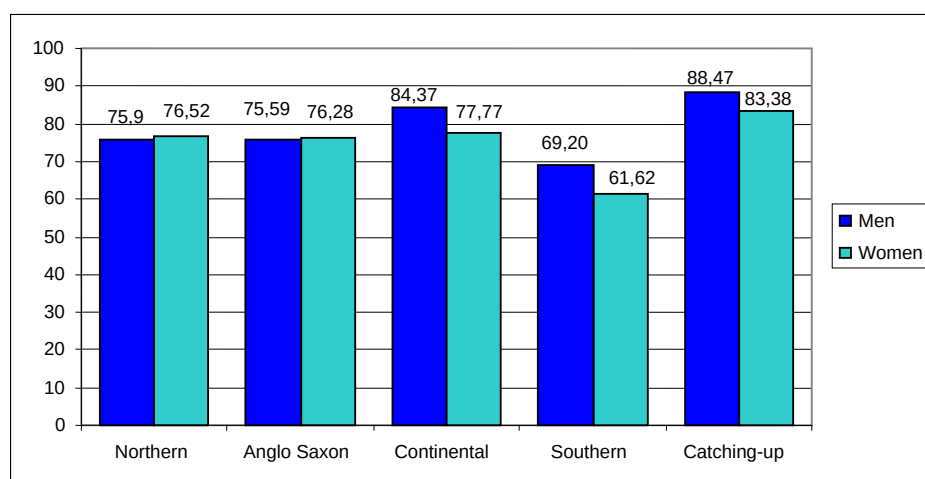
Besides the three models within the EU, other two models prevail: the Southern model (Greece, Italy, Spain, Portugal, Malta and Cyprus) and Eastern European countries model, called “Catching-up” model, including the new European member states.

Irrespective of the social model that is involved, the investment in human capital and human capital development (HDI) are effective tools in enhancing overall welfare.

a. Unemployment vs. education degree

Based on the idea that education and lifelong learning are the key factors of a sustainable development, the authors consider that the unemployment rate is an important indicator embedding both social and economic dimensions. Education and qualification are considered to be the best insurance against unemployment, its rate being the highest among lower educated individuals. The analyses of education indicators show a fairly wide range of education time frame that proves to be inconsistent with the expected number of education actual years (i.e. in the Anglo-Saxon sub-model, the expected number of years for education is 17.4 while the actual number of years is 11.3).

Given that education is one of the most important determinants of sustainable economic development, the unemployment rate may be considered as a proxy incorporating both social and economic elements. As Figure 4 shows, in the Continental sub-model, among those who have benefited at least of a secondary education, the unemployment rate is the lowest (6.4% in 2012). Buiter (1995) supports this idea, by showing that an increase of the unemployment rate is three folded: it means a loss of income for households, an increase of the social cost of welfare and a reduction of public revenue.



Source: Human Development Index (2011).

Figure 3. Population graduating secondary education in the European sub-models (2010)

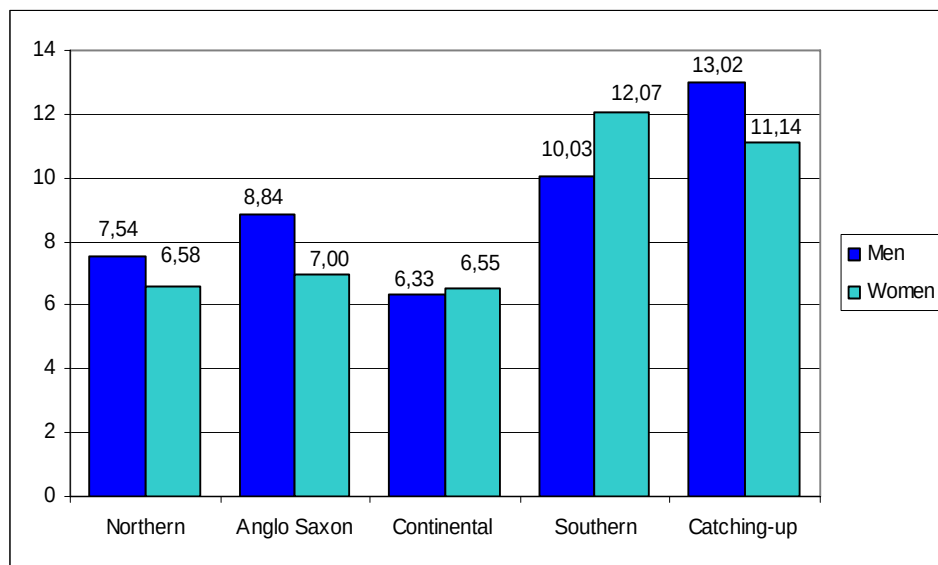
This evidence is contradicted by the Catching-up sub model (Figure 3), where, despite the fact that the level of education is among the highest (85.93% of the population), the unemployment rate is also one of the highest (12.8%). It can be explained by the fact that the competences acquired at graduation do not meet the labour market requirements. The overall unemployment rate is shown in Figure 4.

The aspects mentioned above support the idea that, from economic point of view, sustainable welfare means: employment, limited welfare support, education enhancement, social capital.

b. A comparative analyses between GDP per capita (current US\$) and HDI

The GDP is often used as main aggregate indicator in assessing the economic development and welfare. Nevertheless, the debates concerning the capacity of the GDP to reflect the level of welfare show that this aggregate indicator does not include a number of variables, for example the quality of goods, the purchase of low quality commodities meaning

an artificial increase of GDP, when, actually it, often, leads to waste. In the same manner, the improvement of quality, or the production of new, innovative goods, lowering prices of computers, environmental cleanliness, improved medical healthcare, etc. though enhancing welfare, are not quantified in the GDP.

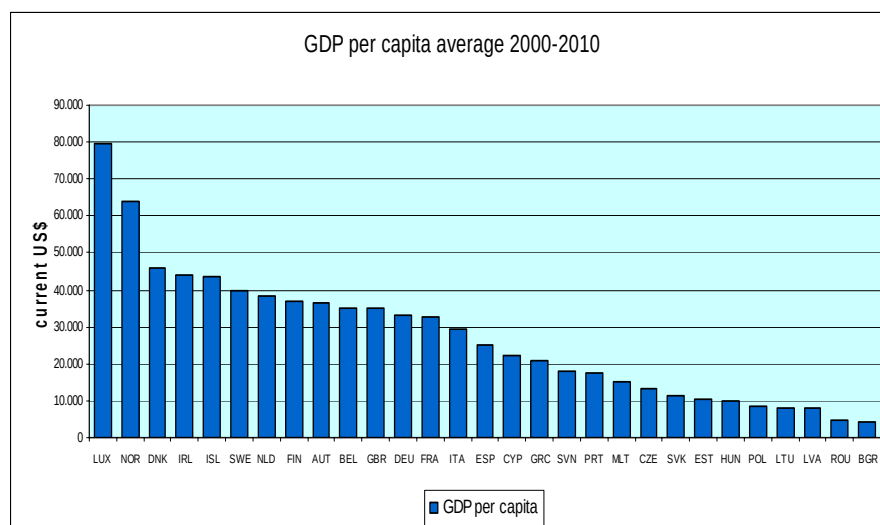


Source: Eurostat and Human Development Report 2011.

Figure 4. Unemployment rate in the European sub-models (2010)

Therefore, it can be stated that the GDP is a conventional monetary measure for the living standard, aggregating all the activities but not their contribution to welfare, thus other methods being recommended. The authors consider the Human Development Index (HDI), as a compound indicator that includes life expectancy at birth, education (measured by average years of education and expected years of education) and living standards (measured by gross national income per capita).

Starting from these considerations, the authors developed comparative analyses of GDP per capita and HDI for the European countries in order to identify the position of each country during 2000-2010, according to each approach.



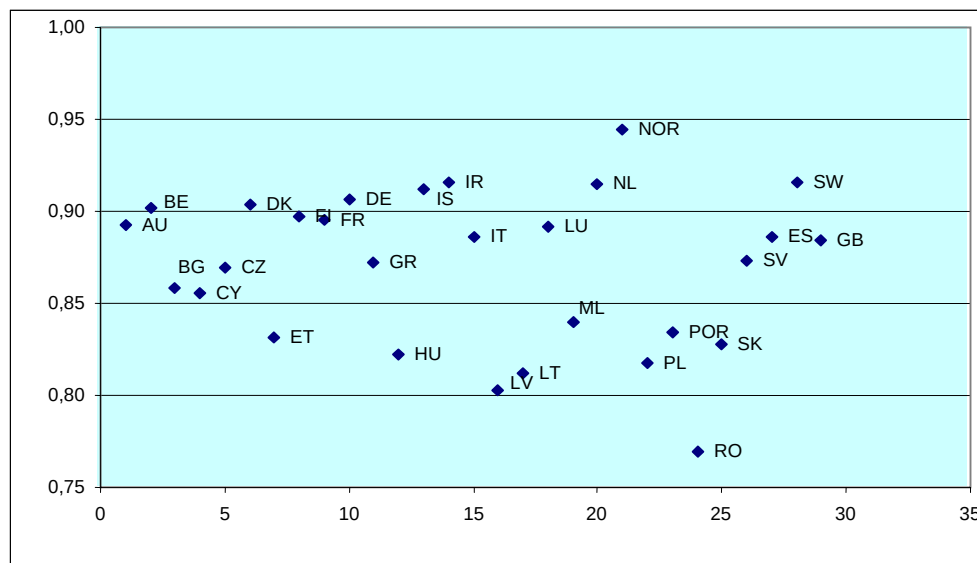
*The GDP per capita is computed as the average statistical values for 2000-2010, in EU, Norway and Iceland.

Source: authors calculation based on the World Bank database.

Figure 5. The average GDP per capita (current US\$) in EU during 2000-2010

The welfare measured by the GDP per capita (current US\$) is shown in Figure 5. The Eastern European countries recorded the lowest values of the indicator, during 2000-2010. On the other hand, the most developed countries recorded high values for the GDP per capita, during the same time frame. This means that, despite the higher rate of growth in the Catching up countries, it is obvious that the level of living standard and welfare are lower than in the old European member states.

The HDI (Figure 6) shows the catching-up group of countries being at the lower level of the graph, while the old member states, despite experiencing lower GDP growth show a higher living standard and welfare. Among these countries, Norway has the highest level of welfare (0.94) while Romania has the lowest level according to HDI (0.77).



* Human development level during 2000-2010, in EU, Norway and Iceland.

Source: Authors calculation based on the UNPD reports 2002-2011.

Figure 6. Average HDI in EU during 2000-2010

The performance of the Northern countries is supported by the quality of the labour force, the high amounts allotted for innovative research and development (3.92% of the GDP in Finland, as compared to the average EU 1.92%). In addition, these countries encounter a better quality of health care resulting in a higher life expectancy at birth.

3. Methodology and data

In the context of the European social model, the aim of the study is to assess the relationship between Human Development Index (HDI) - composite indicator that quantifies the welfare state and four independent variables which emphasizes the socio - economic characteristics of different welfare states existing within the European Social Model.

In order to eliminate the “scale effect” and to identify the distinctive characteristics of each area, as accurately as possible, countries were grouped according to the Esping-Anderson model and highlighting the common feature of each sub-model (SM): Northern (Denmark, Finland, Iceland, Sweden, Norway), Continental (Germany, France, Luxembourg, Netherlands, Austria, Belgium), Anglo-Saxon (Great Britain, Ireland), Southern (Italy, Greece, Spain, Portugal, Cyprus, Malta) and Catching-up (Bulgaria, Romania, Czech Republic, Hungary, Slovakia, Slovenia, Poland, Estonia, Lithuania, Latvia).

To highlight the economic and social dimensions of welfare of each sub-model, the Human Development Index (HDI) is considered as dependent variable. On the other hand, the independent variables considered are as follows:

- (i) Employment rate (as ETP);

- (ii) Research and development expenditure (% GDP) (as RDE);
- (iii) Participation rates in education (% population) (as EDUC);
- (iv) Corruption Perceptions Index (as CPI).

The dataset includes annual series for 29 countries, EU-27 plus Norway and Iceland, covering the 2000–2010 time frame. The data sources are basic indicators of World Bank and Human Development Report.

As the main hypothesis, the authors considers that the employment rate, the research and development expenditure, the participation rates in education and the corruption, influence the level of HDI, the basic equation being:

$$\text{HDI} = f(\text{ETP}, \text{RDE}, \text{EDUC}, \text{CPI}) \quad (1)$$

The methodology used to test the impact of independent variables is the regression estimate of the “pool-data” in E-Views 6.0, Pooled Least Squares method, for each sub-model. The difference between a pool-data regression and cross-sectional regression is represented by the double index of its variables (Baltagi, 2008). The literature distinguishes models with fixed effects (FE) and random effects (RE).

In order to decide which is the most appropriate model – the RE or FE model, the alternative that could be pursued is (a) to perform various tests, considering the associated information model criteria and the economic context; (b) but, if observations can’t be considered as random based on a large enough sample (e.g. when making analysis at the level of sub-groups, provinces) it is desirable to use a FE model (Wooldridge, 2002). Thus, for the model with fixed effects the method of least squares is to be considered.

The estimable equation for empirical evidence is being modelled as following:

$$y_{it} = \alpha + X'_{it} \times \beta + \delta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

Where, y_{it} is dependent variable, X_{it} is independent variables vector, β is dependent variable coefficient, α is intercept, δ is parameter effect (fixed or random) for “sections”, γ is parameter effect (fixed or random), ε_{it} is random variable, i is number of „sections” and t is number of periods.

The OLS pool-data model is:

$$\text{HDI}_{it} = \alpha + \beta_0 \times \text{ETP}_{it} + \beta_1 \times \text{RDE}_{it} + \beta_2 \times \text{EDUC}_{it} + \beta_3 \times \text{CPI}_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (3)$$

In order to facilitate the econometric analysis the authors proceeded to the normalization procedure of the variables, by applying the Fuzzy method, to place the data in the range 0-1. The equations considered for the Fuzzy model are as follows:

$$\text{“+” influence of the independent variable (X)} \implies X_t^n = \frac{X_t - X_{\min_{t-k+1 \dots t}} \{X_i\}}{X_{\max_{t-k+1 \dots t}} \{X_i\} - X_{\min_{t-k+1 \dots t}} \{X_i\}} \quad (4)$$

$$\text{“-” influence of the independent variable (X)} \implies X_t^n = \frac{X_{\max_{t-k+1 \dots t}} \{X_i\} - X_t}{X_{\max_{t-k+1 \dots t}} \{X_i\} - X_{\min_{t-k+1 \dots t}} \{X_i\}} \quad (5)$$

Based on whole theoretical acquisition, the hypotheses are:

The level of welfare is growing as: the intensity of the employment rate, the intensity of research and development expenditure (as % in GDP), the intensity of the participation rates in education are increasing and the intensity of corruption is decreasing. In summary, the authors estimate the Fuzzy model for each variable, according to the hypotheses.

Using normalized data, the “pool date” regression was performed for each of the five sub-models of the European social model. The stationary series were verified by applying the Unit Root test – the Augmented Dickey-Fuller (ADF) method. The results show that the probability associated with this test tends to 0.0.

In order to test the quality of the models, the following quality tests are used:

- (i) The coefficient of determination R-Squared (the dependent variable variance is influenced by the actions of the independent variables);
- (ii) Durbin-Watson test - to detect the presence of autocorrelation.

4. Results and discussion

The most important empirical results show that all variables are significant for the dependent variable HDI in each scenario. The results of ADF indicate that the probability for the series to be non-stationary is very low and the series are stationary at their 1st differenced form. The null hypothesis is rejected, so the series are stationary.

Table 1 shows the descriptive statistics. The results indicate that all series are normally distributed, as confirmed by Jarque-Bera estimates. The negative values for the skewness indicate that data are skewed left for HDI and RDE. On the other hand, ETP, RDE and CPI display positive values for the skewness indicating that they are skewed right. The Kurtosis is greater than 3 only for the EDUC, considering that for a normal distribution asset, its kurtosis equals 3. This means that the distributions have positive excess kurtosis, called leptokurtic distributions - high probability in the future to have high positive or negative returns. For the other variables, the kurtosis is lower than 3, which means that the distribution is flatter than a normal distribution with a wider peak. This implies that the probability for extreme values is less than for a normal distribution, and the values are wider spread around the mean.

Table 1

Descriptive statistics

Variables	HDI	ETP	RDE	EDUC	CPI
Mean	0.636195	0.617843	0.329761	0.615575	0.473242
Median	0.643939	0.592661	0.314789	0.691643	0.452055
Std. Deviation	0.197693	0.130450	0.232189	0.255994	0.301994
Skewness	-0.360835	0.761133	0.489937	-0.774159	0.545919
Kurtosis	1.771436	1.811534	2.658649	3.438479	2.335409
Jarque-Bera	5.974955	23.52709	13.14220	24.17889	11.21853
Probability	0.050414	0.000008	0.001400	0.000006	0.003664

Regression results for the Northern sub-model. The coefficients' sign of the independent variables reveals the nature of the link between the dependent variable and the independent one. Thus, the estimates performed (Table 2) indicate that ETP variable show a positive effect on the HDI, for all countries except Norway, given that the Northern welfare model is supported by active labour market policies. Further, the results estimate a backwards connection between the welfare indicator and the RDE, in the case of Finland. This estimating result can be considered surprising, but the explanation lies in the fact that these countries have made significant investments in research and innovation. Thus, the allocation in R&D induces an effect on welfare that is to be noticed in 10-20 years time. For all the other countries the coefficients sign reveal a positive relation between HDI and RDE. The results regarding EDUC reveal that the independent variable has a positive impact on HDI in the Northern sub-model, except Denmark and Finland. CPI has a negative coefficient for Finland, Norway and Sweden, while for Denmark and Island the coefficients show a direct influence.

Table 2

Regression results for the Northern sub-model

Dependent variable: Independent variable	HDI	Model OLS AR (1)	
ETP_11_DNK	8.003882*** [0.240060]	EDUC_11_DNK	-1.548440*** [0.011801]
ETP_11_FIN	3.038727*** [0.059480]	EDUC_11_FIN	-2.086053*** [0.049336]
ETP_11_ISL	0.492372*** [0.002437]	EDUC_11_ISL	0.872813*** [0.001903]
ETP_11_NOR	-0.123948*** [0.000703]	EDUC_11_NOR	0.088108*** [0.002230]
ETP_11_SWE	0.043794*** [0.021401]	EDUC_11_SWE	0.354847*** [0.019658]
RDE_11_DNK	1.808396*** [0.001599]	CPI_11_DNK	18.58685*** [0.821798]
RDE_11_FIN	-0.168000*** [0.000240]	CPI_11_FIN	-5.419700*** [0.010937]
RDE_11_ISL	0.287610*** [0.003420]	CPI_11_ISL	2.229377*** [0.007276]
RDE_11_NOR	0.064167*** [0.000293]	CPI_11_NOR	-0.248795*** [0.010265]
RDE_11_SWE	3.117636*** [0.056628]	CPI_11_SWE	-9.897095*** [0.781475]
R-squared	0.903537		
F-statistic	5.245344 (0.00001143)		
Durbin-Watson stat	2.430980		

a) Squared brackets, [. . .], denote the Std. Error.

b) Parentheses, (. . .), indicate the attached probability of F-statistic.

c) ***, **, and * denote significance at 1, 5 and 10 % levels of significance, respectively.

The R-Squared coefficient estimates a high value, which supports the validity of the model; this highlights the fact that 90.35% of the HDI variation can be explained by the influence exerted by the independent variables. But, specific to the "pool-data" regressions, the Durbin-Watson test indicates some autocorrelation (2.43) of the existing residual variables, which does not impede on the overall quality of the model.

Regression results for the Southern sub-model. The regression results (Table 3) show that the ETP variable indicates a negative coefficient for all the southern countries, except Cyprus. Continuing, the estimates of RDE variable negatively affect the HDI in the case of Cyprus, Greece, Malta and Portugal. The estimates for EDUC variable strengthen the direct link that exists between education and welfare, in all countries except Spain and Italy. Finally, CPI indicates a negative coefficient for Cyprus, Spain and Italy, while for Malta and Portugal the coefficients sign is positive. Also, the coefficient of determination R-Squared recorded a high value (0.6187) which supports the regression validity. In addition, the Durbin – Watson test (2.12) does not indicate any auto-correlation of the residual variables, defining the model as qualitative.

Table 3

Regression results for the Southern sub-model

Dependent variable: Independent variable	HDI	Model OLS AR(1)	
ETP_11_CYP	2.186173*** [0.046609]	EDUC_11_CYP	0.997977*** [0.000788]
ETP_11_GRC	-1.064908*** [0.004817]	EDUC_11_GRC	0.034377*** [0.005077]
ETP_11_ITA	-1.077779*** [0.020800]	EDUC_11_ITA	-3.027892*** [0.029018]
ETP_11_MLT	-4.980242*** [0.025730]	EDUC_11_MLT	0.312019*** [0.003958]
ETP_11_PRT	-0.531731*** [0.005873]	EDUC_11_PRT	1.148034*** [0.007940]
ETP_11_ESP	-1.768190*** [0.013458]	EDUC_11_ESP	-0.323013*** [0.003417]
RDE_11_CYP	-15.25793*** [0.074076]	CPI_11_CYP	-0.206162*** [0.003559]
RDE_11_GRC	-55.13329*** [0.739066]	CPI_11_GRC	2.745820*** [0.038264]
RDE_11_ITA	14.79518*** [0.158181]	CPI_11_ITA	-5.709959*** [0.158809]
RDE_11_MLT	-0.132165*** [0.005821]	CPI_11_MLT	0.250732*** [0.001213]
RDE_11_PRT	-3.626505*** [0.001977]	CPI_11_PRT	2.970491*** [0.052047]
RDE_11_ESP	0.063314*** [0.011417]	CPI_11_ESP	-0.829494*** [0.010938]
R-squared	0.618684		
F-statistic	1.243916 (0.000000)		
Durbin-Watson stat	2.122450		

a) Squared brackets, [. . .], denote the Std. Error;

b) Parentheses, (. . .), indicate the attached probability of F-statistic;

c) ***, **, and * denote significance at 1, 5 and 10 % levels of significance, respectively.

Regression results for the Continental sub-model. The results for the ETP variable highlight a positive connection between ETP and HDI, for all the countries, except Belgium, where a reverse relationship can be noticed. Also, for Belgium and the Netherlands the allocation for R&D positively influences HDI, while in the other four countries the relation is reversed. The sign of the EDUC coefficients shows a positive relation with the dependent variable HDI, except Belgium and the Netherlands, for which the coefficients are negative. Finally, CPI indicates a negative coefficient only for Luxembourg and the Netherlands, while for all the other countries the coefficients sign is positive.

The R-Squared determination coefficient estimates a high value, which asserts the validity of the considered model and highlights the fact that 61.11% of the HDI variation might be explained by the influence exerted by the independent variables. In addition, Durbin – Watson test does not indicate some autocorrelation of the residual variables, results that claim the model quality.

Table 4

Regression results for the Continental sub-model

Dependent variable: Independent variable	HDI	Model OLS AR(1)	
ETP_11_AUT	0.045322*** [0.000734]	EDUC_11_AUT	0.053821*** [0.016927]
ETP_11_BEL	-2.491508*** [0.291825]	EDUC_11_BEL	-0.524130*** [0.040030]
ETP_11_FRA	12.89877*** [0.613269]	EDUC_11_FRA	6.482252*** [0.403691]
ETP_11_DEU	1.432907*** [0.003260]	EDUC_11_DEU	0.705746*** [0.002164]
ETP_11_LUX	0.138620*** [0.005106]	EDUC_11_LUX	0.887470*** [0.039930]
ETP_11_NDL	0.446811*** [0.070192]	EDUC_11_NDL	-0.873863*** [0.071572]
RDE_11_AUT	-1.181523*** [0.004321]	CPI_11_AUT	1.504710*** [0.020652]
RDE_11_BEL	0.308950*** [0.009282]	CPI_11_BEL	0.304921* [0.200302]
RDE_11_FRA	-0.177905*** [0.020306]	CPI_11_FRA	4.605083*** [0.066822]
RDE_11_DEU	-1.120341*** [0.001663]	CPI_11_DEU	1.095776*** [0.002889]
RDE_11_LUX	-0.315315*** [0.003618]	CPI_11_LUX	-2.565573*** [0.002889]
RDE_11_NDL	0.806496*** [0.258423]	CPI_11_NDL	-3.413674*** [1.078880]
R-squared	0.611159		
F-statistic	20.09233 (0.000004)		
Durbin-Watson stat	2.318408		

a) Squared brackets, [. . .], denote the Std. Error;

b) Parentheses, (. . .), indicate the attached probability of F-statistic;

c) ***, **, and * denote significance at 1, 5 and 10 % levels of significance, respectively.

The regression results for the Anglo-Saxon sub-model (Table 5) estimates a positive influence of the RDE on HDI, while the CPI variable coefficients reveal a reverse relationship to HDI dependent variable. For the case of Ireland, the coefficients' sign is positive for ETP and EDUC. By contrary, the coefficients for Great Britain indicate a negative relationship of ETP and EDUC on the dependent variable HDI. Considering the nature of the connection existing between the independent variables and HDI, the authors emphasise that for the Anglo-Saxon sub-model the possible number of observations considered for the regression is low, which may affect the results. Nevertheless, the results show a high R-Squared coefficient of determination, which proves the validity of the model. This statement is supported by the Durbin – Watson test, which indicates no autocorrelation of the residual variables.

Table 5

Regression results for the Anglo-Saxon sub-model

Dependent variable: Independent variable	HDI	Model OLS	
ETP_11_GBR	-8.15007*** [0.58709]	EDUC_11_GBR	-8.20007*** [0.27808]
ETP_11_IRL	5.46006*** [0.19608]	EDUC_11_IRL	1.28806*** [0.25108]
RDE_11_GBR	1.97116*** [0.17408]	CPI_11_GBR	-5.60107*** [0.80808]
RDE_11_IRL	6.63117*** [0.30608]	CPI_11_IRL	-9.14406*** [0.12607]
R-squared	0.751186		
F-statistic	11.49607 (0.003814)		
Durbin-Watson stat	2.026277		

a) Squared brackets, [. . .], denote the Std. Error;

b) Parentheses, (. .), indicate the attached probability of F-statistic;

c) ***, **, and * denote significance at 1, 5 and 10 % levels of significance, respectively.

Regression results for the Catching-up sub-model. The coefficient sign of the ETP variable highlights an indirect relationship between ETP and HDI (Table 6), for the sub-model countries, except Bulgaria, Latvia, Lithuania and Poland. Yet, the RDE coefficients record positive values for Bulgaria, Hungary, Romania and Slovenia, while for the remaining countries it has a negative value. EDUC variable positively influences the evolution of HDI, except the Hungary, Lithuania and Poland, where the results show an inverse relationship. Finally, the negative sign of the CPI coefficients estimates an indirect relationship to HDI, except Estonia, Hungary and Poland.

The R-Squared coefficient confirms the validity of the considered model, 48.63% of the HDI variation being explained by the influence of the independent variables. Furthermore, the Durbin - Watson test shows a positive autocorrelation existing for the residual variables, but the result (2.42) does not present a significant autocorrelation of the residuals, which does validate the quality of the model.

Table 6

Regression results for the Catching-up sub-model

Dependent variable: Independent variable	HDI	Model OLS	
ETP_11_BGR	0.396847*** [0.27914]	EDUC_11_BGR	0.095615*** [0.11814]
ETP_11_CZE	-0.686883*** [0.20514]	EDUC_11_CZE	2.452694*** [0.76314]
ETP_11_EST	-0.087839*** [0.48614]	EDUC_11_EST	0.154331*** [0.39714]
ETP_11_HUN	-0.072280*** [0.53316]	EDUC_11_HUN	-0.727220*** [0.18414]
ETP_11_LVA	0.152565*** [0.58215]	EDUC_11_LVA	0.027647*** [0.27714]
ETP_11_LTU	0.130916*** [0.37414]	EDUC_11_LTU	-0.158403*** [0.11314]
ETP_11_POL	0.169272*** [0.24115]	EDUC_11_POL	-0.189051*** [0.82116]
ETP_11_ROU	-0.248844*** [0.28915]	EDUC_11_ROU	0.436386*** [0.28515]

Dependent variable: Independent variable	HDI	Model OLS	
ETP_11_SVK	-0.085169*** [0.64915]	EDUC_11_SVK	0.093491*** [0.48915]
ETP_11_SVN	-4.608650*** [0.29413]	EDUC_11_SVN	0.126969*** [0.24216]
RDE_11_BGR	0.482533*** [0.34214]	CPI_11_BGR	-1.872238*** [0.18413]
RDE_11_CZE	-8.555671*** [0.54213]	CPI_11_CZE	-1.545230*** [0.15613]
RDE_11_EST	-0.423701*** [0.56714]	CPI_11_EST	0.163207*** [0.60714]
RDE_11_HUN	2.530971*** [0.14413]	CPI_11_HUN	3.600948*** [0.20413]
RDE_11_LVA	-1.009340*** [0.49813]	CPI_11_LVA	-0.577585*** [0.18213]
RDE_11_LTU	-0.270646*** [0.16213]	CPI_11_LTU	-1.064323*** [0.58813]
RDE_11_POL	-3.223093*** [0.43314]	CPI_11_POL	0.569472*** [0.34014]
RDE_11_ROU	0.490093*** [0.26215]	CPI_11_ROU	-0.272736*** [0.25216]
RDE_11_SVK	-0.132476*** [0.14113]	CPI_11_SVK	-0.837037*** [0.55514]
RDE_11_SVN	0.638847*** [0.94115]	CPI_11_SVN	-0.966837*** [0.11413]
R-squared	0.486358		
F-statistic	86.57261 (0.000000)		
Durbin-Watson stat	2.423184		

a) Squared brackets, [. . .], denote the Std. Error;

b) Parentheses, (. . .), indicate the attached probability of F-statistic;

c) ***, **, and * denote significance at 1, 5 and 10 % levels of significance, respectively.

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VULNERABILITIES OF THE EUROPEAN VERSUS ROMANIAN TAX SYSTEM

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Abstract. *The scientific approach of the authors aims at identifying the vulnerabilities of the European versus the Romanian tax system. Large differences in taxation across countries are explained, through different levels of economic development and policies promoted by public authorities. Taxation rate depends on the economic development potential of the states and on the financial effort requested by achieving economic and social objectives that find their refinancing consolidated in the budget. If practiced tax exceeds a taxpayer's ability to pay whether we talk about individuals or businesses, this will result in adverse effects and negatively influence the economic growth rate.*

Keywords: vulnerabilities; tax system; fiscal policy.

JEL Classification: H00, H20, O10.

REL Classification: 13Z.

Introduction

Romanian fiscal system, as well as the EU's tax system, faces major flaws mainly due to the effects of the economic crisis. Shortage of public funding has led to the implementation of budgetary austerity measures, through cutting spending in most European countries and by amending certain categories of taxes. These measures were taken mainly in order to increase budgetary resources. Though, the tax collection efficiency ratio dropped and tax evasion increased.

In this scientific approach, the authors highlight the deficiencies of the two tax systems, the development of several categories of taxes in EU Member States, and the changes produced in the EU and the Romanian tax system. Research findings show the personal opinions of the authors on the European and Romanian tax system vulnerabilities.

Literature review

As Charles Louis Montesquieu argued, tax is "a portion of his property that every citizen gives up in order that his tenure of the rest may be more secure" (MacFarlane, p. 41).

Over time, there have been several changes both in the structure and level of taxes, as well as in the imposition and collection process.

In the aftermath, "after the First World War, and especially during the global economic crisis between 1929-1933, unions and leftist political forces campaigned for public participation in financing growing public expenditure, in relation to the contributive capacity of each social group, to ease the tax burden on the shoulders of workers" (Văcărel, 2007). Tax issues, have been in the attention of many economists. In the opinion of Jeze (1936), taxes are considering "fiscal burden sharing between individuals.

Later, in the '60s and after that, most economists, followers of modern liberal doctrine, claimed for the withdrawal of the state from the economic activity, not using taxes as a tool for intervention in the economy, replacing progressive taxation of personal income with proportional taxation and reducing tax rates.

One of the most outstanding representatives of classical political economy in the eighteenth century and the first quarter of the nineteenth century, Smith (1962), argued in his remarkable work "The Wealth of Nations" that "the fiscal policy of the state should be based on several principles such as: the equity of taxation, certainty of taxation, convenience of taxation and the principle of tax efficiency. Normally, each newly introduced tax must satisfy the requirements of equity, financial, economic and social policy."

French economist Lalumiere (1970) emphasized that "taxes can be used to encourage or discourage certain economic activities".

Richard A. Musgrave is among those economists who attribute great importance to the requirements formulated by Smith (1962), in order to insure a good tax structure. In this context, he ranks the following requirement: "fiscal burden sharing should be fair. Each should be determined to correctly pay back his share" as the first one (Musgrave and Musgrave, 1973, p. 193).

Another expert on economics, Bernard (1979), proposed a new taxation system that "must result in a direct annual tax, with variable rates, upon the real value of physical capital and consumer durables."

In fact, in the first decades of the twentieth century, in some countries there was only one income tax, which was applied to both individuals and companies, while in others there were different settlement, adapted to the two categories of taxpayers.

American economists Richard Musgrave and Peggy Musgrave (1984) stated that: "any tax or expense affects economy in several ways, and follows the accomplishment of different objectives".

But the acceptance of taxes by taxpayers involves compliance with certain requirements:

- "tax system and each tax should be simple and transparent, so that the one who pays to know how much he has to pay to the state;
- fiscal authorities can not act as an inquisitor, but to respect the privacy of citizens;
- fiscal system administration costs should be reasonable for the two players involved - the fiscal authorities that collect taxes and the taxpayers that must comply with the laws imposing taxes" (Weber, 1997).

Few realize that "the tax system is a fine device, such as a Swiss watch, with each component working together with another and influencing each other" (Biriş, 2012).

Braşoveanu (2009), Cataramă and Pădurean (2010), Câmpeanu and Padurean (2011), Stoian (2011), Attila (2012), Obreja Braşoveanu (2012), highlight that "the level of taxation depends, on the one hand, on the development of the country and on the other hand, on the effort developed to meet financial, social and environmental objectives, in a time period".

Other authors (Țățu, Șerbănescu, Ștefan, Cataramă, Nica, Miricescu, 2010) show the importance of taxation and also highlight the changes stipulated by the Tax Code, in the tax system, as well as in the level of taxation.

The 21st century recorded major changes in the fiscal policy pursued by the countries of the world, due to the economic crisis.

Modern development of taxes within Europe is marked by removing differences between tax laws of the Member States of the European Community, by the harmonizing of those laws and by the establishment of similar tax procedures subordinate to the Community's fiscal policy.

Therefore, in 1992, through the Maastricht Treaty and after that through the Stability and Growth Pact, Member States have decided to adopt a series of fiscal consolidation packages.

Characteristics of European and Romanian tax system

Fiscal systems are a key factor for influencing the entire economy as a whole. They determine “the trend for saving, investment and working, influencing the increase of production and the decrease of unemployment, which represents an essential element of the economic strategy, making the fiscal reform an important component of the economic reform”(Ciobănașu, Postole, Ganea, 2009).

High levels of taxation in the EU, points out that this is an area with significant taxation, increasing especially in recent years. Moreover, the fees’ level within the European Union is not a novelty. This dates since the latter part of the twentieth century.

If we consider the different levels of economic development of European countries, then the major taxation differences between countries can be explained.

There is no unified approach to fiscal policy at European level, as we speak about both developed countries and developing countries with different development levels. Some countries aimed at encouraging the private system and attracting new investments, either foreign or domestic, (emerging countries) and others aimed at “avoidance or reduction of tax evasion, maintaining existing market investors” (Ciobănașu, Priescu, Postole, Iliescu, 2009).

In 2010, the level of taxes and social contributions in EU Member States reveals a high proportion of these in average GDP (38.4%), above the levels registered in the U.S. and Japan. But, taxes in the European Union increased significantly, not only compared with the two countries, but also with other advanced economies, including major countries outside the EU, like members of the OECD. For example, only in Canada and New Zealand taxes exceed 30% of GDP.

Also, large differences in tax between countries can be explained by the policies promoted by public authorities in relation to population regarding the satisfaction of social needs, to a large extent, from public funds (education, health, social security, culture) or only a partial coverage of these needs, i.e. through a public - private partnership.

Industrialized countries have a greater capacity to finance public objectives than those recording lower levels of development.

The situation is quite different in the developing countries where the level of taxation is slightly lower.

Statistics for 2012 show that the state with the highest tax rate in the EU is Denmark (47.6%), while the lowest tax rate is recorded in Lithuania (27.1%).

European Union statistics follow the development of tax revenues in Member States not only by origin and nature – direct and indirect –, but also by the default character of taxation. From this point of view, taxes are grouped according to the taxable object covered such as employment, consumption and capital.

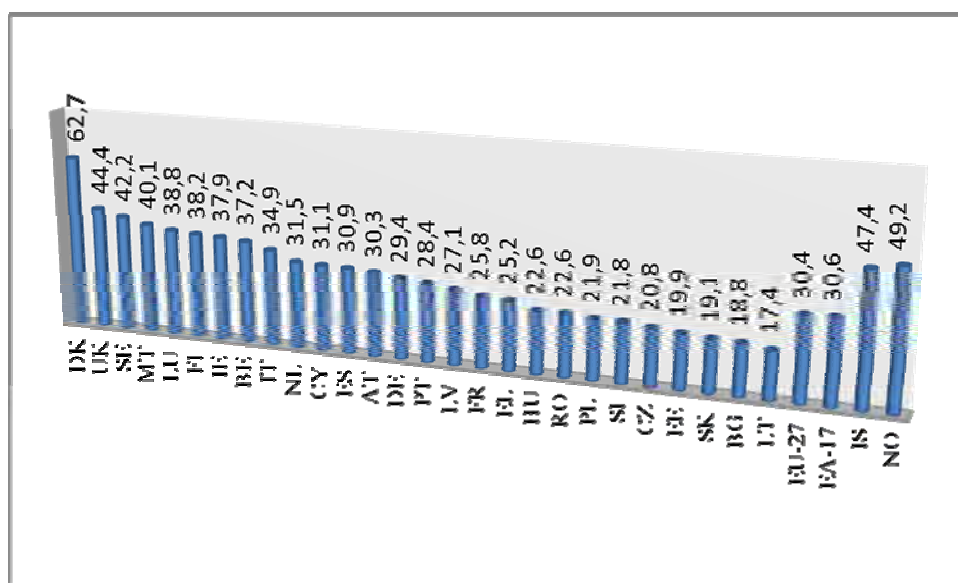
Another category of fiscal liabilities related to work regards income tax, payroll taxes and social contributions. These taxes are incorporated in the category of implicit taxes on labor.

If we consider the importance of consumption, then the taxes levied on the consumption of goods by manufacturers and end users are highlighted as implicit taxes on consumption.

Likewise, taxes on savings and investment income for households and companies and levies targeting accumulated capital from savings and investments of previous periods are marked as default taxes on capital.

”Determined by the constraint exerted by the direct and indirect taxes, tax effects are manifested not only in the economic domain, but also in the legal, psychological domain, as well as in the socio-ecological area, finally affecting all taxpayers, either the natural persons or intentionally” (Postole, Ciobănașu, 2012).

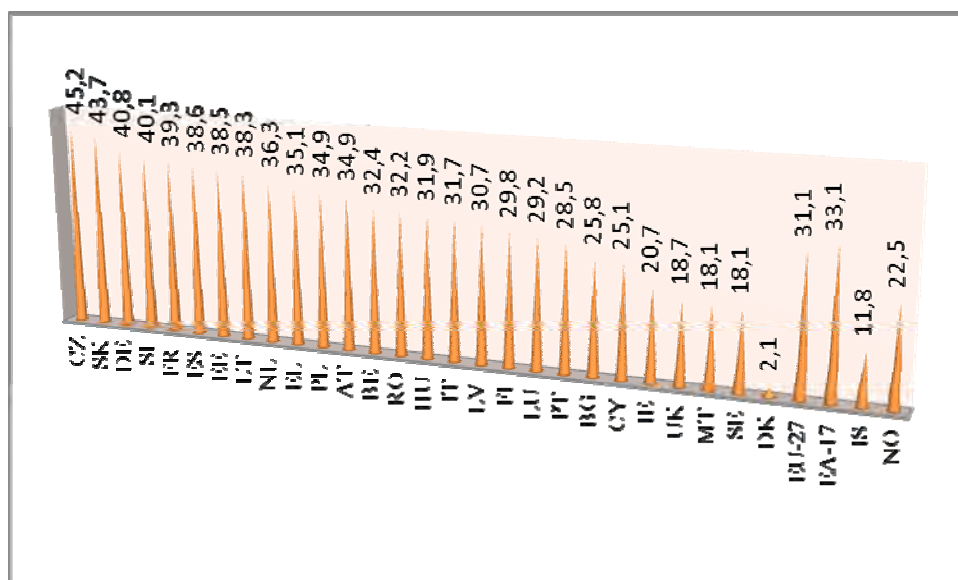
In this context, most of the countries in the EU-15 collect budget revenues from direct, indirect taxes and contributions. With the exception of Malta, members of the NMS-12 (New Member States -12), record a reduced share of direct taxes in total taxes (Figure 1).



Source: Taxation Trends in European Union, Taxation and Customs Union, Eurostat, Statistical Books, European Commission, 2012 edition, p. 25.

Figure 1. Share of direct taxes in total taxes, 2010

The lowest tax collection efficiency ratio is recorded in Lithuania 17.4% (from 31% in 2008), Bulgaria 18.8%, Slovakia 19.1% and Estonia 19.9%. At the opposite pole are the Nordic states Denmark and Sweden, which achieve higher budget revenues from direct taxes collection. Moreover, Denmark is by far the country with the highest share of direct taxes in tax revenues (62.7%). This is due to the fact that the share of social security contributions is relatively low (Figure 2), since a large part of the social benefits is financed by general taxes, which requires a high level of direct taxes.



Source: Taxation Trends in European Union, Taxation and Customs Union, Eurostat, Statistical Books, European Commission, 2012 edition, p. 25.

Figure 2. Share of social security contributions in total taxes, 2010

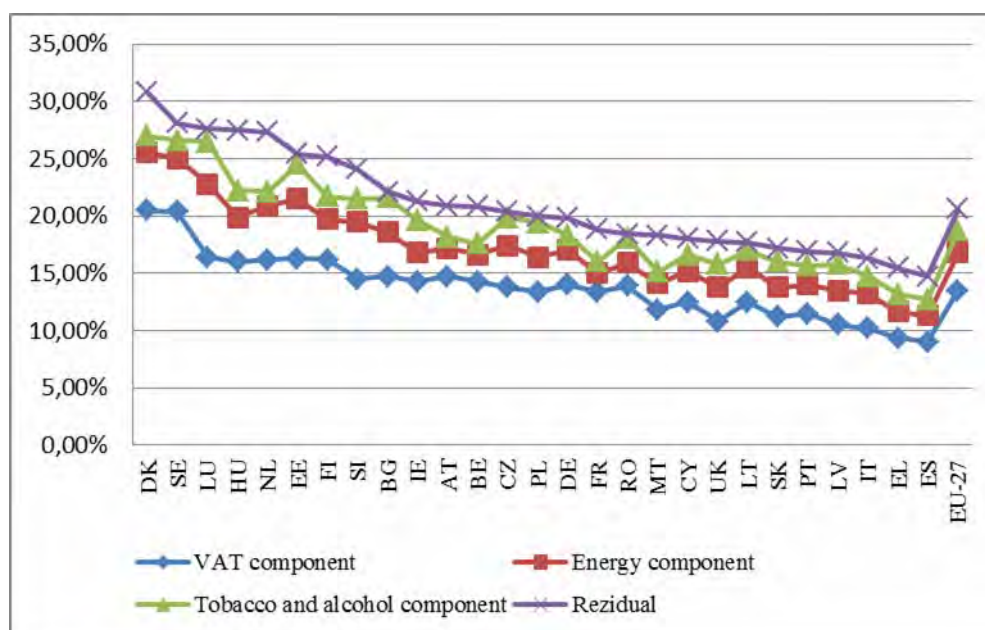
As a consequence of a relatively low level of direct taxation, countries like Germany and France differ significantly from Denmark (see Figure 1).

As we mentioned, budget revenues increased on account of three major categories: consumption, labor and capital.

On average, income taxes account for 50% of total revenues, followed by the consumption taxes, representing one third, and the capital taxes, representing about one fifth. We note that NMS-12 countries tend to have a high share of consumption taxes. A large part of the GDP in the NMS-12 countries is represented by household consumption; lower income taxes in these countries tend to increase the share of taxation on consumption.

Also, the economy of these countries is based intensively on energy and mineral oils, with an important role in consumption taxation.

With the emergence and development of the economic crisis, the effects were drastically felt in the field of consumption taxation. Within EU-27, consumption tax (implicit tax rate - ITR) has faced a significant increase (19.7%), interrupting its decrease recorded in 2007. This may be due to the increase of VAT rate in several EU countries. Standard VAT rates have increased since 2009. Thus, the average of the EU-27 shows an increase of 1.5 points in just four years, reaching about 21% in 2012. Mostly, the VAT (Figure 3) represented, in the year of 2010, the main component of consumption tax (ITR), the other part being represented by excise duties (taxes on energy, mineral oils, tobacco, alcohol) and other indirect taxes.



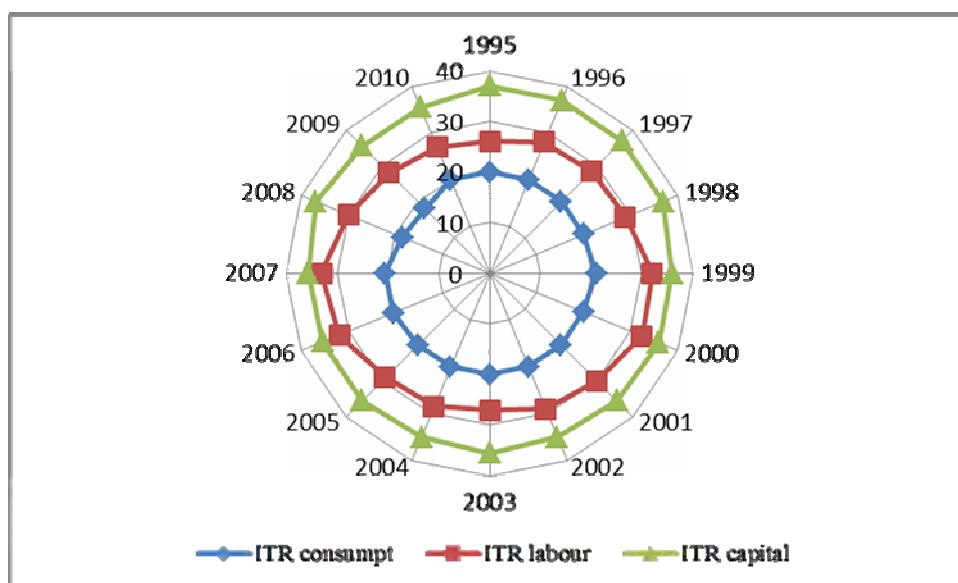
Source: Tax Reforms in EU member states, Tax policy challenges for economic growth and fiscal sustainability working papers, no.34, European Commission, 2012 Report, p. 19.

Figure 3. Decomposition of the ITR on consumption, 2010

For example, in Bulgaria excise duties on alcohol and tobacco have grown nearly five times more than in the Netherlands.

Even though some agreements have been concluded at EU level in order to reduce the tax burden on income, the data available indicates that high tax rates are still paid by the workforce. This confirms the difficulty of attaining the goal of these agreements.

Although the tax burden on labor dropped in 2009, by half a percent from the peak reached in 1990, in 2010 this was around 26% (Figure 4).



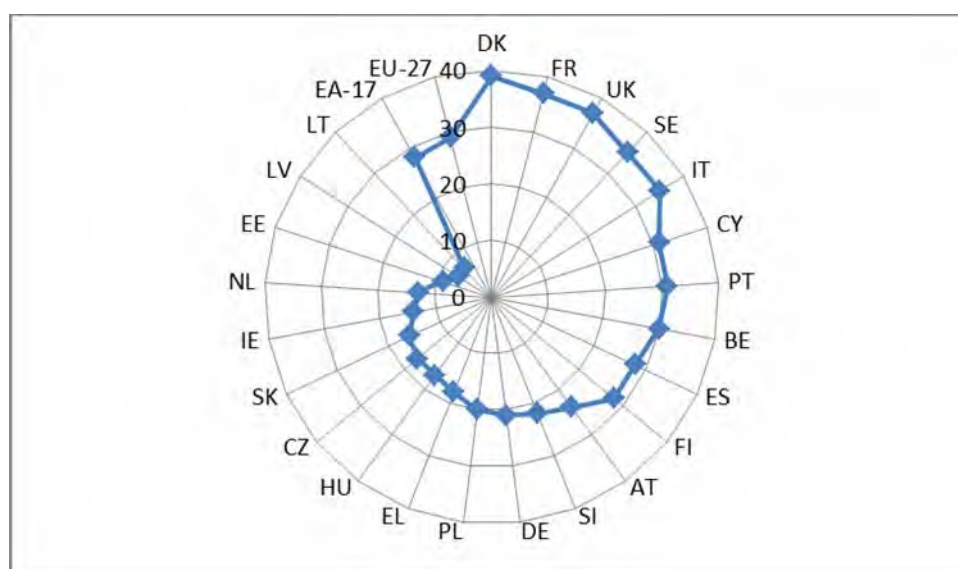
Note: ITR on capital: due to data availability the EU average does not include BG, LU, MT and RO.

Source: Tax reforms in EU member states, Tax policy challenges for economic growth and fiscal sustainability working papers, no.34, European Commission, 2012 Report, p. 19.

Figure 4. Implicit tax rates, EU-27, 1995-2010

Tax burden on labor consists essentially in personal income tax and social security contributions. In most Member States, social security contributions represent a larger share of taxes on labor, than taxes on personal income. Only in Denmark, Ireland and the United Kingdom personal income tax holds a relatively large part of the total taxes on labor. In countries such as Poland, Greece and Slovakia, less than 20% of ITR consists of personal income tax.

Tax on capital experienced a significant decline since 2007. However, it has stabilized in 2010, when the percentage reached 28.8%, with half a percent lower than in 2009 (Figure 5). Moreover, the cyclical effects and the deep cuts in corporate income tax (CIT) affected the ITR's level.



Note: No data available for BG, LU, MT, RO and IS; data for DK, ES and UK refer to 2009.

Source: Tax reforms in EU member states, Tax policy challenges for economic growth and fiscal sustainability working papers, no.34, European Commission, 2012 Report, p. 20.

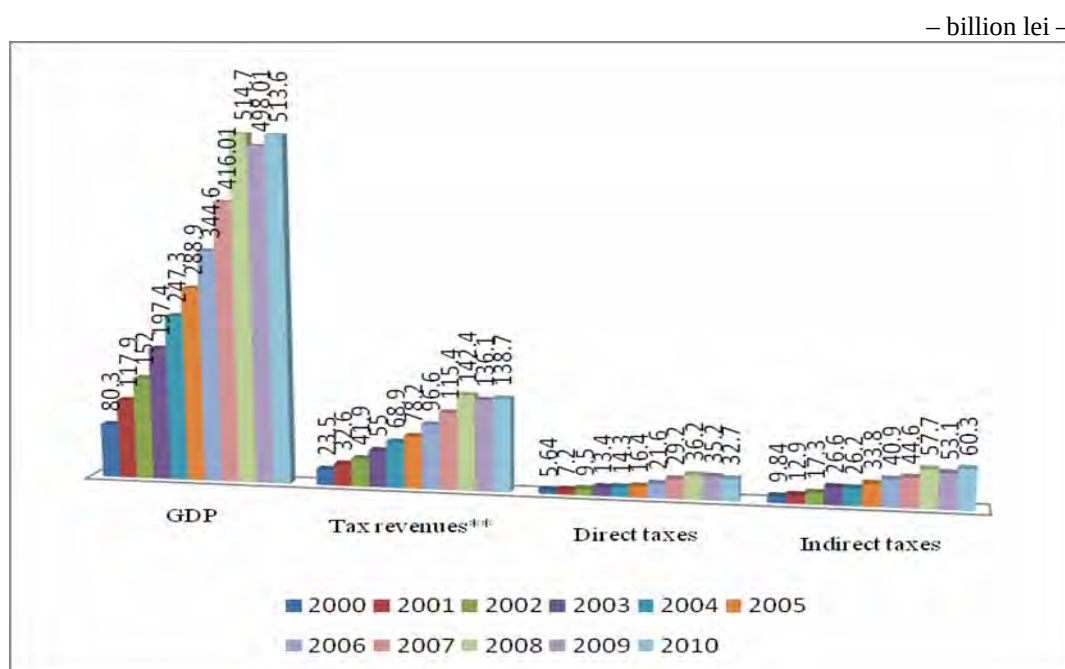
Figure 5. Implicit tax rate on capital, 2010

The level of this indicator varies a lot within the European Union ranging from 39% in Denmark (2009 data) to 9.1% in Estonia. A breakdown of the ITR's show that in most cases the difference between the tax on capital and tax on property is due to large differences in property taxation.

In Romania, after 1989, there was no clear vision of the fiscal policy in the medium and long term. In this context, the continuous changes in the level of taxation have led to an increase in tax evasion and a dramatic decline of the tax collection efficiency ratio. Later, after 1999, when real GDP grew from year to year, the decreasing trend of the level of taxation was interpreted as a result of the general trend of fiscal relaxation manifested until the emergence of the economic crisis. Though, in 2007, the year Romania acceded to the EU, a series of major changes in indirect taxation have occurred.

New regulations in the sphere of indirect taxes, in accordance with Community policies, have directly influenced transactions and business management which had a great impact on decreasing the amount of resources collected to the state budget.

In this scientific approach the authors present an analysis of the evolution of GDP, tax revenue, direct and indirect taxes to illustrate the changes occurred during the period covered by the analysis (Figure 6).

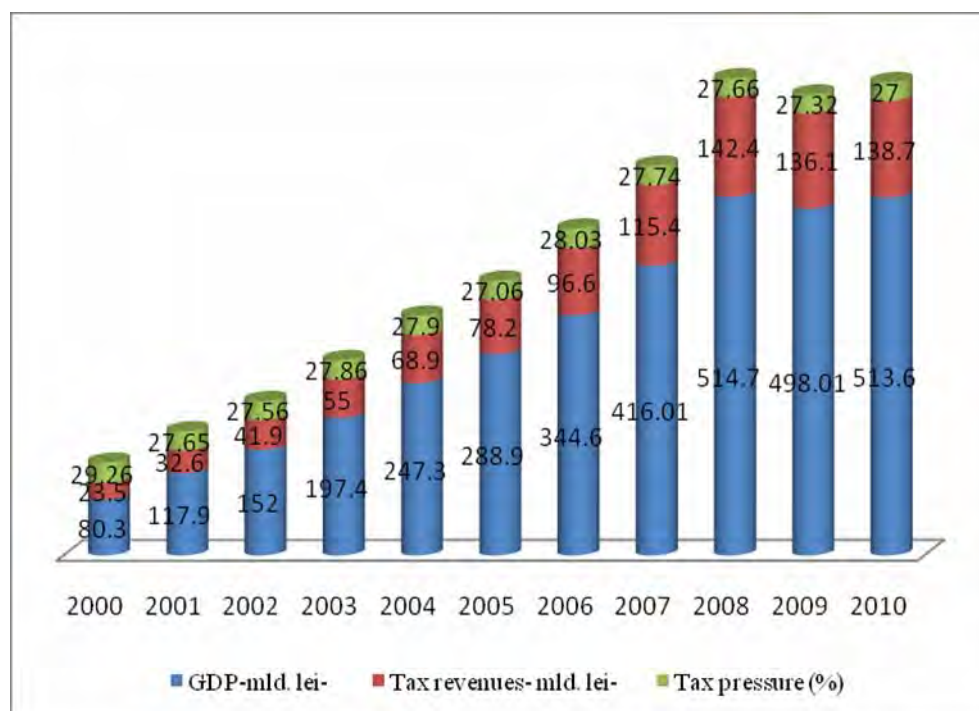


Source: developed by authors, using data from Public Finance Ministry, Romania.

Figure 6. Evolution of GDP, tax revenues, direct and indirect taxes, 2000-2010

An increase in the level of the 4 types of indicators is emphasized. The GDP has grown from 80.3 billion lei in 2000 to 513.6 billion lei in 2010; tax revenues have increased from 23.5 billion lei in 2000 to 138.7 billion lei in 2010; direct taxes increased from 7.2 billion lei in 2000 to 32.7 billion lei in 2010, and the amount of indirect taxes rose from 12.9 billion lei in 2000 to 60.3 billion lei in 2010.

If we analyze during the same period the fiscal pressure (i.e. tax revenue share in GDP), small fluctuations can be observed during the period under review (Figure 7). The tax burden was influenced on one hand by an increase in GDP and on the other hand by an increase in tax revenues, i.e. the growth of revenues from direct and indirect taxes.



Source: developed by authors, using data from Public Finance Ministry, Romania.

Figure 7. Share of tax revenues in GDP, 2001-2010

Due to the economic crisis and the drastic diminishing of budgetary resources, fiscal policy measures have been taken to increase their volume. However, the changes caused by budgetary austerity (a 25% reduction in public spending and an increase in the main indirect tax, i.e. VAT) applied in Romania since mid-2010 led to differences between the two tax systems.

In Romania, the impact of reducing wages and changing the VAT rate from 19% to 24% caused real drama among population. Moreover, these changes have led to the damage of economic situation, to an unprecedented tax evasion, to an increase in inflation and consumer price index, and also to a decrease in domestic demand due to the economic crisis.

Deficiencies of the two types of tax systems: European versus Romanian

European and Romanian fiscal system deficiencies are not of recent date. These are mainly due to the changes made in fiscal policy in the last two decades.

Lately, the European tax system does not look like it would recover. Fiscal policy measures, the so-called reforms recommended by international organizations in some cases, have proved ineffective. Tax collection efficiency ratio dropped, tax evasion has grown and population income was reduced leading to a decrease in the standard of living. Moreover, budgetary revenue collection efficiency, preventing and combating tax evasion represent the great challenge of all European countries and not only.

We continue to rely on higher indirect taxes (VAT, excise duties), on huge social contributions, but very poorly collected. In Romania, in addition to the 16% income tax and social contributions of 44%, we notice that only half of payroll reaches the employee. If we consider the VAT and excise duty payable on the purchase, we conclude that only about a third of what an employee earns is used for the actual payment of goods and services, remaining two thirds representing direct and indirect taxes. So, rising taxes (which is obviously in EU countries and also in Romania) and social assistance has not led to reducing inequalities, but instead affected the economies of these countries. Another deficiency that occurred in the European and the Romanian economy is related to poor results achieved in the field of bringing to light and taxing the underground economy.

Once the economic crisis has been installed, existing relaxation fiscal policies of taxation in all European countries were replaced by aggressive fiscal policy measures which have done nothing but worsen the economic situation in many states.

The austerity measures implemented in most European countries which aimed to collect a larger amount of resources to the budget, failed and increased even further the boundary between poor and rich. Collection efficiency rate has decreased and the amount of resources allocated to priority areas of society (education, health) decreased, leading to an accelerated degradation of society.

EU Member States have different concepts on how they collect taxes through direct and indirect taxation. While developed countries focus on direct taxation, developing states have applied excessive indirect taxation, causing drastic decrease in consumption.

Deficiencies arising within the two types of tax systems, European and Romanian should be treated carefully, because we must consider, first of all, the degree of development of each member state and then the fact that member states apply different taxation policies.

Conclusions

If we consider that the level of taxation is dependent, on the one hand, on the economic potential of the country, on the other hand, on the reported financial effort of achieving economic, social and, environmental objectives, in the period considered, which find their refinancing in the consolidated budget, the fiscal policy measures must meet three criteria: efficiency, effectiveness, economy (referred to in the literature as the three E).

Also, a high fiscal pressure, may exceed the payment capacity of individual taxpayers and businesses, thus generating adverse effects, negatively influencing the economic growth and/or living conditions of population.

In our opinion, the economy can not be develop only by increasing the number of taxes, but by encouraging effective labor, production, consumption. Expansion policy in terms of public spending should be stopped. Efficiency of tax collection must grow, while tax evasion, which also constitutes a problem for the vast majority of the member states, must decrease. Otherwise, without proactive fiscal policy, coherence, clearly defined objectives, greater responsibility for public spending, without clear measures of economic growth and a rethinking of the tax system, both at European and Romanian level, nor Romania or Europe will attract more resources to the state budget.

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CONTENT ANALYSIS OF AN EXPLORATORY STUDY REGARDING THE COMMUNICATION OF LOCAL ADMINISTRATION IN WESTERN ROMANIA

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Abstract: *The purpose of this paper was to emphasize the main characteristics of communication in Western Romanian administration. Using qualitative research we investigated citizens' opinions on the communication in local public administration. As an exploratory study we performed a content analysis of information gathered from five focus-groups. By analyzing data it was possible to highlight the aspects that please or discontent the citizens. The goal was to collect a series of essential events from which some zonal characteristics or patterns could be discerned by interviewing persons in a small cluster.*

Keywords: public administration; communication; focus-group; citizen satisfaction; expectations.

JEL Classification: M31, H83.

REL Classification: 13Z.

1. Introduction

In a classic work Simon, Smithburg and Thompson acknowledged the crucial nature of communication to government performance: blockages in the communication system constitute one of the most serious problems in public administration (Simon et al., 1950, p. 229).

Local government, although less analyzed and criticized by public opinion, determines the actual welfare of citizens in the local community. Being face to face with the citizens, local government can easily learn the needs and expectations of the community they serve. With an open and appropriate organizational culture, through policies and practices that must be borrowed from private organizations management, local government can be positioned closer to the citizen by setting public agenda in accordance with the citizens' expectations.

A long-standing assumption within communication performance literature is that good communication leads to organizational performance. In the administrative literature, few studies have directly examined communication performance. Pandey, Garnett conducted the first large scale empirical study which examines public sector communication performance (2006, p. 44).

With an increasing emphasis on the contracting out of local public services and an increasing importance being given to the involvement of the consumer, there has emerged a corresponding interest in quality management (Freeman-Bell, Gover, 1994, p. 554).

Some researchers have discussed the importance of measuring citizen expectations in the context of explaining citizen satisfaction with local government services (Brown, Coulter, 1983, Stipak, 1979, 1980), the Van Ryzin (2004) study is the first to explicitly test the expectancy disconfirmation with performance model using citizen survey data. The New York study by Van Ryzin (2004) demonstrated that expectations have a large, negative effect on disconfirmation and that performance has a large, positive effect on disconfirmation. In turn, disconfirmation positively and powerfully affects overall citizen satisfaction. Moreover, Van

Ryzin's results also suggest that, at the same time, there remain large direct effects of performance and expectations on overall citizen satisfaction. (Ryzin, 2006, p. 602). As in the New York study, the results imply that the performance of city services primarily influences citizen satisfaction indirectly through disconfirmation of citizens' prior expectations (Ryzin, 2006, p. 604). However, the results of the replication study do differ from his prior study. The modeling results using subtractive disconfirmation suggest that expectations have only about half as large a total effect on citizen satisfaction as in the prior study (Ryzin, 2006, p. 609).

A careful analysis reveals that the policy of western public systems is the foundation of public interest they serve. Considering that the public interest is different from one community to another and from one period to another, the role of the public system is to continually adapt. In order to accommodate the public interest public authority must investigate which are the desires and needs of the public.

The purpose of this research is to identify variables specific to the Romanian community with a minority share of about 25% in terms of local government communication. The goal was to collect a series of grounded events from which some zonal characteristics or patterns could be discerned.

2. Data, measurement and methods

The focus group research objectives consisted in finding answers to the following questions:

- the most frequented institution of local government and the frequency of addressing it within one year;
- presentation of the strengths and weaknesses of the communication activity of local government;
- determination of citizen involvement and of the most effective methods of citizen involvement;
- citizens' satisfaction within local government communication activity;
- presentation of a positive and negative communication critical incident regarding communication with local administration;
- identification of the citizens' needs regarding communication with local government.

The present study aimed the western part of Romania, that is Crisana Region. Thus, the population under review covers a surface comprising Bihor County (entirely), while the extremities belong to Satu Mare County (northern region), Arad County (south) and Salaj County (in the northeast).

The participants in the focus group sample we selected from the three counties of Arad, Bihor and Salaj (but not to require parental consent to interview minors, only adult citizens, over the age of 18 were interviewed). A first step for this study was the selection of local communities (cities, municipalities) from Bihor County, Satu Mare County, Salaj County and Arad County selected for the sample. This we realized taking into account the specific of the region respectively Hungarian minority is dominant at a rate of approximately 20-25% of the total population.

The participants were randomly recruited. Citizens were verbally invited to participate in the study. When using random criteria in the focus groups, the goal is to eliminate subjective selection inherent in certain forms of recruitment of persons (Krueger, Casey, 2005, p. 110).

Focus group can be defined as a research strategy for understanding the individuals attitudes, opinions, motivations, based on information obtained in a relatively free discussion about the main subject, between individuals and a moderator (Wimmer, Dominick, 1987, p. 151).

Focus group was used as exploratory qualitative research. In this case, focus group research is a preamble for the quantitative research. Identifying behavioral tendencies through the focus group facilitates the composition of questionnaire for the quantitative research is

facilitated. Also, there would be lower risk to omit from the questionnaire certain situation the researcher hasn't thought of and which can be collected through the focus group. The focus group was used to identify citizens' attitudes towards involvement in local government and citizens' expectations, opinions, perceptions that may be given easier when interviewee are formulating their own response, and indicates exactly which were the common aspects regarding the experience of communication with local government institution.

All five focus groups were conducted in January 2012 and 44 people attended (FG1 – 8 participants, FG2 – 9 participants, FG3 – 8 participants, FG4 – 10 participants, FG5 – 9 participants). The reason we scheduled five focus groups was to perform a comparative analysis between groups. Its purpose was to identify patterns and themes that are repeated from one group to another.

All of the five focus groups had some features:

- the selected persons were citizens from the analyzed community;
- election of both Romanian and Hungarian ethnics;
- the recruitment questionnaire contained filter questions and only the citizens who answered these questions were selected;
- discussions normally lasted for about two hours,
- were conducted in a neutral place, outside local authorities.

The recruitment of focus group participants was based on a recruitment questionnaire, according to the study objectives. The recruitment questionnaire contains a brief overview of the operator carrying out the study, the purpose of meeting the overall theme of the discussion, filter questions, demographic questions and questions about the details of the person interviewed (phone number, availability of time to participate when were scheduled the group discussions were scheduled). Filter questions are designed to select only those subjects that can provide the necessary information (Marinescu, 2009, p. 60).

The interview guide is the main tool in focus group work. The questions in the interview guide must:

- a) follow a logical sequence;
- b) seem spontaneous, natural;
- c) cover all objectives;
- d) obtain complete information in the discussion (Marinescu, 2009, p. 60).

The discussions were also audio-recorded for later analysis. During the discussions the researcher was the moderator. The moderator tried to keep the discussion focused on research theme (institutional communication, citizens satisfaction, citizens involvement in local government) to ensure that the discussion is not dominated by one or two participants, to stimulate subjects to participate in discussions.

Incentives are needed because the participation at a focus group requires effort. The use of incentives to boost participation in the focus group meeting is frequent. Its main purpose is to persuade the participants to come to the focus group meeting and come on time (Krueger, Casey, 2005, p 116-117). At the end of the meeting each participant received an envelope with money.

The interview guide for focus group research was made based on research objectives and contains 19 questions plus the demographics questionnaire. Open questions predominate because they provide the subject the opportunity to indicate their answers according to their perceptions without being forced to choose between several possible answers proposed. The first questions of the interview guide were simple questions, that move from the general to the specific, focusing on issues directly related to the goal, questions which reach directly the research issue and interpose easier and difficult questions that require longer thinking. The last three questions required a written response so that the participant could have more time to think and didn't get affected by another participant faster response. At the end of the interview participants also completed a demographics questionnaire (e.g. age, sex, education, occupation, household income, geographic location).

3. Findings and discussion

In the present research we used content analysis of focus – group interviews to capture more directly citizens' views on the variety of organizational communications. We have used the word/ expression unit in content analysis. Coding was done manually by the researcher. Content analysis was conducted in two stages: first, the basic structures, codes (labels) were identified, then in the second stage the mentions were subsumed under the appropriate labels.

After the content analysis of the data collected, were identified:

- local government functions 59 mentions, all being neutral;
- the most attended institution 26 mentions, all being neutral;
- access frequency 38 mentions of which one negative mention and 37 neutral mentions;
- accessing motivation 41 mentions of which one positive mention, eight negative mentions and 32 neutral mentions;
- organizing services four mentions of which three negative mentions and one neutral mention;
- appreciation of the County council communication 132 mentions of which 29 positive mentions, 53 negative mentions and 50 neutral mentions;
- information channels 60 mentions, of which 13 positive mentions and 47 neutral mentions;
- institutions' information 63 mentions of which 26 positive mentions, 23 negative mentions and 14 neutral mentions;
- media communication 28 mentions of which 14 positive mentions, five negative mentions and 9 neutral mentions;
- service/ counter location 80 mentions, of which 66 positive mentions, three negative mentions and 11 neutral mentions;
- assessment of mayor 32 mentions of which 25 positive mentions, six negative mentions, and one neutral mention;
- internet communication 21 mentions of which seven positive mentions, nine negative mentions and five neutral mentions;
- minority languages seven mentions of which six positive mentions and one neutral mention;
- prompt answer 29 mentions of which 12 positive one mention , 14 negative mentions and 3 neutral mentions;
- employees behaviour 173 mentions, of which 69 positive mentions, 44 negative mentions and 60 neutral mentions;
- employees training 40 mentions of which four positive mentions, 20 negative mentions and 16 neutral mentions;
- councillor communication 18 mentions of which four positive mentions, eight negative mentions and six neutral mentions;
- adapted communication 27 mentions of which 14 positive mentions, seven negative mentions and 6 neutral mentions;
- problems' solving 11 mentions of which two positive mentions, seven negative mentions and two neutral mentions;
- prevailing citizens' interest 25 mentions of which two positive mentions, five negative mentions and 18 neutral mentions;
- institution's transparency, fairness 40 mentions of which six positive mentions, 19 negative mentions and 15 neutral mentions;
- the competence aria 11 mentions of which five negative mentions and six neutral mentions;
- open sessions 31 mentions of which 11 positive mentions, 10 negative mentions and 10 neutral mentions;

- audience 48 mentions of which 16 positive mentions, 20 negative mentions and 12 neutral mentions;
- communication materials 19 mentions of which five negative mentions and 14 neutral mentions;
- adapted language 87 mentions, of which 32 positive mentions, 34 negative mentions and 21 neutral mentions;
- adapted program 88 mentions of which 27 positive mentions, 22 negative mentions and 39 neutral mentions;
- citizens involving 93 mentions of which 14 positive mentions, 46 negative mentions and 33 neutral mentions;
- public debate 34 mentions of which 18 positive mentions, six negative mentions and 10 neutral mentions;
- meetings with citizens 20 mentions of which 12 positive mentions, one negative mention and seven neutral mentions;
- appreciation of town hall communication 161 mentions of which, 89 positive mentions, 29 negative mentions and 43 neutral mentions.

Of the 31 categories identified by the coding the data gathered from the five focus groups:

- 11 categories are mostly positive (institutions` information, media communication, service/ counter location, assessment of mayor, employees behavior, adapted communication, open sessions, public debate, meetings with citizens, minority languages, appreciation town hall communication);
- 11 categories are predominantly negative (organizing services, appreciation of the county council communication, internet communication, prompt answer, employees training, councilor communication, solve problems, institution`s transparency, fairness, audience, adapted language, citizens involving);
- 9 categories are predominantly neutral (local government functions, the institution attended, access frequency, accessing motivation, information channels, prevailing citizens ` interest, the competence aria, communication materials, adapted program).

Table 1

Key focus group

Example :
 P1/ FG1, Q3- participant number 1, FOCUS GROUP Oradea, question number 3
 P1- participant number 1
 FG1- Focus group Oradea
 FG2- Focus group Aleşd
 FG3- Focus group Chişineu Criş
 FG4- Focus group Şimleu Silvaniei
 FG5- Focus group Oradea
 [researcher's interpretations]

Source: Made by authors.

Focus group participants know some of the town's hall tasks and activities but didn't mention any of the County Council tasks or activities until they were specifically asked to. Each of these statements was supported in a neutral tone of voice.

Town hall is the most frequented local public institution (21 mentions), county council didn't get any mention. In addition, at the participants' recruitment only one person marked county council as local public institution.

On access frequency opinions are divided, there are people who have regular contact with local authorities, but there are people who go there once a year. Most participants said they go whenever they need to.

P6/FG5, Q3 „... whenever necessary, something may occur and I say that I go five times and I have to go six times...”

P6/FG1, Q3 „... about once a year when I pay tax...”

When participants were asked about the accessing motivation various answers were mainly focused on three aspects, 14 references targeted tax payment, 8 mentions fine payment, and 6 mentions issuing civil status documents. There were people who have justified their contacts with the municipality in terms of duty, but also a rather unusual case, a person (P4/FG5) was to visit the City Hall tower.

P7/FG3, Q4 „... taxes that we have to pay...”

P2/FG5, Q4 „... through the activities that I have involving town planning (...) monthly...”

Even though it is mentioned in a single discussion group, once by one participant the organizing services is an organizational deficiency that disturbs the citizens at the contact with the local authority. This statement is approved by other participants through verbal or non-verbal consent.

P6/FG1, Q3 „... I noticed a deficiency (...) I stay in a row as an individual and let's say there comes another, from the owners' association with a stack of files...”

Compared to City Hall's the assessment of the County council's communication was predominantly negative, people noticed less interest in communicating from this institution. In most focus groups was noted the lack of information about the County Council's work, even indifference to it, except FG4 organized at Șimleu Silvaniei where participants were well unformatted about the institution's activities of the and they appreciated the efforts.

P4/FG5, Q5 „... for us the local and county council is a mystery...”

P5/FG4, Q4 „... the communication is in the local press or if we access web, the County Council has a website where you can find all the projects they are involved in...”

P3/FG5, Q11 „... [County Council] doesn't have an activity with which to show, they have nothing to communicate and if they have, they aren't prepared now...”

The preferred channels used by citizens to inform themselves are the television and the Internet.

P5/FG4, Q6 „... most often, City Hall transmits the information on local cable television...”

P7/FG5, Q6 „... Internet, for urgent information phone calls, or for information that requires a writing opinion in written form because words go to the wind...”

Institutions' informing (City Hall and County Council) generated heated discussions between participants. Arguments were sustained by a very high tone of voice, remarking participants' emotional involvement in the subject. When their voice tone expresses tension we can say that they are directly influenced by the topic.

P4/FG4, Q8 „... You don't know what internal or external policies they have, you should be informed as a citizen... they don't disclose anything, that's it...”

P4/FG1, Q7 „... I liked how City Hall communicate with citizens, the ads in newspapers and on the municipal website”

P7/FG5, Q8 „... from City Hall the information is heard more often if you want to catch it ... but I do not think that it's the interest to inform citizens...”

Media communication is predominantly positive oriented, citizens are satisfied with the way institutions (mainly municipalities) managed to inform the public through the press.

P7/FG1, Q7 „... communication through their press office is very good, they are communicating everything, I receive daily 4, 5, 10 press releases, every move that is important for all citizens is announced in the press...”

P6/FG4, Q18 „I think that the communication between those institutions and citizens is good, there are enough ways that are used for the citizen to be informed: local TV, municipal website, local press...”

From the communication activity of the local public institutions, citizens appreciated the efforts of authorities to improve the relationship with population. The pursuit of citizen-centred service is a innovative approach that would facilitate citizens contact with those authorities. The aspects appreciated by the citizens are:

1. The easy access to the desk/service were the citizens' needs to address is predominantly positively appreciated by focus group participants. In all group discussions it was mentioned that there is a guardian who guides people from the entrance.

P1/FG3, Q15 „... We have a porter at the gate...”

P2/FG1, Q15 „... at the entrance the guardian is extraordinarily well-intentioned...”

In the smaller municipalities such as the City Hall Alesd, Chişineu Cris and Şimleu Silvaniei the participants mentioned that that they don't have difficulties in identifying the person or counters that need to be addressed because there are entry indicator tablets and the offices are numbered, plus those municipalities have few counters.

P6/FG3, Q15 „... the City Hall is small...”

P5/FG4, Q15 „... as you enter in the City Hall there are signs leading to financial service...”

Regarding City Hall Oradea, which is arranged on several levels, the problems that existed in the past considering the citizens difficulty to find offices that they needed were solved by building a public relations centre called "one-stop room" or "pyramid" (because of the pyramid-shaped dome).

P2/FG1, Q7 „... they [municipality] reorganize a place that was not used in City Hall, by building, I don't even know how to say it, pyramid, dome, (...) no more walking all over City Hall from door to door...”

P4/FG1, Q7 „... and all counters are in one room...”

P8/FG5, Q11 „... the only good thing I can say about City Hall is that they have made inner pyramid where really you aren't wasting so much time but the rest is inadequate...”

2. Communication can be adapted in various ways by using multiple channels for information dissemination. The main characteristics for adapted communication are flexibility and adaptability. Under these conditions, citizens don't have to go to local government institution to communicate. Regarding adapted communication, the choice and personalization can also be seen as a challenge that can be summarized in the following way:

- citizens can ask questions when the mayor is participating in a radio or TV show;
- citizens may attend the meetings that are held in authorities territory areas, neighborhoods;

- citizens are getting involved in the formation of citizen advisory committees;
- by establishing municipal post offices where citizens can enter even anonymous suggestions;

- by introducing a toll free telephone number for quick information or clarification.

P4/FG2, Q7 „... [mayor] always does, says something in the neighbourhood...”

P6/FG4, Q10 „... at least, in the neighborhoods there were at a time, we were living in a block and the mayor came and asked about the problems...”

P1/FG3, Q19 „... I would put a box at the City's Hall gate as the post ones where people can introduce their complaints and suggestions (even anonymous, they should be accepted) where to say what is right and wrong in the city hall's activity...”

P4/FG5, Q19 „... Entering a free telephone number for quick information or clarification on any matter within the competence of local authorities...”

3. In focus group discussions participants presented arguments “for” and “against” the communication materials that are available to citizens. Citizens from Şimleu Silvaniei appreciated that from public money a local newspaper is funded which informs the community about city hall activity. One of FG4 participants is dissatisfied with the fact that in front of the Simleu Silvaniei municipal building there is no notice board. In agreement with this opinion, the residents of Chişineu Cris want a notice board in front of City Hall unlike the

one from inside the institution, that can't be consulted by citizens outside the town hall timetable. As a priority on the municipal agenda was mentioned by one of the FG2 participants the achievement of a local newspaper, and according to another person municipality's communication strategy should include an increasing number of notice boards in other locations most frequented by citizens. Also a very interesting perspective of a participant from FG1 discussions group refers to the desire to provide citizens a file where there are listed the laws to which clerks refer. It was also mentioned the need to distribute leaflets.

P8/FG4, Q8 „... In front of City Hall there is wide space to have a notice board placed where you can see all the important information, not everyone has a computer to access...”

P7/FG3, Q8 „... except the inside notice board from the city Hall there isn't any other Notice Board in our town, not even in front of the City Hall, where the council meetings should be announced...”

4. Internet communication is predominantly negative assessed because on their website these institutions do not post enough information. Instead, one of the citizens participant in FG1 identified several ways in which citizens' views could be known and quantified by local administration. One of the FG2 participants complain was the impossibility of online payments. Some FG5 participants are dissatisfied with the on-line information, the impossibility of online payments, but not all participants agreed with his point of view. One of the FG4 participant's requirement refers to the transmission of information to citizens through multiple channels, including the Internet. FG3 discussions have not reached the subject of the Internet communication within local public authorities.

P8/FG1, Q19 „... I would create an application on city Hall's website so that citizens could vote the projects that they support, what projects they would like...”

P7/FG2, Q18 „... I would like to pay online my taxes so I won't have to go there so often...”

P4/FG5, Q6 „... on internet, all information is there, you just have to be patient to search and you will find what you need and is easier than to talk to someone on the phone, you immediately find forms...”

Overall positive appreciation on mayor's activity or attitude was specified in the FG1 and FG2 discussions. Discussions with the fourth discussion group (FG4) reached only tangentially this topic. Within FG3 and FG5 the perception is rather negative, but under the circumstance of a discussion dominated by one of the participants (P1/FG3 și P6/FG5).

P2/FG1, Q7 „... at first this Mayor seemed extraordinarily sober but he communicates freely with each citizen, even in the street or in a public meeting he is close to people and his communication is good, very good...”

P1/FG3, Q8 „... we don't know how they spend money ,as we don't know what they do... Mr. Mayor from our town for example never told us...”

P4/FG4, Q17 „... I requested an audience with the mayor without making an appointment, at the moment when a situation arose and although he had no one, he refused to receive me, because he knew my problem and it wasn't convenient (the town is small and we know each other)...”

Statements concerning minority languages were identified only at two of the five focus groups. In the FG1 many people (P1, P2, P4 and P6) have positively appreciated the fact that at the public relations centre people can be served in any language. At the FG2 discussions minority languages is a secondary aspect, one of the participants said that it would be appropriate to set up a separate counter for the Rrom ethnic persons, where there should be a person who speaks their language because there are situations where several people waiting in line when there are disagreements between clerks and Rrom ethnic citizen who doesn't understand what the public servant says.

P2/FG1,Q3 „... have been pleasantly surprised at the taxes services, they are addressing in languages that are spoken frequently in the county, in the town so that the citizen can be able to trust that person, to be opened and to quickly finish the task they have...”

Prompt answer variable was identified in almost all focus groups, the exception is FG3. In the first and last discussion group, participants highlighted the fact that with the inauguration of the public relations centre the time spent for solving a problem had decreased. Since all compartments of the city hall have a representative desks in the room, citizens don't waste time by going up and down the building stairs to get to an office or another. At the FG2 discussions it was mentioned the need to standardize response time depending on the type of request in order to obtain equitable services for all citizens so that if two people make the same request, the response time should be equal. Fairness or uniform standards should be a practice in any institutions and for any public servant.

P2/FG1, Q7 „... I managed in a record time of 10 minutes, to pay my taxes... to ask about a shelter, to see what is the cemetery's program and all these I received in the record time of 10 minutes so, Oradea City Hall's communication is extraordinary...”

P5/FG5, Q11 „... you don't waste your time, you have a special counter, it takes you and in 10 minutes you solve your problem, while before I used to grope at each door...”

P9/FG5, Q11 „... I am satisfied because if I go to solve my problem then rapidly I don't have to sit there for hours and it solved the problem ...”

The employees behaviour was discussed in each focus group. There was noted interaction between people, by confirming the statements of the person who spoke before him or on the contrary each trying to support their point of view when they did not coincide. Sometimes it was felt a tension between participants. Clerks are considered polite, nice, in most cases, interaction style is described as objective.. Generally praised, the behaviour of public administration staff was extensively debated.

P7/FG3, Q12 „... [clerks] are nice...”

P6/FG2, Q12 „... I think they [clerks] interact quite well ...”

P7/FG3, Q12 „... here I don't think it is a very particular problem, in general they mind their own business...”

P7/FG4, Q8 „... of course the clerks attitude towards citizen... that's definitely unsatisfactory ... there is hostility when you get there...”

P4/FG5, Q12 „... relatively positive, I have nothing to object, just because the interaction was brief and it was punctual and has not repeated, but probably if it would have be repeated over and over, and I could make an average of the experiences, for one experience ok, no comment...”

About the employees behavior in local government administration, participants noticed two different situations:

- in the FG4 focus group was raised in discussion the dependence of clerks kindness on whether citizens know someone from the institution;

P6/FG4, Q12 „... depends on whether they know you or not, I think everywhere they [clerks] know you they are very nice to you...”

- in the FG5 focus group was raised in discussion the dependence of clerks kindness on whether there are cameras in the office.

P6/FG5, Q12 „... in the Pyramid everyone is very nice and very polite, they ask you where you want to go, they guide you...”

P8/FG5, Q12 „... [in the pyramid] there are cameras and they are afraid of camera ... I believe that with or without cameras and especially without, services should be the same everywhere...”

Regarding employees training, the participants of FG2, FG3, FG4, FG5 mentioned the need to organize training courses for the local public employees. Although FG1 and FG2 opinions were predominantly positive, analyzing overall mentions from all focus groups the “employees training” category was assessed negatively.

P2/FG1, Q12 „... along with massive dismissals in state administration, there were required specialized training for those who are dealing with citizens; in my opinion in Oradea we have well-trained clerks even on specializations...”

P1/FG4, Q10 „... when you go to the Council there are employees that can't answer, you have a question and they remain so, they don't know...”

P2/FG1, Q8 „... I noticed some slowness in people after a certain age ... computer use is not so great for everyone, the young clerks are more active, more quickly, and can serve the citizen in record time ...”

Local councilor communication is differently valued by the focus group participants. In FG2 discussion group, the attitude regarding local councilors communication was favorable, the councilor communication was seen as positive, instead FG4 discussion group negatively appreciated the same issue.

P6/FG2, Q7 „... and any councilor you meet, you talk with them, they discuss with you, there is no problem, they are not conceited, they're not gods, just ordinary people...”

To identify the attributes on which citizens obtain satisfaction (dissatisfaction) with local government communication activity citizens expressed their views in writing to the last three questions. In this sense, under the label citizen interest prevails most entries were focused through the answers to the last two questions.

P7/FG1, Q3 „... people are consulted, consulted, tell your opinion if we, if we can make this big investment in the area what do you think...”

P4/FG3, Q18 „I would have the citizen in the centre [of administration concerns], the ordinary voter, which has certain expectations from City Hall and the institution should communicate more often with him...”

P4/FG3, Q19 „... City Hall should tell people issues related to investment, rehabilitation, local budget and listen to people's voice...”

The institutions transparency, fairness was considered negative by most of the participants with certain reproaches on how they are treated by local administration. One of the authorities' effort that is appreciated by the citizens is that the council decisions are displayed. It should be noted that the board decisions display is a legal obligation for each local authority.

P7/FG3, Q7 „... the local council decisions are transparent”.

By analyzing the gathered information, we can mention the following citizens' needs regarding transparency and fairness of local administration:

- citizens have expressed the desire to be informed of how public money is spend;
- participants are dissatisfied with evasive answers and the failure in the communication of authority of the true reason why the citizen requirement was not solved;
- it should be a document that justifies the online payments amounts by showing how the required value was calculated;
- the spokesperson should provide more information about the local authority agenda;
- some of expenditures are morally questionable because they are not consistently applied, stating the circumstances in which for certain persons such costs have been removed.

P8/FG3, Q19 „... the mayor should make a report to inform citizens about the achievements (how he spent public money) and discuss with citizens their stringent problems and how he will resolve them in the future...”.

P7/FG3, Q17 „... I wasn't informed about the real reason why street Crişana wasn't asphalted...”.

P7/FG5, Q8 „... the calculation doesn't appear by category, class, area, so the calculation can be anyway, and not once is wrong at this level, I know situations, so not once is wrong and you pay what you see on the screen so you do not know how is calculated...”.

In the FG1, FG3, FG5 discussion groups is highlighted a gap in the presentation of the tasks and activities of local administration. Some people don't know the competence of local authorities and therefore attribute to their cause the unresolved issue. To promote the services

and activities of local public institutions there was identified as appropriate the distribution of leaflets similar to those offered by the big chains, to specify the functions of the various institutions, as citizens have doubts concerning the competencies of certain authorities.

P5/FG5, Q12 „... Perhaps sometimes we have to address some problems somewhere else and yet we put them on the civil servants heads.”

From FG2, FG3 and FG5 discussions groups there was distinguished the open sessions variable important in assessing public institutions communication. Some participants appreciated that they can attend council meetings that the local authority organizes, others are unhappy that these meetings are held at a time that prevents them from participating. Another participants' complaint concerns the lack of information from local institutions about the time and date when these meetings are organized.

P1/FG2, Q7 „... I think that you are allowed to participate as observer to the council meetings...”.

P1/FG3, Q8 „... it's free [attending council meetings] but can you go from work to attend their meetings? you can't go from work, who will let you go?”.

P3/FG5, Q9 „... in the press, in Crişana, Jurnalul Bihorean and in the ones that are in Hungarian language the council meetings are compulsorily announced ...”.

There were some people who got very dissatisfied when hearings weren't run well. Hearings/ audiences organized by local public institutions discontent citizens from the focus group on several aspects:

- audiences protocol;
- non-availability of public institutions management to get people outside of the audience schedule;
- welcoming attitude toward citizens is unsatisfactory;
- audiences duration.

P6/FG5, Q4 „... I wanted to make an appointment at Mr. Mayor office and I was shocked how I was treated ... they stood near a table and I was kept standing, I felt so humiliated as you have no idea, it was awful...”.

P1/FG3, Q10 „... I cannot go there, because they don't let me, there is a schedule, what's its name, you don't have audience appointment...”.

Adapting the language to the citizen capacity of understanding was noted as important attribute in assessing local government communication. The language was analyzed in all discussion groups but in FG1, FG3, FG4 and FG5 the participants noted that clerks explanations are not understood by everybody and they should explain it in plain language to their clients.

P8/FG5, Q8 „... there is no purpose to go there to make it clear because, however, they simply don't make it clear, such they tell them and twist them, that's from there, that beyond there, just not to understand and not to clarify the problem, so they [clerks] are always right...”

P4/FG1, Q13 „... sometimes they are difficult to understand because they speak in legislative terms and they present articles and paragraphs from the laws that we citizens don't know...”.

P3/FG3, Q18 „contact employees (...) should know how to explain the laws and acts that they work with because we are not lawyers...”.

In all of the five focus groups it was discussed the work program of the local government institutions. Moreover, it was identified the need for a program adapted to the citizens needs. Due to new labour market conditions people mentioned the difficulty in solving problems when working hours coincide with the local authority's. Although they have appreciated the program of the same institutions (Oradea City Hall and Bihor Country Council) FG1 and FG5 participants had contradictory views. FG1 participants positively appreciates the work program of these institutions noting that the municipality has adapted the way of serving the citizen by creating multifunction centers in the neighbourhoods where people can go to pay local taxes without having to go to city hall, they can go to the centre in

the neighbourhood they live in. According to FG1 participants the public service has improved by making an afternoon program and by the fact that city hall sized the number of employees depending on the citizen's addressing. Therefore, in crowded periods, the number of counters and hours when the counters are open to the public are increased. The participants from FG5 discussion group stated that the program isn't linked to reality and it should be at least once a week until 20:00. For most institutions the work program is from 8 until 16:00.

P9/FG5, Q14 „... at least once a week it should be an afternoon program until 8 pm, at least once people should be able solve their problems...”.

P2/FG1, Q14 „... in January this year when I paid taxes they [clerks] were 2, 3 hours above the service program, and it was announced in the press and television...”.

Analyzing the participants discussions it can be concluded that they don't get involved in local government activities unless the job requires it, or if they have a personal interest on a particular topic. Citizens' involvement can be seen by the fact that they pay their taxes in time, select waste and promote the local projects.

P1/FG1, Q9 "... since I'm the president of an owners association I attend the meetings with owners associations, the public debate on the draft regulation of the organization and distribution of parking spaces ...”.

P3/FG2, Q9 „... we lack initiative...”.

P5/FG4, Q9 „... payer and observer ... but we don't directly contribute to the wellness of administration but we read and the fact that we pay to date, for me is a way of involving...”.

Among citizen involvement methods, public debates have been positively appreciated by citizens, they considering them opportune and useful. An important note is the fact that to the public debates the top management should participate, the mayor, the country council president without delegating these tasks to other employees. Another amendment relates to the time when these debates are held, which should be in the afternoon.

P8/FG5, Q10 „... only to be real, do you understand? There are debates and then they aren't coming to the debates and are sending their advisers, to be real...”.

P7/FG3, Q10 „... there were debates, on some special themes for example if the dog park should be installed here or at Socodor, I know there were public debates but I didn't attended so I don't know how many were there...”.

The meetings with citizens are favourably rated by the citizens who consider them useful. The participants stated that due to the lack of civic sense there aren't enough people interested in this issue so that they would go to a particular location, or take some time for the good of society.

P4/FG5, Q10 „... I don't really know if the civic sense is so developed in us as to go [to the meetings with citizens]...”.

P3/FG2, Q18 „... I would hold monthly meetings...”.

City Hall's communication appreciation was a generally favourable one. The overwhelming majority of participants in all five focus groups was satisfied with city hall's communication. In the FG1 and FG2 discussion group all participants were satisfied with the city hall's activity. In the FG3 discussion group only one participant said that he is dissatisfied with local government communication. In the FG4 discussion group, two participants said they were dissatisfied with the communication activity. In the FG5, discussion group 3 participants said they were dissatisfied with the city hall's communication. Within all discussion groups was noted interaction between people by confirming the things said by the previous or on the contrary arguing when there were conflicting viewpoints between some persons. The participants supported their statements in an affected tone of voice and non-verbal communication.

P6/FG2, Q11 „... 80% of what they can do ...”.

P4/FG4, Q11 „... particular information concerning you cannot satisfy you, you have to admit this...”.

P7/FG5, Q11 „... It doesn't satisfy me...”.

4. Validity and fidelity

Often, reproducibility of the ratings (classifications) is taken as an indicator of the quality of the category definitions and the raters' ability to apply them. A multitude of measures have been proposed that measure the degree of agreement between raters. Cohen (1960) introduced the kappa statistic κ to measure the degree of agreement between two raters (observers, measuring devices) who rate each the same sample of objects (individuals, observations) on a nominal scale with the same number of k categories. Cohen's κ is by far the most popular statistic of interrater agreement for nominal categories (Matthijs, 2010, p. 272)

Despite the fact that there are qualitative data analysis software programs that can be used in content analysis, in this case the obtained data were processed manually. Since data analysis and coding was done by one researcher, classification by category resumed after an interval of 10 days. From all five focus groups was extracted a sample which was obtained by the method of drawing lots (FG.4 Șimleu Silvaniei). To estimate the confidence of the process Cohen's kappa coefficients were used, measuring the similarity of the classification on codes at moment T_1 compared to moment T_0 . Following the coding, the data collected through focus groups were organized in 31 categories. The value 1 was noted for the category's presence, and 0 for absence. Further, was calculated Cohen's kappa coefficient. The value $\kappa = 0,90$ indicates almost perfect agreement, shows consistency and similarity in coding and the overall process can be considered reliable, with a high fidelity of framing codes, which indicates the possibility of obtaining similar results when it would be done again or by another rater.

Some of the focus group's research limits come from the citizens refusal to participate in focus group; the short period for the data collection (January 2012); the existence in some cases of participants who monopolized discussions and because of this it was limited the imposition of a diffident participant own ideas and beliefs; the use of a single coder; due to the large amount of information obtained, problems in classification have arisen principally with the citizens large variety of opinions and attitudes.

Conclusions

In this study the focus group was used as exploratory qualitative research in order to detect citizens' attitudes towards involvement in local government and to identify citizens' expectations, opinions, perceptions regarding the experience of communication with local government institution.

The participant's views, attitudes (as evidenced by tone of voice, comments made) indicated enthusiasm, and interest in the topic. Given the fact that focus groups research is particularly useful when there are power differences between the participants which can generate large amounts of information, in this case it can be concluded that the purpose was accomplished. Participants interacted with one another, their discussions provided a variety of impressions on local government communication.

Town hall is the most frequented local public institution with overall positive appreciation on mayor's activity or attitude. Compared to the City Hall's positive appreciation, the County Council's communication was predominantly negatively assessed.

The participants have positively appreciated the fact that in the public institutions people can be served in minority's language. In all of the discussions groups the citizens were dissatisfied with the promptitude of the local government's answer.

Customer orientation in public administration as a determinant of satisfaction was analyzed by participants in focus groups in terms of a set of measures that are easy to implement by the authorities. In the analyzed institutions citizens' interests is worth more or less depending on how management noticed this opportunity. They identified the following ways of customer orientation:

- existence of a centre or an one-stop department to serve the citizen;
- communication adapted according to the citizens' needs by using multiple channels for information dissemination (citizens can ask questions when the mayor is participating in a

radio or TV show; citizens may attend the meetings that are held in authorities territory areas, neighbourhoods; citizens are getting involved in the formation of citizen advisory committees; by establishing a municipal post boxes where citizens can enter even anonymous suggestions; by introducing a toll free telephone number for quick information or clarification);

- communication materials available to citizens;
- modern communication via Internet.

The spirit of public involvement in government decision making should be the foundation of any public institution. It would recognize that not everyone will want significant involvement in public services, but would nonetheless encourage members of the public to take responsibility and potentially change their attitudes and behaviors, and when done so the society and the public services would also benefit. There is evidence to suggest that the feeling they can influence services if they consider they need to may be more important to the public than actually getting involved in practice. Public consultation and citizens' involvement as means of legitimating can also be seen as a customer orientation of the local governments management.

Citizens expressed some needs regarding transparency and fairness of local administration:

- citizens want to be informed of how public money is spend;
- participants are dissatisfied with evasive answers and the failure in the communication of authority of the true reason why the citizen requirement was not solved;
- it should be a document that justifies the online payments amounts by showing how the required value was calculated;
- the spokesperson should provide more information about the local authority agenda;
- some expenditures are morally questionable because they are not consistently applied, stating the circumstances in which for certain persons such costs have been removed.

Regarding the employees' behaviour there was raised in discussion the dependence of clerks kindness on citizens' knowing someone from the institution and the existence of cameras in the office. Adapting the language to the citizen capacity of understanding was noted as an important attribute in assessing local government communication. The citizens who participated at the group discussions mentioned the need to organize training courses for the local public employees.

As the preamble for the quantitative research, the citizens' attitudes and opinions are the starting point for further research. A richer discussion which engages with the needs and expectations of citizens is needed, to understand and explain citizens' satisfaction with local government services.

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SOME MEANS OF AVOIDING OF INTERNATIONAL JURIDICAL DOUBLE TAXATION USED BY ROMANIA

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Abstract. *Barrier to the free movement of persons, capital, goods and services, international juridical double taxation is an objective pursued by interested states in international financial flows increase, they act to eliminate or reduce it.*

Fiscal law and practice of world states leads, in many cases, to tax the same income or the same property in the same fiscal year by two different states. Thus, the entrepreneurs, the capital owners, residents of a state are discouraged in investing, obtaining income or properties abroad or, if they obtain them, use means of the tax evasion to pay lower or no taxes, as a rule. Acting and internally and externally, without prejudice to theirs fiscal sovereignty, states use of the certain means and methods of avoiding of international juridical double taxation.

In this paper I present and analyze some of the means used by Romania for the elimination or limitation of international juridical double taxation (IJDT).

Keywords: international juridical double taxation; fiscal sovereignty; tax evasion; domestic laws; bilateral tax treaties.

JEL Classification: E62, F53, F65, H26, H87, K33, K34.

REL Classification: 13Z.

1. Introduction

International juridical double taxation phenomenon (IJDT) occurs not because of different structures of national tax systems or different degree of taxation, but because concepts, respectively, different criteria underlying taxation. Each state sets taxes applicable to its territory under its political and fiscal sovereignty (Roman, 2006). Thus, no other state or regional, interregional or international body can't interfere in fiscal policy and practice of the sovereign State without the consent of free will of its (Roman, 2006).

Double taxation occurs when tax is paid more than once on the same taxable income or asset, and it can be legal or economic (Kesner-Škreb, 2005). Double taxation is *legal* if the same person is taxed twice on the same income in at least two states (or in two entities of the same federal state).[4]

Juridical double taxation refers to circumstances where a taxpayer is subject to tax on the same income (or capital) in more than one jurisdiction.(For example, a resident of Romania who is also considered to be a resident of the Italy would be potentially subject to concurrent full taxation in both countries).

Bilateral tax treaties generally tend to eliminate (or at least reduce) the possibility of international juridical double taxation (IJDT) (Kesner-Škreb, 2005).

International juridical double taxation is the levying of tax by two or more jurisdictions on the same declared income (in the case of income taxes), asset (in the case of capital taxes), or financial transaction (in the case of sales taxes). This double liability is often mitigated by tax treaties between countries.

I appreciate that international juridical double taxation (IJDT) is taxation for the same taxable subjects (income and/or wealth, fortune elements), by the same type of tax, by two

different fiscal sovereignties, or by two different public entities, during the same financial year (fiscal year) (Roman, 2006).

In their action to eliminate or diminish international juridical double taxation interested states are different involved internally and externally.

Externally, the state - public authority - launches issue negotiations with other states to conclude treaties, agreements on the avoidance of double taxation and the prevention and combating tax evasion. The state' involvement in this plan is to establish a common legal framework with another state (if a bilateral treaty) and other countries (if an international treaty with a group of states). Ratification by both states include the following: treaty must be approved by the legislative bodies of the two countries; setting the date and place of exchange of instruments of ratification; entry into force after the exchange of instruments of ratification; application of the Convention as the date specified therein.

Internally, the state can manifest in the following modalities:

The first modality, that arising from the involvement abroad, is coverage of the tax treaty in national set of laws, after ratification by law treaties complex operations.(2)

The second modality of involvement, which also arising from the involvement abroad, whenever the state is found in the quality of residence state, is to quit to collect some tax revenue, taxes on income and wealth, in whole or in part, such as committed by ended treaty. State tax exemption on its residents for income or wealth they hold abroad is a financial relationship that does not exceed the borders, that occur internally, but the State must apply in accordance with the tax treaty concluded with another state. Thus, international character is given no actual financial flows that exceed the borders of a state, but the fact that participants are two states. Also, international character is given by the fact that a resident/national of a State obtains income or owns property/wealth elements in another State.

A third modality of involvement of the state which manifests also internally, independent by the tax treaties concluded with other states, *is to insert in the internal regulations legal clarifications* in order to avoid or to limit the international juridical double taxation.

Given the above and details of the literature (Văcărel, 1995) we can say that the modalities of avoid of international juridical double taxation used by states are, mainly: a) the insertion in internal regulations of clarifications in order to avoid or to limit the international juridical double taxation; b) conclude bilateral or multilateral tax treaties for the same purpose; c) custom; d) jurisprudence; e) doctrine, means which are recognized as sources of international fiscal law.

Next I present some aspects of the first two modalities of avoiding or limiting the international juridical double taxation as they are used in Romania.

2. Specifications in the domestic law

States established by tax laws or other normative documents clarifications, provisions to prevent multiple taxation by two different fiscal sovereignty of income, capital, goods, however in order to stimulate international cooperation. Thus, some states legislation provides for exemptions tax reductions for certain income obtained abroad by individuals or legal resident entities, facilities that can be automatically applied, even if the income tax that was not paid abroad. For example, exemption from taxation of profits obtained by subsidiaries of companies located abroad, if they have economic, financial and functional autonomy. Other states take into account the taxes paid by their residents abroad for income abroad, deducting them from the tax payable in the State of residence, using foreign tax credit.

In the unilateral legislative measures to eliminate international juridical double taxation, as the application of any law rules in one situation, there are three criteria of competence: *ratione loci*, *ratione personae* and *ratione materiae*.

Practical application of the three criteria is specific to each national legislation so that the effect of unilateral measures to eliminate international juridical double taxation differs from country to country.

Concerned to maintain and expand economic relations with other countries, to encourage foreign direct investments, provide a legislative framework and a favorable climate for achieving free movement of persons, capital, goods, Romania is aimed constant coverage in national legislation on taxation of income and wealth of specifications in order to avoid or to limit the international juridical double taxation. I mention a few of these specifications.

This part of this paper reflects the measures in the Romanian Fiscal Code, which took effect on 1 January 2004, and subsequent amendments to the code, including amendments that are effective from 1 January 2008.

The Fiscal Code is defined territory as "Romania-Romanian state territory, including the territorial sea and airspace above its territory and territorial sea over which Romania exercises its sovereignty as well as contiguous zone, continental plateau and exclusive economic zone on which Romania exercises its sovereign rights and jurisdiction in accordance with its laws and the rules and principles of international law." (3)

National rules on taxation of profit and income tax include general provisions defining the permanent establishment, revenues who are considered to be obtained in Romania whether they are received in Romania or abroad, as well as special provisions on exchange of information with EU Member States.

In Titles II and III of the Fiscal Code about corporate tax and that income tax, there is a chapter on international tax issues: Title II- Profit tax, head. 3, art. 29-32 and Title III Income tax head. 12, art. 87-91. (4)

Provisions refer to the income of a permanent establishment, to the income obtained by foreign companies from real estate and the sale-assignment of units, to non-resident individuals income from self-employment and dependent activities, to the foreign tax credit, to the foreign tax losses.

Fiscal Code regulates incomes tax obtained from Romania by non-residents and the tax on representations of foreign companies established in Romania. (5)

It uses the term "tax credit" which means less income tax or corporation tax on the amount of tax paid abroad, as set out in treaties to avoid international juridical double taxation and the Fiscal Code. (6)

Tax relief (foreign tax credit) provided by the State of residence is the "price" paid it in, on the one hand, to stimulate individuals and companies to achieve revenue, acquire goods abroad and, on the other hand, encourage non-residents owners of capital to invest in its territory.

If a Romanian legal entity receives income from a foreign country through a permanent establishment and income are taxed in Romania and in the same fiscal year, in the foreign state, the tax paid to the foreign state shall be deducted from profit tax determined in accordance with Romanian law. (7) *This deduction is limited*, not full, because it states that "the deduction for taxes paid to a foreign country in a fiscal year may not exceed the profit tax calculated by applying the rate of 16% on taxable profit received in the foreign state, determined by Romanian law or on income obtained from foreign State". (8)

Corporate Income Tax. Resident entities are subject to tax on their worldwide income. An entity is resident in Romania if it is incorporated in Romania or if its place of effective management and control is located in Romania.

Non-resident companies that do not have an effective place of management in Romania are taxed in Romania at the standard rate of 16% on earnings derived from their operations in Romania through branches, permanent establishments or consortia entered into with Romanian partners. A permanent establishment of a foreign company in Romania may be constituted in certain forms, including the following: an office; a branch; an agency; a factory; a mine; a place of extraction for gas or oil; and a building site that exists for a period

exceeding six months. Foreign companies are also normally taxable in Romania at the standard profits tax rate on profits derived in Romania from real estate located in Romania and the exploitation of natural resources, as well as on certain capital gains.

Capital gains are included in taxable income and taxed at the normal profits tax rate. Capital gains derived by non-resident companies are also subject to the standard 16% tax rate if they are derived from the disposal of the following: immovable property located in Romania; participation titles in a Romanian company, or a company with fixed assets that primarily consist of, directly or indirectly, immovable property located in Romania.

For the *income of the resident individuals* Fiscal Code provides the same limited credit, but in addition, foreign tax credit is conditional some cumulative conditions.

Non-resident individuals who self through a permanent establishment in Romania are taxed under the Fiscal Code (income tax) net income from self-employment that is attributable to the permanent establishment.

Non-resident individuals engaged dependent activities in Romania are taxed under the Fiscal Code (income tax) only if at least one of the following conditions: i) the resident is present in Romania for more than 183 days in 12 consecutive months ending in the calendar year concerned; ii) salary incomes are paid by an employer who is resident; iii) salary incomes are deductible expense of a permanent establishment in Romania.

From 1 January 2007, *dividends paid by a Romanian legal entity* to a legal entity resident in an EU member state or to a permanent establishment of an entity from another EU member state that is located in another EU member state are exempt from withholding tax if the beneficiary of the dividends owned at least 15% of the participation titles (for example, shares) in the Romanian legal entity for an uninterrupted period of at least two years that ended on the date of payment of the dividend.

Determination of Trading Income. In general, all income that is booked as revenue is included in taxable income. However, dividends received by a Romanian company from another Romanian company are not taxable, as well as dividends received by a Romanian company from an EU resident subsidiary and dividends received by Romanian permanent establishments of EU companies if certain conditions are satisfied. In general, only expenses related to the earning of taxable income are deductible for tax purposes.

Transfer Pricing. Under the provisions of the Romanian Fiscal Code, for transactions between related parties, the tax authorities may adjust the amount of income or expenses of either party to reflect the market value of the goods or services provided in the transaction. Such reassessment affects only the tax position of the Romanian entity. It does not affect the entity's financial statements. The law indicates that in applying the domestic transfer-pricing measures, the Romanian tax authorities must also take into account the Organization for Economic Cooperation and Development (OECD) Transfer-Pricing Guidelines. On request, Romanian entities performing transactions with non-resident related parties must make available to the tax authorities a file containing the transfer-pricing documentation. The specific content of the respective file has been regulated. The following income is applicable rate by 16%: Corporate Income, Capital Gains, Branch income, Dividends, Interests, Commissions Management and Consultancy Services, Services Rendered in Romania, Gambling.

Although progress has been made in eliminating double taxation by unilateral legislative measures, however, the existence of national tax systems and numerous and varied fiscal regulations, differential fiscal techniques from state to state and some own interests of states in avoid of international juridical double taxation not lead to solving complex and multiple problems in this area. Thus, it was necessary bilateral and multilateral international tax treaties.

3. Bilateral tax treaties

3.1. General aspects of tax treaties

International juridical double taxation – generally defined as the taxation of comparable taxes in two (or more) States on the same taxpayer in respect of the same subject matter and for identical periods – has harmful effects on the international exchange of goods and services and cross-border movements of capital, technology and persons.

Reducing or eliminating fiscal burden on income and or wealth held abroad by residents/nationals of one state is the purpose of concluding international fiscal treaties for avoid the international juridical double taxation at direct taxes and is an important step in increasing manifestation of freedom of movement of persons, the capital and goods.

For a business or individual who is resident in one country to make a taxable gain (earnings, profits) in another it is not unusual. This person may find that he is obliged by domestic laws to pay tax on that gain locally *and* pay again in the country in which the gain was made. Since this is inequitable, many nations make bilateral double taxation treaties with each other. In some cases, this requires that tax be paid in the country of residence and be exempt in the country in which it arises. In the remaining cases, the country where the gain arises deducts taxation at source (withholding tax) and the taxpayer receives a compensating foreign tax credit in the country of residence to reflect the fact that tax has already been paid. To do this, the taxpayer must declare himself (in the foreign country) to be non-resident there. So the second aspect of the agreement is that the two taxation authorities exchange information about such declarations, and so may investigate any anomalies that might indicate tax evasion.

Member states of the European Union have concluded a multilateral agreement on information exchange. Thus, they will each report (to their counterparts in each other jurisdiction) a list of those savers who have claimed exemption from local taxation on grounds of not being a resident of the state where the income arises. These savers should have declared that foreign income in their own country of residence, so any difference suggests tax evasion.

The scope of a bilateral tax treaty typically is not limited to commercial and business activities. Treaties may remove tax impediments to desirable scientific, educational, cultural, artistic and athletic interchanges. In addition, a treaty may address issues arising in the tax treatment of pension plans and Social Security benefits, of contributions to charitable organizations, of scholarships and stipends paid to visiting scholars, researchers, and students.

It's well known that bilateral tax treaties help to reduce the risk of double taxation by establishing the minimum level of economic activity that a resident of one contracting state must engage in within the other State before the latter State may tax the resulting business profits. The bilateral tax treaty lays out ground rules providing that one State or the other, but not both, will have primary taxing jurisdiction over income derived from the branch operations in one contracting state by a corporation that is resident in the other contracting state. However, a bilateral tax treaty cannot anticipate every income tax issue that is likely to arise between contracting states. Some issues, such as issues relating to the growth of electronic commerce, are difficult to address currently by tax treaty because the international community has not yet reached a consensus on the appropriate standard for taxation. Generally, the international community recognizes that the current treaty rules relating to the definition of a permanent establishment were based on premises about how commerce is conducted that may not hold for electronic commerce.

The typical tax treaty provides a mechanism enabling the tax authorities of the two states to adopt ad hoc rules to eliminate double taxation when it occurs. In tax treaty text, the tax authorities responsible for negotiating a solution to particular cases of double taxation are the competent authorities. Each contracting state appoints one or more competent authority in accordance with its domestic laws.

There are two model treaties for avoid the IJDTTs available, which are regularly updated and on which treaty partners can base their treaty if they wish to do so: one from the OECD, the other one from the United Nations. The OECD model treaty clearly favours residence taxation, which benefits developed countries since it is mainly developed country investors who invest in developing countries, not the other way around and residence taxation favours countries with net positive foreign asset positions. The UN model treaty provides more room for source-based taxation, which is more beneficial to developing countries for the same reason. The vast majority of IJDTTs are based more on the OECD model (Arnold, 2004, pp. 601-622).

The OECD Model Convention on Income and on Capital, in recognition of the need to remove this obstacle to the development of economic relations between countries, as well as of the importance of clarifying and standardising the fiscal situation of taxpayers who are engaged in activities in other countries, provides a means to settle on a uniform basis the most common problems that arise in the field of international juridical double taxation (OECD Model Tax Convention on Income and on Capital – an overview of available products).

Each treaty contains details about persons covered, taxes covered, general definitions, residence, permanent establishment, income from immovable property, business profits, shipping and air transport, associated enterprises, dividends, interests, royalties, capital gains, income from employment, directors' fees, entertainers and sportspersons, pensions and annuities, government service, students and apprentices, other income, elimination of double taxation, limitation of exemption, non-discrimination, mutual agreement procedure, exchange of information, members of diplomatic or permanent missions and consular Posts, entry into force, termination, exchange of notes.

There are reasons to presume that IJDTTs can increase FDI. Double taxation occurs if a multinational company (MNC) pays tax on the same corporate income earned from economic activity in a foreign country twice: once to the tax authorities of the foreign country, which is host to the economic activity, and once to the tax authorities of the home country, in which the company is domiciled. It is possible that IJDTTs are effective in attracting FDI, but only in the group of middle-, not low-income developing countries (Neumayer, 2007, pp. 1501-1519)

3.2. Some aspects of tax treaties entered into by Romania

I will present some outstanding details shown in tax conventions concluded by Romania with other states.

Regarding *criteria permanent establishment* in the Convention between **Romania and South Africa**, in addition to the usual components: a place of management, a branch, an office, a factory, a mine, an oil well or gas, are provided and plantation, a farm, an orchard or vineyard.(9)

The Convention between *Romania and the United Mexican States* is specified where one person is permanent establishment for an insurance enterprise “an insurance of a Contracting State, except for reinsurance, has a permanent establishment in the other Contracting State if it collects premiums the other State or insures risks situated therein through a person other than an agent of an independent status”.(10)

Regarding *taxation of vehicles used in international traffic* in the fiscal treaty between *Romania and Austria*, the parties have determined that the railway or road vehicles operated in international traffic as well as movable property exploitation shall be taxable only in the Contracting State in which the place of effective management the transport entrepreneur, except where these vehicles or movable part of the assets of a permanent establishment that the enterprise has in the other Contracting State. For latter situation, the tax rule is applicable in the state where it is located permanent establishment.(11)

Regarding the *taxation of certain remuneration*, in the Convention between *Romania and the Kingdom of the Netherlands* provides that remuneration derived by a resident of a

Contracting State in respect of an employment exercised aboard a ship, aircraft or railway vehicle in international traffic operated shall be taxable only in that State.(12)

The rule tax *retirement income*, including amounts received from social security, coming from a Contracting State and paid to a resident of the other Contracting State is that they may be taxed in that other State. But the Convention between *Romania and Canada* is mentioned: " retirement income, including amounts received from social security, coming from a Contracting State and paid to a resident of the other Contracting State may also taxed in the State in which it arises and according to the laws of that State, but in the case of periodical amount, the tax so charged shall not exceed 15% of the gross amount of periodical payments paid to a beneficiary in fiscal year concerned, exceeding 12,000 Canadian dollars or the equivalent in Romanian currency".(13) The Convention between *Romania and Israel* is mentioned: retirement income and other similar remuneration paid to a resident of a Contracting State for past employment shall be taxable only in that Contracting State."(14)

With regard conventions concluded by Romania, they reflect the majority of cases, the solutions given in the OECD model. If before the events of decembrie1989 this does not present much importance because income and wealth of those who were under tax treaties were relatively limited, in market economy conditions, these have new dimensions. It is therefore necessary to review these tax treaties and to renegotiation with the signatory states those provisions that disadvantage our country.

Conclusions

With regard domestic regulations I appreciate that each state, as far as wishing to remove the international juridical double taxation barrier, can insert as many details for this purpose in domestic tax rules.

With regard tax treaties I appreciate that developed countries should show more understanding of the problems faced by developing countries and to agree to a more equitable sharing between the contracting parties the right to impose different income groups. Thus, I consider that income from dividends, interest, commissions, royalties and the like, from developing countries should be taxed in the source states, if not entirely, at least to a greater extent than currently taxed.

At least, I appreciate that IJDTTs are indeed positively associated with foreign direct investment in the host country and this aspect has been partially treated in a previous paper and is part of a broader research underway.

Notes:

(1) <http://www.irwinlaw.com/cold/term/357>.

(2) Lege privind tratatele nr. 590/22dec. 2003, publicată în Monitorul Oficial, partea I, nr. 23/12 ian. 2004, cap. II, art.3-art. 34 inclusiv.

(3) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare, art.7, pct.30.

(4) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare.

(5) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare, Titlul V, art. 113-124.

(6) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare, art. 7. Pct.11.

(7) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare, art. 31, alin. 1.

(8) Lege privind Codul fiscal nr. 571/3003, publicată în Monitorul Oficial nr. 927/2003, cu modificările și completările ulterioare, art. 31, alin. 2.

(9) Lege pentru ratificarea Acordului dintre România și Republica Africa de Sud pentru evitarea dublei impunerii și prevenirea evaziunii fiscale cu privire la impozitele pe venit și pe câștigurile din capital, nr. 59/13.07.1994, publicată în M. O., Partea I, nr. 199/2.08.1994, art.5, par. 2, lit. g) și h);

- ⁽¹⁰⁾ Lege privind ratificarea Convenției dintre România și Statele Unite Mexicane pentru evitarea dublei impunerii și prevenirea evaziunii fiscale cu privire la impozitele pe venit și pe capital nr. 331/28.06.2001, publicată în M.O. Partea I, nr.372/10.07.2001, art. 5, par. 6;
- ⁽¹¹⁾ Decretul Consiliului de Stat nr.254 din 10.07.1978 pentru ratificarea Convenției dintre România și Republica Austria pentru evitarea dublei impunerii asupra veniturilor și averii, publicat în B.O., nr.64/17.07.1978, art.23;
- ⁽¹²⁾ Lege privind ratificarea Convenției dintre România și Regatul Olandei pentru evitarea dublei impunerii și prevenirea evaziunii fiscale cu privire la impozitele pe venit și pe capital nr. 85/25.05.1999, publicată în M.O. Partea I, nr.251/2.06.1999, art.15, punctul 3;
- ⁽¹³⁾ Lege privind ratificarea Convenției dintre România și Canada pentru evitarea dublei impunerii și prevenirea evaziunii fiscale cu privire la impozitele pe venit și pe capital nr. 450/2004, publicată în M.O. Partea I, nr.1043/11.11.2004, art.10, par. 2, a)-b);
- ⁽¹⁴⁾ Lege privind ratificarea Convenției dintre Guvernul României și Guvernul Statului Israel pentru evitarea dublei impunerii și prevenirea evaziunii fiscale cu privire la impozitele pe venit nr. 39/14.02.1998, publicată în M.O. Partea I, nr. 86/23.02.1998, art. 18.

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INVESTIGATION ON THE PERCEPTION OF QUALITY WITHIN EUROPEAN ECONOMIC HIGHER EDUCATION

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Abstract. *The present paper aims to analyze in light of their quality, the educational public services, especially the economic higher education, using the perception of quality depending on the preferences of each stakeholder and being influenced by several factors. The research conducted has in view the calculation of an indicator able to reflect the perception of quality in the European Union member states, while the results enable to conduct a comparative analysis. The results lead to a classification of the countries which have an economic higher education well perceived from the point of view of quality.*

Keywords: higher education, efficiency, quality, performance, government expenditure.

JEL Classification: A29; H52; I 21; I25.

REL Classification: 4B; 13Z.

1. Introduction

When taking into account the local, national and global changes, each society and citizen must reinvent itself continuously so that the welfare status should be created, developed and maintained. To this aim, governments have an important role in ensuring high-quality public services adding to the private ones. At the level of public services an efficient institutional and legal framework must be put into place in order to maximize the functionality of the adequate mechanisms.

The analysis of public services, their financing and efficiency have been important debate topics both in the academic and political environment. Since the public services are varied and dynamic, it is difficult to study them in a single paper. Thus, this paper is the sequel to the research undertaken in another paper published by the authors (Crețan, Câmpeanu, Chirilă, 2012). Taking into consideration the importance of education for the entire society, the present paper aims to analyze these services in light of their quality. Since the perception of quality depends on the preferences of each person and differs according to several factors, the paper focuses on the quantification of the way in which quality in economic higher education is perceived based on some specific indicators. The study has in view the European Union member states and the results of the research allow the countries' classification according to the degree of insurance of an economic higher education evaluated for the quality offered.

For the scientific approach proposed in the paper, we dealt in different sections with expenditure for education, education quality, quantification of the quality perceived and the impact on the economic environment by means of the knowledge surplus created, spread and capitalized on at the level of all economic activities. We also attempt to formulate

appreciations on the economic higher education quality relying on the public information available in the official data bases. As a consequence, the paper is structured in four sections. The first section dedicated to the introduction to the expenditure and quality of education is followed by the second section where an analysis at European level is undertaken on the amounts allocated from public funding to education and namely to the economic higher education. The third section presents the results of the investigation related to the perception of higher education and economic higher education quality based on a built-in indicator. We also test the robustness of the results which confirm what has been previously stated. The conclusions can be found in the last section.

2. Government expenditure for higher education – how far does it go?

The sustainable development and the economy competitiveness cannot be achieved without investments in the human resource through the allocation of important amounts destined to financially support both all levels of education and the cultural and educational system by means of specialized institutions. This financial support is performed through the state contribution reflected in the public expenditure for education, culture, and research-development as well as through the efforts of private entities which directly finance private education units, educational programmes, cultural projects etc. All these efforts are found in the educational, training and cultural public services; the perception of their utility largely depends on each person's likings and it differs according to age, sex, social background, region etc. Despite this, there is a common preoccupation of all the entities involved in the supply of these public services to adjust to local, national and international requirements and to develop without compromising on their quality. As regards the perception of the quality of educational, training and cultural public services, the analysis is subjective as long as it is difficult to express quantitative appreciations for all the inputs and outputs of these services destined to continuously improve the labour force quality and, why not, the entire society.

The development level of a society greatly depends on the education expenditure. The importance of this field is hard to quantify exactly if we have in view the final outcome reflected in the labour force quality.

In order to quantitatively indicate the importance of education one should start with the education expenditures. It can be supported through state financing as well as through private financing. From the perspective of the official available data that can also be compared between states, we have access to data series about education in the public sector.

Using the Eurostat data one can find out that at the European Union level (EU), on the whole, the public spending on education has a fairly constant evolution as weight from GDP (between 3 and 7% of GDP for the total education expenses, 0.1 and 1.8% of GDP for the total higher education expenses, respectively), (Crețan, Câmpeanu, Chirilă, 2012).

As for the evolution in time of education expenditure one can register fairly reduced fluctuations. Since 2007 the majority of European countries have been faced with an increase in public expenditure for education, fact which is not similar in the case of public expenditure for tertiary education. In this last case, the focus also falls on the private financing of this sector of professional training

According to the average at EU level, as shown in Figure 1, four types of states are identified, namely:

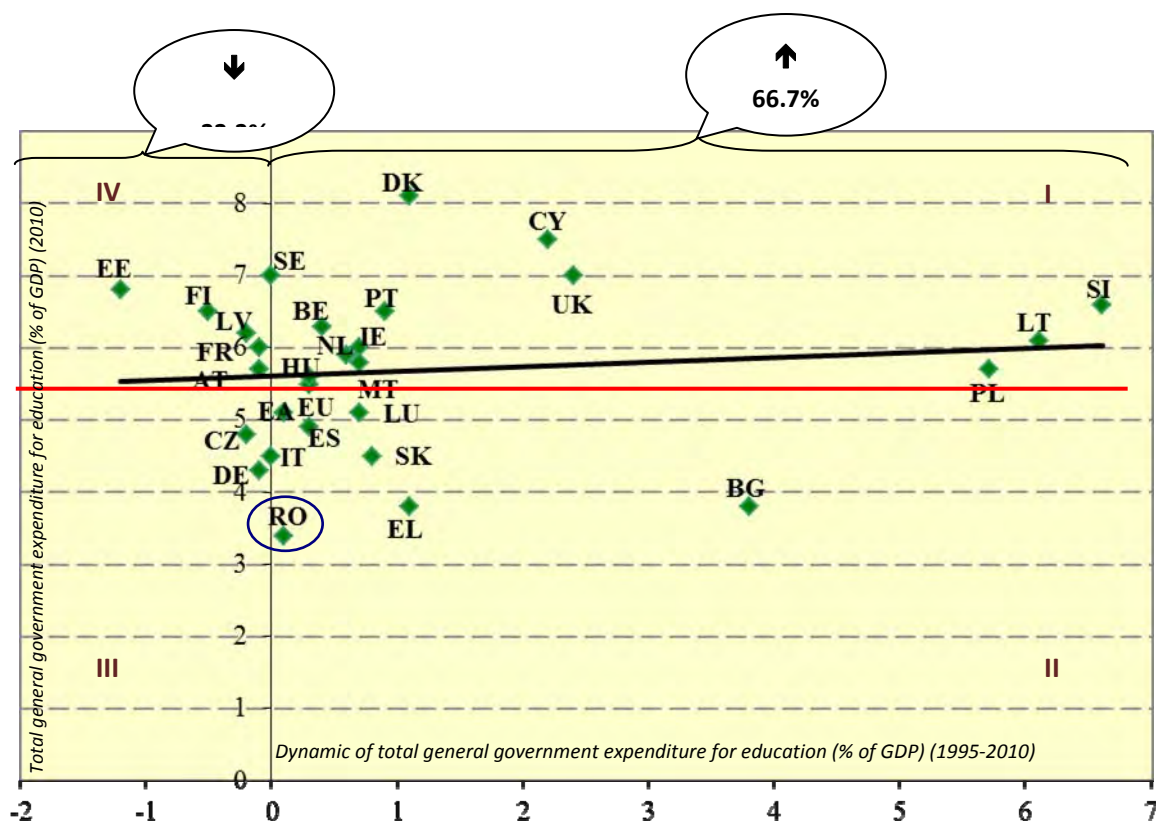
i) countries whose *public expenditure for education are increasing and exceed the European level* (the Ist quadrant where there are Slovenia, Lithuania, Poland, Great Britain, Cyprus, Denmark, Sweden, Portugal, Belgium, Ireland, Holland, Hungary, Malta);

ii) countries whose *public expenditure for education are increasing and under the European level* (IInd quadrant comprising countries such as Bulgaria, Greece, Slovakia, Luxembourg, Spain, Italy, Romania);

iii) countries whose *public expenditure for education* are decreasing and under the European level (IIIrd quadrant where Germany and Czech Republic are);

iv) countries whose *public expenditure for education* are decreasing and exceed the European level (IVth quadrant containing Estonia, Finland, Latvia, France, Austria).

Figure 1 also underlines the important differences at the level of EU countries concerning the amounts allocated to education from public funds.



Source: processing done by the author based on the Eurostat data. The dynamics is calculated for the period 1995-2010 due to the data availability for the European Union member states.

Note: the horizontal line indicates the average value at European level.

Figure 1. The evolution of public expenditure for education (% of the GDP)(1995-2010)

Based on the average values of education and higher education expenditure we ascertain that the countries which allocate important amounts for education also ensure an adequate support for tertiary education (Crețan, Câmpeanu, Chirilă, 2012).

3. Quantifying the perception of the quality in European higher education – overall and economic approaches

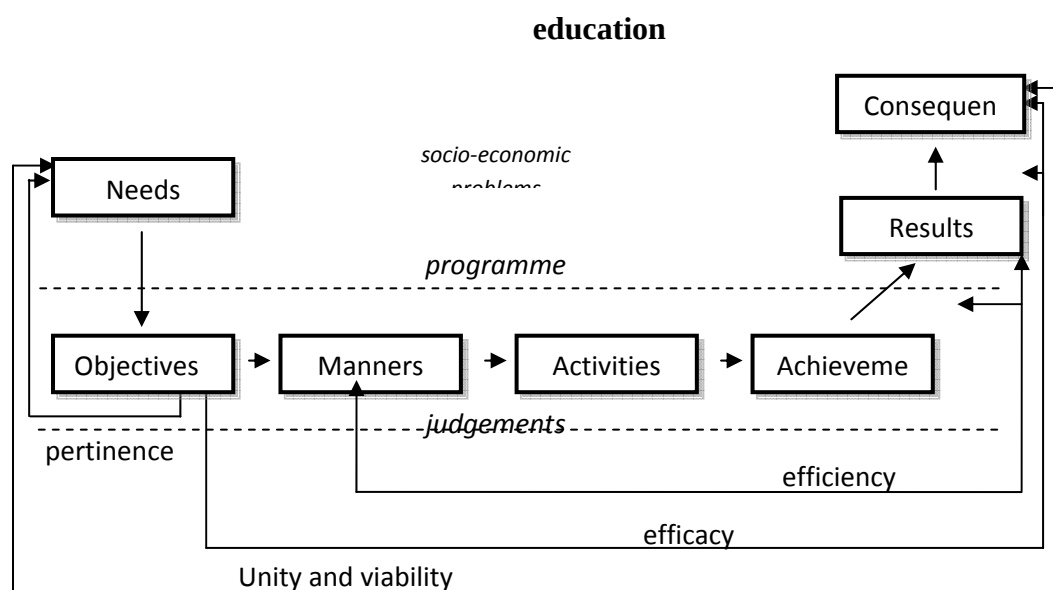
Quality in education is an intensely debated topic often ignoring all its aspects. In order to have a high-quality tertiary education (or generally speaking a high-quality education) one should take into consideration the complexity of the system which is closely connected to the economic, political and cultural environment. At the same time, the quality of education must focus all the involved parties, namely: i) the pupils/students who must be supported by family and society to learn; ii) the environment which should provide security, resources and adequate facilities; iii) the content that must be reflected in relevant materials and programs for the acquisition of knowledge and competences; iv) the didactic processes by means of which trained teaching staff use pupil/student-centered approaches and the existing infrastructure in each educational unit; v) the results which comprise knowledge, abilities,

skills, competences that are connected to the national objectives for education and active participation in society (Green, 1994). When evaluating the quality many times the focus falls on only one part as is the case of Romania.

Quality perception in higher education is subjective due to the factors influencing the individual insight of the stakeholders of higher education process. Thus, favourable consequences on the perception of quality of higher education require credible and flexible regulation.

Higher education is a field with a strategic planning at both national and international level. Political priorities, objectives, annual planning and authorized institutions are established to this aim. All these need to cooperate so that the relationships among needs, goals, activities, achievements, outcomes and consequences should be met. More specifically, it is about the evaluation criteria of policies by means of which educational strategies (see Figure 2) are applied, such as:

- Pertinence, namely to which extent the educational objectives are pertinent in relation to the changing needs and priorities;
- Efficiency, namely to which extent the different manners have found a match in achievements and outcomes in education;
- Efficacy, namely to which extent the policy impact has contributed to the achievement of specific and general goals of education;
- Utility, namely to which extent the policy impact corresponds to the needs of population;
- Viability, namely to which extent we may estimate that the positive changes remain after the end of application of the strategy.



Source: Moşteanu, Câmpeanu, Cataramă, Stoian, Gyorgy (2006), p. 45.

Figure 2. Criteria that need to be achieved through the application of a strategy in

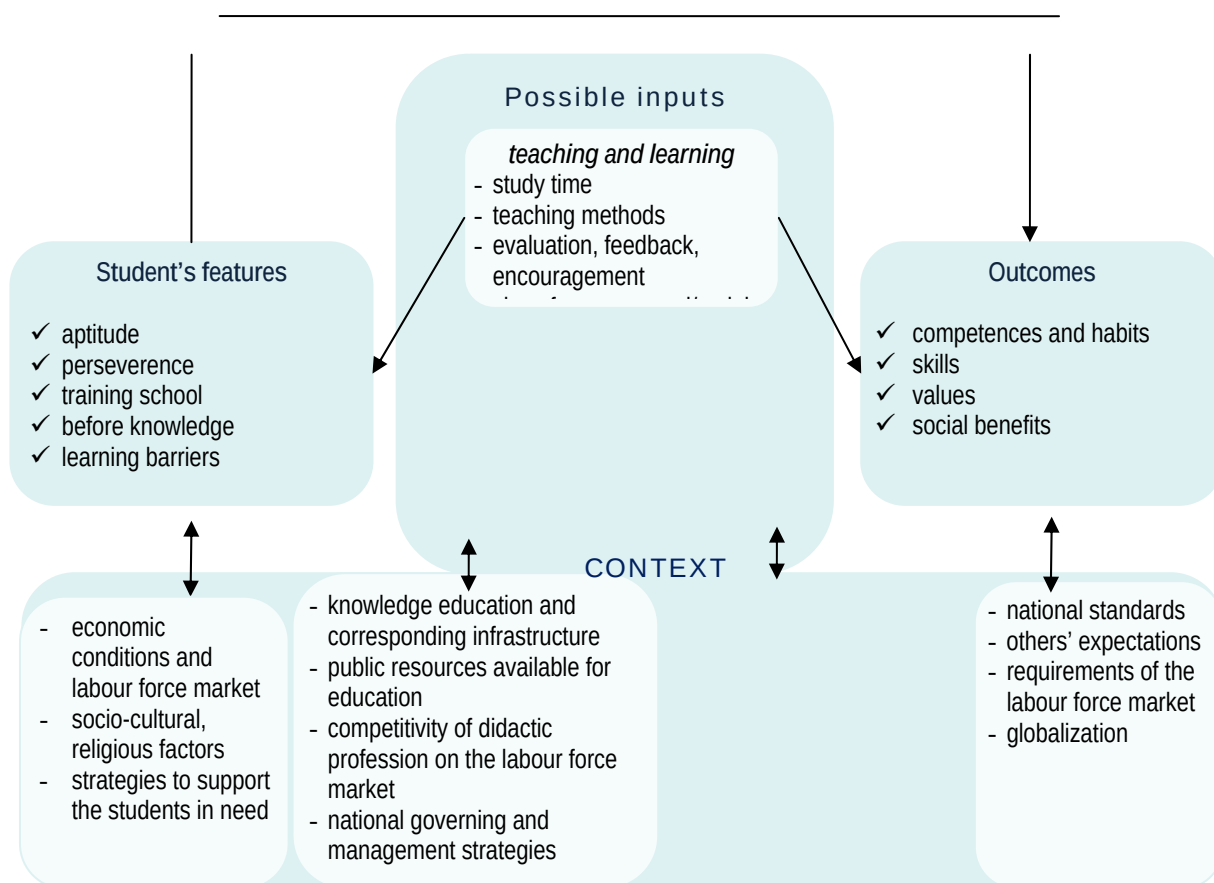
The above mentioned criteria are completed by means of another important goal aiming at the insurance and improvement of higher education quality (Creţan, Câmpeanu, Chirilă, 2012).

The coordination among different decision-making levels is able to ensure the improvement of education quality. This coordination must be achieved on a local, regional, national level as well as on an international level all the more so as we may consider the educational public services as global public services. From this reason, there is a strong

competition at the level of national and international educational units as there is also a competition among pupils/students.

Nowadays, the expression “high-quality education” is also used (Motala, 2000), being set as an objective at local, national level and with reference to the international context. Therefore, the definition of quality in education should be flexible, open to changes and able to encompass the new forms of the challenges for education having in its center on one hand the pupils/students and on the other hand, the beneficiaries (stakeholders) whose perceptions on the meaning and size of quality in education are different. Many times, the subjective nature also interferes since each beneficiary will think about what is best for his child (pupil/student) and then the educational system must meet all these more or less motivated expectations. These are compelled by the institutional, legal and last but not least, by the financial framework.

In order to have a better view of the framework of quality in education all the elements interfering with this complex process must be taken into consideration (Figure 3).



Source: processed by the authors taking into consideration EFA Global Monitoring Report (2005), p. 36.

Figure 3. The framework ensuring the understanding of quality in higher education

Notions such as efficiency, efficacy and performance have been often used as synonyms for quality in education (Adams, 1993). In spite of this, in the present, there is a general consensus focusing on the dimensions of education quality as they have been previously presented.

As the quality of education cannot be ensured without appropriate financial resources it is natural that the analysis should also take into account the efficiency, efficacy in higher education where the achievement of objectives is sought after with minimal expenses.

As regards the efficiency and efficacy in tertiary education an optimum ratio among inputs, outputs and outcomes is ensured. The inputs are reflected in the level of expenses for

higher education to which performances, number of graduates or enrollment rate, qualifications should correspond. All these in their turn should be found in outcomes related to goals such as welfare and increase, being influenced by exogenous political, economic factors.

The paper aims to conduct as well a quantitative analysis in relation to the perception of quality in higher education. As a consequence, a series of indicators must be considered, capable to adequately reflect this perception. To ensure the data comparability the indicator quality of education on the whole and by components is used, being calculated and reported by World Economic Forum (WEF) for the year 2011. This indicator is named quality in higher education on the whole and it is obtained as a composite indicator formed of the quality of the educational system, the quality of economic higher education, the quality of scientific research institutions, the collaboration between universities and the private environment in R&D projects and the brain drain (see Annex 1 for the scores of these indicators by EU countries).

Thus, using the results of a previous paper published by the authors (Crețan, Câmpeanu, Chirilă, 2012), where based on the available data, a score reflecting the perception of higher education was calculated for each state member of the European Union and a classification for the EU member states was performed as regards the level of quality in higher education, focusing on grouping the countries in five classes (see Annex 2 for the results obtained in the previous paper), we tested the robustness of the results obtained by applying several methods of data analysis and regrouped the states in clusters.

The computations of indicators performed in the previous paper were based on the authors' own methodology. Furthermore, in order to see the situation for economic higher education, the methodology was reapplied and a score of the perception of quality was obtained as well as the classification by EU member states (see Annex 2 for the results obtained in the previous paper). As it can be noticed from the simple comparison of classifications, we may observe a change in the distribution of countries which ensure an economic higher education with a significant level of perception of its quality.

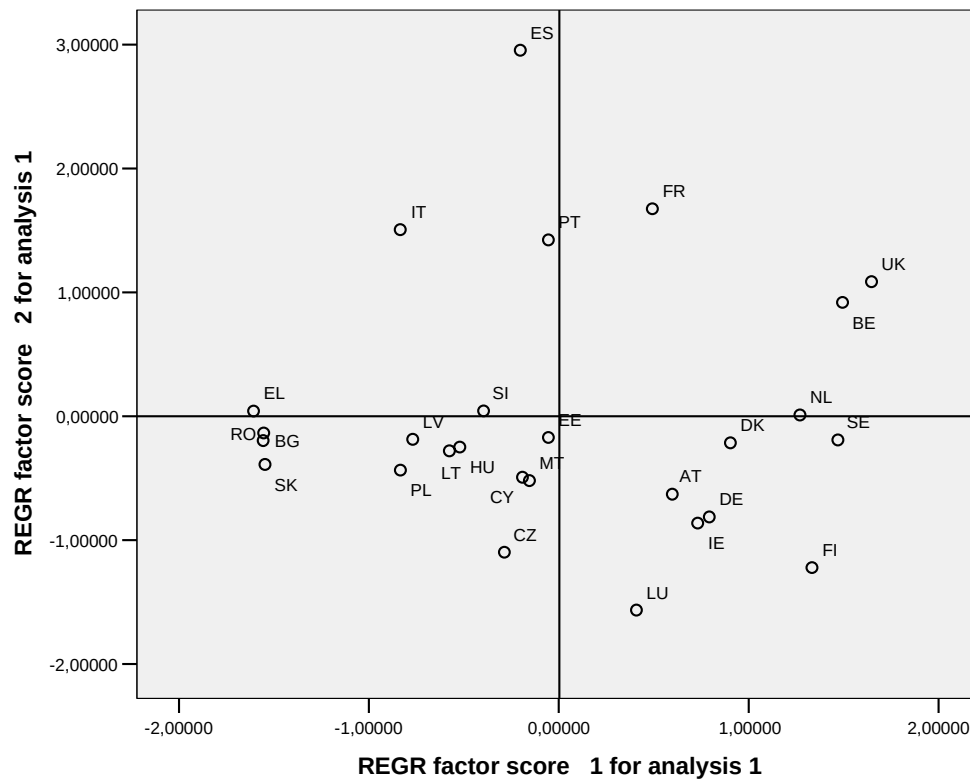
By means of these indicators reflecting the perception of quality in higher education there are also the differences existing between the EU member states as well as their specializations towards certain fields as it has been previously indicated.

Moreover, when synthesizing the results we may classify the countries according to the quality of higher education in three categories, namely:

- HIGHER quality if the perception index is between 4.7 and 7;
- MEDIUM quality if the perception index is in the interval (3.9, 4.7];
- LOW quality if the perception index is in the interval [1, 3.9].

To test the robustness of the results obtained in the previous research we will apply several methods of data analysis: the analysis of main components, the hierarchical classification and the environmental cluster analysis (K-Meand Cluster) for the available data for 2011.

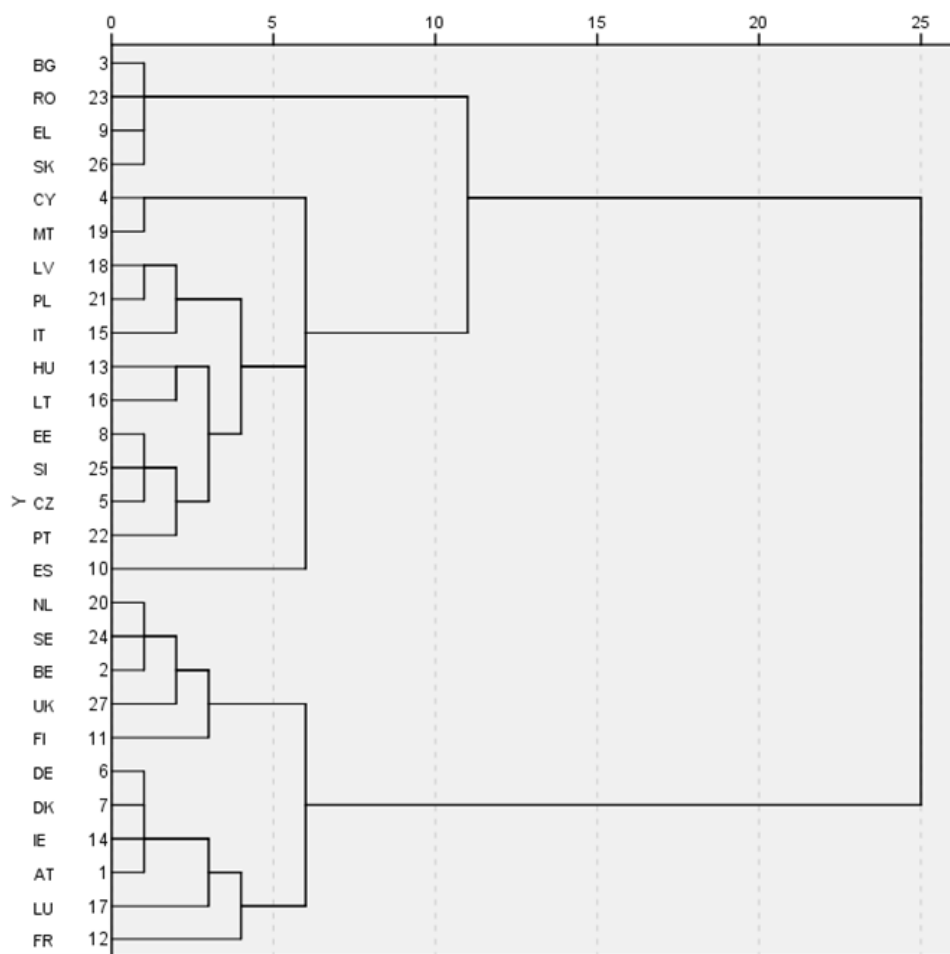
The result of the main component analysis presented in Figure 4 shows two distinct groups of countries for the year 2011, according to the variables taken into consideration. The biggest discrepancies as regards the quality in higher education on the whole is identified in two groups of countries: the first one composed of Greece, Romania, Bulgaria, Slovakia which have values much lower than the average and the second group formed of United Kingdom, Belgium, Netherlands, Sweden, Finland that have values much higher than the average.



Source: processed by the authors.

Figure 4. The representation of analyzed countries in the system of the first two factorial axes (2011)

In order to make a classification of all countries we use the hierarchical classification. Its results are presented in Figure 5. Therefore, the optimum number of clusters identified is three. To indicate the countries belonging to these clusters we will use the K-Means cluster (Pintilescu, 2007).



Source: processed by the authors.

Figure 5. The hierarchical tree (2011)

The three clusters identified following the analysis have the features presented in table 1. This indicates cluster 2 as being characterised by the highest values of the indicators while cluster 3 is characterised by the lowest values of the indicators. As a consequence, cluster 1 comprises countries with average values of the indicators (France, Luxembourg, Estonia, Portugal, Malta, Cyprus, Spain, Czech Republic, and Slovenia). France and Luxembourg change their position from ADVANCED to MEDIUM, while for the other countries the previously obtained results are confirmed.

Table 1
Characteristics of identified clusters

Final Cluster Centers			
	Cluster		
	1	2	3
c1	4.30	5.26	3.48
c2	4.17	5.17	3.38
c3	4.80	5.34	4.00
c4	3.74	4.87	2.60
c5	4.57	5.60	3.84
c6	4.27	5.32	3.53

Source: processed by the authors.

According to the table below, cluster 2 corresponding to the countries with a superior level of the quality in education in general for the year 2011 is represented by: United Kingdom, Sweden, Belgium, Finland, Netherlands, Denmark, Germany, Ireland, and Austria.

Cluster 3 corresponding to the countries with the lowest level of the quality in higher education on the whole in 2011 is composed of: Hungary, Lithuania, Latvia, Poland, Italy, Slovakia, Bulgaria, Romania, and Greece.

Table 2
The final composition of clusters

Cluster Membership			
Case Number	Tari	Cluster	Distance
1	AT	2	1.058
2	BE	2	.913
3	BG	3	.952
4	CY	1	.770
5	CZ	1	1.044
6	DE	2	.816
7	DK	2	.512
8	EE	1	.416
9	EL	3	1.081
10	ES	1	1.383
11	FI	2	.923
12	FR	1	1.299
13	HU	3	1.671
14	IE	2	.917
15	IT	3	.860
16	LT	3	1.211
17	LU	1	1.629
18	LV	3	.719
19	MT	1	1.351
20	NL	2	.333
21	PL	3	.619
22	PT	1	.964
23	RO	3	1.024
24	SE	2	.760
25	SI	1	.758
26	SK	3	.986
27	UK	2	1.333

Source: processed by the authors.

The first cluster corresponding to the average level of quality in higher education on the whole in 2011 is composed of: Cyprus, Czech Republic, Estonia, Spain, France, Luxemburg, Malta, Portugal, and Slovenia.

Therefore, the results obtained for 2011 are not very much different from the results obtained by means of the composite indicator.

Conclusions

In this paper we analyzed the higher education in light of the expenditure for education, the education quality, the quantification of the quality perceived and the impact on the economic environment.

The education expenditure influences the development level of a society. During 1995-2010, there are relatively reduced fluctuations of the expenditure for education in the countries members of the European Union. For the quantification of the perceived quality of higher education we have created a composite indicator and based on it, we obtained a classification by means of the main component analysis, the hierarchical classification and K Means Cluster. Thus, for the year 2011, the countries with a high level of quality in higher education are the United Kingdom, Sweden, Belgium, Finland, Netherlands, Denmark, Germany, Ireland, Austria, the countries with a medium level are France, Luxemburg, Estonia, Portugal, Malta, Cyprus, Spain, Czech Republic, Slovenia and the countries with a low level of perception of quality are Hungary, Lithuania, Latvia, Poland, Italy, Slovakia, Bulgaria, Romania and Greece.

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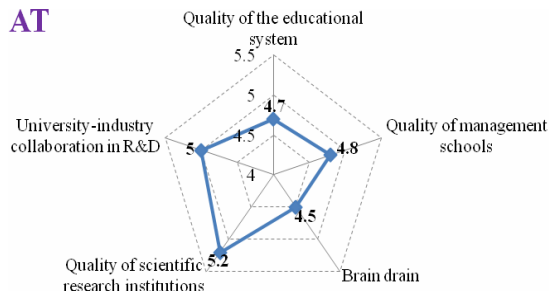
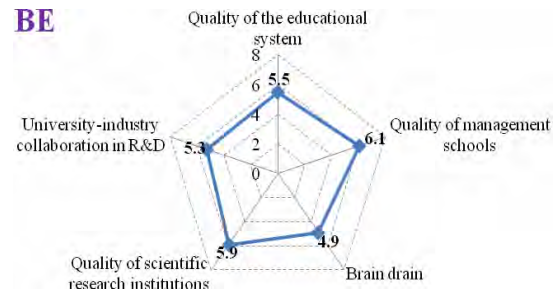
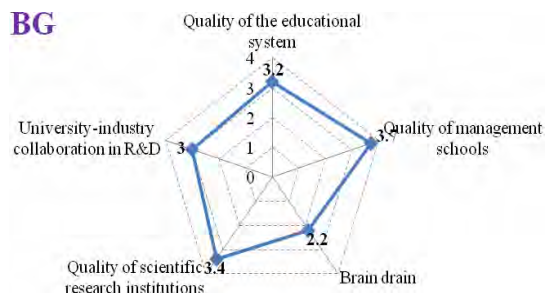
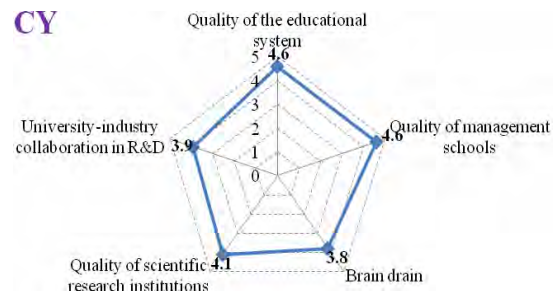
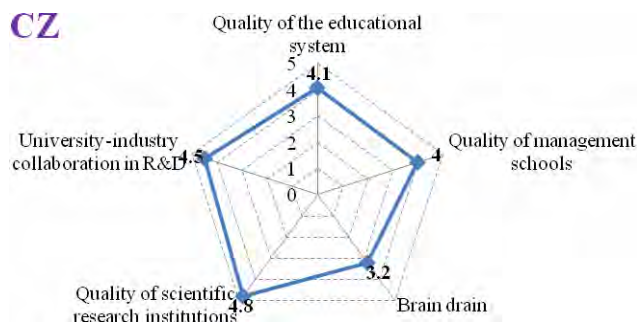
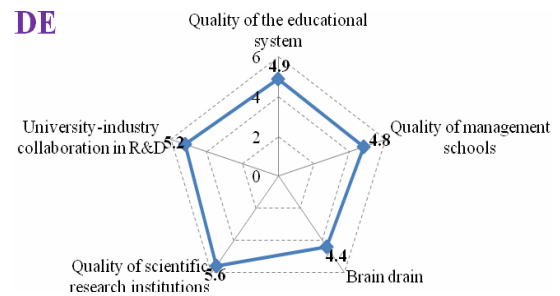
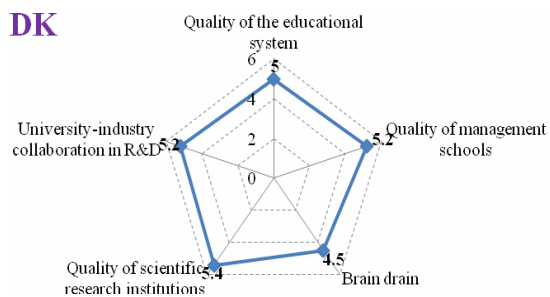
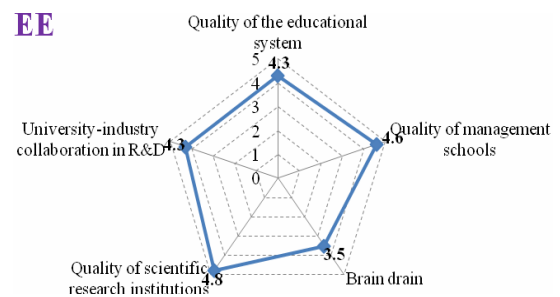
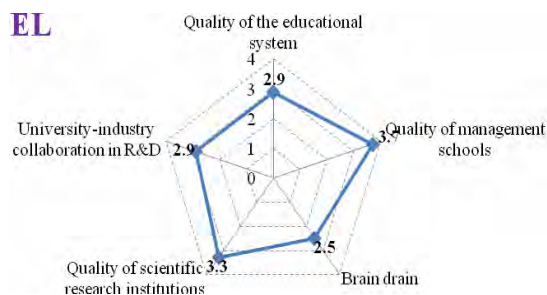
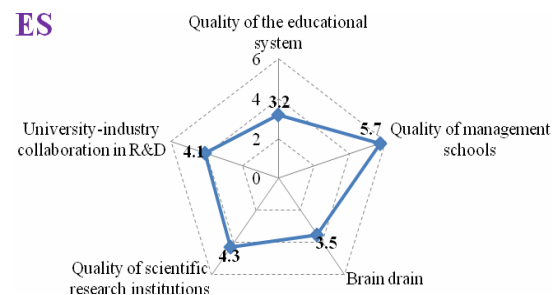
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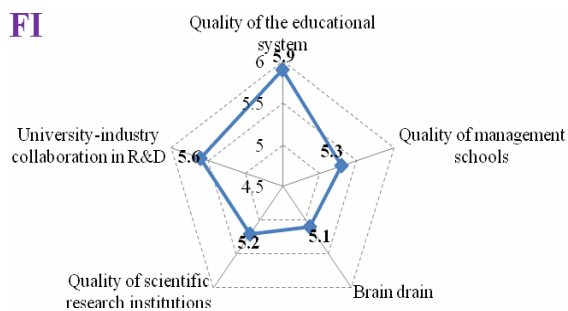
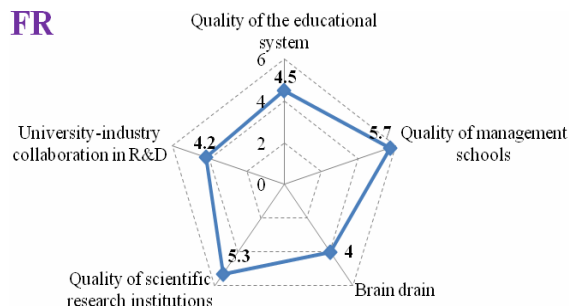
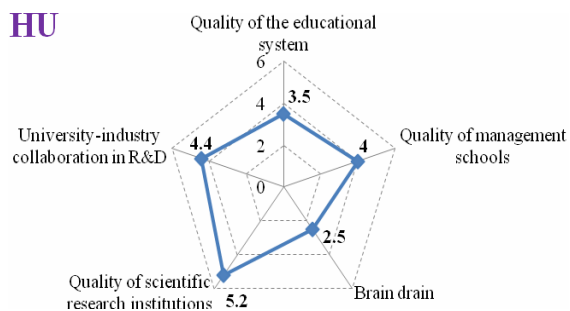
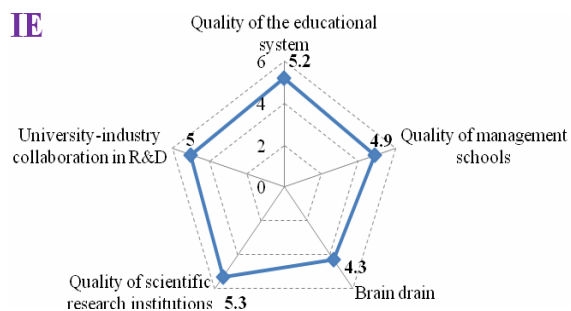
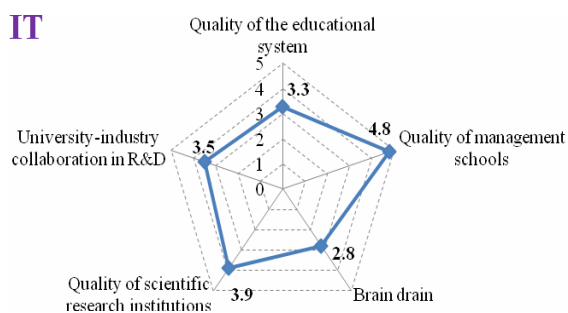
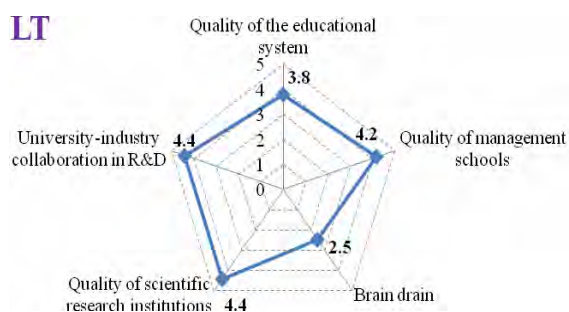
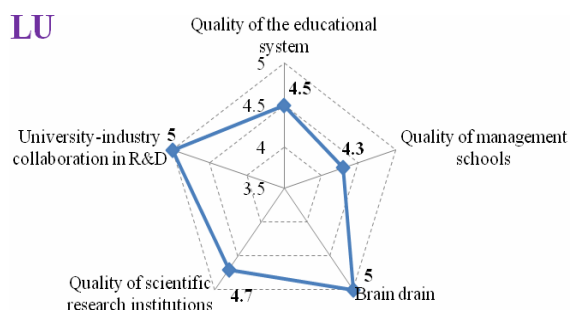
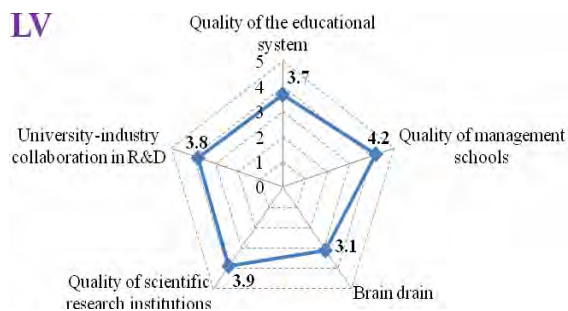
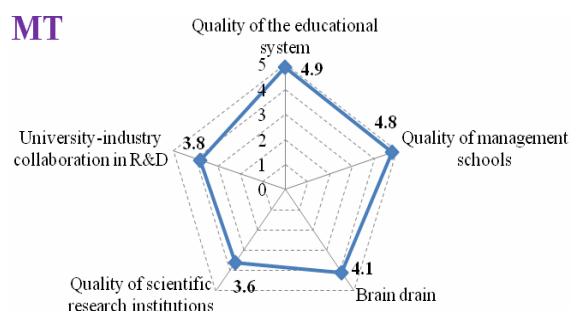
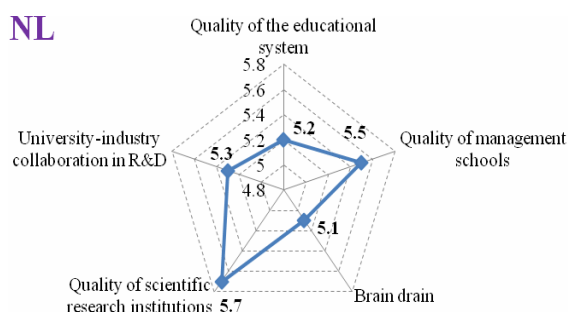
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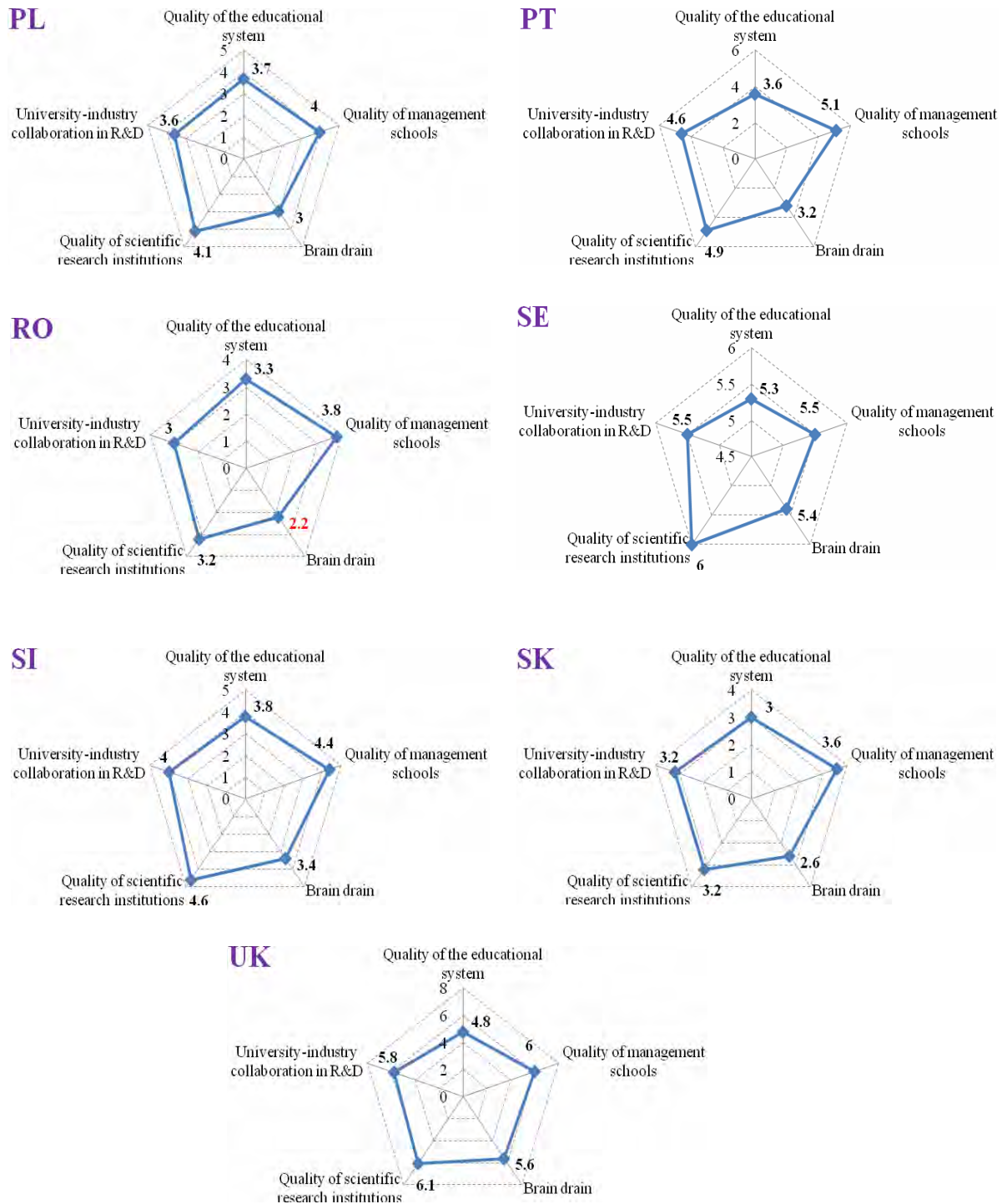
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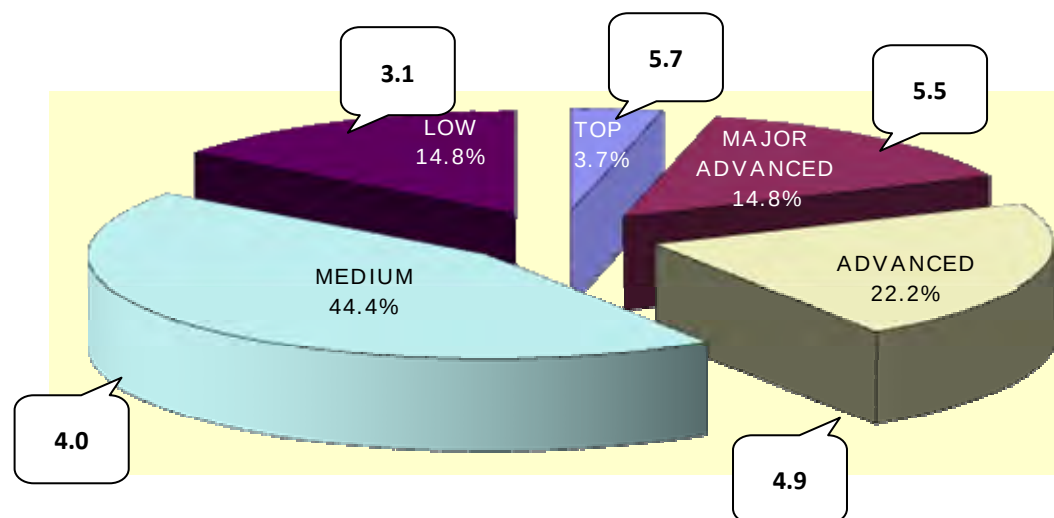
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Source: processed by the authors.

Figure 6. **The score corresponding to the perception of quality in education (2011)**

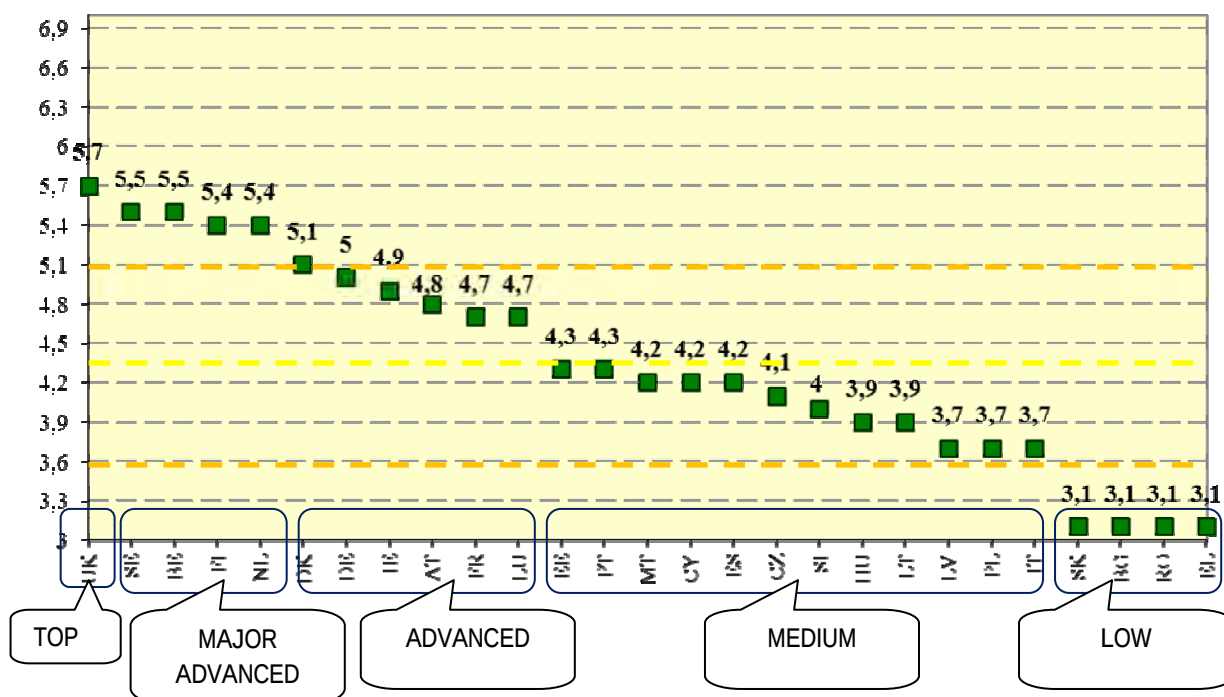
Annex 2



Source: Crețan G.C., Câmpeanu E. M., Chirilă V., Quality in Higher education: from words to reality, Revista economică - Journal of economic-financial theory and practice, supplement no.4/2012, pp. 164-172, 2012

Note: for each category it is indicated the score between a maximum of 7 and a minimum of 1.

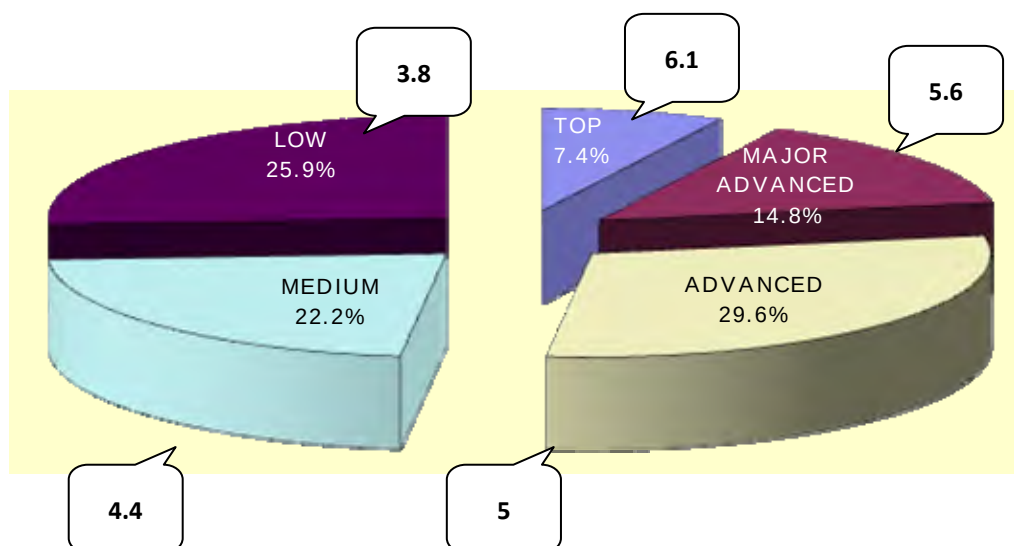
Figure 7. The European situation of the classification regarding the perception of quality in tertiary education and its respective score (2011)



Source: Crețan G. C., Câmpeanu E. M., Chirilă V., Quality in Higher education: from words to reality, Revista economică - Journal of economic-financial theory and practice, supplement no.4/2012, pp. 164-172, 2012.

Note: for each category it is indicated the score between a maximum of 7 and a minimum of 1.

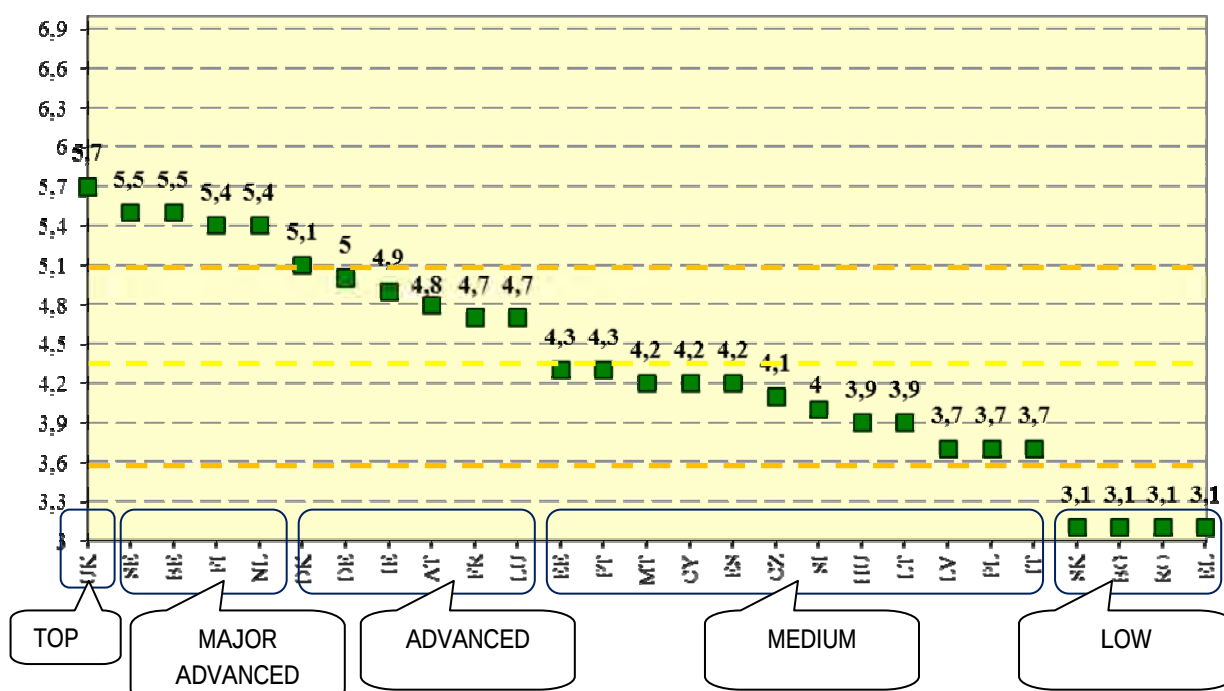
Figure 8. The perception of quality in higher education – score and classification by EU member states (2011)



Source: Crețan G. C., Câmpeanu E. M., Chirilă V., Quality in Higher education: from words to reality, Revista economică - Journal of economic-financial theory and practice, supplement no.4/2012, pp. 164-172, 2012

Note: for each category it is indicated the score between a maximum of 7 and a minimum of 1.

Figure 9. The European situation of the classification regarding the perception of quality in economic higher education and its score (2011)



Source: Crețan G. C., Câmpeanu E. M., Chirilă V., Quality in Higher education: from words to reality, Revista economică - Journal of economic-financial theory and practice, supplement no.4/2012, pp. 164-172, 2012

Note: for each category it is indicated the score between a maximum of 7 and a minimum of 1.

Figure 10. The perception of quality in economic higher education – score and classification by EU member states (2011)

SESSION IV

FINANCIAL MARKETS AND INSTITUTIONS

INVESTIGATION OF THE PROFITABILITY OF MOVING AVERAGE STRATEGIES ON THE ROMANIAN STOCK MARKET

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Abstract. *The efficiency of the Romanian stock market is tested over 5 individual stocks during 2002-2011, with a test period and an out of sample period. Technical analysis strategies are applied on the data to identify if they return profits by exceeding the buy-and-hold strategy. Best moving average trading rules are chosen out of the whole universe of rules. The results were protected from being out of luck by using the data snooping test Hansen's Superior Predictive Ability. Technical analysis did not outperform the buy-and-hold strategies. More, when transaction costs were considered the moving average strategies returned even lower performance compared to the benchmark strategy. It turns out that there are no sufficient reasons to consider the moving average strategies profitable on the Romanian market when compared to the buy-and-hold one.*

Keywords: data snooping; moving average; strategies profitability.

JEL Classification: C52, C82; G15.

REL Classification: 11B.

1. Introduction

Technical analysis is a widely used forecasting method based on the study of past prices and volumes of the transactions, and, in the same time, one of the oldest techniques used to investigate the strategies profitability.

The contribution of this article is to identify if technical analysis returns profits on the Romanian market by exceeding the buy-and-hold strategy when its strategies are applied on the most liquid stocks. The efficiency of this market is tested on individual stocks, which was rarely performed on the Romanian market. According to Samuelson's Dictum (1998) "the stock market is 'micro efficient' but 'macro inefficient' ". Among the originality of this study is the use of a recent method of data snooping on the Romanian market. The data snooping test (1), Hansen's Superior Predictive Ability test (2005) is applied because the performance of the whole universe of strategies was tested on the same dataset and this could lead to out of luck results. The best strategy was chosen as the strategy with the highest profit and then compared to the performance of the buy-and-hold strategy.

The performance of the technical analysis on the Romanian market is tested on five stocks, namely the Investment Funds, which were created due to the mass privatization process and are organized corresponding to the historical regions of Romania. From the beginning the Investment Funds offered unexpected high returns, a convenient liquidity that allows quick buys and sells and even speculations on the market. Moving Average (MA) strategies are applied on the stocks during a period of ten years. Daily closing prices are gathered between 2002 and 2011. Data is split into two sample periods, an in-sample period and an out-of-sample one. The splitting moment was chosen at the middle of 2007 because at that point it can be identified a structural break (2) for the return series of each fund. To diminish data snooping bias, the SPA test was used. The best trading rule out of the whole universe of rules was chosen as the rule that returns the highest profit. This rule was chosen over the test period and its performance was then tested on the out-of-sample period, with and without considering transaction costs.

The paper is organized as follows. A survey of the literature is provided in Section 2. In Section 3 is described the data. Section 4 is a presentation of the moving average strategies and data snooping followed by Section 5 that holds for the empirical results. Section 6 concludes the paper.

2. Literature review

Technical analysis holds an important place among the studies of the capital market investigation. One of the principles that underlie this method based on historical prices is that history repeats, meaning that the direction to which the market moves to is predictable. Once the trend is settled, the market will stay on this trend for a period of time.

Most of the studies on the stock market are performed on indexes and not on individual stocks. Dow Jones Industrial Index has been the subject of several researchers, like Brock et al. (1992), Bessembinder et al. (1998), Sullivan et al. (1999), Hsu et al. (2005). Other investigated indexes are S & P 500 by Sullivan et al. (1999), Hsu et al. (2005) and RUSSELL 2000 by Hsu et al. (2005) and (2010). The results supported the technical analysis method but they raised a question mark on the impact of the transaction cost.

An important issue among the studies of technical analysis is the use of data snooping in protecting the data. Lo and MacKinlay (1990), Brock, Laconishok and LeBaron (1992), White (2000), Hsu and Kuan (2005), Shynkevich (2012) consider that on the same data set should be applied several analysis methods. According to White (2000), when the data is reused the results might be out of luck and not due to a specific method. That's why White (2000) proposed a method of testing the null hypothesis that the best trading strategy is not superior to the benchmark. Sullivan et al. (1999) has used for the first time White's test on a daily time series of the Dow Jones Industrial Average Index over 100 years. Taking Brock et al. (1992) as a starting reference, the paper tries to reveal the importance of data snooping in evaluating the technical analysis strategies. Based on Whites (2000) assumptions, Hansen (2005) develops the test by making it more powerful and less sensitive to irrelevant alternatives. Most of the authors use both tests in their analyze, Hsu et al. (2005), Chen et al. (2009), Shynkenvich (2012).

Huang et al. (2010) tested how data snooping affects the technical analysis on the Asian capital market over 1975-2006. It was concluded that when transaction costs are not taken into account, the short term moving averages are the most profitable strategies. After data snooping tests were applied the results hold, with one exception.

Shynkevich (2012) performed technical analysis strategies on technology industry and small cap sector portfolios over 1995-2010. Data was protected of data snooping by using the White's Reality Check test and Hansen's SPA. 12937 transaction rules, belonging to four classes of strategies, were compared with the buy-and-hold benchmark. Before transaction costs, in the first part of the sample, technical analysis turns out to be profitable, but in the second part of the sample the performance of the strategies do not exceed the buy-and-hold strategy. Also, by taking into account the transaction costs, the performance of technical analysis is reduced.

In Romania, the capital market being young and disadvantaged by an unstable political environment, it allows speculations. In 2007 the Romanian market has reached its maximum for most of the portfolios and it marked the beginning of the decline and the price decrease.

Todea and Zoicas (2011) analyzed the moving average strategy profitability on the Romanian market by the linear and non-linear dependencies. The rules were tested on the Romanian market on daily closing prices of the RON/EURO currency rate over the period 1999-2004. It concludes that the trading rules are profitable in specific sub-periods and that the profitability of the trading strategies is influenced by the market trends.

The researches performed on the Romanian stock market over different periods of time and portfolios or indexes have reached contradictory conclusions. Dragota and Mitrica (2004) conclude that the market is inefficient when the analysis was performed on six portfolios of BVB over 1998-2000. Murgea et al. (2006) have reached the same conclusion of inefficient

market when the analysis was performed on the BVB indexes BET, BET-FI and BET-C over January 2004 - November 2005. The conclusions regarding the profitability of the Romanian market remain contradictory depending on the analyzed periods and portfolios.

3. Data

The profitability of the MA strategy on the Romanian market is tested on the daily closing prices of the five Investment Funds: SIF1, SIF2, SIF3, SIF4, SIF5, during January 2002-December 2011. These Investment Funds have been listed to the Bucharest Stock Exchange and they play an important role on the Romanian economy because they hold shares on important companies in different domains, like: energy, banking, gas.

Besides the role these Investment Funds play into Romanian economy, another reason they are important is the volatility and liquidity that allows speculations. For example, in 2005 their index marked an increase of 175% while in 2009, during the economical and political crisis, it marked an increase of over 90%.

Data is constructed using daily closing prices of the five Investment Funds and it was collected over 10 years, starting first trading day of January 2002 until the last trading day of December 2011. The analysis is performed on the data from 2002 to 2007 and the results obtained are then tested over the second period, 2007-2011. The splitting day was in 2007 for each time series and it is considered the day with the maximum closing price. It was chosen 2007 to split the periods because in 2007 the economical crisis installed on the Romanian and European market. The maximum closing price over the investigated period of 10 years is in July 2007 for each stock. It can be identified an important change for each portfolio at the middle of 2007 and the main characteristics of each time series are expected to change in the two periods of time.

On the below tables are presented the descriptive statistics of the daily returns for the five investigated investment funds over 2002-2011. The return is computed as the difference between natural logarithm of current day closing price and natural logarithm of previous day closing price:

$$R_t = \ln \left(\frac{C_t}{C_{t-1}} \right)$$

Data is analyzed over the two periods of time: January 2002– July 2007 and July 2007 – December 2011. Considering the different economical and political environments for the two sub-samples, the returns are expected to yield poorer results for the out-of-sample period.

Table 1 presents the summaries of the descriptive statistics for the five stock portfolios over both periods of time. The mean returns over 2002-2007 are positive and greater for SIF1 and SIF2 than for the other three portfolios. The non-zero skewness and positive large values for kurtosis suggest that the return series do not follow a normal distribution. This is confirmed by the results of the Jarque-Bera test, which rejects the null hypothesis of normal distribution of the return series.

On the contrary to the above time period during 2007-2011, the mean returns are negative for all the five stock portfolios. The hypothesis of normal distribution of the returns is not accepted, as given by the Jarque-Bera test results. Distributions are asymmetric and leptokurtic.

Automatic Variance Ratio (AVR) implies the existence of linear correlations of the return series, which indicates a potential predictability of the MA strategy.

Table 1

Descriptive Statistics of the portfolio returns over the period 2002-2007

	SIF 1	SIF 2	SIF 3	SIF 4	SIF 5
Panel A: test period January 2002- July 2007					
Nr of obs	1333	1336	1319	1312	1335
Mean	0.02607	0.02606	0.00336	0.00237	0.00276
StDev	0.02626	0.02749	0.03149	0.02654	0.02699
Skewness	-0.014	-0.176	8.023	-0.103	-0.073
Kurtosis	4.956	5.058	172.687	4.53	4.871
JB	1350.278*	1414.795*	1636.793*	1118.248*	1310.717*
AVR	2.6502*	3.0775*	1.3009	3.3246*	0.9879
Panel B: out of sample period July 2007- December 2011					
Nr of obs	1111	1108	1121	1244	1101
Mean	-0.00138	-0.00115	-0.00144	-0.00097	0.00133
StDev	0.03437	0.03476	0.03467	0.03098	0.03403
Skewness	-0.138	-0.14	-0.196	-0.046	-0.069
Kurtosis	3.54	3.545	3.564	4.422	3.369
JB	574.3288*	574.5539*	601.9318*	100.38*	516.7*
AVR	4.1980*	4.3280*	3.9247*	1.9834	3.8368*

Notes: Nr. of observations represents the number of transaction days. JB – Jarque Bera test statistics.

AVR – Automatic Variance Ratio.

* significant at 5%.

**significant at 10%.

4. Moving average strategies and data snooping

Widely used in the past literature, moving average is one of the most important trading strategies. The moving average strategy used in this analyze generates trading signals when it is identified a crossover between a short term moving average and a long term one. Each moving average is computed as a simple moving average, which is the arithmetic mean of the closing prices over the considered period of time. Each day the moving average is recomputed for the considered period, by dropping the first day of the previous moving average and adding the previous price of current day. A simple moving average greater than current price suggests a price increase over the immediate period of time while a lower value suggest a decrease in price over the immediate period of time. The short term moving average is up to 10 days and the long term one is between 50 and 200 days.

Trading signals are generated when the short term and long term moving average intersect because it is considered that a new trend is initiated. When the short term moving average crosses from below the long term moving average it is generated a buy signal. The player remains on the market until the short term moving average crosses from above the long term one, generating a sell signal. This type of moving average was used by Brock, Lakonishok and LeBaron (1992) under the name Variable-length Moving Average (VMA). Additional to the moving averages, VMA takes into account a fix band that avoids the signals generated in a preset interval. This band avoids insignificant differences between short term and long term moving averages.

Through the analysis, the moving average is denoted as MA (n, m, l), where n is the number of days for the short-term moving average, m is the number of days in the long-term strategy and l is the width of the band.

The best trading rule is chosen out of 16610 rules resulted from the combinations of: a short-term moving average of up to 10 days, a long-term moving average between 50 and 200 days and a band between 0 and 1 with a frequency of 10%. An implemented algorithm is used to select the best trading rule as the rule with the highest profitability.

In the later years, the results of technical analysis were questioned for data reuse. It is considered that by testing several trading strategies on the same data set, the results might be out of luck. Recent papers underlie the importance of protecting data from data snooping. This problem occurs when trading rules are tested on the same dataset and the obtained results can be suspected of being out of luck. The selected best trading rule has to be chosen from the whole universe of trading rules and not just from a few. Shynkevich (2012) treats this problem in his research by using the two data snooping tests that consider the entire universe of rules when the best trading rule is selected: White's Reality Check (2000) and Hansen's Superior Predictive Ability test (2005). White (2000) took care of this and proposed a joint testing method for data snooping, Reality Check. Later, Hansen (2005) proposed an improved test named Superior Predictive Ability test (SPA), which, additionally to White's test avoids the inclusion of weak alternatives (3).

In this research is used the Hansen's Superior Predictive Ability test (SPA) which is constructed on the White's Reality Check assumptions but it improves it by avoiding the inclusion of the irrelevant forecasts by standardizing the test statistic. SPA is used to establish if the alternative predictions exceed the benchmark one. In other words, it is tested the null hypothesis that the best trading rule of the whole universe of rules does not outperform the benchmark strategy.

$$H_0: \max_k \mu_k \leq 0, k = 1, 2, \dots, M$$

where μ_k is the performance of the trading strategy than of the benchmark strategy. Model k is better than the benchmark only if $\mu_k > 0$.

It is considered R_k as being the return of the k^{th} transaction rule. The average of the differences between transaction strategy return and the buy-and-hold return becomes:

$$\bar{R}_k = \sum_{t=1}^T R_{k,t} / n, \text{ with } R_{k,t} \text{ being the } t^{\text{th}} \text{ observation of } R_k$$

The test statistic is then:

$$\bar{V}_n = \max_{k=1, \dots, N} \sqrt{n} \bar{R}_k$$

White (2000) used the stationary bootstrap Politis and Romano method (1994) to compare the performance of the best trading strategy with the empirical distribution of $\bar{V}_n$.

$$\bar{V}_n^* = \max_{b=1, \dots, B} \sqrt{n} (\bar{R}_k^*(b) - \bar{R}_k) \quad b = 1, \dots, B$$

where $\bar{R}_k^*(b)$ stands for the b^{th} sample resulted by bootstrap and $\bar{R}_k^*(b) = \sum_{t=1}^T R_{k,t}^*$ is the sample average.

Hansen (2005) highlights two shortcomings of White's test, which are the fact that the mean returns are not standardized and the null distribution is obtained in the most unfavorable configuration. SPA is based on the statistic $\bar{V}_n$, computed on the standardized returns:

$$\bar{V}_n^* = \max (\max_{k=1, \dots, N} \frac{\sqrt{n} \bar{R}_k}{\hat{\sigma}_k}, 0),$$

where $\hat{\sigma}_k$ is an estimator of the standard deviation of $\sqrt{n} \bar{R}_k$.

By adding poor predictions to the prediction set, p-value can be artificially increased. To avoid the influence of the strategies with high negative returns, Hansen (2005) proposed a different bootstrap method of the $\bar{V}_n$ distribution.

The mean of the returns of the b^{th} sample are:

$$\bar{R}_{k,t}^*(b) = R_{k,t}^*(b) - \bar{R}_k 1_{(R_{k,t} \leq -A)} \quad b=1, \dots, B$$

where 1 is an identity function which takes 1 when the assumption is satisfied and 0 otherwise and A is a predefined threshold value. Hansen (2005) proved that the threshold minimum value such that poor alternatives are eliminated is $A = \sqrt{2 \log \log n}$. Even so, A can take other values and still to distinguish between poor and good alternatives. Hsu and Kuan (2005) used the alternative $A = n^{1/4}/4$ and $A_k = \hat{\sigma}_k / (4n^{1/4})$.

P-value is obtained from the empirical distribution of $\bar{V}_n^*$:

$$\bar{V}_n^*(b) = \max (\max_{k=1, \dots, N} \frac{\sqrt{n} \bar{R}_k^*(b)}{\hat{\sigma}_k}, 0) \quad b=1, \dots, B$$

To compute $\hat{p}$ and $\bar{p}$ it is used the same estimator of σ_k . The p-values obtained such way are known as the SPA_c or consistent p-values. Because of the different values A can take, Hansen (2005) computes two additional p-values, which correspond to a lower and an upper bound of the consistent p-value.

$$Z_{k,t}^{L*}(b) = R_{k,t}^*(b) - \max(\bar{R}_k, 0) \quad b = 1, \dots, B$$

$$Z_{k,t}^{U*}(b) = R_{k,t}^*(b) - \bar{R}_k \quad b = 1, \dots, B.$$

Sample averages are computed based on the above statistics and are denoted by $\bar{Z}_k^L$ and $\bar{Z}_k^U$. The following relationship can be noticed: $\bar{Z}_k^L < \bar{Z}_k < \bar{Z}_k^U$. χ^2 si χ^2 distributions are computed in the same manner as for $\hat{p}$. These tests are denoted by Hansen (2005) as SPA_L si SPA_U and even if the p-values are inconsistent, they are the upper and lower bound of the consistent p-value.

Past literature suggests that the number of bootstrapping re-samples to be large enough to reduce the influence of the random term which can influence the value of p. Authors like Hsu and Kuan (2005) consider enough a number of B=1000 re-samples while other studies use B=500. As Sullivan (1999), Marshall (2008) or Hsu (2010), in this study B is 500. The smoothing parameter is 0.1, same as the one used by Sullivan (1999) who showed that p-value is not influenced by this choice.

5. Empirical results

The purpose of the analysis is to test the profitability of the technical analysis on the Romanian market by testing it on the five Investment Funds. In order to achieve the goal, the ten years data sample was split into a test sub-sample and an out-of-sample one.

Table 2

Analysis results over 2002-2007, without transaction costs

	SIF 1	SIF 2	SIF 3	SIF 4	SIF 5
Best trading rule	MA(10,71,0.8)	MA(9,54,0.2)	MA(3,52,0.7)	MA(4,99,0.2)	MA(5,200,0.9)
T-SPA	0	0	0	0	0
SPA _L	0	0.002	0	0.004	0
SPA _c	0	0.002	0	0.004	0
SPA _U	0.562	0.524	0.648	0.602	0.562
Return	2.3549	2.6472	3.4801	2.106	2.4777
Buy & Hold Return	2.6028	2.6302	3.6332	2.3102	2.8721

Notes: Best trading rule is the rule having the largest return with the components: short-term moving average, long-term moving average and band.

T-SPA is the SPA test statistic.

SPA_L, SPA_c si SPA_U represents the lower, consistent and upper p-values corresponding to SPA test.

The performance of the trading rules, the moving average, is tested on daily closing data of the five stocks over the period 2002- 2007. For this period of time, the performance is tested using Hansen's Superior Predictive Ability Test, which returns the best trading rule from the whole universe of considered rules compared to the buy-and-hold strategy.

For each stock portfolio the best rule is the rule that returns the highest performance. For SIF1, the best trading strategy is composed of a short-term moving average of 10 days, a long-term moving average of 71 days and a band of 0.8. The SPA test was applied to the corresponding best moving average strategy from the universe of the 16610 considered rules. All the five chosen rules are significant at 5% if we look at the lower and consistent values of p-value. The null hypothesis that the best trading rule is not superior to the buy-and-hold strategy is rejected according to the lower and consistent values of p at 5% level of significance. On the other hand, according to the upper values of p-value, none of the best trading rules are superior to the buy-and-hold strategy.

To emphasize the profitability of technical analysis, we can compare the return of the best trading rule with the return of the buy-and-hold strategy. Except SIF2, the returns of the best strategies are exceeded by the returns of the buy-and-hold. Only for SIF2, it can be noticed that the

return of the MA (9, 54, 0.2) rule exceeds slightly the return of the benchmark strategy. In average, the return of the buy-and-hold strategy exceeds the return of the best trading rules with 7.5%.

The best trading rules during 2002-2007 are now verified on the test period 2007-2011. As from p-values, none of the moving average rules are significant at any level. Hansen's SPA test can not reject the null hypothesis of better performance of the benchmark strategy.

Even though the tested rules were profitable in the previous period, they do not show performance in 2007-2011 when the market was under the economical and political crisis that affected Romania.

Table 3

Analysis results during 2007-2012, without transaction costs

	SIF 1	SIF 2	SIF 3	SIF 4	SIF 5
In sample best trading rule	MA(10,71,0.8)	MA(9,54,0.2)	MA(3,52,0.7)	MA(4,99,0.2)	MA(5,200,0.9)
T-SPA	1.421021	1.148111	1.957489	1.251155	1.435296
SPA _l	0.524	0.482	0.616	0.62	0.604
SPA _c	0.524	0.482	0.616	0.62	0.604
SPA _u	0.524	0.482	0.616	0.62	0.604

Notes: Best trading rule is the rule having the largest return with the components: short term moving average, long term moving average and band.

T-SPA is the SPA test statistic.

SPA_l, SPA_c si SPA_u represents the lower, consistent and upper p-values corresponding to SPA test.

Trading strategies do not show performance over the buy-and-hold strategy even though the environment of the Romanian stock allows speculations and is a volatile market.

According to Bessembinder and Chan (1998), the return before transaction costs may not be suggestive. When transaction costs are applied, such as different commissions or broker commission, the profitability can be affected and can suffer of an important reduction. How much are the transaction costs is an important issue that has been discussed and researched over time. It seems that it all depends on the market and the amount to be traded. Dellva (2001) suggest that for a small amount the cost of a one way transaction can be up to 0.5% while for a large amount it can lower to 0.1%. Hsu et al. (2010) has used a cost of 0.05% for a one-way transaction and same did Sweeney (1988), who believes that transaction costs depends on the type of investor considered. So, it is all about the market where the stocks are traded, the investor and the amount to be traded.

Table 4

Analysis results over 2002-2007, with transaction costs

	SIF 1	SIF 2	SIF 3	SIF 4	SIF 5
Best trading rule	MA(10,71,0.8)	MA(9,54,0.2)	MA(3,52,0.7)	MA(4,99,0.2)	MA(5,200,0.9)
T-SPA	0	0	0	0	0
SPA _l	0	0.002	0	0.004	0
SPA _c	0	0.002	0	0.004	0
SPA _u	0.586	0.594	0.746	0.622	0.642
Return	2.3039	2.5842	3.3691	2.061	2.2467
Buy&Hold Return	2.5968	2.6242	3.6272	2.3042	2.8661

Notes: Best trading rule is the rule having the largest return with the components: short-term moving average, long term moving average and band.

T-SPA is the SPA test statistic.

SPA_l, SPA_c and SPA_u represents the lower, consistent and upper p-values corresponding to SPA test.

This cost is considered different according to market specific features. For the Romanian investment funds it was considered a transaction cost of 0.3%.

According to the lower and consistent p-values with a transaction cost of 0.3%, the best trading rules are significant at 5%. Same as before considering transaction costs, the upper p-value suggests that these rules are not significant at any level. When considered transaction costs, returns are lower in average with 4%. Also, the returns of the best moving average rules do not exceed the returns of the buy-and-hold strategy.

Conclusions

A contribution of this study is the use of data snooping, which is a new approach on testing the profitability of technical analysis on the Romanian market by being cautious that the results are not out of luck when testing on the whole universe of moving average strategies. Most studies perform the analysis on the main indexes while here it was performed on individual stocks. Technical analysis trading rules were tested on the Romanian market represented by the five Investment Funds between January 2002 and December 2011. 16610 moving average rules were applied on the data to identify the best trading rule out of whole universe of rules, the rule that produces the highest profitability. The analysis was performed on an in-sample period and then tested on an out-of-sample period, with and without transaction costs.

The analysis at the micro level showed that there is slight evidence that the moving average strategy could produce performance on the analyzed stocks during the test period. The lower and consistent p-values rejected the hypothesis that the best trading rule could not outperform the benchmark strategy, but the upper value did not reject the null hypothesis. When returns are compared, it can be seen that, in average, the return of the buy-and-hold strategy exceeds the return of the best transaction rule. There are not sufficient reasons to consider the moving average strategy profitable compared to the buy-and-hold one. On the out-of-sample period, none of the moving average rules outperform the buy-and-hold strategy.

The moving average strategy produces even a lower performance when transaction costs are taken into account. When these costs are considered, the mean returns are lowered down with 4%.

On the five Romanian stocks the moving average strategy does not produce high profits and in most cases is outperformed by the buy-and-hold strategy. When working on the Romanian market, profits are not likely to be earned if considering the moving average strategy. As further work, it would be of interest to analyze the technical analysis performance at an even lower level, by working on intraday data and expand the research on more portfolios and even on the currency market.

Notes:

⁽¹⁾ Data snooping arises when on the same dataset are applied several trading rules and the results can be suspected of being out of luck. The best trading rule was selected out of the whole universe of rules.

⁽²⁾ The structural break can be identified using the Zivot Andrews test.

⁽³⁾ Alternative forecasts are compared to a benchmark forecast. The weak alternatives are the ones for which the observed excess

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THE INFLUENCE OF FINANCIAL DERIVATIVES IN EMERGING CAPITAL MARKETS

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Abstract. *This paper aims to investigate the econometric nuances of financial engineering innovations in emerging capital markets. Financial globalisation and integration of financial markets, along with a series of intrinsic factors such as more specialized risk management strategies, pronounced volatility of financial asset prices, lack of regulation or massive leveraged speculations have contributed to the astonishing growth of financial derivatives. Financial derivatives trading has a significant influence in terms of speculation and this issue leads to increased emerging capital markets volatility. Nevertheless, derivatives have a substantial contribution in hedging against the risks of capital market dynamics and they constitute an indispensable financial instrument for portfolio diversification. Moreover, the behavior of financial derivatives is affected by the inefficiency of emerging capital markets which are highly volatile and fastidious to forecast. In order to capture the relevance of the analyzed issues, the paper highlights the case of Romanian Capital Market based on Black-Scholes model.*

Keywords: volatility modeling; leverage effect; underlying asset; Black-Scholes model; option contracts.

JEL Classification: F31, G10, G12, G14, P45.

REL Classification: 11B.

1. Introduction

This article aims to examine whether financial derivatives have some influence in destabilizing market for underlying assets by increasing its volatility. The debate includes both theoretical and applied analysis. The controversy revolves around Black-Scholes model and its ability to determine the implied volatility of traded markets. Due to features such as sharp degree of leverage, apparent informational inefficiency, lack of liquidity and speculative interest of investors, emerging capital markets are designed as a quite unstable investment habitat. Likewise, emerging capital markets are highly volatile and intricate to forecast, aspects that are reflected by the relatively narrow number of investors and transactions.

Financial derivatives trading is based on a wide range of reasons. In the context of emerging capital markets, this involves a somewhat special connotation. However, one of the most popular motives is that derivatives enable investors to hedge against potential risks that are generated mostly by financial assets price changes, in order to offset possible losses. Synthesizing, the main advantage of using derivatives is to minimize risk for one party while offering to another the potential for a high return at increased risk. On the other hand, the speculative side of financial derivatives is highly exploited. Nevertheless, it is a fact that most financial derivatives are distinguished by high leverage.

On the other hand, financial derivatives markets expand the idea of risk-taking activity relative to capital. Based on concerted action such as optimization and streamlining financial transactions and leverage of capital, derivatives can increase speculation just as facile as reducing the cost of hedging (Birău, 2012).

2. Literature review

The behavior of financial investors is significantly influenced by the instability of emerging capital markets. Although, developing markets represent an increasingly attractive financial environment, they are exposed to diversified risks and structural deficiencies. Consequently, derivatives become a double-edged financial weapon.

According to Steinherr (2000): "Derivatives are dynamite for financial crises and the fuse-wire of the international transmission at the same time. Unfortunately, the ignition trigger does not seem to be under control." The author also concluded that "the growth of derivative markets has made financial crises considerably more virulent, and the fast growth and widespread use of derivatives has increased the risk of financial disturbances".

The same shadowy tone is also used by Warren Buffet: "the derivatives genie is now well out of the bottle, and these instruments will almost certainly multiply in variety and number until some event makes their toxicity clear. ... derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal."

Moreover, it is quite obvious that there is an increasing concern regarding the fulminant growth of financial derivatives. This reserved attitude is due to the implicit influence of financial derivatives over long term capital investments given that encourage short term speculative investments. Their influence is also reflected on the volatility of fundamentals behavior, especially interest rates, liquidity ratios solvency ratios or currency rates. In recent past, financial crisis revealed in a dramatic manner these particular issues.

A turning point in modern finance was triggered by Black-Scholes model and its complex implications regarding financial instruments. One of the most representative characteristics of this particular model is the ability to estimate market volatility of an underlying asset primary as a function of price and time without taking into account risk aversion of investors, expected yield, high degree of leverage, utility functions or volatility of the prices of underlying assets.

According to some authors a defining feature of derivatives is the self replicating strategy or the common knowledge of hedging which is based on the fact that an investor can continuously buy and sell financial derivatives without incurring a loss (Teneng, 2011).

Black-Scholes model is built on certain idealized assumptions regarding stocks and options. The basic idea is that the price of stocks follow a random walk in continuous time based on a variance rate which is proportional to the square of the stock price. Nevertheless, the variance rate of the stock return is constant and the distribution of stock prices is log-normal if it refers to a finite time interval. The short-term interest rate is assumed to be predefined and constant in time, or in other words, completely predictable.

Likewise, there is no possibility to exploit any arbitrage opportunities considering that there are no transaction costs or taxes, continuous trading of securities, no portfolio restrictions and no dividends. Concomitant, there is a non prohibitive attitude regarding short selling of stocks and the price of securities are infinitely divisible at the short-term interest rate. Another important aspect is that options are European so can only be exercised at maturity without paying dividends (Black, Scholes, 1973).

Black Scholes equations are the following:

$$C_t = S_t e^{-\delta \tau} N(d_1) - X e^{-r \tau} N(d_2)$$

where

$$d_1 = \frac{\ln\left(\frac{S e^{-\delta \tau}}{X e^{-r \tau}}\right)}{\sigma \sqrt{\tau}} + \frac{\sigma \sqrt{\tau}}{2}$$

and

$$d_2 = d_1 - \sigma \sqrt{\tau}$$

In order to define the premium of a PUT option (P) it is necessary to be utilized the following parity expression:

$$C_t + Xe^{-r(T-t)} = P + S_t$$

Therefore substituting this relation based on the expression of CALL option it is highlighted the PUT option price, such as:

$$P_t = Xe^{-r(T-t)} N(-d_2) - S_t N(-d_1)$$

Default notation for the parameters of CALL and PUT option prices, C_t and P_t are the following:

S_t : Price of the underlying asset at date t (stock, index, bond, gold, etc.);

τ or $T - t$: Time to maturity or expiration date, where T means maturity;

X : Strike price or exercise price of the option;

r : Risk free interest rate;

δ : Dividend yield on underlying asset;

σ : volatility or standard deviation of the rate of return on the underlying asset, i.e. squared root of the variance;

N : Cumulative distribution function of the standard normal distribution, while $N(d_1)$ and $N(d_2)$ are probability factors.

In order to capture volatility it is necessary to calculate standard deviation of the underlying stock returns, such as:

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^n \left(w_i - \bar{w} \right)^2} \quad \text{and} \quad \bar{w} \text{ is the sample mean which is calculated as:}$$

$$\bar{w} = \frac{1}{n} \sum_{j=1}^w w_j .$$

In addition, it is important to explain that cumulative distribution function $F(x)$ for a continuous random variable X with probability density function f is defined by the following relation:

$$F(x) = P(X \leq x) = \int_{-\infty}^x f(y) dy .$$

Furthermore, if X is a continuous random variable defined by the cumulative distribution function F , then for all real numbers a and b are valid subsequent relations:

$$P(X > a) = \int_a^{\infty} f_X(x) dx = 1 - \int_{-\infty}^a f_X(x) dx = 1 - F(a);$$

$$P(a \leq X \leq b) = \int_a^b f_X(x) dx = \int_{-\infty}^b f_X(x) dx - \int_{-\infty}^a f_X(x) dx = F(b) - F(a).$$

In mathematized approach with financial implications, the cumulative distribution function F is characterized by certain properties such as:

$$\lim_{x \rightarrow -\infty} F_X(x) = 0$$

$$\lim_{x \rightarrow \infty} F_X(x) = 1$$

$0 \leq F_X(x) \leq 1 \quad \forall x \in \Re$ because probabilities are always positive and never exceed a maximum of 1.

In addition F_X is not a decreasing function.

Considering that a standard normally distributed random variable is defined by the following probability density function:

$$f(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}},$$

and thus the the cumulative distribution function F has the following expression:

$$F(x) = \int_{-\infty}^x \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}} dz.$$

3. Empirical evidence on derivatives behavior

Nevertheless, Black-Scholes model has strong utopian shades in the turbulent context of emerging capital markets. In these particular markets are distinguished by a reduced influx of investors and a rather modest number of transactions. Most of the empirical evidence is controversial and inconclusive, but by no means definitive considering the fact that is based mainly on the analysis of developed capitalisation markets. In this respect, empirical studies have identified a heavy, positive correlation between trading volume and price volatility.

Romanian capital market because of its strong emerging influence is relatively insignificant and is represented by the following main segments: Bucharest Stock Exchange – incorporating RASDAQ, SIBEX – Sibiu Stock Exchange, Iasi Romanian Commodities Exchange and Romanian Commodities Exchange Market. However, the derivatives market is in an early stage of development because it is very young and quite fragile in terms of structure. In order to support the previous contention, in the table below are presented the most representative statistics on the evolution of derivatives at SIBEX – Sibiu Stock Exchange. A brief analysis reflects the dramatic impact of the financial crisis on the evolution of derivatives in recent years.

Table 1

Statistics on the evolution of derivatives at SIBEX – Sibiu Stock Exchange

Year	Futures contracts	Option contracts	Total Derivatives	Spot market	ATS market
2012	1.472.260	1.096	1.473.356	4.732.266	778.527
2011	1.613.469	13.105	1.626.574	16.779.926	6.592.703
2010	1.620.078	17.716	1.637.794	15.895.566	5.409.685
2009	2.430.849	52.438	2.483.287	0	0
2008	3.578.582	40.184	3.618.766	0	0
2007	3.456.023	34.900	3.490.923	0	0
2006	4.232.059	36.651	4.268.710	0	0
2005	696.109	11.629	707.738	0	0
2004	72.901	2.273	75.174	0	0
2003	168.545	19.369	187.914	0	0
2002	225.069	67.300	292.369	0	0
2001	135.242	53.731	188.973	0	0
2000	158.536	46.752	205.288	0	0
1999	159.927	15.215	175.142	0	0
1998	193.203	133	193.336	0	0
1997	77.877	0	77.877	0	0

Source: <http://www.sibex.ro>.

The individual evolution of futures contracts and option contracts between 1997 to 2012 is represented in a very suggestive manner by the figures below:

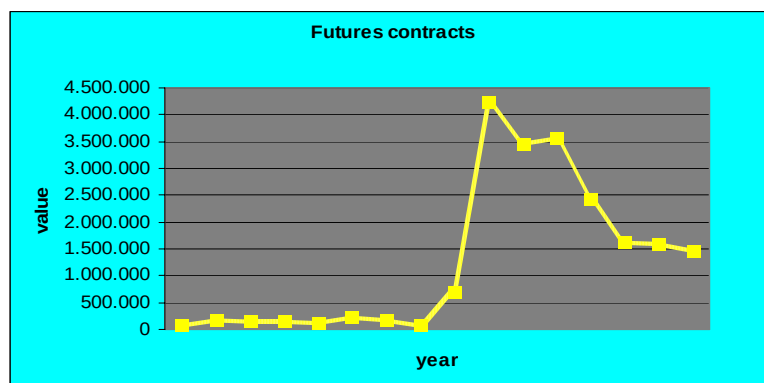


Figure 1. Futures contracts evolution

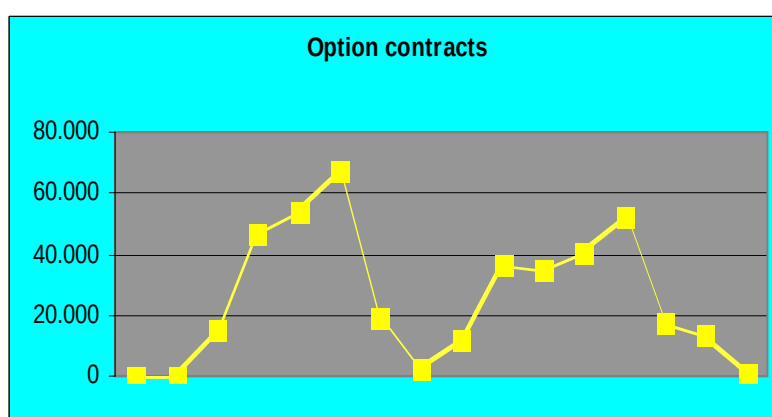


Figure 2. Option contracts evolution

The basic dilemma is whether financial derivatives are not considered sufficiently attractive for investors and this downward trend is due to several other factors. The accuracy of Black-Scholes model is tested empirically based on randomly chosen share options traded at SIBEX – Sibiu Stock Exchange.

At SIBEX – Sibiu Stock Exchange can trade futures contracts with the following underlying assets:

Shares: DEBRD, DEBRK, DERRC, DESIF1, DESIF2, DESIF3, DESIF4, DESIF5, DESNP, DETLV, DEEBS, DESBX, DEBVB, DEFPR

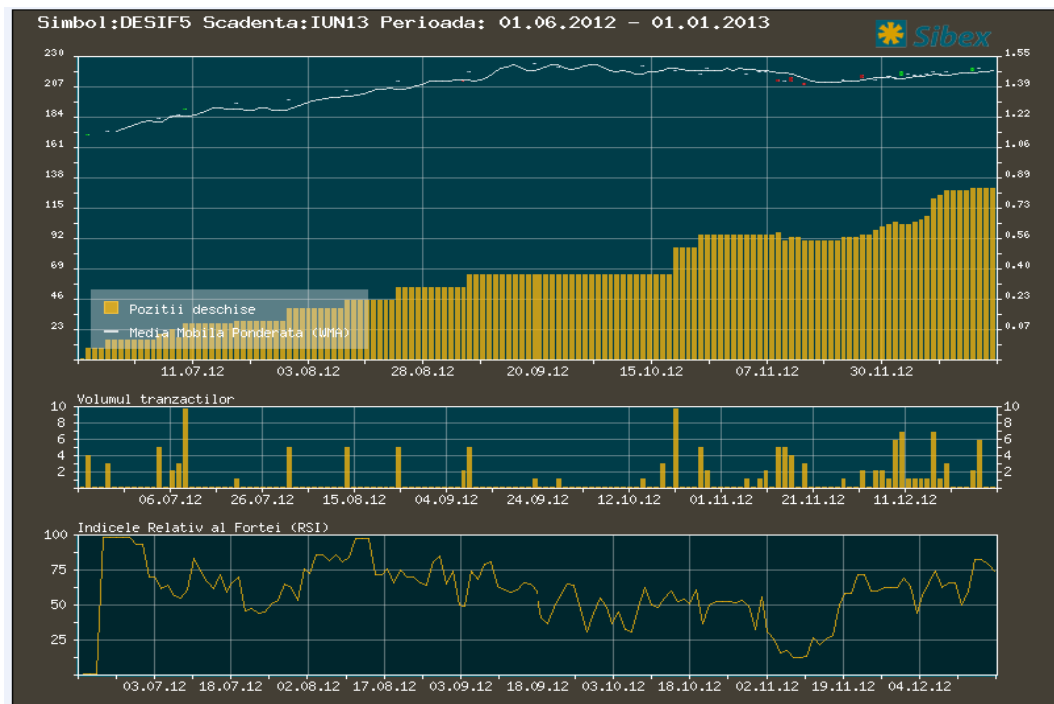
Currencies: USD/RON, EUR/RON, EUR/USD_RON, EUR/CHF_RON, USD/CHF_RON, GBP/USD_RON, EUR/GBP_RON, EUR/JPY_RON, USD/JPY_RON

Commodities: CO2 2008-2012, SIBGOLD_RON, DEOIL_LSC, SIBGOLD

Indices: DEDJIA_RON, DEDJIA_USD

Empirical analysis begins by selecting a share option DESIF5 traded on June 2012 maturity January 2013. Parameters have the following values based on previous Black-Scholes model notations: $t = 0$, maturity $T = 6$ months, $\tau = T - t = 0.5$, exercise price $X = 1.47$ lei, price of the underlying asset $S_t = 1.10$, r = risk-free interest rate 6.25%, volatility $\sigma = 30.4983\%$, dividend yield = 1%.

In the figure below is highlighted the growth potential of the traded share option DESIF5:



Source: <http://www.sibex.ro>

Figure 3. DESIF5 evolution from June 2012 to January 2013

The Black-Scholes model is applied in order to estimate implied volatility of the time series data. Econometric analysis is based on a computational approach that generates the following results:

d1	-1.1085
Nd1	0.2158
d2	-1.3251
Nd2	0.0926
Call Option premium	0.0146
Put Option premium	0.3445

Synthesizing, this empirical analysis provide a genuine insight regarding investment opportunity on emerging derivatives market. Is quite obvious that an investor obtained quite easily benefit considering potential losses. Extrapolating the previous analysis is painted a quite fertile investment area.

Conclusions

Emerging capital markets are characterized by an enormous growth potential and are very attractive to investors. Nevertheless, the influence of financial derivatives in emerging capital markets has not been accurately established, especially in the context of the global financial crisis. Metaphorically, this paper is an attempt to capture the most significant aspects regarding derivatives in a bivalent approach. Emerging capital markets are characterized by certain features that can be easily exploited for speculative purposes. Despite criticism and inherent structural limits, financial derivatives signify a remarkable progress in modern finance.

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- *** <http://www.sibex.ro/index.php?p=despre&lang=ro>

ADOPTION MODEL FOR REGULATORY OF FINANCIAL MARKETS

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Abstract. *The implementing necessity of some regulators of the financial markets that would help at the financial stability in economic crisis conditions led to reactions of the financial supervisory authority and their international associations through IAIS, IOSCO Multilateral. Romania cannot stay out of this reaction and must adapt to the international trend through the reorganization of the regulatory institutions of financial market after another model. Model that includes Romanian National Securities Commission, Insurance Supervisory Commission, Private Pension System Supervisory Commission, given that the regulation of the monetary market seems that must remain under the regulation of one entity, respectively National Bank of Romania.*

Keywords: financial; market; authority; supervision; insurance; pension; securities; prudential.

JEL Classification: G28, G20.

REL Classification: 11B, 11C.

Introduction

The model analysis which member states choose for the regulations of the financial markets in conditions of objectivity must take into account several elements, such as:

- Tradition and specific markets;
- Share and structure of financial markets;
- Regulations and international agreements in domain;
- Policies in terms of financial stability and risk.

The tasks of the regulatory model shall include the following: a. undertaking measures aimed at ensuring regular operation of the financial market; b. undertaking measures aimed at development of financial market and its competitiveness; c. undertaking educational and information measures related to financial market operation; d. participation in the drafting of legal acts related to financial market supervision; e. creation the opportunities for amicable and conciliatory settlement of disputes which may arise between financial market actors, in particular disputes resulting from contractual relations between entities covered by supervision and recipients of services provided by those entities; f. carrying out other activities provided for by acts of law.

The aim of financial market supervision is to ensure regular operation of this market, its stability, security and transparency, confidence in the financial market, as well as to ensure that the interests of market actors are protected.

Chapter 1. Main trends on the implementation of regulation institutions of financial markets

The regulation of financial markets has different approaches in the world states, among which we can detach the next trends:

The traditionalist trend, in which parent banks represent the regulation institution for all markets categories, in the case of: Czech Republic, Slovak Republic, Ireland.

The multilateral trend, in which every market has its own regulation institution, in case of: Cyprus, Lithuania, Portugal, Slovenia, Spain, Romania.

The dual trend, in which, usually, the monetary market has its own regulation institution, and the other markets have one unique regulation institution, such as: Netherlands, Bulgaria.

The unitary trend, in which all markets have one regulation authority, such as: Poland, Austria, Hungary, Belgium.

The unconventional trend, in which interfere other entities that can have the role of regulation authorities (usually, the governmental authorities, finances ministries and professional associations).

AUSTRIA

FINANCIAL MARKETS AUTHORITY

About the FMA

Supervision of the financial market in Austria a stable, competitive and financial system founded on integrity provides the basis for a functioning economy, sustainable employment and secure levels of affluence. The task of supervising the financial markets is therefore a crucially important one in all national economies.

Integrated supervision as an integrated supervisory institution, the FMA, which was founded in 2002, brings together responsibility for supervising all significant providers and functions under one roof. The authority supervises banks, insurance undertakings, Pensionskassen (pension companies), corporate provision funds, investment firms and investment service providers, investment funds, financial conglomerates and exchange operating companies. It also monitors activities to ensure that trading in listed securities complies with legal requirements and the principles of fairness and transparency (supervision of the market and stock exchange). It ensures that prospectuses concerned with the public sale of securities appropriately explain the opportunities and risks of investment to the general public (prospectus supervision). It acts to ensure that the principles of sound company management and advice are upheld (supervision of compliance and rules of conduct), that the unauthorised trading and offering of financial services is prevented and punished, and that all financial institutions have the necessary systems in place to take preventive action against money laundering and terrorist financing.

Tiered structure of supervision any efficient and effective supervisory system builds on the work of “upstream” supervisory instances. This is referred to as the tiered structure of supervision. The first tier of monitoring and control is provided by each financial institution’s own internal auditing department. The institutions’ supervisory boards and auditors form the second tier, which, while appointed by the individual companies, is composed of independent, third-party experts. The state system of supervision takes over at the third stage. In Austria, the job of supervising the financial markets is carried out by three institutions. In outline form, the tasks are as follows:

The Federal Ministry of Finance (BMF) develops and defines the legislative framework, which is then adopted by the Austrian parliament (legislative process).

The Oesterreichische Nationalbank (OeNB) monitors the stability of the financial market at a macro level. It is responsible for the supervision of payment systems, and is also involved in the supervision of banks.

The Financial Market Authority (FMA) monitors and checks the individual financial institutions and participants in the markets (micro level).

All three institutions cooperate closely, and form the Austrian system of supervision of the financial market.

In addition, the Austrian supervisory institutions also collaborate in numerous international bodies, especially European ones, in order to establish consistent standards of supervision and to represent the interests of Austria as a financial centre. More concerted international cooperation within the context of day-to-day supervisory operations is increasing in importance, given the globalisation of the financial sector.

BELGIUM

Organization of FSMA

The Financial Services and Markets Authority takes responsibility for the integrity of the financial markets and fair treatment of financial consumers

The various players in the Belgian financial sector are under permanent supervision, for different aspects of their business, in order to secure confidence in the financial markets and to ensure that investors and financial consumers are treated honestly, fairly and professionally. This supervision is organised since 1 April 2011 according to the “Twin Peaks” model, with two autonomous supervisors, namely the National Bank of Belgium and the Financial Services and Markets Authority, abbreviated FSMA, each of which has a specific set of objectives.

The FSMA is responsible for supervising the financial markets and listed companies, authorising and supervising certain categories of financial institutions, overseeing compliance by financial intermediaries with codes of conduct and supervising the marketing of investment products to the general public, as well as for the “social supervision” of supplementary pensions. The Belgian government has also tasked the FSMA with contributing to the financial education of savers and investors. The FSMA is the successor to the former Banking, Financial and Insurance Commission (CBFA), which on 1 April 2011 changed its name as a consequence of the changes in its mandate, in particular its exclusive competence for the supervision of rules of conduct.

Supervision

The FSMA is responsible for supervising the financial markets and listed companies, authorising and supervising certain categories of financial institutions, overseeing compliance by financial intermediaries with codes of conduct and supervising the marketing of investment products to the general public, as well as for the “social supervision” of supplementary pensions. For documents relating to those supervisory areas (lists, legislation, circulars, etc.), please use the navigation bar on the left.

Consumers

One of the mandates of the FSMA is to supervise compliance with the rules protecting the interests of savers, policyholders and investors. To this end, it is also responsible for protecting the consumers from the illicit offer or provision of any financial product or service. It is also tasked with contributing to the financial information and education of these consumers.

BULGARIA

BULGARIAN NATIONAL BANK

Bulgarian National Bank is one of the oldest national institutions set up immediately after the restoration of the Bulgarian state on January 25, 1879, and on June 6 of that year was made the first bank operation.

Bank issuing institution is independent of the state, which reports to the National Assembly. It plays a key role in the Bulgarian economy and take care of maintaining the stability of the Bulgarian currency, and the strengthening and development of the banking and credit system.

Independence Bank is guaranteed by its statutes (BNB) and the Treaty on the Functioning of the European Union. From January 1, 2007 the Bank is a member of the European System of Central Banks and actively participate in decisions in the areas of banking and finance in the European Union. BNB Governor is a member of the General Council of the ECB.

FINACIAL SUPERVISION COMISION BULGARIAN

Mission

The primary mission of the institution is to assist through legal, administrative and informational means for the maintenance of stability and transparency on the non-banking

financial sector, and to ensure the protection of the consumers of financial services and products.

Regulatory activity

The Commission's regulatory activity includes drafting and adoption of regulations and instructions provided for in the legislation, issuance of guidelines and instructions regarding the implementation and interpretation of the codes and laws. The Commission adopts secondary legislative acts concerning laws' implementation in relation to the carrying out of financial supervision. The regulation of the market participants' activity is in conformity with the European legislation, norms and practices. Usually, the legislative amendments are necessitated by changes that have occurred in the financial system itself, the introduction of new products and technologies or in case imperfections of the effective regulatory framework are established.

Supervision

The unified financial supervision over the supervised entities' activity monitors compliance with the legal requirements, the companies' financial status and the reliability of information that they provide.

The Commission's supervisory activity is being carried out through off-site supervision and on-site examinations of the licensed market participants' activity.

The purpose of FSC's controlling activity is prevention and termination of legal violations in view of ensuring protection of the interests of investors, insurers and the insured persons.

Licensing regime

In its licensing activity the Commission is guided by the principle of impartiality and implementation of a unified approach and criteria with respect to all applicants. The Commission examines the documents that have been attached to the applications for permit issuance or amendment of one that has already been granted in view of their compliance with the regulatory requirements. It is being established whether all the required documents and data have been provided and whether the legal limitations to certain licensing proceedings have been complied with.

Sanctions

Upon establishment of offences on the supervised entities' side, the Commission imposes coercive administrative measures. They include the issuing of recommendations to undertake specific actions, fines and property sanctions.

CZECH REPUBLIC

About the CNB

CNB is the central (central) bank of the Czech Republic and the supervisor of the financial market. She is entrusted with the powers of the administrative authority to the extent provided by law. Manages independently and with due diligence with the property that has been entrusted by the state. In its activities are permissible only on the basis of law.

In accordance with its primary objective CNB determines monetary policy, issues banknotes and coins, manages cash flow, payments and clearing banks, supervises the banking sector, capital market, insurance, pension funds, credit unions, electronic money institutions and foreign exchange supervision. As a central bank provides CNB banking services to the state and the public sector. Keep the accounts of organizations connected to the state budget, which are: financial and customs authorities, the Czech Social Security Administration offices, charitable organizations, state funds, accounts linked to the budget of the European Communities, etc. Based on the authorization of the Ministry of Finance carries out operations associated with government securities. *The mandate of the Czech National Bank care about price stability, oversee the stability of the financial system, ensure the smooth circulation of money and smooth payments, promote balanced and smooth development of the financial market in the Czech Republic.*

Monetary policy, we strive to maintain price stability, i.e. by maintaining low and stable inflation. A necessary condition for meeting this objective is to maintain the stability of the financial system as a whole, which we are trying to achieve with macroprudential policy. Joint operation of monetary and macroprudential policy and contribute to the maintenance of confidence in the value of the Czech koruna and the stability of the macroeconomic environment;

Financial supervision, issuing prudential rules of behavior and conduct with customers and operations in the financial market take care of the stability and development of the financial system and protect its clients;

The management of the payment system and the issue of banknotes and coins ensure smooth payment and cash flow;

We manage foreign reserves.

FRANCE

THE AUTORITE DES MARCHES FINANCIERS (AMF)

Description

The Autorité des marchés financiers (AMF) established by the Financial Security Act of 1 August 2003. It was formed from the merger of the Commission des opérations de bourse (COB), the Conseil des marchés financiers (CMF) and the Conseil de discipline de la gestion financière (CDGF).

The objective in amalgamating these bodies was to improve the efficiency of France's financial regulatory system and to give it greater visibility.

The AMF is an independent public body with legal personality and financial autonomy. Its remit is to: safeguard investments in financial instruments and in all other savings and investment vehicles; ensure that investors receive material information; maintain orderly financial markets.

The finance minister designates the Director General of the Treasury or his representative who has a non-voting seat on all AMF bodies.

The chairman of the AMF is named by decree of the president of the Republic for a non-renewable five-year term.

The AMF has a staff headed by a Secretary General. The staff is composed of public servants under contract, private employees and public servants. At year-end 2010 the headcount was 403.

• *Responsibilities*

The AMF has four kinds of responsibilities: regulation, authorisation, supervision, enforcement.

It has jurisdiction over:

Corporate Finance activities and disclosures: The AMF regulates corporate finance activities and disclosures by listed companies. These companies are required to inform the public regularly about their business, results and financial dealings. The AMF oversees and monitors information to ensure that it is accurate, precise, fair and timely and that it is disseminated to the financial community as a whole.

Collective investment products (1): The AMF authorises the creation of open-end and closed-end funds. It verifies the information set out in the simplified prospectuses that must be provided to customers before they invest in any product. In the case of complex products, such as structured funds, the AMF makes sure that the special features of these products and their effects are clearly described to investors.

Market and infrastructure: The AMF sets the principles of organisation and operation applicable to market operators, such as Euronext Paris, which organises trading in equities, fixed income securities and derivatives, securities settlement systems and central securities depositories, such as Euroclear France. The AMF also approves the rulebooks of clearing houses, such as Clearnet, which centralise transactions on a daily basis; and it establishes the operating requirements for clearing members.

Services Providers: (credit institutions authorised to provide investment services, investment firms, management companies, financial investment advisers, direct marketers). The AMF sets conduct of business rules and other requirements applicable to professionals authorised to provide investment services. It authorises management companies. The AMF approves the professional organisations that represent financial investment advisers (FIAs). In addition, the AMF monitors direct marketers who work for investment management companies.

GERMANY

The Federal Financial Supervisory Authority (BaFin) brings together under one roof the supervision of banks and financial services providers, insurance undertakings and securities trading. It is an autonomous public-law institution and is subject to the legal and technical oversight of the Federal Ministry of Finance. It is funded by fees and contributions from the institutions and undertakings under its supervision.

Banks & financial services providers

A properly functioning banking and financial services system is indispensable for the performance potential of a country's economy. An efficient banking supervision system is therefore essential for the whole economy.

Division of responsibilities between the Deutsche Bundesbank and BaFin

BaFin and Deutsche Bundesbank share banking supervision. Their cooperation is governed by section 7 of the Banking Act, which stipulates that, among other things, the Deutsche Bundesbank shall, as part of the ongoing supervision process, analyse the reports and returns that institutions have to submit on a regular basis and assess whether their capital and risk management procedures are adequate. BaFin and the Deutsche Bundesbank have agreed on the details of this arrangement in a Memorandum of Understanding. The overriding aim behind all of the Bundesbank's activities is to safeguard the stability of the general price level and the financial system. For this, in-depth analyses, long-term goals and impartiality towards individual interests are essential. The Bundesbank's stability policy also relies on the support of economic, fiscal and wage policies. The Bundesbank's participation in the Eurosystem, the integration of the international financial markets and innovations in the fields of payments and finance are creating new challenges for its stability policy. In order to better meet these challenges, the bank has identified five core business areas and is aiming to hone its profile in these areas in the future.

Monetary policy

The main core business area is Eurosystem monetary policy. Its primary task, as laid down in the EC Treaty, is to maintain price stability in the Euro area. Stable prices promote public welfare; they encourage growth and employment in the medium term and protect savers and people on fixed incomes against the negative effects of inflation. The Bundesbank President is a voting member of the Governing Council of the ECB and takes part in the monthly monetary policy decision-making process. In doing so, he draws on the expertise of the Bundesbank's economists, statisticians and monetary experts.

Financial and monetary system

The Bundesbank's work in the core business area financial and monetary system is aimed at helping to prevent national and international financial crises – international crises not least because they could have knock-on effects in Germany. Financial crises, such as the large-scale insolvency of banks, cause growth and employment to slump. Furthermore, they obstruct monetary policy because banks will then probably no longer be able to transmit interest rate policy decisions. Ultimately, they also shake confidence in price stability. The threat of financial crises can occur in a multitude of places when there is too great a build-up of high-risk and insufficiently secured loans. The Bundesbank's wide-ranging analyses and its financial market observation help to recognise sources of such risk at an early stage and identify appropriate countermeasures.

POLAND*PFSA Polish Financial Supervision Authority**Tasks and objectives*

On 19 September 2006, i.e. on the day when the Act of 21 July 2006 on supervision of the financial market entered into force, the Polish Financial Supervision Authority (KNF) initiated its activity. The new supervisory body took over the tasks of the Insurance and Pension Funds Supervisory Commission and of the Securities and Exchange Commission, which were abolished pursuant to the provisions of the said Act. The Chairperson of the PFSA shall perform his functions for five years. In the second phase of the merger of financial supervision in Poland, the Polish FSA took over the powers of the Commission for Banking Supervision together with its Office – the General Inspectorate of Banking Supervision (January 1st 2008).

The KNF supervises the financial services industry in Poland. This includes credit institutions, insurance firms, investment companies, exchanges, pension scheme as well as payment institutions and credit unions.

HUNGARY*Mission statement*

The Hungarian Financial Supervisory Authority is the independent constitutional body that is responsible for the supervision, control and regulation of the financial intermediary system of the Republic of Hungary.

The fundamental mission of the Supervisory Authority is as follows:

- to ensure, and when necessary, to enforce *the solid, transparent and efficient operation of the financial intermediary system*, as well as the prudent activities of the persons and organizations being part of it,
- to create *stable and orderly operating financial markets*, as well as secure and competitive development frameworks, which are compliant with the laws of the European Union, *through its decrees and other regulatory proposals*,
- to identify and efficiently prevent *the risks jeopardizing the individual financial institutions and sectors*, through its preventive measures, as well as to reduce or eliminate the already existing risks,
- to protect *the rights and interests of the customers* who use the services provided by the financial institutions in a *consistent and proactive manner*, to establish a forum for consumer dispute-settlement, and to increase consumers' financial awareness,
- to strengthen public trust in the financial intermediary system,
- with a view to facilitate European-level financial supervision, *as a member of the European System of Financial Supervisors*, to stand for *Hungarian interests* and to cooperate with the European and other supervisory authorities.

Chapter 2. Implementation model of regulation institutions advisable for**Romania**

For making an overview of Romania's position, as a result of signing the IOSCO Multilateral agreement, we made a situation of the international relations resulted due to conclusion of this agreement which presents: the country, the regulation institution and the regulated market segment.

This summary table contains the list of agreements concluded (on bilateral and multilateral basis) between Romania and the foreign counterpart authorities.

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
Australia				
Australian Securities and Investments Commission IOSCO Multilateral	08 10 2002		•	
Austria				
Finanzmarktaufsicht	16 11 1998		•	
CESR Multilateral	01 05 2004		•	
Finanzmarktaufsicht	13 12 2001	•		
Finanzmarktaufsicht	20 03 2002			•
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Finanzmarktaufsicht IOSCO Multilateral	28 10 2009			•
Belgium				
Commission Bancaire, Financiere et des Assurances	05 03 2003	•		
Commission Bancaire, Financiere et des Assurances	06 08 2003		•	
CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
IOSCO Multilateral	03 04 2005		•	
Bulgaria				
Bulgarian National Bank	05 08 2003	•		
Bulgarian Financial Supervision Commission	20 10 2003		•	•
Financial Supervision Commission IOSCO Multilateral	29 10 2010		•	
Canada				
Québec Aurotité des Marchés Financiers	04 03 1992		•	
IOSCO Multilateral	17 12 2002		•	
British Columbia Securities Commission IOSCO Multilateral	10 11 2003		•	
Ontario Securities Commission IOSCO Multilateral	23 10 2002		•	
Alberta Securities Commission IOSCO Multilateral	10 11 2003		•	

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
China				
China Banking Regulatory Commission	21 11 2005	•		
China Securities Regulatory Commission IOSCO Multilateral	29 05 2007		•	
Czech Republic				
Ceská Komise pro Cenné Papíry	12 09 1999		•	
CESR Multilateral	01 05 2004		•	
Ministry of Finance Office of the State Supervision in Insurance and Pension Funds Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Czech National Bank IOSCO Multilateral	29 03 2007		•	
Denmark				
Finanstilsynet CESR Multilateral	01 05 2004		•	
IOSCO Multilateral	17 08 2006		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Finland				
Rahoituskastus CESR Multilateral	01 05 2004		•	
IOSCO Multilateral	22 11 2007			
Vakuutusvalvonta Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
France				
Autorité des Marchés Financiers	24 06 1998		•	
IOSCO Multilateral	19 02 2003		•	
CESR Multilateral	01 05 2004		•	
Commission de Contrôle des Assurances, des Mutuelles et des institutions de Prévoyance Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Commission bancaire (CB) and Comité des établissements de crédit et des entreprises d'investissement (CECEI)	15 08 2007	•		

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
Germany				
Bundesanstalt für Finanzdienstleistungsaufsicht	24 04 1998		•	
IOSCO Multilateral	11 05 2003		•	
CESR Multilateral	01 05 2004		•	
Bundesanstalt für Finanzdienstleistungsaufsicht	14 09 2000	•		
Bundesanstalt für Finanzdienstleistungsaufsicht	07 06 2002			•
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Greece				
Hellenic Capital Market Commission	08 01 2003		•	
IOSCO Multilateral	18 10 2002		•	
CESR Multilateral	01 05 2004		•	
Direction of Insurance Enterprises and Actuaries Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Hungary				
Hungarian Financial Supervisory Authority IOSCO Multilateral	09 07 2003		•	
CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Ireland				
Irish Financial Services Regulatory Authority CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Israel				
Israel Securities Authority IOSCO Multilateral	02 07 2006		•	
Italy				
Commissione Nazionale per le Società e la Borsa	14 09 1998		•	
IOSCO Multilateral	15 09 2003		•	

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
CESR Multilateral	01 05 2004		•	
Banca d' Italia	16 01 2003	•		
Istituto per la Vigilanza sulle Assicurazioni Private e di interesse Collettivo Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Japan</i>				
Financial Services Agency IOSCO Multilateral	19 02 2008		•	
<i>Norway</i>				
Kredittilsynet CESR Multilateral	01 05 2004		•	
IOSCO Multilateral	11 12 2006		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Poland</i>				
Komisja Papierów Wartościowych i Giełd	12 09 1999		•	
IOSCO Multilateral	04 11 2003		•	
CESR Multilateral	01 05 2004		•	
Komisja Nadzoru Ubezpieczeń i Funduszy Emerytalnych Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Portugal</i>				
Comissao do Mercado de Valores Mobiliários	13 09 1999		•	
IOSCO Multilateral	04 11 2002		•	
CESR Multilateral	01 05 2004			
Instituto de Seguros de Portugal Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Republic of Srpska</i>				
Securities Commission of the Republic of Srpska IOSCO Multilateral	27 10 2009		•	
<i>Romania</i>				
Comisia Nationala a Valorilor Mobiliare	16 02 2005		•	
IOSCO Multilateral	04 11 2008		•	

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
National Bank of Romania	21 11 2005	•		
<i>Slovakia</i>				
Národná Banka Slovenska	11 06 2002	•		
Úrad pre finančný trh	27 01 2003		•	•
IOSCO Multilateral	17 06 2004		•	
CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Slovenia</i>				
Agencija za trg vrednostnih papirjev CESR Multilateral	01 05 2004		•	
Agencija za zavarovalni nadzor Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
Securities Market Agency IOSCO Multilateral	20 10 2009		•	
<i>Spain</i>				
Comisión Nacional del Mercado de Valores IOSCO Multilateral	24 03 2003		•	
CESR Multilateral	01 05 2004		•	
Ministerio de Economía Dirección General de Seguros y Fondos de Pensiones Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Sweden</i>				
Finansinspektionen CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Switzerland</i>				
Swiss Financial Market Supervisory Authority (FINMA) IOSCO Multilateral	15 02 2010		•	
<i>The Netherlands</i>				
De Nederlandsche Bank	22 01 2003	•		
Autoriteit Financiële Markten	21 03 2003		•	
CESR Multilateral	01 05 2004		•	

Country/institution	Date	Scope		
		Bank	Capital Market	Insurance
IOSCO Multilateral	22 11 2007		•	
De Nederlandsche Bank Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>Turkey</i>				
Sermaye Piyasasi Kurulu IOSCO Multilateral	14 11 2002		•	
<i>Ukraine</i>				
National Bank of Ukraine	26 10 2009	•		
<i>United Kingdom</i>				
Financial Services Authority IOSCO Multilateral	10 03 2003		•	
CESR Multilateral	01 05 2004		•	
Helsinki Protocol (multilateral) Siena Protocol (multilateral)	01 05 2004			•
<i>United States of America</i>				
State of New York Banking Department	27 02 2002	•		
Securities and Exchange Commission IOSCO Multilateral	19 11 2002		•	
Commodity Futures Trading Commission IOSCO Multilateral	19 12 2002		•	
<i>Argentina</i>				
Comisión Nacional de Valores (NSCA) IOSCO Multilateral	19 03 2009		•	
<i>Ireland</i>				
Irish Financial Services Regulatory Authority IOSCO Multilateral	05 10 2009		•	
Federal Financial Markets Service of Russia IOSCO Multilateral	30 09 2008		•	
<i>Sweden</i>				
Finansinspektionen (FI) IOSCO Multilateral	14 12 2009		•	

Self-assessment based on IOSCO principles

Assessment methodology

An essential criterion or an advanced criterion is assessed using four categories: *fully implemented, broadly implemented, partly implemented, and not implemented*.

The 30 principles promoted by IOSCO were analyzed in terms of implementation, and we used the four classifications: Fully Implemented; Broadly Implemented; Partly Implemented; Not Implemented.

Fully Implemented		Broadly	Partly	Not
Principle 1. The responsibilities of the regulator should be clear and objectively stated.	•			
Principle 2. The regulator should be operationally independent and accountable in the exercise of its powers and functions.	•			
Principle 3. The regulator should have adequate powers, proper resources and the capacity to perform its functions and exercise its powers.		•		
Principle 4. The regulator should adopt clear and consistent regulatory processes.		•		
Principle 5. The staff of the regulator should observe the highest professional standards including appropriate standards of confidentiality.	•			
Principle 6. The regulatory regime should make appropriate use of self-regulatory organizations (SROs) that exercise some direct oversight responsibility for their respective areas of competence and to the extent appropriate to the size and complexity of the markets.	•			
Principle 7. SROs should be subject to the oversight of the regulator and should observe standards of fairness and confidentiality when exercising powers and delegated responsibilities.	•			
Principle 8. The regulator should have comprehensive inspection, investigation and surveillance powers.	•			
Principle 9. The regulator should have comprehensive enforcement powers.	•			
Principle 10. The regulatory system should ensure an effective and credible use of inspection, investigation, surveillance and enforcement powers and implementation of an effective compliance program.	•			
Principle 11. The regulator should have the authority to share both public and non-public information with domestic and foreign counterparts.	•			

Fully Implemented		Broadly	Partly	Not
Principle 12. Regulators should establish information sharing mechanisms that set out when and how they will share both public and non-public information with their domestic and foreign counterparts.	•			
Principle 13. The regulatory system should allow for assistance to be provided to foreign regulators who need to make inquiries in the discharge of their functions and exercise of their powers.			•	
Principle 14. There should be full, timely and accurate disclosure of financial results and other information that is material to investors' decisions.	•			
Principle 15. Holders of securities in a company should be treated in a fair and equitable manner.	•			
Principle 16. Accounting and auditing standards should be of a high and internationally acceptable quality.		•		
Principle 17. The regulatory system should set standards for the eligibility and the regulation of those who wish to market or operate a collective investment scheme.		•		
Principle 18. The regulatory system should provide for rules governing the legal form and structure of collective investment schemes and the segregation and protection of client assets.	•			
Principle 19. Regulation should require disclosure, as set forth under the principles for issuers, which is necessary to evaluate the suitability of a collective investment scheme for a particular investor and the value of the investor's interest in the scheme.	•			
Principle 20. Regulation should ensure that there is a proper and disclosed basis for asset valuation and the pricing and the redemption of units in a collective investment scheme.	•			
Principle 21. Regulation should provide for minimum entry standards for market intermediaries.	•			
Principle 22. There should be initial and ongoing capital and other prudential requirements for market intermediaries that reflect the risks that the intermediaries undertake.	•			
Principle 23. Market intermediaries should be required to comply with standards for internal organization and operational conduct that aim to protect the interests of clients, ensure proper management of risk, and under which management of the intermediary accepts primary responsibility for these matters.	•			

Fully Implemented		Broadly	Partly	Not
Principle 24. There should be a procedure for dealing with the failure of a market intermediary in order to minimize damage and loss to investors and to contain systemic risk.		•		
Principle 25. The establishment of trading systems including securities exchanges should be subject to regulatory authorization and oversight.		•		
Principle 26. There should be ongoing regulatory supervision of exchanges and trading systems, which should aim to ensure that the integrity of trading is maintained through fair and equitable rules that strike an appropriate balance between the demands of different market participants.	•			
Principle 27. Regulation should promote transparency of trading.	•			
Principle 28. Regulation should be designed to detect and deter manipulation and other unfair trading practices.	•			
Principle 29. Regulation should aim to ensure the proper management of large exposures, default risk and market disruption.	•			
Principle 30. Systems for clearing and settlement of securities transactions should be subject to regulatory oversight, and designed to ensure that they are fair, effective and efficient and that they reduce systemic risk.	•			

Chapter 3. The responsibilities of the regulator should be clear and objectively stated.

1. Are the regulator's responsibilities, powers and authority:
 - a) Clearly defined and transparently set out, preferably by law, and in the case of powers and jurisdiction, enforceable?
 - b) If the regulator can interpret its authority, are the criteria for interpretation clear and transparent?
 - c) Is the interpretative process transparent enough to preclude situations in which an abuse of discretion can occur?
2. When more than one domestic authority is responsible:
 - a) Does the legislation ensure that any division of responsibility avoids gaps or inequities in regulation?
 - b) Is substantially the same type of conduct generally subject to consistent regulatory requirements?
3. When more than one domestic authority is responsible:
 - a) Are there effective arrangements for cooperation and communication of information between responsible authorities through appropriate channels?
 - b) Are responsible authorities required to cooperate and communicate in areas of shared responsibility?
 - c) Are cooperation and communication occurring between responsible authorities without significant limitations?

THE SELF-ASSESSMENT OF THE ROMANIAN FINANCIAL SUPERVISORY AUTHORITY AGAINST THE INSURANCE CORE PRINCIPLES

Assessment methodology

An essential criterion or an advanced criterion is assessed using five categories: observed, largely observed, partly observed, not observed, and not applicable.

Under each Principle, the level of observance with each criterion (essential and advanced) is indicated in the column provided [O for *Observed*, LO for *Largely Observed*, PO for *Partly Observed*, NO for *Not Observed*, and NA for *Not Applicable*).

Summary Self-assessment

It should be noted that the level of observance for each principle reflects the assessments of the essential criteria *only*. Assessment of advanced criteria are not included in assessing observance with principles.

Core Principle	Title	Level of Observance (Please tick one for each principle)				
		O	LO	PO	NO	NA
1	Conditions for effective insurance supervision		x1			
2	Supervisory objectives		x			
3	Supervisory authority		x2			
4	Supervisory process		x			
5	Supervisory cooperation and information sharing		x			
6	Licensing		x			
7	Suitability of persons		x3			
8	Changes in control and portfolio transfers		x			
9	Corporate governance		x			
10	Internal control		x4			
11	Market analysis		x			
12	Reporting to supervisors and off-site monitoring		x5			
13	On-site inspection		x			
14	Preventive and corrective measures		x			
15	Enforcement or sanctions		x6			
16	Winding-up and exit from the market		x			
17	Group-wide supervision		x			

18	Risk assessment and management		x			
19	Insurance activity		x7			
20	Liabilities		x8			
21	Investments		x9			
22	Derivatives and similar commitments		x10			
23	Capital adequacy and solvency		x11			
24	Intermediaries		x			

1 Criteria c), e), f) are LO.

2 Criteria b) and c) are PO.

3 Criterion b) is LO, f) is NO.

4 Criterion c) is LO, Criteria d) and e) are PO.

5 Criterion c) is LO.

6 Criterion d) is LO.

7 Criterion a) is PO, e) is LO.

8 Criterion f) is LO.

9 Criteria c) and i) are LO, d), j) and k) are PO.

10 Criteria d) and i) are LO, criteria e) and f) are PO, criteria c), g) and h) are NO.

11 Criterion d) is LO, b) is PO.

25	Consumer protection		x12			
26	Information, disclosure and transparency towards the market		x			
27	Fraud		x			
28	Anti-money laundering, combating the financing of terrorism (AML/CFT)		x			

* (O-Observed, LO-Largely Observed, PO-Partly Observed, NO-Not Observed, NA-Not Applicable)

Essential criteria

a. The government establishes and publicly discloses a policy statement aimed at ensuring financial stability, including the provision of effective financial sector supervision covering the insurance and other financial sectors.

b. An institutional and legal framework – comprising public institutions, laws and regulations – exists for financial sector issues, including those pertaining to insurance, to address system-wide issues. This framework is well-defined and publicly disclosed.

c. There is a reliable, effective, efficient and fair legal and court system (a body of ethical, professional and trained lawyers and judges) whose decisions are enforceable. Alternative dispute mechanisms operate within an appropriate legal framework.

d. Accounting, actuarial and auditing standards are comprehensive, documented, transparent and consistent with international standards. Accounting and actuarial standards are applied and disclosed in a manner that allows current and prospective policyholders, investors, intermediaries, creditors and supervisors to properly evaluate the financial condition of insurers.

e. Accountants, actuaries and auditors are competent and experienced and comply with technical and ethical standards to ensure the accuracy and reliability of financial data and its interpretation. Auditors are independent from the insurer.

f. Professional bodies set and enforce technical and ethical standards. These standards are accessible to the public.

g. Basic economic, financial and social statistics are available to the supervisory authority, the industry and the public.

h. Laws and regulations are updated, as necessary, to reflect current best practices and industry conditions.

i. Well-functioning money and securities markets exist to support the availability of both long-term and short-term investment opportunities.

Conclusions

Romania, as a parcel part of the international agreements concerning the regulations institutions of insurances and pension funds, respectively signer of Memorandum of Understanding on Cooperation Between the Financial Supervisory Authorities, Central Bank and Finance Ministries of the European Union on Cross-Border Financial Stability and taking into consideration Romania's market structure, where the monetary market holds 94%, and the difference of less than 5% representing the capital market, the insurances market and the market of private pensions, heads to a dual model, similar to the one of Bulgaria, in which the monetary market regulation stays at BNR, and the regulation of the other markets will be realized by one institution.

This model presents the advantages of a real moment projection of the financial market characteristics from Romania, leading to the growth of financial stability and a better risk management on this market, leading to a better reference with the European profile institutions.(ESMA,EBA,BCE)

The disadvantage of this kind of institutional regulation consists in the implementation in a certain inferior situation of the financial markets, other than the monetary market, which might affect the developing rhythm in the future.

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RATIONALITY VERSUS IRRATIONALITY ON THE ROMANIAN CAPITAL MARKET

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“In fact, an exactly average human would have to be half male and half female.” (Nassim Nicholas Taleb, The black swan: the impact of the highly improbable, The Random House Publishing Group, a division of Random House, Inc., New York, p. 242).

Abstract. *The driving engine of this research is to verify the stock price formation on the capital market in Romania, under the fundamental Modern Finance assumption of rational economic behavior and financial performance of the issuer, of the industry and the national economy. Moreover, our research also aims to confirm the Behavioral Finance hypothesis of non-rational and non-economic behavior, namely, excessive confidence in own expectations, concerns for equity beyond market mechanisms, the temptation towards corruption, anti-ecologic and anti-social behavior, poor understanding of inflation, a distorted feeling of reality and exaggerated emotional reaction to the emergence of new information.*

Keywords: modern finance; behavioral finance, rational – economic behavior; homogeneous expectations); efficient financial markets; non-rational and non-economic behavior; prospect theory.

JEL Classification: G11, G12, G14.

REL Classification: 11B.

Introduction

The purpose of the financial theory is to explain and understand financial phenomena, and its field of investigation comprises financial markets, firms' financial decisions and economic agents' community. This theory is built around a fundamental concept: the value of assets held by investors.

The abundance of financial transactions (i.e., daily average of 250 million shares traded on the New York Stock Exchange) demonstrates that price among information agents is not identical. Each agent plans to profit by selling and/or buying financial securities based on various expectations.

One question naturally arises: what is, nevertheless, the fair value? The uncomfortable, although necessary, act of “bargaining” is nothing else than a process of persuasion, for the two operators (seller and buyer), that this has been a “good deal”. The seller is convinced that he recovers from the trade, the market value of capital invested in the asset that he is now selling. On the other side, the buyer is convinced that giving up the purchasing power of the money he had, he acquired an asset with future returns greater than the amount paid. When the conviction of the two agents is in no doubt, then a will “naturally” arises to “brotherly” divide the surplus value obtained from this business.

But, as the anticipation processes are random, we realize that the determination of the intrinsic value of financial securities is a process of integrating in their price of available information on the issuer and its economic environment. Specifically, the anticipated value integrates, on the one hand, the information on economic and financial performance of the issuing company: its profit, dividend policy, financial risk caused by its debt rate, its operating risk given by the break-even point, etc. All these characteristics lead to estimating cash flows and/or future dividends (D_t) and growth rate (g). On the other hand, the asset's value integrates information on the industry and national economy performance: the minimum acceptable rate of return on savings (i.e., yield of government bonds), the inflation rate, the market rate of return (i.e., the fluctuation of national stock market indexes), the systematic risk of the business etc. (Whole this?) This information is integrated, using complex pricing models (e.g., Build-up, CAPM, APT, etc.), in the discount rate (k), which expresses the normal return for the risk profile of the business. Based on this information, the Gordon & Shapiro pricing model becomes operational (1):

$$V_o = \frac{D_1}{k - g} ,$$

where:

- V_o – share value;
- D_1 – dividend in current year;
- k – discount rate;
- g – dividend growth rate.

The main goal of financial research is, thus, to estimate the intrinsic value of financial instruments, securities or portfolios, by observing expectations on main economic factors that drive this value: cash-flow or dividend (D_1), the discount rate (k) and the growth rate (g). If all agents would anticipate the intrinsic value of the securities, there would be no arbitrage opportunities and no financial market speculation. The difference between the expected intrinsic value and the market price would be zero (zero net-present-value rule). Such a situation of financial balance (current value = price) is possible in efficient markets from allowance, operational and information viewpoint, which is, though, a very, very rare case. The exit of this apparent impasse is precisely the agents' different perceptions of price information (assuming that it is transparent and cost free). Stock market liquidity (i.e., transactions number and volume of financial securities is, thus, determined by the cost and asymmetry of information. With this latter input, the agents will make personal expectations more or less close to the intrinsic value. On average, these expectations determine the market price (the stock market price or the average transaction price) and they tend to get, sooner or later, close to the intrinsic value (which is also variable, depending on its external and internal determinants).

Arbitrage between market price and fair value of financial securities

The financial market, like any other free market, offers a market price of traded financial instruments (stocks, bonds, etc.). This market price can be recorded empirically as the stock market price. Starting from this market price one always asks questions like:

- Are financial assets correctly priced?
- Are they underpriced or, contrary, overpriced?
- What is the true value? Does this value reflect the true cost and risk of the asset?

Answering these questions is crucial in order to set the attitude of the economic agents operating on the financial market. They will make the arbitrage (2) on the market price differences in time (at different points in time) and space (in various trade markets). When an investor deems a security to be underpriced he or she will be better motivated to this certificate, to take advantage of future growth of its price. Conversely, in case of an overprice security; the investor will sell the title.

Financial theory states that the number of the arbitrage process in a free market determines its equilibrium and, respectively, the setting to the true value of the financial assets price.

Hence, the value is indicated rather by its relevance and stability than by its creation. The profitability and risk are analyzed below, as determinant factors of the value. Financial rational thinking takes into account two dimensions when dealing with the asset value: time and risk. As a consequence, the value of a financial security depends on the value of money and on the instrument's risk-premium.

Current value = value-in-time + risk premium

The most seductive economic law, the supply-and-demand law, finds on the financial market the best conditions for building the market equilibrium price. Although the financial market is the ideal place for the equitable balance of opportunities for operators, in order to understand its main phenomena, we need to postulate a financial market system and to establish some simplifying, hence, restrictive assumptions (Cobbaut, 1994, pp. 188-189):

1. financial market agents have a rational behavior and their goal (through anticipation) is to maximize the utility function of their total assets;

2. there is an atomicity of the financial investments that makes the assets easily marketable and provide market liquidity (the investments are perfectly divisible and liquid). An investor is atomistic position if he develops on the market an insignificant volume of transactions relative to all transactions and, therefore, cannot influence the equilibrium price of the traded asset, that is established on the market;

3. markets are contingent, which allows good repartition of resources in the economy, a very good risk diversification and, therefore, a very good performance of the economic system. Accordingly, the financial market is divided (segmented ?) into money market and capital market, which means there is a single price system for any financial transaction, regardless of its nature;

4. any information is relevant and available free of charge;

5. the assets (securities) exchange rates follow a random walk, the successive rate changes are independent of each other and have identical probability distribution;

6. the investors have homogenous expectations on the price (symmetry of information), which means that all investors assign the same probability distribution to the potential return of each title;

7. one can give a loan and can borrow, at no interest rate risk and in unlimited quantities;

8. all investors homogeneous anticipate the risk-free interest rate of savings (S) at the balance between the marginal rate of substitution (MRS) of current consumption with future one and the marginal efficiency of investment (MEI);

9. all investors have the same economic horizon, consisting of a single period;

10. market operations are not affected by any duty tax and/or transaction costs.

Although not realistic, all these assumptions are necessary for modeling the financial system, and make the concept of "perfect market" a reference as is the case, for example, in physics for concepts like "perfect vacuum" or "absolute cold".

In line with these assumptions, it remains to specify what the relation between perfect market and financial reality is. This relation determines the different types of financial market efficiency, namely allocative, operational and informational efficiency. Starting from these basic assumptions, the financial methodology, developed a coherent assessment model, based on the arbitrage process, this can be used to evaluate securities.

But do the financial markets have the ability to properly assess the titles they are trading? Do the market operators have a fully rational behavior and uniform, in order to predict the asset price at its intrinsic value? Analyzing these questions enables us to estimate the degree of financial market efficiency.

Are there financial markets efficient?

When making an investment, the stock prices (or other financial instruments in general) are given not only by the expectations on the issuer evolution or by the exclusively economic and perfectly rational reasons, but also by non-economic and irrational motivations and, by the subjective perception on how market will influence at this trend in the future. Changes in these expectations translate into different developments of the share price with respect to the evolution of issuer's performance.

The assumption of rationality and homogenous expectations are then contradicted. What lies behind this lapse? Behavioral manifestations of the investors are often irrational and subjective. Investors have strong confidence in their expectations, have concerns for equity beyond market mechanisms, have the temptation towards corruption and anti-ecologic antisocial behavior, have a poor understanding of inflation and have no real sense of reality (Akerlof, Shiller, 2010, p. 30).

We can also add another element of psychological behavior, namely the excessive emotional reaction to the emergence of new information. This can be explained by the Prospectus Theory of Daniel Kahneman, which suggests that when an investment is incurring losses, investors can become (in a quasi non-rational mode) even more interested in assuming additional risk. The informational preponderance of recent events, with significant emotional, financial and social impact occurs when low probability events, but with very large negative effects, seem to occur more frequently than in reality (3). Major emotional impact events, although occurring relatively infrequently, predominate in the emotional register of a person.

"In theory the stock prices are the predictors of the discounted value of those future income streams, in the form of future dividends or future earnings. But stock prices are much too variable. They are even much more variable than those discounted streams of dividends (or earnings) that they are trying to predict" (Akerlof, Shiller, 2010, p. 132).

The investors attitude and decision making are based not only on their own analysis of the determinants of the intrinsic value (profitability, risk, duration, etc.), but also on their anticipation of other market operators behavior with respect to these determinants. This behavior was excellently surprised by J.M. Keynes, who "compared the equilibrium in the stock market to that of a popular newspaper competition of his time. Competitors were asked to pick six prettiest faces from a hundred pictures. The prize was awarded to the competitor whose choices came closest to the average preference of all the competitors as a group. Of course, to win such a competition one should not pick the faces one thinks are prettiest. Instead, one should pick the faces that one thinks other are likely to think the prettiest. [...] Investing in stocks is often like that: just as in beauty contest, in the short run one does not win by picking the company most likely to succeed in the long run, but by picking the company most likely to have high market value in the short run" (Akerlof, Shiller, 2010, p. 133).

Case study on the Romanian capital market

We study the hypothesis of building the stock market prices through anticipating future streams of earnings. In order to accept or reject this hypothesis, we analyzed fourteen stocks and the correlation between their quarterly stock prices evolution and their earning per share (EPS): seven from the manufacturing industry and seven from the financial trading industry (banks and SIFs/Financial Investment Societies). We choose quarterly data given the quarterly reporting of the earning per share ratio. In turn, the reported EPSs were averaged over the last four quarters, ensuring thus a more stable estimation of future earnings from owning those stocks.

The data base for fourteen companies consists of stock trading prices (recorded at the end of quarter), P/E ratios and the earnings per share (EPS, the average of the last 12 months) from all quarters in years 2004 -2010 collected from www.ktd.ro web-site:

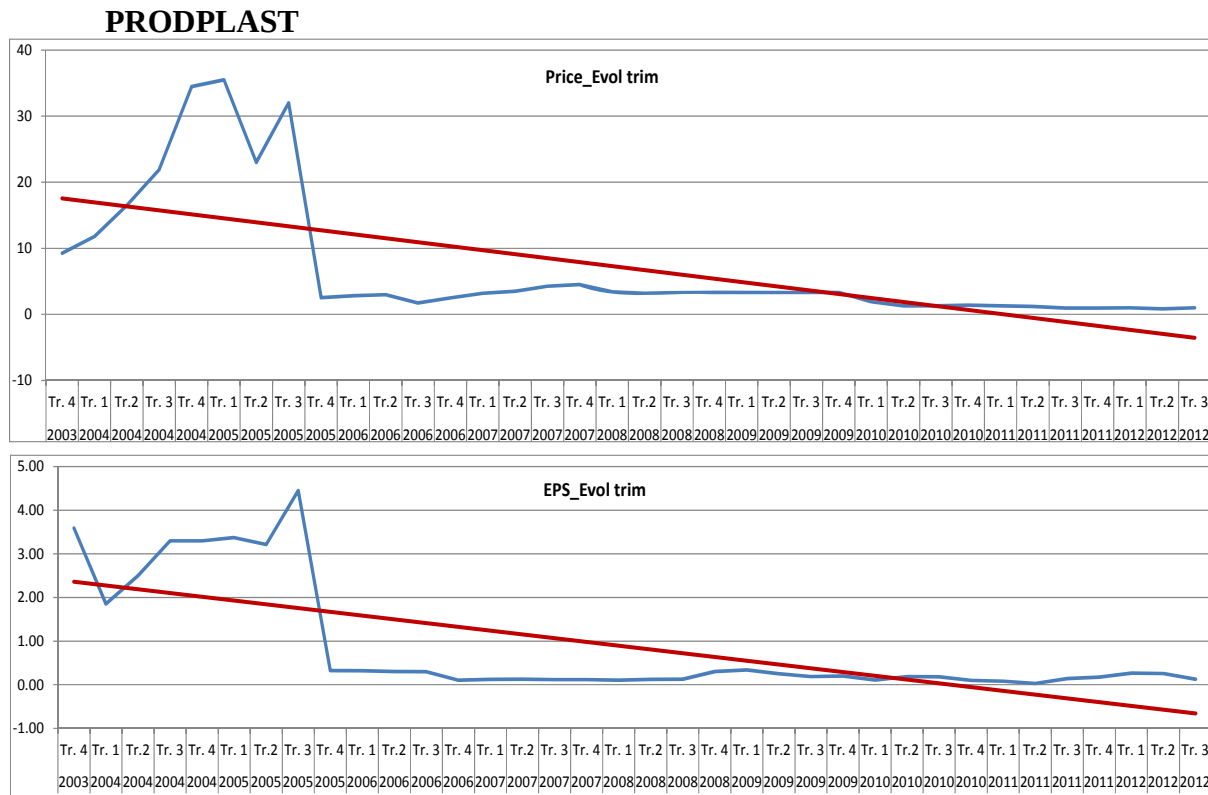
- seven from the manufacturing industry (Aerostar Bacau – ARS; Altur Slatina – ALT; Compa SA Sibiu – CMP; Prodplast Bucharest – PPL; Turbomecanica Bucharest – TBM; Uamt Oradea – UAM; Vae Aparom Buzau – CPA);

• seven from the financial industry (BT – TLV; BRD Societe Generale – BRD; SIF Banat Crisana – SIF1; SIF Moldova – SIF2; SIF Transilvania – SIF3; SIF Muntenia – SIF4; SIF Oltenia – SIF5).

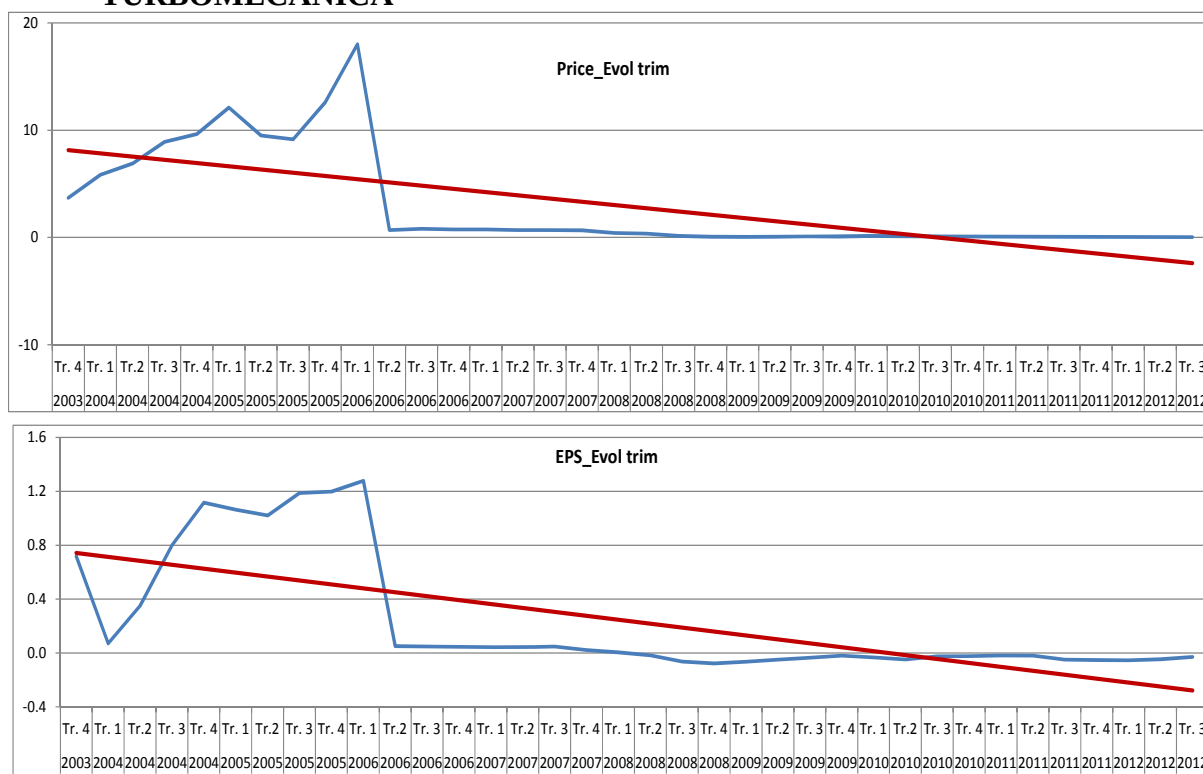
In the manufacturing sector, four companies out of seven (i.e., ARS, CMP, PPL and TBM), are consistent with fundamental analysis. The correlation between the evolution of stock prices and earnings per share is strong (over 50%) and statistically significant.

Sector:					
Industrie prelucrătoare					
	Media		Price ~ EPS		
	Price sf trim	EPS	R Square	β	p value
Aerostar Bacau (ARS)	4.4686	0.3577	53.88%	11.76066	0.00%
Altur Slatina (ALT)	0.3741	-0.0168	-2.55%	-0.54601	72.12%
Compa S. A. Sibiu (CMP)	0.8212	0.0479	16.62%	6.29108	0.79%
Prodplast Bucuresti (PPL)	6.9974	0.8521	82.91%	6.841597	0.00%
Turbomecanica Bucuresti (TBM)	2.8748	0.2325	88.69%	9.744497	0.00%
Uamt Oradea (UAM)	0.5673	0.0083	-2.05%	-1.44158	59.04%
Vae Apcarom Buzau (APC)	0.5673	0.0083	0.43%	8.128038	29.12%
μ/sector		0.2129			

The strongest correlations were found for the companies Prodplast Bucharest – PPL (83%) and Bucharest Turbomecanica – TBM (89%). This is highlighted in the following graphic.



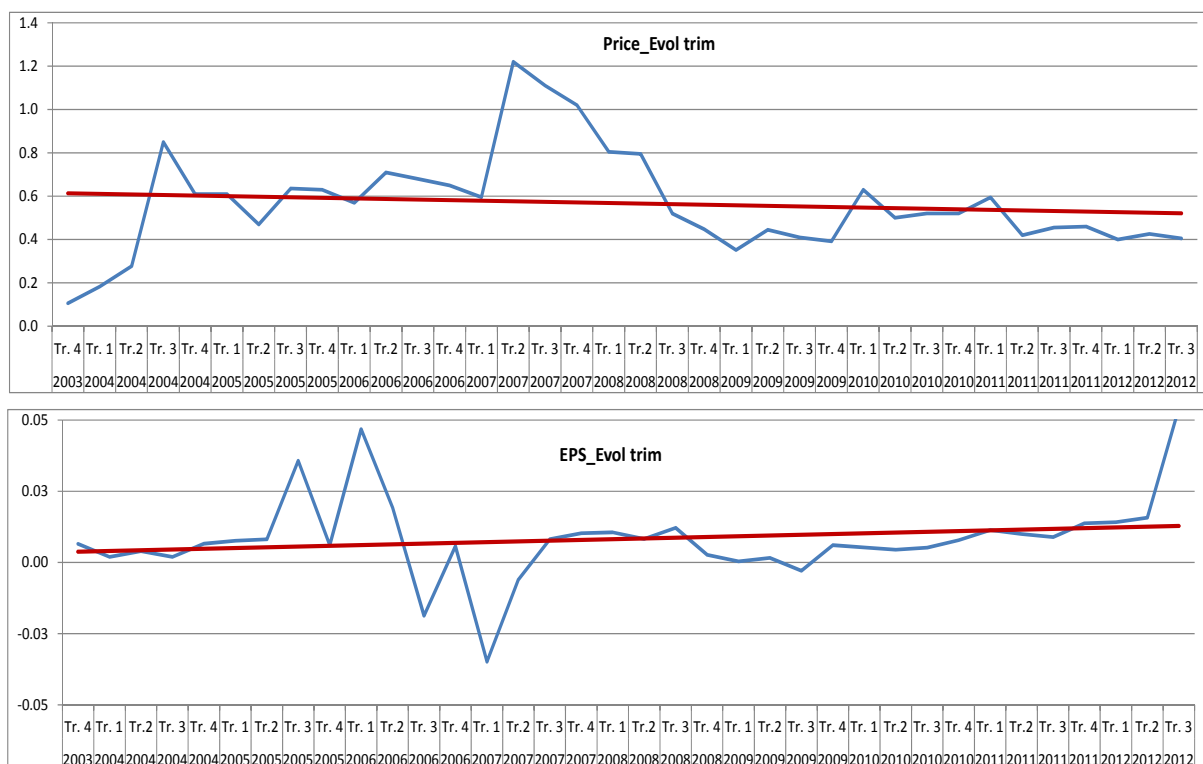
TURBOMECANICA



We are therefore entitled to consider that, in their stock transactions, the investors anticipated the economic and financial results summarized by the earnings per share (EPS).

For three other companies (UAM; ALT and APC) the rational expectation hypothesis is rejected. The correlation between the evolution of the stock prices and the earnings per share is very low (close to zero or little negative) and totally insignificant in statistical terms. This can be observed in their graphic representation (i.e. UAM):

UAMT ORADEA



Looking now to the expectations of the stock prices of the financial services companies, they confirm the second hypothesis, namely that non-rational and non-economic behavior. The investor's decision making in respect to these stocks is based mostly on momentum (imitation behavior), rather than on the economic and financial performance of issuers.

Sector:					
Intemedieri financiare					
	Media		Price ~ EPS		
	Price sf trim	EPS	R Square	β	p value
Banca Transilvania (TLV)	1.0395	0.0818	-2.69%	-0.88325	77.32%
BRD Societe Generale (BRD)	12.8209	0.9296	19.57%	6.301685	0.40%
SIF Banat Crisana (SIF1)	1.5380	0.1433	0.06%	2.576985	31.94%
SIF Moldova (SIF2)	1.5092	0.1681	-0.83%	-1.16444	40.49%
SIF Transilvania (SIF3)	1.1756	0.1108	-2.02%	-1.57079	58.26%
SIF Muntenia (SIF4)	1.0365	0.0860	-2.69%	0.907658	77.35%
SIF Oltenia (SIF5)	1.7457	0.1540	-2.94%	-0.0419	98.74%
μ/sector		0.2391			

Similar as in the case of the manufacturing companies UAM; ALT and APC, the correlation between stock price trends and the earnings per share at the seven financial institutions is considered very low (from 20% to -2.94%) and statistically insignificant (except BRD). The highest lack of positive correlation between the stock prices and the earnings per share is found at SIF5 Oltenia ($R^2 = -2.94\%$), Banca Transilvania ($R^2 = -2.69\%$) and at SIF4 Muntenia ($R^2 = -2.69\%$). Their graphic representation is also clear in this sense (i.e., SIF% Oltenia):

SIF5 OLTENIA



The fact of rejecting the hypothesis of rational economic and homogeneous behavior of financial services companies has great relevance for the Romanian capital market. The shares of these seven issuers are the most actively traded on the market and, therefore, the anticipatory behavior of most investors, who would rather take into account the market developments than the performance of issuers, is predominant in this case. The investors mainly activate as consequence their primarily subjective behaviors, (both individual and collective), which are based on the exaggerated confidence in their own forecasts, on overreacting as new information emerges, on underestimating risks in loss situations and other “animal spirits” that characterize their psychology.

Conclusions

Based on the results of our investigations we summarize the following conclusions:

1. The share of successful manufacturing companies confirms the rational economic behavior, consistent with fundamental financial analysis. This conclusion is reinforced by the fact that these companies have evidently stable numbers of trade and significant volumes of sales on the stock market. Moreover, the financial results are obtained based on tangible products sales, which gives confidence in their stability. This is the result of long-term investments in their assets.

2. Other companies in the manufacturing industry, characterized by large fluctuations in turnover and lower trading volumes on the stock exchange, reject the assumption of rational economic behavior. The investors sanction the instability of these companies financial activity and their volatility of the stock price volatility.

3. The shares of financial services companies confirm the second case, that of irrational, subjective behavior, not only at the level of the individual investor but also at the level of the community of stock exchange operators. The shares are traded mostly for short-term gains purpose. Their stock prices reflect investor expectations of the stock market development and not the issuer's financial performance. As a consequence, investors have the priori belief that these performances are greater than they are in reality. With that in mind, their concern is purely speculative.

Notes:

⁽¹⁾ For a simplified example of the multiple valuation models we have deliberately chosen this model, which is quite suggestive for the finance goal of capital investment evaluation.

⁽²⁾ Arbitration is the risk-free transaction of sale/purchase of the same asset on different markets at different times, in order to take advantage of the differences in the price arising on the market.

⁽³⁾ Kahneman, D., and Tversky A., *Prospect Theory. An Analysis of Decision under Risk*, 1979. Prospect theory comments upon the irrational behaviour of humans/investors to gain quick profits (through selling) and to postpone reporting losses (through holding the asset). A full description on the psychological aspects of investment management in capital markets is presented in Mitroi, A., și Stancu, I., *Finanțe comportamentale versus analiza tehnică și fundamentală*, Economie teoretică și aplicată, nr. 1/2007(506).

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LENIENCY POLICY FOR COMPETITIVE ACTIVITY

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Abstract. *A market driven economy is inconceivable without competition. In this system, the competition is beneficial firstly for consumers, but also for producers. The former have the ability to satisfy their needs according to taste and financial ability, while the latter are incentivized to innovate and increase efficiency. Competition induces natural selection among companies. This selection must adhere to strictly abiding by competition law regulation, while regulation must benefit both consumers and producers.*

The economic development needs an efficient policy to protect competition. Thus, leniency policy helps regulate companies and discourages anticompetitive practices, prevents price fixing, encourages cooperation with competition authorities to prove anticompetitive behavior. This way, companies involved in price fixing can benefit from reduced penalties or immunity from fines.

Keywords: leniency policy; leniency programs; leniency module.

JEL Classification: D49, L49.

REL Classification: 7H, 7Z, 8Z.

1. Introduction

Leniency Policy in Competitive Activity is being structured in two parts: one regarding legislation in the domain, and the second comprises aspects of infringements regarding competitive regulations by different firms and that have taken advantage of leniency for the penalties applied. The respective policy within competitive activities aims at discouraging the abusive anticompetitive practices of the firms.

The paper presents the programs adopted by the European Commission and in conformity with the community acquis The Council of Competition worked out some rules that invite the firms involved in the cartel to cooperate in order to benefit immunity for fines or reducing of it.

Both the European Commission and the Council of Competition as competitive authorities enforced the leniency policy for firms to be investigated as their involvement in the cartel is being concerned. Examples can be seen in the paper.

2. Investigation on the leniency policy

Leniency policy is a body of regulation (conditions and criteria) adopted by the Competition Council (in the case of Romania) that encourages companies involved in anti competitive activities - like price fixing - to cooperate with competition authorities, helping uncover and prove price fixing deals. The competition authority grants favourable treatment to companies involved that cooperate with investigative bodies to uncover anticompetitive practices.

European Union leniency programs offer companies the benefit of immunity or reduced fines in exchange to information provided regarding anti competitive behaviour they engaged in or are engaging in. The first rules regarding conditions and criteria for enforcing the leniency policy in Romania were adopted in May of 2004. According to The European Commission 2006 Model Leniency Programme, the Competition Council adopted in September 2009 the new regulation regarding conditions and applicable criteria for a leniency

policy according to art. 51 alin. (2) from Competition Law no. 21/1996 republished with alterations and subsequent additions.

Companies and people affected by anticompetitive practices can file a complaint with the Competition Council. This is done according to current law.

Deeds and facts the competition law regulates are: anticompetitive practices, anticompetitive deals, dominant market position abuse. If these restrict, prevent or alter competition of: companies, group of companies (companies or individuals with citizenship or of Romanian or foreign nationality) or local and national public administration, are sanctioned by law.

The Model Leniency Programme (MLP) revision was approved November 21, 2012 at the European Network for Competition (ECN) assembly in Brussels. The Model Leniency Programme modifications can contribute to a rise in interest for leniency provisions with companies interested in benefitting from it when dealing with multiple competition authorities of ECN. There were also simplifications and clarifications regarding information that needs to be provided by companies seeking leniency from multiple competition authorities.

The Model Leniency Programme modifications refer to:

- all applicants requesting leniency with the European Commission in cases involving more than three member states will be able to file simplified requests with national competition authorities;
- an unified form that will be adopted in all member states was created.

Along with revising the Model Leniency Programme, the leaders of competition authorities agreed on standardising competition programmes and leniency practice. Emphasis needs to be placed on the fact that modifications include clarifications for the conditions that need to be met by the applicant in order to benefit from leniency – especially the obligation to cooperate – and range of application for clemency programmes according to MLP, that apply to secret cartel-type behavior but also covering cartels that engage in “vertical agreements”.

Vertical agreements are the type of deals or concerted practices that involve two or more companies, each operating at different levels of production or distribution. These agreements mention conditions for buying, selling or reselling goods and services.

The revised Model Leniency Programme also solves the problem of ECN authorities offering the same level of protection for written and oral disclosures.

According to current law, starting with 2009, the leniency policy also applies to very serious “vertical agreements” like price fixing or market division leading to absolute territorial protection.

What are the advantages of leniency policy? The answer to that is in the benefits provided to cooperating companies: immunity to fines or reduced fines.

In order to benefit from these advantages, a company must:

- file a detailed declaration regarding the organisation and functioning of the alleged agreement;
- supply any evidence regarding the alleged agreement;
- real, total, continuous and prompt cooperation with investigative bodies of the Competition Council;
- disclose the seeking of leniency only to other competition authorities;
- stop participating in the alleged agreement at the request of the Competition Council.

The first company to inform the Competition Council regarding the existence of the cartel benefits from immunity from fines. Thus, the cartel is represented by the agreements between two or more companies that resulted in disrupting competition. The main cartel types are those that target price fixing and/or market division.

Immunity from fines means exonerating the company that participated in the cartel from any fines it would have owed had it not been cooperating. The Competition Council grants immunity from fines to a company if it is the first to provide evidence proving a serious violation of Competition Law. Also, based on evidence, the competition authority can start an

investigation to look for the signs of a possible cartel and inspect the premises of involved parties.

A company seeking immunity from fines can contact the Competition Council both in writing and verbally. The Competition Council confirms the receiving of the request and then moves to verify the conditions that need to be met in order to grant immunity. If the conditions are met, the Competition Council grants immunity from fines to that company by issuing a statement.

The negative effects regarding cartel agreements are:

- artificial limits placed on competition;
- price increases;
- avoiding constraints that generate innovation (for example the development of a new product or creating more efficient production protocols);
- restricting employment opportunities.

If the report that results from the investigation signals the possibility of a cartel, the following sanctions may apply:

- financial - fines of up to 10% of the turnover for involved parties, applied to the year prior to the sanction;

- penal - prison for six months to four years or fines for participating with fraudulent intent and instrumental in conceiving, organising or creation of a cartel. This is started by a notification by the Competition Council.

If there are other companies involved in the cartel that collaborate with the Competition Council, they will benefit from a reduction of the fines of up to 50%, according to the new regulation. It is important to note that the Leniency Module works from within the Competition Council and is responsible for liaising between the competition authority and companies requesting leniency within the rules of the law.

Other companies involved in the cartel can benefit from reduced fines, if they provide evidence that significantly strengthen the case of the competition authority.

Current law indicates that the other companies can benefit from reduced fines even if the immunity provision has already been granted. The reductions can be:

- between 30 and 50% for the first company after the immunity has been granted;
- between 20 and 30% for the second;
- a maximum of 20% for the other companies.

If the Competition Council is convinced that the evidence brought by the company has significant value, it will notify the company in writing, but no later than the date of the submission of the Report to the involved parties.

The first immunity from fines granted by the Competition Council through the leniency programme was for the Radio Taxi company after investigating the taxi transport market in Timisoara.

The Report generated after the investigation revealed that 11 companies with dispatches and exclusive taxi operators participated in an agreement resulting in price increases for taxi services starting in December 2007. The fines dispensed by the Competition Council for this situation totaled 348,710 RON. Radio Taxi – providing dispatch and taxi services – Total Radio Taxi and Extra Radio Taxi was the first company that requested leniency by cooperating with the Competition Council, denouncing the anti competitive practices. Following that, the company benefitted from full immunity from fines. The second company denouncing the cartel – Power Up – benefitted from a 50% reduction, also within the clemency programme.

It is important to mention that the same investigation resulted in an investigation in Constanta, exposing 10 taxi companies that engaged in anticompetitive, price fixing activities. This resulted in 302,330 RON worth of fines. In this case there was no leniency, thus no one benefited from reduced fines.

To conclude, we can say that companies that collude in forming of cartels and price fixing will sooner or later be uncovered and sanctioned according to the law. Cartel type agreements are the gravest breaches of correct competition, whether locally or nationally, leading to increased prices for goods and services that consumers have to pay for.

The leniency policy aims to encourage companies to denounce the existence of cartel agreements in order to benefit from immunity from fines and a revert to normal competitive conditions.

Researching this subject I learned that the European Commission issued fines to six LCD producers totaling 648.9 million Euro for colluding in a cartel. LCDs are the main component of flat screens used in manufacturing television sets, computer and notebook monitors.

The six fined companies are: Samsung Electronics and LG display – Korea; AU optronics, Chimei InnoLux Corporation, Chungwha Picture Tubes and HannStar Display Corporation – Taiwan.

During the investigation it was revealed that the cartel operated in the span of four years (October 2001 – February 2006), agreeing to sale prices, including minimal prices, cooperated in regards with products, production capacity and other trading conditions. These conditions generated negative effects on European consumers, because most TV sets, monitors and notebooks sold within the EU had LCD screens of Asian origin incorporated. As Art. 81 from the EU Treaty forbids price fixing and other competition restricting actions, the Korean and Taiwanese companies damaged trade relationships in the member states of the European Economic Space. Thus, when setting the fines, the European Commission took into account both sales in the EU space, and the nature and duration of legislation breach.

The Report mentions that while all companies asked for leniency, only Samsung Electronics benefitted from full immunity to fines within the Leniency Programme, being the first to come forward about the existence of the cartel agreement.

Other three companies benefitted from smaller percentages of fine reductions as follows:

- LG Display - 50%;
- AU Optronics - 20%;
- Chunghwa Picture Tubes - 5%.

The other two companies: Chimei InnoLux Corporation and HannStar Display Corporation did not benefit from any reductions.

Another action undertaken by the European Commission to uncover cartel agreements was the one regarding Henkel, Procter & Gamble and Unilever. The three companies started to coordinate prices starting in 2002, practicing a policy of improving the performance of cleaning products with regard to environmental protection that ended in 2005. Price fixing activities had a wide range of action: Holland, Belgium, Germany, France, Spain, Portugal, Italy and Greece.

Procter & Gamble was sanctioned by the European Commission, with a total fine of 315.2 million Euro for making the agreement with Henkel regarding household detergents. P&G had to pay 211.2 million Euro, while Unilever parted with 104 million. All companies called for leniency. Henkel was the first company to supply information about the cartel and thus benefited from full immunity from fines through the Leniency Policy. The other two companies both appealed to leniency benefitting from a reduction in fines as follows:

- Procter & Gamble - 50%;
- Unilever 25%.

Worth mentioning is the fact that for P&G and Unilever (according to the Commission Report) the fine included a reduction of 10% for pleading guilty, allowing for a swift ending of the investigation.

Another action against agreements that restrict or damage competition was the one that involved 12 air transport companies which colluded in regards to price fixing for fuels and flight security. The European Commission fined the 12 companies almost 800 million euro because they formed a worldwide cartel that affected cargo transport within the EU, over a six year period (December 1999 - February 2006).

Lufthansa and its subsidiary in Switzerland Swiss International Air Lines received full immunity to fines according to Leniency Programme, being the first to supply information about the cartel. The other companies cooperated with competition authorities and received reduced fines following Lufthansa's cooperation. The reductions were as follows:

- 15% for Air Canada;
- 20% for Air France;
- 20% for KLM;
- 50% for Martinair;
- 10% for Air British Airways;
- 15% for Cargolux;
- 20% for Cathay Pacific Airways;
- 25% for Japan Airlines;
- 20% for Lan Chile;
- 20% for Qantas;
- 15% for SAS;
- 0% for Singapore Airlines.

As noted above, Singapore Airlines did not benefit from any fine reduction because it did not acknowledge its participation in the cartel and was forced to pay the full 74.8 million Euro fine.

The European Commission grants special attention to activities to uncover secret cartels that undermine healthy economic activity within the European Economic Space. The competition Commissaries that form the Commission repeatedly expressed opinions that sanctions enforced against companies involved in cartel agreements should be the harshest if they are to be discouraged. So the Leniency Programme must prove its effectiveness and any stimulants granted to companies involved need to lead to cartel detection and new business directions.

Thus, Romania, as a EU member, through legislation adopted regarding competition aligned with the EU law, is available to actively participate in all actions of the European Commission regarding uncovering anticompetitive practices. Also our country enforces the new regulation from the Leniency Programme established for the European Economic Space.

Companies, in order to benefit from current law provisions regarding competition, especially from leniency policy, need to have a deep understanding of the law and abide by it strictly.

Conclusions

The Programs of Leniency Policy adopted by the European Commission must approach the firms involved in the cartel to cooperate with the authority of competition within the EU and with that in the country where the firm has its headquarters. By doing this the number of firms that would break the rules could be reduced. The efficiency of this policy is to be found in those incentives granted to firms that call for the respective program. The growing efficiency of the respective program is connected to the way such rules are being promoted and brought to be known by all firms whether or not involved in the cartel.

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A SIMULATION OF AGENT-BASED MODELS FOR HIGH FREQUENCY TRADING ON THE STOCK EXCHANGE MARKET

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Abstract. *High frequency computer-based trading (HFT) represents a challenging topic nowadays, mainly due to the controversy it creates among investors on the financial market. The hereto paper uses two types of agent-based models, one with zero-intelligence traders and the other with intelligent traders in order to simulate the tick-by-tick high frequency trading market for ten US stocks. The results show that in almost all the cases the intelligent agent-based model performed better when compared to the zero-intelligence agent-based model, which could be interpreted as lower market efficiency, allowing for predictions of the stock market price, or even stock market manipulation.*

Keywords: high frequency trading; agent-based modeling; zero-intelligence traders; double auction; financial markets.

JEL Classification: C63, D44, D53, G17.

REL Classification: 11B.

Introduction

The changes of the stock market structure due to the technological improvement which led to the high speed computer-based trading have switched the market from an investor-focused mechanism to a trader-focused mechanism, where the investors' trust and concerns are ignored. According to a study conducted on the impact of the computer trading on the financial markets based on which the report entitled *The Future of Computer Trading in Financial Markets – An International Perspective* (Beddington, 2012) was released, although the investors are very worried regarding the possible abuse of the market generated by the high-frequency trading and claims on market manipulation using HFT techniques are reported by institutional investors all over the world, it seems like so far economic research has provided no direct evidence that HFT has increased market abuse, but the authors of the report also underlined that the research regarding the measurement of market abuse is at an early stage and incomplete, not being the main focus of the report. Furthermore, Brogaard (2010) examines the impact of HFT on the US equity markets and the results show that HFT activities are not detrimental to non-HFT activities and that HFT tends to improve market quality.

Despite the lack of research on this subject, and even though the abuse is present or not in the market, regulators and policy makers should take in consideration the perception of the investors which show worries in this regard, because this is what determines trading behavior, portfolio management and investment decisions. Thus regulators should increase their ability to detect abuse and obtain significant empirical proof on either to confirm or deny the manipulation related to HFT in order to restore market confidence.

Market abuse in this case is studied by the economists because of its implications on market liquidity, volume, pricing efficiency and even social welfare. According to the studies conducted by Cumming et al. (2012) on the possible risks of market abuse generated by HFT,

the authors find that HFT lead to lower incidence of manipulation, as also another study conducted by Aitken et al. (2012) reports that HFT improves market efficiency without harming the market integrity. The papers mentioned above analyze market abuse at the end of the trading day, while empirical studies for the HFT market abuse during the continuous trading period have not been conducted yet. These results are in contrast with the surveys regarding the perception of the investors over the degree of manipulation in the market generated by HFT, which were conducted on the stock markets all over the world, and which underline the considerable concerns showed by the large investors regarding the market abuse and the lack of action and detection of manipulation by the regulators.

According to the results obtained by Li and Krause (2009) by comparing the market structures with near-zero-intelligence traders with the use of agent-based model simulations, they have observed that the properties of returns arising in double auction markets are not very sensitive to the trading rules employed. Also, Sunder (2004) underlines that artificial and computer intelligence are very important in understanding the distinction between individual behaviour and market outcomes, outlining that computer simulations helped to discover that allocative efficiency is largely independent of variations in individual behaviour under classical conditions, while Herbert Simon was convinced that “the possibility of building a mathematical theory of a system or of simulating that system does not depend on having an adequate microtheory of the natural laws that govern the system components. Such a microtheory might indeed be simply irrelevant.”

A study is conducted in order to see how HFT can be modelled in order to observe different characteristics of the market, this is achieved by using the Adaptive Modeler software developed by Altreva. Two types of agent-based market models are simulated – the *zero-intelligence agent-based trading model* and the *intelligent agent-based model* – for price forecasting of real world market-traded securities such as stocks. Thus, heterogeneous agents trade a stock floated on the stock exchange market, placing orders depending on their budget constraints, where the virtual market is simulated as a double auction market. For the *intelligent agent-based model*, the software uses evolutionary computing such as the *Strongly Typed Genetic Programming* in order to create adaptive, evolving and self-learning market modeling and forecasting solutions. The results obtained from the simulations on different time frames are compared revealing that the high frequency tick-by-tick data is best modeled by the *intelligent agent-based model*.

The organization of this paper is as follows. Section 1 provides an overview of the high frequency computer-based trading (HFT), including the advantages and disadvantages coming from their use, Section 2 describes the datasets used in this study, Section 3 presents the agent-based models used to model the real stock market. The results of the simulations that have been performed are presented in section 4, and the paper ends with the conclusions and avenues for future work.

1. High Frequency Computer-Based Trading (HFT)

The *High Frequency Computer-Based Trading* (from now on called *HFT*) represents a subset of algorithmic trading or a trading strategy where a large number of small size orders are sent into the market at high speed, therefore the securities are bought and sold by a computer algorithm and held for a very short period, usually seconds or milliseconds. HFT is also called “black box trading”, and is an automated program trading which uses high-speed computers governed by complex algorithms to analyze data and trade orders in massive quantities at very high speeds.

The HFT is one of the most significant market structure developments in recent years, as stated by the Securities and Exchange Commission (SEC), but is also controversial due to its divers impact on investors’ perception, which are worried about the degree of manipulation in the market generated by HFT, according to surveys conducted on the stock markets. Despite the investors’ worries described above, research studies on the impact of HFT over

the market show that HFT tends to improve market quality (Brogaard, 2010), while Vuorenmaa (2012) reached the conclusion that the benefits of the HFT have the most weight and dominate the negative aspects of HFT.

Recently, EU Parliament voted in favour of MiFID II, a draft law for strengthening the regulation of HFT and other financial instruments. The new rules will apply starting with 2014 and aims to reduce speculation without harming the real economy, by introducing a synchronised clock for trading shares, bonds, commodities and other instruments across the EU so regulators can spot abuses more easily in a market where many exchanges and platforms trade the same shares, and by extending the minimum time in which high-frequency orders have to remain in the market from 3 milliseconds currently to at least 500 milliseconds. That way, purely speculative business with high-frequency transactions will be discouraged.

Recall that high-frequency and algorithmic trading impact on the financial market has raised worries from behalf of the regulators and the investors since May 6, 2010, when about USD 862 billion was erased from stock values in 20 minutes before share prices recovered from the plunge, while on August 1, 2012 a trading malfunction at Knight Capital Group which poured in the market unintended orders lead to high traded volume and high price volatility, which finally led to a USD 440 million trading loss for the company.

According to a study conducted on the impact of the computer trading on the financial markets based on which the report entitled *The Future of Computer Trading in Financial Markets – An International Perspective* (Beddington, 2012) was released, although the investors are very worried regarding the possible abuse of the market generated by the HFT, so far economic research has provided no direct evidence that HFT has increased market abuse. Furthermore, according to the studies conducted by Cumming et al. (2012) on the possible risks of market abuse generated by HFT, the authors find that HFT lead to lower incidence of manipulation, while also another study conducted by Aitken et al. (2012) reports that HFT improves market efficiency without harming the market integrity. The papers mentioned above analyze market abuse at the end of the trading day, while empirical studies for the HFT market abuse during the continuous trading period have not been conducted yet.

On the other hand, the surveys conducted regarding the perception of the investors over the degree of manipulation in the market generated by HFT underline the considerable concerns showed by the large investors regarding the market abuse and the lack of action and detection of manipulation by the regulators. Also, HFT allows the program trader to “see” ahead of others the major incoming orders and to act benefitting from its speed advantage, in order to gain profits, as HFT has been shown to have a potential Sharpe ratio, which is a measure of reward per unit of risk, thousands of times higher than the classical buy-and-hold strategies (Aldridge, 2010). A major disadvantage is that it can generate trade crashes, such as the one on May 6, 2010, and the one on August 1, 2012, thus eroding the trust of investors in the market.

2. Data

The data in this paper is retrieved from the Russian website <http://www.finam.ru/analysis/profile041CA00007/default.asp> and contains tick-by-tick data from BATS stock exchange. The tick-by-tick data was retrieved from this website, for the trades that occurred on the BATS (Better Alternative Trading System) stock exchange during regular trading hours on December 3rd, 4th, 5th and 6th of 2012 limited to 20,000 quotes for each stock, and includes the date, time and closing price information for each stock. The unique dataset used in this paper, namely the HFT dataset contains real trading data for the following stocks floated at the BATS, a computerized U.S. stock exchange market: Apple Inc. (symbol: AAPL), Adobe Systems Inc. (symbol: ADBE), Alcoa Inc. (symbol: AA), Bank of America (symbol: BAC), Citigroup Inc. (symbol: C) Exxon Mobil (symbol: XOM), General Electric (symbol: GE), IBM (symbol: IBM), Pfizer Inc. (symbol: PFE), Wells Fargo (symbol: WFC) the trades are in millisecond time period. The BATS stock exchange has been chosen for the data retrieval because it is one of the leading US venues for HFT, covering 12-13% of all U.S. equity trading on a daily basis according to the

stock exchange's website <http://www.batstrading.com/about/>. The distinction between the HFT and non-HFT was not defined in this paper, although taking in consideration the nature of the BATS stock market, we consider the trades to be mainly HFTs.

3. The agent-based models

3.1. Agent-based models and financial markets

An agent-based model is a computational model for simulating the actions and interactions of multiple agents in order to analyze the effects on a complex system as a whole. An agent-based model of a financial market may consist of a population of agents (representing investors) and a price discovery and clearing mechanism (representing a virtual market). As regards to the financial markets, agent-based models can successfully replicate time series features like fat-tailed distributions and volatility clustering, on which standard financial models offer few explanations. Conventionally, financial markets have been studied using analytical mathematics based on a generalization of market participants and other simplifications and idealizations. However, the behavior of financial markets as observed in reality can't be fully described by such mathematical models. In reality, market prices are established by a large diversity of investors with different decision making methods and different investment goals. The complex dynamics of these heterogeneous investors and the resulting price formation process require a simulation model of multiple heterogeneous agents and a virtual market. Research has shown that complex behavior as seen in actual markets can emerge from simulations of agents with relatively simple decision rules. Furthermore, commonly observed stylized facts of financial time series (such as fat tails in return distributions and volatility clustering) that have confronted the Efficient Market Hypothesis, have been reproduced in agent-based market models.

Although agent-based research has been introduced over 30 years ago in economics, it is still considered a niche field because of its detailed and complex platforms. Another impeachment in using computational agent-based modeling is represented by the fact that it uses source codes which usually is not disseminated along with the paper, thus being hard to be evaluated, tested and developed for further research by the rest of the community, as underlined by Barr et al. (2008).

Furthermore, agent-based modeling can generate important facts when used for institutional design. At a large scale they are already used for computer simulation by government agencies, an important example being the traffic simulations, while as a small to intermediate size model it can be used by the government agencies as an advisory and prediction instrument.

The agent-based models referred to in this paper are simulated in Adaptive Modeler software, which supports up to 2000 agents and 20,000 observations for each simulation. The cycle of the agent-based models is as follows:

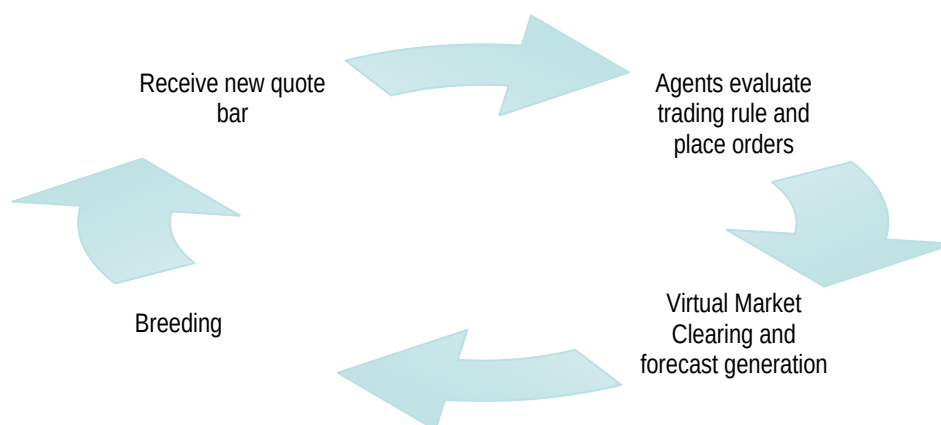


Figure 1. Agent-based model cycle

3.2. Zero-intelligence traders model

Zero-intelligence traders: The concept of *Zero Intelligence (ZI) traders* has been introduced by Gode and Sunder (1993b) in order to study the lower limit of rationality required to participate in a Double Auction market, which implies that agents have no strategy and they behave in a random manner subject to a budget constraint, so that the market mechanism can be observed. In case the ZI traders model generate good results, this means that the market mechanism used is incentive-compatible and most probably is not influenced by the trading strategies used by the investors. This represents a very important result for the market mechanism design, as a market mechanism which performs well despite the trader's irrationality is preferred over the mechanism that performs well only with perfectly rational traders, as underlined in Walia (2003).

In Ladley's (2012) point of view, any effects that are not observed in the ZI model cannot solely be due to the market mechanism and requires the interaction of the investors' strategies, therefore it can be possible to separate the effects of the market mechanism and trader strategy and to determine the driving forces within markets. In this context, a model that assumes stock market traders have zero intelligence has been found to mimic the behavior of the London Stock Exchange very closely, the research being conducted by Farmer et al. (2004) at the Santa Fe Institute, which suggest that the movement of the markets depend less on the strategic behavior of the traders and more on the design of the trading system.

The ZI traders model is design within the context of the continuous double auction, which sets the order placement, price formation, the supply and demand. The model is implemented in the Adaptive Modeler software and will be used in this paper to simulate tick-by-tick high-frequency data.

The Adaptive Modeler software in the ZI model uses only three types of genes or trading strategies, namely *RndPos*, *RndLim* and *Advice*. The *RndPos* gene returns a position value ranging from -100% to 100% which is randomly generated from a uniform distribution, the *RndLim* gene returns a random limit price that is generated as follows: the last closing price is taken from either the Virtual Market or the Real Market which is chosen randomly, then the price is multiplied with a normally distributed random value with $\mu=1$ and $\sigma=3.5 \times \sigma_m$ where σ_m is the standard deviation of the log returns of the last 20 bars of the chosen market. The *Advice* gene combines the position generated by *RndPos* function and the limit price value generated by the *RndLim* function into a buy or sell order advice. The buy or sell order is introduced in the market after comparing the desired position with the agent's current position and calculating the number of shares that need to be bought or sold. This order generation process is explained in detail in the paper *Agent-Based Simulation of a Financial Market* by Raberto (2001), together with the ability of this model to exhibit the stylized facts of financial time series, such as fat tails and volatility clustering, using simple trading rules, budget restriction of the agents, order limit prices, and the creation and matching of demand and supply curves.

Continuous Double Auction (CDA): A double auction is a trading process in which buyers and sellers can enter bid or ask limit orders and accept asks or bids entered by other traders (Gode & Sunder, 1993a). This trading mechanism was chosen to be used for the virtual market simulation in the Adaptive Modeler models because most of the stock markets are organized as double auctions. Double auction stock markets converge to the equilibrium derived by assuming that the traders are profit-maximizing Bayesian.

In the CDA markets, agents introduce bid or ask orders, each order consisting of a price and quantity. The bids and asks orders received are put in the order book and an attempt is made to match them. The price of the trades arranged must lie in the bid-ask spread (interval between bid price and ask price). Also, the amount paid to the seller could be less than the amount charged to the buyer, allowing a commission for the exchange and for the broker.

3.3. The intelligent agent-based model

The agent-based model cycle starts by receiving a new quote bar, so that agents can place a new order or remain inactive according to their trading strategy. After all agents have evaluated their trading strategy, the Virtual Market determines the clearing price, executes all executable orders and releases the price forecast for the next bar. After that, breeding of new agents and replacement by evolutionary operations such as crossover and mutation can take place, a process which repeats itself for each bar.

The trading rules of the model uses historical price data as input, and return an advice consisting of a desired position, as a percentage of wealth, and an order limit price for buying or selling the security. The trading rules are implemented by genetic programming technology explained below. Through evolution the trading rules are set to use the input data and functions (trading strategies) that have the most predictive value.

Genetic Programming: The agents' trading rules development is implemented in the software by using the Strongly Typed Genetic Programming (STGP) approach, and use the input data and functions that have the most predictive value in order for the agents with poor performance to be replaced by new agents whose trading rules are created by recombining and mutating the trading rules of the agents with good performance. The STGP was introduced by Montana (2002), with the scope of improving the genetic programming technique by introducing data types constraints for all the procedures, functions, variables and constants, thus decreasing the search time and improving the generalization performance of the solution found. Therefore, the *genomes* (programs) represent the agents' trading rules, which trade the security on the Virtual Market based on their analysis of historical quotes. The *fitness function* is a measurement of the agent's investment return over a certain period.

4. Simulation results

Simulation results for Apple Inc. (symbol: AAPL):

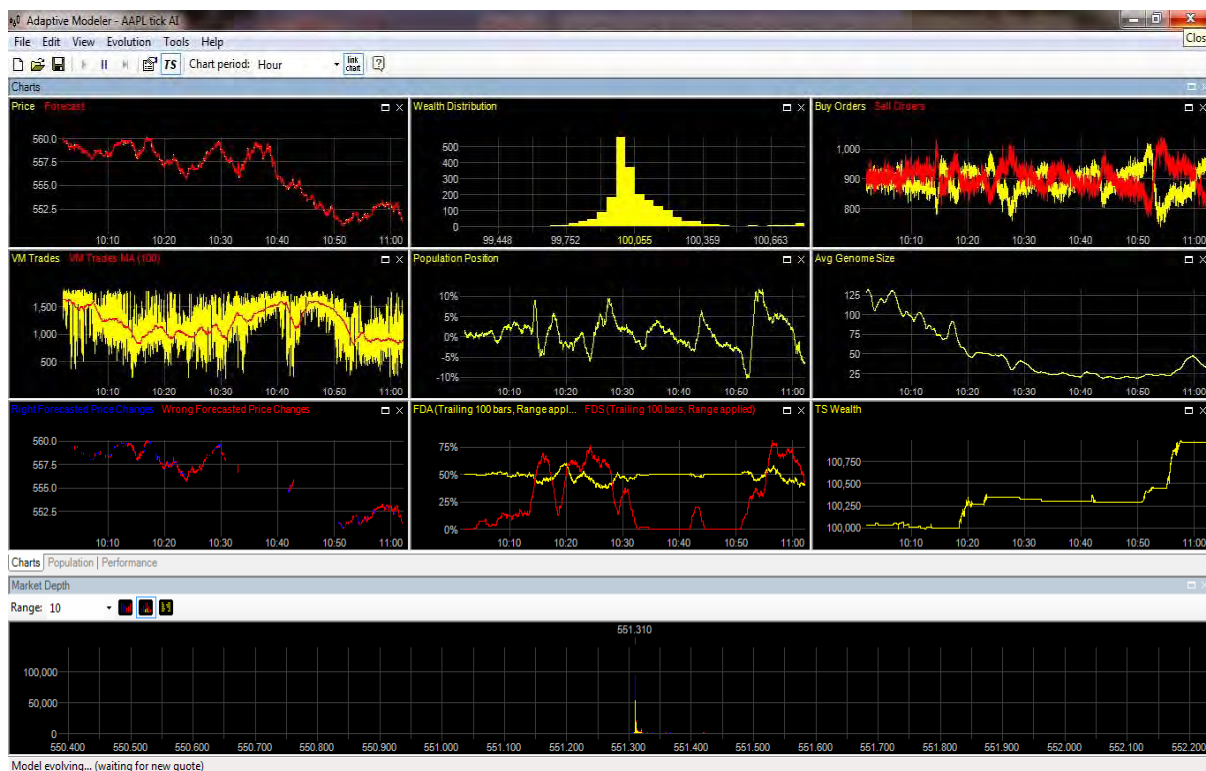


Figure 2. Apple stock simulation print screen – Intelligent Agent-Based Model

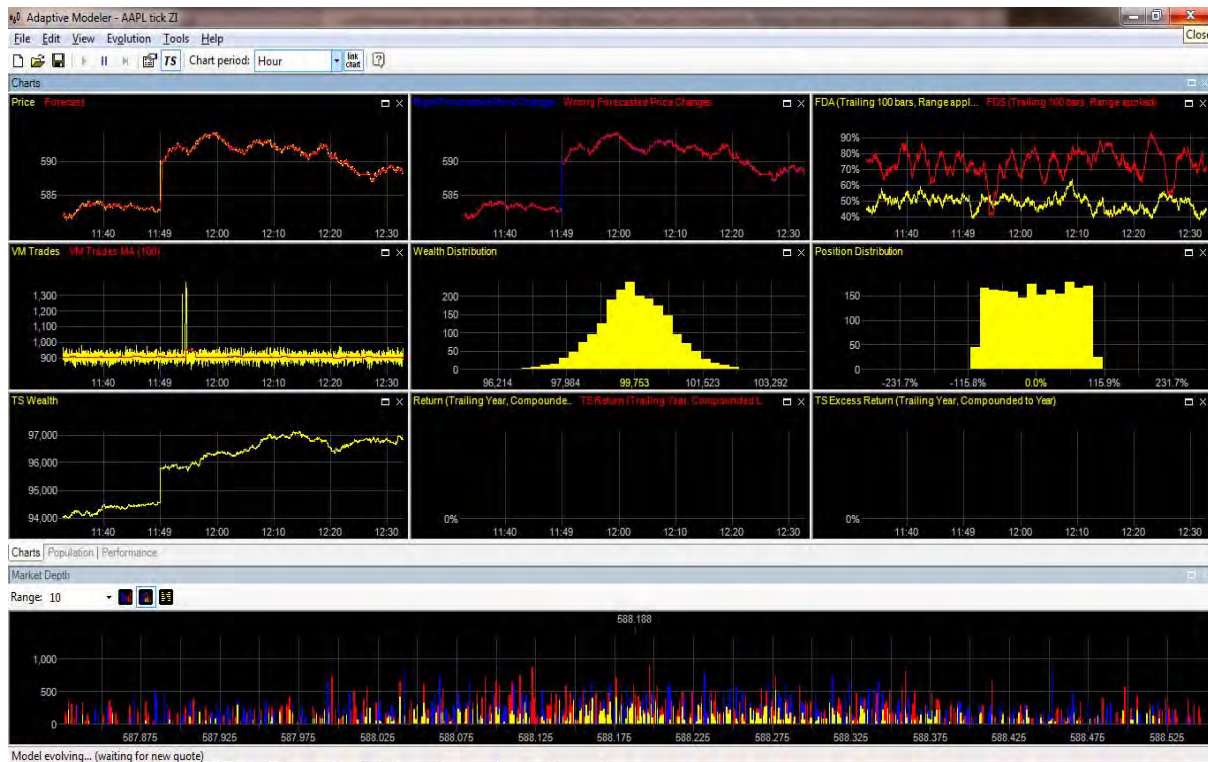


Figure 3. Apple stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Adobe Systems Inc. (symbol: ADBE):

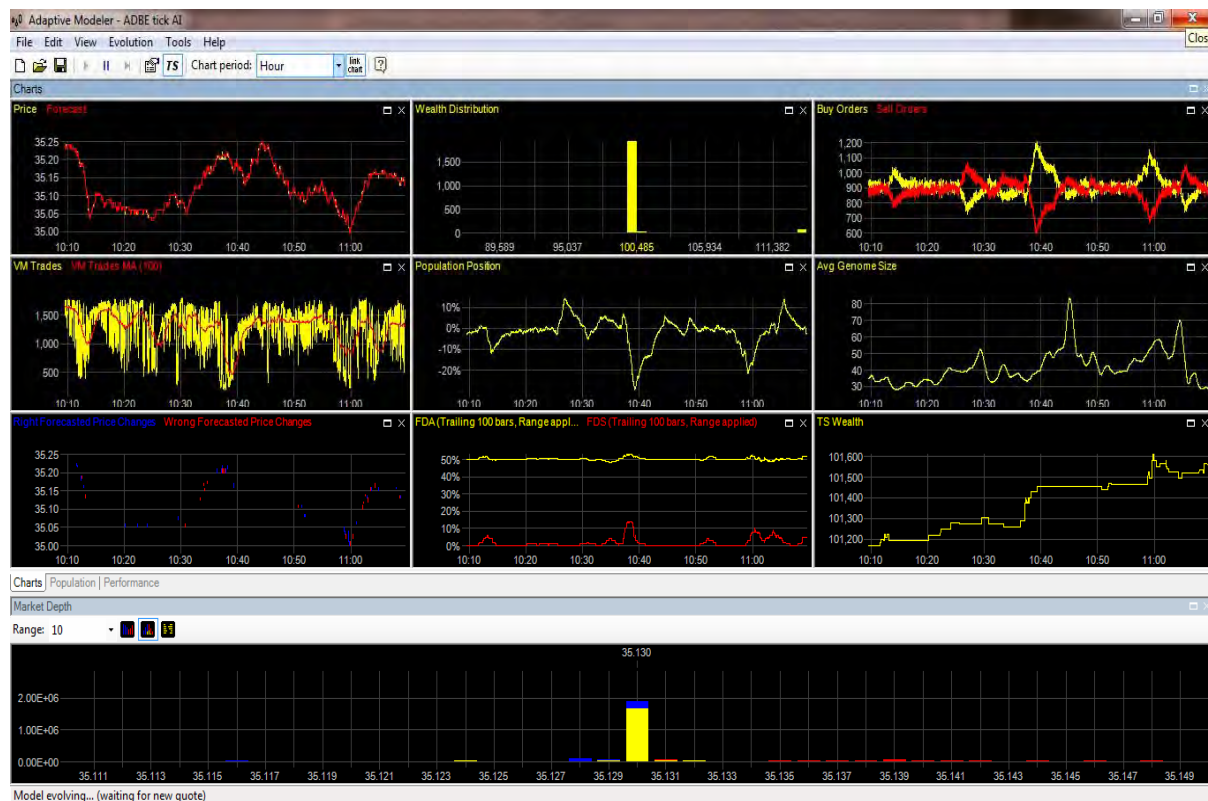


Figure 4. Adobe stock simulation print screen – Intelligent Agent-Based Model

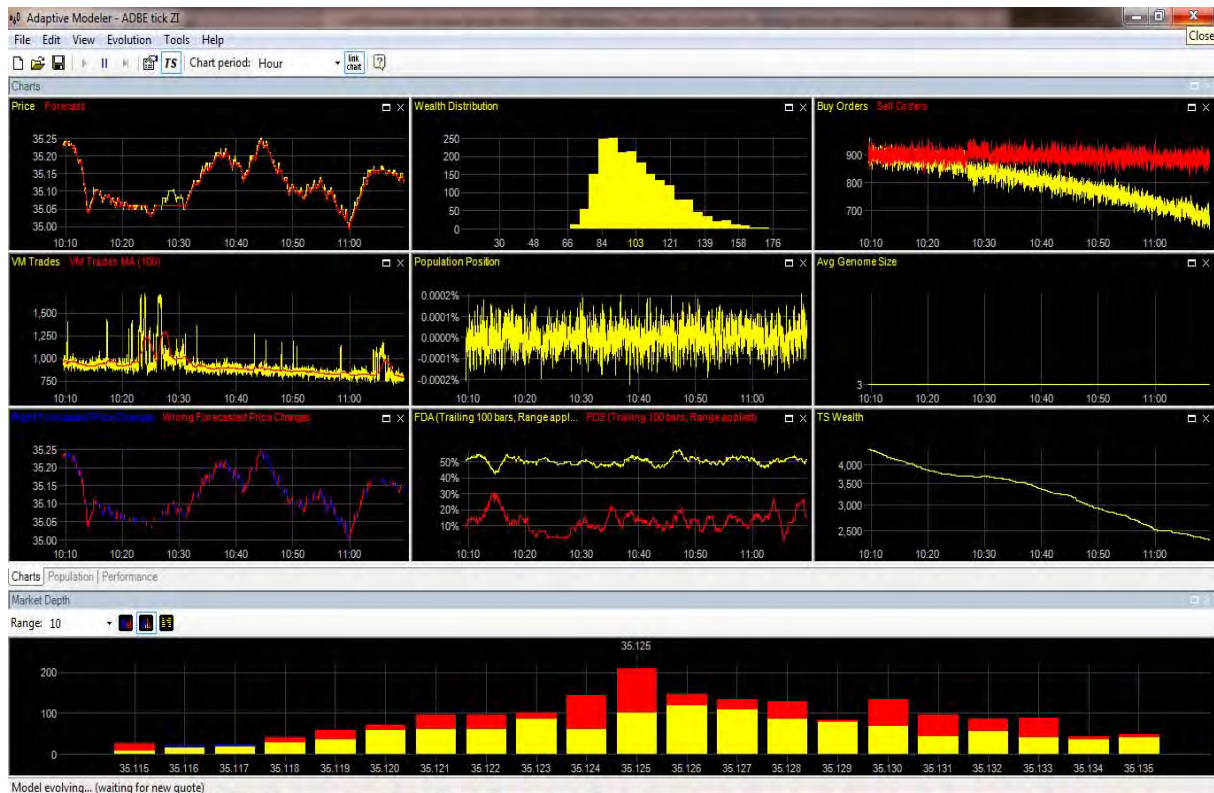


Figure 5. Adobe stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Alcoa Inc. (symbol: AA):

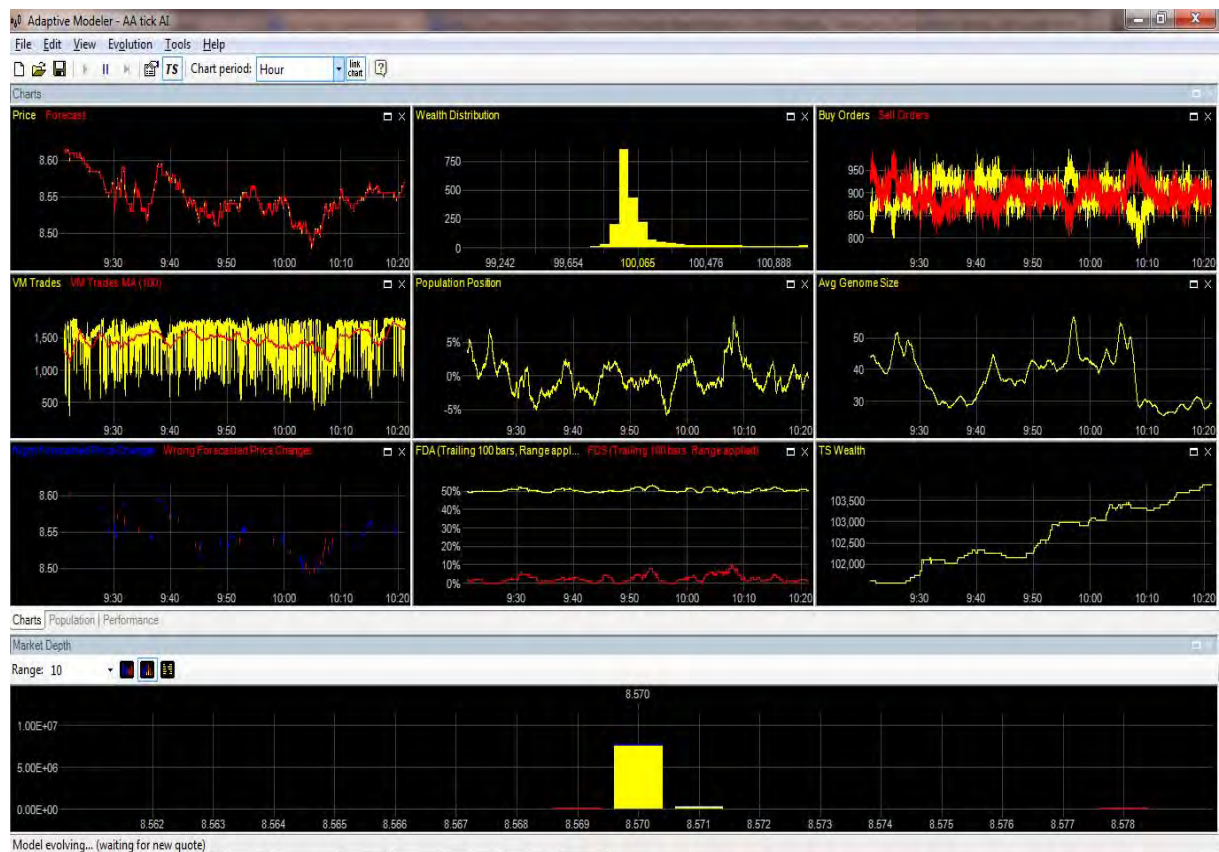


Figure 6. Alcoa stock simulation print screen – Intelligent Agent-Based Model

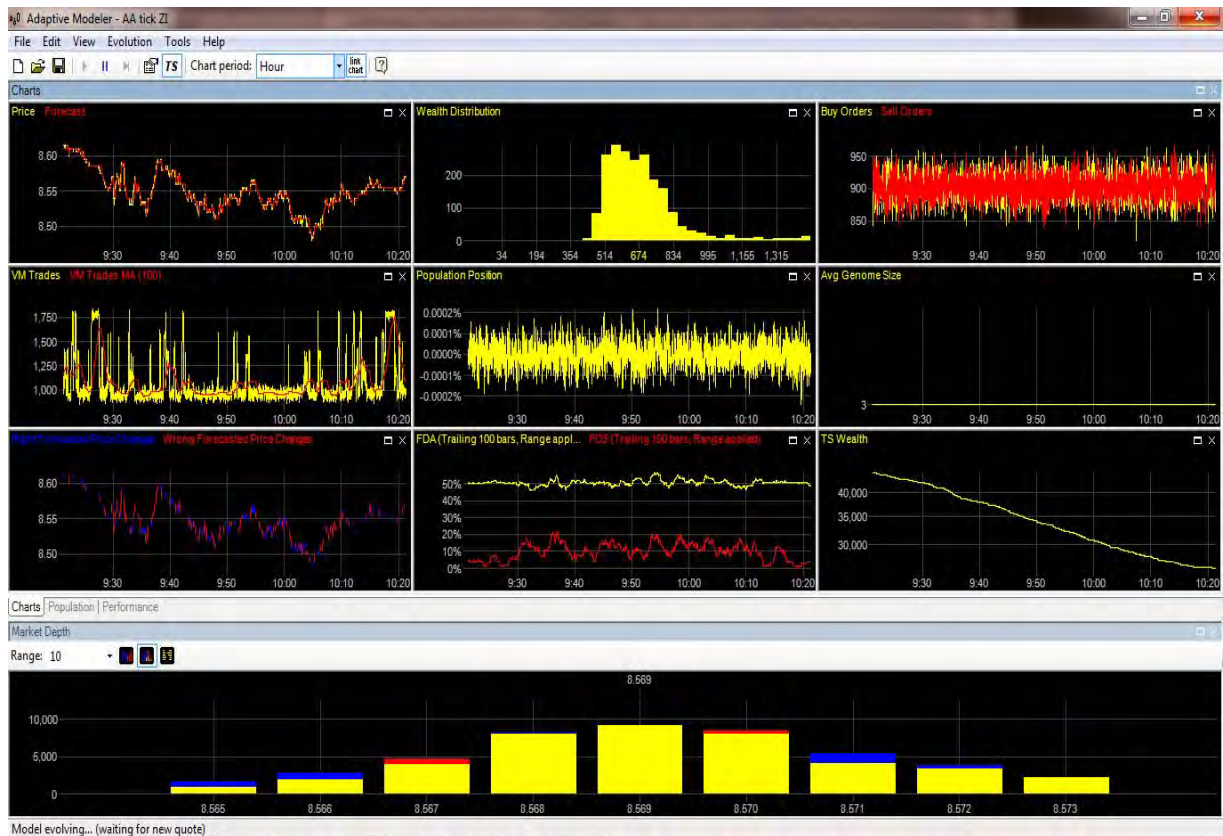


Figure 7. Alcoa stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Bank of America (symbol: BAC):

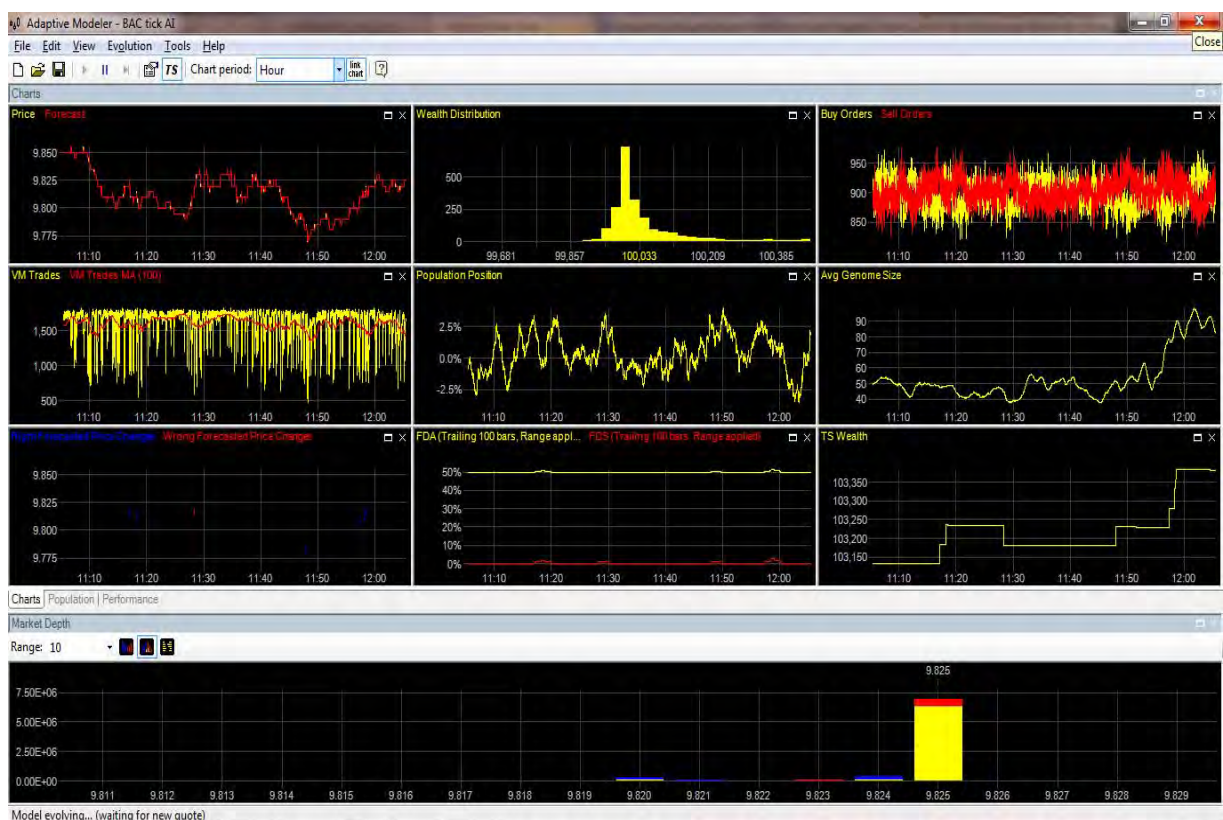


Figure 8. Bank of America stock simulation print screen – Intelligent Agent-Based Model

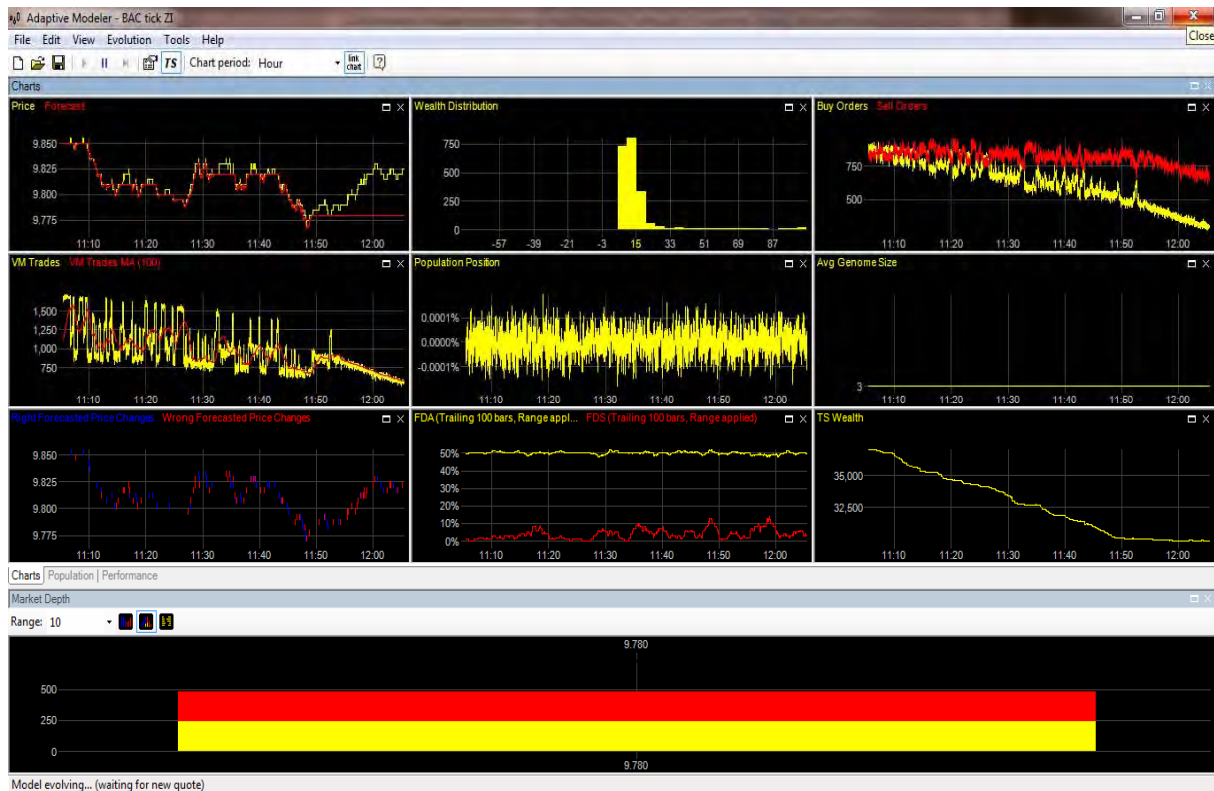


Figure 9. Bank of America stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Citigroup Inc. (symbol: C):

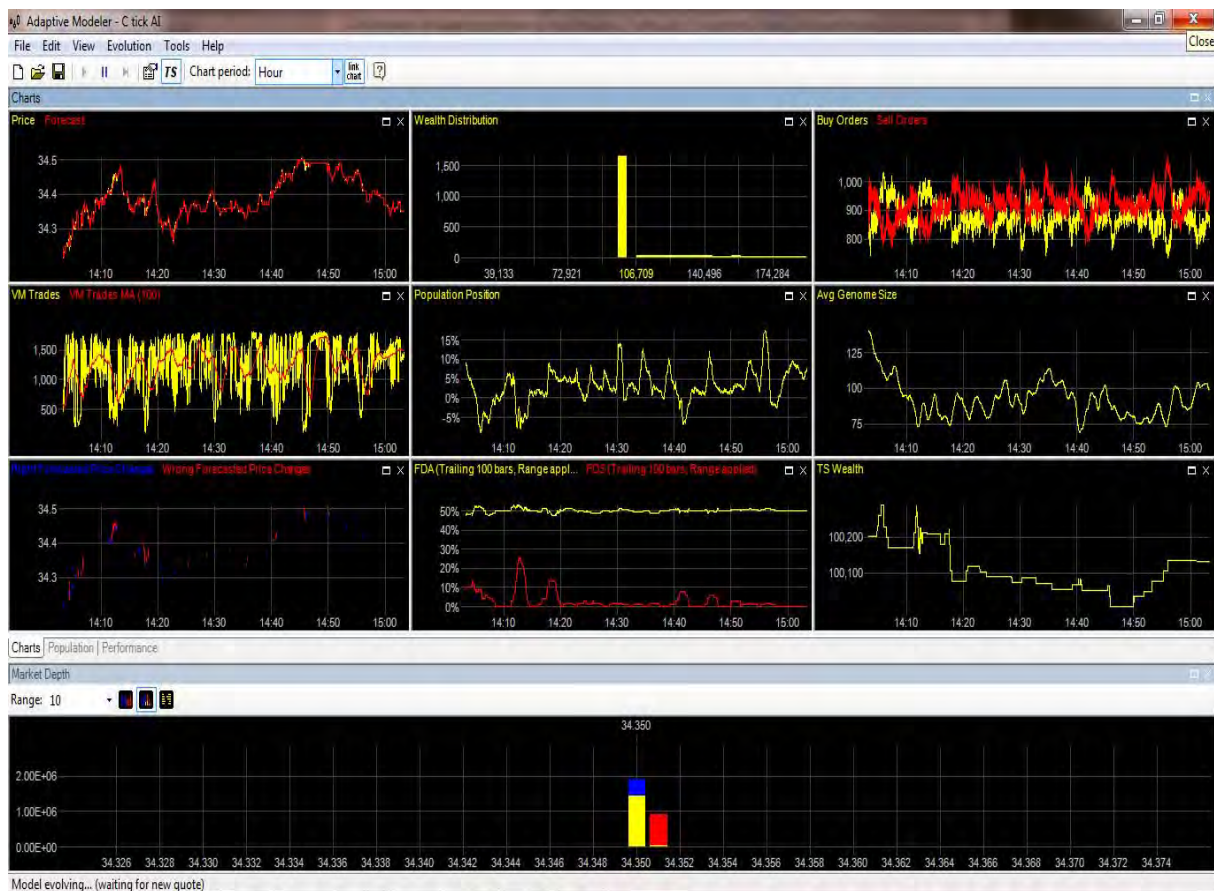


Figure 10. Citigroup stock simulation print screen – Intelligent Agent-Based Model



Figure 11. Citigroup stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Exxon Mobil (symbol: XOM)

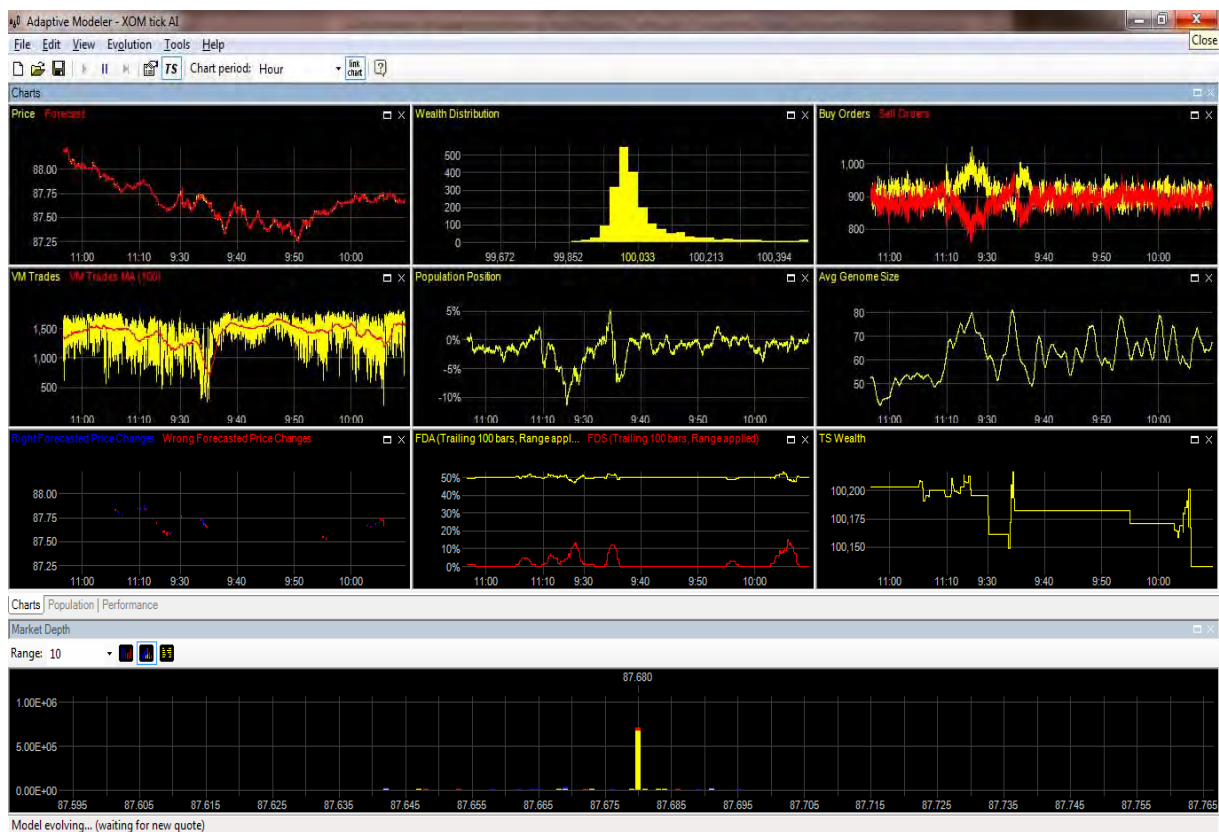


Figure 12. Exxon Mobil stock simulation print screen – Intelligent Agent-Based Model

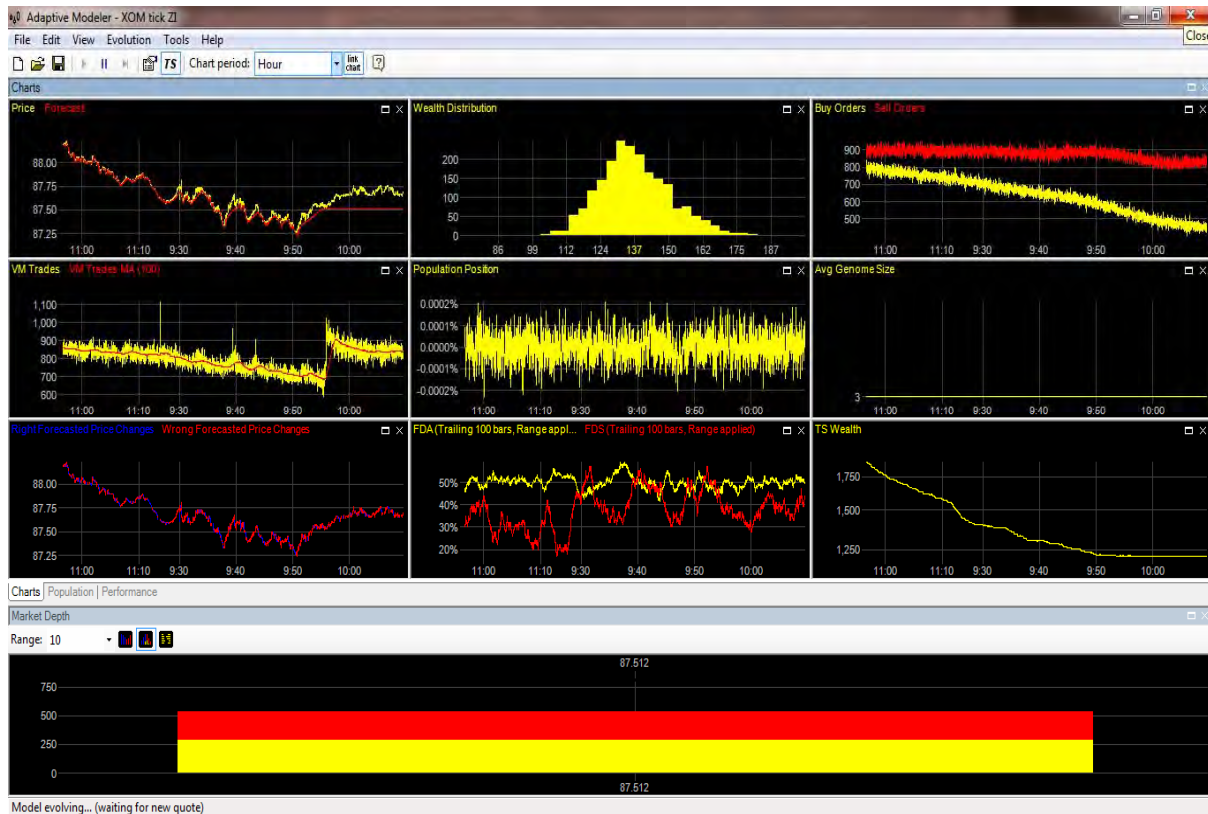


Figure 13. Exxon Mobil stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for General Electric (symbol: GE):

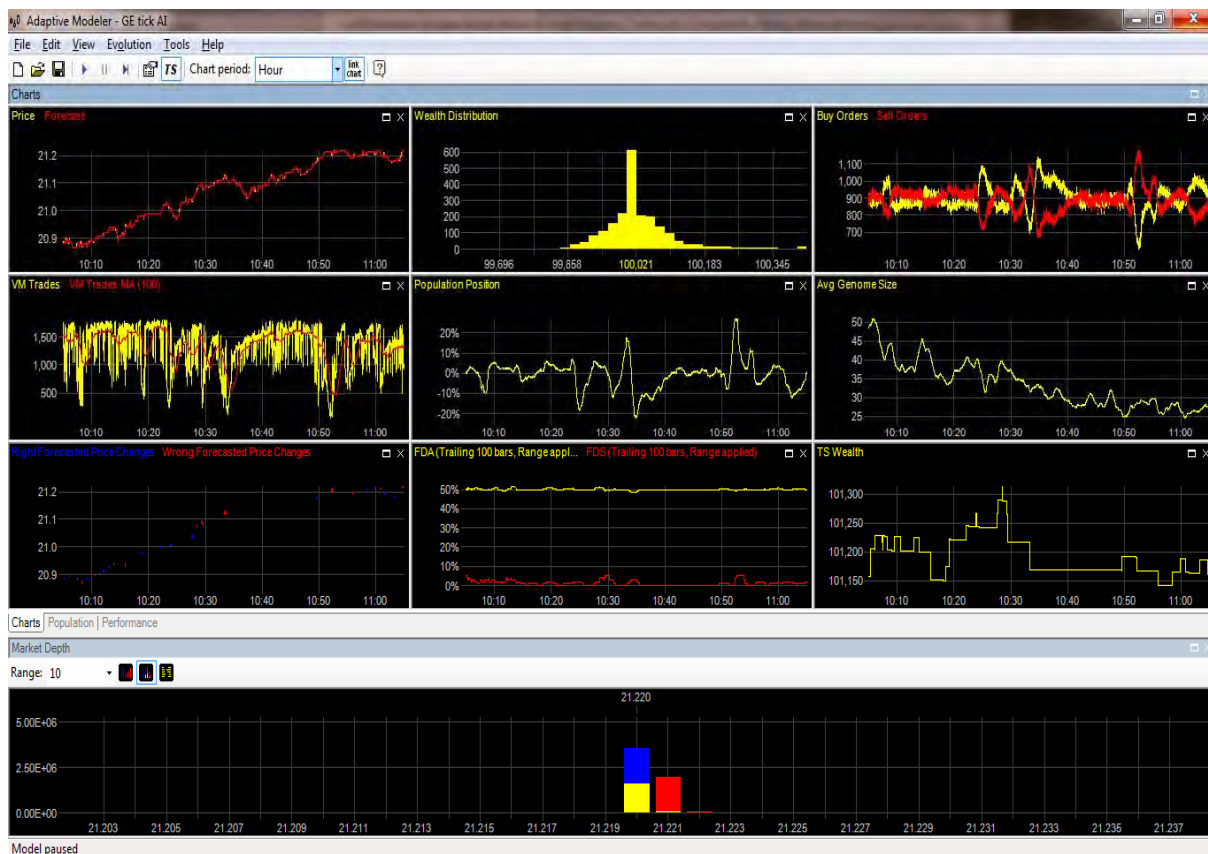


Figure 14. General Electric stock simulation print screen – Intelligent Agent-Based Model

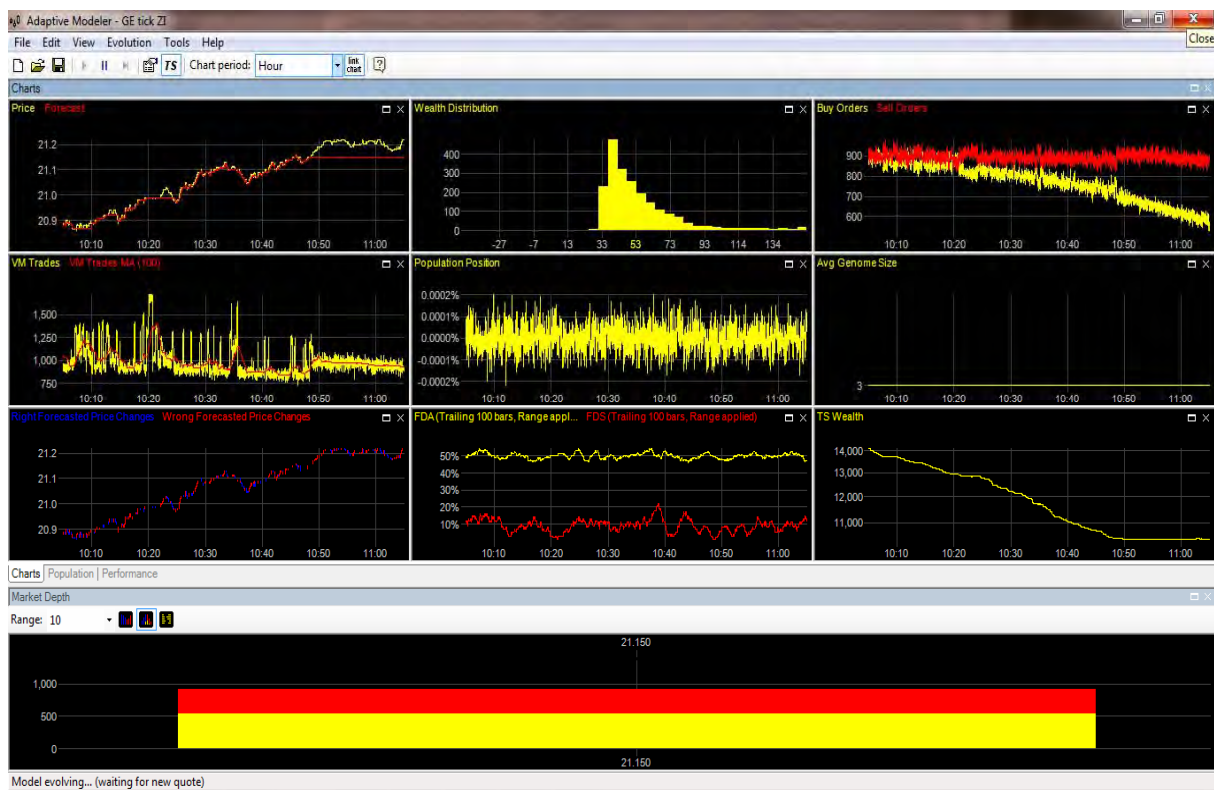


Figure 15. General Electric stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for IBM (symbol: IBM):

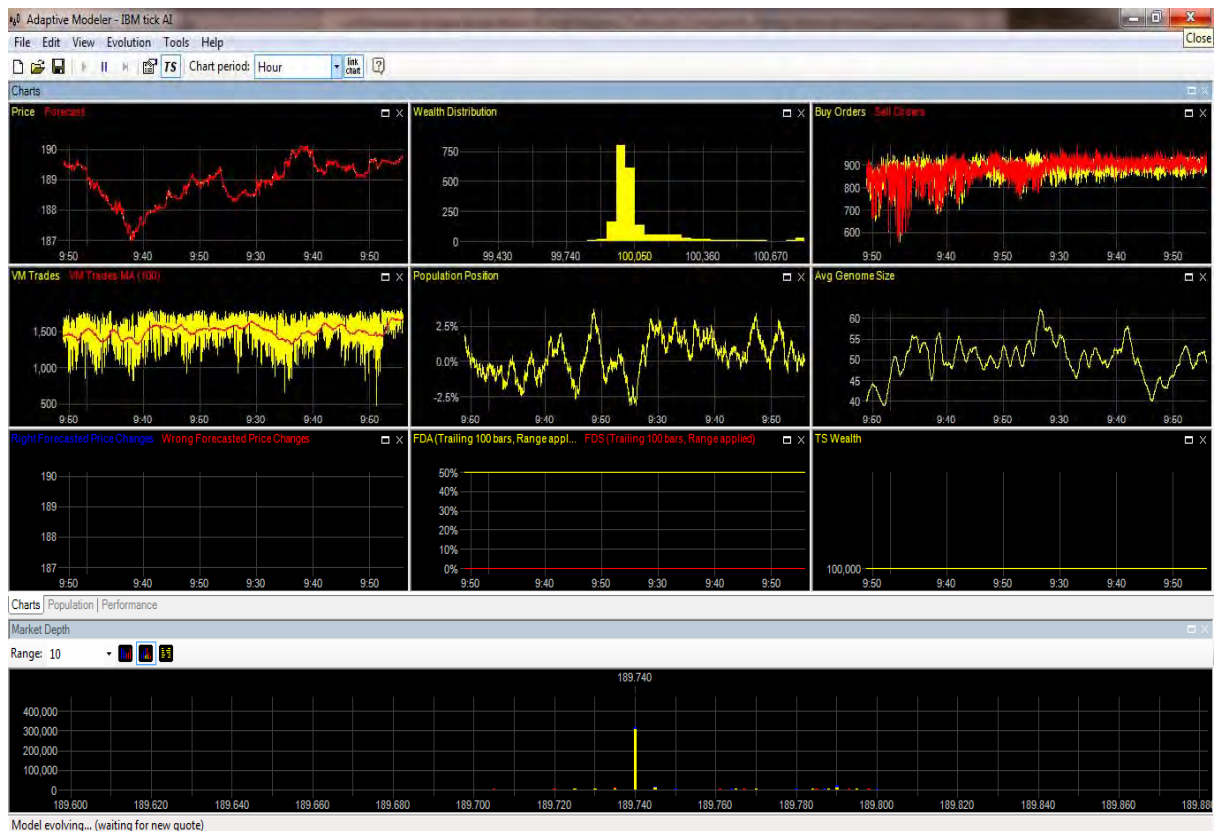


Figure 16. IBM stock simulation print screen – Intelligent Agent-Based Model

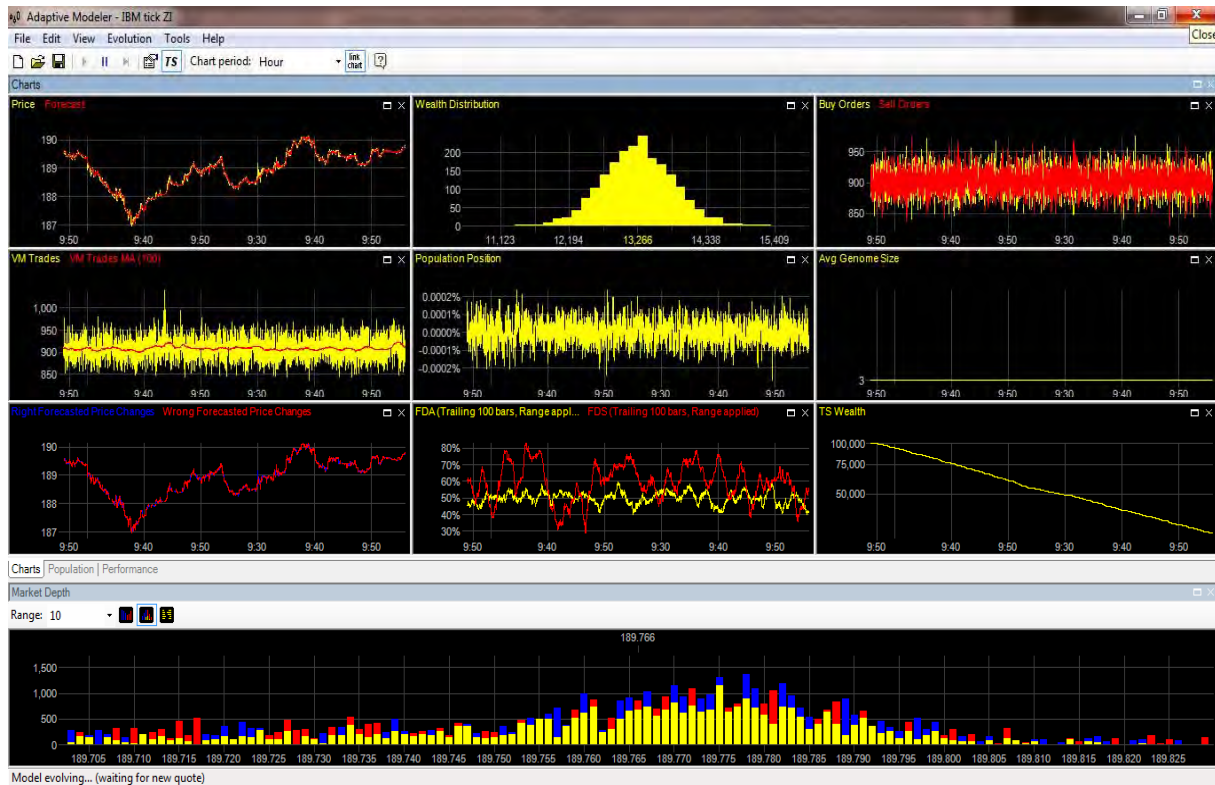


Figure 17. General Electric stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Pfizer Inc. (symbol: PFE):

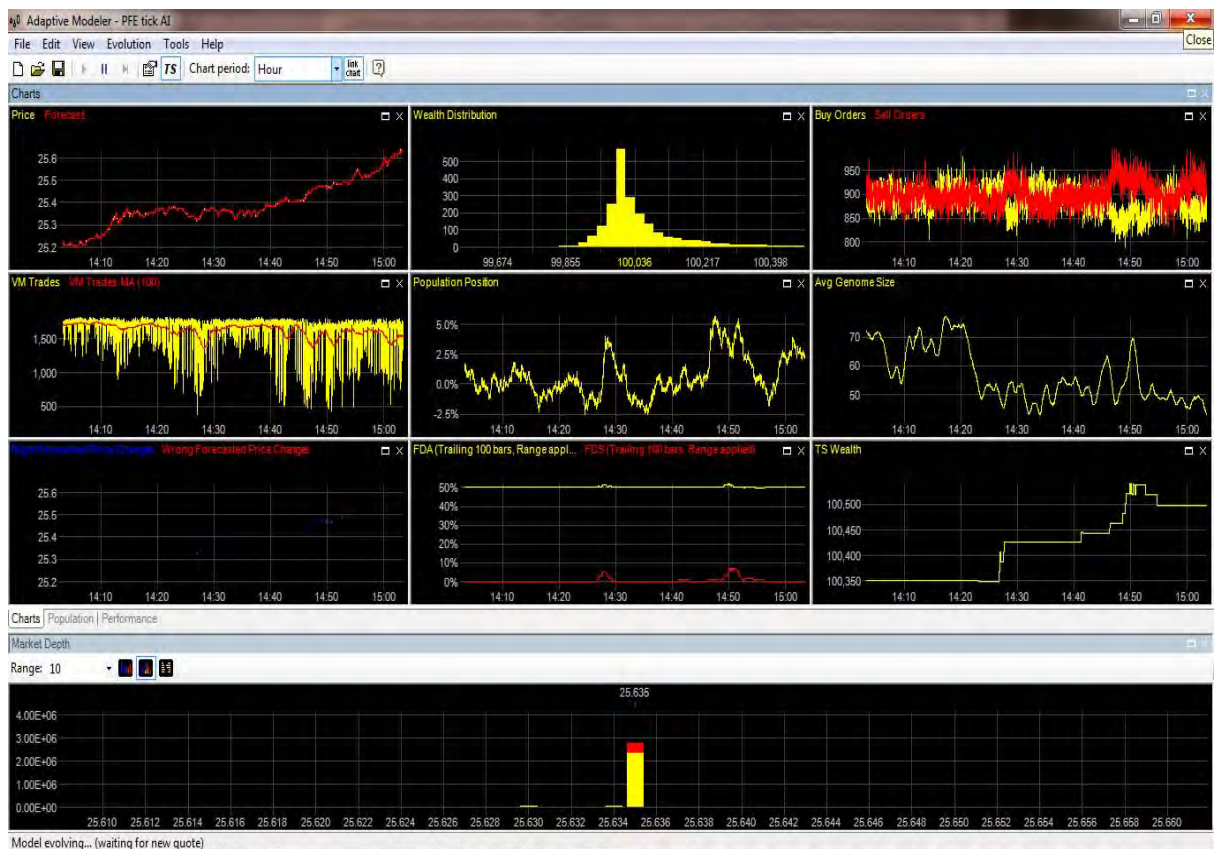


Figure 18. Pfizer stock simulation print screen – Intelligent Agent-Based Model

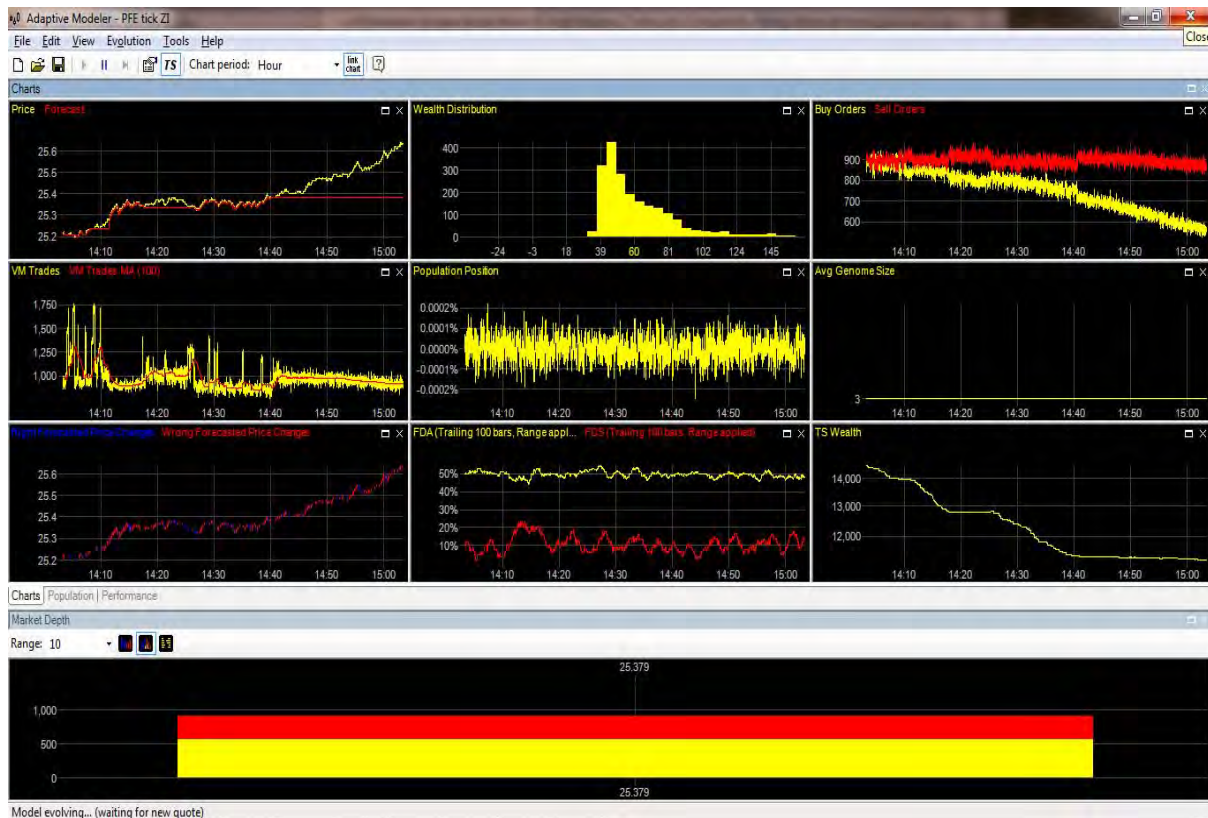


Figure 19. Pfizer stock simulation print screen – Zero-Intelligence Agent-Based Model

Simulation results for Wells Fargo (symbol: WFC):

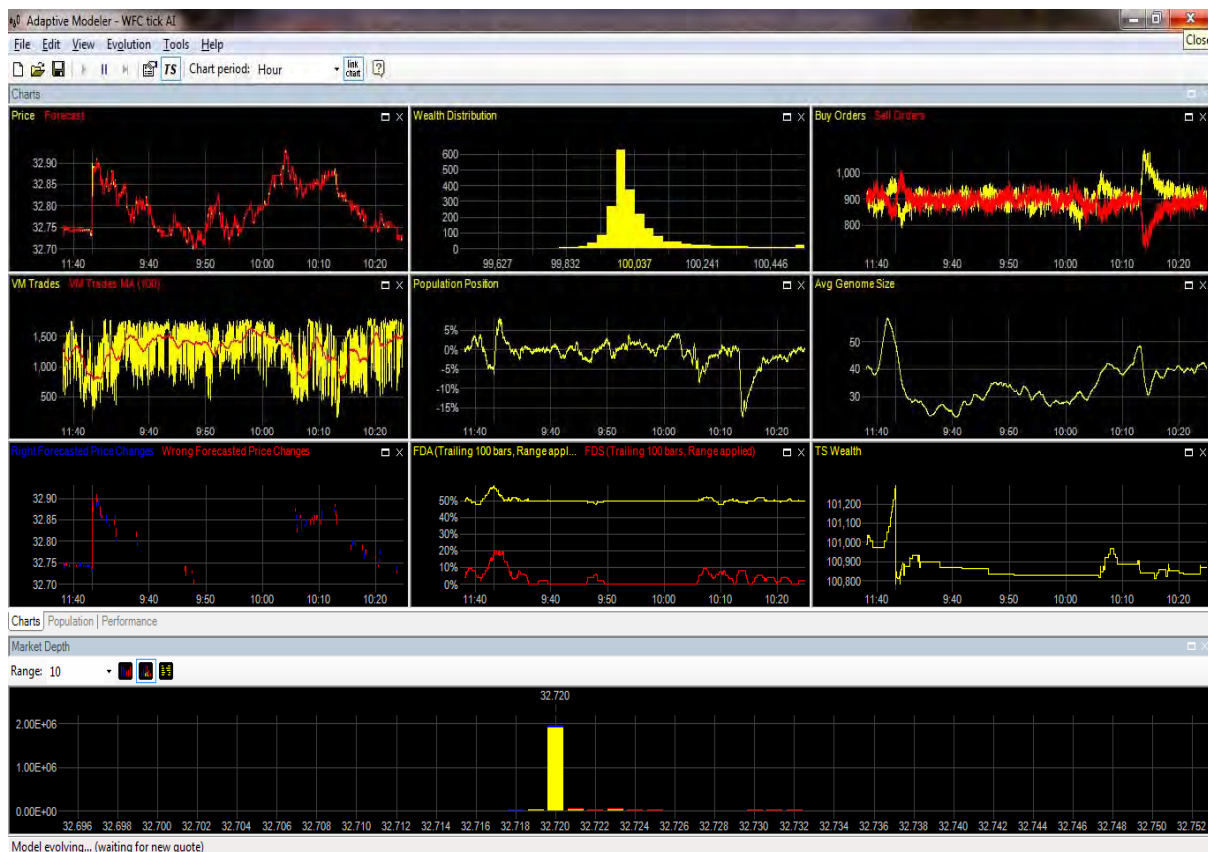


Figure 20. Wells Fargo stock simulation print screen – Intelligent Agent-Based Model

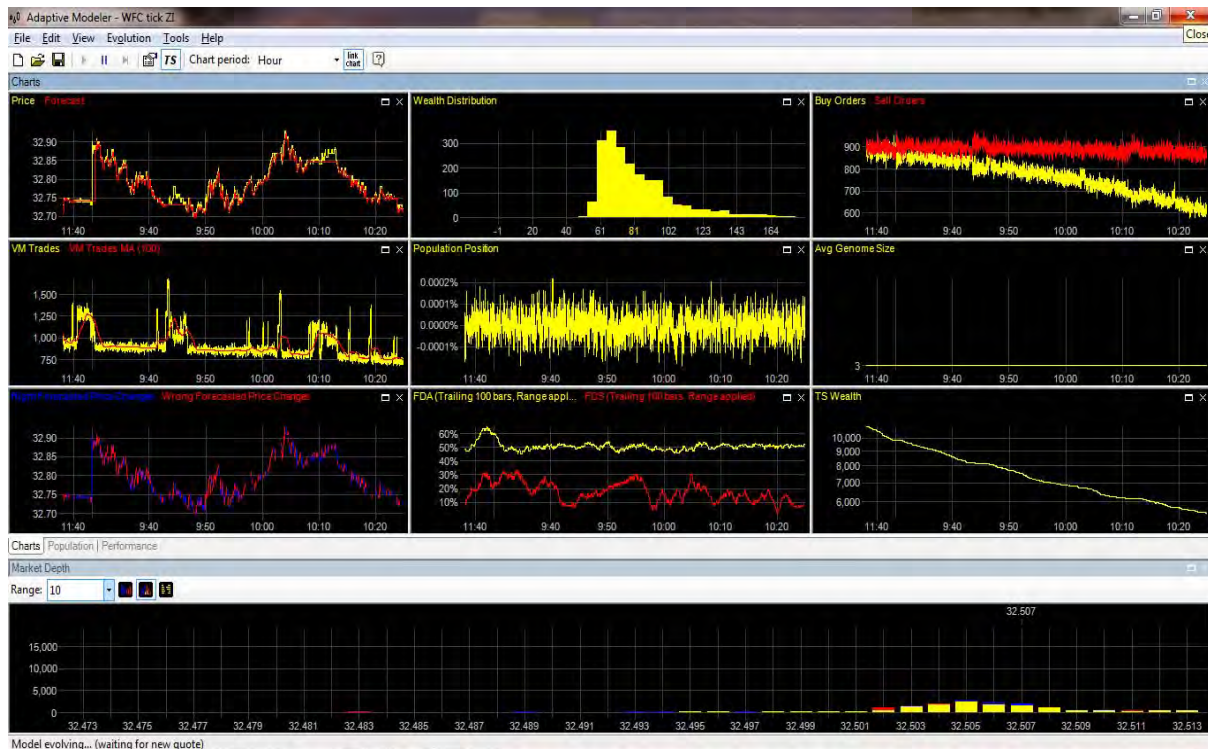


Figure 21. Wells Fargo stock simulation print screen – Zero-Intelligence Agent-Based Model

In order to compare the fit of the models to the real data and to compare the efficiency of the models, the Root Mean Squared Error and Mean Absolute Error have been computed and listed in the table below:

Stocks	Model simulated	Root Mean Squared Error	Mean absolute error
Adobe	ZI-ABM	0.010	0.006
	I-ABM	0.032	0.003
Alcoa	ZI-ABM	0.004	0.003
	I-ABM	0.002	0.001
Apple	ZI-ABM	0.279	0.124
	I-ABM	0.110	0.056
Bank of America	ZI-ABM	0.007	0.003
	I-ABM	0.002	0.000
Citigroup Inc.	ZI-ABM	0.027	0.011
	I-ABM	0.110	0.003
Exxon Mobile	ZI-ABM	0.040	0.020
	I-ABM	0.010	0.005
General Electric	ZI-ABM	0.013	0.006
	I-ABM	0.003	0.001
IBM	ZI-ABM	0.062	0.041
	I-ABM	0.037	0.020
Pfizer Inc.	ZI-ABM	0.035	0.011
	I-ABM	0.003	0.001
Wells Fargo	ZI-ABM	0.009	0.005
	I-ABM	0.004	0.002

Conclusions

Taking into account the previous studies on the impact of high frequency trading on the financial markets, the results have shown that this algorithmic trading has led to higher liquidity, improved market efficiency without harming market integrity and lower incidence of market manipulation. Although the results of the research in this field are rather optimistic thus far, regarding the impact of HFT over the financial market, the studies are few and do not comprise all the intra-day price impact, nor the impact of the unexecuted orders which are introduced into the market by these trading algorithms. Thus, investors are worried regarding the possible manipulation of the market following these high frequency trades, and currently regulators focus more and more on a better policy for regaining the trust of the investors in the market by limiting the HFT in the markets by imposing that the trading systems are configured such as not to cause market disturbances, a higher control of the market strategies is intended to be implemented, and a fee is also to be charged in the case of excessive use of the system and a limit introduced on the ratio of unexecuted orders.

The results show that in almost all the cases the intelligent agent-based model performed better when compared to the zero-intelligence agent-based model, which could be interpreted as lower market efficiency, allowing for predictions of the stock market price, or even stock market manipulation. This has to be further studied and Efficient Market Hypothesis should be tested. The hereto paper brings to light the importance and accuracy of the agent-based models when it comes to stock market price forecast and modeling, and more important it applies these types of models on high frequency trading data, obtaining high accuracy in forecasting.

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TESTING THE RANDOM WALK HYPOTHESIS AND THE LONG MEMORY FOR THE ROMANIAN CAPITAL MARKET

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Abstract. *The capital markets across different economies have always been an extremely debated subject that represents a key point when discussing about the overall degree of performance of any economy. The main purpose of this article is to test the random walk hypothesis for the Romanian stock market using a variety of econometric instruments including Lee Strazicich test, ADF and PP tests, Ljung Box test, runs test, variance ratio tests. The results obtained states the fact that the random walk hypothesis is rejected for BET Index if we analyze the entire period. In the case of stocks the results are extremely mixed.*

Keywords: random walk; long memory; ARFIMA model.

JEL Classification: C12, C22, G14.

REL Classification: 11B.

1. Introduction

The random walk hypothesis has been the subject of several research studies in the field of the financial literature and not only due to the great importance that it has in testing weak form efficiency of capital markets. In an efficient market the prices of stocks fully reflect all available information and the stock returns will follow a random walk process. For stocks that do not follow a random walk process, the returns will have a predictable behaviour (Worthington, Higgs, 2004).

According to Fama (1965) the theory of random walk implies that the series of price changes has no memory, which means that the past could not be used to predict the future. In statistical terms, this means that successive price changes are independent, identically distributed.

According to Campbell et al. (1997), there are three random walk hypothesis: RW1-is the random walk hypothesis with independent and identically distributed increments, RW2-is the random walk hypothesis with independent but not identically distributed increments and RW3-is the random walk hypothesis with dependent but uncorrelated increments (Lazar, Ureche, 2007).

The first objective of this paper is to test the random walk hypothesis for the Romanian capital market. The second objective of this study is to identify possible long term dependence in stock returns. The existence of long memory indicate a reduced assimilation of information into price and can be explained by the presence of autocorrelation at high lags. According to Kasman and Torun (2007), the presence of long memory should be considered an important aspect when referring to risk measurement and investment analysis in emerging markets.

There are several studies that take into consideration the weak form efficiency in Europe. Guidi et al. (2010) have studied the weak-form market efficiency of Poland, Hungary, Czech Republic, Slovakia, Romania, Bulgaria and Slovenia. The results of Ljung Box test indicate that RWH is rejected for BET, BUX, PX50, SAX16, SBI and SOFIX. The runs test failed to reject the RWH in the case of BUX. The results of the variance ratio test indicate that RWH is rejected for BET, SBI, SOFIX and WIG. Borges (2008), test the EMH for France, Germany, UK, Greece, Portugal and Spain used Ljung Box test, runs test, unit root test, variance ratio test and concluded that for France, Germany, UK and Spain most of the evidence does not allow the rejection of EMH, but the hypothesis is rejected for Greece and Portugal. Worthington and Higgs (2004) studied the efficiency of sixteen developed markets and four emerging markets (Czech Republic, Hungary, Poland and Russia). Using unit root, runs and variance ratio tests, the researchers concluded the fact that for the case of emerging countries only the Hungarian stock market follows a random walk. The results of the studies analyzing the Romanian capital market are mixed. Lazar and Ureche (2007) used Ljung Box, LM tests and obtained pertinent evidence of linear dependences for BET Index. The BDS test indicates the absence of nonlinear dependences in the case of BET Index. Dragota et al. (2009) used Multiple Variance Ratio test and concluded that the random walk hypothesis is rejected for BET Index, even if this results cannot be applied for all of the companies from its composition.

The results of several studies show the presence of long memory in stock returns. Kasman et al. (2009) used GPH and ML methods to estimate the fractional differencing parameter for Hungarian, Polish, Czech and Slovak capital markets. Both methods indicate the presence of long memory for Slovak capital market. Lazar et al. (2009) studied the Romanian capital market and used sixteen time series returns. The GPH and Reisen methods were used. There is evidence of long memory in four series returns. According to this results, BET Index has short memory.

This study comes to enrich the existing literature on random walk and long memory for the Romanian capital market.

2. Methodology

In this study we have tried to analyze the concept of random walk, using the following tests: ADF, PP, Ljung Box, runs, Lo and MacKinlay and Automatic Variance Ratio. Also, we used Lee Strazicich test to take into account the presence of structural breaks in returns series. Lee and Strazicich (2003, 2004) developed two tests, one that could be applied for two structural breaks and another that is used for one structural break. The two tests are built from the following data generating process (DGP) based on the unobserved components model:

$$y_t = \delta Z_t + X_t, \quad X_t = \beta X_{t-1} + \varepsilon_t$$

where Z_t contains exogenous variables. The unit-root null hypothesis is described by $\beta = 1$. According to (Lee and Strazicich, 2004) the test with one structural break contains two models: model A and model C. Model A is known as the "crash" model, allowing a one-time change in intercept, under the alternative hypothesis and is described by $Z_t = [1, t, D_t]$, where $D_t = 1$ for $t \geq T_B + 1$ and zero otherwise, T_B is the time period of structural break, and $\delta' = (\delta_1, \delta_2, \delta_3)$. Model C allows for a shift in intercept and change in trend slope under the alternative hypothesis and can be described by $Z_t = [1, t, D_t, DT_t]$, where $DT_t = t - T_B$ for $t \geq T_B + 1$, and zero otherwise.

According to Lee and Strazicich (2003) the test with two structural breaks contains two models: model AA and model CC. Model AA allows for two shifts in the intercept and is described by $Z_t = [1, t, D_{1t}, D_{2t}]$, where $D_{jt} = 1$ for $t \geq T_{Bj} + 1$, $j = 1, 2$, and zero otherwise.

T_{Bj} represents the time period when a break occurs. Model CC allows for two shifts in the intercept and the slope is described by $Z_t = [1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}]$, where $DT_{jt} = t - T_{Bj}$, $j = 1, 2$, and zero otherwise.

The LM unit root test statistics are obtained from the following regression:

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1} + u_t$$

where $\tilde{S}_t = y_t - \tilde{\psi}_x - Z_t \tilde{\delta}$, $t = 2, \dots, T$, $\tilde{\delta}$ are coefficients in the regression of Δy_t on ΔZ_t , $\tilde{\psi}_x$ is the restricted MLE of $\tilde{\psi}_x (\equiv \psi + X_0)$ given by $y_1 - Z_1 \tilde{\delta}$. The LM t -test statistic is given by $\tilde{\tau} = t$ -statistic in order to test for the unit root null hypothesis $\phi = 0$. The location of the structural break T_B is determined by searching all possible break points for the minimum t -statistic as follows: $\text{Inf}_{\lambda} \tilde{\tau}(\tilde{\lambda}) = \text{Inf}_{\lambda} \tilde{\tau}(\lambda)$, where $\lambda = T_B/T$ (Hooi, Smith, 2005).

The ADF and PP tests are used to test the null hypothesis of a unit root, with the alternative that financial series are stationary. Next, we have applied the Ljung Box test in order to identify the existence of linear dependencies. Ljung Box test is used to test the null hypothesis of no autocorrelation up to order k . The test is determined according to the mathematical expression:

$$Q_{LB} = m(m+2) \sum_{j=1}^k \frac{\rho_j^2}{m-j}$$

where ρ_j is the j -th autocorrelation and m is the number of observation (Enowbi et al., 2009).

The run tests are a non-parametric tests used to test the independence between the successive returns. These tests have the advantage of not requiring that financial series follow the normal distribution. A run is a sequence of successive price changes with the same sign. The runs test can also be designed to count the direction of change from any base; for instance, a positive change could be one in which the return is greater than the sample mean, a negative one could be in which the return is less than the mean, and zero change represents a change equal to the mean. The actual runs (R) are then counted and compared to the expected number of runs (m) under the assumption of independence as given in the following equation:

$$m = \frac{N(N+1) - \sum_{t=1}^3 n_t^2}{N}$$

where N is the total number of return observations and n_i is a count of price change in each category. For a large number of observations ($N > 30$), the distribution of m is approximately normal with a standard error σ_m of runs as given by the equation:

$$\sigma_m = \left[\frac{\sum_{i=1}^3 n_i^2 \left[\sum_{i=1}^3 n_i^2 + N(N+1) \right] - 2N \sum_{i=1}^3 n_i^3 - N^3}{N^2(N-1)} \right]^{1/2}$$

The standard normal Z-statistic ($Z = (R - m)/\sigma_m$), can be used to test whether the actual number of runs is consistent with the independence hypothesis. When actual number of runs exceeds the expected runs, a positive (negative) Z value is obtained. Positive (negative) Z value indicates negative (positive) serial correlation in the return series (Abraham et al., 2002).

Another test designed to identify the independence of successive price changes is the Lo and MacKinlay test. According to Lo and MacKinlay (1988), an important property of the random walk process is that the variance of its increments is linear for the observed interval. Taking into account a financial series (p_t) containing T observations $p_1, p_2, \dots, p_T$ of asset returns, the variance ratio of the q -th difference can be written as:

$$VR(q) = \frac{\hat{\sigma}^2(q)}{\hat{\sigma}^2(1)}$$

where $\hat{\sigma}^2(q)$ is the unbiased estimator of $1/q$ of the variance of q -th differences, $\hat{\sigma}^2(1)$ represents the variance of the first differences, q is the number of days of base observation interval. The null hypothesis is that $VR(q) = 1$.

Lo and MacKinlay test takes into consideration both the assumption of homoscedasticity and the assumption of heteroskedasticity. The first statistical test that takes into account the presence of homoscedasticity has the following form:

$$Z(q) = \frac{VR(q) - 1}{\phi(q)^{1/2}} \sim N(0,1)$$

where $\phi(q) = \frac{2(2q-1)(q-1)}{3qT}$. The second statistical test that takes into account the presence of heteroskedasticity, is given by:

$$Z^*(k) = \frac{VR(q) - 1}{\phi^*(q)^{1/2}}$$

where $\phi^*(q) = \sum_{j=1}^{q-1} \left[\frac{2(q-j)}{q} \right]^2 \delta(j)$ and $\delta_j = \frac{\sum_{t=j+1}^T (p_t - \hat{\mu})^2 (p_{t-j} - \hat{\mu})^2}{\left[\sum_{t=1}^T (p_t - \hat{\mu})^2 \right]^2}$ (Ntim et al., 2007).

Another test used to test the random walk hypothesis is Automatic Variance Ratio test under conditional heteroskedasticity. Let Y_t be an asset return at time t ($t = 1, \dots, T$). Choi's (1999) AVR test is based on the statistic of the form:

$$VR(k) = 1 + 2 \sum_{i=1}^{T-1} m(i/k) \hat{\rho}_i$$

where $\hat{\rho}_i = \frac{\sum_{t=1}^{T-i} (Y_t - \hat{\mu})(Y_{t+i} - \hat{\mu})}{\sum_{t=1}^T (Y_t - \hat{\mu})^2}$ and $\hat{\mu} = T^{-1} \sum_{t=1}^T Y_t$,

while $m(x) = \frac{25}{12\pi^2 x^2} \left[\frac{\sin(6\pi x/5)}{6\pi x/5} - \cos(6\pi x/5) \right]$ is the quadratic spectral kernel. Choi (1999) stated the $VR(k)$ is a consistent estimator for $2\pi f_Y(0)$, where $f_Y(0)$ is the normalized spectral density for Y_t at the frequency zero.

Choi (1999) showed that, under $H_0^A: Y_t$ is serially uncorrelated (or $H_0^B: 2\pi f_Y(0) = 1$)

$$AVR(k) = \sqrt{T/k[VR(k) - 1]} / \sqrt{2} \xrightarrow{d} N(0,1)$$

as $k \rightarrow \infty, T \rightarrow \infty, T/k \rightarrow \infty$, when Y_t is iid with a finite fourth moment. In order to choose the value of lag truncation point (or holding period) k optimally, Choi (1999) adopted a data-dependent method of Andrews (1991) for spectral density at the zero frequency. The AVR test statistic with the optimally chosen lag truncation point is denoted as $AVR(\hat{k})$, which is an asymptotic test which may show deficient small sample properties.

Kim (2009) proposed to use the wild bootstrap of Mammen (1993) to improve small samples properties, as in Kim (2006) who applied the wild bootstrap to the Lo-MacKinlay and

Chow Denning tests. The wild bootstrap for $AVR(\hat{k})$ can be conducted in three stages as follows: form a bootstrap sample of T observations $Y_t^* = \eta_t Y_t$ ($t = 1, \dots, T$) where η_t is a random sequence with $E(\eta) = 0$ and $E(\eta^2) = 1$, calculate $AVR^*(\hat{k}^*)$, the AVR statistic obtained from $\{Y_t^*\}_{t=1}^T$ and repeat the first two stages B times to form a bootstrap distribution $\{AVR^*(\hat{k}^*; j)\}_{j=1}^B$.

The two-tailed p -value of the test is obtained as the proportion of absolute values of $\{AVR^*(\hat{k}^*; j)\}_{j=1}^B$ greater than the absolute values of $AVR(\hat{k})$ (Kim, 2009).

Furthermore, in order to identify the existence of long memory in the returns series we used the following methods: Hurst exponent, Geweke Porter Hudak method and ARFIMA (p,d, q) model. In this study, Hurst exponent is calculated based on the R/S analysis. The R/S statistic has the following form:

$$(R/S)_\tau \equiv \frac{1}{s_\tau} \left[\max_{t=1}^{\tau} \sum_{t=1}^{\tau} (r(t) - \bar{r}_\tau) - \min_{t=1}^{\tau} \sum_{t=1}^{\tau} (r(t) - \bar{r}_\tau) \right]$$

where $r(t)$ is a sample of asset returns, $\bar{r}_\tau$ is the sample mean given by $1/\tau \sum_{\tau} r(\tau)$, τ - s the time span considered and s_τ is the usual standard deviation estimator given by

$$s_\tau \equiv \left[\frac{1}{\tau} \sum_{\tau} (r(t) - \bar{r}_\tau)^2 \right]^{1/2}.$$

Hurst (1951) found that in the case of many records in time, the R/S can be determined by the expression: $(R/S)_\tau = (\tau/2)^H$ (Cajueiro, Tabak, 2004).

According to Mandelbrot (1972), for a value between 0.5 and 1 the returns have positive long dependence, for a value equal to 0.5 the returns have short dependence and for a value between 0 and 0.5 the returns have negative long dependence.

The GPH is a method that was used to estimate the fractional difference parameter d . The GPH method starts with the estimation of a spectral density function evaluated at harmonic frequencies as follows:

$$\ln[I(w_j)] = c - d \ln[4 \sin^2(w_j/2)] + \eta_j, \quad \forall j = 1, \dots, n$$

where: $w_j = 2\pi j/T$ ($j = 1, \dots, T-1$) denotes the harmonic frequencies, and

$I(w_j) = (1/2\pi T) \left| \sum_{t=1}^T e^{itw} (x_t - \bar{x}) \right|^2$ is the periodogram of x_t at these frequencies. The number of observations is the number of low frequency ordinates to be used in the estimation of the regression $n = g(T) = T^\lambda$ with $0 < \lambda < 1$, noting that $g(T)$ should satisfy the following conditions: $\lim_{T \rightarrow \infty} g(T)$ and $\lim_{T \rightarrow \infty} g(T)/T = 0$. Geweke and Porter Hudak (1983) showed that estimator of d is consistent and hypothesis tests for $d = 0$ can be based on the conventional t -statistic using the asymptotic variance of the spectral regression error term, $\pi^2/6$ (Kasman et al., 2009).

Fractional integration has been introduced in literature by Granger and Joyeux (1980) and Hosking (1981). An ARFIMA (p,d,q) model has the following form:

$$\phi(L)(1-L)^d Y_t = \theta(L)\varepsilon_t$$

where d is the fractional integration parameter, L is lag operator, $\phi(L)$ and $\theta(L)$ are the autoregressive and moving average polynomials in the lag operator of orders p and q and ε_t are the residuals. According to (Hosking, 1981), for $d \in (-0.5, 0.5)$ the returns series are

stationary and invertible. For $0 < d < 0.5$ the returns have long memory and the autocorrelations are positive and decay hyperbolically to zero, for $d = 0$ the returns have short memory, for $-0.5 < d < 0$ the returns have intermediate memory, since autocorrelations are always negative (Kasman, Torun, 2007).

3. Description and properties of the data

The data used in this study contains daily stock returns for BET Index and five individual stocks from Bucharest Stock Exchange. The returns are defined as the continuously compounded percentage rate of return at time t , $r_t = \ln(p_t/p_{t-1})$, where p_t and p_{t-1} represent the stock price at time t and $t-1$, respectively. Data were obtained from the site of the Bucharest Stock Exchange – www.bvb.ro. Table 1 presents general information about the index and stocks.

The stocks that are used in the study hold a significant weight in the BET Index. The length of the returns series depends of the availability of data. The end date for all series is 09-April-2010.

Table 2 presents descriptive statistics of the daily returns for the index and for the stock. The mean returns are positive for BET, SNP, TLV, BRD and is negative for TEL and BIO. The standard deviation is higher for TLV and BRD, which means that these stocks have a high volatility. On the other hand, TEL and SNP are the least volatile. Skewness coefficients are negative for BET, SNP and BIO, which indicates a greater probability of large decreases in returns than rises. Skewness coefficients are positive for BRD, TLV and TEL. The results obtained for BET Index are similar to those obtained by Guidi et al. (2010) and Samitas et al. (2006). The kurtosis coefficients are higher than 3 for BET and for all stocks, indicating a leptokurtic distributions. This result for BET Index is similar to that obtained by Lazar and Ureche (2006), Lazar et al. (2010) and Todea (2008). Recorded values of skewness and kurtosis coefficients do not correspond with the normal distribution. The Jarque Bera statistic is used to test the null hypothesis of normal distribution of returns. All p-values are smaller than the 0.01 level of significance, which means that the daily returns are not normally distributed. Rejecting the assumption of normality of daily returns is not surprising. This rejection of normality is a common feature of emerging markets.

4. Empirical results

In order to test the random walk hypothesis on subsamples we have applied Lee Strazicich test that allows for two structural breaks. Table 3 presents the results of the Lee Strazicich test that allows for one structural break. Model A allows a shift in mean and model C allows for a shift in mean and change in slope.

After applying Lee Strazicich test it can be seen that SNP, TLV and BIO present a break in the intercept at 1% significance level. When Model C is used, the unit root hypothesis cannot be rejected for BET Index and for the stocks.

Table 4 reports the results for Model AA and Model CC. The results for model AA indicate that the break in intercept is statistically semnificative for SNP, TLV and BIO. When model CC is used, the LS test allows a break in intercept for TLV. For BET Index and for the other stocks the unit root hypothesis is accepted.

Next, it was tested the random walk hypothesis before and after the break points, based on the model CC. First, we have tested whether or not the return series are stationary. For this we have used ADF and PP tests. ADF and PP tests are used to test the following null hypothesis: the return series have a unit root, whith alternative the return series are stationary. As pointed out by Rahman and Saadi (2007), considering only unit root tests can not conclude that a capital market is efficient, because this tests verify the stationarity of a series and not the predictibility. Fama (1965) said that the theory of random walks in stock prices involves that succesive price changes are independent. Thus, to test the correlations between daily returns

we have used parametric test-Ljung Box and non-parametric test-run test. Abraham et al. (2002) emphasized that run tests do not require normal distribution of returns and therefore the run test is more appropriate to test for correlations than a parametric test. The results of this tests are presented in Table 5.

If we take into consideration the entire period, the results of ADF and PP test show that the unit root hypothesis is rejected at a significance level of 1 % for BET Index and for all stocks. The return series are stationary ($I(0)$). The values recorded by Q-statistic indicate that the hypothesis of non-correlation is rejected for BET Index, SNP, BRD, TEL and BIO. The Q-statistic also indicate a weak autocorrelation for TLV. The presence of a weak autocorrelation points out that in the case of TLV may be a random walk process. The results provided for BET Index are similar to those obtained by Lazar and Ureche (2007), Pele and Voineagu (2008), Guidi (2010) and with other studies for emerging markets like Enowbi et al. (2009), who have studied the presence of weak form efficiency for emerging African stock markets, Gilmore and McManus (2003), who have studied the presence of weak form efficiency for the Czech Republic, Hungary and Poland. After applying the runs test, the results showed that the null hypothesis of random walk is rejected for BET Index and for all the stocks at 5% significant level, except TEL. The negative values of Z indicate a positive serial correlation.

If we consider the period before the first structural break, the unit root tests indicate that the returns series are stationary. The results of the Q statistics support the rejection of the null hypothesis of non-correlation for BET Index, SNP, TLV and BRD. The results obtained for TEL and BIO show that the null hypothesis of non-correlation is accepted, which indicates a random walk process. The runs test also indicates that the null hypothesis of random walk is accepted for TEL and BIO and is rejected for BET, SNP, TLV and BRD at 10% significant level.

For the period after the first structural break, the results of ADF and PP test support the rejection of the unit root hypothesis for the BET Index and for all stocks. The null hypothesis of no serial correlation is accepted for all stocks, but is still rejected for BET Index. The results of runs test show that the null hypothesis of random walk is accepted for TEL and SNP and is rejected for BET, TLV, BRD and BIO at 10% significant level.

If we consider the period after the second structural break, the values recorded by ADF and PP indicate that the returns series are stationary. The results of the Q statistics failed to reject the null hypothesis of no serial correlation for all stocks and BET Index (except lag 20). The Q-statistics values recorded at the early period are higher than those recorded at the end of the period. There is a reduction of autocorrelation over time. This is due to the development of the Romanian capital market over time. This result is in favour of RW3 for BET Index and for all the stocks. The runs test also indicates that the null hypothesis of random walk is accepted for all stocks, but is still rejected for BET Index.

Further, in order to test the random walk hypothesis for the Romanian capital market we used a variety of econometric variance ratio tests such as Lo and MacKinlay and Automatic Variance Ratio. The results of Lo and MacKinlay test are presented in Table 6. The main aim of this test was to simplify intervals of 2, 5 and 10 weeks.

For all the period, the results states the fact that the random walk hypothesis, both in terms of homoskedasticity and heteroskedasticity is rejected for BET Index and for TLV. For the other stocks, the test failed to reject the null hypothesis, at some number of q. This results obtained for BET Index are similar to other studies in the literature, such as Smith and Ryoo (2003), who rejected RW for Greece, Hungary, Poland and Portugal and Ntim et al. (2007), who rejected RW for Ghana.

For the period before the first structural break, the random walk hypothesis, both in terms of homoskedasticity and heteroskedasticity is rejected for BET Index and for all stocks,

at some number of q , with the exception of TEL. TEL follows a random walk process and therefore the returns cannot be predicted.

The results for the period after the first structural break indicate that the null hypothesis of random walk is accepted both in conditions of homoskedasticity and heteroskedasticity, for TLV, BRD and TEL, at any number of q . Again, the null hypothesis is rejected for BET, SNP and BIO.

After the second structural break, the random walk hypothesis is accepted, both in terms of homoskedasticity and heteroskedasticity for SNP, BRD and BIO, at any number of q . In the case of BET, the random walk hypothesis assuming heteroskedasticity is accepted, at any number of q . In condition of homoskedasticity, the random walk hypothesis is accepted, with the exception of $q=10$. With regard to TLV, the results indicate that the null hypothesis of random walk is accepted in condition of homoskedasticity, at any number of q . In condition of heteroskedasticity, the random walk hypothesis is accepted, with the exception of $q=2$.

The results concerning the Automatic Variance Ratio test are provided in Table 7. The results for all the period show that the null hypothesis of random walk is rejected only for BET Index. For the period before the first structural break, the null hypothesis is again rejected for BET Index, but also for TLV and BRD. The results indicate that after the first structural break, the random walk hypothesis is rejected for BET Index and for SNP. After the second structural break, the null hypothesis is accepted for BET Index and for all the stocks.

To analyze whether BET Index and SNP, TLV, BRD, TEL and BIO have long memory, we have used Hurst exponent and GPH method. The results of Hurst exponent and the fractional differencing parameter d estimated by Geweke and Porter-Hudak method, can be seen in Table 8.

The values recorded by Hurst exponent for all period and for all subperiods are higher than 0.5. This results indicate that BET Index and all stocks present long range dependence with a persistent behaviour. This results are similar with those obtained by Cajueiro and Tabak (2006) for European transition stock indices, Cajueiro and Tabak (2004) for Hong Kong, Singapore and China.

The results concerning the GPH method indicate the existence of long memory with persistent behaviour for BET Index and for BRD after the second structural break. For the period after the first structural break, SNP and BRD are characterized by long memory with anti-persistent behaviour. The results show evidence of short memory for TLV, TEL and BIO. The results obtained for BRD, TLV and TEL are consistent with those achieved by (Lazar et al., 2009). Other studies with similar results on the existence of long memory have been realized by Kasman et al. (2008) in the Slovakian capital market, by Bilel and Nadhem (2009) for G7 stocks markets and by Tan et al. (2010) in the Malaysian capital market.

Next, we have estimated the ARFIMA models (p, d, q) for periods before and after the structural break points. We have estimated an ARFIMA (1,d,1) for BET Index and for all the stocks. In order to test the residuals of the model, we have used Ljung Box test.(See table 9).

For all the period, the results indicate that in the case of BET Index and all stocks, the parameter d is significantly different from zero and the ARFIMA (1,d,1) models are valid. The observed values of the parameter d are between 0 and 0.5, so BET Index, and all stocks have long memory, which is not consistent with market efficiency in weak form.

For the period before the first structural break, after applying the ARFIMA (1, d , 1) models, we may conclude that SNP, BRD and BIO have long memory.

For the period after the first structural break, the results indicate that in the case of TLV, the parameter d is significantly different from zero and the stock presents long memory. The ARFIMA (1,d,1) model is valid.

For the period after the second structural break, the results indicate that BET Index has long memory. This result is similar with that obtained by Kasman and Torun (2007) for ISE Index.

Conclusions

The main objective of this article was to test the random walk hypothesis for the Romanian capital market using different test such as ADF, PP, Ljung Box, runs test, variance ratio tests. The main conclusion that can be driven after applying these set of tests is that the random walk hypothesis is rejected for the BET Index, but only in the case of the analysis of the entire period. On the other hand the results obtain for the category of stocks are very mixed. The results determined using Ljung Box test indicate the fact that for the case of SNP, BRD, TEL AND BIO the random walk hypothesis is rejected, but in the case of TLV a small autocorrelation can be perceived. After applying the runs test the random walk hypothesis for the case of stocks is rejected in the majority of the cases with the exception of TEL. At the same time, the Automatic Variance test rejects the random walk hypothesis for BET Index. All these obtained results question the existence of the weak form of efficiency for the Romanian capital market. Significant changes took place only after the structural break, when the random, when the random walk hypothesis is accepted for BET Index and for all stocks. This means that the Romanian capital market become efficient only after the second structural break.

The second important objective of this study was to identify the long memory of the returns. For the entire analyzed period, the models used indicate the existence of the long memory for all the stocks and also for the BET Index. The existence of the long memory comprises a series of advantages including the prediction of the returns. Even though this aspect is not complementary with the theory of efficient markets it can generate great opportunities additional profits for the investors.

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Appendix

Table 1

Ample components

Index/Stocks	Number of obs.	Weight(%)	Analyzed Period
Bucharest Exchange Trading (BET)	3154		19.09.1997-09.04.2010
OMV Petrom SA (SNP)	2017	18,74%	09.03.2001-09.04.2010
Banca Transilvania (TLV)	2371	20,88%	02.01.2000-09.04.2010
BRD-Groupe Société Générale (BRD)	2172	20,38%	15.01.2001-09.04.2010
Transelectrica (TEL)	877	8,71%	29.08.2006-09.04.2010
Biofarm București (BIO)	1038	5,35%	30.11.2005-09.04.2010

Table 2

Descriptive statistics of the daily returns

Index/Stock	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	JB Prob.
BET	0,000574	0,000034	0,101127	-0,143094	0,019106	-0,46819	9,58485	0,0000
SNP	0,000820	0,000000	0,139762	-0,162519	0,029108	-0,17379	8,52810	0,0000
TLV	0,000890	0,000000	1,434721	-0,561469	0,043807	12,3319	512,135	0,0000
BRD	0,000742	0,000000	0,974998	-0,499956	0,037147	6,2339	242,853	0,0000
TEL	-0,000110	0,000000	0,139762	-0,153076	0,028100	0,16349	6,97875	0,0000
BIO	-0,000841	0,000000	0,139762	-0,413562	0,036558	-1,73400	22,1647	0,0000

Table 3

Lee Strazicich test: Model A and Model C

Model A				Model C			
Index/Stocks	Break Date	S	B_t	Break Date	S	B_t	D_t
BET	24.03.2005	-1.0543	3.8576	08.02.2005	-1.5817	3.3971	0.3286
SNP	22.10.2008	-1.5916	-5.0364***	16.10.2006	-2.6614	-0.2875	-3.1210
TLV	08.05.2007	-3.0496	-5.4834***	25.02.2005	-3.3053	0.9334	-0.1443
BRD	26.05.2005	-1.7700	32.2248	16.08.2005	-2.3178	-1.5874	1.4072
TEL	02.10.2008	-0.8318	-2.9139	17.09.2008	-1.5377	4.9161	-1.1833
BIO	01.10.2007	-1.4346	-12.0885***	02.10.2008	-2.3916	-2.8427	-1.0003

Note: The critical value for the model A are: -4,24, -3,57, -3,21 for a significance level at the 1%, 5%, 10%. The critical value for the model C are: (-5,05; -5,11), (-4,45; -4,51), (-4,17;

-4,21) for a significance level at the 1%, 5%, 10% (Lee Strazicich, 2004).

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Table 4

Lee Strazicich test: Model AA and model CC

		BET	SNP	TLV	BRD	TEL	BIO
	Break Date 1	11.12.2002	26.04.2004	08.05.2006	26.05.2005	17.11.2008	01.10.2007
	Break Date 2	24.03.2005	22.10.2008	12.05.2008	12.09.2008	12.05.2009	03.04.2009
Model AA	S	-1.0852	-1.6325	-3.3129	-1.8644	-0.8746	-1.5223
	B_{t1}	4.9401	3.4633	-11.6680***	32.3318	-1.4853	-12.1270***
	B_{t2}	3.9189	-5.0251***	-12.3207***	-4.4338*	-3.3005	-1.9309

	Break Date 1	27.04.1999	20.01.2006	07.01.2005	25.05.2005	09.02.2007	28.09.2007
	Break Date 2	05.10.2007	02.10.2008	12.05.2008	09.10.2008	09.10.2008	03.04.2009
	S	-2,8542	-3,9986	-5,1793	-3,9989	-3,6096	-3,9227
Model CC	B_{t1}	-0,2286	-1,5579	-0,7913	-1,6064	-0,8800	0,5574
	B_{t2}	-0,7586	-1,7757	-11,9963***	4,1110	5,5698	-1,9257
	D_{t1}	4,5763	0,9566	3,8974	3,8618	0,8872	-4,2139
	D_{t2}	-4,0558	-2,4282	1,3993	-3,3788	-2,7761	5,1609

Notes: The critical value for the Model AA are -4,545, -3,842, -3,504 for a significance level at the 1%, 5%, 10%. The critical value for the model C are: -5,823, -5,286, -4,989 for a significance level at the 1%, 5%, 10% (Altınay, 2005).

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Table 5

Unit root, correlation and run tests results

Index/ Stock	Period	ADF (p-value)	PP (p-value)	Ljung Box			Run test Z (Asymp.sign)
				Q (5)	Q (10)	Q (20)	
BET	19.09.1997- 09.04.2010	-47,113*** (0,000)	-47,620*** (0,000)	94,194*** (0,000)	105,05*** (0,000)	134,00*** (0,000)	-7,812 (0,000)
	19.09.1997- 26.04.1999	-13,906*** (0,000)	-13,777 (0,000)	46,806*** (0,000)	48,090*** (0,000)	54,611*** (0,000)	-5,534 (0,000)
	27.04.1999- 04.10.2007	-38,821*** (0,000)	-38,739*** (0,000)	72,079*** (0,000)	80,345*** (0,000)	89,234*** (0,000)	-6,148 (0,000)
	05.10.2007- 09.04.2010	-23,307*** (0,000)	-23,287*** (0,000)	5,104 (0,403)	11,708 (0,305)	41,598*** (0,003)	-2,200 (0,028)
SNP	09.03.2001- 09.04.2010	-40,341*** (0,000)	-40,207*** (0,0000)	29,677*** (0,000)	38,824*** (0,000)	62,715*** (0,000)	-2,416 (0,016)
	09.03.2001- 19.01.2006	-25,478*** (0,000)	-24,992*** (0,000)	58,317*** (0,000)	64,858*** (0,000)	67,235*** (0,000)	-3,280 (0,001)
	20.01.2006- 01.10.2008	-28,019*** (0,000)	-28,212*** (0,000)	9,064 (0,107)	10,729 (0,379)	20,955 (0,400)	0,426 (0,670)
	02.10.2008- 09.04.2010	-17,823*** (0,000)	-17,828*** (0,000)	6,434 (0,266)	10,375 (0,408)	28,299 (0,103)	-0,522 (0,602)
TLV	02.01.2000- 09.04.2010	-45,489*** (0,000)	-45,558*** (0,000)	14,492** (0,013)	15,524 (0,114)	27,213 (0,129)	-2,367 (0,018)
	02.01.2000- 6.01.2005	-27,233*** (0,000)	-27,043*** (0,000)	80,198*** (0,000)	83,950*** (0,000)	88,363*** (0,000)	-1,877 (0,060)
	7.01.2005- 11.05.2008	-26,856*** (0,000)	-26,849*** (0,000)	5,417 (0,367)	8,776 (0,553)	21,536 (0,366)	1,725 (0,084)
	12.05.2008- 09.04.2010	-19,475*** (0,000)	-19,474*** (0,000)	1,0762 (0,956)	2,668 (0,988)	6,825 (0,997)	-1,521 (0,128)
BRD	15.01.2001- 09.04.2010	42,472*** (0,000)	-42,472*** (0,000)	19,872*** (0,001)	27,819*** (0,002)	38,979*** (0,007)	-3,101 (0,002)
	15.01.2001- 24.05.2005	-26,802*** (0,000)	-26,855*** (0,000)	34,338*** (0,000)	36,507*** (0,000)	53,229*** (0,000)	-2,686 (0,007)
	25.05.2005- 08.10.2008	-26,967*** (0,000)	-26,953*** (0,000)	2,571 (0,766)	6,981 (0,727)	10,500 (0,958)	-2,007 (0,045)
	09.10.2008- 09.04.2010	-17,239*** (0,000)	-17,218*** (0,000)	8,559 (0,128)	10,951 (0,361)	22,680 (0,305)	-0,104 (0,918)
TEL	29.08.2006-	-29,198***	-29,196***	2,9523	19,106**	38,222***	-0,460

	09.04.2010	(0,000)	(0,000)	(0,707)	(0,039)	(0,008)	(0,646)
	29.08.2006-08.02.2007	-8,581*** (0,000)	-8,231*** (0,000)	4,797 (0,441)	6,542 (0,768)	12,515 (0,897)	-0,539 (0,590)
	09.02.2007-08.10.2008	-18,082*** (0,000)	-17,295*** (0,000)	3,578 (0,612)	6,231 (0,795)	15,300 (0,759)	0,213 (0,831)
	09.10.2008-09.04.2010	-20,182*** (0,000)	-20,174*** (0,000)	2,262 (0,812)	16,236* (0,093)	27,748 (0,116)	0,168 (0,867)
BIO	30.11.2005-09.04.2010	-29,389*** (0,000)	-29,507*** (0,000)	15,415*** (0,009)	20,823** (0,022)	31,935** (0,044)	-2,297 (0,022)
	30.11.2005-27.09.2007	-18,082*** (0,000)	-18,236*** (0,000)	13,080** (0,023)	15,800 (0,106)	26,684 (0,144)	-0,608 (0,543)
	28.09.2007-02.04.2009	-17,719*** (0,000)	-17,534*** (0,000)	4,275 (0,511)	10,243 (0,419)	14,989 (0,777)	-2,612 (0,009)
	03.04.2009-09.04.2010	-14,750*** (0,000)	-14,573*** (0,000)	4,774 (0,444)	8,070 (0,622)	23,601 (0,260)	0,717 (0,473)

Notes: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

Table 6

Lo and MacKinlay test

Index/ Stock	Period	M1			M2		
		q=2	q=5	q=10	q=2	q=5	q=10
BET	19.09.1997-09.04.2010	4,823***	4,169***	3,964***	2,492**	2,109**	2,024**
	19.09.1997-26.04.1999	6,899***	5,210***	3,642***	3,919***	3,083***	2,329**
	27.04.1999-04.10.2007	4,234***	2,803***	1,645	1,838*	1,254	0,769
	05.10.2007-09.04.2010	1,629	1,633	2,063**	1,363	1,266	1,568
SNP	09.03.2001-09.04.2010	0,122	-0,880	-0,017	0,076	-0,573	-0,012
	09.03.2001-19.01.2006	4,732***	2,125**	2,959***	2,252**	1,096	1,624
	20.01.2006-01.10.2008	-2,285**	-2,311**	-2,472**	-1,853*	-1,982**	-2,244**
	02.10.2008-09.04.2010	0,842	0,185	0,161	0,497	0,101	0,091
TLV	02.01.2000-09.04.2010	2,762**	2,114**	1,442	2,209**	1,543	1,045
	02.01.2000-6.01.2005	5,585***	4,989***	5,441***	2,601***	2,628***	3,233***
	7.01.2005-11.05.2008	0,995	-0,784	-0,265	0,881	-0,710	-0,242
	12.05.2008-09.04.2010	1,212	1,322	0,376	1,783*	1,617	0,448
BRD	15.01.2001-09.04.2010	1,502	0,473	-0,127	0,857	0,300	-0,086
	15.01.2001-24.05.2005	5,481***	4,639***	3,232***	2,493**	2,244**	1,789*
	25.05.2005-08.10.2008	0,542	-1,359	-1,744	0,449	-1,265	-1,749
	09.10.2008-	0,893	0,044	-0,582	0,578	0,032	-0,461

	09.04.2010						
TEL	29.08.2006-09.04.2010	1,161	1,633	0,119	0,744	1,099	0,086
	29.08.2006-08.02.2007	0,892	0,252	-0,536	0,7526	0,223	-0,509
	09.02.2007-08.10.2008	0,759	0,976	-0,725	0,549	0,745	-0,602
	09.10.2008-09.04.2010	-2,227**	-1,436	-1,917*	-1,190	-0,832	-1,194
BIO	30.11.2005-09.04.2010	0,851	0,234	1,225	0,603	0,153	0,876
	30.11.2005-27.09.2007	2,039**	2,081**	1,435	1,599	1,771*	1,322
	28.09.2007-02.04.2009	-0,806	-3,342***	-2,457**	-0,609	-2,248**	-1,939*
	03.04.2009-09.04.2010	0,017	-0,583	-0,985	0,016	-0,538	-0,928

Notes: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level; M1-homoskedasticity, M2-heteroskedasticity.

Table 7

Results for the Automatic Variance Ratio test

Index/ Stock	Period	B = 200	B = 1000
		t-statistic (p-value)	t-statistic (p-value)
BET	19.09.1997-09.04.2010	3,5857*(0,015)	3,5857*(0,018)
	19.09.1997-26.04.1999	4,8704* (0,000)	4,8704*(0,000)
	27.04.1999-04.10.2007	3,3089*(0,04)	3,3089*(0,049)
	05.10.2007-09.04.2010	0,9340 (0,245)	0,9340 (0,248)
SNP	09.03.2001-09.04.2010	-0,1044(0,82)	-0,1044 (0,814)
	09.03.2001-19.01.2006	2,2802 (0,115)	2,2802 (0,133)
	20.01.2006-01.10.2008	-1,8806*(0,015)	-1,8806*(0,03)
	02.10.2008-09.04.2010	0,5546 (0,575)	0,5546 (0,555)
TLV	02.01.2000-09.04.2010	2,1234 (0,06)	2,1234 (0,05)
	02.01.2000-6.01.2005	4,6466*(0,01)	4,6466*(0,009)
	7.01.2005-11.05.2008	0,5662 (0,44)	0,5662 (0,425)
	12.05.2008-09.04.2010	0,9799 (0,085)	0,9799(0,074)
BRD	15.01.2001-09.04.2010	1,0332 (0,385)	1,0332 (0,37)
	15.01.2001-24.05.2005	4,1792* (0,01)	4,1792* (0,02)
	25.05.2005-08.10.2008	0,3757 (0,565)	0,3757 (0,595)
	09.10.2008-09.04.2010	0,8761 (0,3)	0,8761 (0,339)
TEL	29.08.2006-09.04.2010	0,7703 (0,425)	0,7703 (0,438)
	29.08.2006-08.02.2007	0,8006 (0,315)	0,8006 (0,284)
	09.02.2007-08.10.2008	0,6298 (0,52)	0,6298 (0,463)
	09.10.2008-09.04.2010	-1,0575 (0,41)	-1,0575 (0,352)
BIO	30.11.2005-09.04.2010	0,4685 (0,595)	0,4685 (0,582)
	30.11.2005-27.09.2007	1,4368 (0,11)	1,4368 (0,113)
	28.09.2007-02.04.2009	0,0236 (0,94)	0,0236 (0,939)
	03.04.2009-09.04.2010	0,0417 (0,85)	0,0417 (0,847)

Notes: * Significant at 5% level; B-the number of bootstrap iterations.

Table 8

Hurst exponent and the parameter $\hat{d}$ estimated by the GPH method

Index/Stock	Period	Hurst Exponent	$\hat{d}$ - GPH method
BET	19.09.1997-09.04.2010	0,58979	0,07696 (0,08452)
	19.09.1997-26.04.1999	0,6602	0,12395 (0,18231)
	27.04.1999-04.10.2007	0,68370	0,00565 (0,20166)
	05.10.2007-09.04.2010	0,68441	0,37504** (0,15585)
SNP	09.03.2001-09.04.2010	0,61273	0,04595 (0,11202)
	09.03.2001-19.01.2006	0,65510	0,33927 (0,22984)
	20.01.2006-01.10.2008	0,56278	-0,06160*** (0,16001)
	02.10.2008-09.04.2010	0,63045	-0,07401 (0,16179)
TLV	02.01.2000-09.04.2010	0,58699	-0,16141 (0,6880)
	02.01.2000-6.01.2005	0,65567	-0,10155 (0,20601)
	7.01.2005-11.05.2008	0,55615	0,10589 (0,20220)
	12.05.2008-09.04.2010	0,59808	-0,14417 (0,10372)
BRD	15.01.2001-09.04.2010	0,61016	0,08369 (0,11754)
	15.01.2001-24.05.2005	0,65851	-0,10163 (0,14860)
	25.05.2005-08.10.2008	0,56557	-0,04878*** (0,08611)
	09.10.2008-09.04.2010	0,63867	0,32250* (0,17247)
TEL	29.08.2006-09.04.2010	0,55752	0,11717 (0,14962)
	29.08.2006-08.02.2007	0,78144	0,07648 (0,24437)
	09.02.2007-08.10.2008	0,71004	-0,21818 (0,16047)
	09.10.2008-09.04.2010	0,69380	-0,04217 (0,13926)
BIO	30.11.2005-09.04.2010	0,60709	0,16154 (0,12884)
	30.11.2005-27.09.2007	0,66446	-0,12917 (0,17977)
	28.09.2007-02.04.2009	0,66789	-0,02324 (0,15183)
	03.04.2009-09.04.2010	0,62471	0,22723 (0,23833)

Notes: $\hat{d}$ was estimate for $T^{1/2}$. OLS standard error are shown in parentheses

***significant at 1% level, ** significant at 5% level, *significant at 10% level.

Table 9

Estimation of ARFIMA models (p, d, q) before and after the structural break points

BET ARFIMA(1,d,1)	19.09.1997- 09.04.2010	19.09.1997- 26.04.1999	27.04.1999- 04.10.2007	05.10.2007- 09.04.2010
D	0,133*** (0,000)	0,028 (0,857)	0,076* (0,0754)	0,181*** (0,000)
LB(10)	13,181 (0,213)	5,914 (0,822)	16,811* (0,078)	12,858 (0,231)
LB(20)	32,804** (0,035)	11,568 (0,930)	31,093* (0,0539)	21,749 (0,354)
SNP ARFIMA(1,d,1)	09.03.2001- 09.04.2010	09.03.2001- 19.01.2006	20.01.2006- 01.10.2008	02.10.2008- 09.04.2010
d	0,144*** (0,000)	0,265*** (0,000)	0,051 (0,276)	0,098*** (0,001)
LB(10)	7,588 (0,669)	16,293* (0,0915)	8,449 (0,585)	10,833 (0,370)
LB(20)	18,888 (0,529)	24,954 (0,203)	22,021 (0,339)	43,438*** (0,0017)
TLV ARFIMA(1,d,1)	02.01.2000- 09.04.2010	02.01.2000- 6.01.2005	7.01.2005- 11.05.2008	12.05.2008- 09.04.2010
d	0,214*** (0,000)	0,110*** (0,005)	0,094* (0,060)	0,107*** (0,003)
LB(10)	4,558	9,394	7,067	22,578**

	(0,918)	0,495	0,719	0,012
LB(20)	30,824* (0,057)	38,762*** 0,0071	31,183* 0,0528	36,045 0,015**
BRD ARFIMA(1,d,1)	15.01.2001- 09.04.2010	15.01.2001- 24.05.2005	25.05.2005- 08.10.2008	09.10.2008- 09.04.2010
d	0,208*** (0,000)	0,321*** (0,0015)	0,070 (0,198)	0,219*** (0,000)
LB(10)	11,031 (0,355)	7,080 (0,717)	8,777 (0,553)	36,750*** (0,000)
LB(20)	21,685 (0,357)	15,685 (0,735)	25,186 (0,194)	93,227*** (0,000)
TEL ARFIMA(1,d,1)	29.08.2006- 09.04.2010	29.08.2006- 08.02.2007	09.02.2007- 08.10.2008	09.10.2008- 09.04.2010
d	0,162** (0,011)	0,056 (0,696)	0,076 (0,861)	0,519 (0,302)
LB(10)	4,308 (0,932)	8,994 (0,5326)	7,445 (0,682)	6,375 (0,782)
LB(20)	16,169 (0,706)	22,52 (0,312)	19,239 (0,506)	19,135 (0,513)
BIO ARFIMA(1,d,1)	30.11.2005- 09.04.2010	30.11.2005- 27.09.2007	28.09.2007- 02.04.2009	03.04.2009- 09.04.2010
d	0,372*** (0,000)	0,168** (0,047)	0,042 (0,531)	0,291 (0,251)
LB(10)	8,701 (0,560)	9,119 (0,520)	15,221 (0,124)	27,549*** (0,002)
LB(20)	16,658 (0,675)	15,459 (0,749)	28,076 (0,107)	41,689*** (0,003)

Notes: ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

THE PERFORMANCE OF ROC ON THE BSE

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Abstract. *This paper focuses on evaluating the performances of the Rate of Change indicator, a very old and very simple technical analysis indicator, on the Romanian Stock Market. The Standard method, as described by Park and Irwin (2007), is used as the basis testing method. However, the methodology is improved versus standard literature and is similar with the one used by Anghel (2012) with some additional improvements. The data sample is comprised out of daily trading series for 20 companies listed on the Bucharest Stock Exchange starting with January 1, 2001 and up to December 31, 2012. The reported results show that the ROC indicator is not a very reliable profit generating tool. More importantly, it does a very poor job of producing excess risk adjusted returns for a potential investor when comparing it with the basic buy and hold strategy. Last but not least, it is not a reliable tool in lowering portfolio risk. All of these mean that the Rate of Change indicator is not a valuable tool for an actual investor on the Romanian Stock Market.*

Keywords: rate of change; technical analysis; investments; trading; momentum.

JEL Classification: G11, G14.

REL Classification: 11B.

1. Introduction

This paper aims to evaluate the performances of the Rate of Change, a very basic technical analysis indicator, on the Romanian Stock Market. Technical Analysis is made up out of a wide variety of practical investment methods that use past trading data to try and forecast future price behavior and thus try to make abnormal trading profits. This, however, comes into conflict with the postulate of the current financial market paradigm, the Efficient Market Hypothesis, which states that even in the case of a weak form efficient market, as described by Fama (1970), past information is incorporated into the current price evolution, thus it cannot be used to generate higher than normal returns for the category of risk the investor exposes himself to. But Fama and Blume (1970) also stated that the ultimate criterion is always practical, so the true market nature, in the sense of information efficiency, cannot be determined until all practical methods have been tested on the market.

As to the author's knowledge, apart from Anghel (2012), which evaluates the usefulness of the moving average crossover rule, studies that empirically analyze performance of technical analysis indicators on the Romanian Stock Market do not exist. Also there is only one paper that tests the performance of moving averages on the Romanian currency market by Todea and Zoicas-Ienciu (2011). Thus, this area of financial studies severely needs to be tackled and this paper does exactly that by testing the performance of the Rate of Change technical indicator for issuers listed on the Bucharest Stock Exchange.

2. The Rate of Change indicator

Technical Analysis indicators are basically linear functions that use past trading data, like open, high, low or close prices, volume, open interest, advances, declines and so on, to calculate recurrent values, which are later analyzed by the technical analyst to make investment decisions. The Rate of Change (ROC) is one of the oldest and simplest technical

indicator. It simply measures the discrete return of the current market price versus an older market price. The basic formula of the ROC indicator is:

$$ROC(t) = \frac{C_t - C_{t-n}}{C_{t-n}} \times 100$$

where C_t is the current period's close price and C_{t-n} is the close price n periods ago.

If one can measure the return between today and a certain time ago, one can intuitively estimate what the market trend would have been during this period. If the ROC indicator is positive, then the market was overall rising. The higher the ROC, the stronger the positive trend has been. Alternatively, if the ROC indicator is negative, then the market was overall declining. The lower the ROC, the stronger the negative trend has been. A near zero ROC indicates a trendless market. So ROC tells a very short story about past market behavior, particularly about where the price is now compared with a particular past point in time thus indicating past market trend and the strength of this trend (1). In this sense, ROC is considered a momentum indicator by technical analysts, which use it to forecast future market behavior.

As all momentum indicators, the way an investor uses ROC to trade is diverse. The simplest way is to track the indicator values and to look for signs of market trend change. The trend can be considered changed when the indicator changes its sign, thus pointing out a new past market trend, which in turn points to a new future market trend. This generates a trading signal in favor of the future forecasted trend. Another way of using ROC is looking for overbought (very high historical values) or oversold (very low historical values) signals, which generate trades against the current market trend (contrarian strategy). Some other ways of using ROC is with a signal line or by looking at convergence/divergence signs versus the market price, the latter being more difficult to model.

3. Methodology

This study focuses on testing the performance of a fictive trading system based solely on the ROC's most basic trading rule, on issuers from the Bucharest Stock Exchange from 2001 to 2012 inclusive. The conducted tests try to answer the following questions:

- Is the Rate of Change indicator capable of generating profit for an investor that uses it on the Romanian Stock Market?
- Is the Rate of Change indicator capable of generating excess economic returns for an investor that uses it on the Romanian Stock Market?
- Does the Rate of Change indicator have any value for an investor on the Romanian Stock Market?

The Standard method, as described by Park and Irwin (2007), is used as the basis testing method. This means that the data samples are divided into several sub-samples, the best system from the trading universe in a sub-sample is chosen using optimisation of a target return measurement and then the results are confirmed on the following sub-sample. However, the methodology is improved versus standard literature and is similar with the one used by Anghel (2012). The similarities include (1) the usage of the same return indicator, *the geometric M2 for Sortino excess return* (denoted $ExM2^s$), as the target optimisation measurement, thus adjusting the returns to trading cost and risk, (2) the usage of the same improved trading simulation procedure to calculate return and risk for a trading strategy on a given data sample, (3) the usage of the same benchmark strategy (buy-and-hold) and (4) of the same bootstrap based test to statistically evaluate results on the confirmation sample.

However, several improvements have been made to the procedure, among which the most important is the usage of multiple sub-samples. Here, up to 12 sub-samples have been created by dividing the initial data sample into separate years. The main reason for doing this is that it mimics even closer what investors actually do in practice, in the sense that they tend not to keep using the same trading strategy for large periods of time. Another improvement is the implementation of only buy signals, because of the Romanian market restraints for short selling trades that were not possible before 2011 and are yet to be properly implemented. One

final improvement if the exclusion from analysis of optimized rules that generated less than two in-sample transaction, this aiming to eliminate the cases in which in sample rules were selected based on perfectly overfitted trades and keep only true active rules in the analyzed universe. These changes are in accordance with the rules of empirical testing derived from Timmermann and Granger (2004) because it makes the testing procedure and finally the conclusions more relevant.

The final difference (that is not an improvement) is the signal function, which is now based on the ROC indicator:

$$S_t = \begin{cases} 1, & \text{if } ROC(n) > c \\ 0, & \text{otherwise} \end{cases}, t \in (1, T)$$

where n is the time period the indicator is calculated on and c is a percentage constant that is also subject to optimization. A mistake would have been to choose $c = 0$, as most practitioners do, but this would have severely restrained the rule universe, which in turn would have led to biased results.

The data sample is comprised out of daily trading series for 20 companies listed on the Bucharest Stock Exchange starting with January 1, 2001 and up to December 31, 2012. The data is collected from free access sources, i.e. the SSIF Broker webpage <http://www.tranzactiibursiere.ro/> and an automated algorithm is used to adjust it, this being based on the data reported on the Bucharest Stock Exchange webpage <http://www.bvb.ro/> for each issuer, in the sections *Financial data – Dividends* and *Share Capital Changes*.

4. Results

Appendix 1 shows the results obtained in testing. Table 1 shows the results grouped by sub-sample periods, each denoted by calendar year. Table 2 shows the results grouped by tested company. Both table 1 and 2 show summed up results for all tested samples and issuers (2).

Overall in only 23% of the cases was the Rate of Change indicator capable to generate profit after deducting trading cost. There can be seen in Table 1 that the majority of profitable investments come from the period prior to 2008 when the market was overall bullish and this makes sense as the testing procedure only implemented buy trades. But the overall percentage is rather low and is something that would worry an investor when actually using this indicator. On the other hand, there can clearly be seen that the profit-generating capabilities of this indicator is highly influenced by the issuer is being used on. While in some cases (as for SIF2) the profit rate surpasses the 50% mark, in other cases (like BCC) in none of the tested sub-periods was this indicator able to generate profit. This heterogeneity is another potential problem for an actual investor when using this technical analysis indicator. The more stable the results, the better because they are more predictable, but the ROC indicator does not imbed such a quality in the results. So, is the Rate of Change indicator capable of generating profit for an investor that uses it on the Romanian Stock Market? The answer is that the ROC indicator is not very good at producing profits.

The above analysis concentrates only on simple market returns and is only significant for practical purposes. In order to see the true economic values of the indicator, a property also a researcher is interested into, its results must be risk adjusted and analyzed relative to a benchmark strategy. The results of such an analysis are reported in columns 4 and 5 of tables 1 and 2. Column 4 reports the percentage of times the ROC indicator was able to generate excess economic return in out-of-sample periods, meaning that $ExM2^s$ was positive, while column 5 reports the percentage of times the ROC indicator was economically relevant, meaning that $ExM2^s$ was positive and also statistically significant. The statistical significance was derived from analysing probability $P1$ (see Table 3) from the empirically determined distribution of $ExM2^s$ via bootstrap simulation.

The results show an overall lack of economic relevance for the ROC indicator, because in only 14 out of 205 out of sample tests was it able to successfully produce individual statistically relevant risk adjusted excess returns. The reported 6.83% probability is

insignificant at the 90% confidence level, this ruling out its usefulness. So, is the Rate of Change indicator capable of generating excess economic returns for an investor that uses it on the Romanian Stock Market? The answer is no, because of the very low percentage of the success rate and the relative random nature of the abnormal events. There are however some exceptions for specific issuers in specific periods. Particularly, while for the majority of issuers the ROC indicator was not able to generate economically relevant results in none of the tested periods, there have been some for which in up to two years this indicator could have successfully been used (ATB, IMP and SIF4). Even though these figures are not very encouraging for an actual investor, it has implications regarding the Efficient Market Hypothesis for the Romanian Stock Market that are later discussed. On the other hand, when looking at economically relevant results on a year by year basis, two sub-sample results clearly stand out from the rest, these being 2010 and 2011. For these periods, the ROC indicator was in 15% and, respectively, 30% of the cases capable to produce positive and statistically significant excess returns. These percentages are not statistically insignificant, especially with a 40-point data sample. This means that this technical analysis indicator could have been used by an actual investor on the Bucharest STOCK Exchange during these periods to obtain abnormal profits.

The final column in Tables 1 and 2 report the percentage of cases when the simulated trading portfolio (obtained when using the ROC indicator as an investment rule) has lower risk than the benchmark portfolio (obtained when using the typical buy-and-hold rule). Overall, in only 1/3 of all cases was the ROC indicator able to lower the portfolio risk, this showing that it is not a very reliable tool in this aspect, especially when compared with the moving average crossover rule which, as shown by Anghel (2012), manages to almost always reduce the portfolio risk versus the benchmark strategy.

So, does the Rate of Change indicator have any value for an investor on the Romanian Stock Market? Since it has a poor record at generating profits, it is not capable of generating economic returns (with some very few exceptions) and it is not a reliable tool in lowering the portfolio risk, the answer is that *the Rate of Change indicator is not a valuable tool for an actual investor on the Romanian Stock Market.*

But this is not the end of the analysis. Even though the ROC indicator is not a recommended investment tool on this market, given the results that it would have obtained, the fact that it managed to generate economically relevant returns in some situations poses some questions regarding the degree of information efficiency of the tested market. When a market is weak form efficient then no past information, including historical trading data, could be used to obtain higher than normal returns in trading. But the testing results show that the ROC indicator, a very old and simple technical analysis indicator, could anticipate future price movement and potentially generate higher than normal returns for an investor in some situations on the Romanian Stock Market, especially for particular time intervals and for particular issuers. Does this mean that this market is not weak form efficient? Classical statistics would say that the Romanian Stock Market was not informationally efficient between 2010 and 2011, but the answer is not so clear because a definite conclusion in this direction would require proof that a real investor could have been using the information ROC provided to trade on it (3).

As the conclusion regarding the overall performance of this indicator states, it is not a very reliable one, so a potential investor should have been guessing at what time and for what issuer will the indicator turn economically relevant, this being highly improbable. For example, in order to profit from the a posteriori detected 2010 market inconsistencies, an investor would have been only relying on the results up to 2009, which all showed that ROC is not overall economically relevant. This, in turn, would have discouraged him to use this indicator as an analysis tool, which, in turn would have prevented him to benefit from the inconsistencies in the following year. The problem is not that the ROC cannot be in some

cases economically relevant, but that these situations come at random for particular issuers and time intervals, thus deeming it unusable in real life scenarios.

So as a final conclusion, the results of this study show that the Romanian Stock Market occasionally behaves in an inconsistent manner, but this is not proof that it is not weak form informationally efficient, although the opposite cannot be concluded, because here only one simple indicator was tested, while such a statement would require testing at least all available technical analysis indicators and deeming them irrelevant (4).

Conclusions

This paper focuses on evaluating the performances of the Rate of Change indicator, a very old and very simple technical analysis indicator, on the Romanian Stock Market. The paper is relevant for both researchers and practitioners because it tries to answer three basic questions regarding the ROC indicator: is it capable of generating profit? Is it capable of generating excess economic returns? Does it have any value for an investor? These questions lead to a fourth very important one: is the Romanian Stock Market weak form informationally efficient?

The data sample is comprised out of daily trading series for 20 companies listed on the Bucharest Stock Exchange starting with January 1, 2001 and up to December 31, 2012. The methodology is similar with the one used by Anghel (2012), but with three major improvements: the individual samples are divided into more than two sub-sample, only buy trades are implemented and obvious passive/overfitted rules are filtered out of the rule universe. These improvements make the methodology more relevant, in that it mimics even closer what investors actually do in practice, this being a very sought after property in empirical testing because it reinforces the validity of the drawn conclusions.

The reported results show that the ROC indicator is not a very reliable profit generating tool. More importantly, it does a very poor job of producing excess risk adjusted returns for a potential investor when comparing it with the basic buy and hold strategy. Last but not least, it is not a reliable tool in lowering portfolio risk. All of these mean that the Rate of Change indicator is not a valuable tool for an actual investor on the Romanian Stock Market.

On the other hand, the fact that the ROC managed to generate economically relevant returns in some situations poses some questions regarding the degree of information efficiency of the tested market. When looking more closely, these situations are rather random, this making identification of such events in practice highly improbable. So as a final conclusion, the reported results show that the Romanian Stock Market occasionally behaves in an inconsistent manner, but these inconsistencies cannot be interpreted as inefficiencies, so the weak form EMH cannot be rejected, although it also cannot be affirmed, as more tests are required.

Notes:

⁽¹⁾ Investors should be warn that ROC says nothing about how the price got from point A to point B, thus nothing is known about short-interval trends, money flow or volatility.

⁽²⁾ Raw testing results can be provided by the author at request.

⁽³⁾ This rule is mentioned by Timmermann and Granger (2004) and is supported by most researchers nowadays.

⁽⁴⁾ Not to mention testing other methods that try to anticipate future past behavior based on past information, that have now grown to significant numbers.

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Appendix 1

Processed testing results

Table 1

Results grouped by sub-sample periods

Temporal statistics					
Year	#Tested issuers	Generated profit* (%)	Generated excess economic return** (%)	Was economically relevant*** (%)	Lower risk than benchmark**** (%)
2002	16	12.50	6.25	0.00	37.50
2003	16	18.75	0.00	0.00	37.50
2004	16	62.50	6.25	6.25	68.75
2005	18	38.89	11.11	5.56	50.00
2006	19	36.84	5.26	5.26	42.11
2007	20	25.00	5.00	0.00	60.00
2008	20	0.00	0.00	0.00	10.00
2009	20	45.00	5.00	5.00	55.00
2010	20	10.00	20.00	15.00	35.00
2011	20	5.00	30.00	30.00	20.00
2012	20	10.00	5.00	5.00	40.00
TOTAL	205	23.41	8.78	6.83	40.98

Table 2

Results grouped by tested company

TEMPORAL STATISTICS					
Issuer	#Tested years	Generated profit* (%)	Generated excess economic return** (%)	Was economically relevant*** (%)	Lower risk than benchmark**** (%)
ALR	11	36.36	18.18	9.09	27.27
ATB	11	27.27	18.18	18.18	27.27
AZO	11	9.09	18.18	9.09	63.64
BCC	8	0.00	25.00	12.50	12.50

TEMPORAL STATISTICS					
Issuer	#Tested years	Generated profit* (%)	Generated excess economic return** (%)	Was economically relevant*** (%)	Lower risk than benchmark**** (%)
BIO	11	36.36	0.00	0.00	45.45
BRD	11	27.27	9.09	9.09	36.36
BRK	7	28.57	14.29	14.29	71.43
IMP	11	36.36	27.27	18.18	36.36
OIL	11	9.09	0.00	0.00	27.27
OLT	11	9.09	9.09	9.09	27.27
RRC	8	25.00	0.00	0.00	50.00
SIF1	11	18.18	0.00	0.00	63.64
SIF2	11	54.55	0.00	0.00	54.55
SIF3	11	27.27	0.00	0.00	36.36
SIF4	11	18.18	18.18	18.18	45.45
SIF5	11	9.09	9.09	9.09	63.64
SNP	11	18.18	0.00	0.00	18.18
TBM	11	18.18	0.00	0.00	36.36
TEL	6	16.67	0.00	0.00	0.00
TLV	11	36.36	9.09	9.09	63.64
TOTAL	205	23.41	8.78	6.83	40.98

* **Generated profit:** Percentage of times an out-of-sample positive return was recorded.

****Generated excess economic return:** Percentage of times the cost and risk adjusted return was higher than that of the benchmark strategy.

*** **Was economically relevant:** Percentage of times the excess return was positive and statistically relevant.

**** **Lower risk than benchmark:** Percentage of times the risk measured for portfolio returns was lower than the risk of the benchmark portfolio.

THE PROPAGATION EFFECTS OF FINANCIAL CRISIS ON LJUBLJANA STOCK EXCHANGE

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Abstract. *The aim of this article is to investigate the propagation effects of the global financial crisis on Ljubljana Stock Exchange. Beyond the myth of cyclical extreme financial phenomena, contagion ravages had a very prominent replication especially in emerging capital markets. Several critical issues and their influence are disseminated, such as: volatility forecasting, dynamic correlations of financial time series, integrated financial markets, regulatory reform, globalization effects, interdependence of financial transmission mechanisms, co-movement of stock returns. Theoretical concepts are intertwined with financial econometric tools in order to establish whether there is any empirical evidence to support the research. The analysis is based on daily closing prices of the Ljubljana Stock Exchange index SBI TOP over the sample period of 1st April 2003 to 21st December 2012.*

Keywords: continuously compounded returns; non-stationarity; diagnostic test; volatility; financial econometrics; financial crisis effects.

JEL Classification: G10, G12, G14, G17.

REL Classification: 11B.

1. Introduction

An emerging capital market is a paradox in almost every sense, but Ljubljana Stock Exchange captures the contrasts even more. Considering this particular intrinsic structure, the meanings of financial globalization reach more or less faded echoes. Thus, on the Slovenian capital market, certain concepts such as integration, cointegration, co-movements of stock returns, interdependence of financial structures, spillover effects, market liberalization, extreme financial events have a quite pronounced internal dimension.

The overall performance of the Ljubljana Stock Exchange is measured by SBI TOP which is the benchmark index. It is also the first genuine blue-chip index considering that it measures the performance of the most liquid and highly capitalized stocks. Ljubljana Stock Exchange was established in 1989, whilst Slovenia still was a constituent part of the Socialist Federal Republic of Yugoslavia, and it has a relatively short history but even more interesting, especially in recent years. However, the relatively extended period of socialist influence still has strong reminiscences.

In another train of thoughts, the acquisition of Ljubljana Stock Exchange by the Vienna Stock Exchange was completed in June 2008, when the latter becomes the new majority owner with over four-fifths of the shares. The effects of this acquisition are expected to be reflected in the expansion of trading volume, regulated legal framework, significant improvements in liquidity, transactional transparency, attracting major foreign investors, informational efficiency, size of listing, increasing market depth, growth of innovative financial products and services, number of the constituents, investors' expectations achievement, quality of operations, decrease of price volatility, financial products and services range visibility and competitiveness. The following period, ie 2009 represented the beginning of a new structural reform along with the establishment of CEE Stock Exchange Group

(acronym CEESEG), which consists of the stock exchanges of Budapest, Ljubljana, Prague and Vienna. In other words, the only shareholder of Ljubljana Stock Exchange is currently CEESEG. Thereby, Ljubljana Stock Exchange has long been perceived as one of the most lucrative European stock exchanges.

2. Basic characteristics of emerging capital markets

In the pre-crisis period, emerging capital markets, such as Ljubljana Stock Exchange were perceived as being increasingly attractive for both institutional and individual financial investors. This particular market structure is composed of the following types of securities: shares, bonds, open-end funds, index open-end funds, close-end funds (ID), investment certificates, warrants and additional products. Nevertheless, the relatively wide range of financial products requires a sustained liquidity and a price volatility less explosive. Above all, and especially the capitalist shell of Ljubljana Stock Exchange operating mechanisms, the Slovenian government still owns about half of its capital and portfolio investments. This is one of the most attractive paradoxes captured in the light of a globalized and integrated worldwide financial dimension.

According to FTSE Global Equity Index Series, there are certain categories of markets, such as: developed, advanced emerging, secondary emerging and frontier. Developed markets include: Australia, Austria, Belgium/Luxembourg, Spain, Canada, Denmark, Finland, France, Germany, Italy, USA, Japan, Netherlands, UK, Sweden, Switzerland and others. Advanced emerging markets enclose: Brazil, Hungary, Mexico, Poland, South Africa, Taiwan, Czech Republic, Malaysia and Turkey (last three were promoted to this status in June 2011). The secondary emerging markets contain: Chile, China, Colombia, Egypt, India, Indonesia, Morocco, Pakistan, Peru, Philippines, Russia and Thailand. Frontier emerging markets include: Argentina, Bahrain, Bangladesh, Botswana, Bulgaria, Croatia, Cyprus, Estonia, Lithuania, Macedonia, Malta, Nigeria, Oman, Romania, Serbia, Slovakia, Slovenia, Sri Lanka, Tunisia, Vietnam and others. Moreover, Slovenian market among 25 other frontier markets is a constituent of the FTSE Frontier 50 Index which is a liquid, tradable index based on several selection criteria required by international institutional investors.

An intensely debated issue regarding emerging capital markets of the Central and Eastern Europe aims the interdependence between continuously compounded returns and stock volatility. The debate is more virulent considering the fact that emerging capital markets, and mainly frontier markets such as Ljubljana Stock Exchange, are still characterized by certain negative features like: underdevelopment, fragmentation, opaqueness, smallness and vulnerability. In particular, Slovenian capital market has some significant drawbacks, such as: a persistent lack of liquidity which diminishes foreign investors interest, a quite overwhelming influence of the government in the economic field, an obvious adversity for foreign partnerships and ownership.

This relatively variegated economic context was heavily disrupted by the global financial crisis that erupted in mid-2007 in U.S.A. and triggered severe consequences. There are no universally accepted explanations regarding the impact intensity on different categories of emerging capital markets. Certainly, this extreme event revealed both globally and locally vulnerabilities of the financial system.

A very interesting dilemma that embroiders this article is how can certain structural abnormalities be transformed in streamlined portfolio returns and informational efficiency in the turbulent context of the financial crisis. Is only an utopian aspiration or financial forecasting of emerging capital market returns can be improved? In order to provide an appropriate solution, the econometric approach is filtered through the economic context and financial crisis effects are undissociated commensurate.

3. An econometric radiography of Ljubljana Stock Exchange

The topics discussed in this article covers an area of current interest both for practitioners and academics. In terms of financial econometrics, emerging capital market behavior is encumbered by certain features such as: volatility clustering, non-stationarity of price levels, leverage effect, heteroskedastic log returns, deviations from normal distribution, time variation, unpredictability, fat-tailed distributions, chaos. In addition, the global financial crisis has emphasized these particular features.

The empirical analysis is based on the daily closing prices of Ljubljana Stock Exchange index SBI TOP over the sample period of 1st April 2003 to 21st December 2012. In the analyzed period, the trend of Ljubljana Stock Exchange index SBI TOP was strongly downwards, in strong correlation with the current global financial crisis, as it can be seen in the following figure:

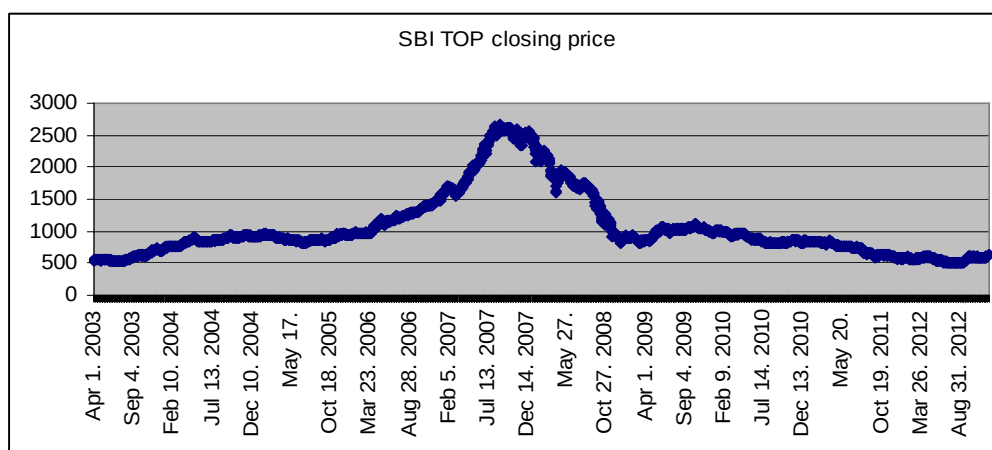


Figure 1. The trend of SBI TOP index

Taking into account that financial time series exhibit time-variation mean and variance, respectively reflect a non-stationary behavior, they need to be converted to stationary ones. Consequently, the transformed financial time series is based on continuously compounded return which is calculated using the log-difference of the SBI TOP index daily closing price, as follows:

$$r_t = \ln\left(\frac{p_t}{p_{t-1}}\right) = \ln p_t - \ln p_{t-1}$$

where p is the daily closing price (level).

The continuously compounded return calculated for SBI TOP index for the period 1st April 2003 to 21st December 2012 is illustrated in the following figure:

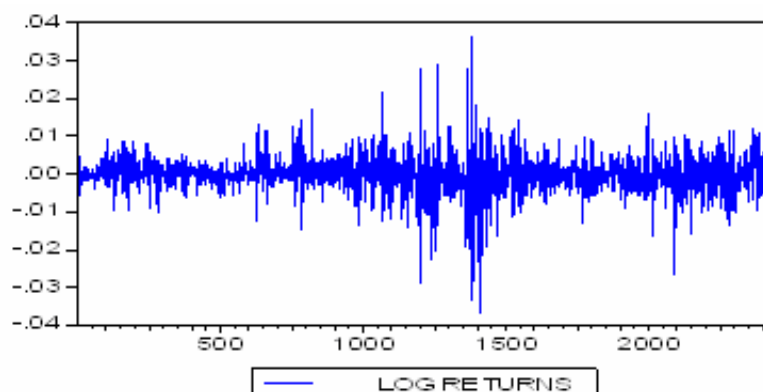


Figure 2. The Log-returns of SBI TOP index

Another feature supported by the empirical results is that the distribution of continuously compounded returns or log returns generally deviates from the normal distribution (Gaussian). In this regard, the following figure is highly suggestive:

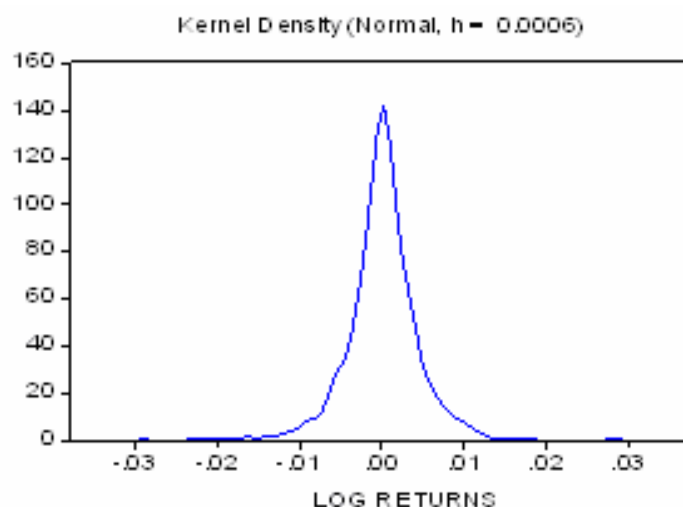


Figure 3. The Log-returns distribution

The main statistical properties, specifically Skewness and Kurtosis, suggest that historical data analyzed in this article is non-normally distributed. In statistical terms, skewness is a measure of asymmetry of the distribution of a data series around its means. The skewness of a symmetric distribution is zero. In conclusion, in the case of normal distribution, the skewness is null. Positive skewness suggests that the distribution has a long right tail, while negative skewness implies that the distribution has a long left tail. Kurtosis measures the peakedness or flatness of the distribution of a return data series. The kurtosis of a normal distribution is 3, any other value having profound implications in the context of emerging capital markets. Thus, if the kurtosis exceeds 3, the distribution is peaked (Leptokurtic) relative to the normal. In the opposite, if the kurtosis is less than 3, the distribution is flat (Platykurtic) relative to normal (Birau, 2012b).

The histogram of the analyzed index is reflected below:

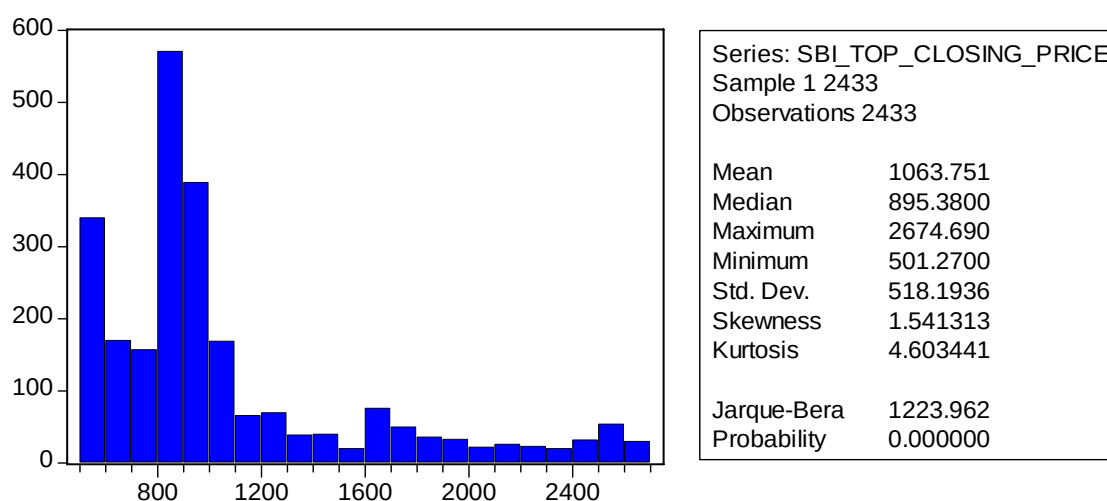


Figure 4. Histogram for SBI TOP index

Some rigorous tests to determine the stationarity of a time series are: ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron). Regarding the Augmented Dickey-

Fuller test, the null hypothesis is that the analyzed time series contains a unit root and it is implicitly non-stationary. On the other hand, the alternative hypothesis is that the analyzed time series does not have a unit root. The analysis performed in this article has led to the conclusion that the time series based on SBI TOP index daily closing price is not stationary in levels, regarding the level of confidence, which is 1%, 5% and 10%.

Analyzing the results based on continuously compounded returns it can be concluded that $t_{\text{test_ADF}} < t_{\text{critic}}(1\%, 5\%, 10\%)$ so the null hypothesis H_0 is rejected and the analyzed time series is stationary. Simultaneous, it is obtain the following result: $\text{Prob}(0\%) < \text{test levels}(1\%, 5\%, 10\%)$ so the null hypothesis H_0 is rejected and the analyzed time series is stationary.

Concomitant, the BDS test was used to determine whether the residuals are independent and identically distributed. In this respect BDS test is an econometric tool for detecting serial dependence in financial time series. In other words, this diagnostic test is based on the null hypothesis of independent and identically distributed (I.I.D.) time series. The alternative hypothesis suggests that the time series is non-linearly dependent, which is a characteristic of chaotic behavior. The null hypothesis should be rejected if the BDS test statistic is greater than or less than the critical values. The null hypothesis was rejected.

The empirical results are presented in Annexes.

Conclusions

This article provides additional empirical evidence of emerging capital markets behavior in the context of the global financial crisis. This particular category of capital markets is characterized by a spiny bouquet of basic characteristics, such as: volatility clustering, non-stationarity of price levels, leverage effect, heteroskedastic log returns, deviations from normal distribution, unpredictability, fat-tailed distributions, time variation and chaos. In addition, Ljubljana Stock Exchange is distinguished by certain intrinsic disturbances like: incomplete legislative regulations, infrastructure and institutional imbalances, a persistent lack of liquidity which diminishes foreign investors interest, a quite overwhelming influence of the government in the economic field, an obvious adversity for foreign partnerships and ownership. Nevertheless, it is considered to be one of the most attractive and profitable European stock exchanges. The propagation effects of the global financial crisis on Ljubljana Stock Exchange are strongly supported by empirical analysis.

Annexes*Table 1***Augmented Dickey-Fuller Test**

Null Hypothesis: LOG_RETURNS has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic based on SIC, MAXLAG=26)

		t-Statistic	Prob.*
<hr/>			
Augmented Dickey-Fuller test statistic		-33.75928	0.0000
Test critical values:	1% level	-3.432847	
	5% level	-2.862529	
	10% level	-2.567342	
<hr/>			
Augmented Dickey-Fuller Test Equation			
Dependent Variable: D(LOG_RETURNS)			
Method: Least Squares			
Included observations: 2430 after adjustments			
<hr/>			
R-squared	0.407796	Mean dependent var	-5.45E-07
Adjusted R-squared	0.407308	S.D. dependent var	0.006165
S.E. of regression	0.004746	Akaike info criterion	-7.861840
Sum squared resid	0.054665	Schwarz criterion	-7.854685
Log likelihood	9555.135	F-statistic	835.6259
Durbin-Watson stat	2.000834	Prob(F-statistic)	0.000000

*Table 2***BDS Test for SBI TOP index**

BDS Test for LOG_RETURNS

Included observations: 2433

Dimension	BDS Statistic	Std. Error	z-Statistic	Prob.
2	0.041687	0.002009	20.75100	0.0000
3	0.075313	0.003187	23.63135	0.0000
4	0.097380	0.003789	25.69925	0.0000
5	0.111398	0.003944	28.24628	0.0000
6	0.117567	0.003798	30.95375	0.0000
Raw epsilon		0.005776		
Pairs within epsilon		4153826.	V-statistic	0.702298
Triples within epsilon		7.81E+09	V-statistic	0.542747

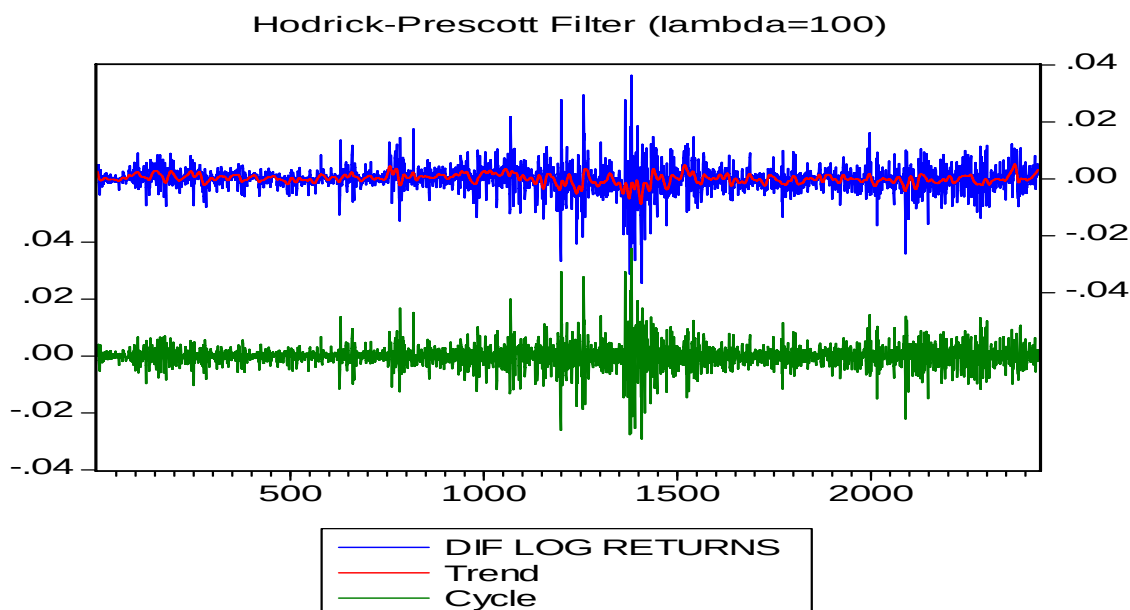


Figure 5. Hodrick–Prescott Filter

Table 3

Empirical Distribution Test for SBI TOP index

Empirical Distribution Test for LOG_RETURNS

Hypothesis: Normal

Method	Value	Adj. Value	Probability	
Lilliefors (D)	0.093999	NA	0.0000	
Cramer-von Mises (W2)	8.715166	8.716958	0.0000	
Watson (U2)	8.651839	8.653618	0.0000	
Anderson-Darling (A2)	48.36044	48.37537	0.0000	
Method: Maximum Likelihood - d.f. corrected (Exact Solution)				
Parameter	Value	Std. Error	z-Statistic	Prob.
MU	2.52E-05	9.83E-05	0.256934	0.7972
SIGMA	0.004845	6.95E-05	69.72804	0.0000
Log likelihood	9511.594	Mean dependent var.		2.52E-05
No. of Coefficients	2	S.D. dependent var.		0.004845

Table 4

Autocorrelations

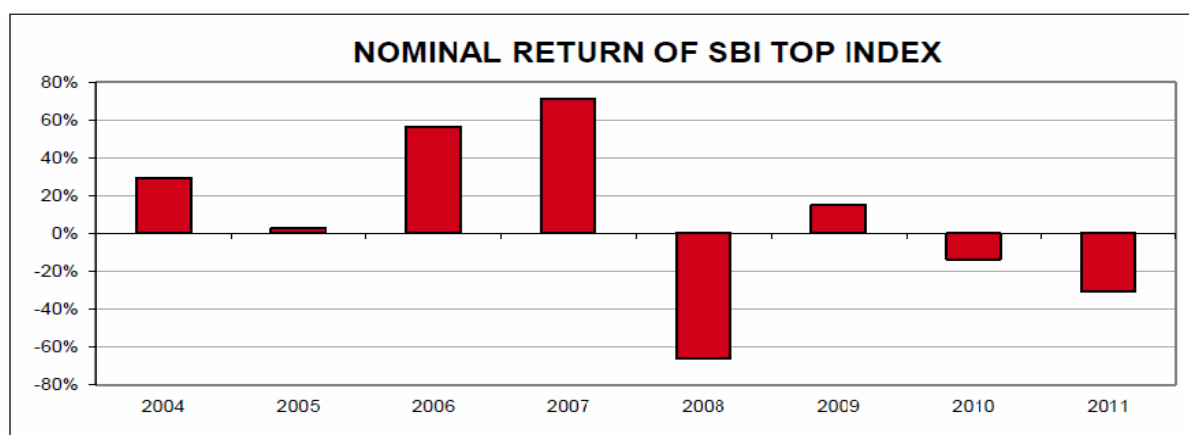
Series: dif log returns					
Lag	Autocorrelation	Std. Error ^a	Box-Ljung Statistic		
			Value	df	Sig. ^b
1	.191	.020	88.996	1	.000
2	-.035	.020	92.019	2	.000
3	-.026	.020	93.729	3	.000
4	-.012	.020	94.101	4	.000
5	.021	.020	95.128	5	.000
6	.008	.020	95.280	6	.000
7	-.007	.020	95.410	7	.000
8	.045	.020	100.253	8	.000
9	.001	.020	100.254	9	.000
10	.026	.020	101.897	10	.000
11	.022	.020	103.051	11	.000
12	-.007	.020	103.180	12	.000
13	.063	.020	112.909	13	.000
14	.080	.020	128.762	14	.000
15	.075	.020	142.645	15	.000
16	.043	.020	147.174	16	.000
a. The underlying process assumed is independence (white noise).					
b. Based on the asymptotic chi-square approximation.					

Table 5

Total turnover and trades

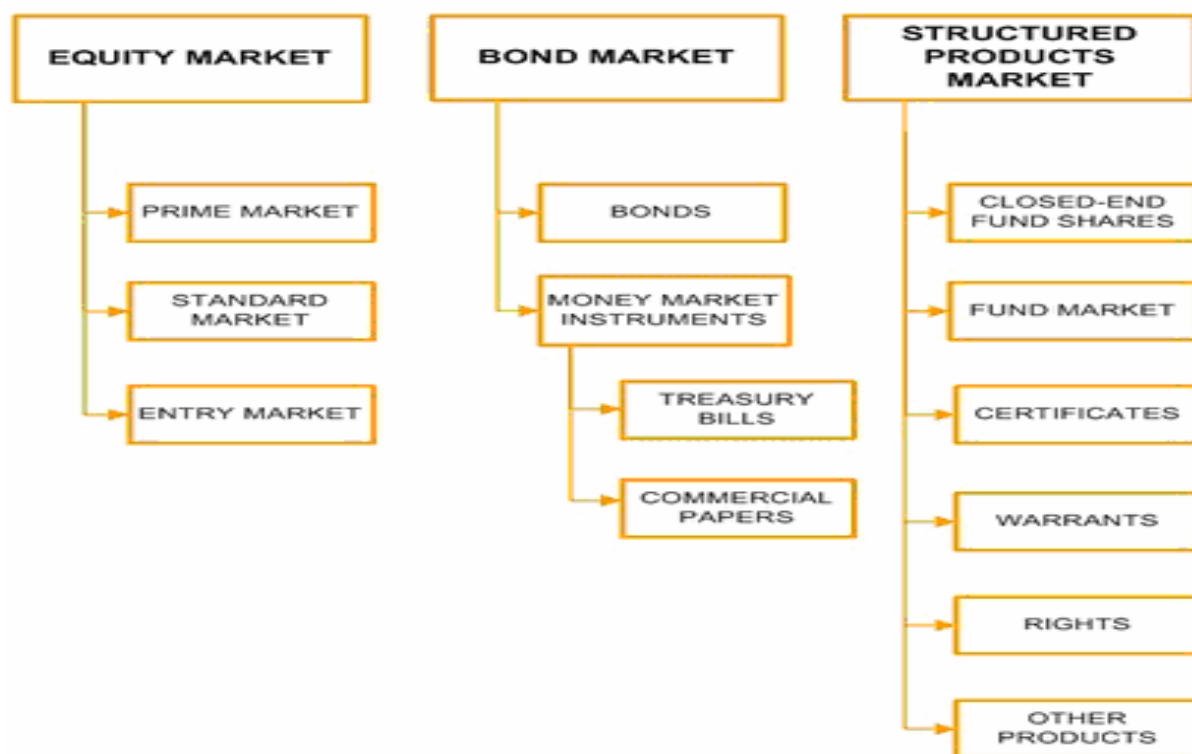
Year	Total turnover and trades					
	Number of trading days	Turnover (in EUR)			Number of trades	
		per year	average per day	average per trade	per year	average per day
2011	250	470,063,642	1,870,805	4,758	97,560	391
2010	251	492,540,215	1,962,550	3,992	123,044	491
2009	251	904,021,130	3,593,223	5,801	162,100	646
2008	250	1,285,790,498	5,129,748	4,907	249,679	998
2007	246	2,226,900,708	9,052,442	7,871	282,939	1,150
2006	247	996,477,198	4,034,321	4,353	228,941	927
2005	250	579,204,722	2,316,819	2,263	255,908	1,024
2004	255	837,861,029	3,285,730	2,382	351,760	1,379
2003	249	700,844,661	2,814,637	2,058	340,582	1,368
2002	247	1,156,611,591	4,682,638	2,563	451,250	1,827
2001	247	707,615,828	2,864,841	2,221	318,645	1,290
2000	249	1,174,224,149	4,715,760	2,971	395,284	1,587
1999	254	1,397,785,135	5,503,091	3,134	445,966	1,756
1998	252	2,259,292,124	8,965,445	9,531	237,049	941

Source: Annual statistics of Ljubljana Stock Exchange (2011), Year XVII, No. 12/11.



Source: Annual statistics of Ljubljana Stock Exchange (2011), Year XVII, No. 12/11.

Figure 6. Nominal returns of SBI TOP in the period 2004-2012



Source: Official website of Ljubljana Stock Exchange <http://www.ljse.si/cgi-bin/jve.cgi?doc=8337>

Figure 7. Structure and classification of markets and products on Ljubljana Stock Exchange

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MAIN RESULTS OF ANALYSES UNDERTAKEN ON THE ARBITRAGE PRICING MODEL

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Abstract. *This paper offers, in a descriptive manner, a summary of some important results of research undertaken on the APT model (Arbitrage Pricing Theory), by means of theoretical approaches or by empirical testing. The factors which determine the stocks return are investigated, whether these factors exist and the way in which they influence the stocks pricing processes. Specifically, in order to fulfill the goal of applying the model, one must try to relax some of the assumptions, so the model might come closer to the reality of finance. The APT model was first stated by Ross, in 1976.*

Keywords: assets; empirical tests; return; assets pricing; explanatory factors.

JEL Classification: G12.

REL Classification: 11B.

The APT model is a general arbitrage model, where the arbitrage is obtained under the influence of several macroeconomic factors that determine financial investments' return. These factors are represented by the growth rate of the gross domestic product, the inflation rate, the interest rate, etc. The model implies both a negation of some restrictive hypothesis, valid for developing previous models, and an advancement towards generalizing financial phenomena and ruling out financial reality's simplifications (Stancu, 2007, p. 52).

For the purpose of dropping the too restrictive hypotheses of the CAPM assets pricing model, Stephen Ross developed a more general model. In a competitive market setting, the set of price-value arbitrages will determine the same return for the level of risk assumed. This return is a function of the traded asset's expected return and of the unexpected influence of different macroeconomic factors, accompanied by corresponding sensitivity coefficients:

$$R_{it} = E(R_{it}) + \sum_{k=1}^K b_{ik} \times f_{kt} + \varepsilon_{it}$$

The notation system is as follows: R_{it} = the return earned by asset i , at a certain moment in time t ; $E(R_{it})$ = the expected return for asset i ; f_{kt} = a risk factor which impacts on the return of asset i ; b_{ik} = a sensitivity coefficient of R_{it} to f_{kt} ; ε_{it} = a normally distributed residual error which measures the unexplained return earned by asset i . The model works with K risk factors.

The arbitrage pricing model is based on fewer and less restrictive assumptions as compared to the more familiar capital asset pricing model (Ross, 1976, pp. 341-360):

- ✓ financial markets are perfectly competitive and frictionless;
- ✓ investors prefer more wealth to less wealth and are characterized by risk aversion;
- ✓ investors believe that, for a set of considered assets, the return can be explained, over time, by a stochastic process such as the one described above.

In addition, the ex-post return of a traded asset can be divided into two components (Van Rensburg, 1997: pp. 60-64). The first component is the expected return $E(R_{it})$; this is a portion of the total return which shareholders predict and which integrates all the information that shareholders have access to, concerning the considered asset. The second component is

the portion of the total return which arises from surprises and unanticipated information; it may be called “risky return”. Applying the distinction between systematic and unsystematic risk allows for rewriting the previous return function – this time without any explanatory factors present:

$$R_{it} = E(R_{it}) + S_{it} + \varepsilon_{it} .$$

The notation system is as follows: R_{it} and $E(R_{it})$ are as previously defined; S_{it} = the unexpected return earned by asset i , generated by the influence of systematic risk factors; ε_{it} = the unexpected return of asset i , generated by unsystematic risk factors.

The arbitrage model that Ross stated in 1976 represents an effective alternative to utility based models, such as CAPM. In the same vein, Solnik offers an analysis of the international extension of arbitrage pricing theory, i.e. the IAPT model. International arbitrage pricing theory shows that, if a factor model is verified when asset returns are expressed in some arbitrarily chosen currency, then this factor structure, as well as its major conclusions, is invariant to the chosen currency. The relation between factor coefficients, as measured in different currencies, had been thoroughly investigated (Solnik, 1983, pp. 449-457).

Some researchers intended to reconcile the CAPM and APT models by means of theoretical argumentation. Starting from the hypotheses advanced by Ross in APT, Wei [1988] tried to relax (even more) these assumptions so as to approach an actual situation and allow practical use of the model. The conclusion is that the APT model with extended equilibrium allows reaching a precise model for determining the influence of assets' return, simply by adding the market portfolio as an explanatory factor. Other results may lead to a generalization of the empirical APT model in the sense that some factors may be omitted from the econometric model (Wei, 1988, pp. 881-892).

A valuable empirical testing of the arbitrage pricing model was carried out by Roll and Ross [1980]. The authors used data collected for securities listed on the American market, during the 1962-1972 period (Roll & Ross, 1980, pp. 1073-1103). The testing followed a two-step method. Firstly, the expected returns and the factor coefficients are estimated from time series data on individual asset returns. Secondly, the estimates are used to test the basic cross-sectional pricing conclusion of the APT. The results show that there are at least three factors which influence securities' return.

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INFLUENCE OF REGIME SWITCHING TO RISK IN PORT-MODERN PORTFOLIO MANAGEMENT

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Abstract. *The present financial crises determines an increase in analysing the application of regime switching over portfolio investments. We applied the switching regimes to measurement of risk as presented in post-modern portfolio management theory.*

Post-modern portfolio theory include investor's tendency to measure risk as the chance to obtain from the investment performed a return lower than the minimum expected by him. The investor, as presented by behavioural finance, is more concerned about his emotional satisfaction as result of the investment process than to obtain an optimal mathematical return.

Keywords: post-modern portfolio theory; switching regimes; risk measure; minimum expected return.

JEL Classification: G12, G02.

REL Classification: 11B.

Introduction

Usually one invests his saving in a portfolio in order to obtain greater revenues at the end of the investment period. Due to the large area of potential financial investments starting from bank savings to complex portfolios, the problem of investment is not an easy one, involving a lot of time and money spent for its management. The purpose of the present paper is not to debate the management of portfolios, but to look at a narrow aspect influencing the portfolios returns – the influence of regime switching over the attitude of the investor.

There is an extend literature debating which investment attitude insures a higher return – an active investment or a passive attitude. Some, as Grobys (2010) include in consideration of investor attitude also the cost of active trading, while many (Alexander, Dimitriu, 2005) consider only the returns obtained from the investment management. Both papers mentioned above, as most of the paper concerning the active or passive investors' attitude, regard the relation of the invested portfolio related to a benchmark or an index. The influence of the business cycles is mostly measured by the abnormal returns obtained from the investor's portfolio related to a market benchmark – that could be a market index or a portfolio created from assets available on the market for trading.

The post-modern portfolio theory (PMPT) brings a different approach related to the benchmark used for an investment return. PMPT states that investor does not necessarily report his profits to a benchmark existing on the market or formed from assets on the market, but to his own minimum expected return rate. The minimum expected return rate can be lower, identical or higher to any benchmark established based on weighted assets. Our paper

sets the benchmark equal to the investor minimum expected return and analyse the influence of the regime switching to this benchmark.

Although the use of minimum expected return rate and the use of a market benchmark seem similar, they comport different approaches. Dissimilar to continuous evolution of the market benchmark, the minimum expected return rate is stable or very little over time on investor will. While the benchmark formed from weighting assets follows market evolution, the investor minimum expected return rate is the level of return that allows his to obtain a subjective emotional comfort and is not varying directly with market evolution.

We shall also analyse another aspect – the influence of the investment horizon. Many papers create econometric models and test them over period of times established by the researches and usually those periods of time extend to several years of daily transactions. Investors usually do not make investments over so long time periods; and even if the investment period is extended over several years, investors measure their investments returns on shorter period of time.

Before going further with the research, we must mention that the paper does not debate the allocation decisions and the weight of assets composing an optimal portfolio. The paper focuses mainly on the influence of price evolution over the minimum expected return rate imposed by investor as an “outside the market” benchmark and on the length of investment horizon on various periods. In order to test the influence of the investment horizon we shall consider only portfolios invested over one period of time and shall not include the problem of rebalancing portfolios. Rebalancing of the portfolio implies high trading costs as research performed in this area shown and the investment returns may be severally affected depending on the frequency of changing the portfolio structure (Grobys, 2010). Many papers debating the rebalancing optimisation goes for few rebalancing over more extend period of time.

From the above results several questions that we try to answer in the following pages: could an investor keeps a constant minimum expected return rate without changing his investment risk? or should the investor adjust his minimum expected return rate? considering that the investor maintains for the entire period a constant relative risk aversion. The period of data between January 2005 and ends in June 2012 used for the empirical test is appropriate for our research, due to the period of financial crises manifested within this period. Will the investor be force to follow a “defensive” investment strategy (Grobys, 2012) in order to face the challenge of switching regimes?

Adapting to regime changes taken place on the capital market is capital of investment results. Boldin, Cici (2010) reflect the attention that the investor has to pay regarding the changes of market conditions, highlighting that not all actively managed portfolios outperform a market index. Guidolin, Timmermann (2006) show that assets do follow not a linear process but regimes switching evolution with different returns and coefficients specific to each period of evolution.

The model used for computing data

In this chapter we shall present the econometric model for switching regime market evolution considering a first order autoregression using Markov chain. As described in Seidl (2012), the switching regime is described using a first order autoregression:

$$r_t = c_{S_t} + \phi \times r_{t-1} + \varepsilon_t \quad (1)$$

with S_t being the state of the regime and $\varepsilon_t \sim N(0, \sigma_{\varepsilon_t}^2)$ following a normal distribution for S_t .

The coefficient $c_{S_t} \in [c_1, c_2]$ reflecting the possible state of the regime on period t, r_t is the return for the period t. The probability of regimes follows a two-state Markov chain, the return on period t depend only on the return of the previous state of regime, but does not have the “memory” of other past state of regimes.

$$P(S_t = j | S_{t-1} = i, S_{t-2} = k, \dots) = P(S_t = j | S_{t-1} = i) = p_{ij}$$

Seidl (2012) shows that the conditional density for observation y_t is:

$$f(y_t | \Omega_{t-1}; \Theta) = \sum_{j=1}^2 \sum_{i=1}^2 p_{ij} \times \xi_{i,t-1} \times \eta_{jt}$$

with $\Theta = (\sigma, \theta, c_1, c_2, p_{11}, p_{22})$ represents the parameters vector and $\Omega_t = (y_t, y_{t-1}, y_{t-2}, \dots)$ is the set of observations of historical series of values. The conditional densities of the two regimes have a normal distribution:

$$\eta_{jt} = \frac{1}{\sqrt{2\pi}\sigma} \times e^{-\frac{(y_t - \theta_j - \theta \times y_{t-1})^2}{2\sigma^2}}$$

$$\text{and } \xi_{jt} = \frac{\sum_{i=1}^2 p_{ij} \times \xi_{i,t-1} \times \eta_{jt}}{f(y_t | \Omega_{t-1}; \Theta)} P(S_t = j | \Omega_t; \Theta) \text{ and } \xi_{1,t} + \xi_{2,t} = 1$$

Grobys (2012), in line with Guidolin, Timmermann (2006) presents a generalisation and highlight the values of coefficient c_{S_t} . The formula (1) is generalized as:

$$r_t = \mu_{S_t} + \sum_{j=1}^p \Phi_{j,S_t} \times r_{t-j} + \varepsilon_t$$

Coefficient c_{S_t} is considered as μ_{S_t} denoting the expectation of the asset return. In the generalised model there are possible more states of the market, but Grobys uses also a two states market – bull and bear. We shall also use further the market with two states as it correspond to majority of the studies performed and it better reflects the usage of the post modern portfolio theory – the concern of the investor that a portfolio has a higher or a lower return than the minimum return that he expects.

The vector that designs the life of an investment over several regimes is given in Grobys (2012):

$$\begin{pmatrix} r_t \\ \vdots \\ r_m \end{pmatrix} = \begin{pmatrix} \mu_{S_t} \\ \vdots \\ \mu_{S_m} \end{pmatrix} + \sum_{j=1}^p \Phi_{j,S_t} \times \begin{pmatrix} r_{t-j} \\ \vdots \\ r_{m-j} \end{pmatrix} + \begin{pmatrix} \varepsilon_t \\ \vdots \\ \varepsilon_m \end{pmatrix}$$

The present financial crises increase the preoccupation for studies that include the non-normality of asset returns in models, Grobys (2010, 2012) divide the time series in periods of “bull” and “bear” evolution.

The modern portfolio theory, that put a logic relation between distribution of return rates and risk of the investment, considered that investors act rational in taking decisions and that they have aversion to risk. Over time, some of the restrictions imposed by the modern portfolio theory were relaxed and adapted to the market reality.

Restrictions related to investors rational behaviour and interest in maximization of returns were questioned by behavioural finance that consider that investors try to obtain emotional comfort rather than financial efficiency (Kahneman, Tversky, 1979, Barberis et al, 1996, Welch, 2010, Bertsimas et al, 2004, Patari, 2008, Dronin, 2012, Rani, 2012). Investors are not comfortable with losses, but like gains over the minimum expected return (considered as premium for the courage of investing – Tsai, Wang, 2012). The PMPT maintain the condition of continuous distribution function (Sortino, Forsey, 1996).

The risk in the post-modern portfolio theory is possibility of returns to be inferior to the minimum return expected by investor considered as benchmark (Nawrocki, 1999, Bawa, Lindenberg, 1977, Fishburn, 1977, Sortino, Forsey, 1996, Huang, 2008). Nawrocki (1999), Kaplan, Siegel (1994) completes the assumption and mentions that the investors' expectations modify over time; so the expected return level modifies together with modification of investment sum, investment horizon and his risk aversion. The attitude towards risk depends on the investor affinity to risk (Kaplan, Siegel, 1994). Minimum return rate expected by the

investor (noted with M) is considered part of the investment policy and is not an intrinsic characteristic of the asset set of returns like average return rate or standard deviation.

The risk in PMPT is defined by the downside risk (noted with V_i), having as benchmark the minimum accepted return rate requested by the investor in order to perform the investment. Risk depends on the portfolio return rate distribution and the minimum expected return rate M .

$$V_i = \int_{-\infty}^M (r - M)^2 \times f(r) dr$$

So, the downside risk for the future investment period t for an investor that expects a minimum return rate M , considering the limited space Ω_{t-1} of past observed return and the set of parameters Θ is:

$$V_{it} = \int_{-\infty}^M (r_t - M_t)^2 \times f(r_t | \Omega_{t-1}; \Theta) dr$$

We introduce the notation M_t because investor may vary the level of minimum expected return rate over period, depending on the state of the market – bull or bear market.

Data selection

The database containing trades of shares listed on Bucharest Stock Exchange (Romanian abbreviation BVB) over the period between January 2005 and ends in June 2012. The selected period for analyse include several years before the financial crises and several years during the financial crises – it allows us to understand the impact of the financial crises. In this period there are 1780 days for trading shares of the 80 companies listed on BVB.

There were applied several criteria of filtering the database. First, there were select companies that had at least 500 days of quotation (about two years of daily trading, considering that a year has around 250 trading days). BVB has shares facing liquidity problems (several consecutive days without trading) which influence over the correct evaluation of shares price (Geambasu, Stancu, 2010), there were kept only shares that were trade more that 75% of the trading days in one year for the period the company was listed (not applicable for the first year of listing a company). It was applied another criterion to insure the relevance of data to present – there were selected only shares that have quotation in more than 80% of the possible trading days in the last three years of the period analysed.

The filtered database remained with 40 companies that passed all the selection criteria applied. For more relevance to analyse, there were included BVB indexes portfolios BET and BET-C - the main indexes of BVB

There were used windows that enlarged from 200 to 1000 daily of quotation. Each window was moved from the first quotation of the company on BVB to the last, and for each position of the window were computed data.

We used the following notation to identify the inferior probability computed for a specific company, numbers of days included in the window and first date from the window computed:

$$V_{it}^{c,w,d,p} = \int_{-\infty}^M (r_t - M_t)^2 \times f(r_t | \Omega_{t-1}; \Theta) dr$$

$$sV_{it}^{c,w,d,p} = \left(\int_{-\infty}^M (r_t - M_t)^2 \times f(r_t | \Omega_{t-1}; \Theta) dr \right)^{\frac{1}{2}}$$

where c is the company (from the 40 companies included in the analyse), w is the window length (takes values from 200 to 1000 – number of quotation days included in the window), d – the first quotation day of the window. The windows cover from 10 month to 4 years, increasing progressively. For determining the influence of minimum expected return M , for each interval of computing data we tested various position of M . In order to determine the position of M on the distribution, we used p as percentage that takes values from 1% to 99%; M is computed as:

$$M = \text{Min} + p \times (\text{Max} - \text{Min}) \quad \text{where } p \in [1\%; 99\%],$$

where Min is the minimum value from the interval, Max is the maximum value from the interval. Using this procedure we moved M through the distribution of returns rate from Min to Max.

For each company there were computed about 800 windows types. Depending on the date of the first quotation and on the window number of days included, each window type, for each company we had several hundred values. For example, for a company that was first quoted before January 2005 and was active over the entire analysed period and had quotations in all days of the analyses period, the window type with 200 days included has over 1500 computed data, the first interval is from January 03rd, 2005 to October 14th, 2005, while the last interval is from September 21st, 2011 to June 29th, 2012. For the same company, for the window type with 1000 days included, the first interval is between January 03rd, 2005 and January 12th, 2009, while the last interval is between February 15th, 2008 and June 29th, 2012 – there are over 775 windows created with 1000 days included.

Results from processing data

The evolution of risk, for the same position of M increase as the regime switches from a bull market to a bear market. The graphic presents various years for first date in the window and for several length of the windows. As the market enters in the financial crises period the risk increase, for an investor that maintains a fix position of M on the distribution of returns – p is constant.

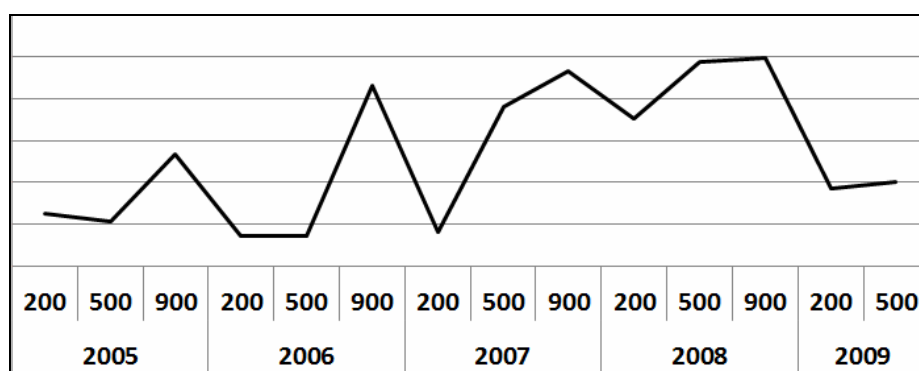


Figure 1. Evolution of downside risk over period 2005 – 2010

If the investor would maintain the same minimum expected return rate as absolute value, as the regime switch to a bear market, the position of M would modify and increase the position p on the distribution of return rates. This would also increase the risk even more that to maintain the same p.

Table 1

Downside risk for p=10%, 20%, 30% and year 2005 as benchmark

days in window	position of M : p=10%			position of M : p=20%			position of M : p=30%		
	2006	2007	2008	2006	2007	2008	2006	2007	2008
200	0.070	0.067	0.231	0.157	0.154	0.567	0.278	0.280	0.933
300	0.064	0.067	0.298	0.143	0.193	0.751	0.252	0.358	1.242
400	0.061	0.098	0.296	0.134	0.410	0.780	0.237	0.767	1.310
500	0.060	0.122	0.302	0.133	0.586	0.815	0.237	1.100	1.387
600	0.081	0.134	0.315	0.318	0.660	0.851	0.594	1.244	1.454
700	0.111	0.137	0.326	0.529	0.680	0.884	0.992	1.292	1.517
800	0.139	0.140	0.336	0.699	0.702	0.912	1.314	1.343	1.568
900	0.140	0.143	0.323	0.710	0.721	0.904	1.343	1.388	1.574
1000	0.142	0.145	0.306	0.726	0.739	0.893	1.385	1.428	1.578

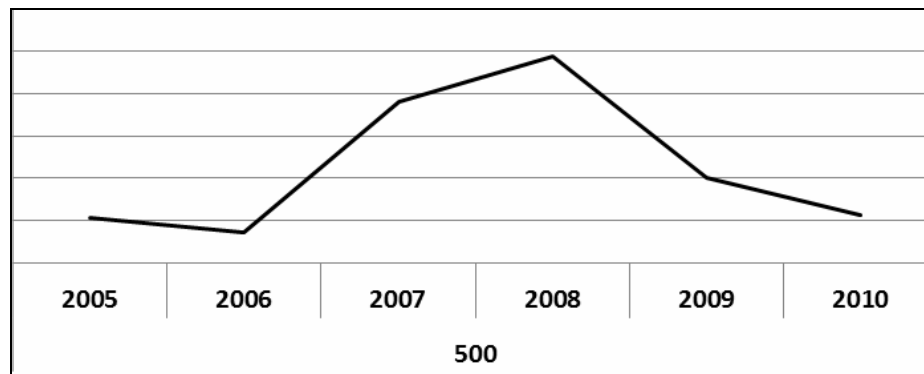


Figure 2. Evolution of downside risk over period 2005 – 2010 for the same $p=50\%$ and windows length = 500 days

On analysis of the evolution of downside risk over time, maintaining the same position of M on the distribution of return rates and the same windows length, the switching from bull to bear market induce an increase of risk, while the switch from bear to bull market the risk decrease.

Discussion

As conclusion, the risk increase drastically if one maintains the absolute level of minimum expected return rate M on the switch from a bull to bear market. If the investor maintains the position of M on the distribution of return rates (a relative level for M), the risk increase at switch from bull to bear market, and register a decrease when the switch reverse from bear to bull market.

The investor has to decide at least over two issues depending on his tolerance to risk and to his wish relative to gain. If the investor is indifferent to risk involved by his investment, then he could maintain an absolute value of M . On the other hand, if the investor needs to keep his risk level, the investor has to decrease M drastically when the market regime switches from a bull to a bear market.

Limitation

The empirical results of the present article are limited to the data and to the period included in analyses. If the models are applied to other sets of data might generate different empirical results. The theoretical aspects presented should remain valid for majority of data sets involved.

Another limitation of the empirical results is generated by the fact that we use historical set of data, no estimative data related to future evolution were available and certified for a pertinent analysis. The issue of data used in PMPT analyses generated debates in the scientific literature between Kaplan, Siegel (1994) that sustain the use of historical data for understanding the past and prefiguring the future and Rom, Ferguson (1993) that intent to use predictive data about future evolution in order to determine the correct decisions to be taken for future investments.

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MARKET TIMING AND SELECTIVITY WITHIN ROMANIAN BALANCED FUNDS INDUSTRY

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Abstract. *This paper studies the performance of Romanian balanced funds over the period 2005-2011. It analyzes recent evolutions of Romanian balanced funds industry and it tries to assess the risk-adjusted performance of this category of funds as well as the market timing and selectivity abilities of funds’ managers. The results show that Romanian balanced funds had a negative risk adjusted performance, meaning that they did not generate excess return per level of risk. Facing the negative evolution of the capital market, investors’ distrust and the legal limits imposed on portfolio diversification, funds’ managers have had a hard time adjusting their portfolios and generating performance.*

Keywords: mutual funds; risk-adjusted performance; performance decomposition; market timing; selectivity.

JEL Classification: G12, G20, G23.

REL Classification: 7Z.

1. Introduction

Even if in Romania there is a limited tradition of private investment in stocks and mutual funds, the market for these vehicles has surprisingly developed since 2000. Nevertheless the Romanian mutual fund industry is still behind the fund markets of other European countries.

Mutual funds are investment vehicles designed to answer to investors needs with respect to expected return and risk aversion. According to the investment strategy, there are four main categories of open-ended funds: stock funds, balanced funds, bond funds and monetary funds.

Balanced funds invest in both equity holdings (maximum 66%) and bonds. They offer high expected returns for a medium risk and are medium and long term investments.

Our aim is to provide an overview of the Romanian balanced funds market and to measure the risk adjusted performance for five of the most durable funds within this category.

The period between 2004 and 2007 is considered to be the boom of financial investment globally, but an obvious increase can be also observed in the national markets. The reason behind growth in the mutual fund industry are the regulations imposed by the legislative organisms CNVM, which create a more safer and stable investment environment, and the presence of a more knowledgeable and informed investor type. Following the events of the year 2000, investors trust starts to gradually build up again.

The entrance in the mutual fund industry of many well known and trusted bank institutions also contributed to the visible growth that mutual funds experienced in that period.

Table 1

Evolution of the performance of balanced funds 2004-2007

(%)

Indicator	2004	2005	2006	2007
BET INDEX	100.96	50.9	22.23	22.05
Annual average return	27.9	25.78	13.64	11.27
Inflation rate	11.9	9	6.56	4.84
Interest rate on deposits	15.44	8.35	7.46	6.7

Source: BNR, kmarket, author's calculations.

The balanced funds managed to obtain returns above the annual rate of inflation, but did not surpass the BET Index. They have had lower performance results than those of the equity funds but higher than those of monetary and bond funds. None of the funds surpassed the BET Index during those for years; the highest return of 2005 was generated by BCR Dinamic (33.38%), in 2006 Transilvania mutual fund had a return of 18.4%, close to the BET Index and in 2007 Fortuna Classic managed to have the highest return of 14.4%. In 2007 the performances of the balanced funds were very poor in comparison to those of the equity funds.

The 2007 financial crises was a consequence of risk mispricing, financial innovation and lack of regulatory supervision. The external and the internal economic challenges had a great effect on the Romanian capital market in general and on the not yet mature mutual fund industry, in particular. The amounts in which the balanced funds were affected by the crises depended on their individual exposure to risky assets, such as listed shares, in comparison to their holdings of bonds or less risky assets. Although balanced funds have performed better than equity funds over this period, they still rendered low, in some years even negative, returns.

Table 2

Indicators of balanced fund's performance 2008-2011

Indicator	2008	2009	2010	2011
Net flow	282.359	239.858	295.859	286.468
Market share	21.49%	7.69%	5.36%	3.11%
Number of investors	50033	47743	51962	34154

Source: kmarket, authors' computations.

Although the number of existing balanced funds has increased over this period, from 18 balanced funds in 2008 to 25 in 2011, investors are still reluctant to place their capital in such types of funds, because they view them as being too risky. In a period of economic downturn, investors do not search for a well diversified portfolio, but rather for a safe investment, offered by bonds, bank deposits, CDs and Certificates of Treasury. Although the balanced funds did not perform as bad as the equity funds, they still had negative returns in two years and the positive returns obtained in 2009 and 2010 were not as high as those of the equity funds.

Table 3

Performance indicators of balanced funds 2008-2011

(%)

Indicator	2008	2009	2010	2011
BET INDEX	-70.47	61.68	12.32	-17.68
Annual average return	-26.06	18.96	5.3	-5.03
Inflation rate	7.85	5.59	6.09	5.79
Interest rate on deposits	9.51	11.99	7.31	6.29

Source: author's computations.

2009 was the only year in which the balanced funds managed to obtain returns above the rate of inflation and the term deposit rate. The maximum return of that year was 33,6% , obtained by Raiffeisen Benefit.

2011 brought lower returns, with the maximum return being 4.5% obtained by Carpatica Global. In conclusion, balanced funds performed poorly between 2008 and 2011 offering to investors extremely low returns in comparison to interest rates on deposits. Investors were dissatisfied with these funds performances, as can be seen in the decrease of the market share and of the net assets invested in this fund category.

The interest for mutual funds performance evaluation has increased during the last decades together with the role played by institutional investors on the financial markets.

Many recent studies have tried to answer the question whether active management adds value to the portfolio. For a „mean-variance” investor the question may be expressed differently: Adding stocks to an actively managed mutual fund portfolio will affect the efficient frontier? If the answer is negative than the investor should rather prefer low commissions index funds.

This paper tries to assess the risk-adjusted performance of Romanian balanced funds as well as the market timing and selectivity abilities of funds' managers. The results show that Romanian balanced funds had a negative risk adjusted performance, meaning they did not generate enough excess return per level of risk.

2. Literature review on performance decomposition and performance attribution analysis

In a perfect market, equilibrium return of all financial assets must lie on the Security Market Line. All operators, perfectly informed and rational, are expected to take exclusively optimal decisions. The strategy that they adopt, which consists of analyzing and using the information according to the theory, can be described as passive.

Instead, in the real market there are *pockets of inefficiency*, relatively unstable, providing opportunities of making considerable profits for those operators who consider themselves able to assume an active management. This takes two forms:

a. The operators able to identify safer and faster than others the securities which are temporarily over or undervalued will concentrate their resources on this particular type of assets and will build portfolios that are not optimal diversified. This ability to predict the securities' returns is called selectivity.

b. The operators with a superior ability to anticipate the evolution of the stock market will underlie their strategy as follows:

b1. Over the periods of market growth (bull market) they will build portfolios with a large number of aggressive stocks.

b2. At the first warning signs of stock market decline (bear market) they will substitute aggressive stocks with defensive stocks and fixed income securities, especially short-term

monetary instruments. In the financial literature, this ability to predict the general market movements is called market timing.

The managers who perform the first form of active management will select securities of which returns are higher than the benchmark. The managers who practice the second form of active management will increase the sensitivity (beta) of the portfolio if the market is expected to grow and will reduce the portfolio sensitivity if the market is expected to decrease. Superior performance will be due either to one of these strategies or to their mix. Because of the high transaction costs of active management, the quality of anticipation becomes crucial. The investor who does not consider himself above average will abstain from an active portfolio management strategy. In fact most institutional investors call themselves Index Funds – investment funds on the market index – and adopt a management policy which consists to follow the market, i.e. to hold a portfolio that is theoretically a perfect substitute of the market portfolio. As this is not possible in practice, there are using more or less sophisticated statistical techniques, as stratified sampling, in order to build portfolios of which returns are highly correlated with the market portfolio's return.

Performance attribution analysis raises many conceptual and empirical issues. The main concern is to define which of the two operator's capacities, selectivity or timing, generated performance and to what degree.

On this line, Admati (Admati et al., 1986, pp. 715-730) distinguished two approaches:

a. Portfolio approach, according to which the timing can be defined as follows. Let there be $n + 1$ portfolio, n risky portfolios and a portfolio composed exclusively of risk-free asset. If $k + 1$ of these portfolios are anticipating the market (market timing) then manager's optimal total portfolio is composed exclusively of these $k + 1$ portfolios. Market timing is therefore a particular case where k is equal to 1. This is the market portfolio. In this case the timing strategy consists of combining optimally the market portfolio with the risk-free asset. If, for example, the timing is industrial, then k is the number of sectors of which evolution can be anticipated by the manager. The inconvenient of this approach is that the information about individual stocks often allows predicting the portfolios evolution, so that both timing and selectivity abilities are not clearly defined.

b. Factor approach (of valuation model by arbitrage) clarifies the distinction between selectivity and timing. The information carried by factors refers to timing, the ones about residuals concern the selectivity.

The performance measurement of actively managed portfolios encounters a difficulty: these portfolios are intentionally not optimally diversified. To avoid this inconvenient, Fama (1972), suggests the use of another version of the systematic risk coefficient:

$$\beta_p = \frac{\sigma(\hat{R}_p, \hat{R}_m)}{\sigma(\hat{R}_m)}$$

The coefficient measures the contribution of asset i or of portfolio p to the total risk of the market portfolio. Although this concept seems closer to the analysis of an individual value, using it on portfolios is important from a methodological point of view in order to build a measure of performance.

The "Security Market Line" equation becomes:

$$E(\hat{R}_p) = R_f + \frac{E(\hat{R}_m) - R_f}{\sigma(\hat{R}_m)} \times \beta_p$$

$$R_p = R_f + \frac{R_m - R_f}{\sigma(R_m)} \times \beta_p$$

The previous equations express ex-ante measures (expectations) and ex-post measures (achievements). As the factorial model shows $\{R_i = E(R_i) + \beta_i(R_m - E(R_m)) + \varepsilon_i\}$, the difference between $(R_m - E(\hat{R}_m))$ is not necessarily zero.

2.1. Selectivity measurement

According to Fama (1972) the manager adopting this active management strategy will build a portfolio of which return is not perfectly correlated with the market portfolio's return.

$$\rho_{p,m} = \frac{\sigma(\hat{R}_p, \hat{R}_m)}{\sigma(\hat{R}_p) \times \sigma(\hat{R}_m)} < 1$$

$$\beta_p = \frac{\sigma(\hat{R}_p, \hat{R}_m)}{\sigma(\hat{R}_m)} = \rho_{p,m} \times \sigma(\hat{R}_p) < \sigma(\hat{R}_p)$$

The total risk $\sigma(R_p)$ of this imperfectly diversified portfolio is higher than its systematic risk (β_p).

$$R_p = R_f + \frac{R_m - R_f}{\sigma(R_m)} \times \beta_p$$

The total performance (GP) of a portfolio, measured by its risk premium was divided into two components, one measuring the selectivity (S) and the other the risk (R), i.e. the normal risk premium given the chose level of systematic risk.

$$GP = S + R$$

$$R_p - R_f = (R_p - (R_x/\beta_p)) + ((R_x/\beta_p) - R_f)$$

where $((R_x/\beta_p))$ is the efficient portfolio return with the same systematic risk as the portfolio p, this portfolio being defined by the expression:

$$R_x = X \times R_f + (1-X) \times R_m$$

Further it must be established whether the risk over-premium S obtained by the portfolio manager remunerates correctly the diversified risk that was intentionally not removed. This is measured by the distance $(\sigma(R_p) - \beta_p)$. A second reference point $(R_x/\sigma(R_p))$ will be established which is the efficient portfolio's return, whose level of systematic risk is equal to the total risk of the portfolio under evaluation.

The measure S can be decomposed into net selectivity (NS), i.e. the over-premium in relation to the efficient portfolio's return with the same risk and diversification (D), i.e. the risk premium obtained in addition to (R_x/β_p) in order to compensate for the diversified risk held in the portfolio.

The relationship can be written as:

$$(R_p - (R_x / \beta_p)) = (R_p - (R_x / \sigma(R_p))) + (R_x / \sigma(R_p) - (R_x / \beta_p))$$

For a manager with a negative net selectivity ($D > S$), his risk over-premium is not so high to compensate for the avoidable risk to which he was exposed.

If the stock market is decreasing in price over the period, the return and SML slope are negative. The manager can make a stock selection that, although inefficient in the Markowitz sense can be extremely defensive. The selected stocks resist in this case better than the average to the market decline so that net selectivity is not only positive but turns out to be even higher than the total selectivity: $SN = S - D$. However, D is also negative as GP and R are.

2.2. Market-timing evaluation

Market timing refers to the manager ability to anticipate the market evolution. If the manager predicts that the market will record in the future a higher increase than anticipated by most operators, he will increase the systematic risk of the portfolio in order to obtain an over

profit. If the manager does not consider that he is able of stock selectivity, he will then try to build efficient portfolios positioned on the SML. In this case $S = 0$ and $GP = R$.

We will present Fama's performance decomposition and attribution analysis. Let β_g be the risk level chosen by the manager and β_i the risk level accepted by the investor who has entrusted the money.

$$R_p = R_f + \frac{R_m - R_f}{\sigma(R_m)} \beta_p$$

$$E(R_p) = R_f + \frac{E(R_m) - R_f}{\sigma(R_m)} \beta_p$$

A first decomposing of the total performance can be made as follows:

$$(R_x / \beta_p) - R_f = ((R_x / \beta_g) - (R_x / \beta_i)) + ((R_x / \beta_i) - R_f)$$

where, $(R_x / \beta_p) - R_f$, $PG \equiv R$, represents the total risk premium;

$(R_x / \beta_g) - (R_x / \beta_i)$, RG , measures the manager's risk premium;

$(R_x / \beta_i) - R_f$, RI , measures the investor's risk premium.

RG is the over-profit obtained by the manager. A finer analysis of the manager's risk premium is obtained by introducing ex-ante measures:

$$R = ((R_x / \beta_g) - E(R_x / \beta_g)) - ((R_x / \beta_i) - E(R_x / \beta_i)) + (E(R_x / \beta_g) - E(R_x / \beta_i)) + ((R_x / \beta_i) - R_f)$$

where, $(R_x / \beta_g) - E(R_x / \beta_g)$, TT , denotes the total timing gain;

$(R_x / \beta_i) - E(R_x / \beta_i)$, CM , represents the gain due to market;

$E(R_x / \beta_g) - E(R_x / \beta_i)$, RAG , denotes the manager's expected gain;

$(R_x / \beta_i) - R_f$, RI , measures the investor's risk premium.

The following relations are valid: $TG = TT - CM$ and $RG = TG + RAG$.

The component RAG is isolated in the total risk premium, which is representing the additional gain due to the additional systematic risk level. To get the measure of the net earnings from timing (TG) will be extracted from the total gain, the over profit which the investor would have received if the manager would be limited to the risk of β_i .

Considering the market portfolio as benchmark, we determine ex-ante SML by relationship:

$$(R_x / \beta_g) - R_f = [(R_x / \beta_g) - E(R_x / \beta_g)] + [E(R_x / \beta_g) - E(R_x / \beta_i)] + [E(R_x / \beta_i) - R_f]$$

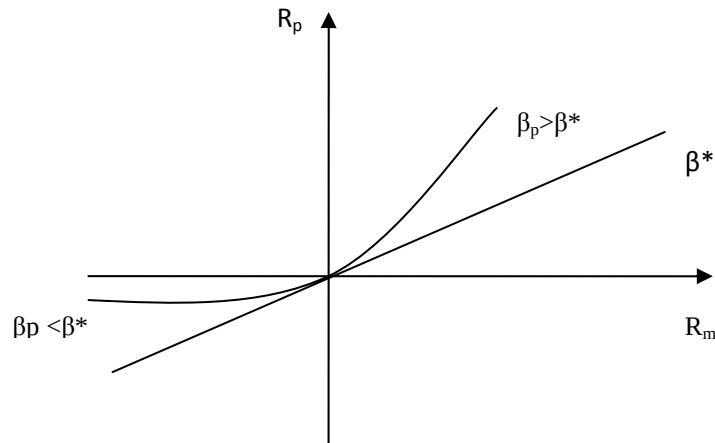
where, $E(R_x / \beta_i) - R_f$, RAI , expected return of the investor, i.e. the risk premium that he would have obtained to the level of assumed risk, if expectations regarding the market conditions would have been exactly correct.

$$(R_x / \beta_g) - R_f = [(R_x / \beta_g) - E(R_x / \beta_g)] + [E(R_x / \beta_g) - R_f]$$

Where $RAT = RAG + RAI$ is the total risk achieved.

2.3. Empirical issues related to performance decomposition

If the fund manager practices an efficient timing policy, then the β coefficient of the fund will have high values during bull markets and lower values during the periods of decline. This policy is illustrated in the figure below:



Source: Grandin P. (1998). *Mesure de Performance des Fonds d'Investissement*, p. 39.

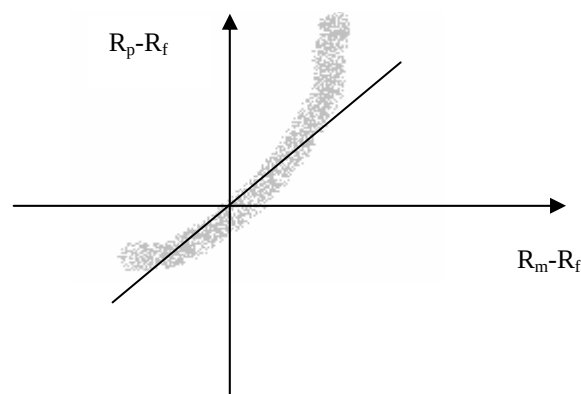
Figure 1. Market-timing ability

The line reflects the performance of the portfolio P if the manager does not change its average coefficient (β^*) according to the market evolution. If the manager adopts a policy of market timing, the portfolio performance depending on market evolution will be represented by a curve. In this case, the use of traditional measures in performance management valuation faces a number of difficulties.

The linear regression $R_{p,t} = \alpha_p + \beta_p R_{m,t} + \varepsilon_{p,t}$ becomes inadequate for estimating the relationship between the fund return and market return. β coefficient computed after Jensen's model overestimates the β coefficient of the portfolio. Consequently, it will generate an underestimated measure of α coefficient of Jensen and managers with real skills to anticipate the market will be valued negatively in terms of this measure.

To correctly capture the relationship between fund return and the market return a quadratic regression must be applied:

$$R_{p,t} = \alpha_p + b_p R_{m,t} + c_p R_{m,t}^2 + \varepsilon_{p,t}$$



Source: after Viviani (1997). *Gestion de portefeuille*, p. 290.

Figure 2. The relationship between market excess return and the portfolio return under timing

In order to overcome the empirical problems highlighted above there were developed several econometric models.

Treynor and Mazuy (1966) proposed a quadratic relationship between portfolio return and market return to appreciate timing ability of 57 funds in the period 1953-1962:

$$R_{p,t} - R_f = \alpha_p + \beta_p (R_{m,t} - R_f) + \gamma_p (R_{m,t} - R_f)^2 + \varepsilon_{p,t},$$

where α_p , β_p and γ_p are the estimated parameters of the model.

A quadratic term is added to traditional regression Jensen, α coefficient measuring further the performance. If manager practiced successfully the market-timing, γ coefficient is positive and significantly different from zero.

Using annual data, Treynor and Mazuy concluded, after estimating the model, that the quadratic equation did not correctly describe the relationship between portfolio return and market return for only one of the funds under study, in all other cases the quadratic relationship being preferable to the linear one. The conclusion of the study conclusion was that managers have not tried or have failed to implement an effective market-timing policy.

Kon and Jen (1979) have developed a performance model directly inspired from the decomposition proposed by Fama. The method aims to identify a correspondingly beta for periods of market growing and to identify an appropriate beta for market decreases. Regressions will depend on the sign of the difference between the market return and the risk free rate.

Sign $R_{m,t} - R_f$	Regression type
> 0	$R_{p,t} - R_f = \alpha_p + \beta_{1p} (R_{m,t} - R_f) + \varepsilon_{p,t}$
$= 0$	$R_{p,t} - R_f = \alpha_p + \varepsilon_{p,t}$
< 0	$R_{p,t} - R_f = \alpha_p + (\beta_{1p} - \beta_{2p})(R_{m,t} - R_f) + \varepsilon_{p,t}$

where β_{1p} corresponds to periods of growth and β_{2p} is the difference between beta during the growth period and beta during the period of decline (the coefficient is significantly positive in the presence of market-timing).

Market return at time t is generated by the following model:

$$R_{m,t} = E[R_{m,t}] + \pi_{m,t}$$

where $\pi_{m,t}$ is the unanticipated market return at time t with $E(\pi_{m,t}) = 0$ and finite variances $\sigma_t^2(\pi_{m,t})$. If β_T is the fund target risk when the manager expectations are correct, and β_t is the actual risk assumed by the fund at time t , the variable $\tau_t = (\beta_t - \beta_T)\pi_{m,t}$ measures the total performance due to the timing.

Kon (1983) studied the managers' timing abilities on 37 investment funds and obtained different results depending on the used measure $E(R_{m,t})$. The author revealed statistically significant timing skills for some funds, the obtained results failing to sustain the market efficiency hypothesis.

Merton (1981) builds a model based on simple market timing behavior: if market return is higher than the risk-free rate, the manager invests all his wealth in the market portfolio, otherwise he invests in risk-free assets. The behavior can be mathematically described as follows: $\gamma(t) = 1$, if the manager anticipates that $R_{m,t} > R_f$; $\gamma(t) = 0$, if the manager anticipates that $R_{m,t} < R_f$.

The following formulas show the probability that the manager makes the right choice, respectively the wrong one in periods of market decrease and increase.

$$p_1(t) = \text{prob}[\gamma(t) = 0 / R_{m,t} \leq R_f]$$

$$1 - p_1(t) = \text{prob}[\gamma(t) = 1 / R_{m,t} \leq R_f]$$

$$p_2(t) = \text{prob}[\gamma(t) = 1 / R_{m,t} \geq R_f]$$

$$1 - p_2(t) = \text{prob}[\gamma(t) = 0 / R_{m,t} \geq R_f]$$

The manager has timing abilities if $p_1(t)+p_2(t)>1$. If the manager is correctly informed, the following conditions are simultaneously satisfied: $p_1(t)=p_2(t)$ and $p_1(t)+p_2(t)=2$.

Based on this result, Henriksson and Merton (1981) built a model that allows for simultaneous measurement of timing and selectivity:

$$R_{p,t} - R_f = \alpha_p + \beta_{1p}(R_{m,t} - R_f) + \beta_{2p}y_t + \varepsilon_{p,t}, \quad \text{where } y_t = \max(0, R_f - R_{m,t})$$

or $R_{p,t} - R_f = \alpha_p + \beta_{1p}(R_{m,t} - R_f) + \beta_{2p}(R_{m,t} - R_f)D_t + \varepsilon_{p,t}$ where D is a dichotomous variable that takes the value 0 when $R_{m,t} - R_f > 0$ and the value (-1) otherwise.

A positive and significantly different from zero β_{2p} indicates the manager's ability to anticipate market evolution and a positive and significantly different from zero α_p indicates the manager's selectivity ability.

Bhattacharya and Pfleiderer (1985) developed a similar model to the Treynor-Mazuy model, assuming that the manager adjusts the forecasts in order to minimize the variance of the prediction errors.

$$R_{p,t} - R_f = \alpha_p + \theta E(R_m - R_f)(1 - \psi)(R_{m,t} - R_f) + \psi \theta (R_{m,t} - R_f)^2 + \theta \psi \varepsilon_t (R_{m,t} - R_f) + u_{p,t}$$

where α_p indicates the selectivity ability;

θ shows the manager's timing ability;

ψ is the coefficient of determination between manager's expectations and the market excess return ;

ε is the manager's estimation error.

The "noise" of this equation provides the needed information for valuing the manager's timing ability:

$$\omega_t = \theta \psi \varepsilon_t (R_{m,t} - R_f) + u_{p,t}$$

$$(\omega_t)^2 = \theta^2 \psi^2 (\sigma_\varepsilon)^2 (R_{m,t} - R_f)^2 + \zeta_t$$

$$\zeta_t = \theta^2 \psi^2 (R_{m,t} - R_f)^2 [(\varepsilon_t)^2 - (\sigma_\varepsilon)^2] + (u_{p,t})^2 + 2\theta \psi (R_{m,t} - R_f) \varepsilon_t u_{p,t}$$

After determining the variance of the excess market return, it will evaluate the coefficient of determination $\psi = \frac{\sigma_\pi^2}{\sigma_\pi^2 + \sigma_\varepsilon^2} = \rho^2$. The coefficient of correlation between the manager's anticipations (forecasting) and the excess market return (ρ) will reflect the quality of the information available to the manager in its forecasts on market evolution.

3. Empirical approach of risk-adjusted performance and performance attribution within the Romanian balanced funds industry

The study assesses the evolution of balanced funds' performance indicators based on the data collected from the UNOPC reports between the 2005 and 2011. The data is monthly data. The time period chosen is convenient because it offers an overlook on the ups and downs of the studied funds and it is sufficient in order to perform statistical analysis, which will give us an insight over market timing and selectivity. The study is conducted on five balanced funds BT Clasic, BCR Dinamic, Fortuna Clasic, Integro and Transilvania which are suited for the analysis as they have activated over the entire period under study.

For a small investor, the advantages of investing in a mutual fund derive from pooling resources in order to construct an actively managed portfolio taking advantage of risk diversification and scale economies. The price of a mutual fund certificate is determined by the net asset value (NAV) of the fund computed as the total value of all assets held by the fund which is divided to the total number of outstanding fund certificates. The monthly returns were computed based on the following relation:

$$R_F = \frac{NAV_T - NAV_{T-1}}{NAV_{T-1}}$$

We used the BET Index as a proxy of the market portfolio and the BNR reference interest rate as a proxy for the risk-free rate.

The table below shows the average monthly return calculated for each year and the average monthly returns of the market benchmark, BET Index, calculated, as well, for each year.

Table 4

Average monthly return for balanced funds

(%)

Fund	BT	BCR	FORTUNA	INTEGRO	TRANSILVANIA	BET INDEX
2005	1.11	2.57	0.95	2.29	1.98	1.32
2006	0.87	0.72	1.22	1.04	1.5	0.98
2007	1.09	0.88	1.04	0.83	0.56	1.3
2008	-1.39	-3.91	-3.28	-3.9	-7.31	-12.12
2009	1.8	1.49	0.69	1.19	1.81	2.45
2010	0.54	0.35	0.58	0.13	0.5	0.43
2011	0.15	-0.22	-0.62	-0.56	-0.14	-1.88

Source: authors' computations.

The classical measures of risk adjusted portfolio performance are based on the Capital Asset Pricing Model (CAPM). The portfolio managers try to obtain the highest possible return to a given level of risk. The risk of the portfolio can be expressed either through the β of the portfolio, which measures the systematic risk of the portfolio, or through the standard deviation, which measures the total risk to which the portfolio is exposed.

Treynor's rate measures the excess return of the portfolio in relation to the risk free rate per unit of systematic risk, while the Sharpe ratio measures the excess return of the portfolio in relation to the risk free rate per unit of total risk.

Jensen's coefficient, α , measures the return, that cannot be explained by the CAPM. The objective of this indicator is to calculate the expected rate of return at a given level of risk and to compare it to the actual return obtained over the studied period. It actually tries to evaluate the risk premium per systematic risk.

The table below synthesizes the results from the three performance indicators. The BET Index was used as approximation for the market portfolio and the BNR reference interest rate was used as the risk free rate. The indicators were calculated for the whole period 2005-2011.

Table 5

Risk adjusted performance indicators

Fund	$R_P - R_f$	Beta	Treynor's ratio	Sharpe's ratio	Jensen coefficient
BT CLASIC	-0.00013	0.185	-0.0007	-0.0048	-0.0001
BCR DINAMIC	-0.00286	0.352	-0.0081	-0.0621	-0.0018
FORTUNA	-0.00472	0.275	-0.0171	-0.0968	-0.0034
INTEGRO	-0.00408	0.343	-0.0119	-0.0899	-0.0026
TRANSILVANIA	-0.00713	0.456	-0.0156	-0.1193	-0.0038

Source: authors' computations.

Both Treynor's and Sharpe's ratio are indicating negative risk-adjusted performances, meaning that this funds were underperforming. Because of their correlation to the market portfolio and the large decrease in the performance of the market during the financial crises, the funds did not manage to obtain returns that match the risk free rate.

A positive α indicates that a fund has generated above average performance, whereas a negative α suggests that the performance is below average. In the case of the studied balanced funds, Jensen's coefficient takes negative values, in concordance to the ratios of both Treynor and Sharpe, suggesting that all balanced funds have had a below average performance over the studied time period.

In order to detect selectivity and market timing we will rule the Treynor and Mazuy's regression:

$$R_{p,t} - R_f = \alpha_p + \beta_p (R_{m,t} - R_f) + \gamma_p (R_{m,t} - R_f)^2 + \varepsilon_{p,t}$$

A positive γ_p indicates market timing ability.

Henrikson and Merton developed a different model for testing market timing. The managers allocate capital between the risk free asset and equity based on future market returns:

$$R_{p,t} - R_f = \alpha_p + \beta_{1p} (R_{m,t} - R_f) + \beta_{2p} (R_{m,t} - R_f) D_t + \varepsilon_{p,t}$$

If $R_{m,t} - R_f > 0$, then $\beta_{2p} = 1$ otherwise $\beta_{2p} = 0$. β_{2p} is a dummy variable used as a market timing measure.

Both methods were applied on the five studied funds, in order to test for fund managers timing and selectivity ability.

Table 6

Henriksson & Merton regression results

Coefficient/Fund	$\hat{\alpha}$	$\hat{\beta}_1$	$\hat{\beta}_2$
BCR DINAMIC	0.009112***	0.364951***	-0.026202
BT CLASIC	0.018292***	0.160280***	0.310029***
FORTUNA	0.005903	0.286283***	-0.022484
INTEGRO	0.005374*	0.330523***	0.083928
TRANSILVANIA	0.008064**	0.488292***	-0.094243

Notes: * the coefficient differs significantly from zero with a risk threshold of 10%; ** the coefficient differs significantly from zero with a risk threshold of 5%; *** the coefficient differs significantly from zero with a risk threshold of 1%.

Source: Authors' computations.

The coefficient α is positive all funds positive and significantly different from zero meaning that all funds managed to derive lower negative excess returns over the risk-free rate than the market.

Market timing is measured by the coefficient β_2 and is for all funds, except BT Clasic, insignificantly different from zero, meaning that no funds have proven to possess market timing abilities. For BT Classic the coefficient β_2 is significant different from zero at a level of risk of 1%, which shows that the fund has demonstrated timing abilities.

Table 7

Treynor and Mazuy's regression results

Coefficient/Fund	$\hat{\alpha}$	$\hat{\beta}$	γ
BCR DINAMIC	0.008259**	0.365891***	0.032161
BT CLASIC	0.008133**	0.210484***	0.085157
FORTUNA	0.005460	0.280759***	-0.003624
INTEGRO	0.004768*	0.400867***	0.258758
TRANSILVANIA	0.008918**	0.405495***	-0.309337

Notes: * the coefficient differs significantly from zero with a risk threshold of 10%; ** the coefficient differs significantly from zero with a risk threshold of 5%; *** the coefficient differs significantly from zero with a risk threshold of 1%.

Source: Authors' computations.

Treynor and Mazuy's model offered results in concordance to the previous findings based on Henrikson and Merton's regression. Coefficient γ , which measures the market timing ability of the funds, is not significantly different from zero, which points out that all funds are lacking market timing abilities. The α coefficient is significant different from zero in most cases.

Conclusions

Romanian mutual funds don't generate risk-adjusted performance and we wouldn't expect such a result taking into account recent evolutions of our financial market. Balanced funds managers lack market timing abilities. Yet, Romanian investors' trust in these investment vehicles seems to have increased after 2000 and so their perspectives remain promising. Between 2005 and 2011, balanced funds had a negative risk adjusted performance, meaning they did not generate excess return over the risk-free rate per level of risk. Market timing is in general not supported by empirical studies. Funds' managers are unable to time the market and to adjust their portfolios by reducing systematic risk in bearish markets.

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SESSION V

MACROECONOMIC STABILITY

IS THE EVOLUTION OF THE EXCHANGE RATE LEU/EURO STILL INFLUENCED BY THE SHOCKS OF INTEREST RATE ON ROMANIAN MARKET?

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Abstract. *Given the recent redesigned path of our country to join the Euro area, the economic objectives of macroeconomic stability become fundamental, especially in the current financial crisis frame. Recession, that probably it would be statistically disclosed for 2012, will "destabilize", once more, the stability of macroeconomic indicators. Interest rate and exchange rate are two associated variables that express, as per theory at least, the cost of capital and the state of the economy relative to other economy for which the currencies are compared. Since inflation has been the key objective of the National Bank strategy, the question is whether the change in monetary policy interest rate has effect on exchange rate and, by consequence on inflation.*

Financial market turmoil and macroeconomic conditions in Romania have reduced the influence of the interest rate on the exchange rate. The present econometric analysis shows that the relationship between the two variables is statistically decreasing.

Keywords: interest rate; exchange rate; financial crisis; inflation; VAR.

JEL Classification: E31, E43, E52.

REL Classification: 8H, 8J, 8Z.

1. Preliminary considerations

The current financial crisis is not a singular event in historical crisis episodes. The essential difference between financial market turmoil from the past and the current crisis is given by the unprecedented severity of the crisis, rate of contagion and its global dimension. (Dardac, Chiriac, 2010).

In the present context of rescheduling Romanian's accession to the Eurozone, which will probably be postponed at least two years beyond 2015, the initial target – pursuing the stability of macroeconomic indicators – is of great importance for achieving convergence of the following: budgetary deficit, public debt and inflation.

The main objective of the NBR's monetary policy is the inflation target. The inflation target strategy, which compels the Central Bank to keep a low inflation, played a leading role in maintaining the price stability in industrialized countries. Taking as a model the developing countries, the former communist countries adopted and implemented this strategy able to increase the monetary policy transparency and determine the authorities to make necessary reforms for a transition from a planned economy to a market economy.

According to Isărescu (2009, pp. 104-105), the inflation target strategy cannot be successfully implemented unless a coherent assembly of economic policies is promoted. As regards the particular case of the emerging economies in Central and Eastern Europe, for formulating and coordinating macroeconomic policies it is required to pay special attention to the specific features of the real and nominal convergence processes. The only valid solution on medium and long terms implies development and implementation of a coherent mix of

macroeconomic policies able to support economic growth and, at the same time, to limit the economy's vulnerability.

The Annual Report of the National Bank of Romania (2012, pp.19) shows that Romania made progress in 2011 in the macroeconomic stabilisation field by promoting a mix of economic policies for economic growth on a sustainable basis. While the monetary policy faced a countercyclical evolution in 2011 because of the monetary space created in the previous years, the size of imbalances accumulated in the pre-crisis period and the need to eliminate the excessive deficit by the end of 2012 have made the fiscal policy go on in a procyclical way.

Our approach to the research, the results of which are presented in this paper, is based on the assumption that setting a monetary policy interest is less effective within the mix of monetary policies as regards the inflation target. Therefore, a shock to the interest evolution has a marginal influence on the leu/euro exchange rate. Interest rate and exchange rate are two variables associated, in principle, with the cost of loan capital and the degree of development of an economy in relation to other countries. While inflation is a key objective of NBR's strategy, the question is whether the policy for changing the monetary policy interest has further effect on the exchange rate and, implicitly, on inflation.

The estimation of the rate of exchange between two currencies by classic methods – forward – is based on the existing interest differential on the two markets.

Ghiba (2010) considers that the financial market shocks revealed the importance of the interest rate for economic recovery. In these circumstances, central banks lowered the monetary policy interest rate to the historical level for stimulating economic growth, as a low interest rate causes capital outflows from a country and, consequently, national currency depreciation. On the other hand, low interest rates might put inflationary pressure on the economy. By raising interest rates, the local currency is influenced so as to appreciate in relation to foreign currencies. On the contrary, monetary authorities could use lower interest rates to prevent the appreciation trend of the national currency. As for emerging countries, such as Romania, the interest in the evolution of the two variables is justified by changes in policies concerning the exchange rate. Most countries consider an inflation target while using floating exchange rates. The consequence is correlated volatility rise in interest rate and exchange rate alike.

In our study, the assessing of the intensity of shocks to system variables is based on the VAR determination, which is a model enabling us to analyse the effects of economic policy measures. VAR analysis has been used in macroeconomic studies since the 1970s, with Cristopher Sims as a leading promoter, as VAR is, in fact, a system-type analysis with all included variables endogenous and, there before, modelled together.

2. The VAR methodology

The VAR method is very common for analysing time series, especially due to its flexibility and easy utilisation. It may be considered a generalisation of both the univariate autoregressive (AR) model, because the dependent variables are lags of explanatory variables and also of simultaneous equations. All variables in the VAR model are treated symmetrically, as each variable has an equation that explains the evolution on the basis of own lags and the lags of other variables of the model.

Ito and Sato (2006) use VAR analysis to measure the effects of exchange rate pass-through on national prices in East-Asian countries. They conclude that the level of the exchange rate pass-through in relation to import prices is very high, but low in relation to inflation, with one exception: Indonesia, whose accommodating monetary policy and high CPI sensitivity to exchange rate changes are important factors that lead to spiral effects of the national price inflation and sharp nominal exchange rate depreciation in the post-crisis period.

Boțel (2002) explains the utilisation of this method, considering that only system-type analyses (simultaneous equations) can reveal the interconnections between macroeconomic variables.

VAR models are based on the analysis of shocks to the variables studied. The shocks or “innovations” form that part of a variable level that cannot be explained by the history (passed values) of that variable or other system variables.

The main purpose of the VAR analysis is assessing the effects of various shocks to system variables. The VAR analysis has three types of results: impulse response, forecast error variance decomposition, or variance decomposition and Granger causality.

Moinescu and Codirlaşu (2012, pp. 40-52) partly use the VAR method to show that as regards services providers a shock to the rate of interest on lei credits affects the non-performing crediting rate beginning in the fourth quarter and is highly persistent and as regards the construction companies the impact of a shock to the Euro interest margin is significant statistically after one quarter in correlation with default rates.

C. Sims, the initiator of the model, describes by VAR the evolution of a set of variables k (called endogenous variables) over the same period of the sample ($t=1,2,...,2000$) as a linear function only in relation to their past evolution.

The variables are gathered into a vector $k \times \text{Vector } (y_t)$ by observing variable i at moment t . For example, if variable i is the exchange rate, then $y(i,t)$ has the value of the exchange rate at moment t .

An autoregressive vector of p order (reduced), denoted by VAR (p), takes the following form:

$$y_t = c + A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + e_t,$$

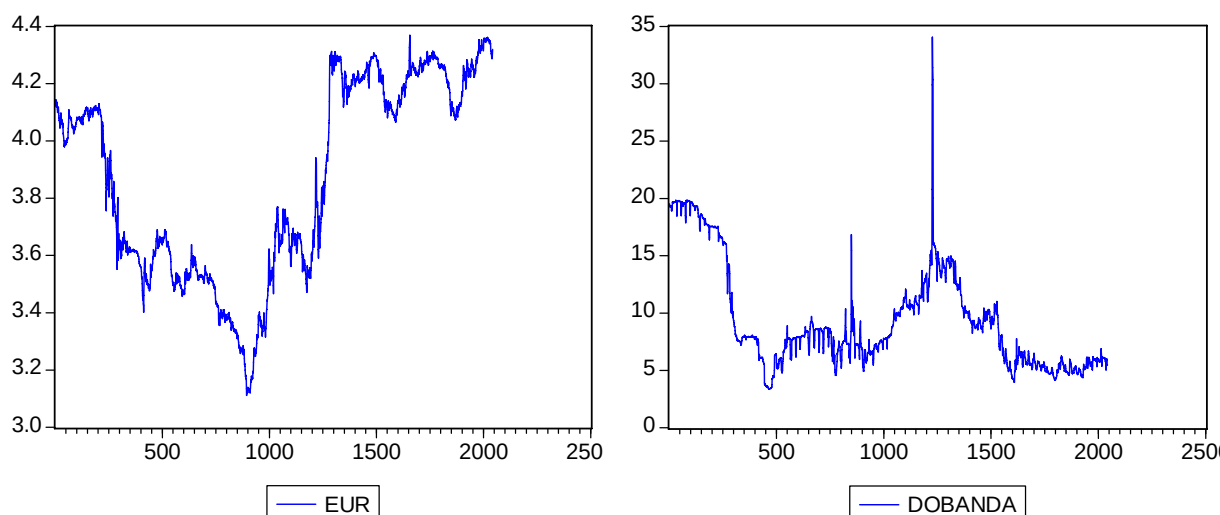
where: c is a vector of constants $k \times 1$ (intercept), A_i is a matrix $k \times k$ (for every $i = 1, \dots, p$) and e_t is a vector $k \times 1$ of error terms that meet the following requirement: each error term has zero significance, the contemporary covariance matrix of error terms is Ω (semidefined positive matrix $k \times k$); and for any non-zero k – there is no correlation over time; especially, there is no serial correlation between individual error terms (Hatemi-JA, 2004, pp. 661-683).

3. Our own application

For our research, we used the leu/euro daily exchange rate and ROBID (daily average rate for deposits on the Romanian interbank market) between 2004 - 2011. The primary data were taken from www.bnro.ro. For the January 2004 - December 2005 period (for the time series regarding the leu/euro exchange rate) the initial rate expressed in old lei/euro (two-decimal fraction) was changed into Lei/Euro by dividing it by 10000, followed by rounding by addition to the fourth decimal.

We selected ROBID because it is strongly correlated with the monetary policy interest. The correlation coefficient for the analysed period was 81%. We selected the daily rate because it was the most sensitive to market shocks.

The evolution of the leu/euro exchange rate and of ROBID between January 2004 - December 2011:



A fundamental requirement to be fulfilled before analysing the shocks to the studied variables is checking the stationary character of the time series, because using them in a non-stationary form might cause illusory regressions. A VAR is stationary when the effects of the shocks to system variables diminish to null in a certain time. If VAR is not stable, then the confidence intervals for impulse response functions cannot be built since the standard errors cannot be computed by common methods.

4. Required tests

4.1. Testing stationarity for the leu/euro exchange rate series

Null Hypothesis: EUR has a unit root

Exogenous: None

Lag Length: 3 (Automatic based on SIC, MAXLAG=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.174843	0.7369
Test critical values:		
1% level	-2.566097	
5% level	-1.940979	
10% level	-1.616595	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EUR)

Method: Least Squares

Sample (adjusted): 5 2042

Included observations: 2038 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR(-1)	1.72E-05	9.81E-05	0.174843	0.8612
D(EUR(-1))	0.201615	0.022040	9.147693	0.0000
D(EUR(-2))	-0.121667	0.022319	-5.451310	0.0000
D(EUR(-3))	-0.111189	0.022030	-5.047290	0.0000
R-squared	0.068249	Mean dependent var		9.41E-05

Adjusted R-squared	0.066874	S.D. dependent var	0.017783
S.E. of regression	0.017178	Akaike info criterion	-5.288406
Sum squared resid	0.600205	Schwarz criterion	-5.277376
Log likelihood	5392.886	Durbin-Watson stat	1.993950

In this example, for the leu/euro exchange rate series, the Dickey – Fuller test (unit root test) takes on the value 0.174843 and value p associated to it is 0.7369. When the test value is higher than the critical value, the null hypothesis is not rejected – the series has a unit root and is non – stationary. Using value p , the null hypothesis is accepted – for a certain level of relevance whenever probability p is higher than that level of relevance.

Null Hypothesis: EUR has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 3 (Automatic based on SIC, MAXLAG=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.988213	0.6069
Test critical values:		
1% level	-3.962551	
5% level	-3.412014	
10% level	-3.127915	

*MacKinnon (1996) one-sided p-values.

Using the TS method for the leu/euro exchange rate series, the Dickey – Fuller test takes on the value -1.988213 and value p associated to it is 0.6069. Thus, the series is not TS type and the test value is higher than the critical value.

Using the first difference, the test value is smaller than the critical value for any level of relevance, so that the series is integrated of order I.

The AIC (for validate the model, the value must be as small as possible, the variance coefficient (R^2) must take on as high values as possible, close to 1, for a strong link between variables. The closer to 1 it is, the stronger the link intensity is considered.

4.2. Testing stationarity for the interest rate series

Null Hypothesis: DOBANDA has a unit root

Exogenous: None

Lag Length: 9 (Automatic based on SIC, MAXLAG=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.807256	0.0673
Test critical values:		
1% level	-2.566101	
5% level	-1.940980	
10% level	-1.616595	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(DOBANDA)

Method: Least Squares

Sample (adjusted): 11 2042

Included observations: 2032 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOBANDA(-1)	-0.001889	0.001045	-1.807256	0.0709
D(DOBANDA(-1))	0.297308	0.022118	13.44194	0.0000
D(DOBANDA(-2))	-0.185339	0.023075	-8.032163	0.0000
D(DOBANDA(-3))	0.007033	0.023427	0.300224	0.7640
D(DOBANDA(-4))	-0.197657	0.023427	-8.437105	0.0000
D(DOBANDA(-5))	-0.153340	0.023589	-6.500330	0.0000
D(DOBANDA(-6))	0.008589	0.023428	0.366617	0.7139
D(DOBANDA(-7))	-0.034905	0.023434	-1.489503	0.1365
D(DOBANDA(-8))	-0.036815	0.023082	-1.594958	0.1109
D(DOBANDA(-9))	-0.097098	0.022133	-4.386992	0.0000
R-squared	0.181910	Mean dependent var		-0.006811
Adjusted R-squared	0.178269	S.D. dependent var		0.537620
S.E. of regression	0.487349	Akaike info criterion		1.405238
Sum squared resid	480.2438	Schwarz criterion		1.432879
Log likelihood	-1417.722	Durbin-Watson stat		2.002660

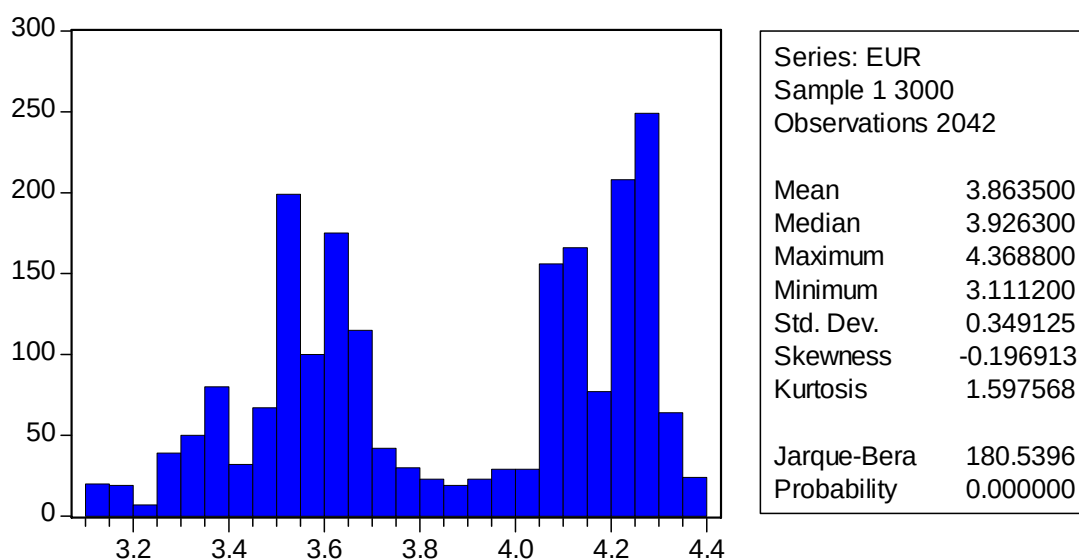
In this example, for the average interest rate series of deposits made on the Romanian interbank market, we find out that the Dickey – Fuller test takes on the value 0.0673 and value p associated to it is 0.7369, so that the series is stationary at a 10% threshold and the unit root likelihood is 6.73%.

Since the test value of the interest variable (dobanda) is below the theoretical threshold, it results that the parameters related to interest variables are significant.

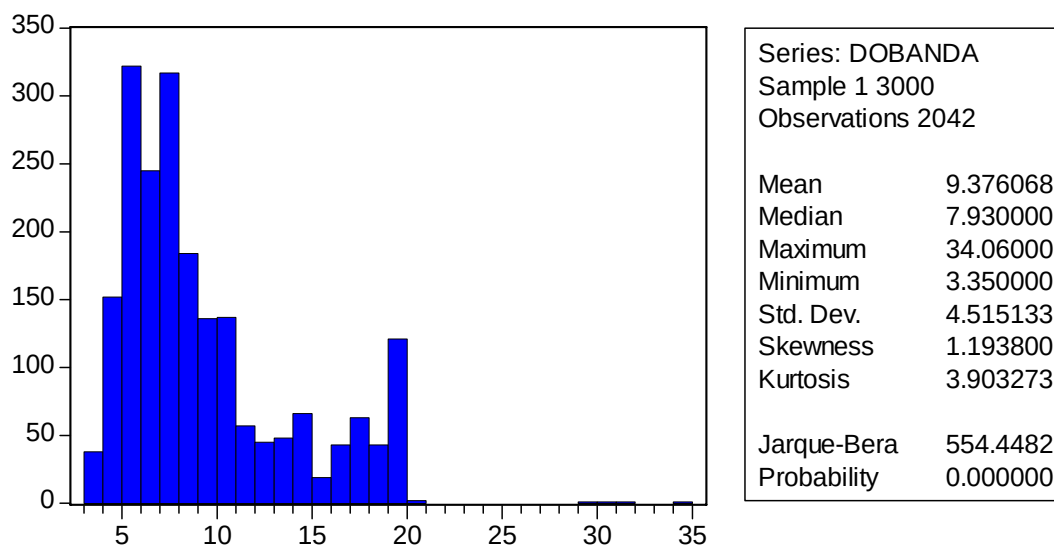
The EUR series is $I(1)$ and interest (dobanda) is $I(0)$, which means that d (EUR) and dobanda (interest rate) can be related.

4.3. The distribution of the leu/euro exchange rate series – Testing for error normality

According to the statistical results, in the case of the leu/euro exchange rate series, the distribution of daily evolutions is averaged close to zero and has negative skewness, and the kurtosis is below 3, which means that this distribution is platikurtosis.



According to the statistical results, in the case of the interest rate series, the distribution of daily evolutions is averaged to approx. 4.5 and has positive skewness, and the kurtosis is higher than 3, which means that this distribution is leptokurtosis.



The correlogram of the leu/euro exchange rate series for the first difference shows autocorrelation for the first two lags.

The correlogram of the interest rate series for the first difference shows autocorrelation for the first two lags.

4.4. Applying the VAR model

Vector Autoregression Estimates

Sample (adjusted): 4 2042

Included observations: 2039 after adjustments

Standard errors in () & t-statistics in []

	DOBANDA	D(EUR)
DOBANDA(-1)	1.290186 (0.02117) [60.9485]	-0.003536 (0.00071) [-4.96308]
DOBANDA(-2)	-0.299823 (0.02115) [-14.1785]	0.003459 (0.00071) [4.85968]
D(EUR(-1))	1.543031 (0.64888) [2.37800]	0.211064 (0.02184) [9.66340]
D(EUR(-2))	0.715232 (0.64872) [1.10252]	-0.140063 (0.02184) [-6.41421]
C	0.085359 (0.02614) [3.26608]	0.000791 (0.00088) [0.89945]

R-squared	0.987170	0.067897
Adj. R-squared	0.987145	0.066064
Sum sq. resids	529.9401	0.600440
S.E. equation	0.510432	0.017181
F-statistic	39125.39	37.04052
Log likelihood	-1519.489	5395.633
Akaike AIC	1.495331	-5.287527
Schwarz SC	1.509112	-5.273745
Mean dependent	9.361275	9.55E-05
S.D. dependent	4.501934	0.017779
Determinant resid covariance (dof adj.)		7.69E-05
Determinant resid covariance		7.65E-05
Log likelihood		3876.533
Akaike information criterion		-3.792578
Schwarz criterion		-3.765014

The values of the AIC, frequently used for selecting macroeconomic models, should be as low as possible to get a valid model.

The variance or determination coefficient (R^2) should be as high as possible, close to 1, for a strong link between variables. The closer to 1 it is, the stronger the link intensity is considered.

Representation

Estimation Proc: LS 1 2 DOBANDA $D(EUR)$ @ C

VAR Model

$$DOBANDA = C(1,1) \times DOBANDA(-1) + C(1,2) \times DOBANDA(-2) + C(1,3) \times D(EUR(-1)) + C(1,4) \times D(EUR(-2)) + C(1,5)$$

$$D(EUR) = C(2,1) \times DOBANDA(-1) + C(2,2) \times DOBANDA(-2) + C(2,3) \times D(EUR(-1)) + C(2,4) \times D(EUR(-2)) + C(2,5)$$

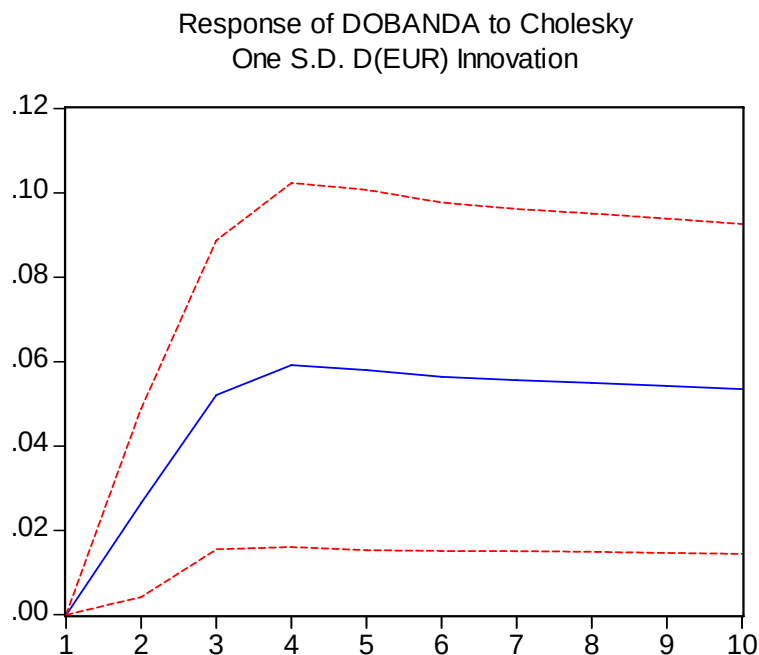
VAR Model - Substituted Coefficients

$$DOBANDA = 1.290185774 \times DOBANDA(-1) - 0.2998229592 \times DOBANDA(-2) + 1.543030698 \times D(EUR(-1)) + 0.7152319558 \times D(EUR(-2)) + 0.0853590982$$

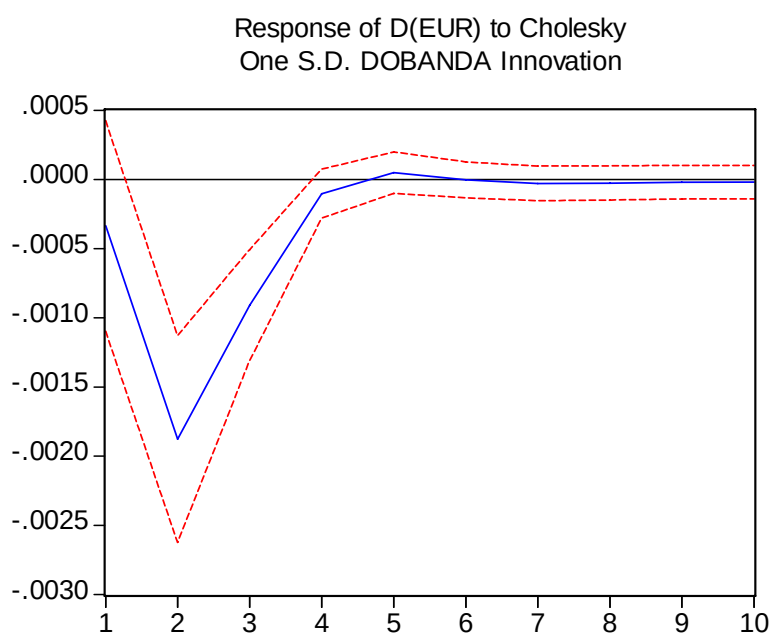
$$D(EUR) = -0.003536406366 \times DOBANDA(-1) + 0.003459104329 \times DOBANDA(-2) + 0.2110639721 \times D(EUR(-1)) - 0.1400631546 \times D(EUR(-2)) + 0.0007912632302$$

Impulse analysis

If $d(eur)$ is modified by a standard deviation, then the interest (dobanda) responds so that in four days it stabilizes at a change of approximately 0.05 standard deviation.



If a shock is caused to the dobanda (interest rate) at the level of a standard deviation, then the change in the exchange rate responds in the first four days and then the shock is dampened.



Conclusions

The method utilized, respectively autoregressive vector (VAR) led to the results of the analysis described in the form of the impulse response function as follows:

If d(eur) is modified by a standard deviation, then the interest (dobanda) responds so that in four days it stabilizes at a change of about 0.05 standard deviation.

If a shock is caused to the interest rate (dobanda) at the level of a standard deviation, then the exchange rate modification responds in the first four days and then the shock is dampened.

The financial market disturbances and the macroeconomic conditions in Romania diminished the influence of the interest rate on the exchange rate. Following the econometric

analysis we found out that the relation between the two variables was less significant from a statistical point of view.

The conclusions to this study may have several explanations. Using a very large sample of over 2000 measurements makes the research econometrically consistent, on one hand. On the other hand, these over 2000 measurements covered three distinct periods as regards the financial market conditions which Romania experienced: the years 2004-2006 witnessed the pre-accession to the EU, an economic boom and spectacular GDP growth, massive inflows of foreign capital, the strengthening of the national currency; the years 2007-2008 faced pre-crises; then the years 2009-2011, the post-crises ones, witnessed market adjustments of the financial institutions balance sheet; interventions of the National Bank of Romania to support the currency, diminution in the monetary policy interest as a main tool for economic recovery, etc. The homogenisation of some trends revealed by the VAR model described by us would lead to less accurate conclusions.

This is the reason why for further research and improvement of result accuracy one has to find the extent during the three above-mentioned periods which Romania experienced and make separate calculation. Thus one can identify and measure the performance of the monetary policy interest mechanism within the monetary policy mix.

Moreover, the equation may also include the inflation factor as the main strategic objective of the National Bank of Romania – inflation target.

Thus, by measuring the correlation between the exchange rate evolution and inflation evolution we can determine to what extent the setting of the monetary policy interest contributes to this objective and how these indicators respond to shock during their evolution.

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THE IMPACT OF THE GLOBAL ECONOMIC CRISIS ON MACROECONOMIC AGGREGATES IN BRICS COUNTRIES AND USA

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Abstract. *The global economic crisis which has emerged 2007 year has led to major financial and corporate scandals, also hence to large fluctuations in macroeconomic developments and the implementation of national policies. Macroeconomic aggregates are important indicators that measure the results of activities of the economy of a country, and therefore are important for macroeconomic analysis.*

The aim of this paper is to show the impact of the global economic crisis on macroeconomic aggregates in the BRICS countries and the United States, which represent today's economic landscape of the world. The displayed turbulence and movement of macroeconomic aggregates, GDP (PPP) per capita GDP, inflation, unemployment, foreign debt and foreign exchange reserves in the five-year period (2007-2011.), in these countries. The work consists of three parts, where the first part describes the origin of the global economic crisis. The second section covers the analysis of macroeconomic trends in the BRICS countries and the U.S. The third part consist the conclusions arising from the experience of countries on their road to recovery.

Keywords: global economic crisis; the macroeconomic aggregates; BRICS; USA.

JEL Classification: E01, F62, F69.

REL Classification: 8Z, 10Z.

1. Introduction

The financial and economic crisis has hit high-strength all countries of the world, all economic sectors, all social classes and individuals. It was created in the United States, emergence of low interest rates, which reflected the expansion of the real estate market, and the creation of redundant sources of funds, the influx of cheap money from abroad. Thus, banks in the U.S. have had to use free cash in order to obtain profit. At this point, the mortgage market was considered to be the safest and most developed market and guarantee a safe profit and low risk.

This is followed by the appearance of two types mortgage loans: prime mortgages that were approved borrowers who are creditworthy take to pay off a mortgage loan and sub-prime mortgages loans, which were approved borrowers who did not meet the requirements for this type of loan. Thus the growing number of borrowers who are unable to obtain mortgage loans from banks, which directly led to an increase in demand, due to the limited supply and rising prices in the United States, there has been a bursting balloon that has spread to all countries of the world. Also, the crisis has caused a drop in all the important indicators of macroeconomic aggregates all countries in the world, measuring the results of the activities of the economy of a country, used to analyze. These macroeconomic aggregates of national accounts are vital for

realistic planning and successful implementation of the national policy on that directly affect key consequences of insolvency crisis, a decline in production and exports, reduced employment, falling living standards and rising poverty. Crisis were most affected countries exporting raw materials due to lower prices of their products because of weak demand.

2. The analysis of macroeconomic trends in the BRICS and in USA

BRICS countries, which have long awaited the chance, try to shake the existing, six and a half decades old, monopolar monetary and political order. Political, social, economic, cultural and religious diversity of the five BRICS countries, is a picture of today's world and a new bridge between the rich and underdeveloped. They have no historical, legal and geographical coherence as the EU, these countries compete with each other and with the U.S. and the EU. BRICS countries are strongly interested in the transition towards a multi-polar system which is not accompanied by instability in the financial markets and impede the flow of international trade and capital. They advocate for the liberalization of world trade, but they also require more space for the role of the state in the economy and a new global currency (for now will reinforce each other using their own). These countries make up 43% of the global population, 17% of world exports, 17% of global FDI inflows. BRICS has no real leader, economically it is by far China and Russia militarily far. By the end of the second decade of the 21st century are estimates that China will overtake the U.S., and that the BRICS 2030th do 47% of world GDP as opposed to 17% 2010th year.

At the last summit of the BRICS, the leaders discussed ways to increase the resources of the World Bank and the possibility of creating a new development bank, managed by a five-member BRICS, confirming their prosperity and power. Below we analyze macroeconomic indicators since the moment of global economic crisis in these countries.

Brazil: Over the past twenty years, Brazil as the largest and most populous country in South America has conducted a series of substantive economic, financial and political reforms that are now the basis for passing through a crisis unlike most developed countries and promising markets. Thanks to foreign trade surplus in the last seven years has accumulated over \$ 200 billion of foreign exchange reserves, which are still remained virtually untouched.

Although it is also faced with the economic crisis, high foreign exchange reserves have enabled the Brazilian public sector to regularly service the external debt and rid the country of historical drama in which she passed with problems of external debt. It is important to note that the Central Bank of Brazil also has reserves in domestic currency from 186 billion reais (about \$ 80 billion), which can intervene in correcting problems in the financial markets as it did last September when its available reserves of 270 billion reais. Brazil characterized by solid economic stability with predictable structure of legal regulation.

Table 1

Analysis of the macroeconomic aggregates of Brazil in the period 2007-2011

Brazil	2007	2008	2009	2010	2011
GDP (PPP) ⁽¹⁾	1849 bill. \$	1993 bill. \$	2010 bill. \$	2172 bill. \$	2324 bill. \$
GDP per capita	9500 USD	10200 USD	10100 USD	10800 USD	11900 USD
Inflation	3.6%	5.7%	4.9%	4.9%	6.6%
Unemployment	9.3%	7.9%	8.1%	7%	6%
Foreign debt	1765 bill. \$	2294 bill. \$	2629 bill. \$	2737 bill. \$	3108 bill. \$
Foreign currency reserves	180 bill. \$	194 bill. \$	238 bill. \$	291 bill. \$	352 bill. \$

⁽¹⁾ PPP - purchasing power parity.

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

Table 1 shows the effect of the crisis on the Brazilian economy as a whole. What first attracts attention is the increase of unemployment in 2007 of 1.40% compared to 2009. However, the fact that Brazil is in crisis has increased the external debt of 273 billion dollars

in 2010 to 310 billion in the 2011th. Inflation 2011th increased by 3.3% compared to 2007. Government measures GDP has increased, so has seen an increase compared to 2007.

Russia: Nineteen years in Russia was marked by very poor economic climate: hyperinflation, economic collapse, corruption and high crime that was directly connected with the industry. The country was heavily indebted, low price of its main export products (oil and minerals), loss of investor confidence, the fall of the ruble led to a serious crisis in 1998. The process of recession have meant high inflation, high unemployment and a decline in production, which led to the melting of foreign exchange reserves as the only alternative. Russian reforms were based on a strategy of liberalization, stabilization and privatization. The Russian economy become experiencing a resurgence during the reign of Vladimir Putin, where the GDP has doubled and it is with 22 of jumped to 11 place. How was this country's progress, show the fact that in Moscow today lives, the largest number of billionaires in the world.

Table 2

Analysis of the macroeconomic aggregates of Russia in the period 2007-2011

Russia	2007	2008	2009	2010	2011
GDP (PPP)	2097 bill. \$	2266 bill. \$	2116 bill. \$	2223 bill. \$	2414 bill. \$
GDP per capita	14800 USD	16100 USD	15100 USD	16900 USD	17000 USD
Inflation	9.0%	14.1%	11.6%	6.08%	8.4%
Unemployment	6.2%	6.4%	8.4%	7.6%	6.6%
Foreign debt	2874 bill. \$	3565 bill. \$	4835 bill. \$	3787 bill. \$	4802 bill. \$
Foreign currency reserves	476 bill. \$	427 bill. \$	439 bill. \$	483 bill. \$	499 bill. \$

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

However, the global economic crisis, did not bypassed Russia and the external debt since 2007. to 2011 increased by 192.8 billion, the highest external debt of these countries. Unemployment was highest 2008th, but fell by 3.2% in the latest research 2011. At the economist researching Russian economy is on the verge of the biggest jumps in the world, according to official forecasts main economic sectors of the country, its gross national product can be increased by three percent.

India: Economy of India consisting of traditional farms, modern and technologically developed agriculture, modern industry, manufacturing, IT and services sector, the fourth most development in the world, after the United States, China and Japan. Economic growth has provided the nineties, since the market was opened to foreign investment and drastically reduce tariffs. Foreign direct investment in the period from April 2006th to March, 2007. year exceeded 15 billion USD, which is, however, far behind China (\$ 60 billion), but India is on a high first place in the world in the inflow of remittances from abroad, which in the fiscal 2005/2006 godini amounted to 24.1 billion USD.

Table 3

Analysis of the macroeconomic aggregates of India in the period 2007-2011

India	2007	2008	2009	2010	2011
GDP (PPP)	2966 bill.\$	3297 bill.\$	3680 bill.\$	4060 bill.\$	4515 bill.\$
GDP per capita	2600 USD	2900 USD	3200 USD	3500 USD	3700 USD
Inflation	6.4%	8.3%	10.9%	11.7%	8.9%
Unemployment	7.2%	6.8%	10.7%	10.8%	6.5%
Foreign debt	1321 bill.\$	1492 bill.\$	2293 bill.\$	2213 bill.\$	2731 bill.\$
Foreign currency reserves	275 bill.\$	256 bill.\$	274 bill.\$	285 bill.\$	499 bill.\$

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

The service sector in India in the last decade, has become a major driver of Indian economy particularly due to the increasing volume of work in the construction, finance and insurance, real estate and information technology. This sector in India accounts for nearly 52% of GDP, and hires $\frac{1}{4}$ of the total workforce. According to forecasts of experts, India will become one of the three economic powers in the world. Table 3 shows that although fallen into the claws of the global economic crisis, India strong central bank intervention and following recommendations of the IMF raised its foreign exchange reserves from 275 billion to 499 billion dollars, but the external debt of \$ 132 billion 2007 jumped to 141 billion dollars by the 2011th.

China: Although faced with the global economic crisis and major changes and transformations in the economy, China today is the political, military and nuclear power with the fastest rate of economic growth, which is a basic principle of economic growth, industrialization and modernization of the export-oriented economy. The process of economic reforms included the establishment of a large number of specialized economic zones with significant tax and customs facilities, where the main objective of attracting foreign investors. The birth of a new economic giant in the Far East caused a massive outflow of capital to China through the growing presence of multinational companies opening manufacturing facilities and amenities that will be used when it comes to foreign investments and above all cheap labor. Trade surplus and inflows of foreign capital have been further boosted foreign exchange reserves amount to 1.540 billion. USD and so far it is the first in the world beyond Japan, which is the world record holder for years.

Table 4

Analysis of the macroeconomic aggregates of China in the period 2007-2011

China	2007	2008	2009	2010	2011
GDP (PPP)	7099 bill.\$	7973 bill.\$	8818 bill.\$	10090 bill.\$	11440 bill.\$
GDP per capita	5400 USD	6000 USD	6700 USD	7600 USD	8500 USD
Inflation	4.8%	5.9%	-0.7%	5%	5.5%
Unemployment	4.2%	4%	4.3%		6.5%
Foreign debt	3056 bill.\$	3630 bill.\$	3798 bill.\$	3493 bill.\$	4066 bill.\$
Foreign currency reserves	1534 bill.\$	1968 bill.\$	2426 bill.\$	2622 bill.\$	3236 bill.\$

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

Chinese economy to 2007 continues to develop at a rate of 11.4%, which is the fastest growth in the last 13 years. GDP has reached the figure of 3,410 mld.USD, thus surpassing Germany, stood in third place in the world in terms of total GDP, just behind the U.S. and Japan. Although it is generally a large importer, China exports a large part of its production, and in 2008 China's exports was 37%, while in India was 13%. The Chinese leadership has a long-term goal to increase foreign trade with the world, to 2020th, to the amount of 2.000 billion dollars.

What is the organization of the country reflected by the fact that GDP increased by \$ 4,301 billion, while foreign exchange reserves increased by \$ 1.702 billion, as shown in Table 4. It should be noted that China was able to maintain high growth rates during the crisis, but still lower than the previous year.

South Africa was the last country that joined the BRICS. It is the second largest gold producer and the world's largest producer of chromium, manganese and platinum, which is why for years been a fertile ground for people who are prepared to get rich, it is the third exporter of coal in the world and exporter of agricultural products. As a developing country, South Africa is also not remained untouched by the global economic crisis, which led to two important aspects: the "financial contagion" that led to the spill-over on the stock exchanges, as well as the negative impact on the area-trade (price pressure), remittances (declined in

developing countries), foreign direct investment (under pressure), commercial bank loans (under pressure), and more. South Africa was heavily dependent on foreign direct investment, and created fears of lower interest rates, high current account deficit, the pressure on the exchange rate and inflation rate.

Table 5

Analysis of the macroeconomic aggregates of South Africa in the period 2007-2011

South Africa	2007	2008	2009	2010	2011
GDP (PPP)	4678 bill.\$	4910 bill.\$	5046 bill.\$	5240 bill.\$	5622 bill.\$
GDP per capita	9700 USD	10100 USD	10300 USD	10700 USD	11100 USD
Inflation	6.5%	11.3%	7.2%	4,5%	5%
Unemployment	24.3%	22.9%	24%	23.3%	24.9%
Foreign debt	5547 bi l.\$	3978 bill.\$	7181 bill.\$	7384 bill.\$	8052 bill.\$
Foreign currency reserves	33 bi l.\$	34 bill.\$	40 bill.\$	46 bill.\$	49 bill.\$

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

Government of South Africa's response to the crisis presented basic principles: compile steps to protect employees from low-income, unemployed and vulnerable groups to strengthen the capacity of the economy to grow and create decent jobs; maintain a high level of public sector investment in infrastructure and encourage investment in the private sector and others. Table 5 shows the first increase in unemployment in the 2011th of 2.0% compared to 2008. However, South Africa is in crisis and has increased the external debt of \$ 40.74 trillion in the 2011th Inflation 2011th increased by 6.3% compared to 2008.

USA: 90-ies of the United States experienced an economic boom and strengthened its position as the most powerful economically and technologically most advanced countries of the world. The US have the longest tradition of market economy, where all decisions are made by private investors and the economic system is significantly greater flexibility in relation to the EU and Japan. USA, the technological leader in the world especially when it comes to computer equipment, medical equipment, aerospace and military equipment. Thus it became the safest place to invest capital, and the huge sums of money constantly pouring in the United States, which, in turn, led to the illusion that capital inflows into the US economy will be a constant and can be go into risky investments, which in case of success brought incredible profits. The growth of real estate have contributed a lot of the U.S. Federal Reserve (Fed) that led to expansionary monetary policy. In addition, the Fed did not control the banking system in a way that should, through lowering the benchmark interest rate, has made loans cheaper and more accessible. Even in the period 2006 to 2008 the price of oil has risen by 50%., And this has caused a jump in the dollar and worsening foreign trade deficit, which is the 2008th increased to \$ 840 billion. To stabilize the financial markets of the U.S. budget is allocated \$ 700 billion called Troubled Asset Relief Program (TARP). In January 2011. Barack Obama has approved an additional 787 bill. \$ to accelerate economic recovery and the U.S., through fiscal reform and direct stimulation of consumption. The budget deficit in 2010 and the 2011th was accounted for about 9% of GDP, but in 2012 the government has managed to reduce it to 7.6% of GDP. United States spends 900 billion \$ on military operations in Iraq and Afghanistan. Total spending on health care accounts are 17.9% of GDP, which is a significant increase from 9% in 1980 year. In July 2010th passed the Consumer Protection Act, which aims to promote financial stability and protect against financial abuse and improving accountability and transparency in the financial system, particularly in dealings with financial derivatives. Key effects of the crisis and long-term problems in the U.S. are: minimum wage stagnation, inadequate investment in infrastructure, an aging population that requires additional medical and pension costs, lack of energy and bulky budget deficit, insolvency, recession and unemployment.

Table 6

Analysis of the macroeconomic aggregates of USA in the period 2007-2011

USA	2007	2008	2009	2010	2011
GDP (PPP)	13780 bill.\$	14260 bill.\$	14120 bill.\$	14660 bill.\$	15290 bill.\$
GDP per capita	45800 USD	46900 USD	46000 USD	47200 USD	49000 USD
Inflation	2.9%	3.8%	-0.3%	1.4%	3.1%
Unemployment	4.6%	7.2%	9.3%	9.7%	9%
Foreign debt	10040 bill.\$	12250 bill.\$	13640 bill.\$	13450 bill.\$	13980 bill.\$
Foreign currency reserves	70570 bill.\$	77650 bill.\$	13080 bill.\$	bill.\$	148,00 bill.\$

Source: <http://www.indexmundi.com/g/g.aspx?v=71&c=rs&l=en>

Due to the crisis in the 2008th it was achieved a lower rate of global economic growth (3.4%) compared to the previous year (5.2%). The US achieved a growth rate of 1.1%, EU 1.3%, which is lower than in 2007 (2% and 3.1%, respectively). Decline of GDP in the 2009th at the global and national level led to a spike in unemployment. USA in 2009th recorded an unemployment rate of 9.3%.

Conclusions

The economic crisis has changed the international economic scene, the fall of the stock market and downturn of financial institutions, so the government was forced to intervene and rescue redirects to regulatory reform. Even though the peace came in late 2009 and early 2010, there was a great economic turmoil, high deficits, pressure on stability levels of the euro zone and falling market share worldwide. No country has emerged from the economic downturn as a way of thinking has not changed. Recovering from the global crisis is linked to the country's rapid track (BRICS), rather than the country's weaker tracks (USA, EU). Undoubtedly it should come to redraw of the financial system and the monitoring and supervision in the world. It is necessary to harmonize the regulations and national policies, as well as to establish common rules in the recapitalization of banks because national approaches are too irrational waste. It also necessary to match the role of the IMF in order to ensure timely multilateral temporary liquidity or perhaps a future in creating new independent international institutions. In Brazil, Russia, India, China and South Africa, home to almost half the world's population, their share of world gross domestic product is only 22 percent. The purpose of establishing this organization was that in economic and political terms to strengthen the position of its members in a multipolar world order. Due to the different interests and heterogeneity of member states, this alliance of countries has not achieved the desired unity and significance. It is an alliance of countries with huge potential.

They see that the financial crisis weakens the West. They know that should not be and can not be form a counterbalance to the West, as America and the European Union too strong. However, all countries BRICS agree that we should use common force to build a counterweight to the influence exercised on the formation of new world order. Of course, there are many open questions. This organization is not homogeneous. However, all its members do not want to become a political organization. South Africa and Brazil are in fact just want to strengthen trade relations with partners who have the resources, which is understandable given the different forms of government in the member countries. Only Brazil, South Africa and India are democratic countries. Russia and China are on the long road of political reform.

To enhance the sense of community between the two countries should form a common political and financial institutions such as the Development Bank of the BRICS countries.

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ROMANIA ON THE WAY OF EURO ADOPTION

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Abstract. *Based on optimal currency area (OCA) criteria, this paper is assessing the real convergence process in Romania from the Euro adoption perspective. Our findings suggest that the correlation of the business cycle in the case of Romania is one of the lowest among NMS, and the demand shocks are still negatively correlated with Eurozone for some NMS, including Romania. The main conclusion of our paper is the fact that Romania still needs time to progress on the real convergence criteria in order to adopt Euro without major costs.*

Keywords: OCA; output gap; business cycle synchronization; Euro adoption; convergence.

JEL Classification: E32, F41.

REL Classification: 8J, 10Z, 20Z.

1. Introduction

Ten countries (Poland, Czech Republic, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania, Cyprus, Malta) joined the European Union (EU) on May 2004 and another two (Romania and Bulgaria) on January 2007. They are expected to adopt the Euro sooner or later after their EU accession, none of these countries been allowed to opt out from Eurozone entry like Denmark, United Kingdom, and *de facto* Sweden. Some of the New Member States (NMS) adopted euro already: Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, and Estonia in 2011.

The accession of the NMS to the European Union has stimulated a growing academic and policy debate about when should the euro area be extended to the new EU members based on the achievements in the convergence process.

Before the global financial crisis from 2007-2008, a rapid expansion of the eurozone to Central and Eastern Europe was expected. However, Euro adoption plans are being now postponed currently across the CEE region, even though adopting the euro is still a legally binding requirement for all EU members from CEE. The main reasons why the CEE countries revisited their Euro adoption strategy are related to:

- The persistent crisis in the Eurozone periphery which triggered a change in the cost/benefit analysis of joining the euro.
- The deterioration of the Maastricht convergence criteria partly due to the effects of the crisis.
- The existing Eurozone members would be reluctant to accept new members which are not very well prepared to survive in the common currency area.

The current status of the Euro adoption targets

Country	Euro adoption target	ERM entry target
Bulgaria	Not set	Not set
Poland	Not set	Not set
Lithuania	2015	2004
Romania	Not set	Not set
Latvia	2014	2004
Czech Republic	Not set	Not set
Hungary	Not set	Not set
Denmark	Not set	1999
Sweden	Not under consideration	Not under consideration
United Kingdom	Not under consideration	Not under consideration

Among the CEE member countries which are still outside Euro area, only Latvia and Lithuania have a specific target for Euro adoption. Latvia submitted the application for euro adoption to the European Commission and ECB in March 2013 to adopt the Euro on 1 January 2014. Lithuania's government and central bank agreed to seek Euro adoption in 2015, provided that they are able to comply with all five convergence criteria. The other states have no specific target for Eurozone entry. In the case of Romania, in the most recent Convergence program (May 2013) there is no specific provision on Eurozone and ERM2 entry targets.

Currently, the Euro adoption has become a rather long-term project for CEE countries - the convergence process to continue to function as an important "disciplinary device" for the governments.

The euro adoption is still constrained by the fulfillment of the convergence criteria. The only formal conditions regarding the Euro zone entry are related to the fulfillment of the nominal convergence indicators, specifically the fulfillment of the Maastricht convergence criteria: public finance criteria referring to the general government deficit and public debt as well as monetary criteria, related to price stability, the level of long-term interest rates and exchange rate stability.

According to the fiscal convergence criteria, in order to adopt Euro, a country cannot have a planned or actual general government deficit in excess of 3% of GDP. Moreover, its public debt should not be higher than 60% of GDP. The inflation criterion is fulfilled when inflation in the applicant country does not exceed by more than 1.5 percentage points the average inflation of the three best EU performers in terms of price stability. The interest rate criterion is fulfilled when the long-term interest rate does not exceed by more than 2 percentage points the average interest rate in the three best EU performers in terms of price stability. Moreover, an accession country is obliged to participate for a minimum period of two years in the Exchange Rate Mechanism II (ERM II). Over this period the exchange rate of the domestic currency against the Euro should be maintained within fluctuation bands not wider than +/-15% around a central parity. Moreover, during ERM II participation no severe tensions in the foreign exchange market, and in particular no devaluations of the central parity should occur.

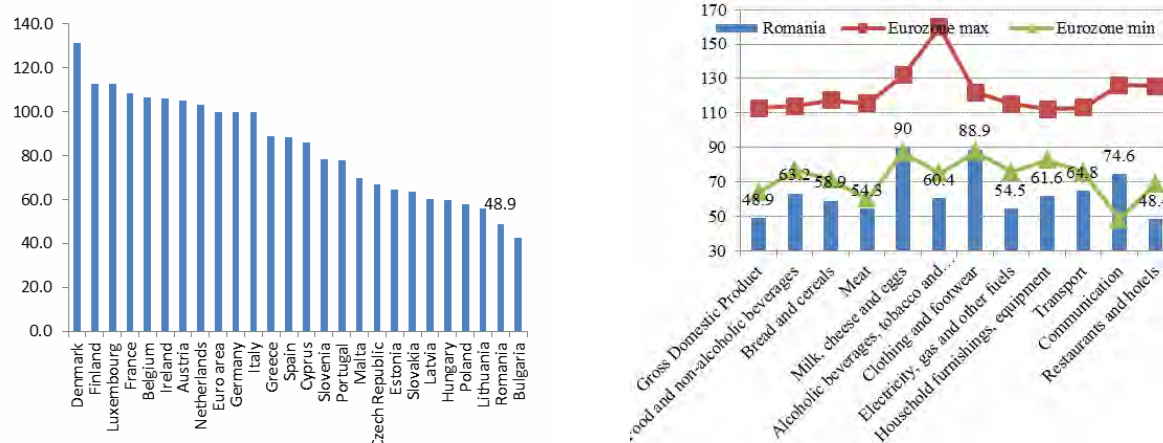
Table 1

Nominal convergence indicators in NMS

Nominal convergence criteria					
Country	HICP inflation rate (12-months average of annual rates) (%)	Budget deficit to GDP (%)	Public debt- to-GDP ratio (%)	ERM II	Long-term interest rate (%) (12-months average of 10yr bond yields)
Reference values	max. 2.5% (as of 31 Mar 2013)	max. 3.0% (Fiscal year 2012)	max. 60%, or declining (Fiscal year 2012)	min. 2 years (as of 31 Mar 2013)	max. 4.81% (as of 31 Mar 2013)
Bulgaria	2.50	0.80	18.50	No	4.03
Czech Republic	2.90	4.40	45.80	No	2.44
Denmark	1.90	4.00	45.80	1 January 1999	1.36
Latvia	4.90	1.90	79.2	No	7.23
Lithuania	1.60	1.20	40.70	2 May 2005	4.00
Hungary	2.80	3.20	40.70	28 June 2004	4.53
Poland	3.00	3.90	55.60	No	4.61
Romania	3.90	2.90	37.80	No	6.43
Sweden	0.80	0.50	38.20	No	1.61
United Kingdom	2.6	6.30	90.0	No	1.67

Source: Eurostat, www.wikipedia.org

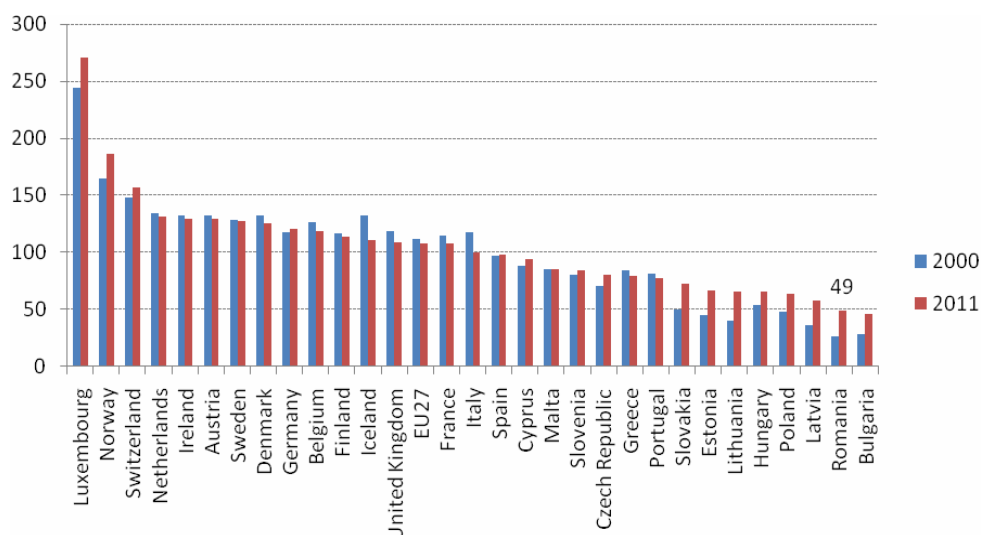
The current nominal convergence indicators of the NMS are presented in Table 1. No NMS country outside eurozone is meeting all the nominal convergence criteria. In the case of Romania, currently just the public debt and budget deficit criteria is fulfilled. Romania still has problems with inflation and will continue probably to post higher inflation than in the Eurozone in the next years, as the price level convergence is expected to continue (which includes also the Balassa-Samuelson effect) and the general price level in Romania is still much lower than in eurozone (Figure 1).



Source: Eurostat.

Figure 1. Price level in Romania (Eurozone=100)

From the real convergence point of view, there is no formal condition in the euro adoption process. Just in the Maastricht treaty there is a general provision mentioning the necessity of social and economic cohesion in order to reduce the development gap between countries. In a broader view, the real convergence means the adjustment process of the social, political and economic structures towards the ones from the Eurozone. In a narrow view, the real convergence means a reduction in the level of economic development gap, the reference being indicators like GDP per capita, productivity, and living standard.



Source: Eurostat.

Figure 2. GDP per capita at PPS (EU27=100)

The GDP per capita is quite low in Romania compared with the Eurozone average (Figure 2). All the NMS which adopted euro at some point in time had a considerably higher GDP per capita at the Eurozone entry moment (Table 2).

Table 2

GDP per capita (EU27=100) at the ERM and Eurozone entry

Country	One year before ERM entry	One year before euro adoption
Greece	1997 – 85%	2000 – 84%
Portugal	NA	1998 – 79%
Spain	NA	1998 – 98%
Slovenia	2003 - 84%	2006 – 88%
Malta	2004 – 77%	2007 – 77%
Cyprus	2004 – 90%	2007 - 93%
Slovakia	2004- 57%	2008 - 72%
Estonia	2003 – 55%	2010 – 65%

Source: ECB.

A special approach in terms of real convergence assessment is related to the Optimal Currency Area (OCA) theory, introduced in the seminal papers of Mundell (1961, 1973).

From the OCA theory point of view, when a country wants to join in a monetary union there should be taken into consideration criteria like the convergence of economic structures, business cycle synchronization, demand and supply shocks correlation, labour market and market flexibility in general, degree of financial intermediation, level of economic openness, etc. In our paper we studied mainly two of these criteria: business cycle synchronization and demand and supply shocks correlation. Regarding the criterion of demand and supply shocks correlation the theory said that costs of losing independent monetary policy are lower the

higher the association of shocks between the potential member and the common currency area. Regarding the business cycle synchronization criterion, if the countries forming a common currency area have synchronized business cycle then the cost of losing the monetary policy independence and the exchange rate as an adjustment mechanism is not significant.

The Romanian economy has a different structure by economic sectors compared with Eurozone, with a much higher share of agriculture in the value added and employment.

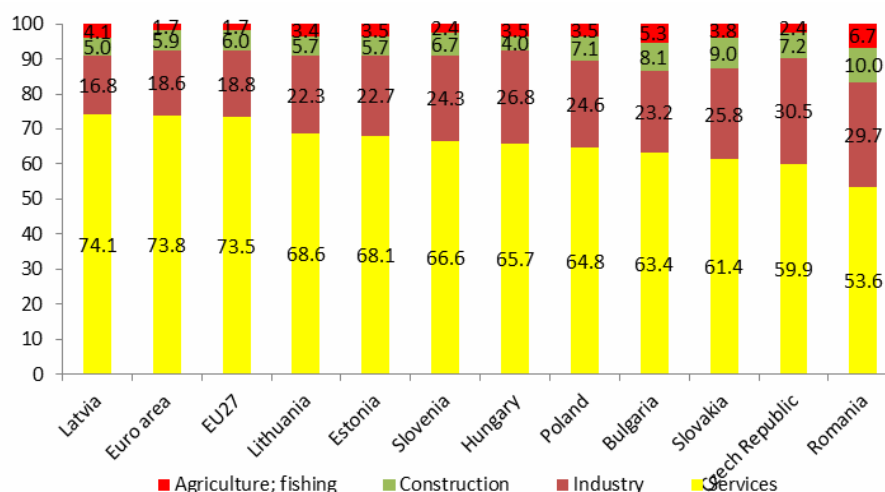


Figure 3. Structure of value added by economic sector, 2011

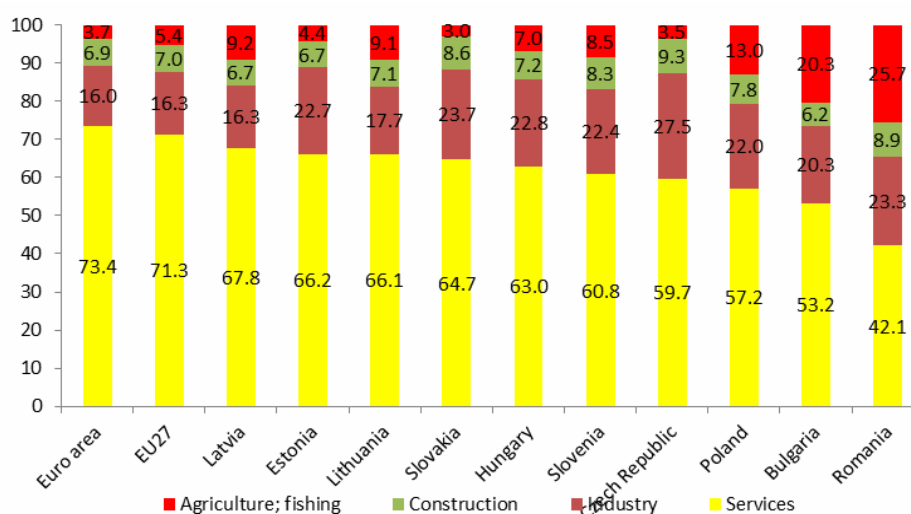


Figure 4. Structure of employment by economic sector, 2011

The current paper has two main goals. Firstly, we investigate business cycles of the New Member States economy and their symmetry to the Euro Area economy using the *correlation of business cycle approach*. Secondly, we identify the demand and supply shocks using the *structural vector autoregression* (SVAR) approach as developed by Blanchard and Quah (1989) and extended by Bayoumi and Eichengreen (1992) and we find if there is symmetry between shocks of the New Member States and Euro area.

2. Optimal currency area – literature review

The Optimal Currency Area (OCA) theory is based on the idea that the advantages of being a member of a monetary union depends on the degree of optimality of this union, meaning that it would maximize economic efficiency to have the entire area sharing a single

currency. The theory of OCA was pioneered by Mundell (1961), with important contributions and extensions McKinnon (1963) and Kenen (1969).

After many amendments, the OCA has become a complex theory associating and mixing various aspects of international macroeconomic processes. Within OCA theory various authors emphasize various criteria:

a) *Production factors mobility*, especially labor force (Mundell, 1961). High factor market integration and sufficient factor mobility within a group of partner countries can reduce the need to adjust real factor prices, and the nominal exchange rate, between countries in response to disturbances. If one country suffers from depression due to a negative shock, factors of production may move from this country to another which is hit by a positive shock. Hence, prices of these factors do not need to fall so sharply in the depressed country and rise in the booming country. The factor mobility is then able to compensate for the exchange rate changes.

b) The *level of economic openness* (McKinnon, 1963; Alesina Barro, 2002). The higher the degree of openness the more changes in international prices of tradable are likely to be transmitted to the domestic cost of living. Also devaluation would be more rapidly transmitted to the price of tradables and the cost of living, negating its intended effects. Hence, the nominal exchange rate would be less useful as an adjustment instrument for small and open economies.

c) *Production and consumption diversification* (Kenen, 1969; Tavlas, 1994). A high diversification in production and consumption diminishes the possible impact of shocks specific to any particular sector. Therefore diversification reduces the need for changes in the terms of trade via the nominal exchange rate and provides “insulation” against a variety of disturbances. More diversified partner countries are more likely to endure small costs from forsaking nominal exchange rate changes amongst them and find a common currency beneficial.

d) *Wage and price flexibility* (Friedman, 1953). When nominal prices and wages are flexible between and within countries contemplating a common currency, the transition towards adjustment following a shock is less likely to be associated with sustained unemployment in one country and/or inflation in another.

e) *Business cycle synchronization and demand and supply shocks symmetry* (Cohen, Wyplosz, 1989; Weber, 1990; European Commission, 1990). Very important criterion is the similarity of supply and demand shocks and business cycles in countries using a common currency (or having their exchange rates fixed). Monetary and exchange rate policy cannot be used as a stabilization tool if a member country is, for example, hit by an asymmetric shock. Hence, business cycles of countries considering creation of a currency area must be correlated to a maximum extent.

f) *Fiscal policy integration* (Kenen, 1969) and *political integration* (Mintz, 1970). Fiscal transfers are a part of a non-market based adjustment process. The aim is the redistribution of financial transfers from relatively richer to relatively poorer countries or from countries hit by a positive shock to countries hit by a negative shock. However, these two aims could be inconsistent: a country hit by a positive shock could be at the same time a relatively poorer country. Moreover, the system of fiscal transfers requires a certain degree of political integration.

g) *Financial markets integration* (Ingram, 1962). Financial market integration can reduce the need for exchange rate adjustment. It permits, amongst others, to cushion temporary adverse disturbances through capital inflows (by borrowing from surplus areas or decumulating net foreign assets that can be reverted when the shock is over).

h) *Inflation differential* (Fleming, 1971). Similarities of inflation rates are also needed to create an OCA. External imbalances can arise from persistent differences in national inflation rates resulting, inter alia, from: disparities in structural developments, diversities in labour market institutions, differences in economic policies, and diverse social preferences.

When inflation rates between countries are similar over time, terms of trade will also remain fairly stable. This will foster more equilibrated current account transactions and trade, and reduce the need of nominal exchange rate adjustment.

The degree of fulfillment of the OCA criteria is an essential factor when judging the advantages and disadvantages of euro adoption.

3. Business cycle correlation

In empirical studies focused on the Euro adoption, the OCA theory is tested in many papers assessing the correlations between the Eurozone (or German) business cycle and those of potential member countries. Boone and Maurel (1998) calculated the correlation coefficients between the cyclical components of industrial production and unemployment rates for the CEECs against Germany and the EU. Their results show a relatively high degree of business cycle correlation for the CEECs with Germany, even higher than for Portugal and Greece. However, correlations with the whole EU are not so high.

Jarko Fidrmuc (2001) tests the endogeneity hypothesis of OCA criteria on five advanced CEECs (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia).

Fidrmuc measures the similarity of business cycles by the correlation of detrended indicator of industrial production. He found that trade between transition countries and EU member countries started to increase and this led to a greater integration between these countries and more correlated business cycles between 1993 and 1999. The highest levels of correlation of business cycles are measured in Slovenia and Hungary (even above the EU average), while the lowest level is in Slovakia.

Darvas and Vadas (2005) proposed a procedure for combining univariate detrending techniques which is based on revisions of the estimated output gaps adjusted by the variance and the correlation among business cycles. They combined quadratic trend, Hodrick Prescott filter, Band Pass, Beveridge Nelson decomposition and Wavelett transformation. The weighting method was used for business cycle analysis, to study the correlation of business cycles. The results affirmed that Hungary, Slovenia followed by Poland, had the highest correlation coefficients with the Euro Zone.

The study of Darvas and Szapary (2005) differs from most of other contributions in the area in that they investigate the behavior of several expenditure and sectoral components of GDP. Using Hodrick-Prescott filter and Band-Pass filter, Darvas and Szapary (2005) obtained that Hungary, Poland and Slovenia have achieved high degree of synchronization for GDP, industry and exports, but not for consumption and services with euro zone. The other CEECs countries have achieved less or no synchronization.

Fidrmuc and Korhonen (2006) in their meta-analysis of 35 identified publications find two major categories of papers on business cycle coordination between the euro and the CEECs. In the first category, papers look at correlations of a detrended output where several authors apply various filters and in the second category the structural VAR model is used to recover underlying shocks with properties derived from the economic theory.

Afonso and Furceri (2007) analyses business cycle synchronization and sectoral business cycle synchronization in an enlarged EU using annual data, trying to identify which sector for each country is driving the aggregate output business cycle synchronization. Their conclusions were that Industry sector, Building and Construction sector and Agriculture, Fishery and Forestry sector show the most relevant contribution in contrast with Services sector although the largest one in terms of valued added share. They obtained by applying first differencing, two HP filters with different smoothing parameter and a Band Pass filter that Hungary, Cyprus and Malta have the larger correlation between business cycle synchronization with Euro zone.

3.1. Estimation methodology

In order to compute the correlation of business cycles we used the following two univariate methods to obtain the trend and the cycle from the GDP series:

I. **Hodrick-Prescott filter (HP)** is a two-sided linear filter that computes the smoothed series s of y by minimizing the variance of y around s , subject to a penalty that constrains the second difference of s . That is, the HP filter chooses s to minimize:

$$\sum_{t=1}^T (y_t - s_t)^2 + \lambda \sum_{t=2}^{T-2} ((s_{t+1} - s_t) - (s_t - s_{t-1}))^2 \text{ where: } y_t = \text{GDP}; s_t = \text{trend};$$

The smoothness parameter λ takes the values of 100 for annual data, 1,600 for quarterly data and 14,400 for monthly data. The HP filter has two main drawbacks: arbitrary chose of the parameter λ and becomes unstable at the end and at the beginning of the sample.

II. **Band-Pass filter (BP)** - intends to remove both high frequency and low frequency of a series, leaving the business cycle frequencies. We define the lower and upper frequencies of the two low pass filters as respectively six and thirty two quarters for the cycle range to be passed through. The major weakness is that in finite samples only various approximations could be used: Baxter-King (1999) and Christiano-Fitzgerald (2003). We used in our paper the approximation of Christiano-Fitzgerald.

3.2. Data

Our data cover the period of 1995Q1-2012Q4. We used the GDP series in constant prices (2005=100) available from EUROSTAT and we seasonally adjusted the data using the X12 procedure.

5. Empirical results

Table 3 reports the results on the output-gap correlation coefficient between the various European countries and the EA, as aggregate. The average correlation for the core EA group of countries is around 90% for both filters, with Germany and Italy having the highest values. Although they are not members of the monetary union, Denmark, Sweden and UK have also a high degree of business cycle correlation with EA, slightly below the one of the EA core countries.

Table 3

Correlations of business cycles

Country	HP filter		Band pass filter	
	Correlation	Lag (in quarters) for maximum correlation	Correlation	Lag (in quarters) for maximum correlation
Core Euro zone countries				
Austria	0.88	0	0.92	0
Belgium	0.86	0	0.87	0
Germany	0.96	0	0.97	0
Spain	0.88	0	0.94	0
Finland	0.88	0	0.93	0
France	0.91	0	0.93	0
Ireland	0.72	0	0.83	0
Italy	0.95	0	0.96	0
Luxemburg	0.79	0	0.88	0
Netherlands	0.89	0	0.95	0

Country	HP filter		Band pass filter	
	Correlation	Lag (in quarters) for maximum correlation	Correlation	Lag (in quarters) for maximum correlation
<i>average</i>	<i>0.87</i>		<i>0.92</i>	
Euro zone periphery countries				
Greece	0.26	7	-0.14	8
Cyprus	0.68	1	0.84	1
Malta	0.58	1	0.76	1
Portugal	0.70	0	0.78	0
<i>average</i>	<i>0.74</i>		<i>0.77</i>	
New Member States				
Bulgaria	0.67	1	0.76	2
Czech Republic	0.84	0	0.96	0
Estonia	0.73	0	0.90	0
Hungary	0.71	0	0.85	0
Lithuania	0.65	1	0.79	1
Latvia	0.70	0	0.88	0
Poland	0.60	0	0.63	0
Romania	0.54	2	0.60	2
Slovenia	0.84	0	0.90	0
Slovakia	0.69	1	0.74	1
<i>average</i>	<i>0.70</i>		<i>0.80</i>	
Non Euro zone countries				
Denmark	0.83	0	0.92	0
Sweden	0.77	0	0.84	0
United Kingdom	0.75	0	0.89	0
<i>average</i>	<i>0.71</i>		<i>0.80</i>	
Non EU countries				
Croatia	0.74	1	0.74	1

Average correlation computed for peripheral economies lies between 70% and 74%, with Greece distinguishing as the least correlated, having even a negative correlation in the case of band pass filter. These findings provide, once again, empirical evidence suggesting that Euro adoption by Greece was premature, leading eventually to the problems EA faces nowadays. In terms of the lag at which maximum correlation occurs, Greece displays also a distinct picture. The results indicate that Greece is two years out of phase when compared to the business cycle in the EA. Greece's correlation with the EA is even lower than that of the new EU member states.

The average correlation coefficient for the new EU members is between 70% and 80%, with Romania being the least correlated. If we analyze the timing of the business cycle, we observe that unlike the EA countries, where excepting Greece, the maximum correlation occurred contemporaneously, for some of the new EU members there is a gap of one quarter. Business cycle in Romania is two quarters behind that of the EA countries.

4. Supply and demand shocks correlation

Several studies have been devoted in the literature to the analysis of the similarities in the shocks affecting EU countries. An important contribution came from Bayoumi and Eichengreen (1992) when they used data from 11 European Union member countries to extract information on underlying aggregate supply and demand disturbances using VAR decomposition. The two authors recover the underlying demand and supply disturbances using the technique developed by Blanchard and Quah (1989). The basic idea is that an economy can be hit by two types of shocks, demand and supply shocks. Shocks are identified with the help of the restriction that their long-term impact of demand shocks on output is zero. Only supply shocks can have a permanent effect on output. Bayoumi and Eichengreen (1992) estimate two-variable vector autoregression (VAR) models for real GDP and GDP deflator. Demand and supply shocks are then recovered from the residuals of the VARs with the help of the aforementioned restriction. Correlation coefficients of different shocks between countries are used to assess the degree of similarity between the business cycles.

Bayoumi and Eichengreen (1992) find that underlying shocks are significantly more idiosyncratic across EU countries than across US regions, result which may indicate that the EU will find it more difficult to operate a monetary union. However, a core of European Union countries made up of Germany and her immediate neighbours, experience shocks of similar magnitude and cohesion as the US regions. EU countries also exhibit a slower response to aggregate shocks than US regions presumably reflecting lower factor mobility.

Using data from mid 1990s to 2000 for ten CEE countries, Fidrmuc and Korhonen (2001) found that Hungary has the most correlated demand and supply shocks with the Euro area as a whole, while at the same time, the correlation of shocks varies considerably between Eurozone and accession countries. When taken individually, Hungary has the highest correlation in supply shocks, while Poland has the maximum correlation among the investigated countries for demand shocks. The least correlated are the Baltic countries namely, Lithuania and Latvia for demand shocks and Lithuania for supply ones.

Frenkel and Nickel (2002) conclude their study that “there are still differences in the shocks and in the adjustments process to shocks between the Euro area and the CEECs. However several individual CEECs exhibit shocks and shock adjustment processes that are fairly similar to some euro area countries”.

Horvath and Ratfai (2004) using quarterly data for the 1993-2000 period show that the degree of correlation among the eight new members of EU is significant but there is a low correlation of these economies shocks with the Eurozone’s core economies. Based on these, they argue that the integration of these countries into Eurozone will be costly.

4.1. Models used and estimation methodology

In order to identify the supply and demand shocks, we used in our analysis a methodology similar with Blanchard and Quah (1989) and Bayoumi and Eichengreen (1992).

The theoretical aggregate demand and supply model provides two distinct features of the original shocks affecting the economy. First, only supply shocks have permanent effect on output, property that will be used for the definition of structural models (VARs). Second, positive demand shocks raise prices while positive supply shocks reduce the price level, property that is called by Bayoumi and Eichengreen (1992) as on overidentifying condition.

The method used to recover supply and demand shocks is presented below for a structural vector autoregressive (VAR) model with two variables (GDP growth rate and GDP deflator).

As we described above, supply shocks have a permanent effect on the output, whereas demand shocks have only transitory effects on output. On the other hand, both supply and demand shocks have permanent effects on the price level. A supply shock decreases the price level, whereas a demand shock increases it.

As we mentioned previously, the method used to separate supply and demand shocks is similar with Blanchard and Quah (1989). They estimated a two-variable VAR with GNP and unemployment, and proceed to identify the two aforementioned shocks. Similarly to our analysis, Bayoumi and Eichengreen (1993) estimated a VAR with the differences of GDP and the price level (in logs) as variables. The joint process of the two variables (GDP and prices) can also be written as an infinite moving average representation of supply and demand shocks,

$$X_t = A_0 \epsilon_t + A_1 \epsilon_{t-1} + A_2 \epsilon_{t-2} + A_3 \epsilon_{t-3} + \dots = \sum_{i=0}^{\infty} L^i A_i \epsilon_{t-i}, \quad (1)$$

where X_t is a vector of differences of logs of output and prices $[\Delta y_t, \Delta p_t]'$, ϵ is a vector of demand and supply disturbances $[\epsilon_{dt}, \epsilon_{st}]'$, A_i are the 2x2 matrices which transmit the effects of the shocks to the variables, and L^i is the lag operator. The long-run restriction that demand shocks do not affect the level of output is the same as saying that the cumulative effect of demand shocks on the change of output is zero, i.e. $\sum_{i=0}^{\infty} a_{11i} = 0$. Also, it is assumed that supply and demand shocks are uncorrelated and their variance is normalized to unity, i.e. $Var(\epsilon) = I$. A finite version of the model represented by equation (2) can then be used to recover the original supply and demand disturbances. Because the vector X_t is stationary, the VAR representation can be inverted to obtain the Wold moving average representation. Here e_t is the vector of residuals from the two estimated equations,

$$X_t = e_t + C_1 e_{t-1} + C_2 e_{t-2} + C_3 e_{t-3} + \dots = \sum_{i=0}^{\infty} C_i e_{t-i}. \quad (2)$$

The variance-covariance matrix of residuals is $Var(e) = \Omega$. Equations (1) and (2) directly yield the relationship between the estimated residuals (e) and the original (ϵ): $e_t = A_0 \epsilon_t$. Therefore, we need to know the elements in A_0 to calculate the underlying supply and demand shocks. The matrices C_i are known from estimation. Knowing that $A_i = C_i A_0$ and $\sum_{i=0}^{\infty} A_i = \sum_{i=0}^{\infty} C_i A_0$ helps to identify A_0 , but to recover the four elements of A_0 we need four restrictions. Two restrictions are simply normalizations which define the variance of the shocks ϵ_{dt} and ϵ_{st} . The third restriction is the assumption that demand and supply shocks are orthogonal, which with our notation means that $A_0 A_0' = \Omega$. The fourth restriction has already been mentioned, i.e. the long-run response of output to demand shocks is zero. The aforementioned restrictions uniquely determine the elements of A_0 , which allows us to recover supply and demand shocks from the residual of an estimated VAR.

4.2. Data and results

Our data cover the period of 1995Q1-2012Q4. We used real GDP data and the GDP deflator. The data are from EUROSTAT. For Romania, the GDP data on EUROSTAT are available since 1998. For 1997 the GDP data for Romania is provided by the National Institute of Statistics.

For the structural VAR decomposition we used the real GDP growth series obtained by first difference of logarithm of real GDP indices with base year 2000 (the indices were previously seasonally adjusted with Tramo/Seats) and inflation rate. For inflation we used the first difference of the GDP deflator (seasonality-adjusted with Tramo/Seats).

In the structural VAR we imposed the structural restriction suggested by Bayoumi and Eichengreen (1992), namely that GDP growth rate (aggregate supply curve) is in the long term horizon independent of inflation rate, but inflation rate may in the long term horizon depend on GDP growth rate (Philips curve, aggregate demand curve). After we derived the residuals (shocks) for each country we studied the similarity of shocks computing the correlation between demand shocks of a NMS and Eurozone and afterwards the correlation between supply shocks (Figure 5).

The results of the supply and demand shocks analysis confirm those obtained in the business cycle correlation analysis, as economic theory predicts a positive relationship between the transmission of external shocks and the degree of business cycles synchronization. As a general conclusion, irrespective of the country group, the supply shocks are more correlated than the demand shocks. This can be explained by the way each type of shock can be interpreted. It is more probable for supply shocks, reflecting unsystematic developments in the production capacity of the European economies, to occur as the result of a common source, than for demand shocks, which reflect the specific characteristics of each economy, such as changes in consumer preferences. Movements of output are dominated by demand shocks in the short-run, and by supply shocks in the long-run.

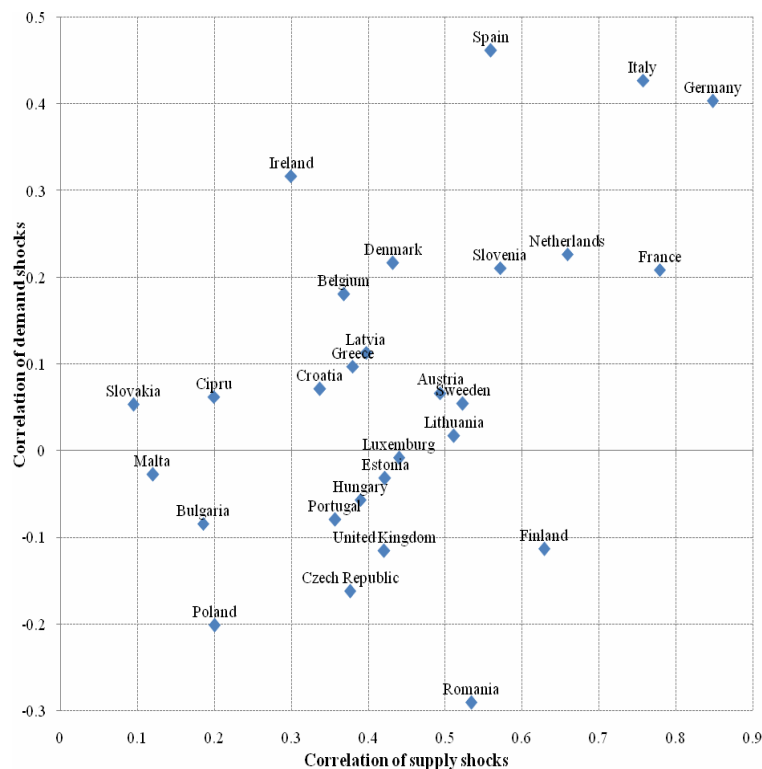


Figure 5. Correlations of supply and demand shocks

Core EA countries and the three EU15 non-EA member states have a similar degree of correlation between supply shocks, of about 70%. Also, peripheral EA countries and new EU members have close values for the correlation between their supply shocks and the same type of shocks in the EA, of about 40%. It is worth mentioning that the demand shocks in most of the new EU countries are negatively correlated to EA, implying that these economies would react to common European monetary policy measures differently than core EA countries.

Conclusions

This paper assesses the degree of readiness of New Member States (NMS) of European Union, including Romania, to adopt Euro, mainly based on optimal currency area (OCA) criteria.

In the case of Romania, in terms of nominal convergence, a lot of efforts need to be spent to bring inflation and budget deficit within the Maastricht criteria. However, from real convergence point of view, Romania seems to be one of the least prepared countries among CEE countries to adopt Euro, at least in medium term, high efforts being needed in terms of structural reforms.

Summing up, our empirical analysis suggests that at least some of the new EU members still have a long way before fulfilling the real convergence criteria and be prepared for Euro adoption. This is especially true for Romania, which is the least correlated with the

EA, regardless of the method employed to determine the output-gap. Possible explanations could consist in differences in the structure of the economy, or in insufficient commercial and financial integration between Romania and EA.

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THE REGULATION AND DEREGULATION OF THE FINANCIAL MARKETS – CURRENT TENDENCIES AND PERSPECTIVES IN THE CONTEXT OF PROVIDING FINANCIAL STABILITY

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Abstract. *The designing of a suitable framework to develop the human activity in general, especially in the financial and economic field, has issued warm debates generated by the difficulty in setting precisely the limit up to and how to interfere on the regulation way.*

The answer to this kind of problem needs to ensure balance between the freedom of action of the economic actors and the elimination of the conflicts of interest that may arise between the public and the private sectors, between the consumers and the investors etc.

The present work paper makes an analysis of the regulation activity as well as of the real perspectives in the context of the changes intervening on the globalization background also in the context of the recent financial crisis that brought back to the public attention the necessity to ensure the financial stability.

Keywords: regulation; deregulation; financial stability; macroprudential policy; financial crisis.

JEL Classification: D78, E58, G01, G21.

REL Classification: 11B.

1. Introduction

The importance of this subject asks for an approach from the historical point of view and from a larger range of aspects than the financial field, only.

For the beginning it is necessary to define the concept of *regulation* that in the economic literature is not unanimously accepted as a term. There is Hertog (2010) who gives a general definition to this term that it is not necessarily included in the economic area, which says that regulation is „*the employment of legal instruments for the implementation of social-economic policy objectives*” by the governing authorities.

These instruments used by the public authority are, in essence, means of constraint through which they aim at changing the individual or organizational behaviour under the threat of some sanctions.

There are two different perspectives in approaching the regulation process that have their roots from the promoted public or private interest, which is to be found at the basis of every action and, from this point of view, there are two theories that have to be considered (Hertog, 2010). The first approach that is focused on the promotion and the protection of the public interest, starts from the assumption that the regulation authorities have enough information and power of decision making in order to promote the public interest.

This theory is based on two postulates: the markets inefficiency to regulate themselves and the efficiency of the governmental interventions. The economic agents following their own interest, fundamental rule in the market economy, may include or not the public interest in their own activities. The objectives an economic agent sets, considering costs or terms (long or short), can be agreeable for the agent, as well under the aspect of effectiveness and efficiency, but also, they can be contrary to the public interest.

Under these conditions the regulation is seen as the promoter of the public interest by conforming the private interests promoted by every economic agent with the public interest

(general) of the economic system in general or of one of its components (e.g financial system), regulation leading eventually to the increase of the social well being.

The second theory is generated by the assumption that the regulators have not sufficient information regarding the economic agents' behaviour and, in consequence, their interference in controlling the companies activities is not perfect. Moreover, the regulation activity requires expenses that, in a way or another, are sustained by other economic agents, by the consumers or by politicians (in the voting manner). The lack of business information raises the issue of the authorities' regulatory capacity of moderating better the „conflicts” among the parties involved: investors, consumers etc. On the other hand, although, this theory emphasizes the group interest that can occur among companies, consumers, unions, legislators etc., *groups that may acquire at one point a greater power of decision making, affecting this way, the general welfare.*

Therefore, the regulation issue is extremely important, in the context in which it is considered as the monitoring and the controlling activities performed by the governing institutions on the activity of the private companies having as objective efficiency, data consistency and safety.

In the same time, deregulation has to be understood not as a renouncement to regulation but as an encouragement for the economic agents' initiative and their latitude by eliminating/diminishing the public authority control, implicitly, an assumption at the microeconomic level of the responsibilities related to the risks control.

The regulation process has become highly important and it manifested throughout time especially in those fields and activities considered fundamental for the economy (the financial field, transportation system, communications etc.), essential to both sides – the consumers as for the companies. The importance of the activity that needs to be regulated is given by the impact a disconnection may have in delivering the respective services on the economic activity also of the risks the consumers are exposed at regarding their health, safety and life in general.

The financial-banking activity has always been very well tied to rules due to the specific and importance of the banking activity. The succeeding waves of regulation and deregulation have influenced the relationship between the governing authorities and the financial-banking system (Constancio, 2006), the *evolution of these waves* being connected to the economic and/or financial crises that developed in the last one hundred years.

The years of the 1930s, 1970s, 1990s, or the year of 2007 represent major reference points regarding the reactions the regulation authorities had to the phenomenon that happened in those periods of time and which, through the taken measures, to diminish or to eliminate the effects of the corresponding phenomena in the future. Gordon (2005) shows that an adequate regulation and supervision (capital request, deposits insurance) explains the difference between the effects of the crisis of the years 1930 and the effects of the financial turbulences of the years 1990s, and, I would say, the effects of the crisis that started in 2007.

2. The importance, vulnerability and the need for regulation in the financial system

2.1. The importance and the vulnerability of the financial system

The importance of the financial system, considered from the regulation necessity perspective, is firstly given by the kind of activity which, in essence, is based on the current feeding with a certain amount of money in the exchange of a future promise of reimbursement. This kind of activity is uncertain in some ways and it is based on the mutual trust between partners and their future expectances.

The activity itself is affected by what is known the asymmetries of information that may lead to the markets failure (Constancio, 2006). Thus, for example, the absence of sanction for the failure in the loan reimbursement (poor regulation) may have as consequences the occurrence of some problems regarding the adverse selection: the borrower will be

encouraged to accept higher rates of interest, he will become more eager to obtain the loan in comparison with other borrowers who are less affected by the risks. Subsequently, the borrower will tend to enter higher risks under the conditions in which he benefits of all the proceeds, without taking any other risks and without incurring losses.

Secondly, it is about the externalities associated to the systemic role the financial sector plays. The financial sector is the axis of the development of the economic activity and the efficiency of the activity of financial intermediation ensures the transformation of savings into investments (White, 1999). An efficient financial sector represents the premises of the accelerated and long term economic growth.

Lastly, the importance of the financial system lies in its omnipresence, starting with the daily activity of every individual and reaching to the most complex companies and organizations that exploit the supplied services and without which the development of their activity would be affected.

The vulnerability of the financial – banking system is mostly connected to the depositors' place within the system. These are the major suppliers of resources exploited in the intermediation process. Because of the poor amount of information, because they are not knowledgeable of the process itself, they do not have the capacity to protect themselves against those who administrate their resources (the shareholders or the banks managers) in their tendency to take excessive risks.

In the case when to the above mentioned aspects, it is to add the imbalances between the maturities liabilities and assets as well as the nature of the financial- banking activity described above, one of the greatest vulnerabilities of the system takes shape and it is called – *panic*.

The panic reaction that mounts among the depositors, rightly or wrongly, may cause problems to any bank and, by contagion, it may lead to cascading failures of many banks, without for these having solvency or liquidity problems before.

Not any other bank can stand up under this kind of circumstances, to a simultaneous drawing back of an important amount of the deposits and with much less in their integrity, of their own funds.

The main concern for a better regulation and supervision is inextricably linked to the importance of the financial field and by its characteristics, that gives it a certain kind of vulnerability, there are any other arguments that may justify new regulations or the supervision increase (Constancio, 2006) such as:

- The unprecedented development and a much higher rate of the financial activity comparing to other activities, that made the financial field to become more important and more complex and, which, consequently, its *stability* has become essential;
- The impact of the *technical progress* (IT) on the activity;
- *The financial innovation* – the emergence of new and complex products designed to increase the capacity of intermediation and of the risks management of the banks. In this category, it has to be included instruments like Credit Defaults Swaps (CDS), Collateralized Debt Obligations (CDO), Credit-linked note etc., that offered the clients of the banks new placement opportunities but also of risks management. However they have created new sources of risk because of their complexity;
- Globalization- has lead to the increase of the markets interdependence and which requires new approaches considering the increase of the *contagion* effect;

2.2. The impact of the technical progress on regulation

The technical progress especially what is known as the *Information Technology* – IT, has a major impact on the entire human activity. The two important components, the calculation machines (the electronic computers) and the communication system, allowed

without precedent, the increase of the storage and of the information processing capacity as well as the speed in sending and receiving the information. Moreover, the new technology allowed the crossing of the geographical and of the temporal barriers due to the sending speed and the absence of the borders in the informatic systems that has permitted a new approach regarding the reconfiguration of the national economic systems.

The financial systems have been among the first systems influenced by the changes generated by the technical progress, making it possible the step to *globalization, deregulation and consolidation*.

The increase of the integration degree of the financial markets has been made possible and accelerated in the same time in the last twenty years by the changes in the communication technology that allowed the crossing of the geographical and temporal barriers in transferring the information. The financial system took part of the first flight that adopted these changes just because of the activity itself that is based on the storage, processing and transfer of information.

The capacity of supplying services everywhere in the world and anytime has permitted to the banks to take action globally, the residence of the service supplier and of the consumer has become irrelevant, a fact that has as consequence the increase of the competition, making it possible for new competitors to enter the market at any time. Probative is in this way is the European financial market in which the financial services can be delivered not requiring the physical presence of the supplier in a specific geographical area.

The technological changes have been necessary but not sufficient, they have to be accompanied by a series of deregulation measures that have aimed at the competition increase and the integration of the financial markets.

The major objective of the deregulation, namely the increase of the markets integration degree, was to eliminate some administrative and geographical barriers that used to restrict the free movement of the capital, the financial services delivery in any geographical area, the supplying of some categories of financial services.

However, deregulation, in spite of the major objectives set, need to be accomplished considering a series of restrictions:

- The insurance of the financial stability that can be affected by the range of changes occurred. This way, the speed in transferring the information represent an aggravating factor in the contagion effect, globalization of the financial system that permits a convenient transfer of the problems of the local financial systems and, not lastly, the increased competition that may affect the financial stability;
- Minimizing systemic risk;
- Ensuring the protection of consumers and investors, especially in relation to the information asymmetry, by delivering more transparent and accurate information.

The consolidation of the financial field has been achieved by developing the regulation framework on two main directions (Nieto, 2001), on one hand, by the abolition of the existing barriers between the local markets (representative for this aspect is the European Union), and, on the other hand, the abolition of the barriers that used to separate the various banking activities.

Deregulation has allowed the expansion of some financial banking colossi that are able to develop numerous specific activities on various markets (the banking market, the insurance market). In the same time, the increasing need for capital has lead to merging and acquisition operations that resulted into strengthening the position held on the market, obviously, under the pressure of the growing competition on the operating markets.

The technological progress has empowered the consolidation of the operational system, that concentrated a great part of the back office as well as of the making decision activities in regional centres. This phenomenon has been very apparent in Romania, for example, where the territorial units of the banks have almost exclusive tasks of promotion and

sale of the products and services, while the activities of support and decision are centralized in the headquarters or at least in some regional centres.

The increasing competition has influenced the banks to bring the costs down and this situation has happened, on one hand, due to the consolidation process, and, on the other hand, due to the innovation process that has made possible the supplying of new instruments, more profitable products and services but also, more riskful, at the same time.

The growing, without precedent, of the intermediation rate and, in general, of the activity in the financial field and its weight in the Gross Domestic Product (GDP) has been made possible due to the technological development but, accompanied by a deregulation process that joining together, have created the premises of developing more complex products, as well as the possibility of integration and consolidation of the markets, companies and, in the end, the globalization of the financial operations.

The technological progress (IT), associated with the globalization phenomenon supported by deregulation and consolidation, has lead to the development and the efficiency of the financial system that, in its turn, supported the recorded economic growth, in the last 30-40 years, with some syncope, in the most developed countries.

Considering the technological progress could help in solving some problems like the efficiency increase by reducing costs or by eliminating the adverse selection in making decisions and of the moral hazard (Nieto, 2001), the authorities in charge with the regulation process had to focus attention towards other directions that needed to be regulated: maintenance of the financial stability, consumers and investors protection, promotion of competition and the increase of the information transparency and accuracy.

The most important objective of the regulation authority is to cover the financial stability, situation that justifies the intervention through regulations in order to create a safe financial network, a *safety net* that would cope with the latest risks involved.

The greatest dangerous situation is represented by the increase of the contagion risk generated by the loss of confidence and which can be transmitted at a faster pace from one bank to the other, or from a financial system to the other, leading to great important financial institutions to fail, these facts generating effects hard to imagine. In this way, they need safety elements to think of, in order to countervail this phenomenon, among this, the Deposit Guarantee Schemes being situated prominently, the central banks, in their capacity of a lender of last resort but also other institutions and transnational bodies capable to supervise and intervene by regulations at macro prudential level.

2.3. The evolution of regulation in the financial system

The successive waves of regulation, deregulation and of re-regulation of the financial system are strongly connected with the important economic phenomena represented by the economic and/or financial crisis that has shocked the global economy throughout time. As a consequence, the governing authorities took actions that aimed at eliminating or, as appropriate, attenuating the effects of these phenomena and, according to the particular economic paradigm for the specific period of time, have meant either the intensification of the governing control or the diminishing of the role the government has to play in the economic activity.

From this perspective, there are two main trends of economic thinking to be identified, on one hand is the Keynesianism (and the successors of the ideas of this trend – neokeynesists) that stands for the idea that the government has to play an important role in the economy. At the basis of this dogma there is the argument that economy is inherently unstable and the occurrence of crises is because of the free markets failure, in this case, it's the public authority who has to take action, respectively, the regulation. On the other hand, the classical economists as well as their successors consider that economy is inherently stable, the market has the capacity to provide balance and, in this way, the excessive regulation or the regulation

inefficiency are considered responsible for the crisis occurrence, consequently, the overcoming of the phenomena cannot be achieved than by diminishing the role the state plays, consolidation of the free markets, respectively, deregulation.

The crisis of the years 1929-1933 represents one of the first important moments from the point of view of the economic thinking evolution regarding that specific situation, also they established the role the governing authorities had to play in the economic life in general, and in the financial system, in particular.

Until this moment, the classical liberal dogma that was based on the markets freedom of action and their efficiency has made for the government to have dramatic limited authority of intervention. Policy of "laissez-faire" specific to the period of time, marked those times with a poor regulation characteristics.

The strong effects of this crisis have lead to a change of dogma, the classical economists' ideas have been contested and the liberal classical dogma has been abandoned partially, being incapable to explain the amplitude of the phenomena and their effects.

This moment is followed by an intense regulation period, especially in the financial field, that considered thoroughly the conclusions taken during the development of the events.

One of the important lessons was that in the financial system the competition is dangerous, being able to affect the financial stability. All the regulators actions had the objective to control the competitors, the capital movement, to control the rates of interest, to control the credit accounts etc. What is representative for this period of time is that the commercial banks separated their activities from those of the investment banking in the USA (The Glass-Steagall Law of 1933) which was issued in order to protect the depositors from the tendency to excessive risk-taking of the shareholders or of the banks managers. A few years later the banking activity disassociated from the insurance activity (Bank Holding Company Act).

All these measures taken represented an increase in the capacity of the government to interfere on the market, respectively, an increase of the regulation that had as a result a more stable financial system although it became less efficient and innovative.

The year 1970 marks out the beginning of a period of time characterized by a serious deregulation that lead to what is called now the "triumph of the markets" (Goodhardt, 2010). The liberalization of the commerce of products and services developed extensively leading to the increase of the global export trade with up to 10% of the total amount of the Gross Global Product at the beginning of the period of time up to 25% in 2005 (Liebscher, 2005).

The beginning of this period was triggered by some important events of which the ceasing of the system from Bretton-Woods is to be mentioned. Gradually, they gave up at a series of restrictive measures or their limits have been diminished. The requests for capital have become looser, they emphasized the need of the system liquidity, they reduced the constraints regarding the existing correlation between the deposits drawn and the banking loans offered. The economic activity and not only experienced a long flourishing time, starting with the years of 1970s and which was into the process of deregulation and integration. The objectives of this great process were circumscribed to consolidate the markets power, ensuring conditions of manifestation of economic freedom of action to stimulate competition and to increase efficiency.

The results were not left waiting so that the degree of integration and consolidation of the financial markets increased, the national barriers were dissolved, all these resulting into the reducing transaction costs, consequently, the activities efficiency, the markets became deeper/larger and more liquid, they also made it possible to improve the risk control through the instruments diversification and innovation.

In Europe, the deregulation process and the financial integration made its first appearance many decades ago and it was marked by some events and actions that show the direction in which the process developed as well as the objectives monitored (Liebscher, 2005):

- Year 1957 – Treaty of Rome laid the foundation of the unique European financial market;
- Year 1985 – A new step is made in creating the unique financial market by establishing the standards of harmonization of laws according to which the financial entities should be acknowledged in all member states;
- Year 1987 marks the liberalization of capital movements;
- Year 1999 is another important moment when with the introduction of the euro were removed exchange rate risks, contributing to increased market integration;
- In 2005, by completing the legal framework, the freedom of the financial markets became effective throughout the EU.

In the case of our country, the transformation process of the financial system started since 1990, and with timid steps, starting with the year of 2006, the year when Romania joined EU, the changes became rapid and of substance being augmented by two major directions. Thus, to the world and European tendency of globalization, deregulation, consolidation and financial integration, they added the economic and political joining of Romania to the EU space/territory, thus speeding up the process of convergence.

The objectives of these changes made in the last decades targeted at the financial integration, consolidation, efficiency and not the least, the consolidation of the markets power but, in the same time, the governing authorities have always aimed at another important objective – the financial stability, without which deregulation and integration couldn't have had the intended effects.

They have adopted this kind of approach because by eliminating barriers and reconciling regulations, it resulted into an increasing competition and this thing makes possible a more efficient allocation of capitals and a more efficient activity by reducing costs. Also, globalization, the free access to financial markets on different areas, have permitted an adjustment of the risk assumed by investors due to the diversification and geographic dispersion, reducing the possibility of concentrating the display in their own region/country, only.

In the same time, the financial integration has been an important factor of improving the markets discipline, of adopting the best practices in corporate governance, of the instruments and the methods of risk management, of increasing transparency, all these bringing their contribution to the consolidation of financial stability (Liebscher, 2005).

Therefore, the financial integration represented a promoting factor of economic development as well of diminishing the risks associated to the financial activity, phenomenon that manifested visibly in the financial global system, but also in our country, starting with January 1st, 2006.

The positive remarkable effects achieved as well as the potential ones accelerated the deregulation and integration process, and this kind of acceleration was not without consequences, leading to the emergence or the cumulation of new risks and challenges

Liebscher showed that the expending of the unique European market implied short-term costs arising from the need to reform or to reorganize institutions.

The institutional consolidation led to the emergence of some large financial groups that have the ability to administrate risks pertinently due to their institutional, technical, financial capacity, of promoting a more advanced risks management, comparing to the small institutions, leading to the consolidation of financial stability.

However, this kind of large institutions and their way of cross-border operating have turned to become threats and, not the least, risks to the address of the financial stability by raising the moral hazard, under the context of a group management behaviour of taking the excessive risks counting on the institution size (*too big to fail*). As well, the global exposure and the cross-border operations have increased the contagion risk that are to become a direct threat to the financial stability.

The globalization and financial integration process have shown that superior results can be achieved both from increasing the activity efficiency as well from the security of the economic environment point of view, but the process is not without risks especially under the conditions of an acceleration above the markets and individual capacity to assimilate and obviously, being a process based on innovation and in essence, a new development approach and vision, more risks, new threats occur that need to be managed properly.

3. Perspectives of regulating the financial system – the lesson of the last financial crisis

The year 2007 marks the beginning of a new “epoch”, the fourth in Goodhart’s opinion (2010), that will influence the economic thinking, the theory and the practices of the central banks and, in general, the approaches adopted by the political factors of decision.

The crisis of the current economic system originates in the financial system and, by contagion, it has affected dramatically the worldwide economy at a fast speed, practically, all the developed countries being distressed by this phenomenon.

For a better understanding of the present context and for a clarification of the global economic perspectives as well of the financial system, it is necessary to make a review of the causes that brought to the worldwide financial crisis and, in this respect, there is a series of opinions that converge towards two opposite points.

It is not possible to mention a single fact that triggered the crisis, this is the result of a whole complex of factors that acted simultaneously, starting from some chronic imbalances of the balance of payments of Member states, of some budgetary deficit that had generated debts, and reaching to the savings overfinancing.

Levine (2010) argues that, to the collapse of the financial system, apart from a series of factors like unsustainable macroeconomic imbalances, proliferation of toxic financial instruments, inconsistency or lack of regulations power, the decisive factor was the *failure of regulatory policies*. The promoted policies encouraged the excessive risk taking and the orientation of the activities and savings to the unproductive activities.

Root cause analysis identifies opinions that indicate that their source comes from deregulation of financial markets and, in consequence, the proposed solutions for economic recovery are prevailingly based on public authorities’ intervention and, opinions that show that the main cause is overregulation. In this case, the solution is to consolidate the freedom of markets.

One of the main causes of the economic crisis that started in the US and then expanded globally, is the *excess liquidity*. Since 2001, EDF has had a policy to counter speculative bubbles appeared on various markets (real estates, the dot com sites crisis) by reducing the monetary policy interest.

Excess liquidity in the market prompted investors to innovate, looking for alternative placement of excess funds, which led to excessive investment.

The world economy financing, due to excess liquidity and innovation, is seen by Watt (2008) as an important cause of the crisis because of the managers’ orientation towards activities that could generate short-term profits.

New financial instruments appeared necessary in the context described above, such as Credit Defaults Swaps (CDS), Collateralized Debt Obligations (CDO), Credit-linked notes and so on, have allowed investors to better manage their portfolios in a volatile context. This is not without consequences because innovation led inevitably to more complex products, through which investors have assumed higher risks which, combined with a lack of transparency, made everything more difficult to understand and quantify risk.

Thus, another important factor in crisis activation arises, respectively, the *risk massive understatement*, highlighted in an analysis of the Romanian financial system and confirmed, as shown by Danila (2010), by the subsequent course of the crisis.

Financial innovation occurred amid a phenomenon of deregulation, beginning as shown in the 1970s, being characteristic of the whole society but with a stronger presence in economic and financial field especially in developed countries. Obviously, deregulation of recent decades did not mean giving up rules, but the presence of some areas and/or products less “controlled” and less transparent, combined with strong innovation led to the accumulation of risks in the financial system.

There are also views according which, the rapid rising volume of complex financial instruments used there and implicitly the accelerating innovation is the result of excessive regulation. Thus commercial banks have responded to the action of public authorities to regulate activity (the Basel I, Basel II Agreements) by removing off-balance sheet assets at high risk, using just these innovations (Glăvan, 2010). Moreover, excessive regulation and transparency imposed entrepreneurial ability of banks to choose according to their own policy investment projects being forced to standardized behavior (the “flock behavior”).

Even if you can not identify a direct link between the existence of a regulated market or an over-regulated one and accumulations of risk caused in the system, however, the effectiveness of the rules may be disputed.

It is clear that since the regulation was issued it may have deficiencies.

The regulated activity being very complex and dynamic, it is impossible for the reality to be surprised with a model, whatever complex it would be at the writing time. But even assuming that the initial gaps are ignorable (they have a significant impact), however dynamics of the regulated activity is sufficient for the model (regulation) to quickly record an inevitable *lagging*.

This way they can identify another charge of crisis: *the regulators’ lagging* (Croitoru, 2010) and/or *poor effectiveness of the financial regulations* (Cerna, 2010). As shown Danila (2010), the specificity of the current crisis is closely linked to model - respectively- how it is performed the assets evaluation, risk analysis and decision making.

As complex as a model of risk assessment is, it represents a simplification of reality and, as such, the results obtained may not fully capture reality. All the investment projects of a commercial bank can not be evaluated by statistical models, even if belonging to homogeneous categories of operations, without taking into account the risk of errors that, eventually, materialize into accumulated potential risks.

Looking at some features of the evolution of the Romanian economy into crisis, they show that it was inevitable, and the global crisis was a factor in the role of initiator and obviously has had significant influence on the characteristics of the Romanian crisis, I mean issues related to the moment of release, the amplitude phenomena, etc. comeback.

Global excess liquidity had no way not to affect Romanian financial and banking system and the economy as a whole. External pressure of liquidity abundance was stimulated by high interest rates prevailing in Romania (result of inflation) and the development of the banking system, especially after 2006 with the entry into the EU, which provided investors more investment opportunities. Simultaneously, the capital account liberalization happened which brought to increasing the existing pressure.

Reforming the financial system and regulatory framework to address the issues raised and highlighted by the financial crisis has become a leading concern of public authorities at national and international level (EU, G20), also of the academic and practitioners in the banking sector.

Based on the stated objective of ensuring the necessary framework for sustainable economic development in terms of financial stability, it highlights several courses of action aimed at reforming the financial system.

Macroprudential approach is such an action to reform the regulatory system that focuses on financial stability and its connection with macroeconomics.

In this course of action they aim at increasing resilience of the financial system to endogenous or exogenous shocks by creating a *safety net system* capable of ensuring stability

even in case its important components fail. This way of approach seeks to avoid overregulation of the system especially on the microeconomic side which can become injurious to future economic development.

There is a risk that regulators, in their eagerness to control risks, to be too concentrated to regulate the banking system in particular and within its framework to harden the constraints against banks as separate entities, thus losing sight of touch with macroeconomics and other policies that should converge towards the same goal.

The result would be that, apart from the loaning diminishing to result into a financial disintermediation, that is to “prepare” the stage for another crisis.

Prudential regulatory and macroprudential supervisory framework should be based on cooperation between various policies applied in the economy (micro-prudential, macroeconomic, macro-prudential) of various institutions/organizations of States, in their capacity to implement these policies between the states and supranational bodies.

Financial stability has become a common responsibility thus leading to the globalization of regulation and, in this context, highlighted the role of macro-prudential supervision practiced at European level of new bodies emerged such as the *European Systemic Risk Board (ESRB)*, or at global institutions such as: the *Financial Stability Board (FSB)*, *International Association of Insurance Supervisors (IAIS)*, *Basel Committee on Banking Supervision (BCBS)*, the *International Organization of Securities Commissions (IOSCO)*.

The new *Basel III agreement* is another course of action of proposed reform by the Basel Committee (Basel III: *A global regulatory framework for more resilient banks and banking systems*, December 2010) that aim at consolidating the banking system to cope with the shocks caused by events of large-scale as the financial crisis mentioned.

A strong banking system is a prerequisite for ensuring sustainable economic growth, banks are called upon to provide the necessary financial intermediation between savers and users of resources, in their capacity as service providers important for their business nationally or globally, in the private or public sector.

Even though many of the regulations introduced have a microprudential character, to consolidate the credit institutions as individual entities, the reform of the international framework of regulation has a macroprudential approach that points at the risks of the whole system. For example, an important role in this regulation is conferred to the institutions deemed systemically important at the global scale (G-SIFI) considering the impact instability could have on the constancy of the overall system (problem *too big to fail*).

Increasing the role of central banks in ensuring financial stability is also an objective of regulatory changes.

Based on the capacity of lender of last resort of a central bank, it must be brought back in the first line of defense of financial stability, assuming the role history conferred but which, in recent decades, it has been turned in the shadows.

Macroprudential supervision policies promoting requires an authority to coordinate policy mix-microprudential, macroeconomic and macroprudential to act in concert, and central banks can undertake this coordination position given its role in the financial system, expertise held and, not least, political and operational independence it has.

Growing importance of the role of central banks requires working towards integration of the monetary and financial stability policies, which will not be very easy to do given the fact that policy objectives can be contradictory on short term.

Conclusions

Economic development in the past decade is certain, the results of extended periods of deregulation are undeniable however but it is still essential the role of public authorities to guide the transformation of existing infrastructure so it can handle the success recorded.

Within this infrastructure the financial regulatory system plays a key role, that eliminating unwanted slippage or excesses, to preserve good direction for development,

making the effective functioning and stable financial system, the point of departure in supporting future economic growth and development.

At the same time it must be considered the regulations limits (crisis erupted during the implementation of Basel II Agreement) and that poor or inadequate regulation can exacerbate financial instability.

To ensure a proper balance between freedom of markets and regulations should be a permanent objective and any exaggeration in one way or another is harmful. In building new institutions or new legislation they must start from accepting the limits of any systems/risk management models (however complex it may be) and give consideration to the *human factor*.

Promoting financial stability can be achieved in the current global context, from institutional and interstate cooperation. Building up the framework to ensure regulation of financial markets, to continue their integration and management of financial crises, international cooperation must stand necessary to address systemic risks and to avoid all potential conflicts policy promoted.

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EARLY WARNING INDICATORS OF ECONOMIC AND FINANCIAL INSTABILITY INDEXES

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Abstract: *This paper is an empirical study which analyzes economic and financial instability periods. I composed two early warning indicators: one for a period of economic instability and other for a period of financial instability. The index of economic instability periods is called EWI (Economic Warning Index) and it is defined with the aid of an intermediary indicator CII – defined in terms of industrial production growth, external trade growth and unemployment growth – and of a basket of significant macroeconomic and financial variables. The index of financial instability period called FWI is defined through an intermediary indicator FII – expressed in terms of a benchmark rate used on the interbank market and of an index from capital market of each country in the panel. I defined a set of fourteen potential leading indicators either macroeconomic or financial, at monthly frequency, in the period January 2000 – December 2012. The countries included in the study are Czech Republic, Hungary and Romania. It was composed a balance panel with six thousand and eighty four observations. At the basis of my decision to choose a continuous model was the fact that it motivates policy makers in steering policy continuously and the fact that there is no need to decide between yes/no value of crisis. This research aim to observe which of the potential leading indicators used in the analysis are significant in explaining the incidence of economic and financial instability periods and give us a warning regardless any negative trends in the macroeconomic or financial activity, affecting the national or the global situation. There is both a quantitative and qualitative approach. Using econometrics techniques as OLS regressions, Fixed effects and Fixed dummy effects there were identified significant indicators in explaining economic and financial instability periods. According to their ability of warning the signals are classified as late warning (less than one year), early warning (one to three years) and ultra-early warning (more than three years). The evaluation results suggest that between economic and financial environment it is a strong relationship and that there is a range of leading indicators which gave us a warning signal regarding any instability periods occurred in the economy.*

Keywords: economic instability; financial instability; leading indicators; early warning.

JEL Classification: B26, E61, G01.

REL Classification: 8H.

1. Introduction

The purpose of this paper is to create an early warning system which can send us alerts about specific vulnerabilities of the economic and financial environment. In this way the attention of decision factors will focus to adjust in time specific policies. At the basis of this research there are the following assumptions. Up to the present, it was demonstrated that there are either macroeconomic or financial variables which gave us a warning signal regarding the macroeconomic and financial environment. Definition of economic and financial instability periods are subject to professional judgment. There is a relationship between economic and financial instability periods. A key lesson drawn from past experience is that we have to take into consideration the interconnections between economic and financial environment, in order to have a complete picture.

This paper is organized as follows. Second section presents us literature review of early warning, in order to obtain a complete picture of the evolution of concerns to improve measuring, predicting and managing the vulnerabilities to the economic system. It is also presented the international framework of current crisis, including the measures undertaken by decision factors, in order to limit the negative effects suffered by the economy. Third section came with the data set used in the analysis, presenting the countries in the sample, the variables analyzed and the period of research. Also, there are presented the transformations of the variables, in order to obtain comparable results and the way of compounding those two continuous indicators which measures the costs of the economy in real terms. Fourth section presents us the composition of the Early Warning System, the econometrics techniques used and its performance assessment. Fifth section shows the results, presenting the estimations and their interpretations. Last section concludes about the utility of this model in actual economic environment and summarizes the main ideas. Detailed description is available in the five appendixes available at request.

2. Literature review

The interest of researchers in early warning was visible even in the 1979 years with Krugman's and Bilson (1979) models for explaining currency crises.

Krugman (2000) believes that only an analysis of international size could give us a warning signal regarding the amplitude of the current crises. In first edition of his book "The Return of Depression Economics", Krugman associated crises with bacteria that once were severe epidemics, but considered defeated by the modern medicine. Surprisingly those bacteria revived in a stronger form, resistant to all antibiotics.

Lucas, from Chicago University, winner of Nobel prize in 1995, explained in one of his paper that macroeconomics appeared as an answer to Great Depression.

Bernanke (2004) and Lucas (2003) declared few years ago that even the economy will suffer occasionally one recoil, the era of great depressions is already gone. The economic cycle was considered an outdated notion. The economist states that we have to learn from all economic and financial crises (1998), because anyway those are very hard to predict.

Kaminsky, Lizondo and Reinhart in their paper "Leading Indicators of Currency Crises" compose an early warning system in predictive purpose for currency crises.

Early warning indicators for costly asset price boom/burst cycles were composed by Alessi and Detken. The conclusions of the paper highlights that financial variables are preferred to real variables in predicting costly asset price booms, global indicators behave better than domestic ones and global credit outperforms global money.

Rose and Spiegel use a Multiple Indicator Multiple Cause (introduced by Goldberger 1972) and focus on national variables to analyze the occurrence and effects of a crisis, but ignoring cross country "contagion" effects, which made their results to fail because they take care on national variables, given that the causes of the crises from contagion or common shocks.

The analysis of Cecchetti, Kohler and Upper (2009) based on 40 systemic banking crises, emphasizes that last financial crises, is computed from a wide range of economic factors.

The paper "This Time is Different: A Panoramic View of Eight Centuries of Financial Crises" includes African, Asian, European, Latin American countries, North America and Oceania, in 1800-2006 period and threat external debt, domestic default, banking crises, currency crashes and inflation excesses, by constructing a composite index of financial instability that is multidimensional, concluding that "financial crises are more a way of life affecting all" (Reinhart, Rogoff, 2008).

The paper "A decade of debt" of Reinhart and Rogoff (2011) presents evidence that public debt in advanced economies surged rapidly, registering a growth of 134%, larger than the percent of 86% registered after the World War II, thus being associated with lower economic growth and higher incidence of default. Those things make the authors to describe the 2008-2017 period as "a decade of debt".

Another paper of Reinhart and Rogoff (2008) is focused on banking crises and highlights that crises are more severe for the financial centers like UK, USA and France. They analyze for the first time in the literature the role of “housing prices” variables and find similarities of the behavior of frequency and duration of banking crises between developed and middle-income countries, highlighting that most countries experience a surge in debt in the wake of a financial crisis, with real central government debt increasing 86% on average during the three years following the crisis.

The paper of Arellano and Kocherlakota (2008) provides an explanation of the fact that sovereign debt crises precede debt restructuring or actual default, arguing that sovereign default risk and private default risk move together in developing countries. According to their results, the problems begin in the private sector and became sovereign government problems because of transfers from sovereign, which leads to sovereign default.

Starting with George Santayana cite: “Those who cannot remember the past are condemned to repeat it”, Kling (2009) analyzes root causes of the current financial crisis in terms of bad bets, excessive leverage, domino effects and 21-century bank runs, in order to assess the importance of the broad policy areas. The paper states that the main causal factor of the crisis was the capital regulation of banking system. The author highlights that the financial crisis appeared as a result of a combination of the four elements.

Last crisis revealed important aspects in the current global architecture and official mechanism that facilitate global financial stability. Current crises emphasizes that the surveillance for crises prevention must be more rigorous, with a better incorporation of financial sector and regulatory issues, with better information regarding cross-border spillovers and systemic risks. If prior to the current crises were considered just vulnerabilities in emerging market economies because they are supposed to be more fragile, now there are taken in consideration the vulnerabilities in advanced economies too, because they could create broader distress through cross border linkages. (Kato, 2010). The G-20 Framework for Strong, Sustained and Balanced Growth and the Mutual Assessment Process reveal the need for policymakers to take care about the multilateral dimensions of the countries.

Ghosh, Ostry, Tamirisa (2009) say that even all crises are different, they all have an economic vulnerability (credit bubbles, asset price bubble, balance sheet mismatch) and a specific trigger (political turmoil, terms of trade shocks, contagion, the collapse of the subprime market). The first step in developing a EWS is determining what events should it warn about ('90 external events). Next step is developing the specific toolkit to make policy makers to react.

Many Fund's publications like the World Economic Outlook (WEO), the Global Financial Stability Report (GFSR) and bilateral surveillance and many other institutions like the Bank for International Settlement (BIS), the US Office for the Comptroller of the Currency, the Bank of England, the Financial Stability Forum (FSF) and some economists like Krugman, Rogoff and Roubini identified vulnerabilities and weaknesses, but they failed to deliver clear messages to policy makers.

Based on the analysis on 14 economies in 2000-2006 period Nouriel Roubini and Menegatti (2009) identified potential risks like: large current account deficit, private sector imbalances, fiscal issues, global/external conditions, investors risk aversion and the risk of sudden stop of capital.

IMF in collaboration with FSB realized an Early Warning Exercise (EWE). IMF leads the work on macroeconomic and macro-financial vulnerabilities and FSB leads the work on vulnerabilities and regulatory tasks in the financial sector. The purpose of this analysis is to prevent the crisis occurrence in order to limit damages, by identifying vulnerabilities and transmission channels and warn about risks that could affect the system. According to this exercise, crises are determined by a collision of vulnerabilities of an economic or financial nature and specific trigger events. In Europe the European Systemic Risk Board (ESRB) was established to oversee the build-up of systemic risk (Brunner et al., 2011). According to DeLong (2009), classic economic theories are not helpful in making us understanding the current global context because the current global recession is different than other ones before it. White said

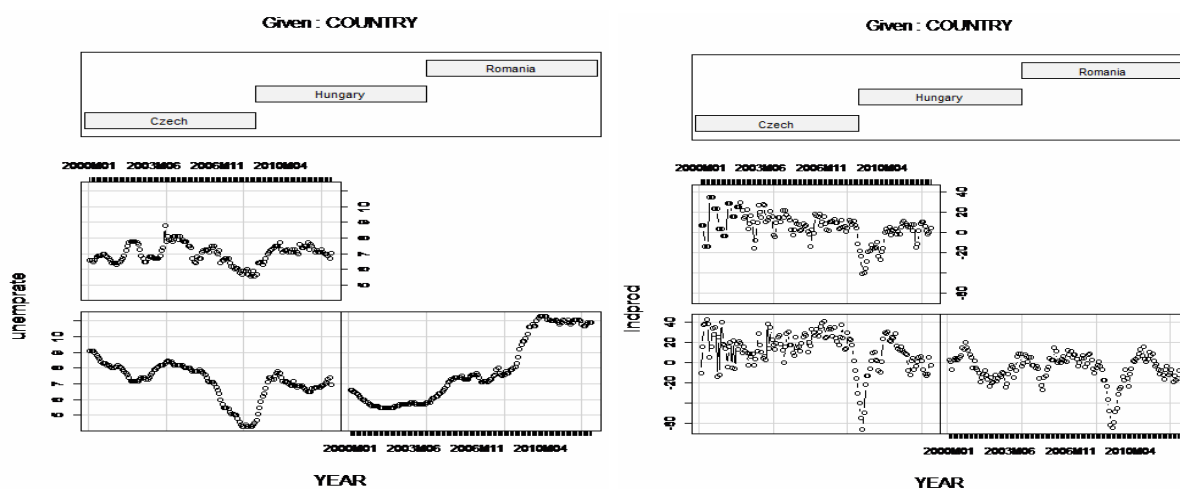
that the guilty is the update of policies and federal regulatory interventions (Federal Reserve credit expansion creating unsustainable mortgage and encouraging of writing riskier mortgages).

Chapter 3 of World Economic Outlook highlights that aspects of the current crises are new and unanticipated (Prego, 2009). The paper “Assessing Early Warning Systems: How Have They Worked in Practice?” looks at the performance of EWS in practice and advises us to use common symptoms of past historical episodes when composing an early warning system. Some models used by the FUND for prediction are KLR, DCSD, PDR and GS-WATCH (Berg et al., 2004). A paper from the MPRA analyses the literature of early warning from 1971 to 2011. According to their research the number of studies increased in 1996, due to globalization, registering a peak in 2001- 2005 period. The useful variables were exchange rates, interest rates and domestic economic activity indicators (Eray, 2011).

Data set

I construct a balanced panel of three countries over January, 2000 – December, 2012 at monthly frequency, obtained from Eurostat Database. I used also Bucharest Stock Exchange site for collection of one leading indicator data (stock market capitalization data) for Romania. I chose to use monthly data for a better efficiency of the issued signals consisting in the fact that allows timely reaction from the decision factors, as policy makers. I choose to perform the analysis for Czech, Hungary and Romania.

Following the analyses of Eurostat Database those countries register comparable variables regarding a list of indicators as GDP per person, unemployment rate, public debt, budget balance. Analyzing Global Financial Stability Report of International Monetary Fund from 2007 up to present it was captured the evolution of the whole economic environment. The report at September 2007 surprises the increasing in credit and market risks and also the increased volatility of markets. After six months, at April 2008, it was demonstrated the fragility of the global financial system. There were assessed the vulnerabilities that the system is facing and were drawn a series of conclusions and policy lessons. In October 2008 financial markets worldwide were facing growing turmoil. In April 2009 crisis has spread to households, corporations and to banking sector in both advanced and emerging countries. In October 2009 there are presented medium term policies that aim to make the financial system more stable. In April 2010 the report analyzes systemic risk and the effects. In October 2010 global financial system is still uncertain. In April 2011 despite the enhancements of the system, vulnerabilities are still present. In September 2011, the report highlights the increase of risks as public debt burdens and weak growth. In April 2012, there are reassess the risks especially sovereign vulnerabilities. In October 2012 the report emphasize increased risks focusing on the euro area crisis. In April 2013 the report investigates the monetary policies of four Central Banks which decreased vulnerabilities of the banking sector on short term.



The variables are classified into two categories: on the one side we have fourteen potential leading indicators and on the other side we have subjective definitions of economic and financial instability periods (CII and FII).

For the comparability of the regressions results, the variables were standardized so they fluctuate around the mean and series variations are constant, to achieve comparable results.

CII is composed by applying weighted schemes to monthly industrial production growth, unemployment rate growth and external trade growth

FII is composed by applying weighted schemes to an interbank benchmark index specific to each country and to a capital market index. For the interbank reference index I used PRIBOR for Czech Republic, BUBOR for Hungary and ROBOR for Romania. For capital market I used BUX for Czech Republic, PSE for Hungary and BET for Romania.

3. Early warning system

a) Composition

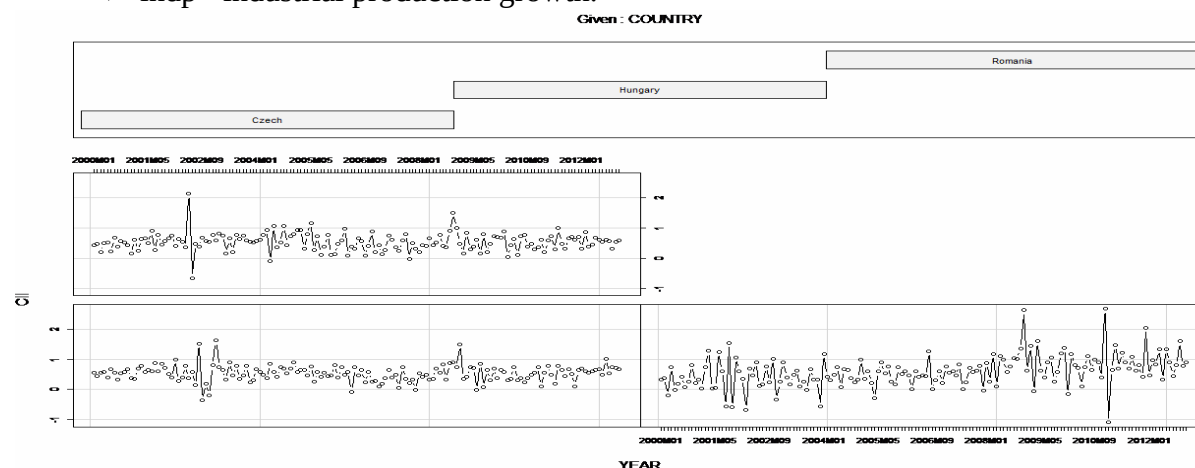
In the next step, an Early Warning Index it is constructed with the combination of potential leading indicators significant in explaining the incidence of the instabilities periods. During the research a problem in estimating the crisis monitoring indicators was the lack of timely and appropriate data, which avoid a complex analysis based on more variables and more years.

In order to compose a EWS, I defined a crisis measure for economic crisis (CII) and a measure for financial crisis (FII). The important part when creating such early warning system is to understand the causes from past experiences episodes. Literature review illustrates that the major international crises have a pattern. Based on backward studies and on my professional judgment I decided to define a measure of economic and a measure of financial instability.

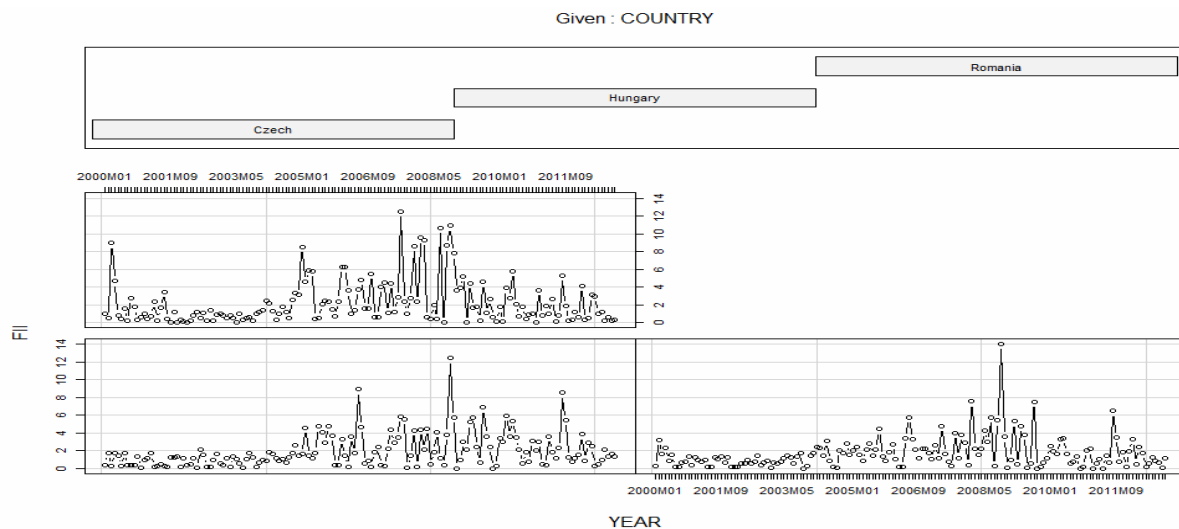
In CII equation a growth of unemployment rate represents a cost for the economy, so it enters with positive sign in composition of CII. According to Eurostat definitions, the unemployment rate is the number of people unemployed, between 15 and 74 years, as a percentage of the labor force. The labor force is the total number of people employed and unemployed. The deterioration of external trade was also visible before and during the last economic and financial crisis. Because first difference of external trade is negative, it also represents a cost for the economy. Industrial production growth enters in the equation with negative sign, because it adds value for the economic activity. The objective of the production index is to measure changes in the volume of output and provides a measure of the volume trend in value added over a given reference period. Considering the fact that there is no database which offers monthly GDP, I used industrial production growth. I also estimate monthly GDP by using interpolation of quarterly GDP with monthly industry production index, but because the results were appropriately, I decided to use monthly industrial production growth.

$$CII = \frac{(unr - ext - indp)}{3}$$

- ▶ unr =unemployment rate growth;
- ▶ ext =external trade growth;
- ▶ indp =industrial production growth.



FII is composed by applying weighted schemes to an interbank benchmark index specific to each country and to a capital market index, indicate significant risk, given the fact that their increase represents a cost in terms of interest rate.

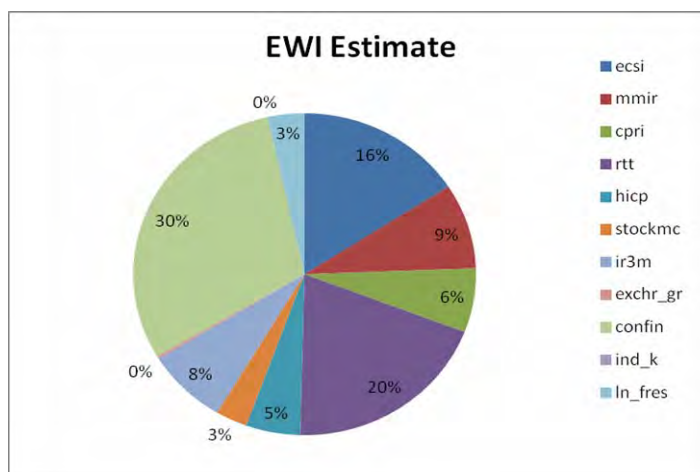
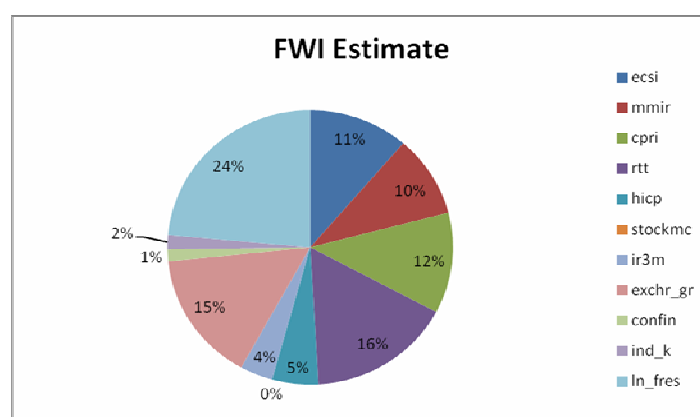


One of the methods used for estimating the unknown parameters in the two linear regression models was OLS. Using OLS there were identified significant variables in explaining CII and FII. According to the above pictures, the significant variables explain only 29.19% and 9.19% from the crisis incidence index evolution, respectively from the financial incidence index.

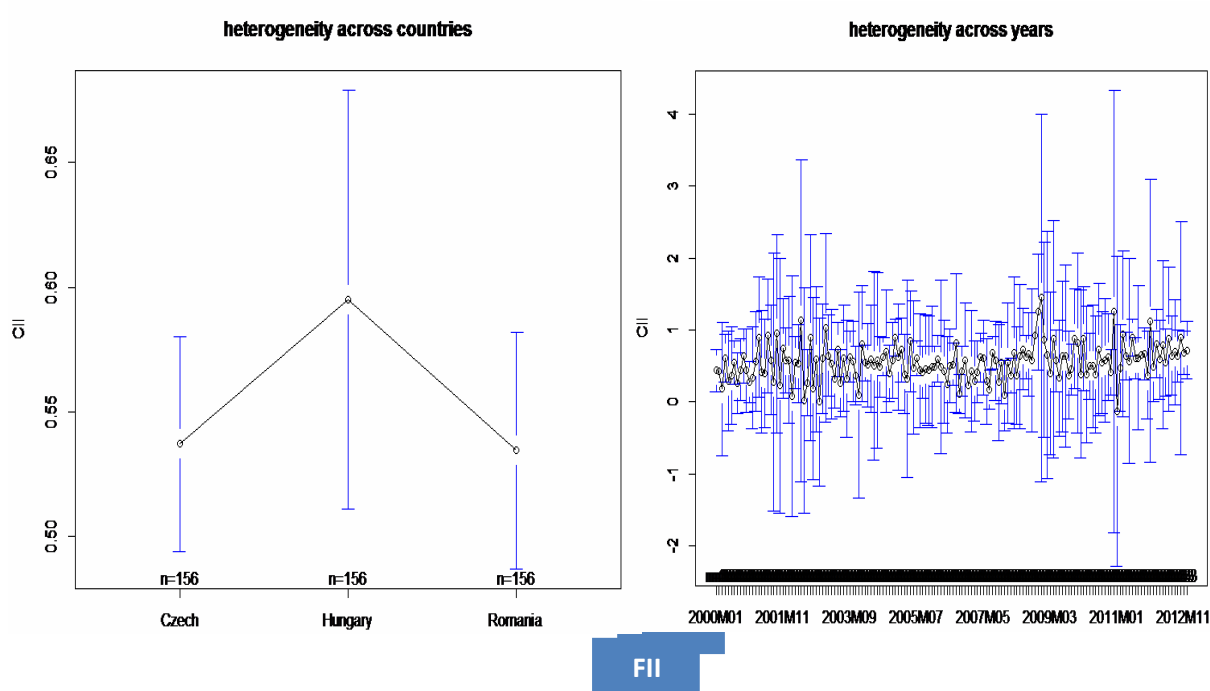
```
lm(formula = CII ~ ecsi + mmir + cpri + rtt + hicp +
stockmc +
ir3m + exchr_gr + confin + ind_k + ln_fres, data =
Panel)
Residuals:
    Min     1Q   Median     3Q      Max
-1.31432 -0.19535  0.01102  0.17839  1.74321
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -0.592165   0.754302  -0.785  0.43283
ecsi         -0.005617   0.002679  -2.097  0.03657 *
mmir          0.011896   0.011330   1.050  0.29433
cpri         -0.003736   0.002471  -1.512  0.13128
rtt          -0.006676   0.008868  -0.753  0.45195
hicp          0.008871   0.005930   1.496  0.13532
stockmc      -0.005888   0.001809  -3.254  0.00122 **
ir3m         -0.011047   0.010823  -1.021  0.30794
exchr_gr      0.041923   0.015945   2.629  0.00885 **
confin        0.005507   0.002771   1.987  0.04748 *
ind_k        -0.048687   0.004221 -11.533 < 2e-16 ***
ln_fres       0.179446   0.058901   3.047  0.00245 **
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.3255 on 456 degrees of
freedom
Multiple R-squared:  0.3086,    Adjusted R-squared:
0.2919
F-statistic: 18.5 on 11 and 456 DF, p-value: < 2.2e-16
```

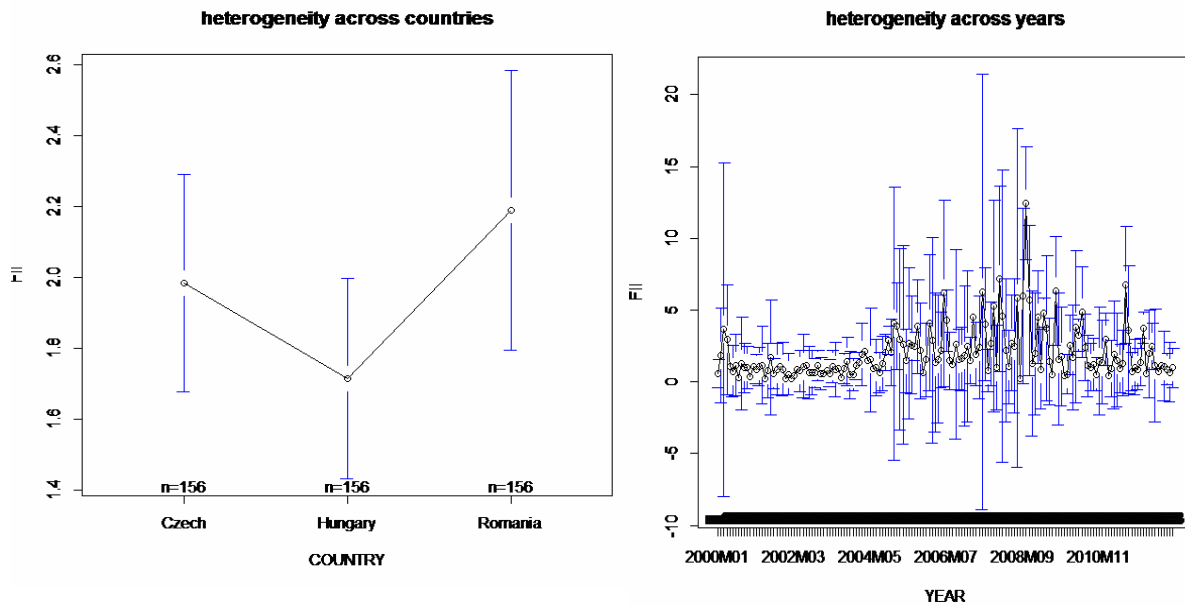
```
lm(formula = FII ~ ecsi + mmir + cpri + rtt + hicp +
stockmc +
ir3m + exchr_gr + confin + ind_k + ln_fres, data =
Panel)
Residuals:
    Min     1Q   Median     3Q      Max
-4.0839 -1.2158 -0.3550  0.6035 12.4043
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -8.66188   4.64076  -1.866  0.06262 .
ecsi         0.02744   0.01648   1.665  0.09664 .
mmir        -0.04385   0.06971  -0.629  0.52967
cpri         0.01370   0.01520   0.901  0.36792
rtt          -0.01297   0.05456  -0.238  0.81219
hicp        -0.02736   0.03648  -0.750  0.45365
stockmc      0.05687   0.01113   5.109 4.76e-07 ***
ir3m         0.10793   0.06659   1.621  0.10574
exchr_gr     -0.30964   0.09810  -3.156  0.00170 **
confin       -0.04552   0.01705  -2.670  0.00786 **
ind_k        -0.04378   0.02597  -1.686  0.09254 .
ln_fres      0.68306   0.36238   1.885  0.06008 .
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 2.002 on 456 degrees of
freedom
Multiple R-squared:  0.1133,    Adjusted R-squared:
0.09193
F-statistic: 5.298 on 11 and 456 DF, p-value: 6.604e-08
```

Based on the regression results, the contribution of significant indicators in predicting CII and FII based on OLS estimation it is presented in the next graphs.



Because OLS regression does not consider heterogeneity across countries and time I continue the analysis with fixed effects and fixed dummy effects. In the following analysis I considered also the heterogeneity across countries and across years for the two indexes.





I estimated fixed dummy effects because the simplest approach to model heterogeneity is to assume that each country has its own specific intercept (dummy). Each component of the factor variable is absorbing the effects particular to each country. According to the estimation results, the significant variables explain 72.22% from the variation of CII and 52.52% from the variation of FII.

Comparing the results of the OLS regression and Fixed dummy effects regression it is visible that OLS estimation is better for CII and Fixed dummy effects it is better for FII.

Fixed dummy effects CII

Call:
lm(formula = CII ~ ecsi + mmir + cpri + rtt + hicp + stockmc +
ir3m + exchr_gr + confin + ind_k + ln_fres +
factor(COUNTRY) -
1, data = Panel)
Residuals:
Min 1Q Median 3Q Max
-1.35654 -0.18135 -0.00212 0.18025 1.69012
Coefficients:
Estimate Std. Error t value Pr(>|t|)
ecsi -0.002705 0.002840 -0.953 0.34128
mmir 0.015041 0.011317 1.329 0.18449
cpri -0.003638 0.002453 -1.483 0.13866
rtt -0.007119 0.008849 -0.805 0.42152
hicp 0.009547 0.005968 1.600 0.11036
stockmc -0.004267 0.002302 -1.854 0.06437 .
ir3m -0.015059 0.010842 -1.389 0.16555
exchr_gr 0.592561 0.212630 2.787 0.00555 **
confin 0.001401 0.003060 0.458 0.64743
ind_k -0.048454 0.004195 -11.552 < 2e-16 ***
ln_fres 0.132642 0.074257 1.786 0.07473 .
factor(COUNTRY)Czech -0.577517 0.846449 -0.682
0.49541
factor(COUNTRY)Hungary -1.918169 0.878774 -2.183
0.02956 *
factor(COUNTRY)Romania -0.482124 0.889712 -0.542
0.58816
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.3229 on 454 degrees of freedom
Multiple R-squared: 0.7791, Adjusted R-squared: 0.7722
F-statistic: 114.3 on 14 and 454 DF, p-value: < 2.2e-16

Fixed dummy effects FII

Call:
lm(formula = FII ~ ecsi + mmir + cpri + rtt + hicp + stockmc +
ir3m + exchr_gr + confin + ind_k + ln_fres +
factor(COUNTRY) -
1, data = Panel)
Residuals:
Min 1Q Median 3Q Max
-3.6755 -1.2542 -0.2948 0.6096 12.4443
Coefficients:
Estimate Std. Error t value Pr(>|t|)
ecsi 0.01498 0.01741 0.860 0.3902
mmir -0.06722 0.06940 -0.969 0.3333
cpri 0.01239 0.01504 0.824 0.4103
rtt -0.03148 0.05426 -0.580 0.5621
hicp -0.04902 0.03660 -1.339 0.1811
stockmc 0.08102 0.01411 5.741 1.73e-08 ***
ir3m 0.10129 0.06649 1.524 0.1283
exchr_gr 0.82003 1.30387 0.629 0.5297
confin -0.03716 0.01877 -1.980 0.0483 *
ind_k -0.04888 0.02572 -1.900 0.0580 .
ln_fres -0.10708 0.45535 -0.235 0.8142
factor(COUNTRY)Czech -0.54603 5.19050 -0.105 0.9163
factor(COUNTRY)Hungary -2.68313 5.38873 -0.498
0.6188
factor(COUNTRY)Romania 0.98875 5.45579 0.181
0.8563
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 1.98 on 454 degrees of freedom
Multiple R-squared: 0.5394, Adjusted R-squared: 0.5252
F-statistic: 37.97 on 14 and 454 DF, p-value: < 2.2e-16

I also performed a Fixed effects estimation. In panel data analysis, the term fixed effects estimator (also known as the within estimator) is used to refer to an estimator for the coefficients in the regression model. If we assume fixed effects, we impose time independent effects for each entity that are possibly correlated with the regressors.

Fixed effects CII	Fixed effects FII
Balanced Panel: n=3, T=156, N=468	Balanced Panel: n=3, T=156, N=468
Residuals :	Residuals :
Min. 1st Qu. Median 3rd Qu. Max.	Min. 1st Qu. Median 3rd Qu. Max.
-1.36000 -0.18100 -0.00212 0.18000 1.69000	-3.680 -1.250 -0.295 0.610 12.400
Coefficients :	Coefficients :
Estimate Std. Error t-value Pr(> t)	Estimate Std. Error t-value Pr(> t)
ecsi -0.0027054 0.0028399 -0.9526 0.341280	ecsi 0.014977 0.017415 0.8600 0.39022
mmir 0.0150408 0.0113167 1.3291 0.184490	mmir -0.067216 0.069395 -0.9686 0.33326
cpri -0.0036381 0.0024525 -1.4834 0.138663	cpri 0.012393 0.015039 0.8241 0.41034
rtt -0.0071193 0.0088491 -0.8045 0.421516	rtt -0.031485 0.054264 -0.5802 0.56205
hicp 0.0095472 0.0059681 1.5997 0.110358	hicp -0.049020 0.036597 -1.3395 0.18109
stockmc -0.0042673 0.0023016 -1.8541 0.064373 .	stockmc 0.081021 0.014113 5.7407 1.727e-08 ***
ir3m -0.0150589 0.0108425 -1.3889 0.165550	ir3m 0.101294 0.066487 1.5235 0.12833
exchr_gr 0.5925613 0.2126305 2.7868 0.005546 **	exchr_gr 0.820034 1.303870 0.6289 0.52972
confin 0.0014005 0.0030603 0.4576 0.647429	confin -0.037158 0.018766 -1.9801 0.04830 *
ind_k -0.0484543 0.0041945 -11.5517 < 2.2e-16 ***	ind_k -0.048880 0.025721 -1.9004 0.05802 .
ln_fres 0.1326423 0.0742573 1.7863 0.074726 .	ln_fres -0.107080 0.455352 -0.2352 0.81419
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1	Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Total Sum of Squares: 69.5	Total Sum of Squares: 2044.5
Residual Sum of Squares: 47.335	Residual Sum of Squares: 1779.9
R-Squared : 0.31892	R-Squared : 0.12943
Adj. R-Squared : 0.30938	Adj. R-Squared : 0.12555
F-statistic: 19.326 on 11 and 454 DF, p-value: < 2.22e-16	F-statistic: 6.13592 on 11 and 454 DF, p-value: 2.0252e-09

According to the results, the fixed effects estimation reveals that significant variables explain in proportion of 30.93% the index of economic instability crises and in proportion of 12.94% the index of financial instability.

b) Methodology

In order to identify vulnerabilities of the economic and financial environment, I composed a EWI and FWI with significant variables estimated using OLS for CII and Fixed Dummy Effects for FII. Those represent two composite index of economic and financial instability that are multidimensional. The significant variables were weighted according to their p-value. As smaller was the p-value, as important was that variable in explaining the Early Warning Index. Weighting process it is very important in such models because it influence the explanatory power of the model. Inadequate weighting as well as not adding a significant variable in the model may strongly decrease the power of the early warning system.

$$EWI = 0.006 * ecsi + 0.0111 * mmir + 0.0148 * cpri + 0.0049 * rtt + 0.0186 * hicp + 0.0319 * stockmc + 0.0124 * ir3m + 0.3697 * exchr_gr + confin * 0.0032 + ind_k * 0.5 + ln_fres * 0.0275$$

$$FWI = 0.02 * ecsi + 0.0234 * mmir + 0.019 * cpri + 0.0139 * rtt + 0.043 * hicp + 0.5 * stockmc + 0.0607 * ir3m + 0.0147 * exchr_gr + confin * 0.1614 + ind_k * 0.1344 + ln_fres * 0.0096$$

As follows I used VAR technique for EWI/FWI and each of the potential leading indicators. I composed for each country a VAR between EWI and each potential indicator and a VAR for FWI and each potential indicator in order to allow for bidirectional causality. I observed the indexes response to a shock in each potential leading indicator. Using orthogonal impulse response functions I set the lag for each indicator equal to the lead where the response function reaches its maximum, without taking into consideration its sign or its statistical significance.

Time lags for potential leading indicators were determined in order to give policy makers time to react at the signals received. The lag is set by examining the impulse responses of CII and FII and each potential leading indicator.

I allow for a minimum lag length of twelve months assuming that a potential leading indicator provides an early warning only if it predicts crisis incidence at least one year ahead so that timely policy action can be taken. Taking in consideration the fact that the lag must be enough for the early warning, but also avoiding excessive parameterization I considered minimum lag of 12 months, because only if it is identified in time a negative aspect in the economy can be treated. According to the impulse responses the leads of the potential leading indicators are between two and twelve months.

EWI	ecsi	cpri	mmir	exch_gr	confin	hicp	Ind k	ir3m	Inres	stockmc	mmir	rtt
Cz	11	4-5	11	3	12	11	3-4	11	11	4	11	3
Hu	11	2	2	11	11	4	2	9	3	11	2	3
Ro	10	2	2	9	7	12	3	3	2	3	2	3
FWI	ecsi	cpri	mmir	exch_gr	confin	hicp	Ind k	ir3m	Inres	stockmc	mmir	rtt
Cz	11	4-5	11	3	12	11	3-4	11	11	4	11	3
Hu	11	2	12	11	2	11	3	12	2	11	11	3
Ro	10	2	11	11	2	4	3	5	3	3	11	3

4. Results

Defining the crisis incidence index as a function of unemployment rate growth, external trade growth and industrial production growth for the three countries included in the study it was visible the upward trend of the indicator starting with 2008. This reflects that the measure of crisis is well defined and captures the beginning of the economic crisis.

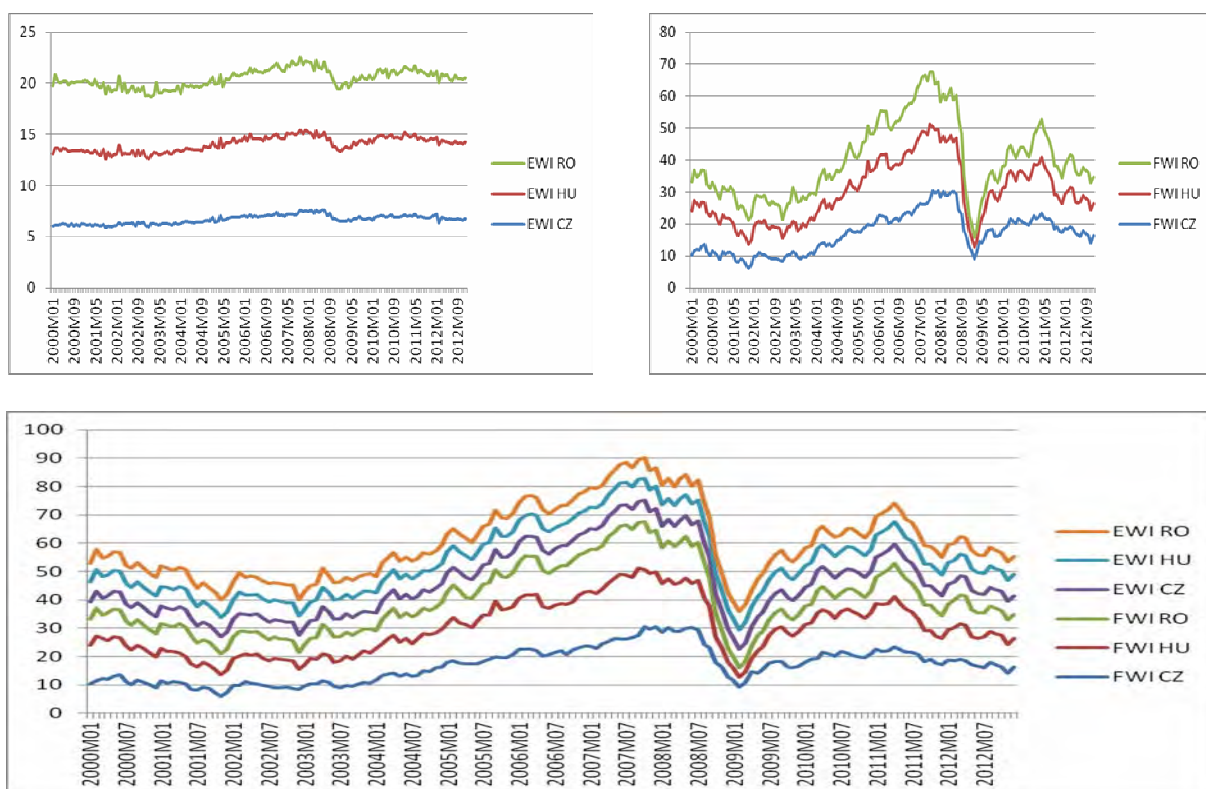
Estimating with OLS an aggregate regression between economic warning index and the potential leading indicators I found that only 29.19% from the instability period is explained by the significant variables. OLS minimizes the sum of squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation. The OLS estimator is consistent when the regressors are exogenous and there is no multicollinearity, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated. Under these conditions, the method of OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances. Under the additional assumption that the errors are normally distributed, OLS is the maximum likelihood estimator.

I also defined a Financial Warning Index as a function of an inter-banking reference index and of a capital market index. Using OLS estimation the financial instability period it is explained only in proportion of 9.19% by potential leading indicators. Because OLS regression does not consider heterogeneity across groups or time I continue the analysis with fixed dummy effects and fixed effects estimation.

Estimating fixed dummy effects it shows that this time significant variables explain 77.22% from the variation of EWI and 52.52% from the variation of FWI. Fixed effects are unknown constants to be estimated from the data and have informative factor levels.

Assuming fixed effects, which means imposing time independent effects for each country, the economic and financial instability period are explained in proportion of 31.89%, respectively 12.84%.

Statistically significant variables are economic sentiment indicator, money market interest rate, construction production index, retail trade turnover, market capitalization, harmonized index consumer price, three months interest rate, foreign reserves, etc. Comparing the three methodologies I found that Fixed dummy effects estimation is efficient in the case of both CII and FII. With significant variables estimated identified above, I compose the Economic Warning Index and Financial Warning Index, which represents composite indexes of economic and financial instability, which are multidimensional. The significant variables were weighted according to their p-value significance. As smaller was the p-value, as important was that variable in explaining the Economic Warning Index/Financial Warning Index.



As follows I used VAR technique for EWI/FWI and each of the potential leading indicators. I composed for each country a VAR between EWI and each potential indicator and a VAR for FWI and each potential indicator in order to allow for bidirectional causality. I observed the indexes response to a shock in each potential leading indicator. Using orthogonal impulse response functions I set the lag for each indicator equal to the lead where the response function reaches its maximum, without taking into consideration its sign or its statistical significance.

The last assumption refers at the relationship between economic and financial instability period. As can be observed from the above graph, we can state that financial crisis induce economic crisis.

I allow for a minimum lag length of twelve months assuming that a potential leading indicator provides an early warning only if it predicts crisis incidence at least one year ahead so that timely policy action can be taken. Taking in consideration the fact that the lag must be

enough for the early warning, but also avoiding excessive parameterization I considered minimum lag of 12 months, because only if it is identified in time a negative aspect in the economy can be treated.

Summarizing the main results I find that economic and financial crisis warning signals come at various horizon classified as: early warning, ultra early warning and late warning.

In order to check the performance of the model, in the sample and out of sample estimation techniques were made. Analyzing the out of sample forecasts for the three countries included in the sample it follows that the model is able to capture the beginning of the crisis in 2008 and predicts the crisis.

After completing the analysis of VAR the key idea is that even if the potential indicators are significant in explaining the crisis incidence, not all of them give important signals regarding its prediction. And also another important aspect is that this model hasn't the same efficiency for all the countries in the sample. This can be caused by the fact that the crisis manifested different in those countries both at indicators levels and direct consequences at the economy level.

All the above countries suffered as the last economic crisis appeared, but the effects consist in different consequences of different extent.

The utility of this research consists in the fact that if policy makers permanently supervise those leading indicators they can react in time by adjusting monetary or fiscal policy or by open market operations. Because it is not possible to predict the exact point in time at which the crisis sets in, the purpose of this paper is to identify vulnerabilities and to treat them in order to limit large scale damages.

According to the analysis, there are some significant variables which are very important in explaining the occurrence of an economic crisis which give important signals to policy makers in order to limit potential damages which can appear through an economic crisis. In the future, a special attention should be granted to permanently monitoring potential leading indicators, reacting to the signals received and include those indicators in the policy measures undertaken, in order to cover all the areas of the economy and to protect against potential risks.

Conclusions

In this research I compose an early warning index consisting in a continuous model of crisis incidence which reflects the real costs of a crisis. The sample refers to Czech Republic, Hungary and Romania over January, 2000 – December 2012 at monthly frequency.

I use fourteen leading indicators representing country specific variables. Using econometric techniques I identified those indicators significant in explaining crisis incidence. Then I assess the model performance in terms of in the sample and out of sample forecast. I test for the optimal lag length using VAR for EWI/FWI and each significant potential leading indicator and examine the impulse response functions. Summarizing the main results I find that economic and financial crisis/instability warning signals come at various horizon classified as: early warning, ultra early warning and late warning. After completing the analysis of VAR the key idea is that even if the potential indicators are significant in explaining the crisis incidence, not all of them give important signals regarding its prediction. And also another important aspect is that this model hasn't the same efficiency for all the countries in the sample. For example in term of signals, it predicts well the crisis for Hungary, than for Romania.

A limitation of the model consists in the fact that using only monthly available variables could reduce the predictability power by omitting important potential leading indicators which are not available monthly. Despite this consequence, I choose to use only monthly variables in order to bring something new in the improvement of the early warning system.

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A STUDY UPON THE GREAT JAPANESE CRISIS

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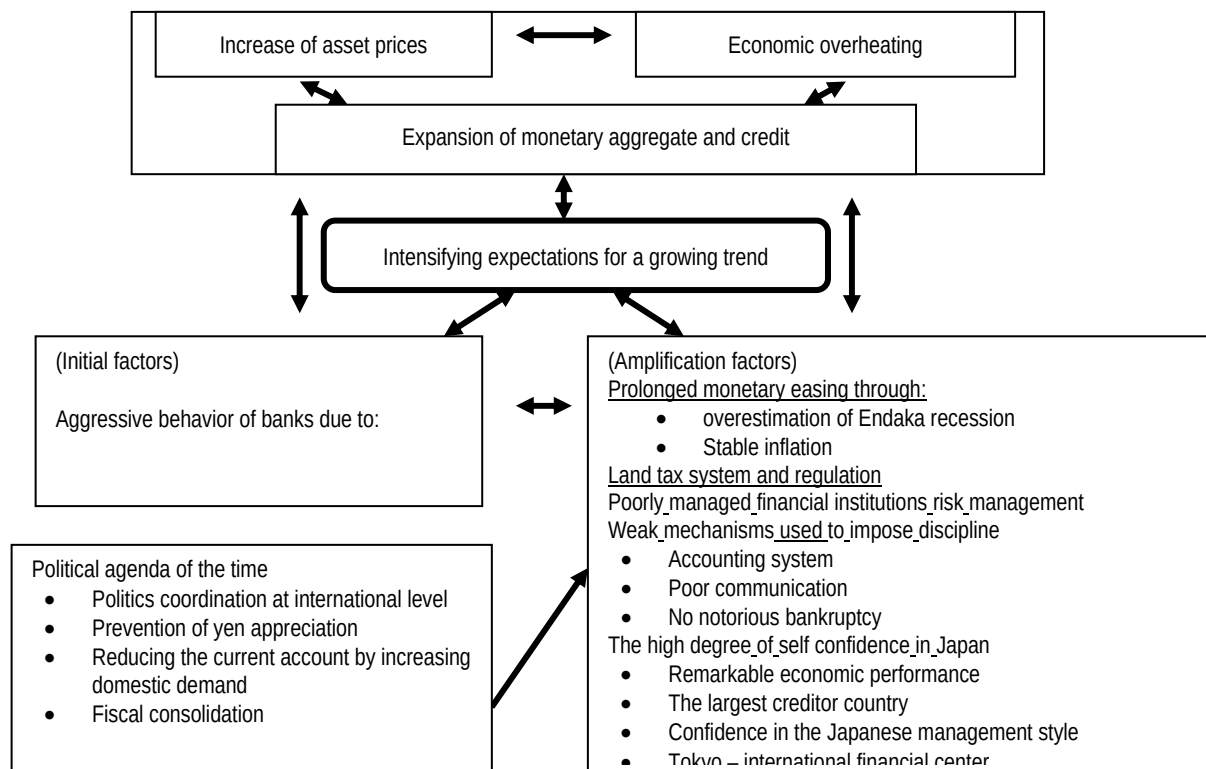
Abstract. This article aims to show that the great Japanese economic crisis of the late 80s followed the same pattern as all the financial crises known over time worldwide. After a period with a remarkable advance after the Second World War, the Japanese archipelago experienced a major crisis. The loan, originally a factor for growth and generating additional profits, became the main factor of instability. We chose to study the Japanese crisis in order to reveal its impact on the Japanese economy which even after 24 years has failed to recover.

Keywords: economic crisis; asset prices; Nikkei 225; speculative bubble; Japan.

JEL Classification: E44, G01, N15.

REL Classification: 10Z.

After a period with a remarkable advance after the Second World War, the late 80s would bring the Japanese archipelago a major crisis. As the great Japanese depression mechanism shows, due to a number of factors (divided into: initial, amplification, or political agenda of the time), in Japan, the expectations of an upward trend were intensifying exponentially and together lead towards economic overheating, expansion of monetary aggregates and, of course, accelerated growth of asset prices.

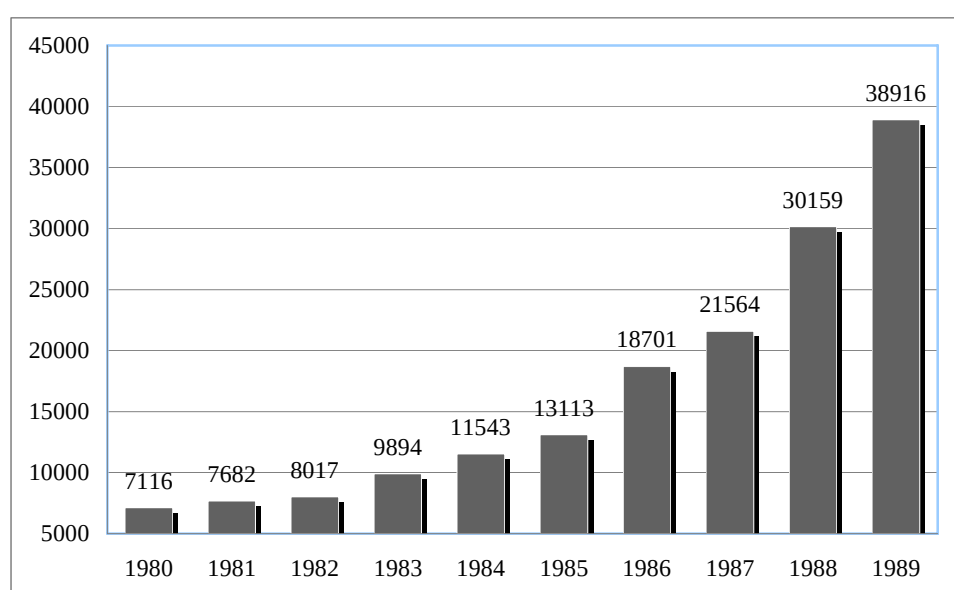


Source: own work, using (Kunio, Shirakawa & Shiratsuka, 2001, p. 409), (Shiratsuka, 2003, p. 54).

Figure 1. The Great Japanese Crisis mechanism

Due to increased real estate lending and connected industries, lack of motivation of the equity holders to form bank deposits (due to interest rates that were at a low level), increased loans to non-banking institutions and the market euphoria, there has been reached a “overinvestment”, which had the immediate effect the explosion of assets quotations, be it about shares, lands (agricultural or residential) or constructions.

In what follows, we will present the evolution of these elements, beginning with the Japanese stock index Nikkei 225's evolution in the period under review. As shown in Figure 2, if in the 1980-1984 period the increases were ranging between 7-15%⁽¹⁾, between 1985 and 1989 there have occurred annual appreciations between 17-43%. As a result of these significant gains, the Nikkei 225 index recorded in 1989 a value close to 200% (+197%), higher than that for the year 1985. Thus, people who have invested \$1 in 1985 came to hold shares worth \$3 four years later, representing an impressive growth, since this was the average of all listed companies.

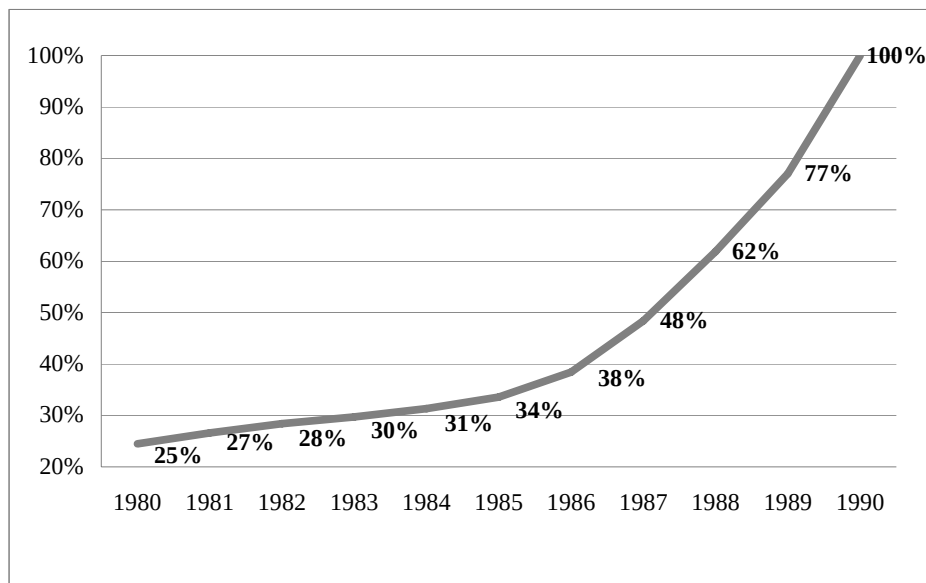


Source: <http://www.stat.go.jp/english/data/chouki/14.htm>, last accessed: 03.01.2013.

Figure 2. The evolution of Nikkei 225 stock index: 1980-1989 (points)

Further we shall analyze the growth of some assets, other than the financial ones, namely real estate. From a detailed analysis of Figure 3, we find that after a slight increase in land prices during 1980-1985, their quotation almost exploded, increasing until 1990, with an average of almost 200% (198.5%). What should be noted is that in this case we also deal with an increase in average quotation of land, with such assets whose price increased tenfold during this period.

In order to provide a clearer view upon land prices' burst, it is interesting to note that in 1988, the land in the immediate vicinity of the imperial palace came to be worth (in theory) as much as entire California and the land of the Japanese archipelago was valued, at the time, at 60% of the total value of all properties of the planet, over 200 times more than the Japanese territory represented, i.e. 0.3% of the total surface of the planet (Woronoff, 1990, pp. 96, 223).



Source: Own calculations according to <http://www.stat.go.jp/english/data/chouki/22.htm>, last accessed: 04.01.2013

Figure 3. The evolution of land prices in Japan: 1980-1990 (1990=100%)

According to Jon Woronoff's analysis made for the year 1988, land prices in Japan have increased two years in a row with 24.4% and 29.9%, therefore a further 61.55%.

Taxation and land regulation also contributed to this growth; together they tried to induce higher values of these real estate properties.

In order to increase the prices of this real estate asset, extremely low taxes were imposed on holdings and huge taxes were imposed on transactions. As Okin Kunio, Shirakawa Masaaki and Shiratsuka Shigenori pointed (Kunio et al., 2001, pp. 395-450, p. 22), when prices are expected to increase, by using such measures the holding is extended and the selling is stopped quite a lot, in order to suffocate the supply. Thus, as a consequence of the laws of demand and supply, the demand being predominant, the price will rise. This creates a mechanism to increase the quotation, and although the price reaches the level at which the owner initially proposed to sell, from this moment the tax benefit increases, which leads him to wait and of course to keep trying to take advantage of any increase in price. Thus, the sale is delayed, the supply is again less intense than the demand and the price moves upwards; from here tax advantages increase again and the mechanism is repeated (up to a point, when the bubble bursts!).

Regulation also supported this artificial growth; interests on housing loans were deductible from the income. Therefore taxes were not paid for them.

Thirdly, there have been induced some expectations of the owners, according to which the mainly agricultural areas would be converted into residential areas, as a result of a failure to apply the rules in force. When there are incentives to maintain land ownership, when it can be sold, this will generally lead to its under-utilization; the land's value will be restored, but by the best use that it could have and not for the activity for which it is currently used⁽²⁾.

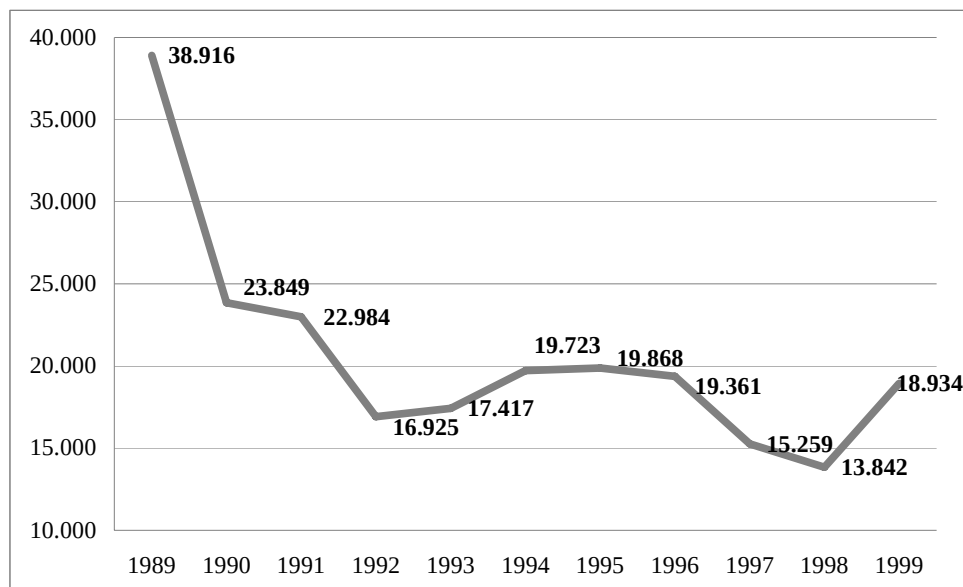
Therefore, landowners were given those so-called „institutional benefits” (Kunio et al., 2001, p. 22) or „rents” created by the system. Their size was directly proportional to the price of land; the more it increased, the more this advantage of the owners grew, in addition to the price difference they benefited from.

The bubble burst

The end of 1989 brought the Bank of Japan a tightening of the monetary policy (from fear of inflation), which meant the Japanese bubble burst and which (as we shall see) put the

Japanese archipelago⁽³⁾ into a very difficult situation. This increase in the interest rate also brought a real estate lending limitation.

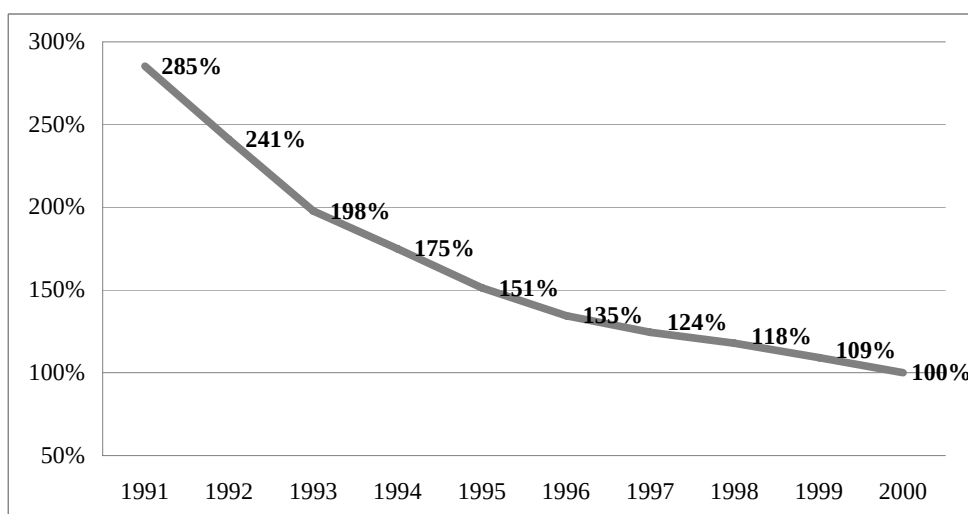
As there could not be found the financial resources to fund the bubble, asset prices began to follow a downward trend. The tone was set by the stock market where the Nikkei 225 index suffered important losses since 1990, as shown in Figure 4.



Source: <http://www.stat.go.jp/english/data/chouki/14.htm>, last accessed: 04.01.2013.

Figure 4. The evolution of Nikkei stock index: 1989-1999 (points)

In just a few months, the average quotation of the shares listed on the Tokyo Stock Exchange collapsed by almost 40%, from a peak of 39,597.44 points reached in December 1989 to 23,845 points for the next year. This staggering loss doubted that real estate prices were based on economic causes or just speculation. The answer investors gave themselves was the second and thus they began (since 1992) to massively sell their properties, which led to a collapse of land prices, as can be seen in Figure 5.



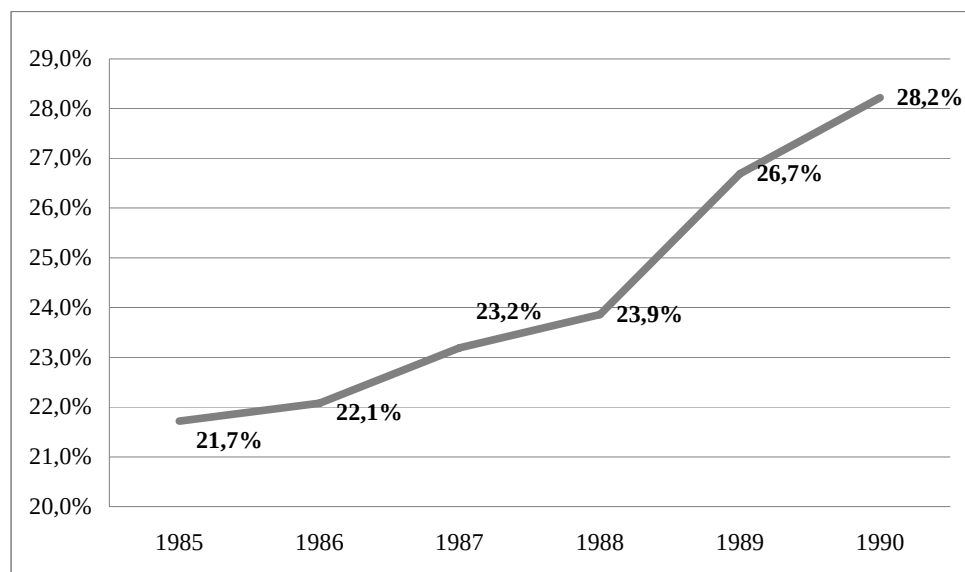
Source: <http://www.stat.go.jp/english/data/chouki/22.htm>, last accessed: 04.01.2013

Figure 5. The evolution of land prices in Japan: 1991-2000 (year 2000=100%)

At a more detailed analysis of the figure we note that throughout the period under review land quotations followed a strong downward trend, recording until year 2000 a decline of almost 70% compared to the beginning of the period.

All these quotations collapses had a disastrous effect on banks, because, as we can see in Figure 6, almost 30% of all loans were secured by real estate.

For the vast majority of these loans the immovable asset was accepted as collateral, for the acquiring of which the loan is contracted⁽⁴⁾, the credit amounting to 90% of the asset's value. As asset prices were crashing, banks' collateral followed the same trend. To the impairments of the recorded quotations, almost half of the total loans became uncovered.



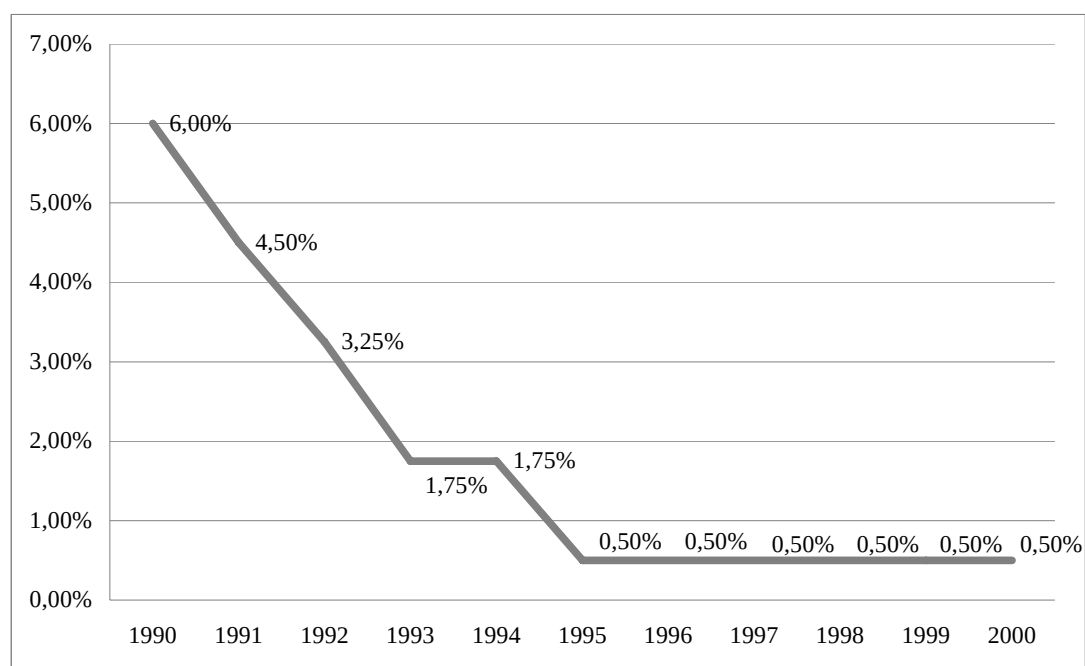
Source: (Kanaya, Woo 2000, 40).

Figure 6. The share of bank loans secured by real estate assets: 1985-1990 (percent of total loans)

Take the example of a house purchased at the price of 30,000,000 yen, for the purchase of which it has been granted a credit of 90% of its value, i.e. 27,000,000. If its price drops by half, i.e. to 15,000,000 yen, the loan becomes undersecured (even if in the meantime the customer has paid 33% from the total). Rather than continuing to pay rates, the borrower prefers to return the property to the bank. Owning therefore some assets, he will put them up for sale, resulting in lower prices for real estate for which there are not enough buyers. Thus, once the trend changes, it becomes a „giant snowball”⁽⁵⁾ that comes over the financial sector, which, in turn, shatters the real economy⁽⁶⁾.

As Takeo Hoshi and Anil K. Kashyap showed (Takeo et al., 1999, pp. 1-47, p. 4), the losses of the Japanese financial institutions have exceeded those suffered by the U.S. during the Great Depression, as ratio of GDP. If, during the American Great Depression, the US banks lost 2.2% of the average GDP for the years 1933-1935, in Japan the percentage amounted to 4%.

During this period, banks went through some difficulties, to which was added the Bank of Japan's decision concerning monetary policy easing. As shown in Figure 7, the average annual discount rate of the Bank of Japan followed a strong downward trend. From a peak of 8.25% reached in 1990, in less than five years it reached 0.5% and in 2001 it was set at 0%. No other modern country charged such low interests over such a long period.



Source: <http://www.stat.go.jp/english/data/chouki/14.htm>, last accessed: 05.01.2013

Figure 7. The evolution of the discount rate applied by the Bank of Japan (BOJ): 1990-2000 (percent)

In such conditions, many financial institutions went bankrupt⁽⁷⁾ and others were difficult to maintain in the market, because, with these interests, they could no longer find depositors (as can be seen in Table 1) and bad loans pressed them terribly.

Table 1

The comparative evolution of bank deposits, respectively credit unions deposits: 1991-1997 (percent)

Year	Banks	Credit unions
1991	-4.84	0.23
1992	-6.05	2.65
1993	1.29	3.33
1994	1.95	4.11
1995	3.03	-5.4
1996	0.06	-3.23
1997	2.86	-3.34

Source: (Kanaya, Woo, 2000, p. 41).

Due to some questionable practices, the extent of the crisis was masked for 3-4 consecutive years until 1994, when it was felt throughout the entire financial system. As Akihiro Kanaya and David Woo showed (Kanaya et al., 2000, pp. 1-47, p. 10), the Japanese commercial code allowed corporations to register in accounts their share holdings at an equal price as the purchase price or at the smaller amount between the cost and the market price. Banks chose the second method. As a proof, Fukao Mitsuhiro (Mitsuhiro, 1998, pp. 250-261) showed that the market value of banks' holdings amounted to 56.4 trillion yen, while their book value was 34.5 trillion yen. Thus, for a certain period, the banks' financial statements did not suffer greatly until the market price fell below the price of purchase (since 1994, 1995 - as can be seen from Table 2).

Table 2

**The evolution of Japanese banks' financial results:
1991-1998 (billion yen)**

	1991	1992	1993	1994	1995	1996	1997	1998
Net interest incomes	14.618	19.189	18.456	19.539	19.523	19.080	17.408	10.562
Other incomes	4.649	4.648	6.269	5.670	6.853	5.272	6.740	3.386
Expenditures	13.193	15.332	15.593	16.654	14.474	14.744	14.888	10.526
Reserves	1.650	3.897	9.163	12.544	23.342	11.532	25.809	21.202
Others	982	6	3.163	5.610	6.534	2.160	6.243	7.790
Gross profit	5.410	4.616	3.131	1.619	-4.905	236	-10.304	-9.990
Taxes	3.045	2.780	1.618	1.347	442	597	-619	-2.515
Net profit	2.367	1.835	1.515	271	-5.346	-360	-9.683	-7.474
Dividends paid	750	864	875	892	710	675	687	343

Source: (Kanaya, Woo, 2000, p. 41).

After a thorough analysis of Table 2, we can record two important aspects:

➤ Japanese financial institutions were allowed to distribute dividends even though they recorded a loss during that period (for example 1995, 1997, 1998); such permission was motivated by the fact that the dividends habit in Japan was grounded and a stop to this process would have generated mistrust;

➤ the fact that publicly traded companies in Japan which recorded a loss for three years were delisted, made the banks reduce their reserves in 1996 to register profit (to remain publicly traded), followed in 1997 when provisions increased exponentially to cover those from the previous year, while the loss for the year was a huge one (over 10000 billion yen).

In addition, the authorities did not intervene to raise the license to none of the financial institutions, until the insolvency of some major banks.

Therefore, between 1990 and 1995 there weren't any significant moves from the government in what the management of the financial crisis is concerned to restore order in this system that was in a progressive degradation. The authorities' policy was one of waiting for an economic recovery, which, unfortunately, did not occur.

Even after 1995, when it was already clear that public intervention was necessary, due to the catastrophic state in which the financial institutions were struggling, regulation and massive intervention were late in coming.

In order to provide safety, only starting from November 26, 1997, the Ministry of Finance intervened and guaranteed deposits until the end of March 2001. Thus, banks would have had to succeed in fundraising and, in turn, would have had to finance the economy.

The year 1998 brought a massive injection of capital, the Diet approving a plan which allocated 30 trillion yen by early 2001, to recapitalize and save the banks. Keeping the previously made parallel with the Great Depression, at that time the US market injected into the market 1.5% of average GDP, while Japan exceeded 6%, i.e. more than 30 trillion yen (Kanaya, Woo, 2000, pp. 1-47, p. 5, p. 29).

Conclusions

The postwar period was, economically speaking, a successful one in the history of the Japanese archipelago, which recorded a great advance up into the late 80s when Japan was entering a deep crisis that failed to be completely solved even today.

The Japanese crisis does not deviate greatly from the pattern of the crises, where there is a state of euphoria in the market, which implies⁽⁸⁾ an increase in monetary aggregates, an overheating of the economy, respectively a spectacular increase in asset prices. This rise is largely based on credit which, during the boom, generates additional profits and when the crisis starts, it becomes the main factor of instability.

The above-mentioned crisis has proven, once again, the strong bond between finance and the real economy, but also the fact that it reversed the trend; all the components which were generating growth suddenly became opponents of this phenomenon.

We would like to note that during the 90s, with little exception, the state did not intervene to manage the crisis, adding that the banks themselves did not do anything in their favour, due to poor corporate governance⁽⁹⁾; rather than take proactive measures, they preferred the more convenient option (tolerated by the state), waiting for prices of assets (financial and real estate) to return to their previous levels.

Notes:

⁽¹⁾ Pushed by the companies offering those huge trade surpluses to the Japanese archipelago.

⁽²⁾ For example, a land area of 700 sqm cultivated with vegetables, on the outskirts of a city, has a high value because the lot could be sold as a place to build a house and not because there tomatoes could be planted.

⁽³⁾ Authors like Gary Saonhouse and Robert Stern (Saxonhouse, Gary R. and Robert M. Stern, "Japan's lost decade: origins, consequences and prospects recovery", *International Economics*, 2002, pp. 1-25) believed that the Bank of Japan should not, after the agreement from Louvre in 1987, have lowered the reference rate from 3 to 2.5%, or, in the worst case, it should have been increased in 1988, when the Bundesbank and the Federal Reserve adopted this type of measure. According to the same authors, even if such an action had occurred in the summer of 1988, it would have alleviated much of the shock that followed.

⁽⁴⁾ Without a thorough analysis carried out by a credit bureau, to consider the debtor's ability to repay the loan.

⁽⁵⁾ Called a "financial accelerator" (Bernanke, Ben, Mark Gertler and Simon Gilchrist, "The Financial Accelerator and the Flight to Quality", *The Review of Economics and Statistics*, 1996: 1-15).

⁽⁶⁾ A number of important financiers like Allan Brunner and Steven Kamin (Brunner, Allan and Kamin Steven. "Bank Lending and Economic Activity in Japan: Did „Financial Factors” Contribute to the newly Downturn?", *International Finance Discussion Papers*, 1995, pp. 1-43), Bayoumi Tamin (Bayoumi, Tamin. "The Morning After: Explaining the slowdown in Japanese Growth in the 1990s", *IMF Working Paper*, 1998, pp. 1-35), Motonishi Taizo and Hiroshi Yoshikawa (Motonishi, Taizo and Yoshikawa Hiroshi. "Causes of the long stagnation of Japan during the 1990's: Financial and real", *Journal of Japanese and International Economies*, 1998, pp. 181-200), considered that the main cause for the Japanese economic stagnation of the '90s is given by the banking crisis through which it has passed.

⁽⁷⁾ 1994 – Tokyo Kyowa Credit Cooperative, Anzen Credit Cooperative, Tokyo Kyodo Bank;

1995 – Cosmo Credit Cooperative, Kizu Credit Cooperative, Hyogo Bank;

1997 – Nisan Life Insurance, Sanyo Securities, Hokkaido Takushoku Bank, Yamaichi Securities;

1998 – Long-Term Credit Bank of Japan and Nippon Credit Bank.

⁽⁸⁾ And is also enhanced by the growth of monetary aggregates, the overheating of the economy, respectively the spectacular increase in asset prices.

⁽⁹⁾ The only noticeable action was recorded in 1993 when they established the Cooperative Credit Purchasing Company (CCPC) which aimed acquiring the bad assets and attempted their recovery; the results of this movement were not the ones expected.

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THE LONG-TERM REAL CONVERGENCE OF CENTRAL AND EASTERN EUROPE ECONOMIES TO THE EURO AREA –THE SIGMA AND BETA CONVERGENCE

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Abstract. *The real convergence is a prerequisite for the long-term development of the EU member states, enhancing the effectiveness of monetary policy in the context of integration in the Economic and Monetary Union. Also, real convergence is a solid foundation for maintaining the nominal convergence criteria on a medium-term horizon, even after the time of adoption of the single currency. The objective of this paper is the assessment of long-term real convergence of the CEE economies to the Euro area during 1998-2010, in terms of recovering the disparities between living standards in CEE countries and the European Monetary Union by using the sigma and beta converge indicators, both absolute and conditional. The results show that the long-term real convergence is confirmed and the pace of the catch-up process in the period 1998-2010 was an alert one. Nevertheless, in recent years real convergence of the CEE countries to the Euro area has slowed significantly due to the economic and financial crisis.*

Keywords: real convergence; sigma and beta convergence; economic growth; euro adoption.

JEL Classification: F15, F43, F44.

REL Classification: 8E, 20F.

1. Introduction

The real economic convergence or real convergence designates the process by which the discrepancies between real macroeconomic variables in a group of countries are reduced in a sustainable manner. One of the main goals of the European Union is the long-term convergence of the economic performance and hence of the living standards in all EU countries and regions. Thus, an initial assessment of the real convergence process aims to analyze the similarities between the aggregated results of the main real economic variables: the level of production, income, employment, productivity. In general, investigating the differences and changes over time in the level of economic development, competitiveness and labor market efficiency may be a way of quantifying the degree of real convergence.

In the literature, two approaches have emerged in terms of real convergence analysis, depending on the time frame considered.

The long term approach of real convergence is considering the mitigation of structural differences between different countries and regions, respectively a catch-up process of the gap from developed economies. Thus, during a transition period, countries with a lower initial level of living standards, incomes, productivity tend to catch up with more developed economies. This approach is present in the literature on economic growth that provides the methodological framework for the analysis of long-term convergence. The starting point of the convergence theory is the neoclassical growth model (Solow, 1956), which shows a negative relationship between the initial level of output per capita and the subsequent growth rate. According to this theory, if two economies are similar in terms of long-term equilibrium but have different initial conditions, respectively they are in a different point on their growth path, poorer countries will advance faster than the rich ones and will catch up with the latter at

some point in time. This circumstance describes the absolute convergence situation while the conditional convergence must be treated separately, involving a relaxation of the assumptions. Thus, it is envisaged a heterogeneity of the economies; the capital endowment is no longer the only difference between economies and other structural differences are considered (e.g. various saving rates and population growth rates) that will lead to different equilibrium positions (steady-states). The conditional convergence shows that the greater the distance to the equilibrium for an economy the faster the economy will grow. Thus, a richer country may have a higher growth rate than a poorer one if the latter is closer to the equilibrium.

The short term approach of real convergence focuses on the structural similarities between economies, namely the degree of business cycle synchronization and trade integration respectively. The starting point is the theory of optimum currency areas which states that the impact of economic shocks in a monetary union depends on their symmetry. Thus, the short-term view of real convergence is considered first when evaluating a candidate for membership in a monetary union. The degree of shocks' symmetry depends on the similarity of the economic structures that determine the response to the changes in macroeconomic variables. The higher the business cycles' degree of synchronization, the more similar the final results of the economic activity, hence the real convergence process is more likely to occur.

The Maastricht Treaty doesn't explicitly state any real convergence criteria, focusing only on the nominal convergence criteria and their fulfillment in a sustainable manner. The real convergence is a prerequisite for the long-term development of the European Union, enhancing the effectiveness of monetary policy in the context of integration in the Economic and Monetary Union. Also, real convergence is a solid foundation for maintaining the nominal convergence criteria on a medium-term horizon, even after the time of adoption of the single currency. Thus, the performance of an economy can be negatively affected even after joining the EMU in the context of choosing a final parity inconsistent with the equilibrium exchange rate or a sustained catch-up process that would put pressure on the inflation rate.

It should be noted that the EMU is the most ambitious project of the European construction and is mainly the result of a political decision based on a strong economic component. There are enough reasons for which it can be stated that the EMU is not an optimal currency area, as defined in the literature, and the Maastricht Treaty does not follow exactly the features of an OCA, mentioning explicitly only the nominal convergence criteria. However, the final objective of the European Union stated in article two of the Treaty includes the convergence of economic performance and economic and social cohesion. The tools used in order to achieve these objectives are the common market and the Economic and Monetary Union. Thus, the EMU is likely to enhance the real convergence process, which is in contradiction with the theory of optimum currency areas that includes real convergence as a precondition for the creation of an OCA.

Next, the real convergence of Central and Eastern Europe (CEE) countries to the Euro area will be assessed in terms of recovering the disparities between living standards in CEE countries and the European Monetary Union.

2. Literature review

The literature on long-term real convergence is relatively homogeneous and envisages the computation of sigma and beta convergence indicators by applying various methods based on the research conducted by Barro and Sala-i-Martin (1992).

A study of the European Commission (Rapacki, Próchniak, 2009) showed the positive impact of EU accession on real convergence for the 10 countries that joined the EU in 2004. Thus, the empirical analysis confirmed the existence of beta and sigma convergence, both absolute and conditional while the period in which it is estimated that the gap with the EU-15 will be recovered varies from 8 to 33 years. A study of the European Central Bank (Borys, Polgar, Zlate, 2008), analyzing real convergence in Central and Eastern Europe, has

demonstrated the existence of conditional convergence and stressed the importance of quality institutions in supporting economic growth. Thus, although the variables highlighting the progress related to the creation of solid institutions or those related to structural reforms proved to be not significant per se, their introduction in the empirical analysis potentiated the effect on economic growth generated by traditional explanatory variables such as macroeconomic stabilization and financial intermediation. Szeles and Marinescu (2010) have shown the existence of conditional convergence in Central and Eastern Europe, while absolute convergence is identified only when Romania is included in the sample.

Given the existence of a short-term trade-off between nominal and real convergence, the Maastricht Treaty does not explicitly require real convergence criteria, but the latter is essential in order to take full advantage of joining a monetary union. However, with the slowdown of the catching-up process of the Central and Eastern Europe countries with the level of development of the Euro area, as a result of the economic and financial crisis, it is expected that the Euro adoption decision will be based mainly on the nominal convergence criteria. The real convergence will likely be seen as a long-term process, while joining the EMU is a medium-term objective, both economically and politically. However, given the sovereign debt crisis in the Euro area, the acceptance of new members in the EMU will be conditioned by a strict compliance with the nominal convergence criteria, including the perspective of meeting these criteria on the medium-term.

Other researches (Buti, Sapir, 1998) support the positive long-term relationship between nominal and real convergence, but admit a potential slightly negative correlation in the short term. Thus, considering a longer period of time, the benefits of macroeconomic stability enhanced by inflation and interest rates stability and also by a sound fiscal position will promote higher investments and a sustainable economic growth. Over the short-term, the fiscal consolidation needed to fulfill the Maastricht criteria and a tight monetary policy pursued in order to reduce inflation may adversely affect the real convergence process.

More recent research revealed the possibility of endogenous optimum currency areas: even if the properties of an OCA are not satisfied ex-ante, they will come to be satisfied ex post, following the creation of a monetary union. Thus, it is possible that real convergence is intensified by institutional integration. Frankel and Rose (1998), and then Rose (2000) have shown, based on a representative sample of industrialized and developing countries, the benefits of a monetary union on trade integration and synchronization of business cycles. Similarly, de Grauwe and Mongelli (2005) showed a bidirectional link between institutional integration and trade. Thus, institutional integration can be a source of real convergence.

As previously mentioned, the long-term real convergence characterizes the process of recovering the differences in development between countries and regions, through a process of more rapid economic growth of economies with a lower initial level of living standards, incomes and productivity.

The starting point of the convergence theory is the neoclassical growth model (Solow, 1956), whose fundamental relationship is given by:

$$\dot{k} = s \times f(k) - (n + \delta) \times k \quad (1)$$

Where $\dot{k}$ is the change over time of the capital stock per worker, s is the saving rate, $f(k)$ designates the production function expressed in intensive form, i.e. per worker, n is the population growth rate and δ the rate of capital depreciation. Thus, the capital stock per worker will increase if the saving rate is higher than the population growth rate plus the rate of depreciation of fixed capital. It may be noted that the above relationship is a nonlinear differential equation that depends only on k .

The long-run equilibrium point (steady-state) corresponds to an increase in the capital stock per worker equal to zero ($\dot{k} = 0$), i.e. when:

$$s \times f(k^*) = (n + \delta) \times k^* \quad (2)$$

Where k^* designates the level of capital per worker in the steady-state. Thus, in the classical model, the stock of capital per worker, the output and production per worker do not increase after reaching equilibrium. The aggregate level of production, consumption and total capital stock will increase by an amount equal to the rate of population growth

If we divide by k both members of the relationship (1), we obtain that the growth rate of capital is equal to:

$$\frac{\dot{k}}{k} = s \times \frac{f(k)}{k} - (n + \delta) \quad (3)$$

The growth rate of output per worker is given by:

$$\frac{\dot{y}}{y} = f'(k) \times \frac{k}{f(k)} = \left[k \times \frac{f'(k)}{f(k)} \right] \times \frac{k}{k} \quad (4)$$

The equation (4) shows that the relationship between $\frac{\dot{y}}{y}$ and $\frac{\dot{k}}{k}$ depends on the evolution of the production portion that equals the efficiency of capital owners. In case of a Cobb-Douglas production function, the return on capital is a constant α while $\frac{\dot{y}}{y}$ is the fraction α of $\frac{\dot{k}}{k}$. **Therefore, the growth rate of output per worker is equal to the growth rate of capital per worker.**

If we derive the equation (3) with respect to k and consider the properties of a neoclassical production function (i.e. decreasing returns of capital while maintaining the number of workers and technology used), we get:

$$\partial(k' / k) / \partial k = s \times [f''(k) - f'(k)/k] < 0 \quad (5)$$

Thus, lower values of the capital stock will lead, *ceteris paribus*, to higher growth rates of the capital stock and output respectively. According to this relationship, if two economies are similar in terms of the long-term equilibrium, but have different initial conditions, respectively they are in different points in their growth path, poorer countries will advance faster than the rich ones and will catch-up with the latter at some point in time. This situation describes the absolute convergence and must be distinguished from conditional convergence, which implies a relaxation of the assumptions. In the case of the conditional convergence, the structural differences between economies are considered (e.g. different dynamics of saving rates and population growth) that will lead to different equilibrium positions. The conditional convergence shows that an economy will grow faster the greater the distance to the equilibrium.

The recent literature on long-term convergence is based on the research of Barro and Sala-i-Martin (1992) who introduced the concept of beta-convergence and sigma-convergence. Thus, beta-convergence denotes the convergence speed to the equilibrium of an economy and it is present when there is a negative correlation between per capita growth and its initial level, while sigma-convergence occurs when the income per capita dispersion in a group of countries decreases over time. The two types of convergence are not similar and beta convergence is not a sufficient condition for sigma-convergence. Also, the two can be considered both in the context of absolute and conditional convergence. Empirical research revealed that long-term convergence is more likely as the economic and institutional structures are more similar within the group of countries considered.

Next, the assumption of sigma and beta convergence of Central and Eastern Europe economies with the Euro area economic structures will be tested, both in absolute terms and considering a relaxation of the assumptions. It should be noted that the convergence process

will be analyzed in terms of recovering the gap with the Euro area, given the purpose of the research, namely the assessment of long-term real convergence towards the Euro area.

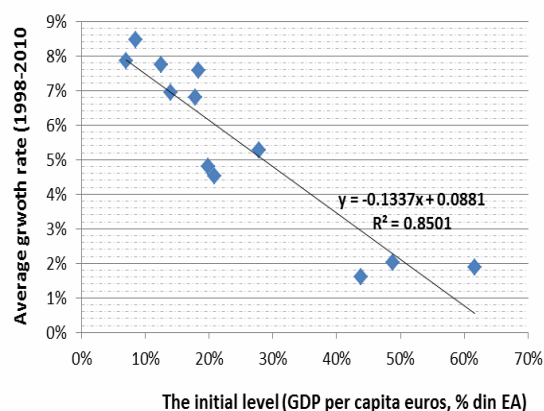
3. The beta and sigma-convergence of the CEE economies to the Euro area

The econometric estimation of absolute beta convergence is based on the regression equation proposed by Barro and Sala-i-Martin (1995):

$$G_{i,t,t+T} = \alpha + \beta \ln(y_{i,t}) + u_{i,t} \quad (6)$$

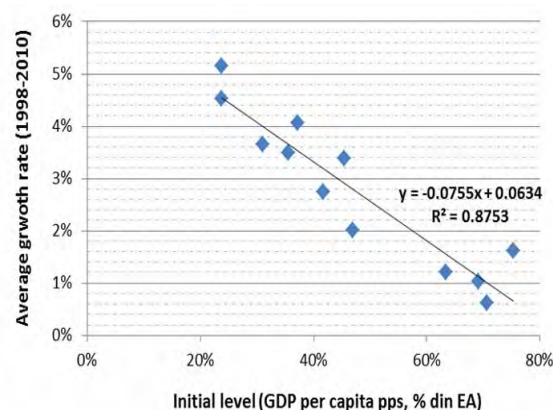
Where $G_{i,t,t+T} = \frac{\ln\left(\frac{y_{i,t+T}}{y_{i,t}}\right)}{T}$ is the average growth rate of the economy i for the period $t + T$, $y_{i,t}$ is the initial level of GDP of country i expressed as a percentage from the euro area and $u_{i,t}$ is the error term for country i at time T . A negative level of β will confirm the existence of absolute beta-convergence.

The data used is acquired from Eurostat and it refers to the ten countries that joined the EU in 2004 (Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovakia, Cyprus and Malta) plus Bulgaria and Romania. The data frequency is annual and the period considered is 1998-2010. The values used in estimations are expressed in purchasing power parity standards or in euro given the nominal exchange rate. The variables are computed as a percentage of the corresponding value for Euro area indicators, in order to capture the catching up process with the EMU.



Source: Eurostat, own calculations.

Figure 1. The absolute beta-convergence (Euros at the nominal exchange rate)



Source: Eurostat, own calculations.

Figure 2. The absolute beta-convergence (purchasing power parity standard)

The results confirm the existence of absolute convergence of economies that joined the EU after 2004, both using the variables expressed in nominal terms as well as variables expressed in purchasing power parity standards. Thus, the economies with the lowest starting level of capital stock and output (Bulgaria, Romania, Estonia, Latvia, and Slovakia) had the fastest growth rate, while in Slovenia, Cyprus and Malta, economies characterized by a much smaller gap with the Euro area, there were recorded significantly lower growth rates. The β coefficient indicates a faster convergence in nominal terms compared to purchasing power parity values, which may be considered normal given the undervaluation of exchange rates in the new Member States against the euro according to the PPP theory. It is expected that the spread between variables expressed in euros and in the ones expressed in PPP terms will narrow in time through the real appreciation of the national currencies against the euro.

Considering the average advance of the CEE economies in the 1998-2010 periods and using the assumption that the growth rate approximates the speed of convergence to the equilibrium point, we can construct scenarios for the time necessary in order to recover the gap with the Euro area.

Table 1

The gross domestic product in CEE countries (% of the Euro area's GDP) and scenarios regarding the necessary time for full convergence to the Euro area

Country	The initial level (GDP per capita, % of EMU)	The average growth rate, % (1998-2010)	2010 level GDP per capita Euros, % of EMU	The period necessary for full convergence (years)	The initial level (GDP per capita pps, % of EMU)	The average growth rate, % (1998-2010)	2010 level GDP per capita pps, % of UEM	The period necessary for full convergence (years)
Bulgaria	6.97	7.86	17.14	23	23.71	4.53	40.23	21
Czech Republic	27.86	5.27	50.71	13	63.40	1.20	72.93	26
Estonia	17.91	6.79	38.21	15	37.11	4.06	59.02	13
Cyprus	61.69	1.89	77.14	14	75.26	1.61	90.98	6
Latvia	12.44	7.74	28.57	17	30.93	3.66	46.99	21
Lithuania	13.93	6.93	30.00	18	35.57	3.49	52.63	19
Hungary	20.90	4.51	34.64	24	46.91	2.02	59.40	26
Malta	43.78	1.60	52.50	41	70.62	0.62	75.56	46
Poland	19.90	4.81	33.21	23	41.75	2.73	57.52	21
Romania	8.46	8.46	20.71	19	23.71	5.16	42.86	17
Slovenia	48.76	2.03	61.79	24	69.07	1.03	77.82	25
Slovakia	18.41	7.57	43.21	12	45.36	3.38	67.29	12

Source: Eurostat, own calculations.

Thus, if the growth rate recorded in the period 1998-2010 would be maintained, Romania's gap with the Euro area would be recovered in about 19 years, while the Czech Republic, Slovakia, Estonia and Cyprus would recover the differences in development in 12 - 15 years, considering the situation in which the variables are expressed in Euros using the nominal exchange rate. However, the beta-convergence indicates a reduction in the growth rate as the gap decreases, implying that the catch-up process will take much longer.

The β coefficient represents also a more adequate measure of the speed of convergence to the equilibrium. Given that absolute convergence implies the same structural characteristics of the economy and thus the same steady-state, the β coefficient allows the calculation of the convergence speed to the Euro area. Thus, the growth trajectory depending on the starting point can be written as:

$$\frac{y_t}{y_e} = -\beta \times \ln\left(\frac{y_t}{y_e}\right) \quad (7)$$

Where y_e is the estimated level and y_e^* , the level at the equilibrium point.

This method has the advantage that it takes into account the lower growth rate of GDP as economies approach the equilibrium, but the major disadvantage derives from the estimation method of the β coefficient, namely by using cross-sectional data. Thus, the coefficient represents an average for the CEE region and relevant conclusions cannot be formulated for each economy.

Equation (7) is a differential equation with respect to $\log[y_{e(t)}]$, whose solution is given by:

$$\log[y_{e(t)}] = (1 - e^{-\beta t}) \times \log(y_e^*) + e^{-\beta t} \times \log[y_e(0)] \quad (8)$$

Thus, the time in which $\log[y_{e(t)}]$ is half (or three quarters) between $\log[y_e(0)]$ and $\log(y_e^*)$ satisfies the condition $e^{-\beta t} = \frac{1}{2}$ ($\frac{1}{4}$). Therefore, if $\beta = 0.0755$, 7.55% of the distance

between y_e and y_e^* is recovered in a year. The time required for half (three-quarters) of the initial gap between CEE countries and the euro area to be recovered is 5 (10) years if we

consider variables expressed in purchasing power parity standards and 9 (18) years using variables in Euro at the nominal exchange rate. Thus, considering the decreasing growth rates as the economies are approaching the equilibrium, the full convergence takes place in a significantly longer period of time.

The conditional beta-convergence implies a relaxation of the assumptions, namely giving up the hypothesis that all economies are characterized by the same saving rates and population dynamics, which will lead to different equilibrium points. Essentially, the beta conditional convergence implies a negative relation between the initial level of GDP per capita and subsequent growth rates given the peculiar parameters of each economy: specific saving rates, population dynamics, trade indicators, public finance position exchange rate, inflation rates. Moreover, these indicators are included among the criteria for the assessment of an optimum currency area.

The neoclassical growth model shows that the growth rate of the capital per worker (which also equals to the growth rate of output) depends on the saving rate, the population growth rate and the rate of capital depreciation. Given that the model assumes a closed economy, savings equals investments and the relationship between saving and the growth rate of output is positive, leading to higher investment and thus higher capital per worker and output. Given that the Romanian economy is an open economy, in the empirical analysis the investment rate and not the saving rate will be considered since investments were higher than savings (through increasing debt to the outside), which may be considered relatively normal for an emerging economy.

The trade intensity is generally associated in the literature with higher growth rates and acts as an evaluation criterion of an optimum currency area. Thus, in the empirical analysis two indicators regarding trade will be included: the degree of openness of the economy and the relative price of exports to imports. The relationship between openness and economic growth is expected to be positive, while the terms of trade indicator can be positively or negatively correlated with the growth rate, depending on the particularities of each economy. An appreciation of the terms of trade indicator (imports become relatively cheaper) may reflect an improvement in the income balance and facilitate the further import of technology, thus contributing to increased investments and gross domestic product. However, the appreciation may be accompanied by an increase in imports of consumer goods, contributing negatively to the GDP growth rate.

The fiscal policy can contribute positively to the economic growth while maintaining a sustainable level of public debt and budget deficit. A high level of these indicators, however, leads to a decrease in the growth rate through increased interest rates and reductions in confidence in the economy, with a negative impact on consumption and investment. Nevertheless, a reasonable level of debt and budgetary deficit, especially when the additional resources are directed towards increased public investment, can contribute positively to the economic growth.

The exchange rate has a mixed impact on economic growth. Thus, a small-scale real depreciation may stimulate the exports, while the relative stability of the exchange rate may increase the economic advance by reducing transaction costs and uncertainties. On the other hand, targeting a particular level of the exchange rate may reduce the ability of an economy to react to asymmetric shocks and increase the likelihood of speculative capital flows. From a longer term perspective, the significant depreciation of the exchange rate represents a relevant risk in emerging economies, affecting the balance sheets of firms and banks as some portions of their debt is denominated in foreign currency (Eichengreen, Hausmann, 1999). In debtor countries, with a significantly dollarized financial sector, the relative stability of the exchange rate promotes economic growth (McKinnon, Schnabl, 2004). Given the high volatility of exchange rates in the CEE countries during the analyzed period, the expected sign of the relationship is negative, namely a depreciation of the local currency is expected to contribute negatively to growth.

A high inflation acts in the sense of reducing the economic growth, as it is associated with negative externalities in the economy: generates uncertainty about the profitability of investment projects, negatively affects the external competitiveness under real exchange rate appreciation, leads to increases in liquidity management and administrative costs coming from the need to frequently change the pricing policy. A moderate inflation can stimulate growth by encouraging investment in detriment of saving, by reducing the debt in real terms and also by helping to correct some imbalances accumulated in the economy in the context of the rigidity of nominal variables (e.g. wages are relatively rigid in nominal terms).

The econometric estimation of conditional beta-convergence will be based on panel data with annual frequency, using the following specification:

$$y_{it} = \beta_1 X_{it} + \beta_2 W_{it} + v_i + \varepsilon_{it} \quad (9)$$

Where y_{it} is the average growth rate of the economy i for the year t , X_{it} is a vector of strictly exogenous variables that are not dependent on the present or past errors ε_{it} , W_{it} is a vector of possible endogenous variables that might be correlated with present or past errors ε_{it} , v_i is the characteristic fixed effect of each economy (it represents basically the association of dummy variables, through which the specific characteristics of each country are taken into account, peculiarities that are not explicitly captured by the explanatory variables in the model). The above equation has the following properties:

$$E(v_i) = E(\varepsilon_{it}) = E(v_i \varepsilon_{it}) = 0 \text{ and } E(\varepsilon_{it} \varepsilon_{js}) = 0 \text{ for } i \neq j \text{ and } s \neq t.$$

In the econometric estimation I have used additional variables capturing the characteristics of each economy that are likely to influence the long-run equilibrium point of GDP per capita: gross fixed capital formation (variable chosen at the expense of savings, given the higher level of investment relative to saving for new EU member states), the budget deficit, foreign trade indicators (degree of openness of the economy, terms of trade indicator), exchange rate, inflation rate, population growth rate, public debt.

The results of the estimations, considering both the gross domestic product expressed in euros at the nominal exchange rate or using purchasing power parity standards, are detailed in the table below:

Table 2

Conditional beta-convergence (OLS)

Explanatory variables - euro s at the nominal exchange rate	Coefficient	Standard error	Explanatory variables - purchasing power parity standard	Coefficient	Standard error
<i>Log GDP per capita*</i>	-0.0648	0.0199	<i>Log GDP per capita*</i>	-0.1086	0.0230
<i>Budget deficit*</i>	0.0048	0.0007	<i>Budget deficit*</i>	0.0034	0.0005
<i>Log openness*</i>	0.1487	0.0292	<i>Log openness*</i>	0.1252	0.0348
<i>Dlog REER*</i>	0.8512	0.0408	<i>Dlog REER*</i>	-0.1691	0.0521
<i>Inflation rate*</i>	-0.0026	0.0005	<i>Inflation rate***</i>	-0.0010	0.0006
<i>Dlog population growth***</i>	-0.6145	0.3623	<i>Dlog population growth*</i>	-1.0158	0.3448
<i>LOG GFCF*</i>	0.0816	0.0230	<i>LOG GFCF*</i>	0.0710	0.0203
<i>Log debt**</i>	-0.0392	0.0161	<i>Log debt***</i>	-0.0199	0.0109
<i>Log terms of trade</i>	-0.0584	0.0925	<i>Log terms of trade*</i>	0.1096	0.0421
<i>Number of countries</i>	12		<i>Number of countries</i>	12	
<i>R squared</i>	0.88		<i>R squared</i>	0.61	

* indicates rejection of the null hypothesis at a significance level of 1%.

** indicates rejection of the null hypothesis at a significance level of 5%.

***indicates rejection of the null hypothesis at a significance level of 10%.

Source: Eurostat, own calculations.

Thus, the beta-conditional convergence hypothesis is validated using both variables expressed in euros at the nominal exchange rate and the purchasing power parity standard. The speed of convergence is higher in the latter case, which is a distinct case compared to the results obtained from testing the absolute convergence. The β coefficient of -0.0648 in the first equation and -0.1086 into the second one indicates a slower convergence for the variables denominated in euros and a faster rate for the gross domestic product expressed at purchasing power parity standard. Under these conditions, the time required for half (three-quarters) of the initial gap between CEE countries and the Euro area to be recovered, can now be estimated at 6 (13) years if we consider purchasing power parity variables or 11 (21) years when using variables expressed in euros at the nominal exchange rate. However, given that the international financial crisis has reduced the potential growth rate in CEE economies and caused in the short term even a slight divergence between these economies and the Euro area, the convergence process will probably take a significantly longer period of time.

The beta-convergence estimation also allows the assessment of the influence of variables affecting the long-run equilibrium point of output on the economic growth rate. Thus, an increase in the budget deficit by one percentage point of GDP generates an additional economic advance of about 0.5% (0.2% if we use PPP standard), due to higher consumption and investment. However, a higher deficit may have a positive impact on the growth rate only to the extent that this deficit is perceived to be sustainable and does not lead to further problems of solvency. An increase in openness by 1% leads to an additional growth of 0.1657% (0.1621% if we use PPP standard) through the increased intensity of trade relations that contributes positively to growth in the economy, a result which is in line with the predictions from the relevant literature. A depreciation of the exchange rate contributes negatively to growth, probably due to the deteriorating balance sheets of the economic agents indebted in foreign currency. Also, the high volatility of the exchange rates in CEE countries during the analyzed period is expected to have contributed negatively to the economic advance. A further increase in prices by one percentage point would lead to a reduction in economic growth by 0.26% (0.1% if we use PPP standard), a result which is in line with the expectations given the high rates of inflation recoded in the analyzed period. The gross fixed capital formation has a positive contribution to the economic growth, an increase by 1% in this indicator resulting in an additional advance of GDP by 0.08% (0.071% if we use PPP standard) which is in line with the assumptions of the neoclassical growth model. The public debt has a negative effect on economic growth as a result of the solvency uncertainties which affect negatively the confidence in an economy.

The period 1998-2010 was characterized by a rapid catching-up process of the development gaps between CEE countries and the Euro area but the economic and financial crisis caused a significant slowdown in this trend. The CEE economies' dependence on foreign funding, increasing costs of attracting financial resources, the accumulation of structural imbalances (high current account deficits, housing bubbles, etc.) led to a sharp drop in CEE economies, followed by a slow recovery that is likely to continue in the medium term. The economic crisis led to a reduction in the rate of potential growth in the region, so that the pace of recovery observed in the period 1998-2010 is not expected to be reached very soon and the process of real convergence will probably take a longer period of time. However, the strengths of CEE economies like the well-educated labor force and high productivity growth potential favors the resumption of beta-convergence.

From the perspective of the single currency adoption, the decision will be driven mainly by the nominal convergence criteria, as the reduction of the development gaps between CEE countries and Eurozone economies will probably take a longer period of time. Most likely, there will not be very soon a rapid catch-up process likely to endanger the nominal criteria of inflation or exchange rate.

The sigma-convergence measures the extent to which countries are becoming more similar in terms of the level and evolution of GDP per capita. Thus, even if the CEE

economies with a lower initial level of development tend to grow faster than the Euro area (beta-convergence is present) it is possible that other countries that are closer to the equilibrium, are characterized by higher growth rates. Sigma-convergence evaluates the extent to which structural differences between economies are diminishing or not. The most common approach for testing the existence of sigma-convergence is based on calculating the standard deviation of GDP per capita. In essence, the indicator shows the dispersion of observations around the average and a reduction indicates an increase in the economies' similarities, namely the degree of convergence.

The computation of the standard deviation will be achieved, using the Euro area as a reference (domestic GDP is expressed as a share of Euro area's GDP using both the PPP standard and Euros at the nominal exchange rate) through the following formula (the standard deviation is obtained by calculating the square root):

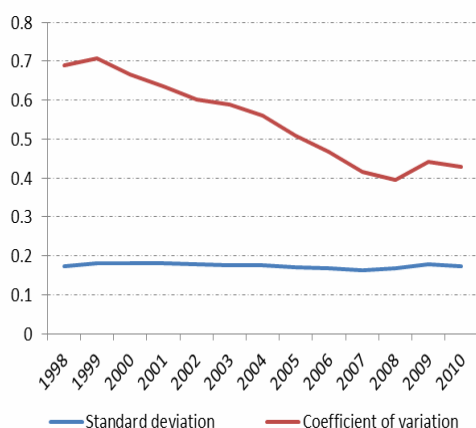
$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 \quad (10)$$

Where σ^2 is the variance, x_i is the share of the gross domestic product per capita in country i in the GDP per capita of the Euro area, $\bar{x}$ is the average GDP per capita in CEE countries.

An alternative measure of the sigma-convergence can be obtained by using the coefficient of variation (CV), which is calculated by dividing the standard deviation to the mean of the sample, the result measuring the relative variation. This indicator has the advantage that it does not depend on the unit of the data and it is expressed in percent. The calculating formula is given by:

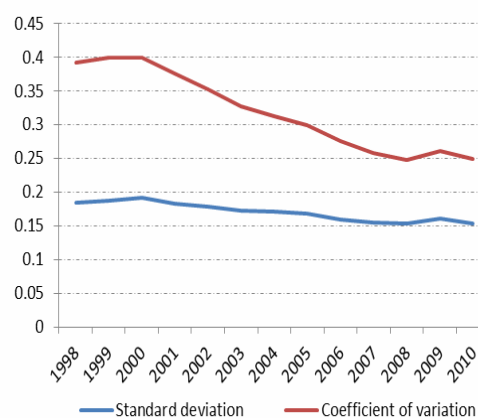
$$CV = \frac{\sigma}{\bar{x}} \quad (11)$$

Where σ is the standard deviation and $\bar{x}$ is the average GDP per capita in CEE countries.



Source: Eurostat, own calculations.

Figure 3. Sigma-convergence
(Euros at the nominal exchange rate)



Source: Eurostat, own calculations.

Figure 4. Sigma-convergence
(purchasing power parity standard)

In the analyzed period, the sigma-convergence is confirmed as the coefficient of variation had registered a decline both when using the variables expressed in Euros (from 0.69 to 0.43) or in purchasing power parity standard (from 0.39 to 0.25). In terms of the standard deviation, a reduction can be observed only when using the PPP standard (from 0.18 to 0.15), while the value of the indicator based on variables expressed in Euros is approximately constant. Also, a slight divergence is present during 2008-2009, due to the different impact of the financial and economic crisis on the CEE economies. It can be concluded, however, that

the differences between CEE economies have shrunk over time and the presence of sigma-convergence is confirmed. Thus, in the analyzed period both the gaps that separate these countries from the Euro area but also and the gaps within the region have narrowed.

4. Concluding remarks

The long-term convergence of CEE economies with the Euro area economy, as measured by the beta and sigma-convergence, both absolute and conditional, is confirmed, the pace of the catch-up process in the period 1998-2010 being an alert one. Nevertheless, in recent years real convergence has slowed significantly due to the economic and financial crisis. Most probably, a rapid catch-up process likely to endanger the nominal convergence criteria related to inflation or exchange rate will not happen in the near future. However, the advantages of CEE countries like the well-educated labor force, a high productivity growth potential, favor the resumption of beta-convergence. The sigma-convergence, which assesses the extent to which economies of CEE recover the development gaps with the Euro area at a more similar rate, was also confirmed throughout the analyzed period, except in 2008 and 2009 due to the different impact of the crisis on the CEE economies, as a result of the peculiar imbalances accumulated by each country.

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INFLATION TARGETING AND FINANCIAL STABILITY DURING THE FINANCIAL CRISIS

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Abstract. *The discussion on the conflict or complementarity between financial stability and price stability has always been one of great interest for economists, but this issue becomes even more relevant when confronted with special circumstances such as the recent financial crisis. It can be suggested that inflation targeting can contribute somewhat to a better economic response to such a shock. Comparing a sample of countries that have chosen inflation targeting with some that have not, both individually and overall, with respect to certain key indicators, we try to see if inflation targeting actually contributes to a country's financial stability.*

Keywords: financial stability; inflation targeting; monetary policy; financial crisis; response to shocks.

JEL Classification: G01.

REL Classification: 11B.

1. Introduction

In order to underline its importance, the concept of price stability has been defined in economic literature in different forms.

One definition refers to the aggregate level of prices measured by using price indices. Another definition maintains that price stability is reached when the value of money is constant over time and their purchase power is slow in decreasing.

Many economists have tried to give a full and descriptive definition of the term. Paul Volcker affirms that if the expectations of an increase or a decrease in prices, over a considerable period of time, do not influence economic behaviour, we can consider price stability has been reached. Alan Greenspan defines the phenomenon as a situation in which the public's expectations of the change in the level of prices is small and gradual enough not to be taken into consideration in corporate and household spending decisions. If people stop worrying and talking about inflation, we can consider we have reached financial stability, concludes Alan Blinder.

The European Central Bank considers appropriate a level of inflation of below (but close to) 2%, measured based on the HIPC.

One of the ways to reach this target is inflation targeting. Central banks that use this strategy focus on a target figure that is defined as a value, as variation band or as a value with an associated variation band.

Price stability has become the main objective for more and more central banks around the world. This task implies a more significant level of responsibility on the part of a central bank in sustainable economic growth. High and volatile levels of inflation have a negative effect on economic growth, due to the fact that they lead to a reduction in income and savings value and to an increase in interest rates. If the level of prices is highly volatile, the

¹ The opinions presented in this paper are the author's and do not engage in any way the affiliated institutions. The author is responsible for any errors.

uncertainty regarding the future value of prices will be higher and this will lead to an increase in costs. Due to the uncertainty, financial markets will require a larger risk premium and investors will consider mostly short-term investment; high interest rates tend to attract short-term capital. Over the long-term, these disadvantages can affect economic growth. On the other hand, the disinflationary process that leads to price stability has its own short-term costs, such as weak economic growth and an increase in unemployment, but these are all justified by the long-term positive effects. Countries with low levels of inflation have stronger economic growth than countries with high levels of inflation.

In 2007, Mishkin stated that inflation targeting was the best strategy for obtaining price stability. The inflation targeting regime allows other objectives to be included in the monetary policy strategy, as well as deviations from the target if certain supply-side shocks justify it.

The main characteristics of the strategy are: a numeric target that is made public, a monetary policy that considers expectations essential and a high degree of transparency and responsibility assumed by the central bank.

There are countries such as Canada and Sweden that have chosen a fixed target with a variation band, or countries that have chosen a strict numerical value, such as the UK and Norway. There is no major difference between the two types of target because even the banks that chose to use a variation band aim for its centre.

Inflation targeting is not necessarily rigid, but rather flexible, considering that the main purpose of central banks is not primarily to make prices reach a certain level, but also to achieve and maintain economic stability.

Even if financial stability has always been a much discussed topic, there is no fixed definition of the concept. In the last few years, many institutions that have responsibilities related to financial stability were created: the Basel Committee, the Financial Stability Institute, the Committee of the Global Financial System, the Committee on Payment and Settlement Systems, the International Association of Insurance Supervisors, the International Accounting Standard Board, etc.

One broad definition suggests that if the financial system is capable of raising and placing funds efficiently and can withstand shocks without affecting the real economy, then we can consider we are in a situation of financial stability. In this case, the main role of a central bank is to ensure prudential supervision.

A more restrictive definition maintains that such a situation is characterised by an economic environment in which economic crises do not manifest themselves, and the price of assets and the interest rate are relatively stable. In this case, mention could be made of the role of a central bank in setting the interest rate, because it influences both financial stability and monetary stability.

The relationship between the two types of stability can be described from two points of view (Isărescu, 2009):

- The conventional approach considers that the two types of stability support each other in the long run. This view, which was supported by Anna Schwartz, considers that “price stability is a necessary and sufficient condition for maintaining financial stability” (Mesonnier, 2004). Bordo and Wheelock (1998) also studied the relationship and found a direct connection between price instability and financial instability. But situations such as the recent financial crisis prove the contrary: financial instability can manifest itself even against the background of price stability.

- The new environment approach considers that, after obtaining an economic environment with stable inflation, a new environment with different characteristics is created, in which financial stability is no longer ensured.

A compromise between the two has to be made, because without financial stability, monetary policy cannot act efficiently in order to maintain price stability.

If the economy experiences a long period of high inflation, the monetary and fiscal policies tend to become more restrictive. Such an action will lead to a decline in aggregate demand, recession and unemployment, which will in turn mean that the profits of companies will decrease and the volume of non-performing loans will grow. Such circumstances, correlated with a highly volatile exchange rate and a large share of foreign currency-denominated loans, can lead to bank default.

2. The role of central banks

Central banks play a key role in conducting monetary policy and in maintaining price stability. Nevertheless, this has not always been the main responsibility of central banks. Another key issue for some central banks was and still is financial stability. Goodhart (1988) maintains that the initial reason for creating central banks was to stop the financial turmoil generated by “free banks”. In his study on the role of lender of last resort of a central bank, Bagehot (1873)⁽¹⁾ lists several arguments to support this view. Moreover, recent events have confirmed the role of central banks in maintaining financial stability.

In his paper titled “The changing role of Central Banks”, Goodhart affirms that central banks have generally played three important roles in their history:

- to maintain price stability
- to maintain price stability and to promote financial developments
- to meet the financial needs of a state in times of crises, but to limit its abuse of financial power in conventional times.

Central banks played each of these roles according to the needs of each period in history and the characteristics of each financial crisis, in turn.

Many economists argue that the monetary policy should be blamed for the recent financial crisis, due to the low interest rates and the current account surplus in emerging countries, especially Asia and some oil producing countries, which generated a liquidity surplus that induced increases in asset prices. This is especially relevant in the real estate sector. When prices started going down, the crisis broke out. Therefore, it is believed that the monetary policy did not act in an efficient and timely manner and that it allowed for unbalances to emerge. But such increases in asset prices do not necessarily induce a crisis. We have to take into consideration the financial fragility that accompanied the process. The main reason behind this fragility is thought to be the continuous financial innovations, which caused great distortions that neither the markets, nor the authorities could foresee.

The monetary policy's role is to smoothen the economic cycles and to control inflation. A less restrictive monetary policy can induce an increase in credit and asset prices and, if it is too loose, it can boost even more an economic boom. However, such a monetary policy conduct is not enough to explain the financial crisis, because there are many countries where the policy rate was as low as the FED's and they had no problems.

Financial stability must be reached by means of system regulations that limit excesses. There may be situations in which they could derive from inflation targeting in order to address financial stability, but such situations should be rare. Monetary policy did not represent a trigger of the financial crisis as much as the financial innovations, the lack of restrictions and regulations, or the reduced standards for loans did.

Banks were tempted by such risky investments and a way to avoid such situations in the future would involve understanding the reason behind their actions.

Banks that are influenced by the information asymmetry can be tempted to assume higher risks. Banks that are risk neutral act as risk-loving agents, because they do not bear the burden of their losses, but transfer them through deposits and bonds. Such banks will prefer investments with higher risks and yields.

Moral hazard is also essential in avoiding future situations such as the financial crisis. So we must take into account the fact that the more a bank invests of its own capital, the more it may lose in case of a default.

De Niccolo (2010), Dell Ariccia, Laeven and Marquez (2010) consider the role of the policy rate in the level of risks assumed by banks. Normally, banks transform short-term funds into long-term loans. A reduction in the policy rate will determine a cut in the interest rate on deposits, but will only partly influence interest rates on loans. This translates into an increase in bank profits and a decrease in risk. Therefore, a cut in the policy rate will make risky assets less attractive.

Until the recent financial crisis, many economists believed that financial stability and monetary stability complemented each other, but the events of the past years have proved the contrary.

In order to face the problems generated by the crisis, many central banks lowered the policy rates to minimum levels. But once the economy is rebalanced, it is extremely possible that policy rates will be increased in order to address the regular issues such as inflation. At this moment, banks will have assets with fixed yields, while the cost of financing will be bigger. One way to avoid losses will be to take on loans with a high level of risk. Thus, judging from the point of view of the relationship between the two types of stability, we can understand the possible conflict.

The conventional view before the crisis was that there was no trade-off between financial stability and monetary stability (Issing, 2003). Anna Schwartz (2000) stated that a central bank that was able to maintain price stability would minimise the risk of an intervention as a lender of last resort.

3. Inflation targeting countries vs. non-inflation targeting countries

The recent financial crisis did not only affect the financial sector, but it also influenced the real economy. Because of the lack of funding and high interest rates, companies were less likely to make investments, which led to a rise in unemployment and a drop in GDP.

Among the scholars who tested this relationship we can mention Mishkin and Schmidt-Hebbel (2007), who compared the conduct of inflation targeting countries as opposed to non-inflation targeting countries in terms of the oil price shocks. Their results indicate a better response from the first type of countries because their central banks benefit from a higher level of credibility, which makes anchoring expectations possible.

Another study on the recent financial crisis was made by Carvalho Filho (2011) and it includes an analysis of 51 countries, concluding that inflation targeting countries performed better in this period.

Inflation targeting countries benefit from a higher level of discipline and high central bank credibility. Such countries have a less volatile inflation rate and exchange rate, respectively, high levels of reserves and strict fiscal policies.

Some of the direct consequences of the financial turmoil of the last years include an increase in interest rates and unemployment and a decrease in investments and GDP all around the world. Considering that dedicated literature correlates inflation targeting with better fiscal policy management, we can assume that, in terms of the level of debt, such countries would face less problems when confronted with a shock⁽²⁾.

In the event of a lack of access to international financing, the role of the international reserves accumulated by a central bank becomes more and more important. One argument supporting this statement is the swap arrangement that the European Central Bank made with the Federal Reserve, in order to ensure the stock of dollars. The role of international reserves is highlighted not only in such exceptional circumstances, but also in conventional times, as a guarantee of a country's eligibility for loans at lower interest rates.

In inflation targeting countries, interest rates tend to be higher in order to maintain control on liquidity and inflation, allowing central banks to respond to shocks such as the crises, providing the system with liquidity by cutting the interest rate and still keeping it high enough to avoid the zero bound.

The main problems that were generated by the economic crisis were a lack of trust between financial partners, and, as a consequence, a high level of uncertainty, moral hazard and adverse selection. Under the circumstances, the advantages of an inflation targeting central bank – transparency and credibility – can prove extremely important to investors and financial markets.

4. Case study

After more than 20 years from the moment New Zealand decided to implement this monetary policy strategy, more than 26 countries took the same decision, many of them in emerging markets. Important banks such as the European Central Bank, the U.S. Federal Reserve, the Bank of Japan and the Swiss National Bank decided to use elements of financial targeting in their monetary policy (Scott, 2010).

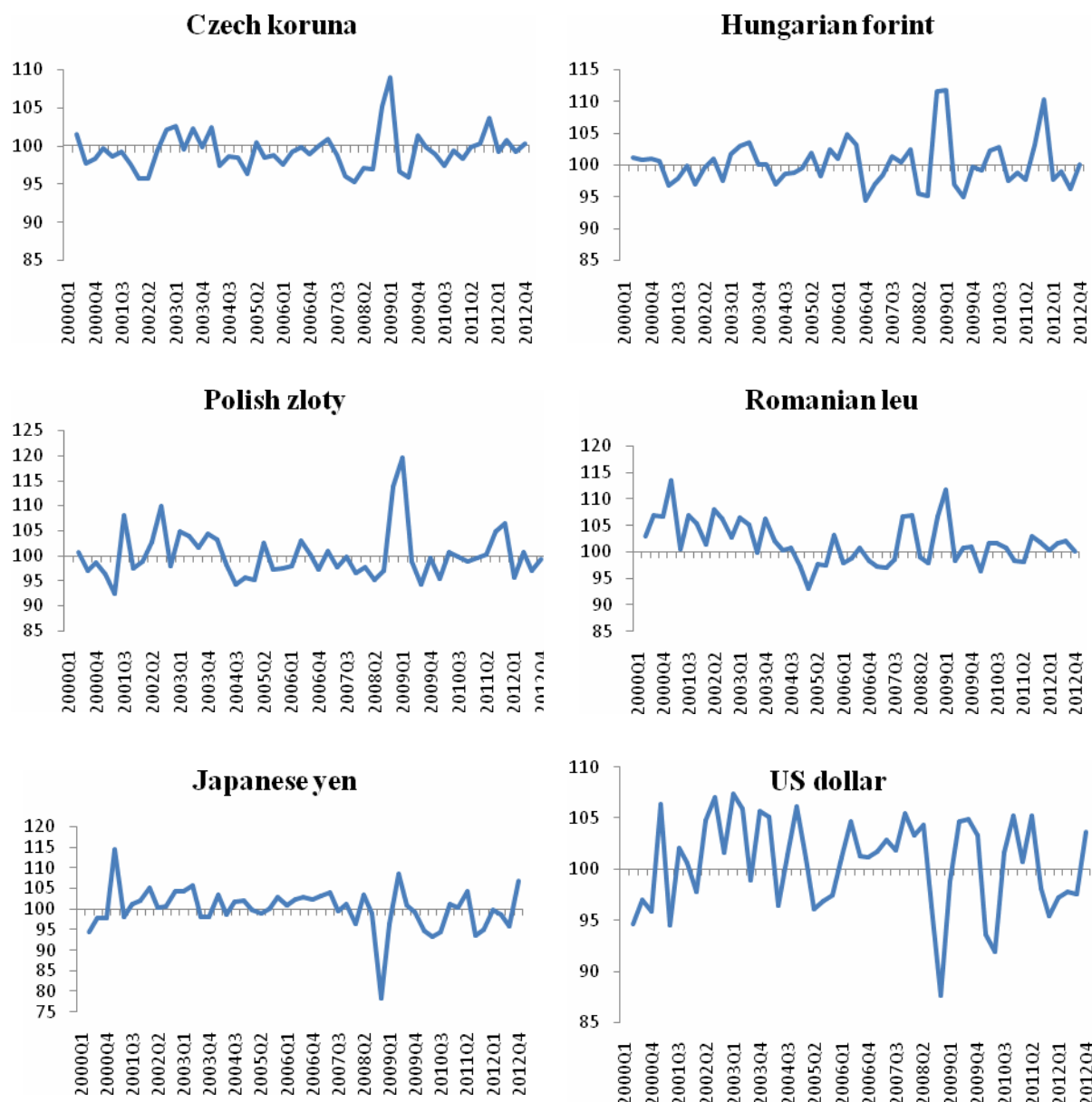
Country	Adoption date	Inflation rate at adoption date	Country	Adoption date	Inflation rate at adoption date
New Zealand	1990	3.3	Korea	2001	2.9
Canada	1991	6.9	Mexico	2001	9.0
United Kingdom	1992	4.0	Iceland	2001	4.1
Sweden	1993	1.8	Norway	2001	3.6
Australia	1993	2.0	Hungary	2001	10.8
Czech Republic	1997	6.8	Peru	2002	-0.1
Israel	1997	8.1	Philippines	2002	4.5
Poland	1998	10.6	Guatemala	2005	9.2
Brazil	1999	3.3	Indonesia	2005	7.4
Chile	1999	3.2	Romania	2005	9.3
Colombia	1999	9.3	Turkey	2006	7.7
South Africa	2000	2.6	Serbia	2006	10.8
Thailand	2000	0.8	Ghana	2007	10.5

The study will include an analysis of inflation targeting countries and non-inflation targeting countries in Europe, as well as two important economic reference countries: the USA and Japan. The period taken into consideration will be that after 2000 and, more specifically, the focus will be on the years of financial turmoil and those that followed. The study will offer an overall perspective, as well as an individual perspective for certain countries considered representative. The main aspects taken into account will be the exchange rate, the inflation rate, gross domestic product, government debt as a percentage of GDP, interest rates and the current account.

Exchange rate

In terms of exchange rate volatility, a comparison between some inflation targeting countries in Europe and the US dollar and the Japanese yen reveals a spike in all countries at the height of the financial crisis. Especially the US dollar reports obviously high volatility, whereas inflation targeting countries with a longer history with the strategy, such as the Czech Republic, show a less volatile exchange rate. The volatility of the exchange rate can be, in part, caused by the level of uncertainty and the level of trust in the economy.

In the case of the Czech koruna, the shock of the crisis was mainly absorbed by the exchange rate, causing a depreciation from about 20 koruna/Euro to about 30 koruna/Euro. This made the country more competitive than its trading partners. Hungary, on the other hand, seems to have had problems generated not only by the effects of the financial crisis, but also by weak fundamentals, problems regarding debt, credibility and market expectations. The volatility of the US dollar can be explained by the volatility of risk aversion in this period.

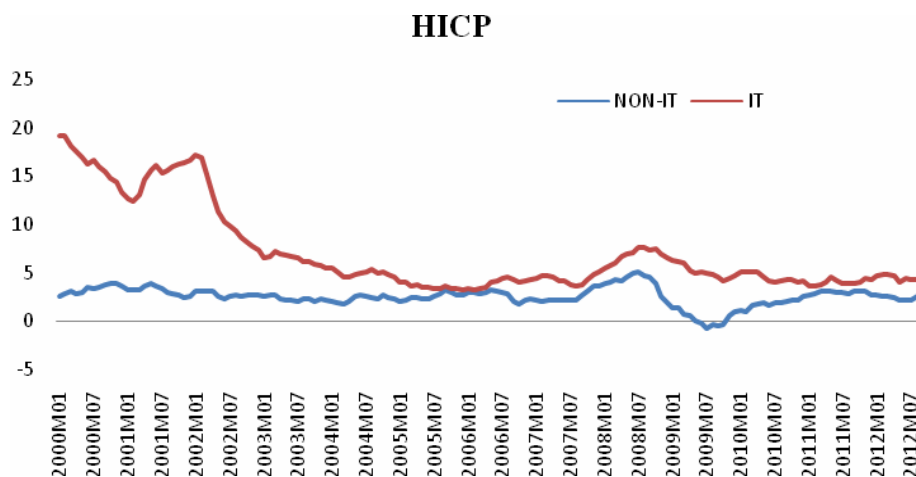


Source: Eurostat, author's calculations.

Figure 1. Exchange rate volatility (percent)

Inflation rate

In terms of their inflation rates, the sample of 23 countries shows an overall decrease in inflation for inflation targeting countries from two digit values to one digit values. Looking at the period 2008-2010, we can notice a larger decrease in inflation rates in non-inflation targeting countries, while in IT countries the inflation rate remained relatively stable throughout the interval. This can be explained by the fact that in non-IT countries the policy rates were already low and, in order to increase the liquidity in the financial system, they were lowered even further, to all-time minimums, inducing a drop in inflation, even if that was not necessarily the effect they primarily targeted, but rather the stability of the financial system. On the other hand, IT countries had the necessary space of manoeuvre to reduce policy rates without pushing inflation rates to undesirable values. Moreover, as inflation targeting is flexible, in times such as the latest financial crisis, the focus of central bankers shifted from reaching a strict inflation target to sustaining and supporting the financial system.



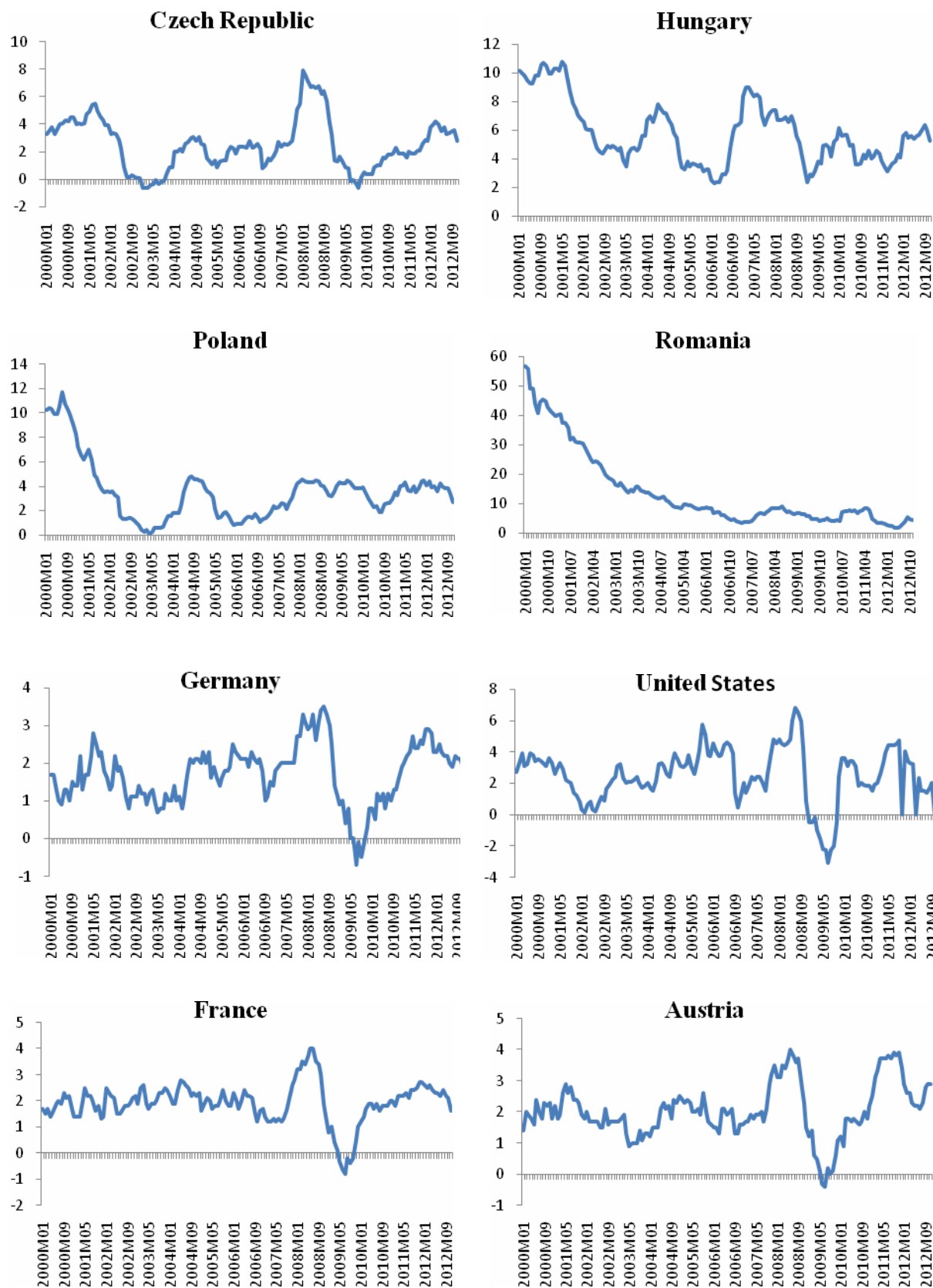
Source: Eurostat, author's calculations

Figure 2. HICP average annual rate of change (percent)

In countries such as Poland and Romania, the chart shows an obvious decrease in inflation rates and relatively stable rates in the last years. In Hungary, we can observe lower levels of inflation since 2001, when the strategy was adopted; nevertheless, in 2007, inflation rates were higher than 8% and, as a response, the central bank went from interest rates of 6% to 8% and continued increasing them until 2009, when inflation reached lower levels.

In non-IT countries, inflation rate volatility is very high, especially in countries such as Germany and the USA; in most of them there is a similar move in inflation: a large increase at the end of 2008, followed by a similar decrease in 2009, when inflation rates reported negative values (the USA is one of the best examples in this case).

Benefitting from the advantages of a floating exchange rate, the Czech Republic had more instruments to smoothen the effects of the crisis on the economy and there was no risk of deflation. The FED's policy in fighting the financial crisis was to offer even more money to the system by setting the interest rate at zero. Maintaining interest rates at such low levels for a long time can lead to high inflation rates.

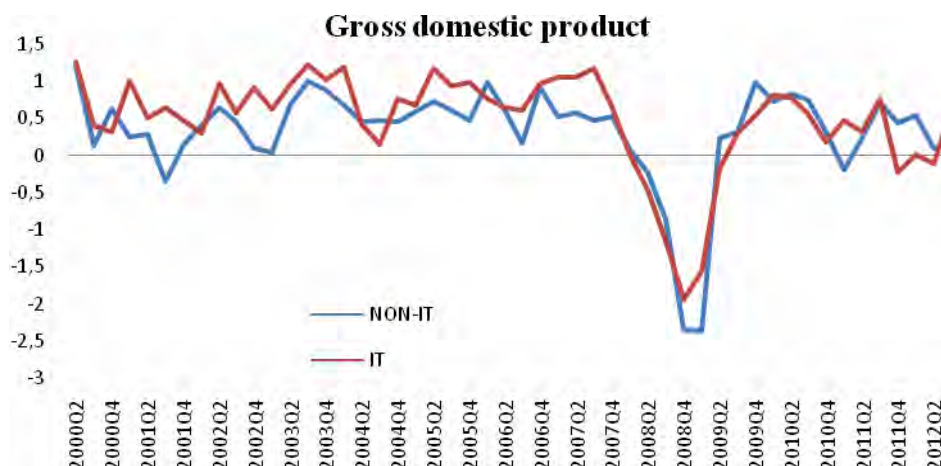


Source: Eurostat, author's calculations.

Figure 3. HICP annual rate of change (percent)

Gross domestic product

The gross domestic product was one of the most important indicators during the financial crisis because most countries suffered a recession – more or less obvious. Overall, both IT and non-IT countries followed the same path, namely reporting a large decrease in GDP, relatively less pronounced in IT countries. This evolution can be explained, in part, by the fact that most countries depend on each other in terms of imports and exports. Still, over the period after 2000, IT countries have recorded higher rates of growth than non-IT countries. It is very difficult for a country with financial relations with other countries to overperform if GDP in the other countries declines.

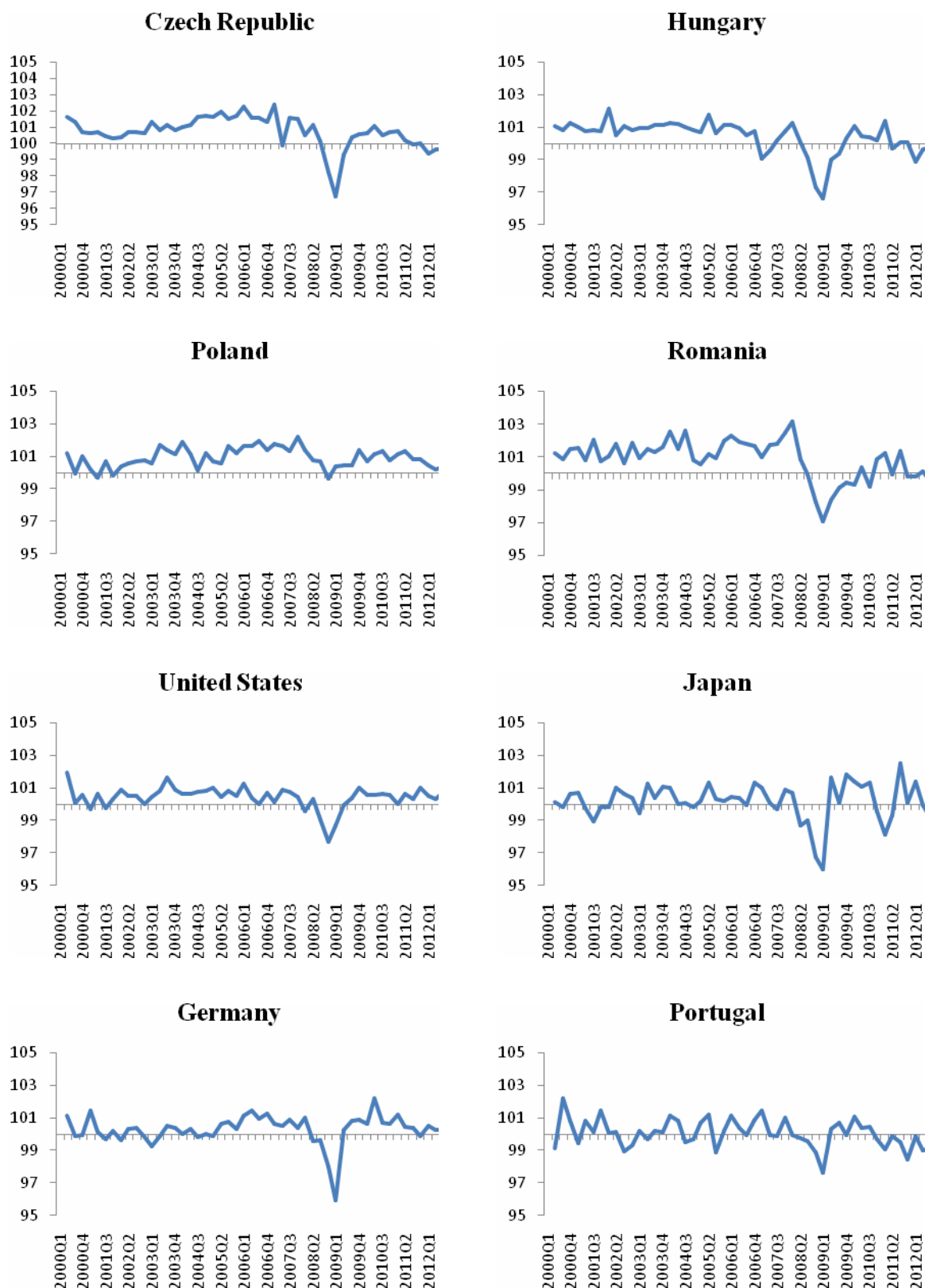


Source: Eurostat, author's calculations.

Figure 4. GDP rate of change in European countries (percent)

A country a country breakdown shows that IT countries generally have higher growth rates – some of them, such as Poland, managed to perform rather well in terms of their GDP, facing but minor problems in the last years. On the other hand, many non-IT countries – such as Japan and Portugal – report high volatility with respect to GDP growth, having experienced more than one period of sharp decrease. It is natural to see such a fall in all countries. The problem is how fast a country can overcome the shock and how stable it can maintain itself compared with others.

Before the economic crisis broke out, the rates of growth in the Czech Republic were above 6%, while in 2009 the economy contracted by 4%. The state was mainly affected by the fact that it is a small export-oriented country, which makes it vulnerable to external shocks. The US economy fell to 0.4% at the beginning of 2011 and the economy was affected by the rise in gas prices, the earthquake in Japan, which made it hard for the former to obtain supplies, and unemployment continued to grow. Hungary found it particularly hard to recover from the crisis and its debt was downgraded to “junk”. Moreover, being a small opened economy dependent on trade partners, with a high export-to-GDP ratio, Hungary is very vulnerable to external shocks.



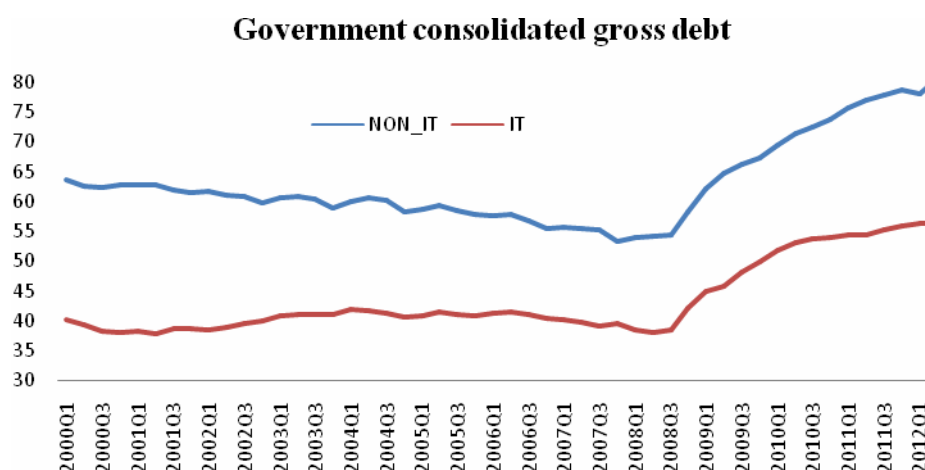
Source: Eurostat, author's calculations.

Figure 5. GDP rate of change (percent)

Government debt

If we take into consideration government debt as a percentage of GDP, it is obvious that inflation targeting countries have much lower levels of debt than non-IT countries. This may be in part the result of a stricter and more rigorous fiscal policy. A high level of debt represents a risk for a country and it can be a source of uncertainty for investors and creditors. It could result in an increase in risk premium for a country, which means higher interest rates, as well as an increase in CDS values.

Starting with 2010, the Czech Republic initiated a consolidation programme, trying to meet the deficit target for that year, which meant a cut in expenditure and wages and an increase in the VAT rate.

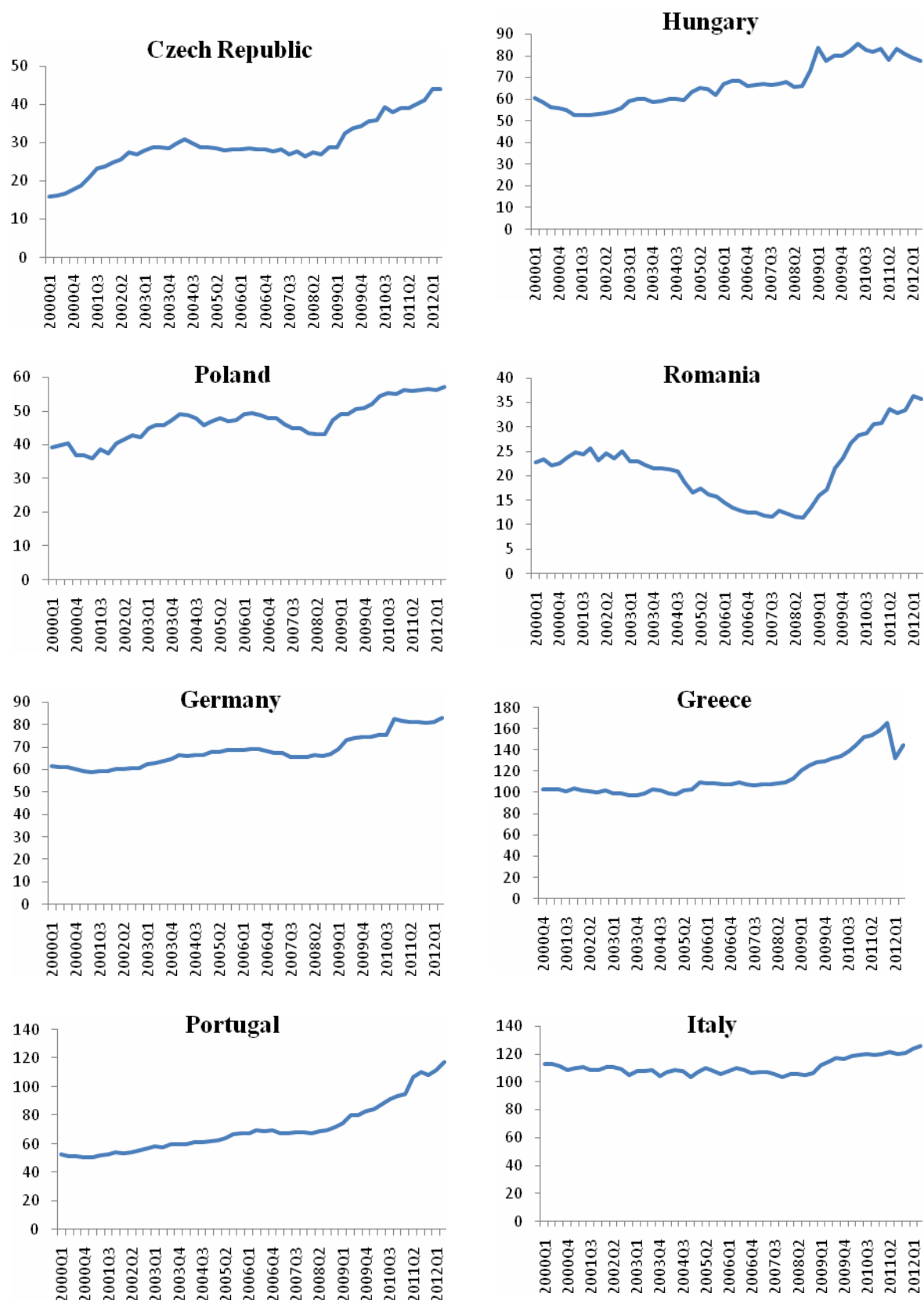


Source: Eurostat, author's calculations.

Figure 6. Average government consolidated gross debt as a percentage of GDP

An individual analysis of the situation shows the same picture. Although there are some countries, such as Hungary, where the level of debt has increased, it is still lower than in many non-IT countries, where we have values of over 100%. The financial crisis meant a rise in the debt-to-GDP ratio, partly due to an increase in debt, but also due to a decrease in GDP. Another interesting aspect that is worth mentioning is that PIIGS countries (Portugal, Ireland, Italy, Greece and Spain) are not IT countries. It could be argued that they could have benefitted from stricter and more responsible policies. Many of these countries have debt-to-GDP ratios well above 100%.

The Greek crisis was a result of government debt, as opposed to Spain or Portugal, where large amounts of debt were generated by the private sector. This means that, judging from the point of view of total debt to GDP, the second group of countries has a similar level of debt. Another interesting aspect is the fact that many companies from Portugal were financed by Spanish banks, which makes it a problem for both countries. On the other hand, the US debt has risen to a level similar to those reached during World War II. This was mainly the result of a significant difference between spending and revenue, the necessary policies implemented in order to maintain stability and the general financial situation. This was equivalent to a loss in trust from the investors, who expected a fiscal crisis.

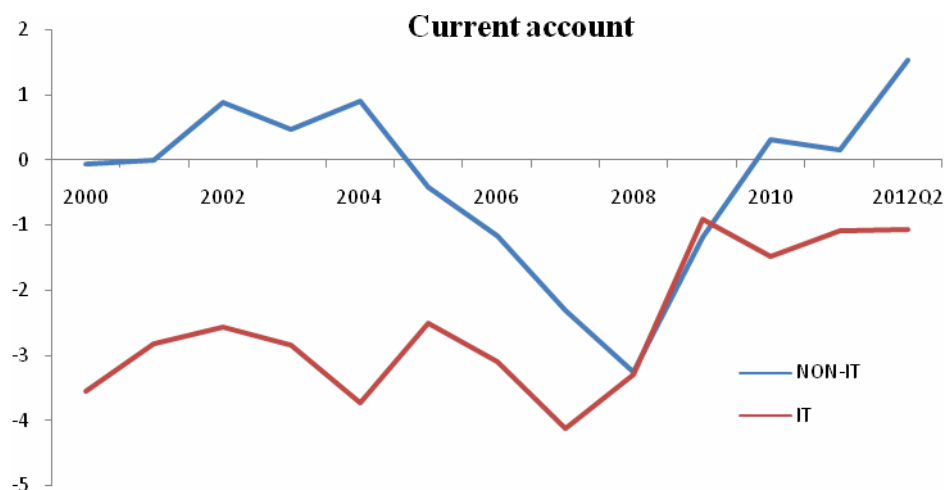


Source: Eurostat, author's calculations.

Figure 7. Government consolidated gross debt as a percentage of GDP

Current account

The current account as a percentage of GDP shows lower levels for IT countries until 2008, but a less steeper fall after 2005 and similar increases in non-IT countries after 2008. Although these countries seem to report, on average, mostly negative values for this indicator, their evolution appears to be more stable in the reviewed period.



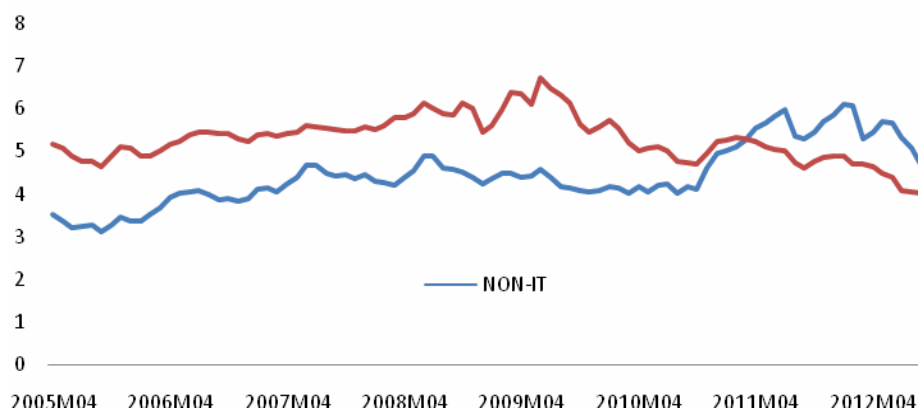
Source: Eurostat, author's calculations.

Figure 8. Average current account as a percentage of GDP

Interest rates

If we take into consideration long-term interest rates, and, more specifically, the Maastricht criterion interest rates, we can observe that until 2011 IT countries reported much higher rates than non-IT countries. This was also supported by higher policy rates, designed to control the level of inflation. High rates allowed sufficient space for policy loosening at the moment when the financial system needed liquidity. In many countries where interest rates are high and the exchange rate is highly volatile, this can be an important risk, because many loans are foreign currency-denominated. In times of crisis, people have less money, unemployment is high, costs are larger and this can lead to a high level of NPLs.

EMU convergence criterion bond yields



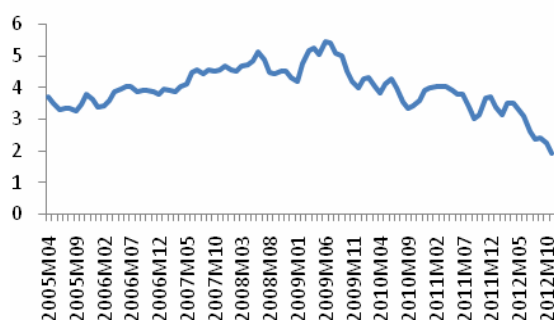
Source: Eurostat, author's calculations

Figure 9. Average EMU convergence criterion bond yields (percent)

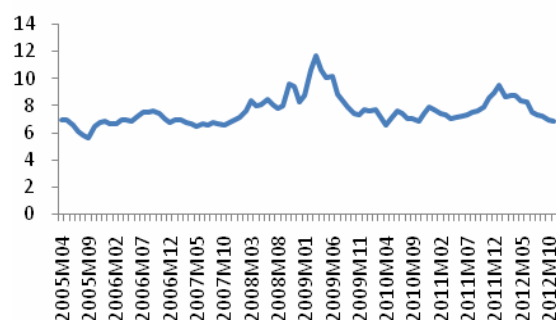
Looking at some examples of IT countries and non-IT countries, respectively, we can observe a somewhat different trend. While IT countries showed higher interest rates, which have tended to decline only in the recent months, non-IT countries can be characterised by lower interest rates over the last years and a sudden increase in the recent period. This could mean a change in perception, as well as a need to address problems in a different manner. During the financial crisis, having the instruments to inject liquidity into the system was essential for the financial system.

During the financial crisis and the Greek crisis, bond yields rose in many European countries, but after the Greek bailout they started to go down, yet remaining at relatively high levels. Under the circumstances, it is very hard for indebted countries such as Italy, Portugal and Greece to continue financing themselves. On the other hand, an increase in interest rates would reflect a decline in investors' trust.

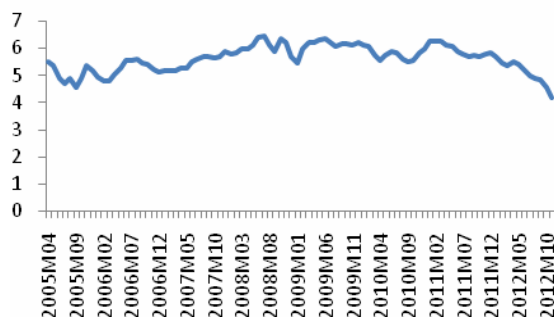
Czech Republic



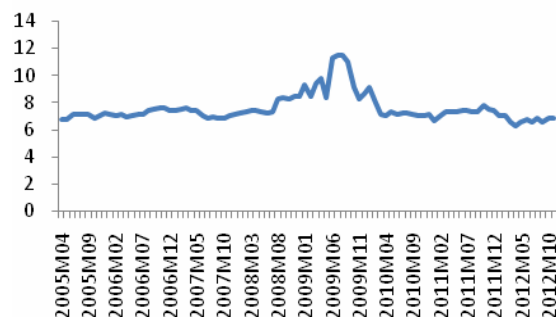
Hungary



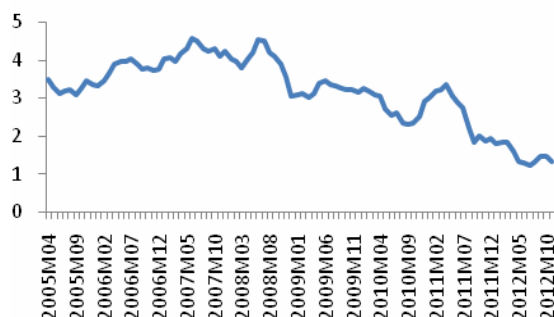
Poland



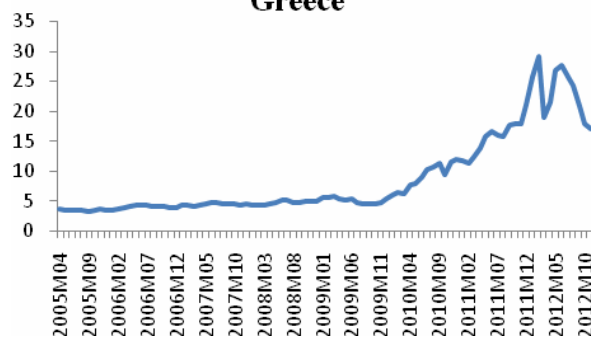
Romania

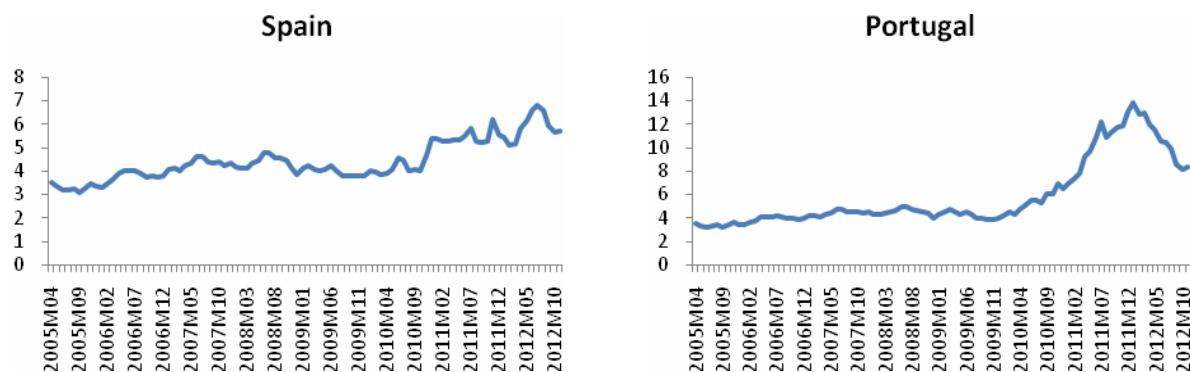


Germany



Greece





Source: Eurostat, author's calculations.

Figure 10. EMU convergence criterion bond yields (percent)

Conclusions

Looking at the overall picture, we can conclude that inflation targeting countries overcame the financial crisis smoother and with fewer shocks to the economy. This can be partly explained by policy makers' having the possibility to respond to shocks without affecting the economy too much. The existing levels of policy rates allowed for a cut without pushing rates to almost null values, thus injecting the necessary liquidity in the system without losing track of inflation rates.

It is also true that during the crisis the fact that inflation targeting is not a strict, but a flexible regime contributed to policy response. Policy makers could focus more on maintaining the system's stability and less on reaching the inflation target.

That is the reason why most inflation targeting countries recorded an increase in inflation, which continued to be rather low notwithstanding, while other countries experienced high inflation volatility and, because of low policy rates, many could not avoid negative values.

Due to the existing interdependence between countries' economies, it is almost impossible to avoid a domino effect, irrespective of the monetary policy regime. Therefore, it should not come as a surprise that almost all countries were confronted with a fall in GDP, but an overall analysis of the period can show lower volatility, more stable GDP levels before the crisis and a less pronounced fall at the peak of the crisis in the case of IT countries.

In terms of debt, IT countries report much lower levels as a percentage of GDP, which is not necessarily surprising if we take into account the fact that such countries have a stricter fiscal policy. Although both types of countries posted an increase in debt since the crisis years, the levels reached are not comparable. Moreover, it is worth mentioning that the PIIGS states (Portugal, Italy, Ireland, Greece and Spain) are not inflation targeting countries, which could be a clue in leading us to conclude that IT countries perform better in times of turmoil, responding better to shocks.

It is natural for IT countries to have higher interest rates, because policy rates are usually higher than in non-IT countries. This is partly why, even when policy rates were lowered, IT countries did not report negative inflation values.

An important aspect that needs to be taken into consideration is that European countries are connected by means of trade, currency or economic partners.

Another interesting fact that is worth mentioning is that many European countries that are trying to adopt the euro have to fulfill the Maastricht criteria, which refer to price stability, exchange rate stability, interest rate levels, government debt and deficit. Many of them are also inflation targeting countries, which is another reason for a higher level of discipline in their case. Analysing the relationship between the degree of fulfillment of the Maastricht criteria and the performance in terms of financial stability and price stability could represent a further path of study.

Notes:

⁽¹⁾ Tucker (2009) paraphrases Bagehot (1873), "In order to avoid panic, central banks should lend solvent companies, without any limit, in exchange for guarantees and high interest rates."

⁽²⁾ Blanchard et al. (2010), Carvalho Filho (2011).

⁽³⁾ Calvo (2010).

⁽⁴⁾ Inflation Targeting turns 20 – Scott Roger, March 2010.

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COMPETITION: CLASSICAL VERSUS NEOCLASSICAL VIEW

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Abstract. *Competition is an important element from economical theory. Over time it has experienced several definitions and classifications much of them being contradictory. In this paper I will make a parallel between classical and neoclassical point of view according to competition.*

Keywords. Competition; neoclassical theory; classical theory; monopolistic; perfect competition.

JEL Classification: B12, B13.

REL Classification: 1C; 1D.

1. Introduction

Even we are speaking about economical or social life, competition plays an important role as elements which provide a certain position in society for economical agents and also provide the development of different markets. We can say that the presence of competition is a positive factor if we have a significant growth at macroeconomic and microeconomic level.

Studying competition began in 16 and 17 century by Jean Bodin and Thomas Hobbes who made reference to how businesses have adapted to the constraints imposed by the environment in which they worked and the rivalry between authority and freedom. Later, Physiocrats, marginalists and of course the great classics of economics as William Petty, Adam Smith and David Ricardo were study competition.

Other economists interested in studying competition were: Frederic Bastiat, Leon Walras, Augustin Cournot, Vilfredo Pareto, Karl Marx, Alfred Marshall, Francois Y. Edgeworth, Joseph A. Schumpeter, Edward H. Chamberlin, Joan V. Robinson, Francois Perroux, John Maynard Keynes, Milton Friedman, Friedrich A. Von Hayek and others.

2. Competition in classic view

Liberal economists but mostly the classics were convinced that the market economy have some resorts that allow it to function rationally, efficiently and harmoniously, despite the fact that economic agents are selfish and are unconcerned with the general interest or public good. Thus, liberal economists were optimistic about the operation and prospects of the market economy both short term and long term. This optimism was illustrated in particular in Adam Smith's theory of “invisible hand” and in JB Say's theory of “markets or outlets” that dominated the literature in Western countries before the economic crisis of 1929 to 1933.

In his book, using the metaphor “theory of the invisible hand” Adam Smith said that the clash of private, narrow and selfish individuals interests, determine an overall balance of the market economy which enables its effective and smooth functioning, capable to provide not only the gain and prosperity of individual agents, but also the public interest. We can speak in this case about normal operation, not only at a microeconomic level but also at a macroeconomic level. To achieve these goals of welfare and efficiency, according to Adam Smith, there should be complete freedom of movement of individual businesses and non-interference of the state in the economy – free exchange and free competition. If at

microeconomic level each trader seeks profit and take decisions in this regard, at the macroeconomic level things should follow a natural course as if an invisible hand would arrange everything.

Throughout his work, Adam Smith argues for free trade. Thus, he recognized the role of competition as being an invisible hand, independently of any state intervention, of any supply and demand adjustment made by individual impulse, and so disciplining all economic activity (Sălăjanu, 1992).

What Adam Smith recognized as truly useful is external competitiveness considering that at the base of trade between countries is the principle of absolute advantage. If some countries manufacturers offer products or services of the same type but which had different costs, the one with minimum cost of production will have absolute advantage over competitors. In other words, Adam Smith believes that absolute advantage occurs when recording gains by purchasing products or services with low prices. According to Adam Smith, exchanges of goods or services, whether we are talking about internal or external market, are based on the law of value by comparing production costs for a particular product or service and absolute advantage lies in the difference of costs and in savings that can be achieved by manufacturers. Through such trade, the author believes that both producers and consumers are benefiting. Of course, this trade can be achieved with full economic freedom without imposing restrictions of any kind (Smith, 2000).

Starting from “invisible hand theory“, in “Treaty of political economy” (Say, 1880) and “political economy course” the French economist J.B. Say supports and strengthens the view of Adam Smith saying that the market has some mechanisms to control the demand and supply of goods called price oscillation mechanism. He argues that the disequilibrium between supply and demand is temporary and there are different incentive that can adjust it; the lower prices will lead to lower production and implicitly, increasing prices will determine the increase of production, which is available both on the internal and external markets. This supports the fact that under complete freedom of movement of all economic actors, each trader has to find the optimal market to sell the products.

In classical economics, competition is seen as a mechanism to coordinate economical agents interests and acting in order to attain balance, a never ending process which removes excessive profits or significant losses, process which establishing a certain level of prices. This is why Adam Smith said in his book that beyond reach they own interests, economical agents are led by an invisible hand that evens or limit their personal motives. J. S. Mill (Mill, 1848) is more explicit about the coordination mechanism that helps us to see economic phenomena in a scientifically and rigorous as well. Thus, Mill (1848) argues that by competition product prices and inputs can be determined in a rigorous way and also that the most important is “independent people desire”; Mill recognizes that the economy is operating with objective mechanisms that can be theorized. Classical economists described the competition as an endless rivalry balancing process and not as a final state or as a state of affairs as it is described in neoclassical economics. For example, Smith described this process as a rivalry which determines lower prices and so companies are under continuous pressure to innovate.

Moreover, in this competitive process prices are attracted to their natural thresholds, and thus the rate of profit and wages tend to normal values. The sine qua non condition of this phenomenon is the free mobility of capital, or as Adam Smith says "the perfect freedom".

The invisible hand of competition directs the actions of every individual who wants to satisfy their own interests so that it contributes to promoting the welfare of society although this would not be his intentions.

Classical economists are not very precise about the competitor behaviour requirements and how this affects the number of participants. Stigler (1957) considers competition being a direct link with the number of participants. In other words, regardless of industry, prices fight was given between several combatants (Palgrave, 1987, Moudud, 2010).

It seems that Smith, Ricardo and J.S. Mill has not differentiated enough clearly the competition inter-industry or intra-industry (Tsoulfidis, 2011). Shortly (Tsoulfidis, 2011), Smith, Ricardo and J.S. Mill conceived competition as a process that short-term aims to establish a price equal ("law unique price") and in the long term, an unequal income between companies in the same industry and different rates between industries that tend to be equalized with their natural prices, due to the inflow and outflow of capital ("equal profitability law").

3. Competition in neoclassical vision

In the neoclassical view time is not taken into account, it relies on assumptions about consumer preferences saying this is the only way to obtain a positive result. Also, it is said that in a market with many competitors the registered profit and products or services prices are lower comparing to a market with a single seller.

In neoclassical theory, competition analysis is contained in perfect competition model, which describes the ideal conditions to be taken into account in the market to ensure its existence in companies in a particular field, and, by extension, it characterize the industry as competitive or not. The model of perfect competition describes a market containing a large number of small firms that sell a homogeneous quantity of goods for a large number of consumers.

Competition intensity is directly proportional to the number of producers, and overall with industry structure. The company is seen as a legal entity that by hiring and organizing the services is providing goods and services market. The company do not have any input, it simply contract them. As the number of firms in a given area is bigger, as it will be more vigorous the competitive behaviour and thus it is established a profit rate within an industry. As the number of firms is lower, as the form of competition will be more monopolistic or oligopolistic, and thus the profit differences from industry will be higher. If a firm record increased quantities of profit for a longer period of time, it is considered as part of a case of imperfect competition, therefore monopolistic.

The term of perfect competition appears for the first time in Cournot's work (1838) whose analysis was premised on maximizing behaviour of firms participating in the equality of marginal revenue and marginal costs and it is also related to the number of firms in the market, as more as lower will be the price; if the number of firms is very large (infinite) then the price will be equal to marginal cost. The concept was presented in other 19th century French engineers writings which knew the marginal cost pricing efficiency and the difficulty of applying them.

According to Walras (1874), participants should act independent from each other and react to price announced by an auctioneer. Also, perfect competition is a sine qua non condition for the model of the determination of the equilibrium price – a lot of small firms.

In his work, Edgeworth (1881) spoke about perfect competition although it hadn't got a big success with this idea. At that time the idea seemed inconceivable both because less realistic and because of strong domination of classical economics. Marshall (1880) sought to clarify the issue of acceptance of new theories. He tried to implement dynamic process of competition in static terms, namely the characterization made to competition form by the number and type of products. Marshall's work was continued by Knight (1921) who described in detail how the conditions of perfect competition can be translated into the real economy. The problem was that it could not easily be applied in the real economy and according to

Stigler (1957) this has led to the emergence and acceptance of the concept of monopolistic competition in 1930. The notion of perfect competition and marshal theory were rough criticized by Sraffa (1925, 1926) which showed that in a partial equilibrium framework there cannot be defined marginal cost curve and average cost curve which determine a upside downhill supply. Based on the words of Sraffa in the 1930s appeared the notion of monopolistic competition. Whether recognized or not, Sraffa's studies were the basis of this concept. Both, J. Robinson (1933) in the United Kingdom and Chamberlin (1933) in the United States, independently one to another, raised the problem according to which the perfect competition should be abandoned in favour of monopolistic competition.

As a consequence of the monopolistic competition revolution, perfect competition has become a special case of imperfect competition (monopoly). This led to heated debates among classical economists. On one side of the barricade were economists from Harvard University (Chamberlin, Mason, Gaulbraith) which had the opinion that the current economy is a deviation from what would be normal - perfect competition and that governments should remedy this problem. On the other hand, the economists from University of Chicago (Stigler, Friedman, Harberger) who considered monopolistic competition being more complex than the perfect one. Otherwise, Friedman (1953) said that "a model is judged in relation to its predictive content and not in its assumptions with realism".

Monopolistic competition revolution took place from 1930 to 1940. Then up to 1980 it was replaced by perfect competition. The second monopolistic competition revolution began in the 1980 with the arrival of Keynesian economy (Tsoulfidis, 2011).

Conclusions

Competition is an important and a central element in economical theory. The meaning of this concept and the way that this is perceived differs from a theoretician to another. Competition contributes to the economical development. In this paper we saw the different between classical and neoclassical opinion about competition.

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ON THE DECLINE OF MIDDLE CLASS AS AN EFFECT OF GLOBALIZATION. EVIDENCE FROM THE DEVELOPED AND EMERGENT COUNTRIES

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Abstract. *The paper is aimed at investigating the negative consequences that the globalization generates for both the developing and the developed countries in the social field. The sharpening of inequality within the most exposed developed economies and also at within the emergent countries has caused the polarization toward the margins of income distribution. The paper finds that the power systems, the power relationships and the fiscal system could be responsible for the actual income distribution in society. The empowerment of poor is the only solution to re-establish the social equilibrium in the world.*

Keywords: globalization; middle class; inequality; poverty; income.

JEL Classification: F63, F69.

REL Classification: 10Z.

1. Introduction

In the economic literature, globalization refers to the integration of national economies into the international economy, through trade, foreign direct investments, migration and capital flows. At a conceptual level, the libertarians and the proponents of globalisation claim that the free trade leads to a more efficient allocation of resources, to lower prices, unemployment reduction, higher output and a higher standard of living in the developing countries (Sachs, 2005). Therefore, globalisation may be viewed as a product of capitalism. Other people (the pro-globalists) argue that, in order to prevent the negative consequences of globalisation, global political institutions must be created to represent the will of world citizens.

After the II World War, the advantages of participating at the international economic integration over the protectionist policies were largely recognized by politicians and economists. One significant stage of the post-war contemporary economy relies on the development of international financial and trade institutions. First, the Bretton-Woods conference led to the creation of the International Monetary Fund (IMF) and the World Bank. Elimination of barriers to international trade and promotion of free trade were promoted by the General Agreement on Tariffs and Trade (GATT), North American Free Trade Agreement (NAFTA) and Maastricht Treaty.

The starting point in our approach is to establish whether globalization is a residual product of the development of world economy in the last decades or rather the expected effect of the power relationships between countries and continents. In the case that globalization is not the accidental product of the contemporary economy, a detailed analysis of the underlying power systems may reveal interesting findings for both the developed and developing countries.

The last section of the paper summarizes the conclusions and the perspectives over the cross-country interactions in the process of globalization. It is shown that the deepening of

global economy could sharpen the economic and social inequality in the most developed and opened economies, while the struggle against poverty in the less developed countries will never be successful as long as those countries remain simple pawns in the game of the big players. The middle class, which should represent the fundament of any society, will continuously decline, as more and more people will move from the middle class to the poor class. The empowerment of poor countries seems to be the only solution for many of the issues debated in this paper.

2. On the effects of globalization (Theoretical grounds)

In order to be able to analyze the effects of globalisation, we expose in this section the most important factors explaining this broad process:

➤ The increase in the number of countries moving from a closed, centralized economy toward an opened and free market economy becomes significant after the II World War. South Korea, Taiwan, Hong Kong, Singapore in the past and China, India and Russia more recently have opened their economies, becoming attractive destinations for the foreign direct investments.

➤ The role played in the global economy by the developing countries is more and more important. There is a number of countries, such as Taiwan, Singapore and Hong Kong, which had sustainable growth rates for a long period of time. The dynamics of their economies helped them to leave the category of poor countries and to become developing or emergent markets. China continues to be the only economy having an annually growth rate higher than 10% since the '80s onwards.

➤ The technological progress has allowed the improvement of communications and the decrease in the cost of transportation. This has a positive impact on the management of multinational corporations.

➤ The increase of the international competition, the opening of national economies, the technological progress and the increase in the volume of FDI are visible symptoms of globalisation everywhere.

As globalisation becomes more and more evident and active into the world economy, pro-globalisation and anti-globalisation lobbies have arisen. They claim either the advantages or the disadvantages induced by globalisation.

The positive implications of globalization have been often debated in literature. The emergence of worldwide production and financial markets, the increase in information flows, the growth of cross-cultural contacts, the development of telecommunication infrastructures, the increase of international cooperation in solving global problems such as the environmental ones and the migration of people and labour are just few symptoms of globalisation. One of the most invoked advantages of globalisation, which directly or indirectly relates to all symptoms above, is the cost reduction.

Instead of the well acknowledged benefits from globalization, there are several critical effects that represent sensitive issues at present, at a political level. Although globalisation may increase the overall incomes, the benefits are not shared equally between individuals. This will generate losers in relative and absolute terms.

Most of the anti-globalisation activists argue that the development and functioning of power systems will generate both desirable and unexpected consequences for all countries involved in this mechanism. We cannot ignore at this point the international players who benefit from the process of globalization. From this point of view, globalization can be seen as "a term of propaganda used conventionally to refer to a certain particular form of international integration that is (not surprisingly) beneficial to its designers: multinational corporations and the powerful states to which they are closely linked" (Chomski, 2006).

A particular issue often invoked when analyzing the activities of global corporations is called "legitimacy of Modern Corporation". As they are profit-oriented entities, they normally fail in achieving the general social objectives.

3. The impact of globalization on the developing countries

As often highlighted in literature, globalisation could have a negative impact for the developing countries. This comes from the fact that the developed countries set the rules into the world economy, according to their own interests. The opening of developing economies allows them to benefit from the free trade, but equally force them to sell agricultural products at very low prices. The cheap labour force in the developing countries gives another dimension of globalisation. This advantage moves the production divisions of multinational companies into the poor countries and creates a sort of dependency, in the sense that the impoverished workers have to accept low salaries because they basically have no choice. This creates a spiral of precariousness and makes almost impossible the reduction of poverty and inequality in the world.

As presented above, the big corporations move to the developing countries, where the low skilled labour is low paid and the benefits are high. But only certain industries, which provide the advantage of cheap low skilled labour, are seen as interesting by the big corporations. In this light, globalisation appears as one of the factors responsible for the gap between the skilled and unskilled workers. The persistence of this gap over time leads to the decline of the middle class and also to the increase of inequality by the polarisation of society. Escaping from poverty becomes thus more and more difficult, as the middle class can be seen as a stepping one (Mcmahon, Tschetter, 1986).

The impact of globalisation, at a global level, reflects two main tendencies: whereas trade globalization is associated with a reduction in inequality, financial globalization and foreign direct investment in particular are associated with an increase in inequality (World Economic Outlook, 2007).

There is a number of empirical studies aimed at investigating whether the level of inequality in the EU comes from the inequality between member states or within them. It was found that the between country inequality component accounts only for a small part of overall inequality (Papatheodorou, Pavlopoulos, 2003). Considering this, it seems that policies aimed at reducing inequality in each EU member state would be more effective in reducing overall inequality than policies targeting only the disparities between member states.

We cannot ignore here the advantages induced by globalisation. By off-shoring production, corporations optimize the production beyond national borders and benefit from the economy of scale, on long run. In this light, the winners from globalisation are the consumers who benefit from a wide range of products and services at lower prices.

4. The impact of globalization on income distribution. Empirical evidence

The empirical evidence suggest that the inequality both between and within countries has continuously increased in the last decades (Wade, 2001), although the World Bank's figures look different. However, the methodological issues are so complex that it is difficult to reach the consensus around this topic. The income of the richest 1% (50 m people) is the same as the income of the poorest 60% (2.7 bn people), as was mentioned in the Economic Journal (January 2002).

The most significant trends regarding the dynamics of inequality in the world can be summarized as follows:

- Inequalities between countries are rising since 1978.
- In the last three decades inequalities within countries have risen, especially in UK, USA, China and India.
- Inequality between people in the world is high. The Gini index is between 62 and 66. For instance, not even richest people in rural India intersect with poorest people in France.
- The poverty has increased in Africa ("africanisation" of poverty), where half of population have incomes lower than 20 or 30 years ago.

One of the most debated topics in the last decade relates to the well-being of the wealthiest nations. The most advanced economies are the most financially integrated, but new

countries are advancing very fast. The FDI in total liabilities has risen across the emerging markets from 17 percent of their total liabilities in 1990 to 38 percent in 2004 and far exceeds the share of portfolio equity liabilities, which rose from 2 percent to 11 percent of total liabilities over the same period (World Economic Outlook, 2007).

It appears that the rise of income inequality is predominant in most nations, even the most egalitarian welfare countries. According to the Gini coefficient indicator, inequality has raised in developing Asia, emerging Europe, Latin America, the NIEs, and the advanced economies over the past two decades and it has declined in sub-Saharan Africa and the Commonwealth of Independent States (CIS).

Among the developed countries, the United States and the United Kingdom experienced large increases Canada and Australia experienced moderate increases in inequality while the Scandinavian countries, France and Japan experienced small increases. The Netherlands and Germany experienced slight reductions or increases (notably).

The question that arises here is whether the increases in inequality were the result of the widespread or selective changes in real economic well being within nations. For instance in Ireland the increase in inequality may be associated to the increase in real incomes and falling of poverty at all levels of the income distribution (Nolan, 2001). But in Ireland the evidence shows that the standard of living is rising across all groups of population. In Canada, France, Germany, Australia and Luxembourg, the increases in inequality may be seen as a consequence of the growth of trade, increased capita and labour mobility, which characterise the globalizing economies.

At a global level, increasing inequality is largely explained by the increasing income share of the richest quintile at the expense of the middle quintiles, while there has been little change in the poorest quintile.

Overall, in the most developed countries the least skilled workers are better protected from the negative effects of the increased trade and technological change, than in the developing countries. This protection is provided in the developed economies by the winners from the globalisation (e.g. multinational corporations), but sometimes this is done with the price of letting uncovered the same group of population in the developing economies. This process is mainly caused by the delocalisation of production.

5. Facing globalisation and its negative effects

Despite of all negative effects derived from globalisation, it is well acknowledged that protectionism against the global market would result in a loss in economic well being. This kind of policies may first affect those corporations which are dependent on components or other inputs from the emerging markets. They will be forced to pay higher prices for imported goods, and this will cause a decrease in domestic demand. But even so, globalisation still generates negative effects for most of the countries. One negative consequence of globalisation is the increase in income inequality all over the world.

The increase in income inequality in the developed economies is deeply related to the technological progress and revolution in IT. This has resulted in a shift from labour-intensive to capital-intensive production methods. Due to this complex change that affected most of the contemporary economies, the capital-owners and the high-skilled workers are the winners and the low-skilled workers are the losers. It therefore results that a major source of income inequality is unemployment, which affects especially the low-skilled labour.

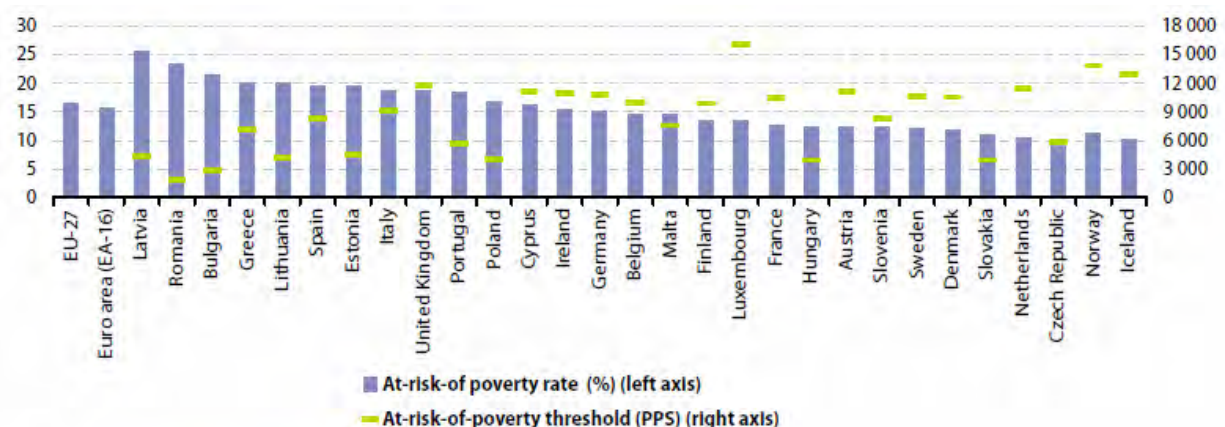
Due to the increase in inequality, globalisation requires a flexible and mobile labour force. The low/skilled labour must shift to more productive tasks. Investing in education, training and human capital becomes the most effective solution to face the negative consequences of globalisation, especially for the low/skilled labour. Equally important, other measures may support employability, especially those in the social field such as: transportation, child care and income negative tax.

Another solution to eliminate the negative impact of globalization is to empower the poor. Empowering the poor requires the removal of all institutional barriers that limit their choices and prevent them from taking action to improve their well-being. The local government plays a very important role in promoting democracy and equal opportunities for each person. When the poor will be able to escape from precariousness, they will become a part of the middle class.

Still, for the time period 2006-2009, the global crisis has done nothing more but deepen the social inequality. Several indicators that we can relate to, demonstrate this fact, especially in countries that are in the process of UE Integration. Such are the cases of Romania and Bulgaria, who have not managed to adapt to the global financial crisis that has affected the entire European Union.

For example, in 2008, 16.5%⁽¹⁾ of EU-27 population was assessed to be *at-risk-of-poverty*⁽²⁾ (see Figure 1). From these countries, Romania and Bulgaria belong to the group of five member states where one fifth or more of the population is at-risk-of-poverty, as follows: Latvia (25.6%), Romania (23.4%), Bulgaria (21.4%), Greece (20.1%) and Lithuania (20.0%).

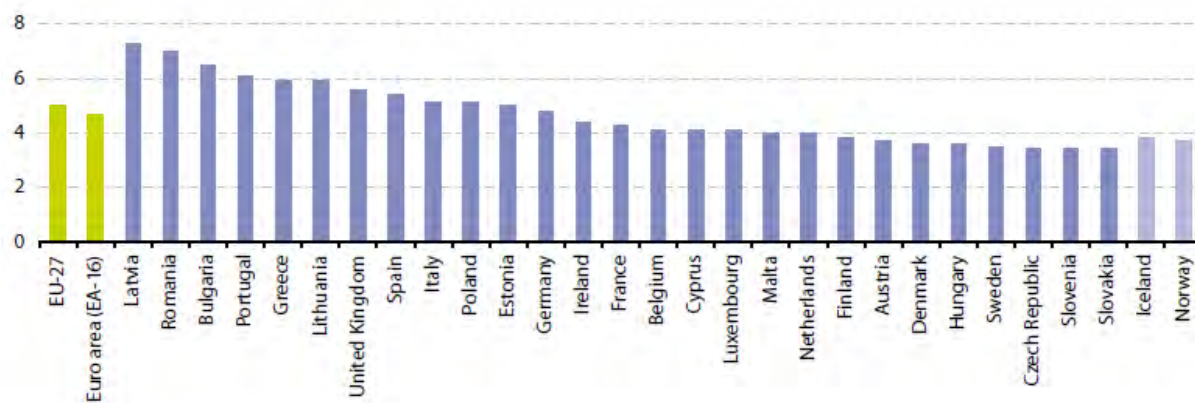
Another indicator that expresses the increase of poverty in a national economy: the *at-risk-of-poverty threshold* (a very stable indicator from one year to the next) is expressed in purchasing power standards (PPS) in order to take into consideration the differences in the cost of living across countries. Romania and Bulgaria have the lowest levels, PPS 2000 and PPS 3000, respectively. For comparison, we underscore that the highest levels are more than PPS 10,000 in eight member states and PPS 16000 in Luxembourg (Figure 1).



Source: Eurostat (ilc_li01 and ilc_li02)

Figure 1. At-risk-of-poverty rate and threshold

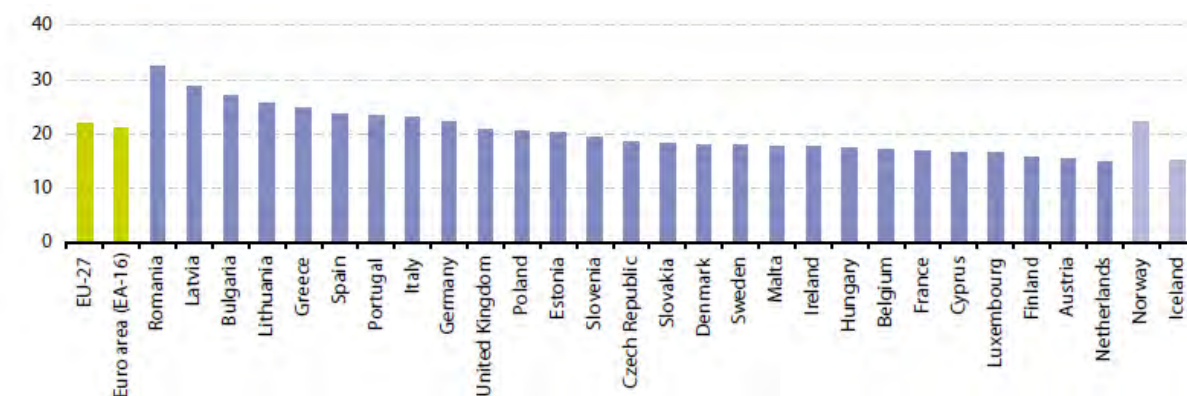
Inequality between classes is developed from several other economical means. Such is the *income inequalities* are particularly important for estimating relative poverty, because the distribution of economic resources may have a direct bearing on the extent and depth of poverty. Figure 2 shows that there were wide inequalities in the distribution of income among the population of the EU: the 20% of the population with the highest equivalised disposable income received five times as much income as the 20% of the population with the lowest equivalised disposable income. This ratio varied considerably across the member states, from 3.4 in the Czech Republic, Slovenia and Slovakia to more than 6.0 in Portugal and Bulgaria and the highest levels in Latvia (7.3) and Romania (7.0). Therefore, Romania and Bulgaria take again the first worrying positions.



Source: Eurostat (ilc_di11)

Figure 2. Inequality of income distribution, 2008(income quintile share ratio)

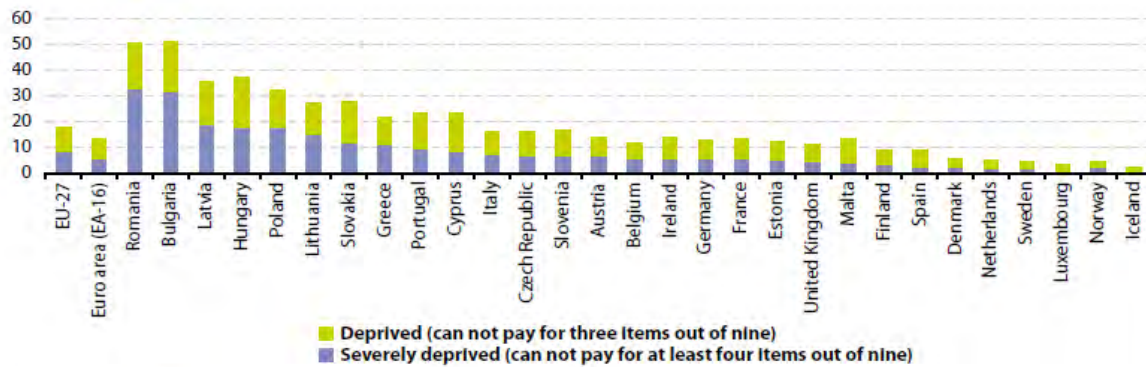
Another indicator which measures the depth of poverty and can determine the inequality between classes is the *relative median at-risk-of-poverty gap*. As Figure 3 indicates, the widest national at-risk-of-poverty gap was registered by Romania (32.3%), Latvia (28.6%) and Bulgaria (27.0%).



Source: Eurostat (ilc_li11)

Figure 3. Relative median at-risk-of-poverty gap, 2008 (%)

In order to have a deeper understanding of poverty, we can also analyze another indicator, the *material deprivation*⁽³⁾. According to Figure 4, if less than one in ten people in Luxembourg, the Northern countries, the Netherlands and Spain were materially deprived, this proportion was approximately one third of the population in Latvia, Hungary and Poland and half of the population in Romania and Bulgaria. Also, if the proportion of people severely deprived was below 3% in Spain, Denmark, the Netherlands, Sweden and Luxembourg, this proportion was more than 30 % in Romania and Bulgaria.



Source: Eurostat (ilc_sip8)

Figure 4. Material deprivation rate – proportion of persons who cannot afford to pay for selected items, 2008 (%)

After comparatively examining the social indicators in the EU, it could be interesting to analyze the reasons for which poverty and the economic crisis have differently affected the European Union Member States. Besides the poor economic and social policies applied across years in Bulgaria and Romania, one must take in consideration that in the case of Romania the fiscal taxes that have led here to an even wider inequality between social classes. The fiscal taxes will be discussed in the next section.

6. Examining the effects of the Lump Sum Tax on the income distribution

The Lump Sum Tax is a standard amount of money demanded by the state to a company, regardless of the company's balance sheet. Whether or not that company declares profit or loss, the company is obliged by the law to pay a monthly standard amount of money just because the company is registered and operational. The tax has the purpose of acting like a regressive tax, so that for the amount of money is important when the company is running on loss, but hardly has any significance when the company profit rises. Due to this aspect, the tax is considered more effective than an unique share, when it applies to profitable companies.

In the economic theory, the tax is regarded like one suited of a light fiscal system. In Romania it was first applied in the year 2010, and it works differently from the original French or Irish versions. When it was first introduced, it was considered as a minimum tax, meaning that if a company would be running on loss or minimum profit, then it should just pay to the state a standard sum as regarded by the fiscal grill. But if the profit was to be high, then that company would pay the full tax profit of 16%.

So when the Romanian Government introduced this tax, each company would have to pay 500 Euro every year, regardless their profit situation.

This law lead to the bankruptcy of more than 100 thousand small and medium companies, leaving only the large companies to manage with the new tax. It meant a high increase in the social inequality and quickly became a serious problem for the Romanian economy. In the end, more than a quarter of all small and medium companies working in Romania went in bankruptcy due to this tax. Another result was that more than 200 thousand employees lost their jobs because of this tax. The tax was considered a fiscal disaster and was in the end abolished after two years of working in the national economy. Although it only lasted for two years, the destruction of small and medium companies only meant that the large companies could benefit from the tax, while the indicators like those presented in the previous chapter show us that the poverty raised and social inequality grew in the reference period.

In the year 2013, another version of the tax is going to be applied by the government and specialists are worried of the effects that this tax will once again have. A total number of 400 thousand companies are estimated to be affected by this tax and things will surely repeat themselves once more.

The tax is expected to become active starting with February 2013. Besides the negative effects like the fiscal evasion, the tax will have a negative impact on social inequality, just like in the past, by enhancing even more the difference between the poor and rich classes. This will happen because the most affected will be the middle class, e.g. the workers and owners of small and medium companies. The unemployment rate is expected to increase and a large number of companies will probably go in bankruptcy once again.

Another tax that could have a negative impact on social inequality is the tax on the small and medium enterprises (IMM). Rather than establishing a standard amount of money like the Lump Sum Tax, this tax will require small and medium companies to pay an income tax of 3%. Further on, the government has lowered the limit for incomes for small and medium companies, from 100 thousand Euro to 65 thousand Euro, and all companies under this threshold will have to pay the 3% tax on the income they make. This will most likely spell even more problems for small and medium companies.

In conclusion, it seems that the government, rather than helping the Romanian state from reducing poverty and decreasing social inequality, will only increase the social disequilibria, pushing Romania in the top of the list of EU countries with high economic and social difficulties.

Conclusions

This paper raises more questions than answers. As globalization is an irreversible process, effective solutions to minimize the negative impact especially on the poor people must be advanced very soon. The paper has explained that the global economy may generate a spiral effect which could affect not only the developing countries, but also the developed countries.

The empirical evidence shows that in the industrialized countries the income inequality has risen, with skilled workers' incomes rising faster than compensation for the low-skilled labour. At a global level, both the within and between inequality have increased, despite of the technological progress and economic growth in the last decades. This evidence claims for increasing the state intervention by social protection programs. Therefore, the addition cost of the social protection programs could offset the marginal benefits resulting from the participation at the global economy.

Rather than applying taxes like the Romanian Lump Sum Tax, the governments should try to apply social measures that could increase the economic process and develop a stronger and stable middle class. Examples of good measures could be in our opinions the decreasing of taxes for workers hired from the unemployed group or the setting of a higher threshold for establishing in the case of the small and medium companies the income category or the income tax category to which they belong. The social impact that the fiscal taxes carry on the society should be better taken into consideration. Judging only the economic effects will only lead to a economic struggle in the end.

The most effective policies aimed to reduce the negative effects of globalisation are those which target first the increasing gap between poor and rich. Reducing inequality between and within nations is important because this cause the polarisation of society and the weakening of the middle class. People who shifted from the middle class into the poor class are not able to protect themselves against the adverse effects of the global economy. The empowerment of poor seems to be in this light the only protection of the developing countries facing globalisation.

Overall, the most disadvantaged people within the globalisation process are the poor from everywhere. They miss the capabilities and functionalities (Sen, 1993) to escape from poverty. The empowerment of poor is in this light the only solution to help them skipping from this social category into the middle class. We came at the conclusion that the developed countries are the only actors who might reverse this spiral of precariousness induced by globalisation, by empowering the poor people and the poor countries to decide and to action

according to their own interests. But this is possible only by changing the power systems and power relationships in the world.

Notes:

⁽¹⁾ This figure was calculated as a weighted average of national results.

⁽²⁾ The at-risk-of-poverty rate is defined as the share of people with an equivalised disposable income that is below the at-risk-of-poverty threshold (expressed in purchasing power standards –PPS) set at 60% of the national median equivalised disposable income.

⁽³⁾ The material deprivation rate measures the number of people who cannot afford to pay for at least three from a list of nine items, while those who lack four or more items are considered to be severely deprived.

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SESSION VI
BANKING

BRIDGE BANK AND BAD BANK TOOLS IN EU. AN EFFICIENCY ASSESSMENT CASE STUDY

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Abstract. *The financial turmoil that disrupted the functioning of the banking systems across EU has revived the international debates related to developing proper mechanisms for the orderly recovery and resolution of failing banks. The paper provides an insight into the regulatory initiatives launched by the European Commission, the Financial Stability Board or the World Bank and outlines the current status of the national options related to a particular resolution tool. The second part of the paper empirically assesses the extent to which the bad bank schemes implemented since the end of 2009 in two EU countries (Ireland and Germany) achieved their purpose, of running the wind-up activity efficiently, by employing a non-parametric technique.*

Keywords: banking system; bridge bank; bad bank; efficiency; data envelopment analysis.

JEL Classification: C14, G28.

REL Classification: 10J, 11C, 20H.

Introduction

The global financial crisis not only has disrupted the functioning of financial system and real economy, but also it has been at the core of an ample process of institutional reconfiguration at EU level. Also, the crisis brought into attention the rapid pace spread of internal, national vulnerabilities across borders, as a result of strong interconnections between financial institutions and markets in the Union. The insolvency of several financial institutions overlapped on the limited powers national authorities had in order to prevent banks failure or to restore their essential functions, by putting in place adequate restructuring tools. As a consequence, governments had to intervene promptly to bail out failing banks, using public funds. This is why national and international institutions launched a stringent call to strengthen the harmonization of regulations at EU level, in order to solve future episodes of national or cross border bank distress.

The European Commission Communication (2010) outlined the need for a European regulatory framework designed for the recovery and resolution of failing banks, to prevent that the burden of bailing out future failing banks be transferred to taxpayers. The envisaged legislative framework has to become a credible alternative instead of government support and to give supervisory authorities extended powers in order to exert a corrective intervention in the banking business (requests for designing recovery or resolution plans, troubled bank top management's replacement, and resolution tools).

Until the onset of the global financial crisis, resolution tools such as the takeover of a failing bank by a sound, viable one, or the implementation of an orderly bank resolution mechanism by transferring all or part of its core activity to a temporary bridge bank or bad bank had a national dimension and coverage, being ruled exclusively by internal laws. Therefore, the European Commission intends to fill the gap, by providing a common,

harmonized EU regulatory toolkit, so as to allow national authorities to manage the banks failures, in an efficient and costless manner, from the standpoint of financial stability, state budget and taxpayers' fiscal burden.

Another similar initiative in this regard belongs to the Financial Stability Board (2011), which emphasizes the need to develop comprehensive recovery and resolution plans, designed for global systemically important financial institutions.

The World Bank's concerns in terms of banking resolution have resulted in the development of guides that define the implementation of such mechanisms for problem banks (McGuire, 2011). These mechanisms depend on the jurisdiction and the legal framework in each country, but in general, the methods used are the same, namely:

i) Liquidation/Closing consists of the withdrawal of the insolvent institution's operating license, sale of assets and payment to depositors and creditors;

ii) Conservatorship/Temporary Administration: it replaces bank management and implements a conservation plan. The rights of shareholders may be temporarily restricted. The Temporary Administration aim is restructuring the banks' operations and improvement of their financial situation, to prepare them for sale.

iii) Purchase and Assumption (P & A) consists in transferring the operations of a troubled bank to a healthy bank. The process involves: the withdrawal of the operating license, the liquidation of shareholders rights in the bank, taking deposits and good quality assets by the resolution authority. If the government intervenes to fund a bank in order to take over the failing bank's assets and deposits, the former bank is known as bridge bank.

Concepts as bridge bank, bad bank or Asset Management Company are not new, several European countries having resorted to them as reliable asset relief tools at the beginning of the 90s (see the European Commission Communication in February 2009 for a detailed presentation of bad bank experiences in Europe). The new feature the European Commission intends to assign to traditional resolution tools consists in giving national authorities common mandates for coordination and cooperation in dealing with failing banks that operate in more than one Member State. In addition, resolution tools should be adapted, so as to be applied to banks deemed too big or too interconnected to fail.

The crisis management framework, proposed by the European Commission, includes three classes of measures: preparatory and preventive measures; early-intervention of the supervisory authority and final resolution.

In the final resolution option, the European Commission includes the following methods:

- a) The full sale of the entire business or only a fraction of the credit institution's activity, without the consent of the shareholders;
- b) The bridge bank option, which involves the transfer of part or all business lines of an insolvent bank to a special created institution;
- c) The separation of toxic assets and their transfer to a bad bank institution.

In various combinations, the authorities in each country may apply the measures agreed in the bank resolution program. However, applying these measures may interfere with the rights of shareholders and, in part, to the rights of creditors.

According to a recent EC communication, any resolution measure should be subordinated to the fulfillment of the following desiderates: safeguard the ongoing, proper functioning of core banking business; protect depositors and client assets; avoid the shift of bailing out costs to taxpayers; minimize risks to financial stability and avoid the unnecessary destruction of value (European Commission, 2012).

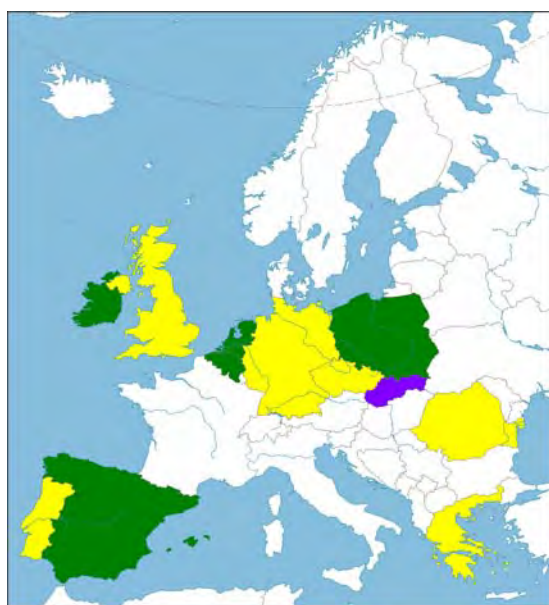
However, this procedure is subject to competition distortions, because, by allowing the restructuring of insolvent banks, it favors the beneficiaries of assistance, giving them an unfair advantage over the banks that successfully survived the financial crisis, as a result of having implemented a healthier, prudent business model.

The paper aims to give an insight on the current status of the crisis management framework, with a particular focus on the resolution tools meant to be applied in the case of failing or likely to fail banks. The first part of the article makes a brief review of the features of two resolution tools and emphasizes the EU Member States' national option for a particular type of resolution tool. The second part consists of an empirical case study, based on the Irish and German experience with their troubled banks' resolution option. The last section concludes.

1. Orderly resolution tools – a EU cross country perspective

At present there is no harmonization of the mechanisms and tools for managing insolvent credit institutions at European Union level. Some Member States have already adopted changes in their regulations, to allow the use of specific defined mechanisms for dealing with insolvent credit institutions, meanwhile others have expressed their intention of introducing such tools (Figure 1). However, all these are unilateral legislative changes, characterized by the heterogeneity of their legal components: the authority which is designated to fulfill the resolution tasks (for example the central bank, the supervisory authority, the deposit guarantee scheme, the ministry of finance), the specific powers assigned to the resolution authority, the design of recovery and resolution plans, the financial institutions that make the scope of the regulation (banks, investment firms, insurance companies, holding companies etc).

As the EC Directive proposal (2012a) stresses, “national differences in the conditions, powers and processes for the resolution of credit institutions are likely to constitute barriers to the smooth operation of the internal market and hinder cooperation between national authorities when dealing with failing cross-border banking groups”.



Source: the authors.

Figure 1. Snapshot of measures related on bank resolution tools, adopted or under discussion in some Member States

Legend	Countries
	Countries supporting bridge bank regulations: Germany, UK, Romania, Greece, Portugal, Czech Republic
	Countries supporting bad bank regulations: Slovenia
	Countries that promote both bridge bank and bad bank regulations: Poland, Spain, Netherlands, Belgium, Ireland

In the following it has been considered two instruments used by national authorities in the ultimate case of dealing with insolvent banks, with the stated goal of restructuring banks' core business lines, so as to preserve their basic functions and not put at risk the confidence in financial markets and financial stability.

A *bridge bank* is a newly, temporary created institution designed to maintain the core business lines of a bank, until a viable, permanent solution will be adopted. It is a particular case of the purchase and assumption approach (P&A), consisting in the transfer of all or part of the assets and liabilities of a failing bank, which allows the bridge bank to preserve and prevent the erosion of the initial bank's value.

The bridge bank institution first appeared in the Federal Deposit Insurance Corporation (FDIC) deposit guarantee scheme legislation in the United States, in 1987, when it was launched the Competitive Equality Banking Act. According to FDIC, the bridge bank is the best solution in terms of cost-effectiveness, to preserve the banking services offered to customers by banks in difficulty, and to give authorities enough time to solve the situation.

The main purpose of this resolution method is to fill the gap between a troubled, insolvent bank which can no longer rely on the financial support of its major shareholder and its acquisition by a private investor. This type of transaction is not meant to save a bank without a definite real value; in this particular case the best option is bank closure. In other countries the bridge bank tool is reserved only to systemic banks. During the period of time a bridge bank is operational (which may vary from one to five years, according to national regulations), it has the mandate to act as an open deposit-taking institution. This prerogative means that it has to conduct the banking business in a conservative manner, so as to preserve the franchise value of the failed bank (McGuire, 2011) and to manage appropriately the banking and trading book in order to increase assets value (applying techniques for overdue loans' restructuring, managing financial assets held for trading or available for sale) and to maintain the confidence and satisfaction of existing customers. Also, the bridge bank will have to comply to all the prudential regulations, in terms of capital adequacy with risks, requirements of liquidity and solvency, leverage ratio etc.

From a technical standpoint, the functioning of the bridge bank is related to several issues:

- the transfer of assets and liabilities, which requires a period of 1-2 months for its completion. It must be mentioned that only the good quality un-risky assets and the insured or guaranteed deposits will be transferred;
- the bridge bank operations: it returns customers deposits on demand and collects payments made on behalf of customers loans, using the failed bank's employees;
- the closure of the bridge bank: the authority that established the bridge bank dissolves it when the acquisition or liquidation of bankrupt bank completes.

The bridge bank mechanism is used as a tool for protecting deposits and maintaining trust in the failed bank resolution process.

The functioning of the bridge bank has to be protected from the creditors' claims. As Bocuzzi (2011) stated, "the shareholders and creditors of the affected bank shouldn't have any right over the bridge bank, but only on the residual value realized from the sale of the bridge bank, after the payment of all other creditors and expenses connected to the crisis management".

Gonenc (2009) outlines that the bridge bank procedure can be assimilated with a temporary nationalization, but questions whether a government sponsored institution can achieve a good performance.

The *bad bank* alternative allows the cleaning of the troubled banks balance sheets, preserves the medium term financial stability and minimizes the banking crises effects in the entire economy. In principle, the good bank/bad bank separation allows the discrimination between sound assets and impaired, non-performing ones, and the transfer of the latter to a special created entity (the bad bank or asset management company - AMC), in order to manage them appropriately. In practice, there are two methods for managing impaired assets: banks chose to directly manage their troubled assets or to transfer them to bad banks or asset management companies. As McGuire (2011) notes, a bank should be more suited to manage impaired assets than an AMC because of the "bank's knowledge of the borrower and the

ownership of loan files and collateral. However, successful workout of loans requires specialized skills and resources that may not be present at an individual bank, so in some circumstances AMC's may be better at disposing of troubled assets. Empirical studies indicate that AMC's are most successful when they have narrow mandates".

The European Commission (2009) proposes another approach for managing impaired assets: creating a bad bank for each distressed bank or establishing a national coverage institution (aggregator bank) meant to purchase the impaired assets from the entire banking system or from a group of banks.

Beck, Coyle, Dewatripont, Freixas and Seabright (2010) draw attention that, in the process of transferring troubled assets and part of liabilities, good assets need to be separated from impaired ones according to the valuation uncertainty principle, meanwhile liabilities will be divided according to seniority principle: the junior ones will be transferred to the bad bank and the senior ones will remain in the balance sheet of the good bank. In addition, they propose a better classification, to make distinction between good banks and uncertain banks.

However, the EC Directive proposal (2012a) suggests that this asset separation tool should be employed only in conjunction with another resolution tool, so as to minimize competitive distortions among sound banks and rescued ones and risks of moral hazard.

To decide on the opportunity and feasibility of setting up a bad bank, the authorities must answer the following questions (McKinsey, 2009): in what circumstances the authorities decide to set up a bad bank scheme? Which design to choose for the scheme? What is the cost supported by government?

In general, the success of a bad bank scheme depends on a number of crucial factors: the amplitude of government's financial involvement; the identification of proper means and tools for separating toxic assets from sound ones and consolidating the banking business; changes in banking regulation.

Before adopting the bad bank scheme, authorities must determine whether the financing of the scheme will impose additional costs to taxpayers.

In supporting the bad bank opportunity, the authors Downey, del Din, Haas, Lacaze (2009) identify a number of features of this scheme: the establishment of one or more bad bank institutions to take off toxic assets from participating banks; transparency, by publishing the list of troubled assets and their real value; the sale to the bad bank at a discount price from the face value; providing state assistance through public funds, which can take different forms from capital injection in the bad bank institution, loan facilities to guarantees and swaps or government bonds; payment of compensations by banks participating in the scheme.

Recent analyses use the concept of the new wave of bad banks. If during previous banking crises, bad bank resolution was limited only at the level of a single bank, during the current financial crisis, the phenomenon of occurrence of these institutions has widespread in Europe, becoming more complex and depicting some differences from previous episodes. These differences consist in larger portfolios of assets, generally between 30 and 100 billion dollars, the assets transferred to the bad bank show a broader range of coverage (mortgage loans, structured assets and bonds, loan portfolios that have a high rate of default, regardless of destination or any other financial asset whose removal from the bank balance sheet would contribute to deleveraging), incentives to create bad bank entities with national coverage (national bad-bank schemes).

As documented by McKinsey (2012), the national bad banks plans implemented until present in Europe are the UK state guarantee scheme, the Ireland program named NAMA, the Germany one and the Switzerland StabFund.

If the government decides to develop a comprehensive, national bad bank scheme, its design in terms of bank coverage is influenced by four factors (McKinsey, 2012): the degree of banking consolidation and the interconnectedness nature of banking activity; the size of the banking system as a share in country's GDP; government's financial capacity to support this

scheme; the political will for implementing such a rescue tool, which requires also a change in the existing regulation.

To analyze the appropriateness of certain types of banking resolution tools, their estimated costs should be compared with the costs of other alternatives: the immediate sale of a bank without the bridge bank mechanism or deposit reimbursement. In practice, the World Bank has developed The Least Cost Model which can be used by supervisors to determine the relative cost of different resolution options. The cost associated with these options can be calculated using various methods for valuing assets and guarantee schemes. The most relevant use of this model is found at the FDIC, which estimates costs using the following factors: the cost of operating the bridge bank, the market value and attractiveness of bridge bank assets, the price difference if the bank is sold, the treatment of uninsured deposits. For example, if FDIC initial analysis indicates loss when transferring uninsured deposits to the bridge bank, there will be transferred only the insured ones.

2. Performance assessment: methodology and empirical results

In the following, we performed an empirical case study, focusing on the troubled banks' resolution options adopted by Ireland and Germany. As McKinsey (2012) emphasizes, the final, operational form a bad bank may take is a nation coverage scheme, as it is the case for Ireland, or a bad bank set up for the wind-up of impaired portfolios of assets owned by a specific financial institution. The latter situation corresponds to Germany, which has established a bad bank for WestLB (called Erste Abwicklungsanstalt – EAA) and another one for Hypo Real Estate (called FMS Wertmanagement).

a) *The German resolution option.* The Erste Abwicklungsanstalt (EAA) has been created on 11 December 2009, by the Financial Market Stabilisation Authority (FMSA), as a result of WestLB's shareholders' decision to transfer a fraction of its portfolio to a winding up institution. The mission of EAA consists of winding up a broad, risky portfolio, with a nominal value of € 77.5 billion, comprising international syndicated and bilateral loans, government, corporate and bank bonds, structured securities, personal loans, while minimizing risk. The winding up strategy consists of three components: the sale of securities and loans prior to their maturity, the holding until the maturity and the restructuring option. According to the first annual report, released at end 2010, in the next four years the EAA's aim is to diminish by half the book value of its assets portfolio. The EAA has the right to fully dispose of the assets it acquired, while WestLB will refocus on its core activity. In order to raise funding for its winding up activities, the institution issues bonds on the capital markets and enters into money market, securities repurchase and securities lending transactions.

On 8 July 2010 the Financial Market Stabilisation Authority (FMSA) has founded a second winding up institution, called FMS Wertmanagement, with the purpose of managing a portfolio of impaired commercial real estate loans, bonds issued by EU member states' governments, derivatives and structured securities transferred from the Hypo Real Estate Group. It has the mandate to liquidate the portfolio in a manner that minimizes losses and maximizes assets' value. Also, it is expected to conduct its activity as an efficient institution, by seizing all opportunities for obtaining income. The first annual report released at end 2010 stated the management board vision, regarding the successfully winding up of the entire portfolio, estimated at a nominal value of € 173 billion, over a period of ten years. At the end of this time horizon, any remaining asset will be sold at its book value.

b) *The Irish resolution option.* The Irish Government established, on 7th April 2009, a state asset management agency, namely the National Asset Management Agency (NAMA), which is expected to operate over a 7-10 year horizon. It is a nationwide bad bank scheme, meant to cover several distressed Irish systemic banks, allowing them to clean up their balance sheets, by removing a certain type of homogenous assets (real estate loans).

It was an additional measure requested by the Minister of Finance, in order to stabilize and strengthen the Irish banking system, because the recapitalization through public funds

proved to be unlikely for the goal of improving bank solvency, as banks preferred to use the capital buffer for provisioning against current and future asset impairment.

The Agency's operational aim is to remove impaired or potentially impaired property related loans (land and development loans), together with the derivative positions (mainly interest rate swaps) attached to them, from systemic importance banks' balance sheets and to replace them by Government bonds. From the stand point of NAMA, it will obtain control power over the loans acquired, being able to negotiate directly with the borrower (regular analysis of business plans, assessment of borrower creditworthiness). Also, NAMA will have to pay a coupon for the Government bonds issued, at a floating interest rate, and will have to collect income from the acquired loan portfolios, at a floating interest rate plus a profit margin.

From participant banks' perspective, the balance sheet structure will be cleaned and modified, the impaired loans being replaced by high quality assets, such as Government bonds. This shift will have the effect that banks will be able to request financing from Central Bank or market counterparties, as they now possess good collateral, and lending towards nonfinancial customers will be revived.

According to the NAMA *modus operandi* (2009), the agency will have two distinct business lines: the loan management division, meant to manage the acquired loans and the asset management division, to manage real assets acquired post enforcement.

The goal of our study is to assess to what extent the three bad bank entities fulfilled their purpose of conducting the winding up activity in an efficient manner, while acting as an asset relief tool. It should be mentioned that the bad banks may follow, also, a focus on profitability, as it had been established by the Swedish regulators in the early 90s, when it was decided to restructure several impaired banks by means of the good bank-bad bank model. The strategy of acting as an aggressive equity investor, which follows profit maximization, had been perceived as being the only one appropriate for recovering at least part of the taxpayers' contribution to bailing failing banks (Gonenc, 2009).

To this end, we have employed the Data Envelopment Analysis non-parametric technique, a widely used tool devoted to performance evaluation, in order to reveal the relative operational efficiency achieved by the agency. DEA is a linear programming technique that builds a best practice frontier and, with the aid of several distance measures, computes a rating or efficiency score. An advantage of employing DEA consists in the possibility for a simultaneously computation of the three bad banks' efficiency scores, in each year considered.

We have considered two scenarios: a traditional approach in which input and output variables are clearly defined and embedded into the mathematical model and a second one, consisting in designing DEA models without explicit input variables (DEA-WEI models).

The first step of the traditional approach is to define the input and output variables in order to measure bad banks' efficiency. In the literature devoted to this topic there isn't a consensus relative to the optimal specification of input and output variables. As Pawlowska (2005) observed, it can be identified five approaches to the input-output specification: the production approach (PA), the intermediation approach (IA), the asset approach (AA), the user cost approach (UCA) and the value added approach (VAA).

For the purpose of our study, we have chosen two approaches as being the most suitable for assessing the viability of bad banks' business plan: the *production approach*, which treats financial institutions as producers of financial assets, usually taking the form of deposit accounts and credits granted to nonfinancial sector, and the *operating approach* which mainly considers the functioning of a financial institution from the cost/revenues perspective. In the operating approach we used as inputs the expenses, while for outputs we took the income obtained. For the production approach the input variable used was debt securities issued, while the loans acquired were an output of the model. Therefore, in this study, we have developed the following input-output specification (Table 1):

Table 1

DEA models configuration

Model 1	INPUT VARIABLE – expenditure OUTPUT VARIABLE - income
Model 2	INPUT VARIABLE – debt securities issued OUTPUT VARIABLE – loans acquired

Expenditure variable comprises interest expenses on debt securities issued, on derivatives or on bad banks' borrowings on money markets and agency costs related to fees payable to firms carrying out loan and derivatives valuation, property valuation or audit. The item *loan* includes land and development loans and investment property loans acquired by bad banks from participating institutions. *Debt securities in issue* consist of debt instruments issued, in compensation of the loan portfolio purchased from participating institutions. *Income* variable comprises fees income, interest income related to loans and derivative financial instruments acquired from participating institutions, interest earned on cash, short-term deposits, exchequer notes and commercial paper held by the bad banks and other income.

The second scenario, also known as *DEA-WEI (without explicit inputs) models*, is employed in the performance assessment analyses where input variables are not explicitly defined. We have taken as starting point the study of Lovell, Pastor (1997), which emphasize a particular case, in which the input variable is constant over time and equal to unity.

The rationale for the second approach lies in the mere object of activity of the bad banks, namely the management of impaired, risky assets. We believe that outputs obtained haven't to be correlated with initial inputs, as the bad banks cannot choose the quality of the inputs, they are predetermined by law: likely to default or impaired, toxic assets from banks' balance sheets. In addition, main part of income obtained is linked to the financial performance of the loan portfolio purchased.

The data has been collected from bad banks' balance sheets and income statements and consist of annual data for the period 2010-2012.

The models are single input – single output because of data sample size constraint. The two DEA models have been tested under the assumption of output oriented models, which assumes that with a given amount of inputs it could be produced the highest amount of outputs. Relative to the structure of the DEA models' returns to scale, we chose the constant returns to scale (CRS) option, which allows outputs to increase relative proportionally with the increase of inputs amount.

Table 2

Results obtained under the traditional scenario

Decision making unit	Country	Efficiency scores (%)	
		Model 1	Model 2
NAMA, year 2010	Ireland	678.63	100.00
NAMA, year 2011	Ireland	100.00	101.22
NAMA, year 2012	Ireland	503.46	103.43
Erste Abwicklungsanstalt, year 2010	Germany	293.00	109.31
Erste Abwicklungsanstalt, year 2011	Germany	300.67	111.23
FMS Wertmanagement, year 2010	Germany	224.40	118.42
FMS Wertmanagement, year 2011	Germany	246.63	121.90

Source: authors' computation, through EMS software.

According to DEA terminology, an entity's activity is termed efficient or Pareto optimum if its efficiency score is equal to one (100%); on the contrary, it is inefficient.

The results obtained in the two model specifications point mixed findings. The three bad banks performed best under model 2 specification, the relative efficiency scores lying closer to the efficient frontier. It is a sign of a certain balance over the whole time horizon considered, between the amount of debt securities issued and the loans acquired from participating banks. All the three bad bank institutions succeeded to refinance themselves mainly by issuing debt instruments with medium and long-term maturities, so as to carry out their tasks. The deterioration of efficiency scores recorded a slight increase for each of the three bad banks, a trend that corresponds to lower amounts of loans purchased than debt instruments issued.

Under model 1 specification, only NAMA performed efficiently in the second year from the beginning of its activity. It means that, from the standpoint of the expenses generated by bad banks' current activity and the income obtained, there is a clear and persistent imbalance, signaling a state of inefficiency. The results recorded are in line with the decrease of amounts recovered from property sales (as a result of a fall in real estate market value) or from debtor repayment of principal and interest over the time period under analysis.

For the second scenario, we have constructed DEA models in which the input variable was assigned the value 1, and the output variables were represented by loans acquired and income, as in the previous traditional scenario.

Table 3

Results obtained under the second scenario

Decision making unit	Country	Efficiency scores (%)	
		Model 1: output variable is loans acquired	Model 2: output variable is income
NAMA, year 2010	Ireland	7542.78	7120.45
NAMA, year 2011	Ireland	332.10	452.87
NAMA, year 2012	Ireland	222.72	519.02
Erste Abwicklungsanstalt, year 2010	Germany	102.23	148.42
Erste Abwicklungsanstalt, year 2011	Germany	105.91	144.27
FMS Wertmanagement, year 2010	Germany	108.02	100.00
FMS Wertmanagement, year 2011	Germany	111.72	117.54

Source: authors' computation, through EMS software.

Neither under this approach the functioning of bad banks complies with the best practice frontier, but it can be noticed that the state of inefficiency is lower for the two bad banks in Germany, that have the mission to wind up the portfolio of assets transferred from only a financial institution, as opposed to the Irish national coverage scheme meant to clean up the balance sheets of six systemic banks.

Conclusions

The global dimension of the debates related to reforming the financial sector regulations, with a focus on crisis management framework, both nationally and cross-border is meant to strengthen the financial sector stability and resilience to shocks and also, to give national authorities extended powers and asset relief tools regarding the resolution of distressed banks, so that to avoid future reliance on taxpayers' money.

Although there is the agreement that it cannot be found a resolution solution fit for all countries, the common denominator consists in developing uniform guidelines to be followed by each country, according to its particular needs. Several questions still remain: should be developed different resolution options, to discriminate between small or medium sized banks versus systemically important ones? What about the resolution mechanisms for cross-border

banking groups or global systemic financial institutions? In which circumstances a given crisis management tool or plan is more appropriate to be used?

Our case study doesn't provide evidence of sustained efficiency in conducting the activity of the Irish national bad bank scheme, nor in the case of German bad banks. Ultimately, the bad bank resolution tool's utility can be judged not in terms of profitability obtained by managing impaired or likely to impair assets, but, more importantly, in terms of preserving confidence in the sound and proper functioning of the banking system and mitigating risks to financial stability.

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FOREIGN BANKS APPETITE FOR LIQUIDITY RISK AND THE BANKING SYSTEM STABILITY. CASE STUDY FOR ROMANIA

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Abstract. *Foreign banks own a large share of Romanian banking system and proved to be a direct contagion channel for external financial turbulences into the Romanian financial system since September 2008. From the financial stability point of view, liquidity risk emerged as a major source of turmoil for the banking system, being able to cause disruptions in lending activity. Empirical evidence points out a significant impact of credit growth and government fiscal position on liquidity risk management for foreign banks, while term deposits improve banking system resilience.*

Keywords: banking sector; liquidity; risk management; contagion; financial stability.

JEL Classification: G21, G32, G01.

REL Classification: 11C.

1. Introduction

Romanian banking system followed a privatization process prior and after European Union ascension in 2007 and European financial groups reached to own a large share of the local banking sector. That led to a more resilient domestic banking sector, but also to a more sensitive banking system to external factors. Because the economic convergence to European Union standards is taking place with a relative high velocity, the required capital must be imported, taking into account the still low saving ratio in Romania. External funding has been a major resource for the Romanian banking system that supported the lending boom before the onset of global financial crisis in September 2008.

The strong capital inflows before 2008 were channelled mainly to lending activity, therefore global financial crisis found the Romanian banking system with a good, but not strong liquidity position. The government securities holdings were low, while funding through term deposits was similar to that of demand deposits. The liquidity injected by the parent banks was short term, but the risk of funding reversal was low to moderate because of the capital ownership that made the parent banks concerned about their subsidiaries liquidity position.

This study brings innovation in the field of liquidity risk analysis to Romanian banking system because adapts an international methodology widely accepted to local bank particularities. A robust toolkit for measuring liquidity risk in the banking system, as well as the ability to provide feasible solutions to decrease the negative impact of a liquidity shock are of a high importance for the research in banking system stability.

2. Literature review

The liquidity risk is systemically important for the banking system. Banks are efficient liquidity providers to real sector if they perform both lending and deposit taking activities, following (Cornett et al., 2011, Gatev et al., 2006, Gatev, Strahan, 2006, Chang, Lin, 2005. Moreover, liquidity risk influence banks profitability and capitalization and determine banks lending activities, as indicated by (Kunt, Huizinga, 2010, Martin, McAndrews, 2010, Agenor, El Anynaoui, 2010, Ivashina, Scharfstein, 2010, King, 2010). Other studies, like (Cetorelli,

Goldberg, 2011, Belke et al., 2010) are considering banks liquidity in respect with financial markets.

Aiyar (2011) observed that foreign banks diminished lending activity during international financial crisis in a more pronounced way compare to the local banks, thus impacting the real economy. Having strong linkages to parent banks through funding channel, foreign banks preferred to reimburse the credit lines to the parent banks when financial markets became unstable.

The impact of foreign capital on the banking systems from emerging Europe is analyzed by Dinger (2009). The author notes that foreign banks have stronger liquidity position than local banks during periods of financial market distress, acting as a stability factor for the emerging banking systems. Detragiache, Gupta (2004) assessed the behaviour of Malaysian banks during the Asian crisis (1997-1998). Empirical evidence points to a greater confidence of depositors in foreign banks, but credit risk exposure of foreign banks was as high as local banks. Beirn et al. (2009) observed contagion from developed capital markets to emerging ones, while Forbes, Rigobon (2002) concluded that correlation should be adjusted with the volatility in order to detect the “true” contagion when an external shock occurs. Other studies about emerging markets are elaborated by Mannasoo, Mazes (2009) and Haas, Lelyveld (2006).

In a study of bank failures caused by rapid deposits withdrawal Skeie (2008) concludes that the maturity mismatch between banks’ assets and liabilities is not sufficient to explain the liquidity crisis in the banking sector. Pokutta, Schmaltz (2010) examine how major banking groups optimize the liquidity allocation within the group: a single centre or multiple decentralized subsidiaries. For delayed access to liquidity, volatility in liquidity demand is crucial to organize liquidity centres.

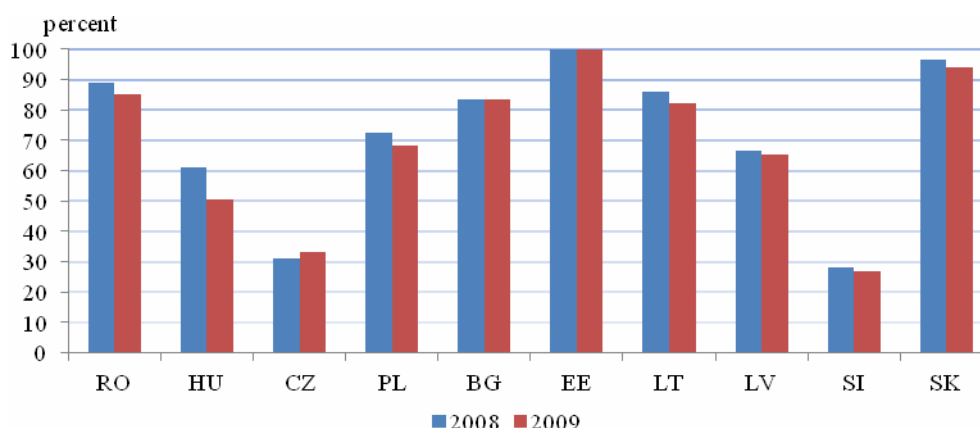
3. Data

The data used in this study consists in balance sheet and off-balance sheet information from Romanian banks, the share of foreign banks in the Romanian banking system, data from local and external money markets, the developments in EUR/RON exchange rate and macroeconomic indicators (GDP, government fiscal position (budget deficit/surplus)). Data sources are the websites of National Bank of Romania, Ministry of Finance, National Institute of Statistics, Deutsche Bundesbank and the European Central Bank.

Because the Romanian banks moved to IFRS accounting standards in January 2012, we used dummy variable to correct possible changes in balance sheet items measurement. However, we expect only minor changes or even none in the indicators used in this analysis due to the IFRS implementation. The database includes quarterly data and covers the period January 2007 - September 2012.

4. Foreign banks in Eastern Europe

Dinger (2009) performed an assessment of banking systems in Central and Eastern Europe and observed some countries like Romania and Bulgaria were among the last in the region that have liberalized their capital account, while Estonia and Hungary allowed foreign capital to enter their financial systems years before. Notwithstanding, foreign banks were strongly present in Romania at the onset of international financial crisis, in 2008, after the European Union ascension speeded up the privatisation process (Figure 1).



Source: European Central Bank, EU Banking Sector Stability (September 2010).

Figure 1. The share of foreign banks in banking systems from emerging Europe at the onset of global financial crisis

The deleveraging process that is in progress since 2009 across Europe diminished the foreign capital share in the European emerging banking systems, but the decrease was not significant. The parent banks of foreign banks from several European emerging countries (including Romania), together with the central banks, international financial institutions (International Monetary Fund, World Bank, European Central Bank) and other European and national institutions signed an agreement called *Vienna Initiative* in 2009. The parent banks decided to maintain their exposure on host countries to prevent a regional crisis and to maintain the long term growth prospects for the region.

The structure of Romanian banking system by origin country of capital can be found in Table 1. Data are available for the end of first semester of 2012 and are relatively similar with the figures for 2008. The strong domination of foreign capital explains the development of liquidity indicators, before and after the Lehman Brothers failure in September 2008. We assess as significantly important the strong presence of foreign banks in Romanian banking system from the point of view of liquidity risk development.

Table 1

The structure of capital ownership in Romanian banking system by origin country (June 2012) (main countries)

Country	The capital share of total banking system (percent)	The share of total banking system assets (percent)
Greece	21.5	12.1
Austria	20.6	38.0
Holland	11.2	9.2
Hungary	4.6	1.5
France	4.3	13.4
Italy	4.8	2.5
Portugal	1.7	0.7
Romania	20.6	18.8

Source: National Bank of Romania, Financial Stability Report 2012.

The ratio of assets held by state owned banks and by local investors was below 20% at the end of the first semester of 2012, highlighting the significant exposure Romanian banking system has on external factors. Because the foreign capital is predominantly European, Romania is particularly sensitive to European financial crisis. Even if the worst of sovereign debt crisis in Greece and other European countries seems behind, financial tensions persists in

European financial markets and foreign capital is staying away from Romania and other emerging European countries for the moment. The Greek banks present in Romania are well capitalized; still the foreign investors assess the local banking system as risky because contagion is difficult to predict and control, even under the strict supervision performed by the central bank.

5. The theoretical model

The methodology considered in this study to model liquidity held by foreign banks was proposed by (Dinger, 2009), but instead of panel regressions we use aggregate figures and OLS and GMM estimations to identify the financial markets and macroeconomic influence on foreign banks strategy regarding liquidity management, as well as foreign banks ability to stabilize the banking sector through liquidity holdings.

Some adjustments have been made to Dinger (2009) methodology in order to accommodate it to the particular period of time considered for this analysis. While the current research is being run during a global financial crisis that emerged from the developed countries, Dinger (2009) referred to the financial crises of the 1990s in emerging European countries and the stability factor brought by foreign banks. Therefore, additional data from external financial markets are included in the empirical research and the final conclusions will consider also the broad international background. The developed countries became unstable and transmitted the imbalances to the emerging markets through the financial institutions established in emerging countries.

The model focuses on two main pillars: (i) analyze financial and macroeconomic factors that influence the behaviour of foreign owned banks in terms of liquidity management (Regression 1) and (ii) assess the ability of foreign banks to enhance banking system stability through liquidity management (Regression 2).

$$liquidity_t = \beta_0 + \beta_1 foreignbankassets_t + \beta_2 volrobor_t + \beta_3 creditgrowth_t + \beta_4 eurron_t + \beta_5 IFRS_t + \beta_6 X_t + \beta_7 voleuribor_t + u_t$$

(Regression 1)

and

$$volrobor_t = \beta_0 + \beta_1 liquidity_t + \beta_2 foreignbankassets_t + \beta_3 termdep_t + \beta_4 creditgrowth_t + \beta_5 eurron_t + \beta_6 X_t + \beta_7 voleuribor_t + v_t$$

(Regression 2)

where $X = [creditgdp, gdpgrowth, fiscalposition]$.

Liquidity refers to the share of liquid assets held by foreign banks (cash and securities), *foreignbankassets* equals the ratio of assets held by foreign banks to the total banking system assets, *volrobor* is the volatility of interest rate on Romanian money market, *credit growth* is the change in credit stock, *eurron* is the EUR/RON exchange rate, *IFRS* is a dummy variable, *voleuribor* is the volatility of interest rate on euro area money market and *termdep* divides term deposits to total deposit base in banking system. X is a set of variables related to the macroeconomic conditions, composed of the outstanding bank loans over GDP (*creditgdp*), the GDP growth rate (*gdpgrowth*) and deficit/surplus of the consolidated government budget (*fiscalposition*).

The model allows also for using lagged variables when the influence on foreign bank liquidity holdings and money market requires one or several months to embed all the new information, as macroeconomic factors, banks exposure to liquidity risk or external factors.

The volatility of money market interest rate in euro area – EURIBOR3M (*voleuribor*) detect if external contagion occurred from the European financial system to the Romanian one since September 2008.

A high share of credit stock is denominated in foreign currencies; therefore total credit depends on how domestic currency performs. A weaker currency involves an increase in

outstanding loans, while a currency appreciation leads to a lower credit stock, all else being equal. Consequently, the exchange rate variable *eurron* is used in Regression 1 to capture any impact of currency developments on total credit granted by the banking sector. Regarding Regression 2, the variable *eurron* should estimate the impact of exchange rate market on money market. National Bank of Romania adopted a managed float regime for the exchange rate. This mean that the central bank may step in if considers that domestic currency rate deviated from its fundamental value.

IFRS is a dummy variable inserted into the first regression of the model to adjust the results in case IFRS accounting standards would have an impact on banks balance sheet items. Romanian banks switched to IFRS accounting standards in January 2012 and changes in computing indicators are possible; nevertheless, the changes in the indicators used in this analysis are expected to be minor or none.

6. The results for Romanian banking sector

The inclusion of a large number of variables proposed by Dinger (2009) and considered also in this analysis increases the model efficiency. Foreign banks holdings of liquid asset depends on a large number of factors, as financial, economic, external, as well as the share of foreign banks in Romanian banking system. In the same time, in order for the model to capture the capacity of foreign banks to stabilize the domestic banking system (measured by volatility on money market), other variables that directly influence money market volatility should be included into the model.

Nevertheless, based on data from Romanian financial system and real economy, a correlation measure reveals strong linkages between some variables. A correlation above 0.5 or bellow -0.5 was found for the following pairs of regressors: (*gdpgrowth*, *voleuribor*), (*creditgrowth*, *eurron*) and (*creditgrowth*, *creditgdp*). Therefore the variables *gdpgrowth*, *eurron* and *creditgdp* are removed from the model when run estimations to prevent multicollinearity and bias results.

OLS estimation provides robust results under the assumption of normal distribution for error terms, but the normal distribution for residual is a very strong assumption, especially when the sample size is not large. On the other side, Soderbom (2009) observed that GMM estimation may be more efficient if heteroskedasticity occurs or is serial correlation in the error terms, although the weight matrix is defined arbitrary for the first step and that may lead to inference problems. Taking into account the high volatility in time series used for this study, specific for an emerging market, as well as the limited sample size, both OLS and GMM estimation are considered for empirical analysis.

The impact of financial and macroeconomic conditions on foreign banks behaviour in respect with their liquidity management can be observed in Table 2. A lower credit growth rate leads foreign banks to increase their liquid assets holdings, whereas the adjustments performed in fiscal position after the strong economic downturn in 2009 triggered lower growth outlook in short and medium run and increased foreign banks holdings of liquid assets. A positive sign for fiscal position coefficient with four lags obtained using OLS estimation indicates that on longer term high public deficit increases foreign banks liquidity risk aversions, but the statistic evidence is low.

A larger liquid assets portfolio can be also explained by the growing supply of government securities during the recession phase of economic cycle. The fact that foreign banks increase investments in liquid assets like government securities after the outburst of 2008 – 2009 global financial crisis instead of deleveraging sustains a positive long term outlook for the Romanian financial system.

Table 2

Estimation results for the Regression 1

The dependent variable: <i>liquidity</i> (the share of liquid assets held by foreign banks)				
	OLS		GMM	
Intercept	0.034585	[1.487273]	0.035606	[0.457563]
The share of foreign banks	-0.000678	[-0.581063]	0.028050	[0.809187]
Volatility of ROBOR3M	-0.297567**	[-2.121912]	-0.324524	[-0.355260]
Annual credit growth	-2.594485***	[-3.716438]	-5.130175*	[-1.795618]
Fiscal position/GDP (4 lags)	0.425713*	[1.678999]	-1.906268**	[-2.416732]
Volatility of EURIBOR3M	0.722564	[0.674909]	-3.734636	[-1.353702]
IFRS dummy	-0.037064	[-0.790223]		
Number of observations	65		63	
Durbin-Watson stat	2.220107		1.469768	
Breusch-Godfrey Serial Correlation LM Test (F-statistic/Probability)	1.373284/ 0.261821		-	
J-Statistic	-		0.015178	

Note: significance levels - 1% ***, 5% **, 10% *; in brackets are the values for t-Statistic.

The share of foreign bank assets slightly declined since the onset of global financial crisis; still no statistical influence on foreign banks holdings of liquid assets was detected. The negative sign for the domestic money market coefficient emphasizes the fact that banks adjust their balance sheets based on medium and long term prospects, whereas volatility on money market reacts quickly to liquidity injections of the central bank. National Bank of Romania stepped in and injected significant amount of liquidity through repo transactions, while the real economy recovery after the financial shock had been much slower.

Regarding foreign banks ability to stabilize the banking system, the model emphasizes a negative relationship between the liquid assets hold by foreign banks and the volatility of money market interest rate in Romania, although the statistical significance is not strong (Table 3). Foreign banks did not inject additional liquidity in the banking system after 2008 – 2009 financial crisis, but switched from lending activity to a more conservative investment strategy. Nevertheless, the increasing in foreign bank holdings of liquid assets improved banking system resilience.

Table 3

Estimation results for the Regression 2

The dependent variable: <i>volrobor</i> (volatility of money market interest rate in Romania)				
	OLS		GMM	
Intercept	0.103116***	[6.625281]	0.061781**	[2.091453]
Liquidity	-0.102375**	[-2.000687]	-0.134694	[-0.320723]
The share of foreign banks	0.001391	[1.304678]	0.004850	[0.415263]
The share of term deposits	0.088198	[1.361452]	-0.307304** (1 lag)	[-2.189710]
Annual credit growth	-1.377332**	[-2.397487]	-0.164612	[-0.051092]
Fiscal position/GDP	0.515828**	[2.082891]	-0.479155	[-0.550970]

The dependent variable: <i>volrobor</i> (volatility of money market interest rate in Romania)				
	OLS		GMM	
Volatility of EURIBOR3M	-2.173328** (2 lags)	[-2.377157]	1.195500	[0.651119]
Number of observations	67		63	
Durbin-Watson stat	1.822910		1.680711	
Breusch-Godfrey Serial Correlation LM Test (F-statistic/Probability)	0.361258/ 0.698356		-	
J-Statistic	-		4.02E-30	

Note: significance levels - 1% ***, 5% **, 10% *; in brackets are the values for t-Statistic.

Term deposits own the capacity to lower volatility on money market as GMM estimation reveals. The statistical significance is not a strong one, still a higher share of term deposits in total bank deposit base increase investors' confidence in the banking system and lower uncertainty (volatility) on money market. Moreover, a diminished credit growth rate signals liquidity problems for banks and consequently high volatility on money market.

Conclusions

The Romanian banking system had been severely hit by the 2008 – 2009 global financial crisis. Banks had to switch their business model from granting loans to preserve their stability and increase holdings of liquid assets. At the onset of global financial crisis foreign banks owned over 80% of Romanian banking system assets, following a major privatization process. The foreign banks have reduced lending activity since 2009 and made strong investments in liquid assets, mostly government securities, to protect themselves from possible funds withdrawal, but also to lower their credit risk exposure.

When the credit growth is low because either loan demand decreases or granting loans become a risky activity, foreign banks increase their government security holdings to protect themselves from liquidity outflows and to assure a stable return for their investments. Regarding the government policy, the abrupt fiscal adjustment performed after the strong economic decline in 2009 made foreign banks to increase their holdings of liquid assets because the banks expected the economic recovery to be sluggish.

The significant presence of the foreign banks in Romanian financial system improved the banking sector resilience. Foreign banks did not deleverage after the outburst of global financial crisis in 2008 - 2009, but maintained their exposure on Romania and switched from lending activity to a more conservative investment strategy as buying government securities.

When the banking system is financed through term deposits, volatility on the money market interest rates falls. The results are in line with the new global financial regulatory framework (Basel III), which encourages financial institutions to use more stable funds as term deposits rather than demand deposits and wholesale funding. Both demand deposits and wholesale funding are more volatile and expose banks to liquidity risk.

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FINANCIAL CONTAGION AND ITS TRANSMISSION CHANNELS BETWEEN PIIGS ECONOMIES

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Abstract. *This paper identifies the most important similarities between the four PIGS countries: Portugal, Italy, Greece and Spain, in terms of principle macroeconomic indicators in the current crisis. This article also treats the principle transmission channels of sovereign risk and implicitly the financial crises. These transmission channels are the following: increase in sovereign bond yields, critically budgetary position, banks' exposures toward PIIGS economies and other states banks' exposures to sovereign debt of the PIIGS states. Studying the transmission channels of sovereign risk, results that, the European Framework is under institutional reform, but it should be improved in terms of instruments which quantify financial stability and crises prevention.*

Keywords: financial contagion; public debt; financial stability; public deficit; exposure.

JEL Classification: E50, E60, E62, G01, H62.

REL Classification: 11C, 8J.

1. Introduction

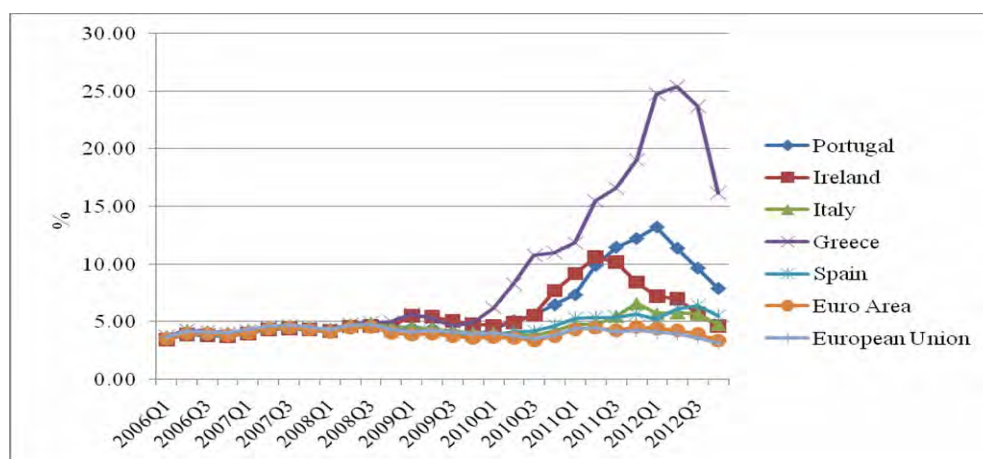
The financial crisis revealed the weaknesses tax of EU countries, bringing to the fore a concern for states known under the acronym PIIGS namely: Portugal, Italy, Ireland, Greece and Spain. The specific of these states is the critical fiscal position and its influence on financial stability framework. If we look at the crisis as a debt crisis, we can ignore Ireland, as Ireland's debt respected the convergence criteria, since the adoption of the Euro. Another criterion for differentiating Ireland from PIGS is the geographic coverage of the four countries (S, SW Europe), which facilitates trade development between them.

Sovereign credit risk management has a significant impact on financial stability. Given this, we propose in this paper to analyze the main channels of contagion, that contributed to the spread of sovereign credit risk to identify similarities and differences of PIGS - Ireland that characterize these states, direction of spreading it among states, possibility to stop the financial crisis and potential ways of quantifying the stability/financial instability.

According to the European Central Bank, to which we subscribe, there are various channels of contagion of sovereign credit risk.

2. Channels of contagion of sovereign credit risk

The first channel of contagion is deteriorating credit growth due to sovereign debt, which resulted in an increase in sovereign bond yields (ECB, 2010, 76 p.).

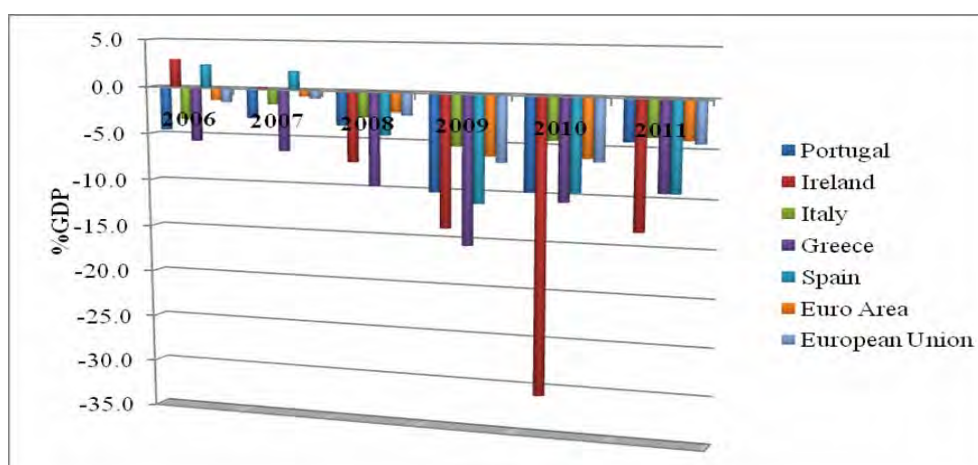


Source: <http://epp.eurostat.ec.europa.eu>

Figure 1. The evolution of long-term bond yields in the PIIGS (2006-2012)

As shown in Figure 1, performance bonds of Greece came in 2010 to 11.03, registering an increase of 73%. Spain's government bond yields increased moderately at start of the period 2006 to the third quarter of 2010. Portuguese bonds with a maturity of 30 years reached 5.57 percentage points, an increase of 44% from recent lows. At the end of 2011 and the beginning of 2012, we assist to an improvement in terms of PIIGS economies bond yields, despite the fact that in some cases it's still critical: Greece, Ireland and Portugal (Table 1, Appendix).

The second channel of contagion is the tax namely the *excessive deficits*, which increase long-term interest rates and risk premiums leading to an increase in the cost of borrowing.



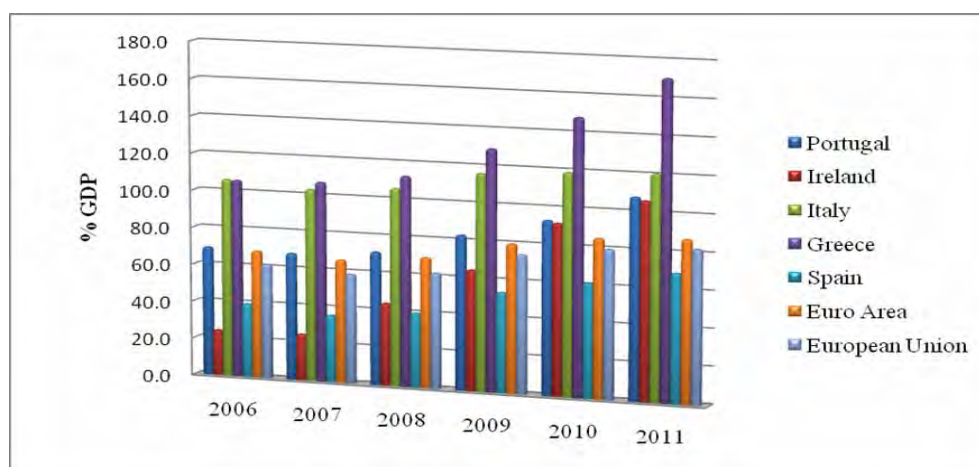
Source: <http://epp.eurostat.ec.europa.eu>

Figure 2. Evolution of the budget deficit in 2006-2011 (% in GDP)

Increased sovereign vulnerability, states can translate into chronic budget deficits, which resulted in higher levels of debt default with worsening growth potential. Countries with weak fiscal position reached record double-digit deficits, Greece in 2009 reached a deficit of 15.6% of GDP, followed by Ireland with a deficit of 13.9% of GDP and 11.2% of GDP Spain. In terms of share in GDP, the public deficit of Ireland recorded a worsening again in 2010, reaching over 35% of GDP, followed by a decrease in 2011 (Table 2, Appendix). In other analyzed economies, we can observe an improvement of public deficit, but without touching the 3% target imposed by Maastricht Treaty.

Italy with a lower budget deficit of 5.4% of GDP is facing a very high public debt. Excessive deficits indicate the trend of rapid growth and increased vulnerability to debt financial position of a state.

Another common feature of the four analyzed countries refer to high public debt respectively exceeds 100% of GDP in the second quarter of 2010 (148.3% of GDP Greece and Italy 119.2% of GDP, with such high tax risk government debt of Greece proves to be too large to be paid, one of the primary problems is that the international community lacks a framework to deal with such situations. In 2011, the succession of these five economies remains unchanged in terms of public debt. The higher public debt, bigger than 100% from GDP is presented by Greece (170.6% of GDP), Italy (120.7% of GDP), followed by Portugal (108.1% of GDP) and Ireland (106.4%) (Table 3, Appendix). Spain, Portugal faces a level high indebtedness of the private sector. Increase refinancing costs for the government means additional efforts and private sector debt refinancing, resulting spread fiscal problems in the private sector.



Source: <http://epp.eurostat.ec.europa.eu>

Figure 3. The evolution of public debt (% in GDP), 2006-2011

The rapid growth of public debt and budget balance deterioration may compromise financial stability as sovereign shocks are transmitted to the banking system that can help to spread across borders. In this key task of central government is to design medium-term fiscal consolidation strategy aimed at clear shots debt mitigation and emergency response in deteriorating public budget. Transmission of sovereign risk on local banking systems and its effects on the real economy is a threat to global financial stability.

The third channel of contagion could be through the banking system (Table 4, Appendix). Quantification of contamination can be achieved by analyzing *banks' exposures toward four PIGS economies* (Portugal, Italy, Greece and Spain). As a result of financing difficulties faced by Greece tend to differentiate markets in the euro area banks' exposure criterion to these economies (IMF-a, 2010, p. 4).

French and Dutch banks have significant exposures in the banking system in Spain. If not resume growth and not implementing fiscal consolidation measures, concerns will go on public finances of Spain. High interest rates in Spain can highlight the weaknesses of Spanish financial system. Savings banks, especially the "Cajas" face bad loans caused by deteriorating housing market and increased cost of funding. Concerns over the finances of a country may be transmitted to other financial systems. Exposures of banks in Belgium, Ireland and Netherlands to Italy and Spain are significant. Thus these states are extra vulnerable to worsening fiscal problems (Financial Stability Report, 2010, p. 23).

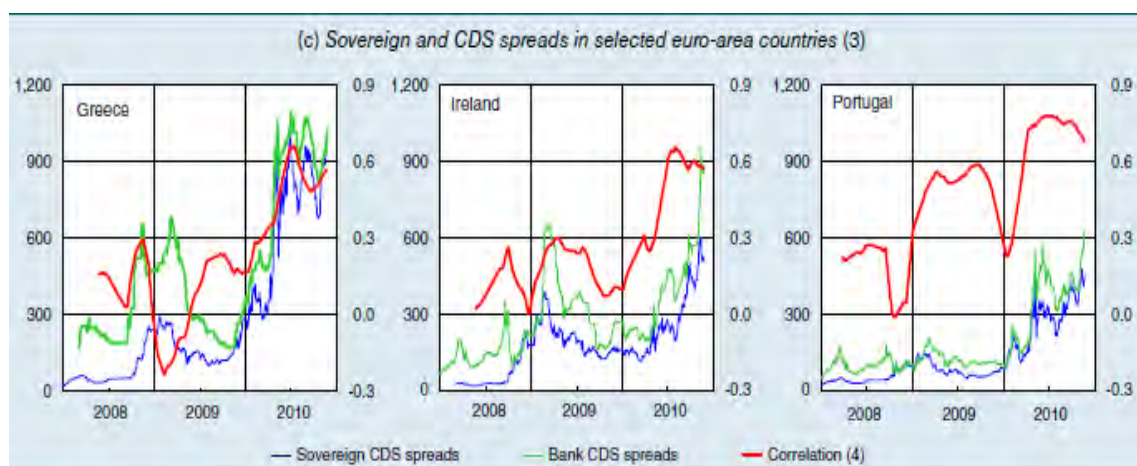
Table 1

Banks' exposure level to the PIIGS (% GDP) in 2010

	Greece	Ireland	Italy	Portugal	Spain	Total
France	0-5	0-5	15-20	0-5	5-10	33
Germany	0-5	5-10	5-10	0-5	5-10	21
Holand	0-5	0-5	10-15	0-5	15-20	31
Spain	0-5	0-5	0-5	5-10	-	10
Belgium	0-5	5-10	5-10	0-5	0-5	21
Ireland	0-5	-	15-20	0-5	10-15	40
Italy	0-5	0-5	-	0-5	0-5	3
Portugal	0-5	0-5	0-5	-	10-15	23
Greece	-	0-5	0-5	0-5	0-5	<1

Source: Financial Stability Report, “Financial unrest in Europe –possible consequences for financial stability in Sweden”, January 2010, p. 23.

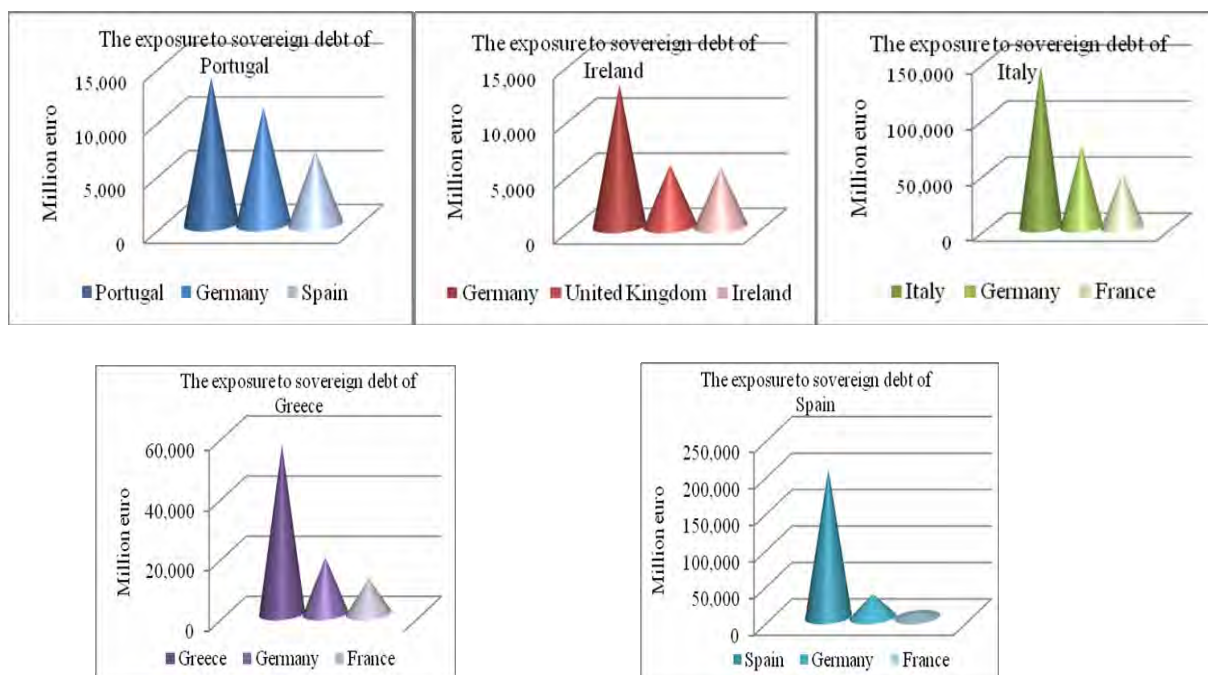
The fourth channel, which can contaminate the financial system is that banks resident in countries with excessive deficits are holders of government debt.



Source: Banca D'Italia, Eurosystem, “Financial Stability Report”, December 2010, p. 20.

Figure 4. Spread the sovereign CDS and bank in 2010

Following an analysis of the Euro area, it was found that an increase of 100% government bond yield increases of 10-20% corporate bond yields in the euro area as a whole (ECB, 2010, p. 77). Moreover, the situation is amplified in the case of banks: government intervention from the euro area to support the financial institutions has diminished the distinction between sovereign and private debt thereby transferring risk from the banking system by governmental sector, which resulted in a close correlation between the spread the bank CDS⁽¹⁾ and sovereign. This close relationship resulted in higher spreads of banks, resulting in increased financing costs. So, the growth of the yield bonds may weaken the banking activity, because of the decreased market value of the portfolio. Approximately 50% of long-term bond market are issued by euro area countries and held by banks from the euro area, some of them with high levels of exposure to governments.



Source: Adrian Blundell-Wignall and Patrick Slovik, "The EU Stress Test and Sovereign Debt Exposures", August 2010, p. 8

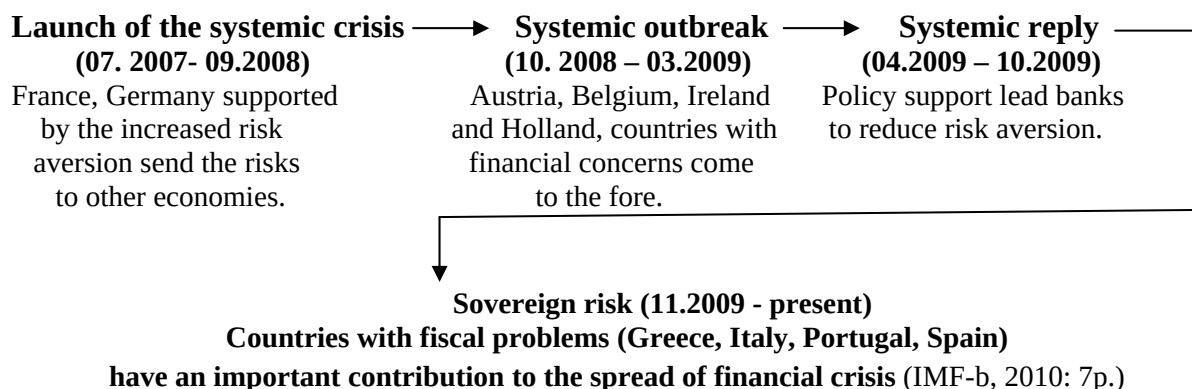
Figure 5. Banks' exposures to sovereign debt of the PIIGS (million Euro)

Looking at the chart (Table 5, Appendix) above, we see that banks tend to be exposed to the sovereign debt of the country resides. This rule is not valid in the case of Ireland, where a significant proportion of exposure to public debt is owned by Germany, followed by Great Britain. This is another difference of Ireland compared to the four PIGS countries.

3. Direction of contagion

In the early stages of the crisis, France and Germany, the healthy core of Eurozone benefited from increased risk aversion. After the collapse of Lehman Brothers, states that reacted negatively on other sovereigns issuers, have been hit hard by the financial crisis. These countries were Austria, Ireland and the Netherlands. Some states have influenced their government balance - public budget, to support banks, which improved the concerns regarding the systemic crisis and the risk aversion decreased. But the financial crisis has turned into economies with weak fiscal outlook and financial tensions. These tensions were most evident in Greece.

If we were to give back the main stages of the financial crisis, chronologically and spatially, we can distinguish the following steps in drawing the schedule for conducting financial crisis:



Countries with fiscal problems (Greece, Italy, Portugal, Spain) have an important contribution to the spread of financial crisis (IMF-b, 2010, p. 7)

Another significant difference between Ireland and the PIGS states is in terms of temporal scale deployment financial crisis. Ireland comes to the fore in October 2008, contributing to the outbreak of systemic crisis, compared with PIGS states that are emerging in the context of the transmission of sovereign risk, until November 2009.

Regarding the contribution of risk propagation, it can be observed the significant contribution of the analyzed states. The main contributors to transfer the sovereign risk are Greece and Portugal, followed by Spain and Italy, in order mentioned.

4. Ways of quantifying the financial stability

The crisis has shown that the system of financial supervision in Europe is inadequate scale integrated in EU financial services market. Importance of systemic risks lately led to the conclusion that the emphasis should fall on macro-prudential regulation and not on micro-prudential regulation. Micro-prudential regulation concerns the protection and regulation of individual institutions and macro-prudential regulation refers to the risk of collapse of financial systems, considered as a whole. It is necessary to have simultaneously two types of regulation, because they are interconnected.

Indicators of financial stability and systemic risk measures the current level of instability and systemic stress. A complete macro-prudential analysis requires that the financial stability indicators to be available and relevant to each market and market infrastructure, intermediate, and combinations of these components, in the financial sub-sectors and in the financial system as a whole. Using indicators of systemic risk and financial stability of macro-prudential bodies is justified by their typical task of identifying systemic risks and issuing warnings about the increased risks. Moreover, the availability of systemic stability indicators can serve as an input to identify emergencies. An advantage of these indicators is that they can be developed for all relevant systemic intermediaries and markets. Moreover, the set of indicators can be expanded relatively rapidly and flexibly, depending on the specific problems of interest at some point in time, and in response to innovation and structural change in the financial system. This is why macro-prudential authorities should have a comprehensive set of indicators of financial stability at their disposal and to continuously review and update extensions.

Composite indicator of systemic stress ("CISS") developed by the European Central Bank, allowing real-time monitoring and assessing the level of stress in the financial system, also helps to delimit and characterize historical episodes of "financial crisis". This indicator could be used to assess the impact of the policy measures to reduce systemic stress levels. For current assumptions crisis, and considering the current state of global interconnection of economic markets, it is important to analyze the contagion of financial instability. This is extremely important to examine in the case of the countries we analyzed.

Building an *aggregate financial stability index* (ISF) is one of the quantitative methods which measure the stability of a financial system along with early warning systems and stress tests.

Early warning systems allow the predictions of the probability of a financial crisis, but does not provide information about the capacity to respond to shocks, respectively that techniques such as "stress testing", which enable comparisons between the performance of stability of different periods or between the stability of financial systems. Compared with early warning systems, *aggregate financial stability index* (ISF) offers the possibility of making comparisons between different periods and systems and also observe the development level of stability.

Even though this technique is considered simple, rigid and mechanical, it has many advantages over other methods: high transparency, can more easily identify the necessary statistical data and simplicity of calculations. To determine the ISF is calculated three

composite indices – Financial Development Index (IDF), Financial Vulnerability Index (IVF) and Financial Soundness Indicators (FSI) – the sum gives rise to aggregate financial stability index (ISF). In the event of unavailable data, composite indicator can be calculated as the average of available indicators.

$$IDF = \frac{\sum_{j=1}^4 i_{dj}}{4}; IVF = \frac{\sum_{j=1}^6 i_{vj}}{6}; FSI = \frac{\sum_{j=1}^5 i_{sj}}{5}$$

Thus, individual indicators used in determining composite indicators are:

(i) for the IDF: Total credit/GDP, Bank margin, Market capitalization/GDP, Banking reform and the interest for liberalization;

(ii.) for IVF: NGO Credit/Total Credit (Reserves/Deposits)/(Cash/M2), Inflation rate, Budget deficit/GDP, Loans/Deposits, Bank deposits variation/Variation M2;

(iii.) for SWFs: Nonperforming Loans/Total Loans, Equity/Total Assets, Regulatory capital/Risk-weighted assets, Liquid assets/Total assets (%) ROA (Albulescu, 2009, p. 77).

Aggregate Financial Stability Index (ISF) is obtained by summing the three composite indicators.

Conclusions

Contagion and spillover models are used primarily to assess cross-transmission of financial instability (ECB, 2010, p. 144). A strict definition approach derived from the contagion effect is given by Kaminsky and Reinhart and Eichengreen and Rose: “contagion effect is the situation where information about the existence of a crisis in another country increases the probability of a crisis in the local plan” (Păun, 2010, p. 2).

Price stability does not ensure financial stability, and not every problem has a fiscal origin (eg. Spain), evasion of regulation and supervision of financial markets creates major systemic risk and excessive leverage private sector (banks) gives rise to systemic risks. Due to the extremely high degree of interconnection within the EU countries, and hence the PIGS states, is difficult to stop the contagion between economies of these countries, since the crisis and problems in these economies already exists. European framework for financial stability at this time is unable to stop the negative effects of contagion, European authorities are currently powerless to influence the negative effects of economic downturn spread among the countries analyzed.

Portugal, Italy, Greece and Spain are the countries in the Euro zone and adopted the single currency euro. This means that adjustments in these countries can be made only by fiscal and structural reforms, rather than by adjusting national currency, its devaluation.

In our opinion, the best solutions to ensure financial stability objective should take into account the contradictions generated by imposing a single currency in countries with different fiscal policies. Since the adoption of the euro, the four PIGS states facing budget deficits and public debt burden, causes uncertainty in the situation in each country is different, however. Italy and Greece, despite the fact that does not comply with the convergence criteria on public debt and have high pre-crisis debt, are still supported in the euro area. However, the two countries have opted for debt weighting against the adoption of austerity policies, which led to a chronic debt situation and the expansion to other states with poor fiscal positions. At the same time, importance of systemic risks lately led to the conclusion that the emphasis should fall on macro-prudential regulation and not on micro-prudential regulation. But not forget to take into account the interrelationship between micro and macro regulations.

We believe that, in order to avoid future financial crises, the task of the European surveillance currently covering classical, traditional geared more towards regulation and legislation, should in future be complemented by surveillance based on identification, prevention indicators that quantify financial crisis.

Note:

⁽¹⁾ CDS- Credit Default Swap - is a swap contract in which the protection buyer makes periodic payments (spread) to the seller and punching exchange, receives a certain amount if the credit (loan or bond) suffers an unexpected event (not reimbursed).

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Appendix

Table 1

The evolution of long-term bond yields in the PIIGS (2006-2012)⁽¹⁾

	2006 Q1	2006 Q2	2006 Q3	2006 Q4	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1	2008 Q2	2008 Q3	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4
Portugal	3.61	4.07	4.04	3.94	4.16	4.49	4.60	4.45	4.31	4.69	4.77	4.30	4.51	4.44	4.05	3.85	4.35	5.11	5.63	6.50	7.36	9.9	11.5	12.2	13.2	11.4	9.67	7.91
Ireland	3.48	3.95	3.88	3.75	4.03	4.38	4.44	4.38	4.21	4.64	4.69	4.56	5.54	5.45	5.09	4.82	4.70	4.98	5.59	7.70	9.17	10.6	10.2	8.44	7.21	7.03	5.77	4.68
Italy	3.72	4.27	4.17	4.03	4.24	4.54	4.64	4.53	4.38	4.78	4.90	4.66	4.54	4.46	4.19	4.06	4.02	4.03	3.90	4.19	4.78	4.81	5.49	6.61	5.71	5.79	5.69	4.78
Greece	3.77	4.28	4.19	4.03	4.26	4.57	4.66	4.51	4.39	4.82	4.97	5.03	5.72	5.35	4.66	4.97	6.24	8.30	10.79	11.03	11.9	15.5	16.6	19	24.7	25.4	23.7	16.2
Spain	3.49	3.97	3.89	3.79	4.06	4.39	4.45	4.33	4.15	4.51	4.64	4.16	4.15	4.11	3.87	3.79	3.93	4.18	4.19	4.70	5.3	5.38	5.43	5.66	5.23	6.17	6.43	5.56
Euro Area	3.54	4.02	3.95	3.83	4.08	4.41	4.46	4.34	4.13	4.50	4.56	4.05	3.89	3.96	3.77	3.65	3.69	3.60	3.44	3.74	4.32	4.51	4.3	4.53	4.39	4.27	3.99	3.41
European Union	3.72	4.18	4.16	4.04	4.34	4.65	4.70	4.55	4.36	4.73	4.77	4.31	4.12	4.26	4.15	3.97	4.03	3.83	3.59	3.85	4.38	4.45	4.14	4.25	4.12	3.97	3.66	3.2

Source: <http://epp.eurostat.ec.europa.eu>

⁽¹⁾ Data source for Figure 1. from page 1.

Table 2

Evolution of the budget deficit in 2006-2011 (% in GDP)⁽²⁾

Period State	2006	2007	2008	2009	2010	2011
Portugal	-4.6	-3.1	-3.6	-10.2	-9.8	-4.4
Ireland	2.9	0.1	-7.4	-13.9	-30.9	-13.4
Italy	-3.4	-1.6	-2.7	-5.4	-4.5	-3.9
Greece	-5.7	-6.5	-9.8	-15.6	-10.7	-9.4
Spain	2.4	1.9	-4.5	-11.2	-9.7	-9.4
Euro Area	-1.3	-0.7	-2.1	-6.3	-6.2	-4.1
European Union	-1.5	-0.9	-2.4	-6.9	-6.5	-4.4

Source: <http://epp.eurostat.ec.europa.eu>

Table 3

The evolution of public debt (% in GDP) 2006-2011⁽³⁾

Period State	2006	2007	2008	2009	2010	2011
Portugal	69.4	68.4	71.7	83.2	93.5	108.1
Ireland	24.6	25.1	44.5	64.9	92.2	106.4
Italy	106.3	103.3	106.1	116.4	119.2	120.7
Greece	106.1	107.4	112.9	129.7	148.3	170.6
Spain	39.7	36.3	40.2	53.9	61.5	69.3
Euro Area	68.6	66.4	70.2	80.0	85.4	87.3
European Union	61.6	59.0	62.2	74.6	80.0	82.5

Table 4

Euro area states' contribution to financial crisis propagation (%)

Contribution to	Contribution from										
		Germany	France	Italy	Spain	Nether-lands	Belgium	Austria	Greece	Ireland	Portu-gal
	Germany	-	12	11.1	13.4	4.8	7.4	6.9	19.8	6.2	18.3
	France	5.6	-	13.4	14.8	6	8.1	7.7	18.2	8	18.3
	Italy	4	10.4	-	16.4	3.3	6.8	7.2	24.2	7.2	20.5
	Spain	4.3	10.2	14.4	-	3.3	7	7.4	23.9	8.4	21.1
	Netherlands	4.5	13.2	10.2	12.2	-	8	5.3	22.1	3.3	21.2
	Belgium	4.3	10.3	10.9	12.9	4.6	-	7.6	22.6	8.1	18.8
	Austria	3.8	8.7	10.8	12.5	3	7	-	26.5	6	21.8
	Greece	4.1	7.5	14.2	15.7	4.2	7.8	10.5	-	15.7	20.3
	Ireland	3.1	7.7	9.9	12.8	2	6.8	5.9	31.3	-	20.6
	Portugal	4.2	8.5	13.7	15.7	4.6	7.4	10	23.6	12.3	-
	Total	3.7	8.3	11	12.7	3.4	6.5	7	21.4	8.1	18

Source: IMF-b, *Global Financial Stability Report*, "Meeting New Challenges to Stability and Building a Safer System", april 2010 <http://www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/text.pdf>

⁽²⁾ Data source for Figure 2. from page 2

⁽³⁾ Data source for Figure 3. from page 3

Table 5

Banks' exposures to sovereign debt of the PIIGS (million euro)⁽⁴⁾

Exposure State	The exposure to sovereign debt of Greece
Greece	56,148
Germany	18,718
France	11,624

Exposure State	The exposure to sovereign debt of Spain
Spain	203,310
Germany	31,854
France	6,592

Exposure State	The exposure to sovereign debt of Portugal
Portugal	13,707
Germany	10,888
Spain	6,807

Exposure State	The exposure to sovereign debt of Ireland
Germany	12,922
United Kingdom	5,580
Ireland	5,322

Exposure State	The exposure to sovereign debt of Italy
Italy	144,856
Germany	72,717
France	48,185

Source: Adrian Blundell-Wignall and Patrick Slovik, "The EU Stress Test and Sovereign Debt Exposures", August 2010, p. 8

⁽⁴⁾ Data source for Figure 5. from p. 5.

BASEL III - ISSUES AND IMPLICATIONS FOR THE ROMANIAN BANKING SYSTEM

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Abstract. *Basel III is the result of the continuous effort made by the Basel Committee on Banking Supervision to enhance the banking regulatory framework. It seeks to improve the banking sector's ability to deal with financial and economic stress, improve risk management and strengthen the banks' transparency. The purpose of this paper is to identify possible outcomes of implementing Basel III on the Romanian banking system, given the current position of the key financial ratios. Although the impact is considered to be limited, financial institutions will need to adapt their financial strategies and business model to the new environment.*

Keywords: Basel III; capital requirements; financial stability; banking system; systemic risk.

JEL Classification: G21.

REL Classification: 11C.

1. Introduction

The global economic crisis has provided an opportunity for a fundamental restructuring of the approach to risk and regulation. The new proposed framework, Basel III, aims at reforms that are expected to strengthen global capital and liquidity rules for a more resilient banking sector. Compared to Basel II, the new framework is considered to be more dynamic, more complex and somehow interdependent to the global regulatory environment. From these considerations, it is expected that the implementation of Basel III will be a challenge to the authorities worldwide.

The motivation for introducing the Basel III is based on the following considerations:

- The negative effects of banking crises. Economic theory shows that the outcomes of financial crises materialize in losses of economic output of about 60% of GDP.
- The frequency of banking crisis. Since 1985, there have been over 30 banking crises in Basel Committee-member countries. It may be considered that this corresponds to a 5% probability of a Basel Committee member country facing a crisis in any given year.
- The benefits of Basel III exceed the implementation costs, because a stable financial system is the basis of a sustainable development, with beneficial effects in the long term.

An important aspect of strengthening international arrangements for supervision and regulation include the efforts in the area of crisis prevention and crisis resolution. The 2007 financial crisis clearly showed the deficiencies of pre-existing arrangements for cooperation in normal times between home and host supervisors. Given the 81.2% share in total banking assets of foreign capital, Romanian authorities need to show a great interest in effective cross-border collaboration. Liquidity problems that large financial groups may face in their home country could materialize in a withdrawal of their funds from the host country. In respect of this, the Vienna Initiative could be mentioned when the largest financial groups present in Romania agreed to maintain their exposures and continue the business on the local financial market although they were facing liquidity risks in their home countries.

2. Quantitative impacts of Basel III proposals

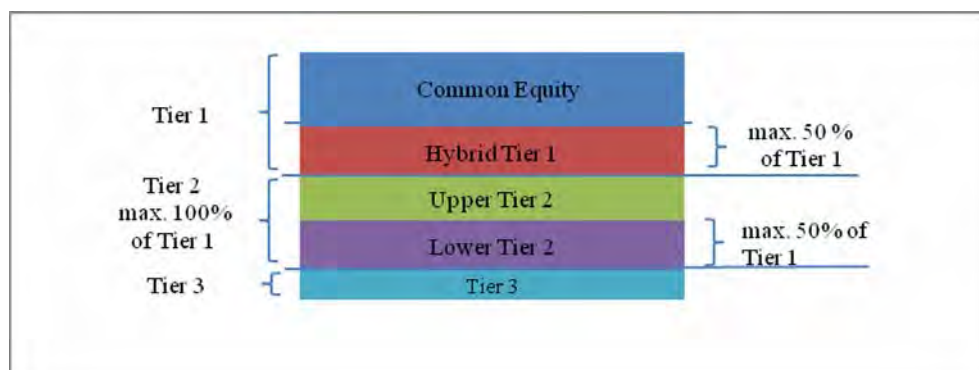
The financial crisis showed that not all institutions did hold sufficient capital and that the capital was sometimes of poor quality and not available to absorb losses as they materialized. Basel III introduces a new definition of capital to increase the quality, consistency and transparency of the capital base. Key elements of the revision include along with introducing new limits for the capital elements, a raise in quality and quantity of Tier 1 capital, simplification and reduction of Tier 2 capital and the elimination of Tier 3 capital.

According to the new definition, capital comprises the following elements:

- Going-concern capital (Tier 1 capital).
 - Common Equity Tier 1 capital (CET 1 capital);
 - Additional Tier 1 capital;
- Gone-concern capital (Tier 2 capital);

While going-concern capital (Tier 1) should allow an institution to continue its activities and help prevent insolvency, gone-concern capital (Tier 2) would help ensure that depositors and senior creditors can be repaid if the institution fails.

Under Basel II, the 8% minimum capital requirements had to be met mainly with Tier 1 and Tier 2 capital, with the latter counting up to 100% of the former. This was transposed by the practice that banks could meet the minimum capital requirements by holding Tier 1 capital equal to 4% of risk-weighted assets (RWA). Under Basel III the minimum own funds requirements computed as a percentage of the RWA remains 8%, but the minimum Tier 1 ratio is increased to 6% and there is an explicit requirement of 4.5% of the risk-weighted assets for the CET1 capital ratio.

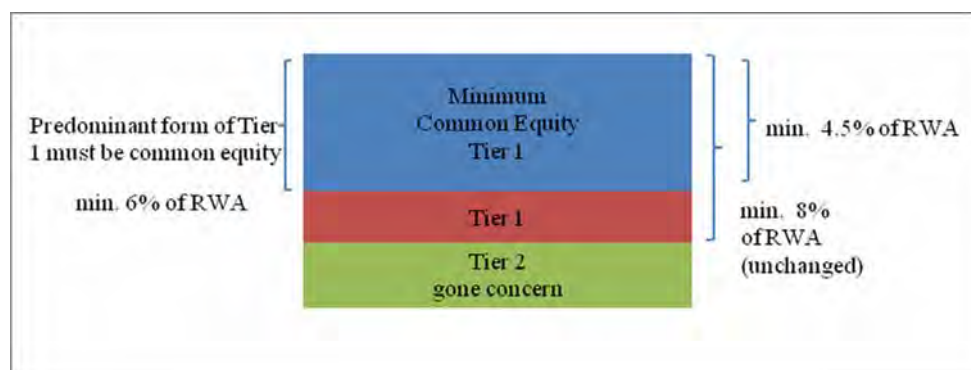


Source: Author, on the basis of Basel II.

Figure 1A. Current structure of the Basel II capital requirements

According to the Basel III capital requirements, CET 1 consists of the following:

- Common shares;
- Share premium resulted from the issue of instruments included in CET 1;
- Retained earnings and other comprehensive income, including interim profits or losses;
- Accumulated other comprehensive income and other disclosed reserves;



Source: Author, on the basis of Basel III.

Figure 1B. Future structure of the Basel II capital requirements

A counter-cyclical capital buffer is being developed, which is expected to be implemented by increases to the capital conservation buffer during periods of excessive credit growth. The minimum total capital requirement, including the conservation buffer is increased to 10.5%.

The new definition of capital rationalizes Tier 2 capital by eliminating Upper Tier 2 from the capital structure. It also introduces harmonized and strict eligibility criteria. Under Basel III, Tier 2 capital ensures loss absorption in case of liquidation (gone-concern).

Basel III aims at reduced leverage through introducing a backstop leverage ratio which is set at 3%. It will act as a non-risk sensitive backstop measure to reduce the risk of an excessive leverage within the individual institution and the financial system as a whole. The leverage ratio remains controversial as it could lead to reduced lending with impact on economic growth and probably affecting prices of the real estate as there may be pressure on the banks to sell low margin assets (mortgages classify here).

The recent financial crisis showed the importance of liquidity risk management, as a result, the Basel Committee has strengthened its liquidity framework by developing two minimum standards for funding liquidity. The 30-day liquidity coverage ratio (LCR) is intended to promote short-term resilience to potential liquidity disruptions. The stock of high-quality assets is compared to with the expected outflows over a 30-day stress scenario. The expected cash-flows are to be covered by sufficient liquid, high-quality assets. Another requirement is that assets are weighted liquidity – based, varying from 100% for government bonds and cash to 50% for corporate bonds. Although the risk of impact from a bank run of a single institution should be reduced, which would improve the overall stability of the financial system, new liquidity requirements may cause banks to change their funding profile and head to long-term funding with preference which may result to be a scarce resource given a higher demand.

The second liquidity standard is Net Stable Funding Ratio (NSFR) that has a time horizon of one year and has been developed to capture structural issues in order to provide a sustainable maturity structure of a financial institutions assets and liabilities. The objective of the NSFR is to promote resilience over a longer time horizon by creating additional incentives for banks to fund their activities with more stable sources of funding on an ongoing basis.

The treatment of systemically important financial institutions is currently under discussion. The objective is to reduce the probability of failure by increasing their going-concern loss absorbency and reducing the extent or impact of failure, by improving global recovery and resolution frameworks.

3. Qualitative impacts of the Basel III proposals

Under adverse economic conditions, with regulatory scrutiny being more intensive, it is expected that the weaker banks will find it more difficult to raise the required capital, as a

result it will lead to a reduction in business and, potentially, in competition. Weaker banks may find it difficult to meet the Basel III requirements.

A significant pressure on profitability and ROE will occur due to increased capital requirements. Investor returns will decrease as the business will have to rebuild and restore buffers.

Regarding liquidity, the introduction of two liquidity ratios to address the short-term and long-term liquidity and funding it is likely to encourage long-term funding arrangements with the consequent impact on pricing and margins that are achievable.

Increased supervisory focus on proprietary trading, matched with the treatment of minority investments in financial institutions is likely to lead to group reorganisations, including mergers and acquisitions and disposals of portfolios, entities or parts of entities.

Basel III proposals may result in a more stable banking system, as a successful implementation may reduce the risk of a systemic banking crisis. The enhanced capital and liquidity buffers together with the focus on the enhanced risk management standards and capability should lead to reduced risk of individual bank failures and reduced interconnectivity between institutions.

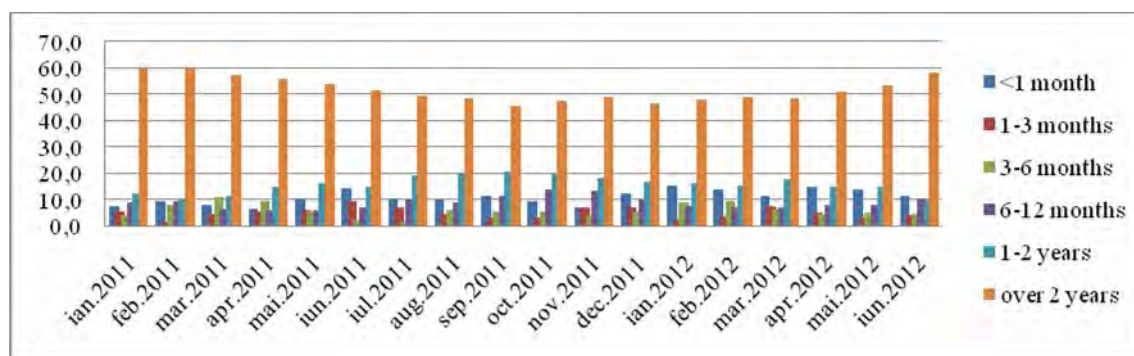
A controversial outcome of the Basel III implementation is the reduced lending capacity of banks. Although the extended implementation time line is intended to mitigate the impact, significant increases to capital and liquidity requirements may lead to a reduction in the capacity of banking activity or at least at a significant increase in the cost of provision of such lending.

Investors may be less attracted by bank debt or equity issuance given that dividends are likely to be reduced to allow rebuilding the capital basis, the return on equity and profitability will likely decrease significantly. This will become evident through investor sentiment in the cost of capital issuance and the interbank lending rate.

Due to the fact that there might occur inconsistencies between different jurisdictions in implementing Basel III it may lead to international arbitrage as in both cases of Basel I and Basel II.

4. The impact of implementing Basel III proposals on the Romanian banking system

Given the significant share of foreign capital in the Romanian banking system, there is a potential risk of restructuring activities being carried within parent-banks. From this point of view the new capital requirements are beneficial to our national banking system as the gradual implementation of Basel III are expected to strengthen the base capital and as a result will mitigate the impact of a potential financial disintermediation.

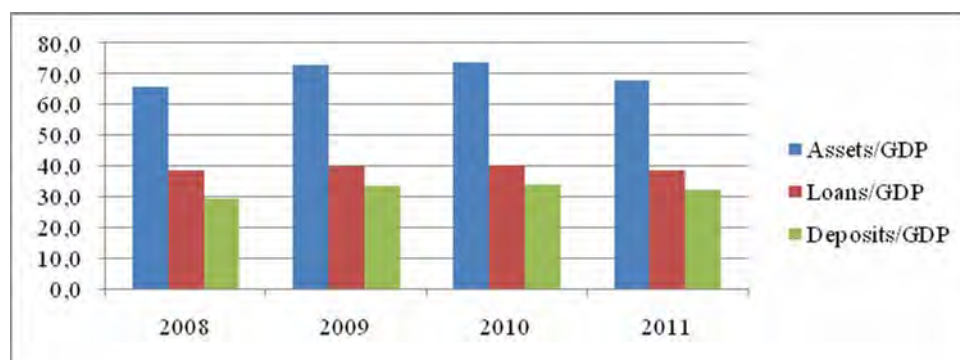


Source: Author, based on NBR data.

Figure 2. Maturity structure of the funding received from parent-entities

Figure 2 shows that the maturity of the financial resources received from parent-entities have an increasing trend in the first quarter of 2012. In spite of the international

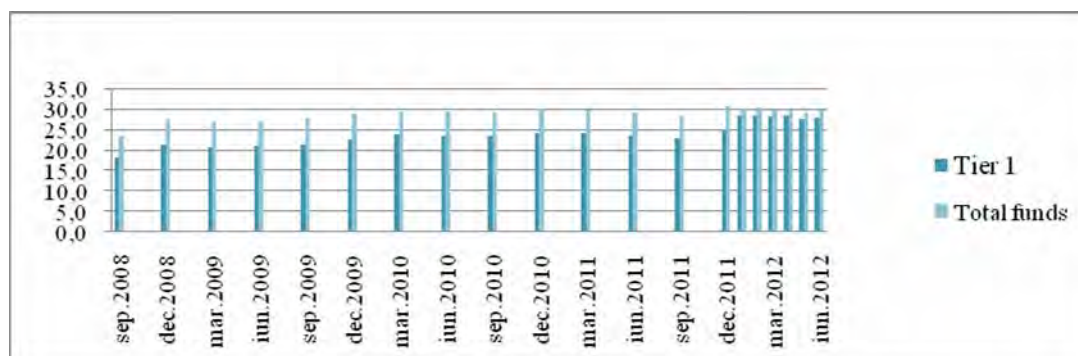
financial pressure, the financing from parent-banks increased by 2% in June 2012 compared to June 2011 and as a result did not great liquidity problems for the Romanian financial institutions.



Source: Author, based on NBR data.

Figure 3. The financial intermediation within the Romanian banking system

The maturity structure shows a comfortable level of long term resources (approx. 70% of total attracted resources) as well as a good financial intermediation levels (Figure 3), capable of absorbing eventual liquidity problems derived from external financing.



Source: Author, based on NBR data.

Figure 4. The level of capital and Tier 1 capital (billion lei)

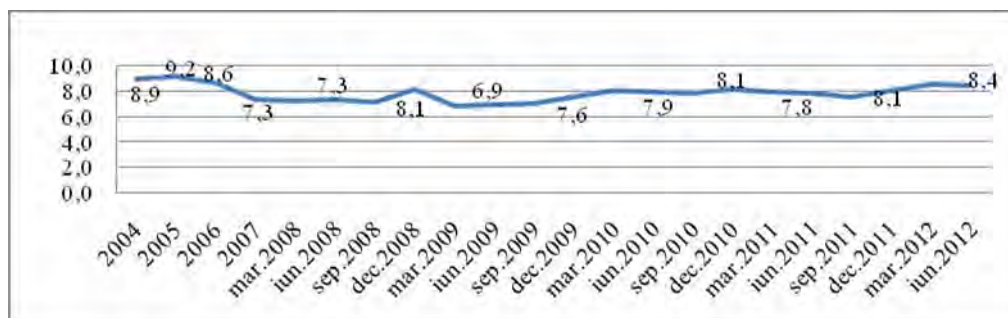
In order to assess the capital adequacy standards of the Basel III, an analysis can be conducted on the top 5 financial institutions within the Romanian banking system that have a cumulated market share of approximately 55% considering the value of their assets. It is assumed full implementation of the final Basel III package. The analysis is based on the data of each individual institution considered as at 30 of June 2012.

It was computed the average common equity Tier 1 capital ratio (CET1) considering the effect of all changes to the definition of capital and risk-weighted assets. For the top 5 financial institutions it is 10.3% and 7.9% for the whole banking system. The results are compared to the recommended 7% (CET 1 of 4.5% plus 2.5% buffer) and seem to meet the essential Basel III capital adequacy criteria.

The NBR has carried out an analysis on the basis of prudential data reported by financial institutions (NBR, RSF, 2012, p. 157) as at 30 of June 2012. The analysis was conducted for both systemic important institutions and institutions that are not of systemic importance. Capital ratios were computed according to Basel III capital requirements. The results show that systemically important financial institutions fall within the minimum levels of capital adequacy ratios, having additional reserves to cover systemic risk damper.

The financial data as of 30 of June 2012 shows that within the Romanian banking system, total own funds consist mainly from Tier 1 (Figure 4) and that hybrid Tier 1 and

innovative hybrid capital instruments are completely absent, which indicates a high level of quality of the capital of the financial institutions. In June 2012, the percentage of Tier 1 capital was of 93%. Common Equity Tier 1 includes banking capital of the highest quality, available to the financial institution at any time and which has to fully absorb losses during periods of congestion of problems, referring to the going concern principle (Dănilă, 2011). This structure of Tier 1 mitigates the potential impact of implementing the Basel III capital requirements.

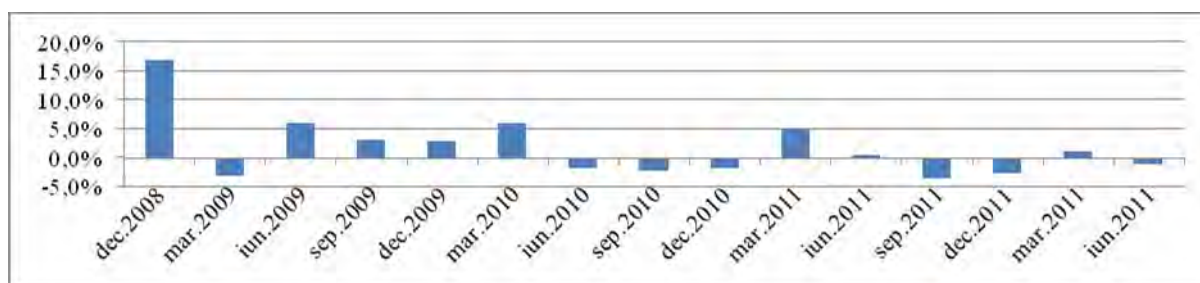


Source: Author, based on NBR data.

Figure 6. The evolution of the leverage ratio during 2004-2012

The leverage ratio of the financial institutions has an aggregated value of 8.4% in June 2012. It is a quite comfortable value and as a result of this, the implementation of Basel III will not affect directly the Romanian financial institutions. A computation of the leverage ratio for each individual financial institution on the June 2012 data concluded that the 3% limit as per Basel III proposals is not being met.

A significant pressure on profitability and ROE will occur due to increased capital requirements. This will impact negatively on the already decreased profitability from the past years. The evolution of ROE over the last years is represented in Figure 7.



Source: Author, based on NBR data.

Figure 7. The evolution of ROE during Dec 2008 - June 2011

The risk of liquidity reveals the capacity of a bank to fund the increases in assets and meet its financial obligations according to their maturity, without incurring unacceptable losses. The minimum capital requirements are necessary but not sufficient for the stability of the financial system, as an example, the liquidity risk has played a central role in the dynamics of the financial crisis, especially in its first phase (Dănilă, 2011).

In order to meet the Basel III liquidity standards, banks can, for example, lengthen the term of their funding or restructure their business model. According to Dănilă, 2012, financial institutions may return to traditional activities ("back to basics") and there is a possibility of reducing their trading activity, especially proprietary trading activities. It is possible that banks will restructure their portfolio of assets and will reconsider their approach to different categories of clients. This may involve designing new banking products tailored to the specific needs and financial position of each targeted group of clients. Innovation could result in being an essential element also with direct impact on decreasing costs.

The gradual implementation of the new standards can mitigate the impact of banks being able to adapt by capitalizing profits, issuing actions, changing the structure of their liabilities. It is expected that the Basel III implementation will not affect the lending capacity of the banks.

Meeting the Basel III requirements will impact the cost of capital and cost of liquidity, as well as the operating cost due to the multiplication of the supervision levels. The banking activity is expected to be more complex and difficult, it will have to face the needs of clients and in the same time prioritize capital, resource and liquidity management and not least important risk management (Dănilă, 2013).

Efficient corporate governance, according to the adopted business model and appropriate risk profile is the first step towards a successful implementation of Basel III. As the additional capital ratios in Basel III will likely amplify any inefficiency in existing internal modeling approaches, it will be necessary to improve the performance of existing assessment methodologies in internal ratings-based credit risk approach and internal models market risk approaches.

The introduction of the new standards is expected to have only a modest impact on economic growth over the transition period. The level of GDP would decline by about 0.2% for each percentage point increase in a bank's actual common equity capital ratio once the new rules are in place (Walter, 2010), assuming no changes are performed to the structure of financial institutions portfolio or their efficiency, and that the level ROE is fully maintained.

Conclusions

In response to the serious nature of the recent financial crisis, several measures at the micro and macro level are being considered to increase the stability of the financial markets. The Basel III proposals are a major step in strengthening global capital and liquidity rules. Some key aspects of Basel III are: a stricter definition of capital in order to increase the quality, consistency and transparency of the capital base; introduction of capital buffers; a new global liquidity standard introducing two new ratios which banks need to fulfill, introduction of a leverage ratio to supplement the risk-based framework of Basel II. There are also included increased requirements for systemically important financial institutions.

The implementation of the Basel III requirements will probably not affect significantly the capitalization, level of provisions or liquidity of the Romanian financial institutions. The prudential requirements implemented by the National Bank of Romania resulted in an appropriate cover of the risks as shown by the past years experience when financial institutions worldwide faced high liquidity problems and even bank runs, the Romanian banking system remained stable due to a good capitalization of every single bank.

It is not expected that significant additional capital will be needed to be risen in order to meet the new capital requirement. The high share of Tier 1 capital from own funds held and the absence of hybrid instruments limits the impact of Basel III on capital requirements on national financial institutions. The presence of a conservation buffer will allow banks to count on it during periods of stress.

Given the significant share in total banking assets of foreign capital, Romanian authorities need to show a great interest in effective cross-border collaboration. Nevertheless, maturity structure of financial shows a comfortable level of long term resources attracted from parent-banks.

The implementation of the Basel III requirements will not affect significantly the capitalization, level of provisions or liquidity of the Romanian financial institutions. The prudential requirements implemented by the National Bank of Romania resulted in a good capitalization of financial institutions. Most probable, the Romanian banking system will not need significant additional capital to be risen in order to meet the Basel III capital requirements.

As a result of implementing the Basel III proposals, financial institutions are expected to change their funding profile. Long-term funding will be preferred which may result in the scarcity of long-term financial resources.

Financial institutions will redesign their products and services to ensure that they continue to meet the needs of customers, while optimizing capital and liquidity. Business segments will be evaluated depending on accessibility criteria, given the fact that financing and capital are expected to be scarce resource.

Basel III will lead to a more stable banking system, as a successful implementation may reduce the risk of a systemic banking crisis. The enhanced capital and liquidity buffers together with the focus on the enhanced risk management standards and capability should lead to reduced risk of individual bank failures and reduced interconnectivity between institutions.

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EVALUATING THE IMPACT OF BANKING SERVICES QUALITY ON CUSTOMER LOYALTY IN CREDIT EUROPE BANK (ROMANIA)

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Abstract. *The main concern of credit institutions in Romania should be to maintain the portfolio of clients. Long-term cooperation relations between a bank and its customers represent the proof of the bank's efforts in providing quality services that meet consumer demands. Moreover, keeping existing customers is a challenge for banks and a starting point in attempting to improve results, financial performance.*

Keywords: service quality; customer satisfaction; loyalty; SERVQUAL; perception.

JEL Classification: G21, M31.

REL Classification: 11C.

1. Introduction

Service quality is an abstract concept considered by many quality and marketing specialists as being particularly difficult to define and measure. Defining service quality requires a distinction between service quality measurement and customer satisfaction measurement. Customer satisfaction and service quality are complementary concepts. Improving service quality is one of the surest ways to counter competition. Consumer expectations depend on his previous experience, corporate advertising and communications regarding the product. Levels - accepted, desired-, the difference between them, meaning the tolerance area, the accepted or perceived level are significant in this respect, both for company and consumer.

The closer the providing company gets to the customer's desired level, by the whole serving system, the higher his satisfaction and vice versa; hence the possibility of repeating the experience with the same company and consequently the development of a loyalty relationship.

The quality of service can and should be measured objectively but it cannot be controlled before the service is sold. The subjective nature of assessing the quality of a service is given both by the intangibility and heterogeneity of services and also by the diversity of subjects that assesses it. Thus, two customers that benefit from the same service on the same terms perceive its quality differently, due to different lifestyles, expectations, etc. Service perception is different even for the same person from one moment to another.

2. Methods of measuring the quality of banking services

The specialized literature presents different ways of measuring and assessing the quality of services. We can identify two main categories:

- methods developed from a behavioural perspective - are focused on measuring the activity (audience) of a website (e.g. number of visitors, the rate of change of visitors, number of pages visited, and time spent on our site)

3.2. The measurement and evaluation procedure

The measurement and evaluation of service quality using SERVQUAL method consists of the following main steps:

Step 1. Establishing requirements for service quality

Depending on the area covered by the service, the significance adapts to the five SERVQUAL dimensions and reads the contents of each dimension attributes. The result of this step is a tabular representation of the dimension and quality of service attributes (in the specified context of use).

Step 2. Data collection based on questionnaires and interviews

The questionnaire technique is used in order to collect data. As a general rule, there are two evaluation questionnaires:

Questionnaire no. 1 that registers "customer expectations regarding the service quality"

Questionnaire no. 2 which measures "customer perceptions regarding the service quality"

Questionnaires are sent to evaluators, electronically or on paper, along with instructions for completion and use of questionnaires and explanatory comments on the significance of quality attributes.

Step 3. Calculation and determination of quality of service indicators

Data collected through questionnaires are structured and arranged in a format that allows the calculation and determination of quality of service indicators:

a) determining the quality of service for each dimension - the indicator is calculated as the mean between "perceptions" and "expectations" for each dimension of service quality.

b) calculation of overall service quality (unweighted) – the indicator is calculated as the average dimension of the service quality, without taking into account the weights (levels) of importance assigned by the evaluator

c) calculation of overall (weighted) quality service (SQP) - the indicator is calculated taking into account the weight given by the evaluator to each dimension of the service quality.

Step 4. Presentation and interpretation of results

The results of the measurement and evaluation process are recorded in an evaluation report and presented both in tabular formats, and as graphics.

Regarding the outcome of the evaluation - the indicator "quality of service" expressed as the difference between perceptions and expectations - interpretation is the following:

- Positive values show a service better than expected;
- Negative values show low quality;
- Zero means a satisfactory level of quality.

3.3. Applying the SERVQUAL method to bank Credit Europe Bank (Romania) SA

This study was conducted on a sample of 200 people, clients of Credit Europe Bank (Romania) SA. In order to collect information about the quality of the services provided by Credit Europe Bank (Romania) SA, a questionnaire was applied, whose results will be presented below. The five dimensions of service quality for Credit Europe Bank (Romania) SA are tangibles, reliability, responsiveness, assurance, and empathy. For each dimension there was created a set of statements graded twice by respondents, on a scale from 1 (strongly disagree) to 7 (totally agree), grades that reflect, on one hand customers' expectations for the analyzed quality of service and on the other hand the perceived perceptions of the analyzed service quality (Table 1).

Table 1

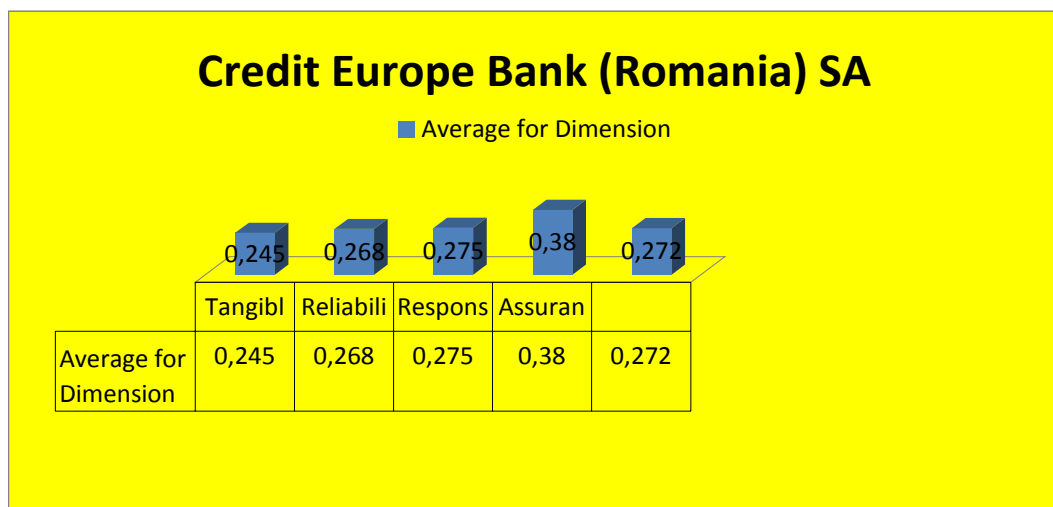
Average scores of the SERVQUAL dimension

Statement	Expectation Score	Perception Score	GAP Score
Tangibles	Average for Dimension		0.245
1. Excellent banking companies will have modern looking equipment.	5.56	5.84	0.28
2. The physical facilities at excellent banks will be visually appealing.	5.78	6.04	0.26
3. Employees at excellent banks will have a neat appearance.	5.98	6.18	0.20
4. Materials associated with the service (such as pamphlets or statements) will be visually appealing at an excellent bank.	5.04	5.28	0.24
Reliability	Average for Dimension		0.268
5. When excellent banks promise to do something by a certain time, they do it.	4.68	4.96	0.28
6. When a customer has a problem, excellent banks will show a sincere interest in solving it.	4.80	5.12	0.32
7. Excellent banks will perform the service promptly.	4.74	5.14	0.40
8. Excellent banks will provide the service at the promised time.	5.16	5.36	0.20
9. Excellent banks will insist on error free records.	5.32	5.46	0.14
Responsiveness	Average for Dimension		0.275
10. Employees of excellent banks will tell customers exactly when services will be performed.	4.98	5.3	0.32
11. Employees of excellent banks will give prompt service to customers.	5.1	5.46	0.36
12. Employees of excellent banks will always be willing to help customers.	5.14	5.46	0.32
13. Employees of excellent banks will never be too busy to respond to customers' requests.	4.88	4.98	0.10
Assurance	Average for Dimension		0.380
14. The behavior of employees in excellent banks will instill confidence in customers.	5.16	5.52	0.36
15. Customers of excellent banks will feel safe in transactions.	5.26	5.66	0.40
16. Employees of excellent banks will be consistently courteous with customers.	4.98	5.42	0.44
17. Employees of excellent banks will have the knowledge to answer customers' questions.	5.36	5.68	0.32
Empathy	Average for Dimension		0.272
18. Excellent banks will give customers individual attention.	4.68	5.02	0.34
19. Excellent banks will have operating hours convenient to all their customers.	4.84	4.84	0
20. Excellent banks will have employees who give customers personal attention.	4.76	5.08	0.32
21. Excellent banks will have their customer's best interests as main concern.	4.18	4.48	0.30
22. The employees of excellent banks will understand the specific needs of their customers.	4.60	5.00	0.40

Source: Made by authors.

Analyzing the average score of both expectations and perceptions of the Credit Europe Bank (Romania) SA customer (Table 1), we can see that all five dimensions obtained, in general, average scores between 4.6 and 5.9.

This indicates a high level of banking service quality as perceived by the respondents, both before and after becoming customers of Credit Europe Bank (Romania) SA. In conclusion we can appreciate this score as favorable for the analyzed bank, most of the customers agreeing the statements regarding the quality of services offered by the bank.



Source: Made by authors.

Figure 1. Average scores

From Table 1 and Figure 1 we can observe that the GAP values are set in a range between 0 and 1, showing that the difference between perceptions and expectations is not very high. In other words, the quality of services offered by the bank is higher than the expectations expressed by customers. Looking at the overall average GAP value calculated in the above table, namely 0.288, we conclude that the level of the perceived quality by Credit Europe Bank (Romania) SA customers is good, meaning that the perceptions values exceed the expectations they had. All opinions expressed by the customers regarding the quality of services offered by Credit Europe Bank (Romania) SA, converge towards the same trend, expressed above, regardless of employment, social status, or income.

Thus, as shown in Table 1 and Figure 1, for each dimension of the quality of banking services, a positive GAP score was obtained after calculations, with values ranging between 0 and 1. This indicates that the actual level of banking service quality is above customer expectations. Worst score was found for the “tangibles” category (0.245), and the most favourable (maximum) was recorded for the “assurance” one (0.380), proving that the bank inspires trust and confidence to clients due to the courtesy and knowledge acquired by employees and also to its services.

Table 2

The importance granted to each dimension, according to data from questionnaires

Features	Points
1. The appearance of the physical facilities, equipment, personnel, and promotional materials of the bank (tangibles).	22.70
2. The ability of the bank to perform the promised service dependably and accurately (reliability).	20.70
3. The willingness of the bank to help customers and provide prompt Service (responsiveness).	18.60
4. The knowledge and courtesy of the bank's employees and their ability to convey trust and confidence (assurance).	20.10
5. The caring, individual attention the bank provides to its customers (empathy).	17.90
Total:	100

Source: Made by authors.

The surveyed people granted most importance to facilities, equipment, personnel and promotional materials of the bank (22.7), to bank's ability to perform the promised service with certainty and accuracy (20.70) and then to the safety of transactions performed by the bank (20.10), as shown in Table 2.

Table 3

The SERVQUAL (weighted) scores of banking quality at Credit Europe Bank (Romania) SA

SERVQUAL Dimension	Average for Dimension	X	Importance Weight	=	Weighted Score
Tangibles	0.245	x	22.7	=	5.5615
Reliability	0.268	x	20.7	=	5.5476
Responsiveness	0.275	x	18.6	=	5.115
Assurance	0.380	x	20.1	=	7.638
Empathy	0.272	x	17.9	=	4.8688
TOTAL					28.7309
AVERAGE (= Total/5)					5.7462

Source: Made by authors.

Table 4

The hierarchy of weighted scores at Credit Europe Bank (Romania) SA

Weighted Score	Dimension
Maximum	Assurance
Minimum	Empahy

Source: Made by authors.

According to Table 2 and Table 3, we can notice that the hierarchy of banking service quality dimensions changed after weighting average scores obtained in the previous step, now the maximum value being still granted to "assurance", and the minimum to the "empathy" dimension.

Conclusions

- Credit Europe Bank (Romania) is considered the safest in the opinion of the surveyed customers and the most used service is the ATM. Moreover, most of the respondents are young people aged between 18-25, working in the private sector and getting an average income between 900 and 1600 Ron.

- On the whole, customers' perceptions are noticed to have a higher score than expected, positive for the bank review. This shows that the quality of services offered by the bank is higher than the expectations expressed by customers.

- Analyzing the average score of both present expectations and perceptions of customers of Credit Europe Bank (Romania) SA, the general conclusion indicates that each statement has obtained an average score that ranges around grade 5, which points the high quality banking services offered.

- The most favourable GAP recorded by Credit Europe Bank (Romania) SA was obtained by the "assurance" dimension and the worst by the "tangible" dimension in the first step of the study. This GAP indicates that the bank inspires trust and confidence to customers due to the courtesy and knowledge of its staff and also to the offered services.

- As for the analyzed characteristics, the customers grant more importance to the aspect of the facilities, and equipment, to the appearance of the personnel and to the promotional materials of the bank.

- The hierarchy of banking service quality dimensions changed after weighting the average scores of the previous step, this time the maximum value was still recorded by “assurance”, whereas the minimum value was that of the “empathy” dimension.
- Credit Europe Bank (Romania) wants to be the reference bank of Romania through professionalism, innovation, quality development and profitability. In this respect, Credit Europe Bank (Romania) will pursue a sustained investment policy to adapt its business to the specific Romanian market⁽¹⁾, achieving large scale processing and diversify its range of products and services.
- As the most obvious differentiation is achieved through high quality services, we can state that the basic strategy in banking products and services is the strategy of quality.

Note:

⁽¹⁾ The nine largest financial groups that control more than 70% of the assets within the Romanian banking system – Erste Group, Raiffeisen, Eurobank, National Bank of Greece, UniCredit, Societe Generale, Alpha Bank, Piraeus Bank.

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BANKS INTEREST RATE MARGINS AND FINANCIAL DEREGULATION IN MAURITIUS

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Abstract. *The objective of developing Mauritius as a regional financial center indicated the rationale for deeper financial reforms. Therefore, the paper aims to investigate the commercial banks interest rate margins in the case of Mauritius starting with the review of the literature. Also, looking at the major trends in interest rate margins will be discussed the results of the model capturing the determinants of interest rate margins.*

Keywords: bank; interest rate; financial deregulation; liberalization; financial reform.

JEL Classification: E52; E59.

REL Classification: 8J.

1. Introduction

In line with the objective of overall economic liberalization, a number of financial reforms have been implemented since the late 1980s in order to liberalize the financial system (Jankee 2005, 2006). After the liberalization of commercial banks interest rates in July 1988, the establishment of Treasury bill market became a priority in order to shift from direct control to indirect market-based instruments of monetary policy. Credit ceilings on commercial banks were abolished, reserve requirements were reduced and government borrowing from commercial banks below market rate was rationalized. The objective of developing Mauritius as a regional financial center indicated the rationale for deeper financial reforms such as development and internationalization of capital markets, capital account convertibility, diversification of the financial system, greater openness to foreign banks, liberalization of trade in financial services, enhancement of banking sector infrastructure and consolidation of financial regulatory framework.

The basis of financial liberalization is to increase competition and financial intermediation efficiency. In this context, interest rate margins have attracted researchers, particularly in the developing countries which have implemented market-oriented financial sector reforms over the preceding decades (Fry, 1995; Brock and Suarez, 2000, pp. 113-134). A number of factors have motivated these researchers to investigate the level and determinants of interest rate margins. Firstly, there was the need for a better understanding of the behavior of interest rates following the mixed experiences of many LDCs with interest rate liberalisation. There was also the concern that in many developing countries, the level and structure of interest rates have remained inflexible with higher interest rate margins during the post-liberalization period (Turtelboom, 1991). Moreover, policy makers care about interest rate margins because they reflect intermediation costs and financial market efficiency. With financial deregulation, interest rate margins are expected to converge to international levels. Moreover, in the absence of government intervention on bank activities, high margins are usually interpreted as an indicator of inefficiency, which adversely affects domestic real savings and investment. Moreover, researchers have also concentrated on other aspects such as the effects of market structure, regulatory framework, taxation, interest rate risk and macroeconomic environment and banking controls on interest rate margins (Sarr, 2000, Hanson and Rocha, 1986; Demirguc-Kunt and Huizinga, 1997).

Hence, issues on margins are also relevant to developments in the Mauritian banking sector. It is found that banks' interest rate margins have remained high during the post-interest rate liberalisation period, notwithstanding the efforts of policy makers to instill competition in the banking sector and develop the financial market. Different informal opinions have been expressed regarding the persistence of high interest rate margins. From the bankers' point of view, this is a result of high operating costs, high reserve requirements and taxation. On the other hand, policymakers have also attributed high margins to the lack of competition in the banking sector. Despite the growing consensus about the factors that influence interest rate margins, there is a dearth of literature quantifying the impact of the various known factors, especially in developing countries. These are operating costs, reserve requirements, taxation, risk, interest rate volatility, real income amongst others. This study explores the determinants of interest rate margins for Mauritius. In contrast with earlier works, we will use direct indicators of financial repression in the form of banking controls to examine their effects on interest rate margins. We will also distinguish between the different types of controls namely the quantitative (credit ceilings) and interest rate. Finally, we will also integrate the effects of financial depth on margins in our analysis.

In the light of these issues, an investigation of commercial banks interest rate margins in the case of Mauritius is carried out in this section. To start, we will review the literature in section 2. Section 3 looks at the major trends in interest rate margins while section 4 discusses the motivation and proposed framework. The model capturing the determinants of interest rate margins is specified in sections 1.4.1 and 1.4.2. In section 5 presents the estimation and analysis of results. Finally, in section 6, we will discuss the estimated results.

2. Review of previous studies

Interest rate margin is defined by microstructure characteristics of the banking sector and the policy environment. Ho and Saunders (1981, pp. 581-602) defined pure spread (margin) as the proportion of the margin which cannot be explained by bank specific characteristics. The pure spread is influenced by the degree of bank risk management, size of banking transactions, interest rate elasticity and interest rate variability. Zarruk (1989, pp. 797-810) considering risk management by banks found that risk-averse banks operate with a smaller margin than risk-neutral banks while Paroush (1994, pp. 79-94) explained that risk aversion raises the bank's optimal rate of interest and reduces the amount of credit supplied. Actual spread which incorporates the pure spread is in addition influenced by macroeconomic variables including monetary and fiscal policies. Hanson and Rocha (1996) emphasized the role of direct taxes, reserve requirements, cost of transactions and forced investment in defining interest rate margin.

Research on bank interest rate margins has concentrated more on developed and emerging economies and only recently it has been directed to LDCs. We next carry a survey of literature on some issues relating to bank interest margin which would provide for a background to study bank margins for this study. Thomas et al. (1981, pp. 581-600) developed a model of bank margin in which a bank is viewed as a risk-averse dealer. They showed that an interest margin would always exist and was the result of transaction uncertainty faced by the bank. According to them, pure margin depends on four factors: the degree of managerial risk aversion; the size of transactions undertaken by the bank; bank market structure; and the variance of interest rates. It was also shown that because of transaction uncertainty, hedging behavior was perfectly rational within an expected utility maximizing framework. Moreover, when they extended the model from a structure with one kind of loan and deposits to loans and deposits with many maturities, it led to further interesting insights into margin determination, especially as "portfolio" effects become apparent. The results from a sample of U.S commercial banks showed a positive and significant relationship between interest rate margin and the variance in the rate on bonds. When the sample was split into two subgroups (measured by asset size), it was found that smaller banks had an average transaction spread of approximately one-third of one percent more than the larger banks. While this difference is

small, it appears to be statistically significant. They concluded that the difference was largely due to market structure factors, which allowed the smaller banks to earn some additional “producer’s” rent or profit.

Hanson and Rocha (1986) analyzed the determinants of interest rate margins looking at the role of explicit and implicit taxes and also other factors like bank costs and profits, inflation, scale economies and market structure. Using aggregate interest rate data for 29 countries for the period 1975-83, they found a positive correlation between interest rate margins and inflation.

Allen (1988, pp. 231-35) used an extended version of the Ho-Saunders model (1981, pp. 581-602) to consider the case of loan heterogeneity. He found that pure interest spreads may be reduced when cross-elasticities of demand between bank products are considered. He found that diversification benefits emanated from the interdependence of demands across banks and products- a type of portfolio effect. He also found that control over relative rate margins across product types and the resulting ability to manipulate the arrival of transaction demands enabled the financial intermediary to maintain a more active role in managing its inventory risk exposure.

Friedrich et al. (1992, pp. 403-18) provided both theoretical and empirical evidence that capital market reforms in LDCs leads to a reduction in interest rate margins. They found that two different aspects contribute to this result: the warranted increase of competition within the formal banking sector leading to an elevation of deposit rates and the decrease in informal credit interest rates. Using a two-period consumption framework (Fisher-Hirshleifer model), they found that these two effects tend to smoothen the kink in the intertemporal budget constraint but affect households’ utility quite differently. For instance, relaxation in the credit interest rate favors debtor household while higher deposit rates are to the benefits of net saving households, *ceteris paribus*. Given the unstable macroeconomic environment under which most capital market reforms are undertaken, they claimed that government should accompany such reforms with incomes policy that reduces present households’ disposable income while increasing future, if it aims to foster the utility of net savers. This is so because if the (additional) government expenditures do not touch the present disposable income, pure Ricardian equivalence will set in, that is bond financing is equivalent to future tax increases. Hence, net savings category of households will save more today in order to maintain their respective consumption standard tomorrow.

Zarruck (1989) examined the relationships among capital regulation, deposit insurance and the optimal bank interest margin. They found changes in capital regulation or deposits insurance premiums to have direct effects on the bank’s margin in a model where loan losses are the source of uncertainty. An increase in bank capital requirement or in deposit insurance premium resulted in a reduction in interest margin under non-increasing risk aversion. Moreover, comparative static analysis between asset quality and interest margin showed that mean preserving of the distribution of loan-losses resulted in a reduced margin.

Yu (1995, pp. 1374-88) developed a model whereby a number of hypotheses about bank rate margins based on risk-neutral bank objective function which he used to maximise the return on equity capital and tested these hypotheses using Canadian data. He found interest rate margin to depend on size. Thus, contrary to the U.S banking system, interest rate margin determination favored large banks in Canada. He also showed that the margin increased with bank capital-to-asset ratio. Further, no direct link between the interest margin and banks’ non-interest expenses were identified.

Wong (1997) found bank interest margin to be positively related to the bank’s market power, operating costs, credit risk and the degree of interest rate risk. Increase in bank’s equity was found to have a negative effect on the spread when the bank faced little interest rate risk. However, the effect of changes in the interbank market rate on the optimal margin was found to be ambiguous and depended on the bank’s position in the interbank market.

Angbazo (1997, pp. 55-87) tested the hypothesis that banks with more risky loans and higher interest rate risk exposure would select loan and deposit rates which would achieve higher net interest margins. Using Call Report data for different size classes of banks for 1989-1993, he showed that the net interest margins of commercial banks reflect both default and interest rate risk premium. The net interest margins of money-center banks were affected by default risk but not by interest rate risk, which was consistent with their greater concentration in short-term assets and off-balance sheet (OBS) hedging instruments. By contrast, super-regional banking firms are sensitive to interest rate but not to default risk. He found that OBS activities promoted a more diversified, margin-generating asset base than deposit or equity financing and that cross-sectional difference in interest-rate risk and liquidity risk were related to differences in OBS exposure.

Barajas et al. (1998) examined the impact of the financial liberalisation of the Colombian economy on interest rate margin in the banking system. Being highly repressed financially, Columbian policymakers set out to completely liberalize its financial system in the early 1990s, reducing financial taxation, privatizing certain state-owned banks, freeing interest rates, facilitating market entry and exit, and removing certain capital account restrictions. These measures were expected to increase the efficiency and competitiveness of financial intermediation and therefore, reducing interest rate margin, historically high by international standards, was an implicit objective. Based on aggregate banking data for the pre-liberalisation period (1974-88) and aggregate and panel data on 22 banks with monthly observations during the post-liberalisation period (1991-96), they estimated their model whereby interest rate spread was a function of operational costs, financial taxation, market power, and loan quality. They found mixed results. Liberalisation was found to have increased banking sector competition significantly, lowering market power and reducing financial taxation from its highest levels of late 1970s. However, they found that taxation was still high compared to international standard, and operational costs have been slow to decline. Their results also showed that banks appeared to be more responsive to changes in loan quality, which according to them might be an indication of an improvement in banking supervision and/or reporting. Finally, significant differences were found between the behavior of private and state-owned banks in the post-liberalisation period.

Randall (1998) examined the persistently high interest rate margin in the Eastern Caribbean countries compared with other low inflation countries over a six-year period from 1991 to 1996. He found that reserve costs, operational costs and provision for loans accounted for over 75 % of the observed spread. He used an interest rate identity that decomposed the spread into its cost and profit component on the basis of key structural variables. These variables characterized the region's deposits and loan market such as elasticity of loan supply with respect to the deposit rate, the elasticity of loan demand with respect to the lending rate, and the production cost elasticity with respect to deposits. He found that 4% statutory minimum deposit rate added significantly to the costs of bank intermediation. Tightening of loan loss provisioning guideline in July 1995 did not add to commercial bank costs after accounting for the tendency of banks, in the aggregate, to under-provision in the case of government loans. Commercial banks fixed costs, including the costs of capital controls (which were largely invariant over the review period), operating costs, were significant explanatory factors of the interest rate margin over the period 1991 to 1996.

Demirguc-Kunt et al. (1999) used bank level data for 80 countries for the period 1988-1995 to look at the differences in interest rate margins and bank profitability. They showed that these differences reflected a variety of determinants such as bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure and underlying legal and institutional indicators. According to their results, a larger ratio of bank assets to gross domestic product and a lower market concentration ratio lead to lower margins and profits, controlling for differences in bank activity, leverage and the macroeconomic environment. Foreign banks are found to have

higher margins and profits than domestic banks in developing countries while the opposite holds in industrial countries. They also found evidence that corporate tax burden is fully passed onto bank customers while higher reserve requirements were not, especially in developing countries.

Sarr (2000) looked at the effects of market structure on the optimal level of interest rate margins. He developed a conceptual and empirical framework for analyzing optimal bank margins. In the study, he found that commercial banks' ability to lower deposit interest rate (market power) could increase deposit mobilization. Interest rate expenses saved can subsidize and lower fees on checking and branching services and thus help attract deposits.

Other studies have also examined the impact of international differences in bank regulation using cross-country data. Analyzing interest rates in 13 OECD countries in the years 1985-1990, Bartholdy et al. (1997) found that the existence of explicit deposit insurance lowered the deposit interest rate by 25 basis points. Barth (1997) used 1993 data from 19 industrial countries to further examine the impact of banking power on bank return on equity controlling for several bank and market characteristics. They found that variations in banking powers, bank concentration and the existence of explicit deposit insurance did not significantly affect the return on bank equity.

The upshot of the above review is that bank margins are determined by a number of factors that can be classified under market structure, legal and regulatory framework, taxation, macroeconomic environment, risk elements and interest rate elasticities. We next develop an empirical model to study the behavior of interest rate margins and test the model with Mauritian banking sector data.

3. Trends in interest rate margins

There are a variety of lending and savings facilities in the banking sector. Loans are granted by banks based on different criteria in terms of type of borrowers, duration and use with varying lending rates. On the other hand, banks also offer a number of saving products to customers paying different deposit rates. Hence, the margins between lending and deposit rates will also vary according to banking products.

Table 1 displays measures of margins between various lending and deposit rates in the banking sector since 1987. The different margins are defined below. Overall, we find lot of variation in bank margins. Although, we find that margins have declined during recent years, they still remained quite high despite the efforts in the economy to foster banking competition and liberalise the financial system. This has been a matter of concern for policy makers.

Table 1

Interest Rate Margins

As at June	Margin 1	Margin 2	Margin 3	Margin 4	Margin 5	Margin 6
1987	5.50	4.50	4.00	5.50	3.75	4.00
1988	5.50	6.50	4.00	3.50	3.75	4.50
1989	6.50	8.50	7.25	2.75	7.00	5.50
1990	6.50	8.50	6.50	2.75	6.25	5.50
1991	6.50	7.00	5.75	3.50	5.50	5.50
1992	6.00	3.50	8.50	5.00	8.25	5.00
1993	5.00	2.50	7.50	5.00	6.88	3.75
1994	8.38	11.88	6.63	3.38	6.13	7.13
1995	6.25	8.00	6.50	3.25	5.88	4.75
1996	6.25	8.00	8.25	4.75	7.63	4.75
1997	8.50	8.25	8.50	5.00	7.38	6.50
1998	8.25	8.50	8.25	5.00	7.13	6.25
1999	6.00	6.00	5.75	2.25	5.25	6.25
2000	6.75	6.75	6.75	3.50	7.44	7.25
2001	7.25	9.25	9.25	4.50	8.08	7.13

As at June	Margin 1	Margin 2	Margin 3	Margin 4	Margin 5	Margin 6
2002	10.00	11.50	12.00	8.00	11.63	9.13
2003	9.50	9.50	9.50	4.75	9.13	8.31
2004	8.75	8.75	8.75	4.25	7.00	6.31
2005	10.50	10.88	11.00	6.00	8.63	7.88
2006	10.25	10.38	11.00	6.75	10.25	7.88
2007	9.75	9.00	9.00	7.00	8.63	8.44
2008	7.50	8.50	7.75	6.00	7.00	6.57
2009	7.00	6.25	6.25	6.00	5.50	6.50
2010	6.75	7.75	7.00	6.75	6.13	5.58

Source: Bank of Mauritius Annual Report, various issues.

Note: Margin1= lending rate to Personal/Professional– Saving rate; Margin2 = lending rate to Traders – Savings rate; Margin3 = lending rate to Financial Institutions – Savings rate; Margin4 = lending rate to EPZ–Saving rate; Margin5= lending rate to Financial Institution–3-month deposit rate; Margin6= lending rate to Personal/Professional -1year deposit rate.

4. Motivation and proposed framework

The focus of this paper is to investigate the factors responsible for high bank margins in Mauritius with special reference to policy changes. We discuss first some of the features of government interventions in the banking sector before developing a framework. First, until recent years, government intervened in the allocation and pricing of financial resources by fixing interest rates and imposing credit ceilings. In such a situation, allocation of funds might have been inefficient because of uneven credit rationing criteria and lack of incentive by banks to compete for public deposits because deposit rates are also administratively fixed. Secondly, the allocation of funds to poor performing sectors could have increased the credit risk for commercial banks. The slow development of direct financial markets in the Mauritian economy could be seen as another factor which has led the banking sector to absorb too much risk given the heavy reliance on banking finance. Thirdly, with changes in interest rates, however, banks are constrained in charging the appropriate interest on loans and the only option available was to offer the minimum possible interest rate on deposits.

Following financial deregulation, considerable changes are expected in banking market structure, financial depth, financial controls and interest rate volatility which might have implications for bank margins. However, the persistence of high level of interest rate margins despite various attempts to liberalize the banking market and develop other financial institutions has been a disquieting outcome of the reform process. It will be instructive to look at the impact of policy changes on interest rate margins. In this case, we will test the effects of policy variables such as bank reserve requirements and financial regulation on the level of interest rate margins. We will estimate the direct impact of financial regulation in terms of quantitative and interest rate controls on margins.

4.1. Model specification and estimation

In the literature, a number of approaches have been used to examine the determinants of bank margins. The main approaches generally used to model bank margins are as follows. First, we have the accounting framework in which the balance sheets of commercial banks are used to calculate and decompose interest rate margins. This exercise gives insights about the various underlying factors. Second, some researchers have model banks as profit-maximisers and derive reduced form equations for interest rate margins.

Finally, a number of researchers have also specified and estimated reduced form equations of bank margins including the policy variables as additional determinants as found in the literature. It is this last approach that will be followed in our study of bank margins.

It has been found in the literature that various macroeconomic variables such as inflation, economic growth, reserve requirements, savings deposits, government credit from the banking system, interest rate volatility, market share and risk are taken as determinants of interest rate margins. In addition to investigating the effects of these variables, the main contribution in this study will be to test for the impact of financial repression and financial depth on interest rate margins. We will distinguish between quantitative and interest rate controls and their impact on bank margins.

In line with the literature, we specify a general model to explore the determinants of bank margins as given below:

$$\text{IRM} = F(\text{RY}, \text{RES}, \text{INF}, \text{YD}, \text{BMS}, \text{IFR}, \text{IRV}, \text{FD}) \quad (1)$$

where,

IRM = Interest Rate Margin

RY = Real Income (Real Gross Domestic Product)

RES = Bank Reserves

INF = Inflation

YD = Yield on 91-day Treasury Bills

BMS = Bank Market Share

IFR = Index of Financial Repression

IC= Interest Rate Controls and QC= Quantitative Controls and

OC= Overall controls

FD = Financial Depth (M2/GDP)

REY = Reserves/Real GDP

IRV= Interest Rate Volatility

4.2. Hypotheses building

We intend to test the following hypotheses by estimating equation 1. We adopt a general to specific approach. Researchers have found both statistically significant positive and negative relationship between real income (RY) and margins (IRM). A rise in income in the economy can lead to higher bank margins when there is an excess demand for bank loans given the availability of investment opportunities. Banks can raise lending rates and reduce deposit rates due to higher growth in deposits. On the other hand, it can be hypothesized that a rise in income can lead to a fall in bank margin when the growth in banks' deposits is greater than the demand for bank loans. A fall in the demand for loans is leading to a more than proportionate fall in lending rate than the increase in deposit rate, hence reducing the margins. In the light of this, the expected sign of the coefficient on real income is assumed to be indeterminate.

In the case of bank reserves (RES), a positive relationship with margins is generally found in the empirical literature. Reserves represent an implicit tax on banks and these costs may be passed on to customers in terms of higher lending rates and hence, a positive relationship is expected between bank reserves and margins. As for inflation (INF), it is expected to have a dampening effect on margins. High inflation has adverse effects on the economy and in particular, the financial sector. It also represents higher costs of financial intermediation and a fall in the demand for bank deposits. Banks will normally pay higher deposit rates to compensate for a fall in real income on deposits therefore reducing margins. Thus, we expect a negative sign on the coefficient of inflation. Moreover, portfolio investments by banks in short-term and long-term instruments can lead to a fall in bank margins. For instance, higher returns on alternative investments (YD) in other financial institutions due to greater competition can also lead to lower bank margins. In this case, banks would reduce their lending rates or offer higher deposit rates in order to consolidate their market share.

There is empirical evidence using SCP framework (Gilbert, 1984) that a higher market share in the banking sector (BMS) have a positive effect on margins. A higher market share indicates monopoly power, which banks can use to pay lower deposit rates and charge higher rates on loans. Financial repression (IFR) in terms of interventions in the banking sector by imposing credit ceilings and fixing interest rate may lead to higher costs of financial intermediation and hence, higher margins. The financial depth (FD) and development is expected to have a negative relationship with margins because in a more developed financial system, we expect higher financial competition and efficiency, thus leading to lower margins. Another important factor having bearing on margins is interest rate volatility (IRV). It is expected that higher interest rate volatility would have a positive impact on margins

Savings deposits (SD) and bank credit to government (GC) are two important factors not included in equation. The influence of these factors is nevertheless present in our construction of other variables. Savings deposits and real income are highly correlated. Bank credit to government is included while developing the financial repression index (OC).

4.3. Sources of data, construction of variables and diagnostic tests

Data on financial variables, namely interest rates, bank reserves and money supply are obtained from various reports of the Bank of Mauritius. GDP data are available in CSO's National Income Accounts. The difference between the lending rate to the Personal/Professional sector and deposit rate on savings rate has been used as a measure of interest rate margin. The three indices of financial repression, namely interest rate controls, quantitative controls and overall banking controls have been constructed using the principal component method. These are summary measures of financial restraints which incorporate the joint influence of several or all policy variables. The first index (IC) consists of a summary measure of all interest rate controls in the form of ceilings and floors on deposit and lending rates. The second index (QC) captures all quantitative controls such as different types of credit ceilings and reserves requirements. Finally, the overall index (OC) is constructed which encapsulates all banking controls including exchange rate, capital controls and bank credit to government.

The market share represents the proportion of the assets of the two largest banks out of total assets of the 21 commercial banks. Due to the unavailability of long-term detailed balance sheets of individual banks over a long period of time, it has been difficult to construct other measures of market share. Finally, the moving three-year and five-year standard deviations of yields on 91-day Treasury bills have been used as a measure of interest rate volatility.

Before entering into estimation, the time series properties of the annual data are tested. The order of the variables has been examined using the Augmented Dickey Fuller unit root test. Margin, real income, bank reserves, financial depth, market share, interest rate volatility and the three indicators of financial repression are found to be integrated of order one. However, inflation rate is stationary in the level form. The presence of any cointegrating relationship between the variables has been tested using both the Engle-Granger approach and Johansen and Julius technique. No evidence of cointegration is found using both the methods. Table 4.8 gives the results of the Johansen and Julius cointegration test. Both the Eigen and trace statistics are found to be smaller than the 5% critical values thus rejecting the null hypothesis of at least one cointegrating vector. Given a very high multicollinearity between reserves and real income, we have constructed variable REY (reserves/real GDP) to be used as a regressor in some of the regressions. DW statistic and the Lagrange multiplier (LM) test have been used to detect serial correlation while the Ramsey Reset (RR) test statistics tests for any misspecification.

Table 3

Johansen Cointegration Test

Margin, Inflation, Bank reserves, Real income Equation				
Hypothesised No. of CE	Maximum Eigen Statistic	5% Critical Value	Trace Statistic	5% Critical Value
$r \leq 1$	29.6	31.7	59.9	63.0

5. Estimation and Analysis of Results

Regressions have been estimated using both level and first difference. However, since estimations in level form indicated the problems of serial correlation and misspecification, the results generated from first difference are reported. Boxes 1 (a) and (b) display the regression results.

Box 1(a): Regression Results

$$\Delta \text{IRM} = 7.99 - 0.00004 \Delta \text{RY} - 0.620 \text{INF} - 0.459 \Delta \text{YD} + 2.22 \Delta \text{IRV} \quad (4.4)$$

(3.56) (-2.39) (-3.21) (0.68) (1.16)

$$\bar{R}^2 = 0.45, \quad \text{LM} = 0.006 \text{ (p=0.940),}$$

$$\text{DW} = 1.9, \quad \text{RR} = 0.0007 \text{ (p=0.933)}$$

$$N = 30$$

$$\Delta \text{IRM} = 9.30 - 0.0007 \Delta \text{RY} - 0.750 \text{INF} - 0.201 \Delta \text{YD} + 1.28 \text{OC} \quad (4.5)$$

(3.91) (-2.16) (-3.97) (0.68) (1.41)

$$\bar{R}^2 = 0.47, \quad \text{LM} = 0.006 \text{ (p=0.938),}$$

$$\text{DW} = 1.8, \quad \text{RR} = 0.030 \text{ (p=0.862)}$$

$$N = 30$$

$$\Delta \text{IRM} = 8.41 - 0.0006 \Delta \text{RY} - 0.691 \text{INF} - 0.417 \Delta \text{YD} + 1.43 \text{QC} \quad (4.6)$$

(3.76) (-2.10) (-3.61) (-0.63) (1.30)

$$\bar{R}^2 = 0.46, \quad \text{LM} = 0.257 \text{ (p=0.874),}$$

$$\text{DW} = 1.81, \quad \text{RR} = 0.019 \text{ (p=0.890)}$$

$$N = 30$$

$$\Delta \text{IRM} = 9.12 - 0.0001 \Delta \text{RY} - 0.655 \text{INF} - 0.024 \Delta \text{YD} + 2.78 \text{IC} \quad (4.7)$$

(4.12) (-2.56) (-3.51) (-0.39) (1.81)

$$\bar{R}^2 = 0.50, \quad \text{LM} = 0.509 \text{ (p=0.581),}$$

$$\text{DW} = 1.82, \quad \text{RR} = 0.315 \text{ (p=0.581)}$$

$$N = 30$$

Box 1(b): Regression Results

$$\Delta \text{IRM} = 6.43 - 0.006 \Delta \text{RY} - 10.70 \text{MS} - 0.55 \text{IC} + 0.299 \Delta \text{FD} \quad (4.8)$$

(1.28) (-1.89) (-0.50) (-2.83) (0.38)

$$\bar{R}^2 = 0.50, \quad \text{LM} = 0.509 \text{ (P=0.581)},$$

$$\text{DW} = 1.82, \quad \text{RR} = 0.315 \text{ (p=0.581)}$$

$$\text{N}=30$$

$$\Delta \text{IRM} = 8.0 - 0.0007 \Delta \text{RY} - 0.607 \text{INF} + 3.19 \text{IC} + 1.84 \text{QC} \quad (4.9)$$

(3.95) (-2.42) (-3.56) (2.03) (1.71)

$$\bar{R}^2 = 0.47, \quad \text{LM} = 2.57 \text{ (p=0.122)},$$

$$\text{DW} = 1.35, \quad \text{RR} = 0.802 \text{ (p=0.790)}$$

$$\text{N}=30$$

$$\Delta \text{IRM} = 7.58 - 0.0006 \Delta \text{RY} - 0.238 \Delta \text{YD} - 0.607 \text{INF} - 1.41 \text{DUM1} \quad (4.10)$$

(2.78) (-0.73) (-0.34) (-3.51) (-1.81)

$$\bar{R}^2 = 0.38, \quad \text{LM} = 0.055 \text{ (p=0.816)},$$

$$\text{DW} = 1.85, \quad \text{RR} = 0.402 \text{ (p=0.532)}$$

$$\text{N}=30$$

The constant term is found to be positive and significant in most of the regressions indicated in the box. This constant may represent part of the fixed costs on interest rate margin. These costs may be passed on to customers in terms of higher margins.

In most of our regressions, we obtain a negative and statistically significant relationship between changes in real income and changes in bank margin. Higher real income can lead to lower bank margins in terms of lower demand for loans and higher deposit rates which should be paid by the banks to attract deposits. However, the estimated coefficient is very small.

Since the opportunity cost of holding unremunerated reserves is higher, reserve requirements act as an implicit tax to banks and thus increase bank margins through increased costs. Thus, a positive relationship is expected between bank reserves and margins. Although our regression results indicate a positive sign on the coefficient of reserves, it is not statistically significant. Given the imposition of credit ceilings until 1993, there has most probably been an excess liquidity in the banking system. This is probably the reason why the impact of reserves has not been rightly captured in the regressions.

Inflation entails higher costs but also higher non-interest income through increased transactions. This allows banks to reduce their interest rate margin which may explain the negative and significant relationship between inflation and margins. This result is however not consistent with Hanson (1996) who finds a positive and significant relationship between inflation rate and margins. He explains the positive relationship between margins and inflation in terms of higher bank costs. Moreover, in the case of Mauritius, this negative relationship may be also explained in terms of interest rate policy. In order to maintain positive real interest rate on deposits, policy makers have been raising deposit rate in times of high inflation and thus, leading to lower bank margins.

In order to capture the effects of financial sector development, we have also regressed margins on financial depth. Contrary to expectations, we obtain a positive but insignificant relationship between financial depth and bank margins. A dummy variable has been used to capture financial liberalisation and found to be negative and insignificant. This probably implies that financial liberalisation has not impacted the relationship between margins and the policy variables in the economy over the period of study. This can be explained due to the slow pace of financial liberalization through interest rate management.

We attempt to test the effects of financial regulation in terms of quantitative controls and interest rate controls on bank margins. As expected in both cases, we find a positive and significant effect on margins. Financial repression leads to higher costs of intermediation which would result in higher margins. This would imply that financial repression leads to inefficient pricing and allocation of financial resources. With deeper financial liberalization beyond interest rate management, this inefficiency is expected to reduce.

A higher market share increases the market power and generally contributes to higher interest rate margins since larger banks tend to have higher margins. In Mauritius, given the monopolistic structure of our banking system where two major banks occupy more than 70 % of deposits, we would have expected market share to contribute positively to interest margins. Contrary to expectations, we obtain a negative relationship between market share and margins although the coefficient is not statistically significant. This may be an indication of competition among the big banks in Mauritius.

Treasury bills are safe financial assets and have generally been an alternative portfolio investment for banks. We would have expected a negative impact of Treasury bill yield on margins. However, we observe a negative sign in all the regressions and the coefficients are not statistically significant.

Volatility in interest rates increases interest risks which in turn have a positive effect on interest margin. We find a positive impact of interest rate volatility on margins although it is not statistically significant. The positive relationship between volatility and margins suggests that macroeconomic policies consistent with reduced interest rate volatility can have a positive effect on financial resource allocation by reducing bank margins.

6. Conclusion and policy implications

The main purpose of this paper was to examine the determinants of interest rate margins in Mauritius. The analysis followed a general-to-specific estimation of a single equation using annual data for the period 1980 to 2010. In the light of the empirical evidence discussed above, the following policy measures are tested for the impact of real income, inflation, market share, unremunerated reserves, financial depth, banking controls, alternative investments, and interest rate volatility on the level of bank margins. We found evidence that real income and inflation have a negative impact on bank margins. Financial repression captured by quantitative and interest rate controls have a positive and significant effect on margins.

A higher market share increases the market power and generally contributes to higher interest rate margins since larger banks tend to have higher margins. In Mauritius, given the monopolistic structure of our banking system where two major banks occupy more than 70 % of deposits, we would have expected market share to contribute positively to interest margins. Contrary to expectations, we obtain a negative relationship between market share and margins although the coefficient is not statistically significant. This may be an indication of competition among the big banks in Mauritius.

Several policy implications follow from the empirical findings: a) policy measures that would lead to a decrease in government borrowing from the commercial banks and decrease in discount rate of the central bank have potentials for reducing the interest rate margins in Mauritius, and b) reduced statutory reserve requirement ratio prescribed by the central banks would also serve to reduce the interest rate margins. An extreme policy approach in contemporary literature would be central bank elimination in monetary policy programming of the statutory reserve requirement, an implicit tax in bank operations; c) lack

of a negative effect of the level of development of the banking sector on interest rate spread in Mauritius suggest the financial system is yet to be vibrant; and, therefore, more efforts should be directed to development of a competitive financial system. Measures by the central bank to maintain low inflation, which is factored in pricing of financial assets, would also help reduce interest rate spreads in the commercial banking sector.

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