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Instruments and practices concerning the absorption and use of structural and cohesion funds in Romania

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Abstract. *In view to improve the competitiveness and economic growth as well as to diminish the gaps between Romania and the EU developed states, the Structural and Cohesion Funds represent an outstanding source of investment.*

The operationalisation of the structural instruments is paramount for a sustainable socio-economic development.

After Romania joined the European Union, during the programming period 2007-2013, Romania has been allocated approximately 19.21 billion euro from Structural and Cohesion Funds and Romania's contribution (including private sources) to complement the EU investments was forecasted to reach at least 5.6 billion euro.

The absorption of Structural and Cohesion Funds has represented one of the major priorities of the Government of Romania since the approval of the Operational Programmes, Romania being among the first Member States whose Operational Programmes were approved by the European Commission. The difficulties faced since the very beginning of implementation have overlapped with the effects of the economic and financial crisis, thus the absorption rate was under the previous expectations. The management authorities and the beneficiaries have also faced multiple and complex problems.

The current paper aims to present the institutional mechanisms, instruments and practices for the absorption and use of structural funds in Romania, focusing on the main problems and challenges during the implementation process.

Keywords: absorption capacity, Structural Funds, instrument.

JEL Classification: O30, O35.

1. Background

For the time being, the European Union is facing the challenge of overcoming the global economic and financial crisis as well as the accomplishment of the objective to become a more dynamic and competitive economy.

The cohesion policy is aimed at reducing the economic, social and territorial disparities among the EU regions. Its Structural Funds and its Cohesion Fund represent a genuine expression of solidarity, triggering the economic recovery and convergence in the European Union. As stated by the Report to the European Council (2012), the European Structural Funds and the co-financing provided by Member States, constitute a very significant proportion of public investment in Europe – “more than half of all public investment in several Member States”.

In times of necessary fiscal consolidation, the EU structural funds are contributing significantly to Europe's prosperity and the accomplishment of the goals of Europe 2020 Strategy.

The Cohesion policy aims investments in view to modernise national and regional economies through the support of innovation and job creation, entrepreneurship, research and development, by building key network infrastructures, protecting the environment, enhancing social inclusion and enhancing the administrative capacity. The effective implementation of the cohesion policy is outstanding since 2008 because it ensures the continuous public investments in the EU Member States.

The Cohesion policy is financed by means of three structural instruments: the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF). The projects funded through the structural instruments are based on co-financing in view to strengthen project ownership and sound management.

Concerning the programming period 2007-2013, the budget allocated to the regional policy amounts to around 348 billion euro, comprising 278 billion euro for the Structural Funds and 70 billion euro for the Cohesion Fund, representing 35% of the Community budget and also the second largest budget item after agriculture.

The objectives of the Cohesion policy are as follows:

- *Convergence objective* aimed to accelerate the convergence of the least developed Member States by improving growth and employment conditions. The EU contribution is ranging from 75% to 85% for the projects supported by ERDF and ESF and up to 85% for the Cohesion Fund.
- *Regional competitiveness and employment objective*, which aims to trigger the economic and social change, promoting innovation, entrepreneurship and environmental protection. The EU contribution is ranging from 50% to 85% for the projects supported by ERDF or ESF.
- *European territorial cooperation objective* is targeted to strengthen cooperation at cross-border, transnational and inter-regional levels. The projects supported by ERDF receive 75%.

According to the Strategic report of the European Commission (COM 2013(2010)), around 400000 jobs have been created, 53160 start-ups have been sustained, support has been given to 53240 RTD projects and 16000 cooperation projects between enterprises and research institutions, over 19000 educational infrastructure projects have received support, about 700,000 civil servants have upgraded their skills and four EU Member States (Bulgaria, Greece, Hungary and Romania) implement programmes dedicated to institutional capacity building.

In order to overcome the financial crisis, the European Commission has been working in partnership with the Member States and it has made efforts in view to ensure that the structural funds comply with the most important needs. In this respect, the European Commission has proposed a number of innovative ways in order to accelerate the disbursement of structural funds and to make them more flexible and responsive, especially in the most vulnerable Member States.

Thus in 2011, the EU Regulation No. 1311/2011 of the European Parliament and of the Council stipulated certain provisions relating to financial management for certain Member States experiencing or threatened with serious difficulties with respect to their financial stability. The Regulation provides a temporary increase of EU contribution by ten percentage points (top-up mechanism). Romania together with Greece, Ireland Portugal, Hungary, Latvia benefited of the mechanism since 2011 and Spain and Cyprus since 2012.

2. Absorption capacity of the structural instruments

The absorption of Structural and Cohesion Funds has been acknowledged as a major concern related to the implementation of the EU cohesion policy.

The absorption capacity represents the capacity of a country to effectively and efficiently allocate the European Funds and the extent to which a state is able to fully spend the allocated financial resources from the EU funds in an effective and efficient way (Šumpíková et al., 2003), being expressed in percentage of the total allocation.

According to the literature review, a high absorption capacity depends on a large extent on the macroeconomic capacity, defined and measured in terms of GDP, financial capacity and administrative capacity.

The institutional factors are important both at EU level (consistency and increased coordination in the fund allocation process) and at national level.

According to Horvath (2008), the financial absorption capacity is also very important as it represents the ability to co-finance EU-supported programmes and projects, to plan and guarantee these national contributions in multi-annual budgets, and to collect these contributions from several partners (public and private), interested in a programme or project.

At the same time, the absorption capacity is correlated directly to the ability of central and regional authorities to prepare consistent multi-annual plans, to face the currents

challenges and problems, to finance and supervise project implementation, to decide on programmes and projects, to arrange coordination among the main partners and to fight against corruption.

As stated by Kálmán (2002) the new EU Member States have to face an outstanding challenge, as many of them are still ongoing “public administration reforms with overburdened institutional framework, poorly trained human capital and weak inter-vertical communication, all of these creating a higher cost, and a weak absorption capacity”.

Also “the human capital presents another problem, as it has been observed that many times, the people working in monitoring and managing Structural Funds, do not have the proper job training, or there are budgetary restrictions that translate into insufficient trained personnel, or even lack of a proper number of civil servants.” (Kálmán, 2002).

The European Commission (Strategic report, COM, 2013) has also identified several factors with impact on the absorption capacity. Those factors relate to the late start of programmes due to the extension of the previous period, inadequate administrative capacity, challenges in preparing major infrastructure projects and obtaining Commission approval, changes in EU legislation, inconsistent political ownership (changes in national and regional governments, changes to institutions).

Other important factors for the absorption capacity take into consideration the complex implementation system, financial management, control and audit both at EU and national level.

Of course a high absorption represents an important quantitative indicator. At the same time, the following aspects are essential: the qualitative aspect, the quality of the projects, the excellence of the projects, the right projects for the real needs, the success of the project implementation in achieving the objectives.

Therefore, the European Commission has taken a range of actions to enhance growth through the use of structural funds, in view to ensure a quicker delivery of the available funding.

2. Status of implementing the Structural and Cohesion Funds in Romania

After Romania joined the European Union, the absorption of Structural and Cohesion Funds has represented one of the major priorities of the Government of Romania. The main programming documents are as follows: the National Development Plan for 2007–2013, the National Strategic Reference Framework 2007–2013, The National Reform Programme 2011-2013.

The fundamental objective of the National Strategic Reference Framework aims „to reduce the disparities of economic and social development between Romania and the EU Member States by generating an additional growth of 10% GDP until 2015”.

The seven Operational Programmes for the Convergence Objective in view to implement the National Strategic Reference Framework 2007-2013 benefit of an allocation of 19.21 billion Euro from the Structural Funds (ERDF, ESF, CF) and a national co-financing estimated at around 5.6 billion Euro (including private sources). The breakdown of the EU allocation on the three funds is as follows:

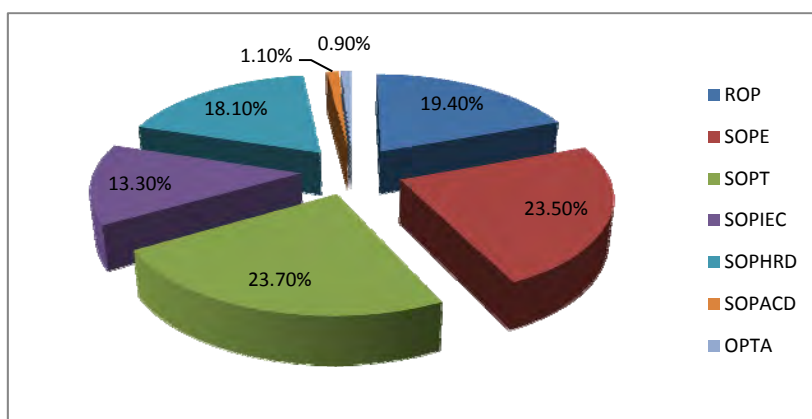
- European Regional Development Fund – 8.976 billion euro.
- European Social Fund – 3.684 billion euro.
- Cohesion Fund – 6.552 billion euro.

Table 1 reflects the allocations and structural instruments for the Operational Programmes in the framework of the Convergence objective.

Table 1. Operational Programmes, allocations and structural instruments for the Convergence objective

Operational programme	Abbreviation	% of allocated amounts from the total budget	Structural instrument
Regional Operational Programme	ROP	19,4%	ERDF
Sectoral Operational Programme Environment	SOPE	23,5%	Cohesion Fund ERDF
Sectoral Operational Programme Transport	SOPT	23,7%	Cohesion Fund ERDF
Sectoral Operational Programme Increase of Economic Competitiveness	SOPIEC	13,3%	ERDF
Sectoral Operational Programme Human Resources Development	SOPHRD	18,1%	ESF
Sectoral Operational Programme Administrative Capacity Development	SOPACD	1,1%	ESF
Operational Programme Technical Assistance	OPTA	0,9%	ERDF

Figure 1. Breakdown of allocations for the Operational Programmes, 2007-2013



Source: based on data of the Ministry of European Funds, <http://www.fonduri-ue.ro/>

In establishing the concrete targets for each operational programme, there were taken into consideration the rates of economic growth estimated on the basis of the positive developments registered during the pre-accession period.

As an overview, the period 2007–2012 could be divided into three distinct intervals: 2007 and 2008, which complied with the forecasts, 2009 and 2010 were marked by a profound recession, 2011 and 2012 revealing an economic recovery.

It is worth to mention that the profound economic crisis had negative impact on businesses in Romania, exerting also a major pressure on the public budget.

Thus, since 2009, the Government of Romania has applied a series of legislative, financial, budgetary measures in view to counter the effects of the crisis and for economic recovery.

In this context, the increase of the absorption capacity represented an objective for the National Reform Programme 2011–2013 and key measures have been taken by the Government of Romania in view to improve the whole mechanism for absorption.

In the context of implementing anti-crisis measures with the support of the structural instruments, actions have been taken in view to ensure a higher and broader accessibility for the public and private sector, by providing broad information about the European funds, by financing investments in direct correlation with a more efficient use of human resources.

The Regional Operational Programme (ROP) has brought a significant contribution to diminishing the effects of the economic crisis through the increase of jobs created. Thus, according to the projects contracted over 18000 new jobs have been created.

The purpose of ROP is to support an equally balanced growth of all regions of Romania, not so much by redistributing public resources but by ensuring that all areas should have a minimum level of business, social and human capital infrastructure in order to trigger the economic growth. The financial allocations at the regional level are based on local development stage by privileging more underdeveloped regions. The projects financed have a major impact in the context of local development, being facilitators of growth: rehabilitation and modernisation of local transport infrastructure to improve accessibility, education and health infrastructure to ensure human capital formation and healthy population, strengthening the business support structures (industrial, logistics and business parks) to attract investors, support to business creation of micro companies to allow local market to reach a critical self-sustaining mass, valorisation of the local tourism, cultural and natural patrimony by supporting the tourism infrastructure development and related entrepreneurial initiatives.

The Sectoral Operational Programme Environment (SOPE) aims to protect and improve the environment and living standards in Romania, reducing the infrastructure gap between the European Union and Romania in terms of quantity and quality.

Taking into consideration the dimension and complexity of the projects financed through the SOPE, the investments in environment infrastructure are triggering the development of other areas of activity, through creation of jobs in complementary or related fields, thus contributing to the local and regional economic development.

Two categories of projects are financed: major projects and demand-driven projects. The major projects comply with the requirements of *acquis communautaire* and commitments of Romania through the Treaty of Accession to the EU – Chapter 22 on environment.

Using the top-up mechanism, the EU contribution for the whole operational programme has increased to 85%, thus diminishing the national co-financing by around 300 million Euro.

Concerning the Sectoral Operational Programme Transport, the investments will contribute to modernisation of highways, roads and railways, river and air transport, ensuring a balanced transport infrastructure at European standards. In this way, accessibility will increase, quality, efficiency and speed of the transport services will improve. This programme contributes to construction and upgrading of the transport infrastructure, generating also new jobs in related fields of activity.

The European funds in the Sectoral Operational Programme Increase of Economic Competitiveness represent a concrete modality in view to compensate the negative effects of the crisis and the measures of austerity, and financial resources are ensured for investments in various fields, production, research-development-innovation, information and communication technology.

The specific objectives of the programme focus on consolidation and environment-friendly development of the Romanian productive sector, establishing a favourable environment for sustainable enterprises' development, increasing the R&D capacity, stimulation of cooperation between RDI institutions and enterprises, valorising the ICT potential and its application in the public administration and private sector.

For example the project “Extreme Light Infrastructure – Nuclear Physics” represents a good example, the project constituting a complex research infrastructure, which inscribes in the list of big laboratories worldwide. This project will have a major impact both for general and applied research and it reveals the international recognition concerning the research resources and capacities of Romania.

In the framework of Sectoral Operational Programme Human Resources Development, a good example reflecting the positive contribution to countering the effects of the economic crisis consists in the three state aid schemes aimed to meet the labour market needs: a scheme for vocational training, a scheme for employment and a scheme of minims. The beneficiaries are the enterprises requiring financing for training or specialisation of employees, for employing disadvantaged persons, in view to develop mentorship programmes or to implement measures for health and safety at work.

The Sectoral Operational Programme Administrative Capacity Development represents an instrument for supporting the activities of the authorities and institutions of central and local government.

This programme aims to contribute to the creation of a more efficient and effective public administration for the socio-economic benefit of Romanian society.

The specific objectives are focused on achieving structural and process improvements of the public policy management cycle and improving the quality and efficiency of the delivery of public services on a decentralised basis.

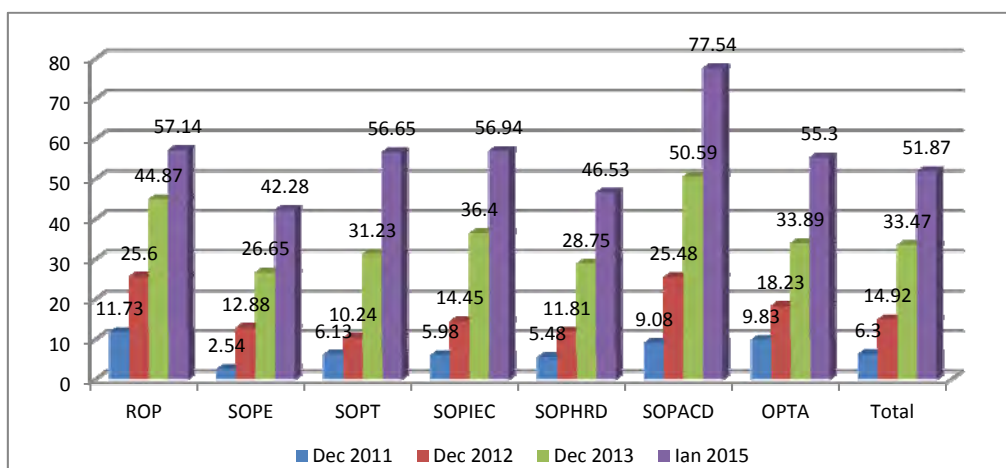
This programme has supported the best initiatives of reform in public management, human resource development at the level of public institutions and authorities as well as the processes of public service decentralisation. The sustained efforts have been translated into an accelerated pace of contracting and absorbing the available funds.

Table 2. Evolution of the absorption rate (%) of EU contribution for the Operational Programmes

Programme	Dec. 2011	Dec. 2012	Dec. 2013	Jan. 2015
Regional Operational Programme	11.73	25.6	44.87	57.14
Sectoral Operational Programme Environment	2.54	12.88	26.65	42.28
Sectoral Operational Programme Transport	6.13	10.24	31.23	56.65
Sectoral Operational Programme Increase of Economic Competitiveness	5.98	14.45	36.4	56.94
Sectoral Operational Programme Human Resources Development	5.48	11.81	28.75	46.53
Sectoral Operational Programme Administrative Capacity Development	9.08	25.48	50.59	77.54
Operational Programme Technical Assistance	9.83	18.23	33.89	55.3
Total	6.3	14.92	33.47	51.87

Source: based on data of the Ministry of European Funds, <http://www.fonduri-ue.ro/>

Figure 2. Evolution of the absorption rate (%) of EU contribution for the Operational Programmes



Source: the authors.

As revealed by Table 2 and Figure 2, in 2014, the highest absorption rate is registered for the Sectoral Operational Programme Administrative Capacity Development (77.54%), followed by Regional Operational Programme (57.14%) and Sectoral Operational Programme Increase of Economic Competitiveness (56.94%). At the other extreme, the lowest absorption rate is recorded for Sectoral Operational Programme Environment (42.28%) and Sectoral Operational Programme Human Resources Development (46.53%).

The current absorption rate of 51.87% at the end of January 2015 was increased almost by six times further the following measures:

- Implementation of direct payment mechanisms for the activity of public and private final beneficiaries;
- Flexibility of the public procurement procedures for the private beneficiaries;
- Promotion of efficient mechanisms in view to implement major infrastructure projects;
- Reducing the average period of processing the requests for reimbursement and payment (for example, SOPHRD from 60 days to 20 days);
- Simplifying the project access and implementation through reducing the average period of project evaluation and selection (for example, SOPHRD from 6-9 months to 1-2 months);
- Implementing new mechanisms for preventing the conflicts of interests.

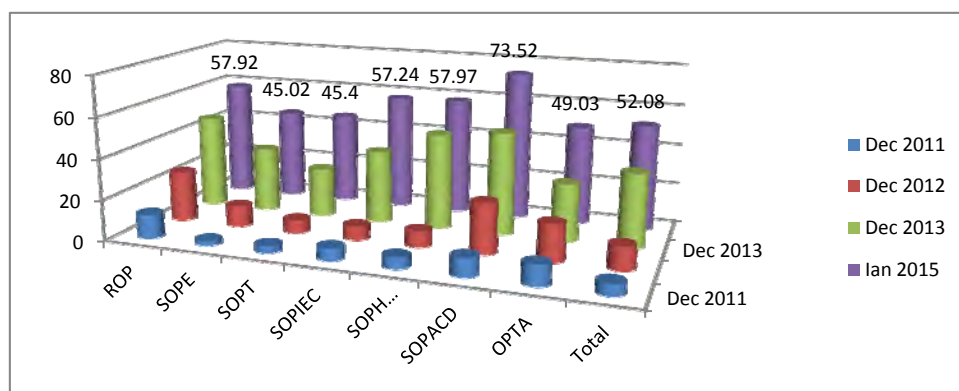
Table 3 reflects the percentage of reimbursement for each Operational Programme.

Table 3. Evolution of the rate (%) of reimbursement for the Operational Programmes

Programme	Dec. 2011	Dec. 2012	Dec. 2013	Jan. 2015
Regional Operational Programme	11.73	24.7	45.94	57.92
Sectoral Operational Programme Environment	2.12	10.3	31.93	45.02
Sectoral Operational Programme Transport	3.39	6.46	24.23	45.4
Sectoral Operational Programme Increase of Economic Competitiveness	5.98	6.77	35.82	57.24
Sectoral Operational Programme Human Resources Development	5.48	7.73	47.04	57.97
Sectoral Operational Programme Administrative Capacity Development	9.08	24.63	50.4	73.52
Operational Programme Technical Assistance	9.83	18.23	28.22	49.03
Total	5.55	11.47	36.47	52.08

Source: based on data of the Ministry of European Funds, <http://www.fonduri-ue.ro/>

Figure 3. Evolution of the rate (%) of reimbursement for the Operational Programmes



Source: the authors.

As expressed by Figure 3, the development of the rate of reimbursement is similar with the evolution of the absorption rate.

For the time being, the total amounts required from the European Commission represent 12.06 billion euro, of which 10.73 billion euro were already received.

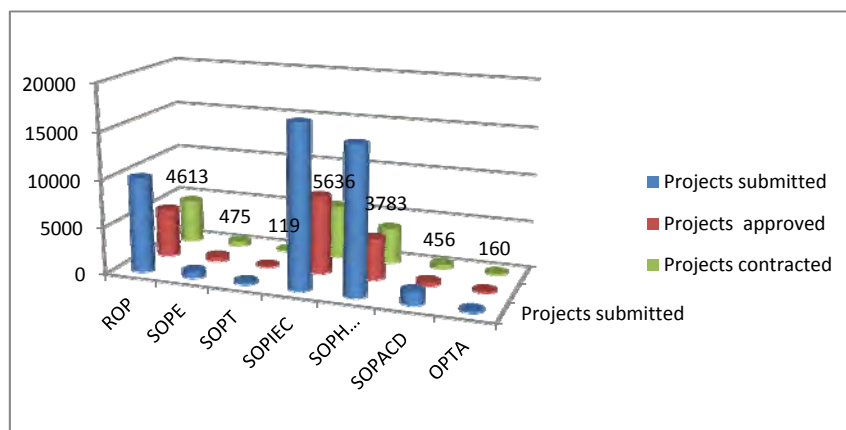
During the period 2013-2014, Romania recorded the highest growth of the reimbursement amounts versus the period 2007–2012 in the European Union, 236%, followed by Italy, 125%, Cyprus, 106%, Malt, 97%, Greece, 90%, Bulgaria, 89%. This important accomplishment represents the outcome of the measures taken by the Government of Romania in terms of simplifying and enhancing the efficiency of the reimbursing system, reflecting also the higher efforts of the Romanian authorities in achieving the objectives designed.

Table 4. Status of the projects submitted, approved and contracted for each Operational Programme on 31 January 2015

Programme	Projects submitted	Projects approved	Projects contracted
Regional Operational Programme	10046	5125	4613
Sectoral Operational Programme Environment	703	525	475
Sectoral Operational Programme Transport	256	136	119
Sectoral Operational Programme Increase of Economic Competitiveness	17089	8248	5636
Sectoral Operational Programme Human Resources Development	15419	4339	3783
Sectoral Operational Programme Administrative Capacity Development	1371	456	456
Operational Programme Technical Assistance	191	167	160
Total	45075	18996	15242

Source: Ministry of European Funds, <http://www.fonduri-ue.ro/>

Figure 4. Status of the projects submitted, approved and contracted for each Operational Programme on 31 January 2015



Source: the authors.

As revealed by Table 4 and Figure 4, the difference between the projects submitted and projects contracted is very high. For all programmes this difference represents 29833 projects, fact which could be explained through the lack of meeting the administrative

and eligibility criteria, lack of relevance of the projects related to the objectives of the programmes. At a global scale, the high number of projects rejected could also be explained by the existence of a great number of requests compared to the available budget.

The higher difference is registered for the Sectoral Operational Programme Human Resources Development, respectively, 11636 projects and Sectoral Operational Programme Increase of Economic Competitiveness, respectively 11453 projects.

The higher contracting rate is recorded for the projects submitted for the Operational Programme Technical Assistance, 84%, followed by Sectoral Operational Programme Environment, 68%, Sectoral Operational Programme Transport, 46%, and Regional Operational Programme, 46%. At the other extreme we find the lowest contracting rate at Sectoral Operational Programme Human Resources Development, 25%, Sectoral Operational Programme Increase of Economic Competitiveness, 33%, Sectoral Operational Programme Administrative Capacity Development, 33%.

3. Main difficulties and solutions during implementation of the European structural instruments

Both the management authorities for the operational programmes and the beneficiaries have faced various difficulties during the programming period 2007-2013.

A. Main issues during project cycle management

According to the National Strategic Report on Structural and Cohesion Funds (2013), during 2007-2009, the main difficulties relate to preparation of the portfolio of projects, launching of the requests for projects, effective start-up of project implementation at the level of beneficiaries, evaluation, selection and contracting of projects and legislative barriers.

The lack of expertise of some applicants in drawing up projects has involved requirements for revising adequately the documentation and has imposed their continuous support through the help-desk facility, activities of information and advertising and participation to events organised on local, county level by third parties.

During 2010-2013, the evaluation and selection of projects was more efficient and it has improved as to large extent external evaluators were involved in this process.

During the whole implementation period, there was recorded a gap between the number of projects approved and contracted. The following facts have been identified: the beneficiaries encountered problems in complying with the requirements for concluding the contracts, inadequate administrative capacity to process the projects approved. The large number of appeals and the heavy mechanism for solving them has represented another factor. Other difficulties relate to submission of a high number of projects in the last days before the deadline, failure of the beneficiaries to transmit complete and proper documents.

Also the difference between the value of the contracts and the payments has revealed a low pace of effective project implementation and a long period for checking the reimbursement demands.

In 2012, the Government of Romania issued the Memorandum for approving measures aimed at simplification of the process for checking the reimbursement demands corresponding to the contracts financed from structural instruments. The process of simplification comprises a package of measures aimed at simplification and reduction of requirements for documents when submitting the demands for reimbursement, eliminating the administrative checking of the items with low cost value, simplifying the procedures applied to checking the procurement of private beneficiaries.

B. Financial issues

A major problem faced by beneficiaries has related to their capacity to ensure the resources necessary for co-financing the projects. Thus, for a series of public beneficiaries (local public authorities, institutes of research, higher education institutions), the Government adopted a mechanism for supporting them in contracting credits aimed for co-financing their own projects, granting state guarantee for a series of key areas: road infrastructure, energy infrastructure, education, research-development, infrastructure in the field of health and social security (Government Emergency Ordinance no. 9/2010).

Another major problem generating delays during project implementation has related to the procedures of public procurement. Moreover, the deficiencies in the public procurement system have determined pre-adjudgment at the level of the operational programmes and application of systemic financial corrections.

In Romania, the principle of transparency is guaranteed by the legislation in force, being ensured by the National Authority for Regulation and Monitoring of the Public Procurements through the Electronic Public Procurement System (SEAP). All contracting authorities publish awarding documentation in SEAP, according to the applicable legal requirements. In this way, any company interested to participate in a procedure for awarding a public procurement contract can access SEAP to find out all the information needed in view to draw up the offer. In 2012, the Electronic Public Procurement System was improved in order to adjust to the legislative changes.

It is worth to note that there are differences between various operational programmes related to contractual documents with impact in the transparency of the public procurement market and decrease of interest of the international companies in the implementation of EU funded projects (especially for large infrastructure programmes).

C. Administrative capacity

In the context of the measures of austerity adopted to encounter the effects of the economic-financial crisis, the administrative capacity of the structures involved in the management of operational programmes has been seriously affected especially by the turnover of employees, high vacancy rates, increased workloads for the existing staff, as well as legislative restrictions concerning employment in the public system.

Thus, a large number of organisations had encountered difficulties in ensuring the adequate human resources both quantitatively and qualitatively.

Other issue relates to the insufficient capacity of these organisations to use efficiently human resource policies and practices.

The Code of conduct for avoiding the situations of incompatibility and conflict of interests by the staff involved in the management of the programmes financed from European funds was adopted by the Government at the end of December 2011.

The Ministry of European Funds has achieved the assessment of the administrative capacity of the institutions with responsibilities in the management of structural instruments. According to this assessment, the following needs have been identified:

- The need to improve and strengthen the management and control systems, to simplify the operations, procedures and to reduce the administrative burden.
- The need to improve the capacity of the beneficiaries in view to enhance project management and technical skills, access to support services and financial resources.
- The need to ensure sufficient power to the coordinating structures in order to ensure effective management and coordination.
- The need to improve the capacity to use human resource policies and practices in view to ensure adequate resourcing, continuous development of the human resources and an effective performance management, able to respond to the challenges of the system.

D. Issues concerning the macroeconomic context

The depreciation of the national currency related to euro in 2009 has triggered financial difficulties for the providers of goods and services. In 2010, the VAT was changed from 19% to 24%, leading to a series of price increase for the goods and services included in the projects of investments.

The negative evolutions in the macroeconomic context have also led to restrictions concerning the credits, with immediate effects on the access to financial resources for the companies involved in works for investments.

Thus in 2011, the Romanian authorities issued a Plan of Priority Measures in view of strengthening the absorption capacity of the structural instruments and solving the problems which generated a low absorption level.

E. Measures to be undertaken in 2015

The Romanian authorities are searching the best solutions aimed to optimize the use of European funds and to speed up the absorption rate.

The projects will be divided into two stages of implementation, in view to require the reimbursement of the eligible expenses before the end of 2015 from the funds allocated to the programming period 2007–2013. The amounts spent in the second stage of project implementation will be reimbursed from the funds allocated to Romania for the programming period 2014–2020.

At the same time, in view to accelerate the absorption rate in 2015, the last year when we can spend the funds allocated for 2007–2013, the authorities are trying to identify the projects financed from public sources, which can be finalized before the end of 2015, in order to require the reimbursement from the EU funds. This solution used also by other countries is stipulated in the European regulations. This solution has been already applied for Sectoral Operational Programme Transport and Sectoral Operational Programme Environment, and the intention is to extend the approach by identifying all the projects of the local public authorities which are implemented and respect the European rules and principles.

According to the Ministry of European Funds the following measures will be taken in view to accelerate the absorption rate:

- Continuing the process of simplification and making efficient the implementation of the programmes and projects.
- Preparing the portfolio of major projects.
- Launching the calls for projects for all Operational Programmes.
- Simplifying the mechanisms for promoting and managing the investment projects (standardization of documents, diminishing the number of documents required, reducing the deadlines for obtaining authorisations).
- Reform of public procurement on legislative level (transposing the new Directives), on institutional level (making efficient the institutions), on procedural level (standardised documentation, diminishing the number of documents required to the companies).
- Continuing the administrative reform by introducing the evaluation of the employees involved in European financed project management based on performance indicators.
- Involving the banking system in the process of accessing and implementing the Operational Programmes.
- Setting up the bank of development for ensuring the easy access to financing the beneficiaries.
- Reaching a level of 80% of absorption, according to the Governing Programme.

4. Lessons learned by the Romanian authorities

The experience in implementing the Operational Programmes during 2007-2013 has highlighted the necessity to take measures and actions in view of developing and strengthening the administrative and institutional capacity of the management structures, as well as of the beneficiaries.

The deficit of institutional capacity in managing the structural instruments represents a key problem of the period 2007-2013, both at the level of managing authorities and beneficiaries, especially in implementing major projects by local public authorities.

From the prospect of the management authorities, they have learned the lesson of the need to simplify the procedures, of outsourcing some activities and designing a realistic and flexible strategy of technical assistance in view to overcome the problems in implementation.

Other problem relates to the management system of the Operational Programmes concerning the low monitoring capacity for projects and inadequate risk management, especially for Sectoral Operational Programme Transport, Sectoral Operational Programme Increase of Economic Competitiveness and Sectoral Operational Programme Human Resources Development.

The local public authorities have represented an important category of beneficiaries, which have a decisive role in absorption of the European funds. It is essential that the local authorities hold units for preparing and implementing projects with a high level of expertise.

The expertise is important in view to solve various problems, to achieve sound financial management, especially when there are many projects to be implemented, to focus on accomplishing high quality documentation, to carry out the public procurement.

The implementation of major projects, especially in the framework of the Sectoral Operational Programme Environment and Sectoral Operational Programme Transport have revealed the necessity to correlate the proposed projects with other local development strategies, as well as to achieve substantiated analyses for the alternatives to attain the objectives. Difficulties have been encountered in drawing up feasibility studies and cost-benefit analyses, in achieving substantiated projects at the time when the programmes were launched, further delays in implementation, such as contracts without clear clauses concerning the quality of the works, achieving the schedule of activities.

Concerning the Regional Operational Programme, the main aspects reflected the necessity to implement a system of correlation in evaluating the projects financed from various European funds which aim to attain strategic objectives of territorial development.

An important issue relates to the necessity of development and operationalization of a well-defined monitoring system, which enables to achieve financial prognoses on the use of funds and attaining the indicators, as well as the coordination between various investments supported by public funds in view to concentrate the resources and maximise the impact.

Measures have been taken for the simplification and acceleration of the process of conveying reimbursement demands to the European Commission, analysing the possibilities in order to interfere in the organisation of the system without disturbing the activity of management authorities, imposing “zero” tolerance to any law infringement situation, including conflicts of interests and other aspects.

Further the problems encountered, the following best practices have started to be applied:

- Strengthening the consultancy provided to public administration authorities and institutions so that they could access more efficiently and effectively the European funds.
- Consolidating the public-private partnership in order to achieve better projects.
- Involving banks and private institutions in view to access the European funds.
- Stimulating the public bodies which attract the European funds.

- Eliminating the causes of fraud and corruption.
- Increasing the transparency of public procurement.
- Taking measures in view to intensify the execution of the projects ongoing various phases of execution.
- Improving the communication between management authorities and beneficiaries of financing from structural instruments.
- More active involvement of the management authorities in efficient and coordinated activity, as well as involvement of research-development institutes and universities in monitoring and implementing the operational programmes.

5. Perspectives of the programming period 2014-2020

The European Commission approved the Partnership Agreement with Romania on 6 August 2014, Romania being the 11th EU Member State which obtained approval for this document. It comprises the results of socio-economic analyses on areas of activity, sectoral strategies as well as the main development needs and priorities of Romania during 2014-2020.

The Partnership Agreement 2014-2020 accomplishes a general overview for attracting the European funds earmarked for that period, offering the issues of the reform of the current system.

Taking into consideration the macroeconomic context and the public policies, the Government of Romania has set up the funding priorities for the use of European funds aimed to reduce the economic and social development disparities between Romania and the EU Member States, by generating additional growth of the GDP and additional growth of employment by 2022.

In order to become a modern and competitive economy, Romania should approach the following five development challenges:

- competitiveness challenge;
- people and society challenge;
- infrastructure challenge;
- resources challenge;
- administration and government challenge.

Among the most important measures in order to reinforce the administrative capacity, the Partnership Agreement specifies:

- A horizontal policy for human resources involved in the management of the EU funds and support for introduction of effective human resource practices.
- More efficient systems and tools at all levels of implementation.
- More effective technical assistance and financial support for beneficiaries in parallel with a reduction in administrative burden.
- Elaboration of comprehensive guidelines of good practices and avoidance of the main risks in public procurement.
- Standardisation of procurement documents.

- Centralised help desk and assistance for project implementation.
- Implementation of an annual training programme for public beneficiaries.
- An effective system for planning, committing and procuring publicly funded activity.
- Reforming of public policy, better regulation and governance, transparency and accessibility in the public administration.
- Enhanced administrative and financial capacity at national, regional and local level to implement actions in pursuit of Romania's development goals.
- Developing and implementing unitary and long-term human resources strategies and policies.
- More efficient, transparent and less bureaucratic public administration that imposes a lesser burden on businesses and citizens and enjoys an improved public reputation.
- Increase and effective cooperation and coordination between central and local institutions involved in human resource management.
- Better public services which are accessible to citizens in all social groups throughout the territory of Romania.
- Developing, introducing and supporting the use of e-government tools and open data concept.

Conclusions

As revealed by the paper, the main reasons for the low absorption capacity during the programming period 2007 -2013, are as follows: the effects of the economic-financial crisis, inadequate administrative capacity, difficulties in project cycle management, low capacity to mobilise the financial resources as risk factor for operational programmes performance, inadequate financial management, control and audit, difficulties of less-favoured regions in providing co-financing for projects, various highly bureaucratic procedures for certifying documents, inadequate communication between management authorities and beneficiaries of financing from the structural instruments.

In order to accelerate the implementation of the operational programmes a series of measures have been undertaken, such as: simplification of the work procedures, simplification of the guidelines for applicants, simplification of the documentation required to beneficiaries, simplification of the clauses of the contracts of financing, organisation of events seminars and meetings in view to strength the beneficiaries' capacity.

Further the measures taken by the Government concerning the amendment of the institutional, legislative and procedural framework, the rhythm of project implementation has increased significantly as well as the absorption capacity of the European funds.

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Foreign direct investment and income inequality in Central and Eastern Europe

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Abstract. *The paper explores the impact of foreign direct investment (FDI) on income inequality in ten countries from Central and Eastern Europe (CEE) in the period 1990 – 2012. First, the theoretical and empirical literature on the distributional effect of FDI is outlined. Second, we discuss briefly general trends in FDI inflow and income inequality in the countries from CEE after 1990. Third, we estimate several fixed effects regression models and find that FDI has the potential to exert influence on income inequality but this effect varies depending on the level of education and economic development of the host countries.*

Keywords: foreign direct investment, income inequality, Central and Eastern Europe, panel data.

JEL Classification: F23; F62; O15.

1. Introduction

In line with the trend of increasing economic globalization taking place in the last three decades, an extensive body of theoretical and empirical literature has been devoted to studying the various effects of FDI on host economies. As some authors point out, however, most studies have traditionally focused mainly on the efficiency outcomes of FDI such as economic growth and productivity, leaving their distributional effects largely neglected (Figini and Görg, 2006). Therefore, studies concerning the impact of FDI on income inequality are still relatively new, scarce and ambiguous, which calls for further research on this topic. Furthermore, there are rising public concerns about the socio-economic consequences of high income inequality especially in the aftermath of the recent global economic crisis, making this issue figure prominently in current political and academic discourse.

This paper tries to contribute to the existing literature by exploring the distributional impact of FDI in the context of ten post-socialist countries from CEE, currently members of the European Union (EU) – Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and the Czech Republic. Due to the similar political and economic changes that EU membership requires, these countries provide high level of comparability (Mahutga and Bandelj, 2008). Moreover, they represent a unique context for analysis of the distributional effect of FDI because of the fact that the latter was absent in the previous regime but afterwards played an important role in the transition to a market-based economy. Starting from a very low level in the beginning of the 90s, FDI inflow in the CEE region increased substantially, with the steepest rise taking place between 2004 and 2007. Although FDI inflow in CEE countries decreased as a result of the global crisis, FDI stock is significant and has the potential to exercise significant influence on their economic and social development.

Besides the intensified economic globalization during market transition, CEE countries also experienced a pronounced upward trend in income inequality. The parallel development of these two processes suggests that there might be some sort of relationship between them which is worth studying. We argue that FDI has the potential to affect income inequality in CEE countries but its influence is not homogeneous and depends on certain features of the host economies such as their level of economic development and human capital. In order to explore the distributional effect of FDI we use a panel of the abovementioned ten countries observed over the period 1990 – 2012 and use fixed-effects method to control for time-invariant country-specific characteristics.

The rest of the paper is organized as follows: section 2 summarizes the existing theoretical and empirical research on the relationship between FDI and income inequality. Section 3 describes briefly general trends in FDI inflow and income inequality in CEE countries after 1990. Section 4 presents the chosen econometric approach and the data used. Section 5 discusses the empirical results and section 6 concludes.

2. Literature review

Several contending theories have been traditionally used by researchers to account for the distributional impact of FDI especially in developing countries. Modernization theory on the one hand and dependency and world-systems theories on the other are the first attempts to delve into the relationship between foreign capital penetration and income inequality in host economies.

Modernization theory, which emerged in the 50 - 60s and is close to neoclassical economics, assumes that countries progress from traditionalism to modernity in stages (Rostow, 1960). It states that less developed economies can converge with advanced economies by following their path of development and an integral part of this process is the integration into the world economy. Proponents of modernization theory argue that foreign capital penetration generates a variety of positive direct and spillover effects for the host economy – transfer of technology, know-how and managerial skills, employment creation, enhancement of competition, productivity and growth. As far as inequality is concerned, it is perceived as a necessary precondition for the eventual improvement of each individual's income. This is in line with the famous "Kuznets' inverted-U curve" hypothesis, according to which income inequality increases at the early stages of development but declines later once a certain stage of development is reached (Kuznets, 1955). Although modernization theorists address the distributional effect of FDI indirectly, their position is evident from the fact that regardless of the origin of capital, they always treat it positively because it fosters growth and its benefits are eventually spread throughout the whole economy. Even if FDI-induced growth is initially limited to several sectors where workers receive higher wages, in the long run the growth in these leading sectors has the potential to contribute to the decrease of income inequality in the host country.

Another set of theories includes dependency and world-systems theories which occurred in the 60s and 70s respectively as a critical reaction to modernization theory. A central tenet in dependency theory is the differentiation between core and periphery. The core is formed by developed and rich economies whereas the least developed countries form the periphery. In these theories underdevelopment is perceived as a result of exogenous factors, namely international trade and FDI which lead to a high integration of peripheral countries into the world economy. The latter, however, is dominated by the advanced industrial nations from the core which restrain the opportunity of dependent peripheral countries to follow their own path of development. It is exactly through the process of dependent development that the degree of inequality within a peripheral country is determined (Rubinson, 1976). Contrary to the implicit arguments of modernization theory, dependency theory has put forward some very specific criticisms about the negative impact of FDI on income distribution (Tsai, 1995). In the course of industrialization, accompanied by FDI penetration in less developed countries, it becomes common that employees in foreign firms tend to form a new social class ("labor elites")

and earn significantly higher wages than local firms (Girling, 1973). Although FDI entry might lead to an increase of wages in the traditional sectors, it is most likely to be accompanied by a more capital-intensive production, which in turn results in higher unemployment in the traditional sectors, thus contributing to a rise in inequality. Furthermore, within the dependency/world-systems framework the state is assumed to have a dominant role in the economy and since the aforementioned “labor elites” usually include powerful actors in the state organization, both being supported by foreign credits, an economic and political “triple alliance” occurs naturally (Evans, 1979). It has the potential to deter state’s policies aiming at improving income distribution and thus to contribute to the increase of inequality.

When analyzing the theoretical groundings of the “FDI-income inequality” nexus many authors also use international trade theory. They reckon that the distributional effect of FDI in a developing host economy is similar to that of international trade according to the Heckscher-Ohlin model and the Stolper-Samuelson theorem. They predict that both trade and FDI should take advantage of the abundance of low-skilled labor in developing countries. This leads to increased demand and higher wages for low-skilled workers, which in turn decreases wage dispersion and income inequality in the host economy. The reverse processes take place in the developed country, which is the source of FDI, with the final result being an increase in income inequality. However, some authors have addressed important theoretical arguments against these predictions. First, according to Feenstra-Hanson’s model (1997) what is unskill-intensive in a developed country may be skill-intensive in terms of the labor market of the recipient developing country. In this case FDI inflow from the developed towards the developing country may result in increasing income inequality both in the former and in the latter. Second, since the technologies transferred through FDI are likely to be more skill-intensive than those used in the host economy before FDI liberalization, FDI penetration may lead to results that are opposite to those predicted by the Stolper-Samuelson theorem, namely an increase in the demand for skilled labor and so an increase in income inequality (Lee and Vivarelli, 2006). Third, globalization is often accompanied by market-oriented policies (such as liberalization of the domestic labor market or privatization of state-owned enterprises) which might also lead to higher income inequality in the host country (Milanovic, 2003).

The brief review of the theories underlying the distributional impact of FDI reveals that they are very ambiguous which calls for empirical research on this topic. The empirical literature, however, is also far from conclusive. Earlier studies generally provide support for the dependency/world systems hypothesis. A survey of Bornschier and Chase-Dunn (1985) shows that among the fifteen studies reviewed, all but one by Weede and Tiefenbach (1981) find that FDI deepens income inequality. However, the literature that has emerged since the 90s is much more diverse. Some studies find evidence for a detrimental distributional effect of FDI, others show that FDI alleviates income inequality

and a third group of studies fails to find a statistically significant relationship between the two variables.

The first group of studies, which reveal that FDI deepens inequality, is the most extensive. In a panel data analysis on 88 countries in the period 1967 – 1994, Alderson and Nielsen (1999) find a positive relationship between FDI and income inequality. Using panel data for 65 countries in the period 1980 – 1995, Beer and Boswell (2002) find that the dependence on FDI might turn problematic for countries that are committed to the problem of income inequality. They also point out the important role of education in improving human capital, which contributes to a more even income distribution without negative effects on growth. Pernicious distributional impact of FDI is also found in the study of Reuveny and Li (2003), which uses data on 68 countries in the period 1960 – 1996. A similar conclusion is reached by Choi (2006), whose study is based on 119 countries in the period 1993 – 2002 and finds that the rise of FDI stock is associated with higher income inequality in the host country. In a panel data study on 119 developing countries in the period 1970-1999, Basu and Guariglia (2007) find that FDI fosters growth but also leads to an increase in income inequality in the host countries. For FDI to manifest positive distributional effects, the authors suggest policies aimed at improving poor people's access to education. Similar results, revealing the detrimental distributional impact of FDI, as well as the importance of education in alleviating this problem, are found in a study by IMF economists (Jaumotte et al., 2008). In a study on 10 European countries in the period 1980 – 2000, Herzer and Nunnenkamp (2011) find that FDI deepens income inequality but only in the short run. In the long run FDI contributes to a decrease of inequality. In a more recent study on Latin America, however, Herzer et al. (2013) find that in the long run FDI increases inequality.

Several studies on a single country also find that FDI leads to higher inequality. Worth mentioning are the studies of Feenstra and Hanson (1997) on Mexico, Lipsey and Sjöholm (2001) on Indonesia, Mah (2002) on South Korea, Zhang and Zhang (2003) on China, Nunnenkamp et al. (2006) on Bolivia.

A second group of empirical studies, although less extensive than the previous one, finds that FDI decreases income inequality in the host country. An example is the study of Jensen and Rosas (2007), which finds that FDI in Mexico leads to a reduction in income inequality at the state level. Bhandari (2006) examines FDI in the USA and finds that it has a beneficial distributional impact although the latter is not homogeneous across states. A similar conclusion is reached by Chintrakarn et al. (2010), who find that FDI in the USA decreases inequality but this effect is again heterogeneous across states.

A third group of studies, which fail to find statistically significant relationship between FDI and income inequality, adds to the ambiguity of the empirical literature on this topic. Milanovic (2002) uses panel data on 88 countries in the period 1985-1991 and finds that FDI doesn't exert any effect on income distribution. In a study on 29 developing

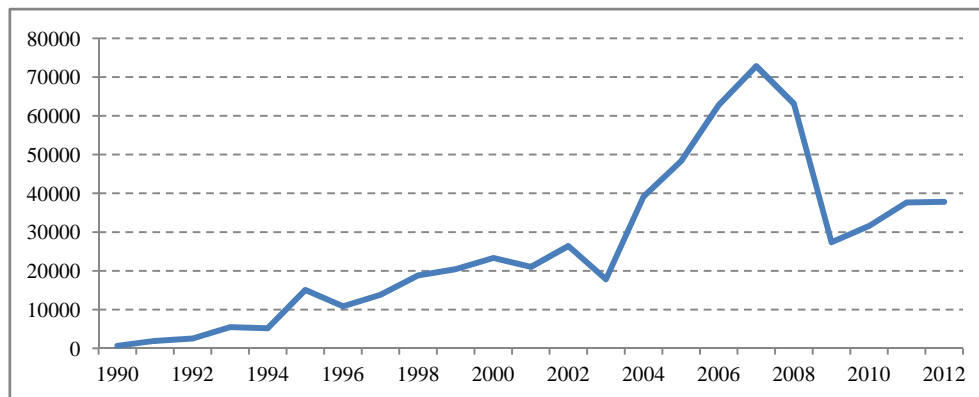
countries in the period 1970-1990, Sylwester (2005) also fails to find evidence of a distributional impact of FDI.

The scarcity of the empirical studies on the distributional effect of FDI is all the more pronounced in the case of CEE countries. Among the studies, which find that FDI deepens inequality, the one of Bandelj and Mahutga (2008) is worth mentioning. Using data on ten CEE countries, currently members of the EU, they find that the detrimental distributional impact of FDI is due to the higher wages in foreign affiliates, as well as the wage gap between the management and the workers in these companies. Halmos (2011) examines data on 15 Eastern European countries and also finds that FDI leads to higher income inequality which the author explains with the increase in the return to skilled labor as a result of the technology transfer that accompanies FDI entry. Using a larger dataset encompassing ten CEE countries, which are currently EU member states, the countries belonging to the Commonwealth of Independent States and four South Eastern European economies, Grimalda et al. (2010) find that FDI increases income inequality only in the new EU member states. A study based on a single country, where evidence of a negative distributional impact of FDI is found, is the one of Skuratowicz (2005). The author finds that FDI in Poland leads to higher demand for qualified labor and thus increases wage inequality.

Studies, which find evidence of a beneficial distributional effect of FDI in CEE countries, are very few. An example is the one of Georgantopoulos and Tsamis (2011), which finds that FDI in Hungary after 1990 has contributed to a more even income distribution. There are also few studies on CEE countries, which do not report any statistically significant relationship between FDI and income inequality (see Bruno et al., 2004; Franco and Gerussi, 2010).

3. General trends in FDI inflow and income inequality in CEE countries

In the first years of market transition, FDI inflow in the ten CEE countries under study (CEE-10) was scarce because in many of them the economic and political environment was not quite favorable to foreign investors (drop in output, high inflation, underdeveloped financial services, as well as political instability and delay of reforms in some countries). As Figure 1 shows, until 1994 the total volume of FDI inflow in CEE-10 was less than 10 billion USD.

Figure 1. FDI inflow in CEE-10 (million USD), 1990 – 2012

Source: UNCTAD.

Apart from being at a low level, FDI in the beginning of the transition process was also quite unevenly distributed across CEE countries. Until 1997 the predominant part of FDI inflow was concentrated in Hungary, Poland and the Czech Republic, which at that time were more advanced and ahead in implementing market-oriented reforms. Despite the small size of FDI inflow, in terms of GDP per capita Estonia was close to Hungary, which was due to the early adopted liberal course in its economic policy.

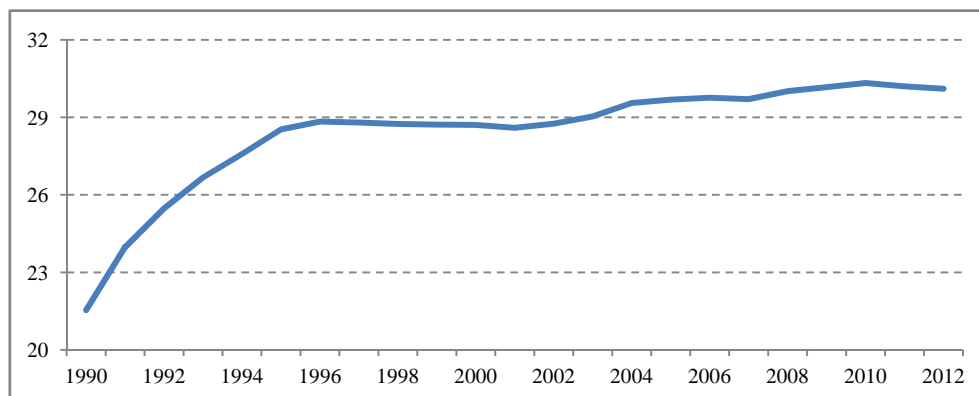
After 1998 there was a slow increase in FDI inflow, followed by a drop in 2003, which was largely due to the end of the privatization in the Czech Republic and Slovakia. Between 2004 and the onset of the global economic crisis in 2007 - 2008, FDI inflow in CEE experienced a steep increase. Another feature of this period was the emergence of some countries from the Balkans, such as Bulgaria, as preferred destinations for FDI. Being at a very low level in the first years of transition, FDI inflow in Bulgaria started to grow after macroeconomic stabilization was achieved through the adoption of a currency board in 1997. As a result of this, in the period 1998 – 2007 Bulgaria ranked first among CEE countries in terms of average FDI inflow as a percentage of GDP, followed by Estonia and Slovakia.

The global financial and economic crisis led to a reduction in FDI inflow, which affected severely all countries in the region. The largest drop was in 2009 when FDI inflow in CEE-10 amounted to 27.3 billion USD which was more than 50 % less than the previous year. In the following years there were fluctuations in FDI inflow but in all countries it still remained a long way below pre-crisis levels. Despite the drop of FDI inflow as a result of the crisis, FDI stock as a percentage of GDP in CEE countries is substantial, especially in Bulgaria, Estonia, Hungary and the Czech Republic, where in 2012 it reached 98%, 86%, 82% and 70%, respectively.

Apart from the economic liberalization and integration into the world economy, another feature of the transition process in CEE was the increase in income inequality. As seen

from Figure 2, the greatest rise in income inequality in CEE-10 was in the first seven years of transition when the average Gini index increased from 21.4 in 1990 to 28.8 in 1996. After 2000 there was again a rise in income inequality but it was much slower and smoother than in the beginning of the 90s.

Figure 2. *Income inequality in CEE – 10, measured by the average Gini index, 1990-2012*



Source: Standardizing the World Income Inequality Database, Version 4.1, March 2014.

The most significant rise in income inequality in the beginning of the transition process was accompanied by the implementation of market-oriented reforms in CEE countries and falling of their economies into a deep recession. Among the main transition-related drivers of income inequality, Mitra and Yemtsov (2006) point out the following: wage decompression and growth of the private sector, restructuring and unemployment, changes in government expenditure and taxation, price liberalization and inflation, asset transfer and growth of property income. To the list of determinants of income inequality, however, the authors also add technological change and globalization. This implies that if in the beginning of the period under study the main drivers of inequality were transition-related factors, later on globalization and FDI in particular started to play an important role in shaping its dynamics.

The way the different determinants of income inequality interact with each other depends on the circumstances and the policy choices in each country. That is why, although rising income inequality is a common trend in CEE, its level and dynamics vary across the different countries. In the first six years of transition all countries experienced an increase in income inequality, which was most pronounced in Estonia and Lithuania and least pronounced– in Poland and Hungary (see Figure A1 in the Appendix). After the initial rise of the Gini index, its dynamics has been the weakest in Poland, the Czech Republic, Hungary, Slovenia and Slovakia. In Bulgaria the Gini index fluctuated and after a decrease between 1998 and 2003, it has started to grow again. The country with the steepest increase in income inequality throughout the whole period is Latvia. In 2012 it has the highest Gini index (35.4), followed by Bulgaria (34.6) and Lithuania (34.2). The

countries with the lowest income inequality in 2012 are the Czech Republic (24.3), Slovenia (24.7) and Slovakia (26.1).

4. Methodology and data

The sample comprises ten CEE countries in the period 1990-2012, which forms an unbalanced panel of 190 observations. Descriptive statistics of the data is shown in Table A1 in the Appendix. In order to estimate the impact of FDI on income inequality we use the following basic model:

$$\text{GINI}_{it} = \beta_0 + \beta_1 \text{FDI}_{it} + \beta_k X_{itk} + u_i + \varepsilon_{it} \quad (1)$$

where GINI is Gini index in country i in year t . This is the most widely used measure of income inequality. It can take values from 0 (perfect equality) to 100 (perfect inequality). Data for the Gini index is taken from the Standardized World Income Inequality Database (SWIID) developed by Solt (2009), which is one of the most comprehensive and comparable datasets on income inequality. As pointed out by Herzer et al. (2013), the SWIID combines information from the World Income Inequality Database (WIID) provided by the World Bank with information from the Luxembourg Income Study (LIS) database, which offers harmonized micro-data collected from multiple countries, and data from UNU-WIDER to create a dataset with greater coverage than the LIS data and greater comparability than the WIID. SWIID has been used in the recent studies of Bergh and Nilsson (2010), Herzer et al. (2013) and Ostry et al. (2014).

FDI is the main independent variable and it is measured as FDI stock as a percentage of GDP. As in Herzer and Nunnenkamp (2011), we use FDI stock rather than FDI inflow because FDI stock captures long-run effects more effectively than annual FDI inflow, which fluctuates considerably. Data source for FDI stock is UNCTAD. Due to the contending theories about the distributional impact of FDI, the sign of β_1 is a priori ambiguous. X_k is a vector of control variables, discussed below; u_i is the individual and time-invariant country's fixed effect and ε_{it} is the standard error term.

In order to control for factors of income inequality other than FDI, we include several control variables. In line with previous studies (Tsai, 1995; Jensen and Rosas, 2007, Bandelj and Mahutga, 2008), we control for the spread of education by including secondary school enrollment ratio (EDUC). It is expected to reduce inequality based on the following reasoning. Education increases the overall level of human capital which results in higher supply of skilled labor force. This, in turn, contributes to a decrease in skilled wage premium, lowering overall income inequality.

A traditional measure of economic development, GDP per capita (GDPPC), is also included in the model. It is introduced in order to control for the possibility that within-country income inequality can be affected by the stage of economic development, as for instance theorized by Kuznets (1955). The impact of GDP per capita in CEE countries is

difficult to predict because it has specific dynamics, characterized by a significant drop in the first years of transition, followed by an upward trend after 2000 and a slump in 2009 as a result of the global financial and economic crisis. However, if we base our reasoning on the specifics of Kuznets hypothesis and take into account that GDP per capita in CEE is lower than in the developed Western economies, we might expect that income inequality in CEE tends to increase as a result of rising level of economic development. GDPPC is computed in terms of Purchasing Power Parity with reference to 2011 constant international dollars and is expressed in natural logarithm.

Due to the distributional impact of inflation, which was very high in the first years of transition (Ivaschenko, 2002), we add the inflation rate as a control variable (INFL). As inflation erodes real wages and disproportionately affects those in the bottom part of the distribution, it tends to increase income inequality. The variable is measured by the annual growth rate of the consumer price index and is expected to have a positive effect on the Gini index.

Within-country income distribution may also be shaped by the government through its fiscal policy. It has been suggested in the literature that the retrenchment of government spending in the post-socialist economies might be one of the factors explaining the upswing in income inequality during transition (Ivanova, 2007; Bandelj and Mahutga, 2008). Hence, we include a variable which controls for this effect (GOVERN). It is measured as general government final consumption expenditure as a percentage of GDP and is expected to have a negative impact on the dependent variable.

Last but not least, it is important to control for the distributional effect of the specific structural changes in CEE during transition. It has been suggested that the diminishing importance of the industrial and agricultural sectors and the substantial increase of the service sector, which is typically characterized by higher wage differential, might be one of the key factors behind the rise in income inequality in post-socialist countries (Ivaschenko, 2002; Franco and Gerussi, 2010). Given that, we include a control variable (SERV), which is measured by the value added of the service sector as a percentage of GDP and is expected to increase income inequality. Data for all control variables is taken from the World development indicators of the World Bank.

In order to investigate further the complex relationship between FDI and income inequality, we estimate two interaction models, which test whether the distributional effect of FDI depends on some features of the host economies such as their level of education and economic development. In the first interaction model we generate an interaction term between the variables measuring FDI and education and include it as a separate regressor. It has the following form:

$$\text{GINI}_{it} = \beta_0 + \beta_1 \text{FDI}_{it} + \beta_2 \text{EDUC}_{it} + \beta_3 \text{FDI}_{it} \times \text{EDUC}_{it} + \beta_k X_{itk} + u_i + \varepsilon_{it} \quad (2)$$

What is central in this specification is not the distributional impact of education itself but the way it modifies the relationship between FDI and income inequality. In other words, education is the modifying variable and the coefficient in front of the interaction term

shows how the marginal effect of FDI on income inequality changes at different levels of education.

In another model we check whether the distributional effect of FDI depends on the level of economic development of CEE countries. In this case GDP per capita is treated as the modifying variable. An interaction term between FDI and GDP per capita is included in the model to illustrate how the marginal effect of FDI on income inequality changes at different levels of economic development. The specification has the following form:

$$\text{GINI}_{it} = \beta_0 + \beta_1 \text{FDI}_{it} + \beta_2 \text{GDPPC}_{it} + \beta_3 \text{FDI}_{it} \times \text{GDPPC}_{it} + \beta_k X_{itk} + u_i + \varepsilon_{it} \quad (3)$$

The use of panel data in the estimation of these models requires to control for unmeasured heterogeneity across cases by using fixed effects or random effects methods. The fixed effects method is preferred for several reasons. First, a crucial assumption for the random effects model is that the country-specific terms are uncorrelated with the other explanatory variables. If such correlation exists, random effects estimates are biased and inconsistent whereas the fixed effects estimates are still unbiased. In order to test whether the country-specific effects are correlated with the regressors, Hausman test is performed for each model. The results, shown in Table A2 in the Appendix, lead to rejection of the null hypothesis according to which there is no such correlation and suggest the use of fixed effects estimation.

Second, when one cannot consider the observations to be random draws from a large population (especially if the data refers to large geographical units), it often makes sense to treat the individual effects as parameters to estimate, in which case one should use fixed effects estimation (Wooldridge, 2002).

Third, fixed effects estimator (also called “within” estimator) allows one to focus on how changes in within-country characteristics are related to changes in within-country inequality (Ivashenko, 2002). Hence, since the main goal of the paper is to explore how FDI has caused changes in income inequality over time within countries rather than to explain variation of inequality across countries, the use of the fixed effects method is very appropriate.

In order to assure the consistency of the estimates, tests for heteroskedasticity, autocorrelation and cross-sectional dependence are performed for each of the three models. The results from all diagnostic tests are shown in Table A3 in the Appendix. The modified Wald test for groupwise heteroskedasticity leads to rejection of the null hypothesis for each of the three models. This indicates presence of heteroskedasticity, which causes the standard errors of the estimates to be biased. Since autocorrelation represents a problem in macro panels with long time series and causes the standard errors to be smaller than they actually are, Wooldridge test for autocorrelation is performed. The results lead to rejection of the null hypothesis, which means that there is autocorrelation.

Another issue to be considered is the possibility of cross-sectional dependence, which can cause biased statistical inference. To test whether the residuals are correlated across entities, Pesaran cross-sectional dependence test is performed. The results lead us to

reject the null hypothesis and conclude that there is cross-sectional dependence in the case of each of the three models. In order to account for all these problems, we estimate the fixed-effects models with Driscoll and Kraay standard errors as suggested by Hoechle (2007). These standard errors are heteroskedasticity consistent and robust to general forms of cross-sectional and temporal dependence. All regressions and diagnostic checks are performed using the econometric software STATA.

5. Empirical results

The results from the basic model, presented in column 1 in Table 1, do not indicate statistically significant relationship between FDI and income inequality in CEE countries. A possible explanation might be that for the distributional effect of FDI to manifest, certain levels of education and economic development of the host countries must be reached. As for the coefficients of the control variables in the first model, all of them, except for government expenditures, are statistically significant and have the expected signs. The negative sign of the coefficient of EDUC reveals the important role of education in mitigating income inequality, which was also pointed out in previous studies. The positive sign of the coefficient of GDPPC confirms the conjecture that due to the lower level of economic development in CEE compared to other developed countries, the increase in GDP per capita is accompanied by a rise in income inequality. INFL has a coefficient with a positive sign, which confirms the inequality-increasing effect of inflation in CEE countries. The coefficient of the variable SERV is also positive, which indicates that one of the major structural changes in CEE, namely the rapid growth of the service sector, has been a key determinant of income inequality.

Table 1. Estimation results from the fixed effects regression models

Variable	1	2	3
FDI	-0.017 (0.015)	0.396 *** (0.067)	1.121 *** (0.333)
EDUC	-0.101 ** (0.043)	0.021 (0.062)	-0.065 (0.045)
FDI×EDUC	-	-0.004 *** (0.001)	-
GDPPC	3.860 *** (1.358)	4.613 *** (1.440)	6.864 *** (1.565)
FDI×GDPPC	-	-	-0.116 *** (0.033)
INFL	0.003 *** (0.001)	0.003 *** (0.001)	0.004 *** (0.001)
GOV	-0.080 (0.072)	-0.043 (0.060)	-0.040 (0.056)
SERV	0.245 *** (0.036)	0.202 *** (0.047)	0.160 *** (0.051)
Observations	190	190	190
R ²	0.53	0.59	0.59

Notes: Dependent variable is GINI. Driscoll and Kraay standard errors are reported in parentheses.

* p-value < 0.1; **p-value < 0.05; *** p-value < 0.01.

Contrary to model 1, in model 2 the coefficient of FDI is statistically significant and has a positive sign. This suggests that FDI deepens income inequality but in the same time the statistically significant and negative sign of the interaction term shows that this effect diminishes when the spread of education improves. However, as argued in Brambor et al. (2005), the interpretation of multiplicative interaction models differs a lot from linear-additive regression models. The major reason for this is that the coefficient of the independent variable in an interaction model (FDI in our case) shows the effect of this variable on the dependent variable (income inequality) when the modifying variable (education) is zero. However, since there are no cases in which the variable EDUC is zero, the results from column (2) in Table 1 are not that informative and to illustrate the marginal effect of FDI across the range of values of the modifying variable (EDUC) we use Figure 3. It has also been suggested by Brambor et al. (2005) as a better way of interpreting interaction models.

Figure 3. Marginal distributional effect of FDI depending on the spread of education

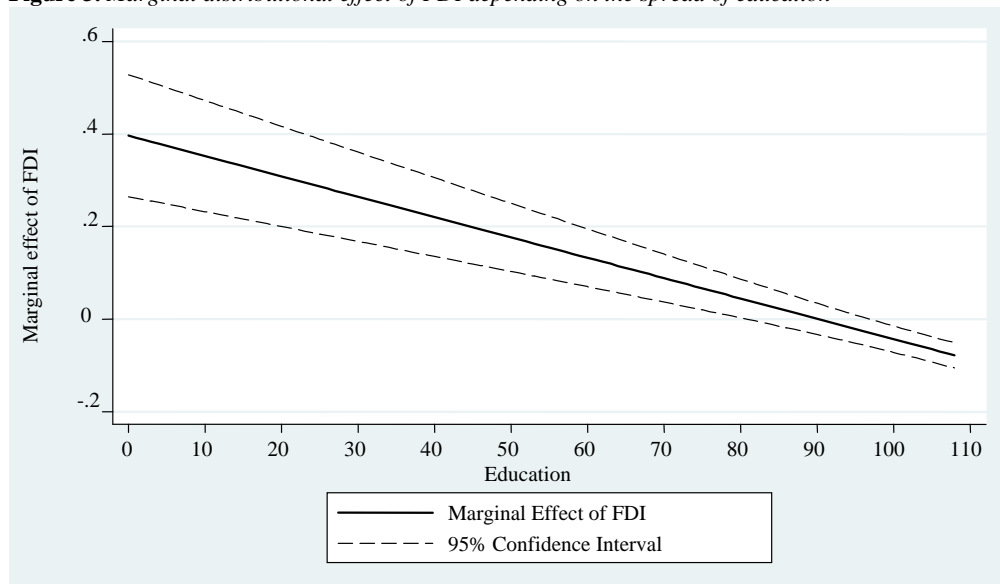


Figure 3 shows how the marginal effect of FDI on income inequality changes across the observed range of the variable measuring the spread of education. The solid sloping line indicates this marginal effect, which at any particular point on this line is equal to:

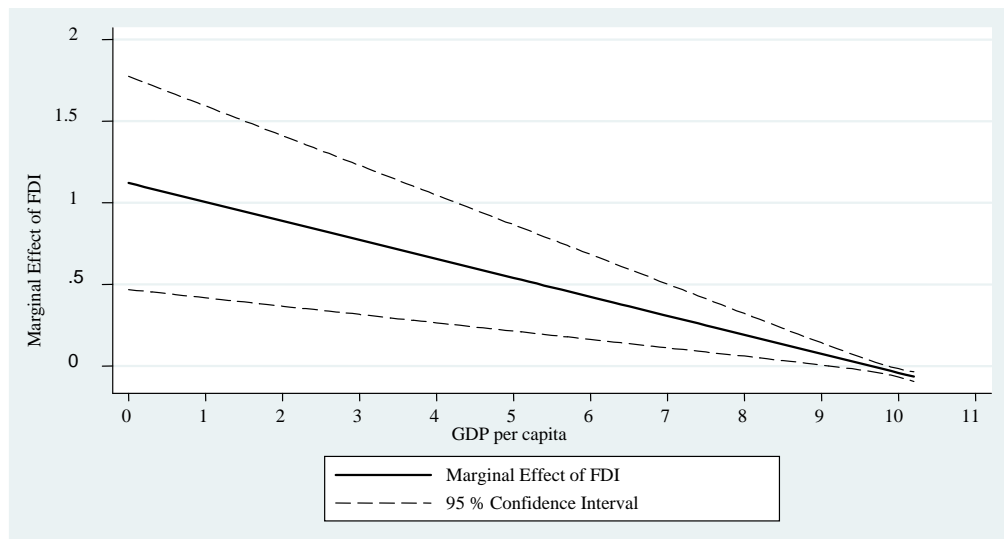
$$\frac{\partial \text{GINI}_{it}}{\partial \text{FDI}_{it}} = \beta_1 + \beta_3 \text{EDUC}_{it}$$

95% confidence intervals around the line allow us to determine the conditions under which FDI has a statistically significant effect on income inequality – this effect is significant whenever the upper and lower bounds of the confidence interval are both above (or below) the zero line. As seen from Figure 3, FDI has statistically significant positive effect on income inequality but this effect diminishes with the increase of education and becomes insignificant when secondary school enrollment

ratio reaches 81% (at this point the lower confidence interval crosses the zero line). For better interpretation of these outcomes it is necessary that we also report the percentage of the sample that falls within the region of significance. After examining the sample, we found that secondary school enrollment ratio has a value below 81% only in Romania until 2004. This means that only in this country FDI has been a determinant of income inequality and this effect is due to the lower level of human capital.

Figure 3 also shows that at higher levels of human capital (when secondary school enrollment ratio is above 96%) the marginal effect of FDI on income inequality becomes negative. The countries, where the average value of this indicator exceeds 96 %, are Estonia, Lithuania and Poland. Those, which have secondary school enrollment ratio higher than 96% only in the second half of the period under study, are Hungary, Latvia and Slovenia. This means that when the host economy reaches a higher level of human capital, FDI contributes to a decrease of income inequality. This result has its theoretical groundings. According to the theoretical framework of the studies of Figini and Görg (2006) and Franco and Gerussi (2010) for example, one of the main reasons for the inequality-increasing effect of FDI is related to the transfer of technologies induced by FDI. These technologies very often require the use of skilled labor. The higher demand and limited supply of such labor in the host economy initially leads to a rise in the wages of skilled workers and thus the increase of the wage differential between skilled and unskilled workers contributes to an increase of income inequality. Improving the spread of education, however, leads to a higher supply of skilled labor. In this way, with the gradual increase of the level of human capital and the adoption of the new technologies by the local firms, income inequality starts to decrease. The results from model 2 show that because of the higher level of human capital in some countries in CEE, FDI has exactly such inequality-decreasing effect.

The results from the other interaction model are displayed in column (3) in Table 1. They reveal how the marginal distributional effect of FDI changes depending on the level of economic development. As in model 2, in this specification the coefficient of FDI is statistically significant and positive whereas the coefficient of the interaction term is statistically significant and negative. This means that FDI increases income inequality but this effect diminishes with the increase of GDP per capita. This result is illustrated in Figure 4.

Figure 4. Marginal distributional effect of FDI depending on GDP per capita

In Figure 4 the marginal distributional effect of FDI is equal to: $\frac{\partial \text{GINI}_{it}}{\partial \text{FDI}_{it}} = \beta_1 + \beta_3 \text{GDPPC}_{it}$ and it changes across the range of values of GDP per capita. When the variable GDPPC has values, which are below 9.2, FDI has a statistically significant positive effect on the dependent variable, i.e. it increases income inequality. Examination of the range of values of GDPPC shows that this effect applies mainly to Bulgaria in the first half of the transition period and also to Latvia, Lithuania, Poland and Romania for shorter time spans again in the first years of transition. Furthermore, Figure 4 shows that when the level of economic development gets higher (values of GDPPC above 9.9) FDI again exerts statistically significant effect but it is negative, which means that FDI reduces income inequality. Such effect is observed mainly in the Czech Republic and Slovenia and for shorter periods of time after 2000 also in Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia. These results reveal that the distributional impact of FDI in CEE countries depends to a great extent on the level of economic development of the host economy. FDI tends to deepen income inequality when GDP per capita is low but with the increase of the latter, the effect of FDI changes and when a certain higher level of economic development is reached, FDI even contributes to a reduction of income inequality.

As far as the control variables in models 2 and 3 are concerned, the results are similar to those from model 1. Government expenditure is again insignificant whereas inflation and the value added in the service sector are found to increase income inequality in CEE countries.

6. Conclusions

The paper analyses the impact of FDI on income inequality using panel data for ten CEE economies observed in the period 1990 - 2012. Using fixed effects regression models, we find that FDI has the potential to affect income inequality but the manifestation of this effect depends on the absorptive capacity of the host economy. At lower levels of human capital and economic development FDI tends to increase income inequality but if the spread of education and GDP per capita increase, this distributional effect of FDI diminishes. After higher levels of human capital and economic development are reached, FDI can even contribute to a reduction of income inequality. As for the other determinants of income inequality, we find that inflation and the expansion of the service sector have contributed to the increase of income inequality in CEE economies.

The results from this paper might lead to some tentative policy recommendations for the countries in CEE. First, more efforts should be put in order to enhance the spread and quality of education. Improving the level of human capital leads to an increase of the supply of skilled labor which not only weakens the inequality-increasing effect of FDI but also makes it possible for the host economies to benefit from FDI. Second, countries should introduce more policies which facilitate investments in high value added activities and foster productivity. This is important in terms of increasing host countries' level of economic development, which seems to be an important precondition for reducing the negative distributional effect of FDI and taking advantage of their potential to mitigate income inequality when a higher stage of development is reached.

The conclusions and the policy considerations mentioned above are in line with previous studies, which argue that the benefits of FDI, in terms of the spillover effects they generate, depend on the absorptive capacity of recipient countries (see Bijsterbosch and Kolasa, 2009). Besides the level of wages in foreign-owned affiliates, which represents a direct transmission mechanism, it is exactly through spillover effects that FDI channels its indirect influence on income inequality (through the induced changes in the productivity of local firms and the resulting changes in the level of wages in these firms). In order to better understand the distributional effect of FDI in the case of CEE countries, future research should focus on exploring how these transmission mechanisms work using microeconomic data on the firm level.

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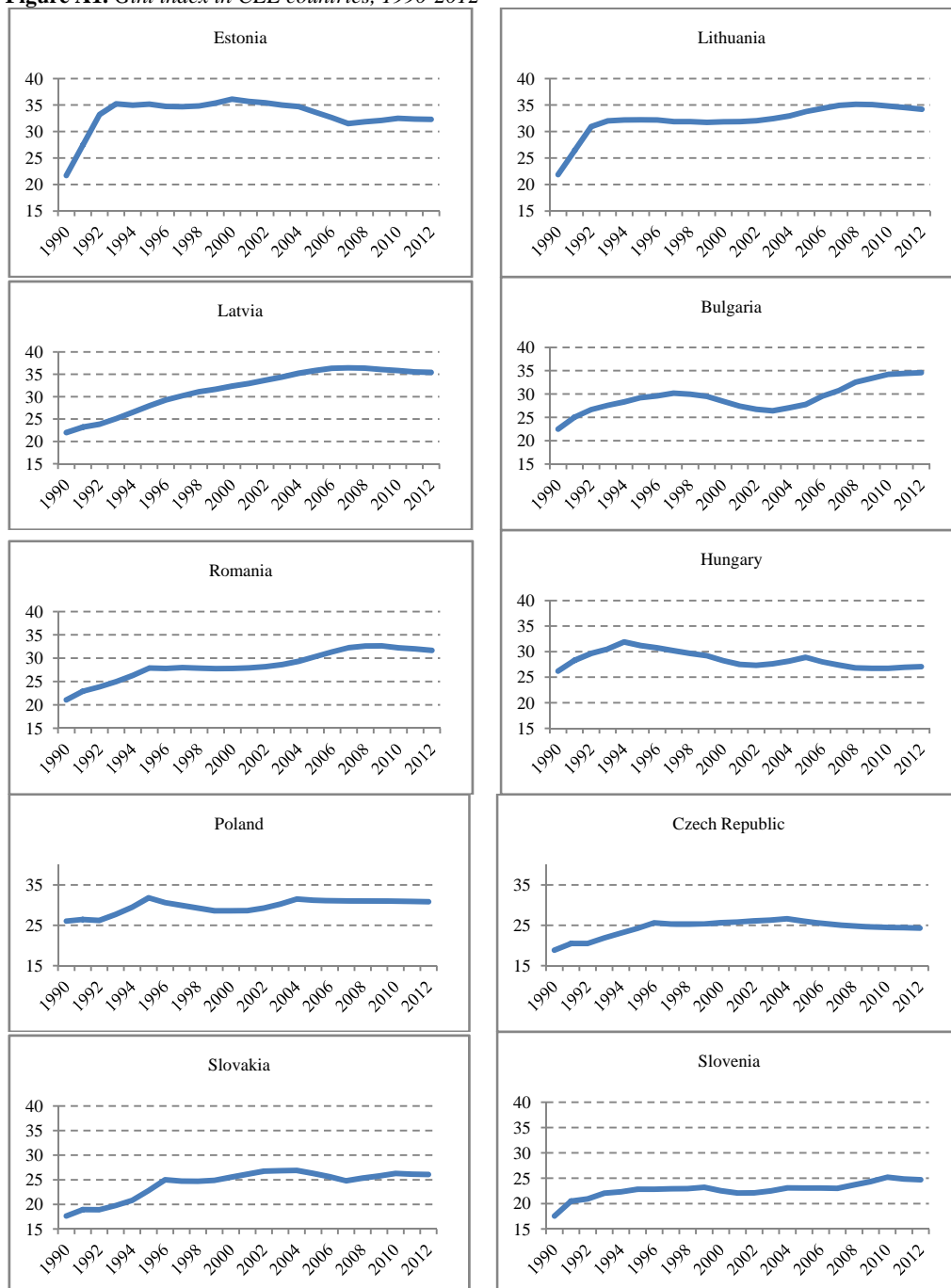
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Appendix

Figure A1. Gini index in CEE countries, 1990-2012



Source: Standardizing the World Income Inequality Database, Version 4.1, March 2014.

Table A1. *Descriptive statistics*

Variable	Obs.	Mean	Std. Dev.	Min	Max
GINI	230	28.41	4.42	17.55	36.42
FDI	216	32.55	24.50	0.00	101.35
EDUC	221	93.84	6.93	75.22	109.37
GDPPC	227	9.66	0.34	8.98	10.32
INFL	210	29.58	95.46	-1.15	1058.37
GOV	222	18.62	4.22	5.69	28.38
SERV	210	58.90	9.28	26.32	76.06

Table A2. *Results from Hausman test*

Model	Hausman test
1	Chi-square = 137.63 p-value = 0.0000
2	Chi-square = 224.96 p-value = 0.0000
3	Chi-square = 112.29 p-value = 0.0000

Table A3. *Results from diagnostic checks*

Model	Modified Wald test for groupwise heteroskedasticity	Wooldridge test for autocorrelation	Pesaran cross-sectional dependence test
1	chi2 (10) = 70.32 Prob>chi2 = 0.0000	F(1, 9) = 146.945 Prob > F = 0.0000	Pr = 0.0015
2	chi2 (10) = 43.82 Prob>chi2 = 0.0000	F(1, 9) = 149.996 Prob > F = 0.0000	Pr = 0.0007
3	chi2 (10) = 53.25 Prob>chi2 = 0.0000	F(1, 9) = 148.270 Prob > F = 0.0000	Pr = 0.0013

Exports – trends and impacts on Romania’s economic growth process

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Abstract. *In the post-crisis period when domestic consumer demand had slumped, Romania and other European Union countries have tried to promote exports as an important engine of economic growth. In order to achieve this, some countries allowed a significant depreciation of their national currency so as to increase competitiveness, others turned to internal devaluations, to improvements of the exported product’s technological intensity, to diversification of export destinations, etc., depending on the pre-crisis (initial) structural conditions from which they had started. Our study aims to investigate how Romanian exports have changed in recent years, as well as the factors, both internal and external, that influence Romania’s export capacity, with the purpose of achieving economic recovery.*

Keywords: export-led growth, imports, labour productivity, external demand, trade.

JEL Classification: E20, E32, E52, E60, E62, E65, H12, H61, H62.

Introduction

After 2008, on the basis of a slump in domestic demand, many European Union countries, and not only them, have tried to support an *export-led growth* model that would compensate the inevitable decline in internal demand. The latter was brought upon by several factors, among them:

- a stop in the flow of foreign direct investment and portfolio investment;
- a decrease in credit and financial deleveraging in the banking system, plus a NPL rate surge (Spain, Romania);
- a decline in the price of some assets which had skyrocketed in the previous period (e.g. real estate);
- a sharp increase in unemployment in most countries (Greece, Spain, Portugal);
- the fiscal consolidations measures adopted by governments in order to diminish budget deficits within the parameters established by the EU through the Treaty of Maastricht and/or meet compliance targets set by financial assistance programs contracted with international financial institutions (IMF, World Bank, etc.).

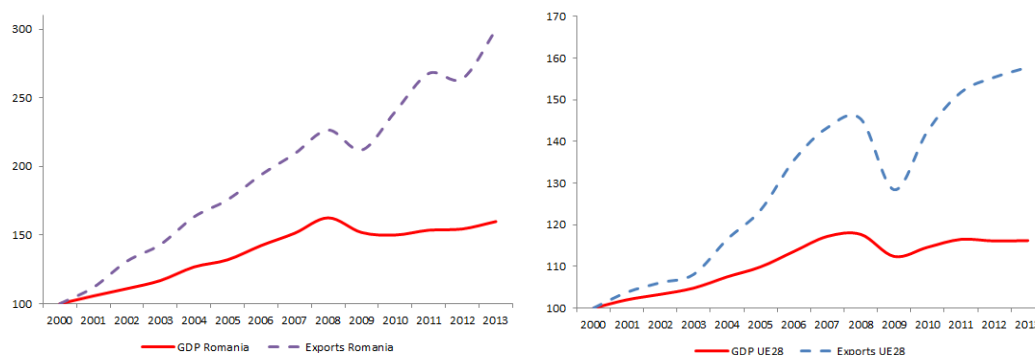
As shown in *Figure 1*, both in Romania's case, as well as in the case of the 28 member states of the EU, the export growth rate was much higher than that of the GDP after 2008.

In general, countries outside the Eurozone, with their own monetary and foreign exchange policies, accepted a nominal depreciation of their national currency with the purpose of gaining a surplus of cost competitiveness of the exported goods and services and tried to diversify their export destinations, especially to Asia's emerging countries.

Moreover, another aspect that has been improved refers to the structure of the exported goods, with a larger share for goods of a higher technological intensity in total exported goods. Our analysis focuses on Romania, in whose case *high-tech* and *medium high-tech* types of goods have become predominant in the structure of goods by technological intensity.

On the other hand, several countries within the European Economic and Monetary Union, which lack the exchange rate tool, achieved competitiveness by depreciation in real terms of their national currencies (*domestic devaluation*), which helped in increasing export of goods and services.

Figure 1. Evolution of GDP and export for Romania and the EU28 (Y2000=100)



Source: Eurostat.

The present study consists of *three parts*. Firstly, the literature regarding the connection between export and economic growth is presented, as well as the export structure's role in engaging other non-exporting sectors, with particular attention on developing countries.

The second part describes evolutions of Romania's export both from the nominal point of view, as well as from a structural perspective, in the sense of its modifications function of the exported goods' technological intensity; the classification used is that of the National Prognosis Commission: *high-tech* (HT), *medium high-tech* (MHT), *medium low-tech* (MLT), and *low-tech* (LT) categories of goods.

Lastly, the third part of this study offers some recommendations for governmental and/or trade policies with the aim of maximising the benefits created by the increase in Romania's export on the overall economy.

1. Export and economic growth. A literature analysis

The study into the contribution of export to economic growth is not new, it being discussed in literature starting with the theories of the 19th century classic economists, like *Adam Smith* and *David Ricardo*, who highlighted the importance of international trade in the process of economic growth, and the fact that specialising in producing mostly those goods for which a national economy holds a comparative/competitive advantage may result in productivity gains.

Regarding literature, there are many significant studies that offer a useful background for the analysis of the link between export and economic growth (Feenstra, 1990; Grossman and Helpman, 1990; Rivera-Batiz and Romer, 1991; Baldwin and Forslid, 1996).

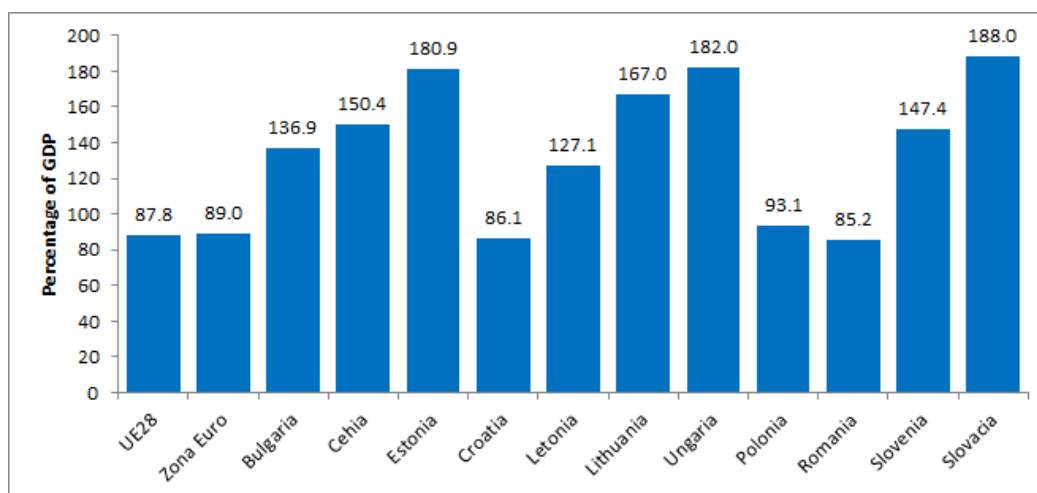
These studies are based on the idea that at economy level, an increase in exports accrues total factor productivity thanks to their positive impact on economies of scale, the fact that they generate other externalities, such as technology transfer, improvement in workers' abilities and management capabilities, production capacity growth of an economy (Dreger and Herzer, 2011).

A large part of the literature is based on the analysis of the *export-led growth hypothesis* (ELGH). This hypothesis argues that promoting and increasing export represents one of the best methods to achieve economic growth; a country's economic expansion may be created not only by increasing endowment with capital and labour factors, but also through export stimulus, which may result in positive externalities from opening to the global market, especially in regard to the reallocation of resources to the more efficient and truly competitive sectors, economies of scale or effects on the workforce professional training (Medina-Smith, 2000).

If we were to analyse the trade openness of Central and Eastern Europe countries, we would notice that Romania has the lowest degree of economy openness (share of the export and import aggregate in GDP) out of the region's EU member countries (see Figure 2).

According to Eurostat, Romania's export amounts up to 40% of its GDP, while import represents about 45%. However, when comparing to other countries, it is advisable to take into consideration that Romania's surface is much larger (also its larger population), which renders a higher importance to domestic trade than to foreign trade. Nevertheless, in the case of Poland, which is larger than Romania, the degree of openness is higher by approximately 8 percentage points.

Figure 2. Economy openness degree in various EU countries (2012)



Source: Own computations based on Eurostat data.

It is considered that there are several explanations that validate ELGH and the reasons why a relatively good export performance is crucial for a country to achieve sustainable economic growth both from the demand perspective, as well as from the offer perspective.

The argument on *the demand side* is that usually the geographic size of the internal market limits the volume of products manufactured and sold by local businesses and that export opens domestic industries to the global market, leading to a potential increase in demand for the goods produced. This increase in size of the potential market can consequently bring about a rise in company earnings, whereas the internal market was too small for a company to achieve an optimal scale.

Economies of scale can result from an increased usage of resources due to export demand, which in turn leads to a greater variety of products and productivity gains (McCann, 2007). On the other hand, a greater openness to the global market may result in exposure of domestic companies to foreign companies and competition, may encourage local innovation, may ease technological advancement, and at an aggregate level, the economy may benefit from knowledge externalities, factors that lead to technological upgrade and efficiency gains in production and in managerial practices (McCann, 2007; Gorg and Strobl, 2005).

Moreover, it has been acknowledged that exports provide the economy with the necessary foreign currency for the import of the goods that cannot be manufactured by local businesses, especially capital goods or new technologies. The latter can be used for a possible reorientation of domestic production towards more competitive industries that can better fuel growth.

Specialisation towards the more productive export industries and dismissal of the more inefficient sectors concurrently enhance human capital by increasing the general level of ability of a country's workforce.

However, it is assumed that a country should not make external trade a purpose of its own and, evidently, a national economy cannot have growth just by simple export stimulus, but rather export composition and concentration degree are more important. Thus, the structure of a country's export basket is an important ELGH endorsement factor.

In most cases export structure is analysed through the perspective of the *Heckscher-Ohlin theory*. This theory supposes that all considered countries have identical production technology, the sole difference being the level of endowment with the labour factor and the capital factor. As consequence to the varied proportions with which each country is endowed, one can determine the specific basket of goods that each country manufactures.

It is considered that countries that manufacture more technological intensive goods also have a relatively higher *capital-labour ratio*. Moreover, another possibility is that in these countries the level of the human capital is high, which is highlighted by a higher *qualified workforce-unqualified workforce ratio*. These assumptions usually apply to developed countries. On the other hand, less developed countries are generally dominated by a lower *capital-labour ratio*, as well as a lower *qualified-unqualified workforce ratio*, which means that goods manufactured in these countries are more workforce intensive and with a lower degree of technological sophistication. Generally, it can be supposed that countries will have a tendency to export goods whose production makes use of resources that have a relatively high offer and, at the same time, to import goods that require usage of resources that are rare at national level (McCann, 2007).

Furthermore, from the perspective of the export-led economic growth hypothesis and the positive effects generated by an intensification in foreign trade, *Edwards* (1991) – completing the significant contribution made by *Lewis* (1955) – states that developing countries that manage to integrate into the commercial flows of the global economy will have an advantage in their absorption capacity of the technological innovations coming from developed countries.

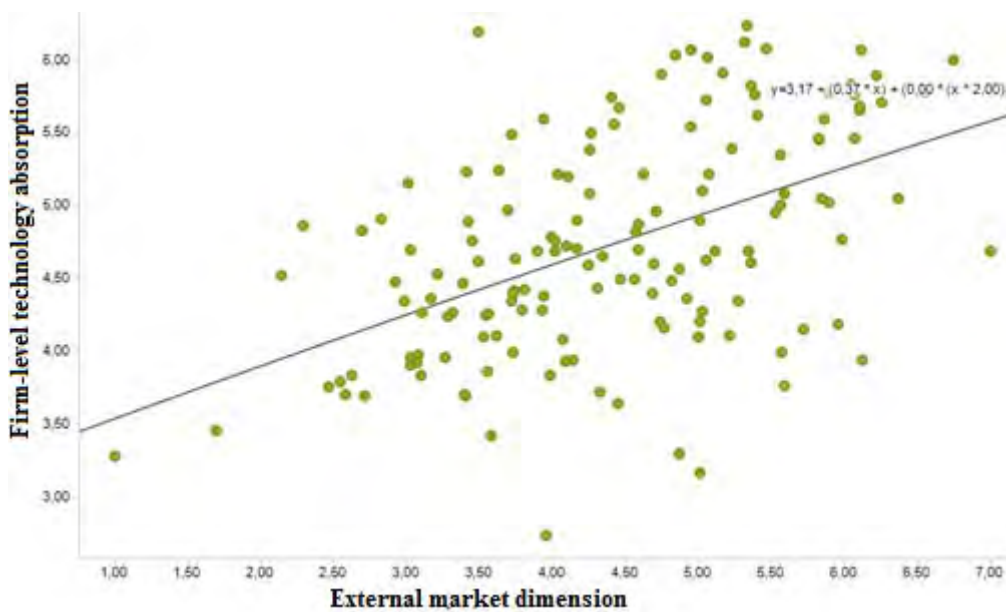
The latter characteristic can be associated with a *learning-by-looking* type of process (Galimberti, 2009), where contact with new goods and technologies increase innovation absorption efficiency. This idea is present in the models designed by *Edwards* (1989), also *Grossman and Helpman* (1991), and *Feder* (1983) uses *Lewis's* (1955) model as a starting point and analyses the existence of potential effects of the positive externalities brought upon the overall economy as a result of an increased openness of the internal production and local companies to the global market.

Another study that analyses the benefits of an economy open to foreign markets and trade liberalisation is Thirlwal's (2000), who identified two types of gains: *static* and *dynamic*.

Static gains are considered advantages obtained through resource reallocation from less productive sectors to higher productive ones, leading to specialisation – static gains are directly correlated to the comparative advantage theory of the classic economist David Ricardo. In the case of *dynamic gains*, international trade is associated with increased investment and productivity growth rate acceleration based on the emergence of economies of scale, the manifestation of *learning-by-doing* effects, and also as a consequence to the acquisition of new knowledge from outside the country, especially due to foreign direct investment (FDI) entry.

As shown in Figure 3, which works with World Economic Forum data (2013), there is an evident positive direct relationship between external market size and technology absorption degree at company level and, generally, the correlation is also maintained in the case of the relationship between external market size and foreign direct investment that lead to a technology transfer toward the attracting country.

Figure 3. The relationship between external market size and technology absorption degree at company level



Source: World Economic Forum (WEF), The Global Competitiveness Report 2013-2014.

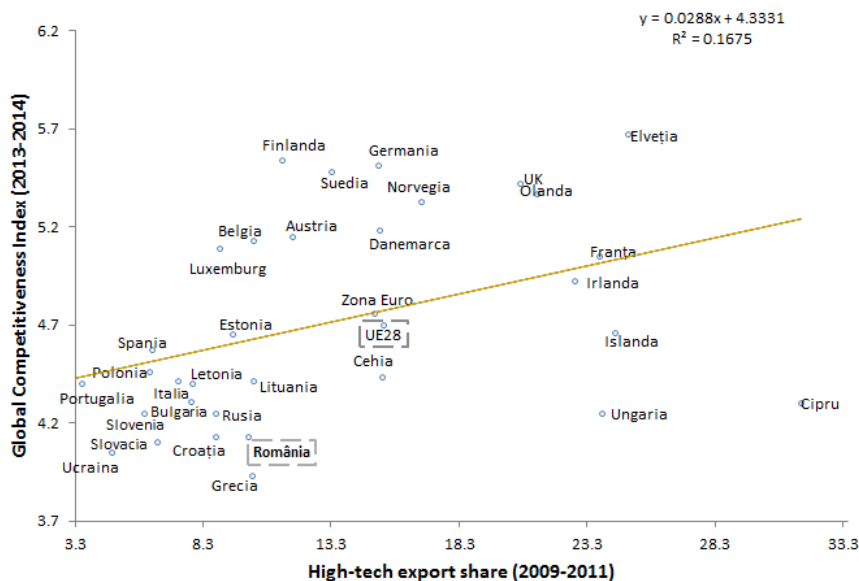
Note: all countries with available data were taken into consideration. *External market size* is defined according to WEF methodology, as natural logarithm of the total exported goods and services at purchasing power parity, normalised on a scale from 1 to 7. *Technology absorption degree at company level* is expressed on a 1 to 7 scale, depending on the answer given to the question “To what extent the company adopts new technologies?” (1 = not at all; 7 = adopts aggressively).

Thirlwal (2000) also states that the effect of trade liberalisation on economic growth tends to emerge mostly from efficiency improvement and export stimulation, which have strong positive effects both on demand, as well as on offer in an economy. Thus, even if trade liberalisation does not necessarily imply an increase in export – this requires other factors too, including additional production capacities and external promoting networks for local companies – in practice there seems to be a strong correlation between the two.

A baseline study of the connection between export and growth is that of *Giles and Williams* (2000), authors that probed into more than 150 empirical studies on this subject, concluding that there is no evident agreement among researchers regarding exterior-oriented growth, even if there are many studies in which exports have a positive effect, statistically significant, on economic growth.

Moreover, other studies can be mentioned, studies that focus on the issue of export composition; in this case the ones most worth mentioning from literature are the works of Fosu (1990), Funke and Ruhwedel (2001), Crespo-Cuaresma and Worz (2005), and Herzer et al. (2006). It can be noticed that at global level, the more competitive countries also have a relatively higher share of high-tech goods in total export (see Figure 4 below).

Figure 4. Share of high-tech (HT) exports and competitiveness index



Source: own computations on World Bank and World Economic Forum data, 2013.

Another study worth mentioning from literature is the one written by *Foster* (2006), who tested the existence of thresholds in the relationship between export and growth on a sample consisting of several African countries, thresholds determined by initial GDP per capita level, export share in GDP and export growth.

In general, his findings suggest that there is a significant connection between export growth rate and economic growth rate and that a country does not have to necessarily be

relatively developed in terms of initial income or to have a relatively large export base in order for this relationship to be valid. The results also suggest the presence of decreasing scale returns for export (Galimberti, 2009).

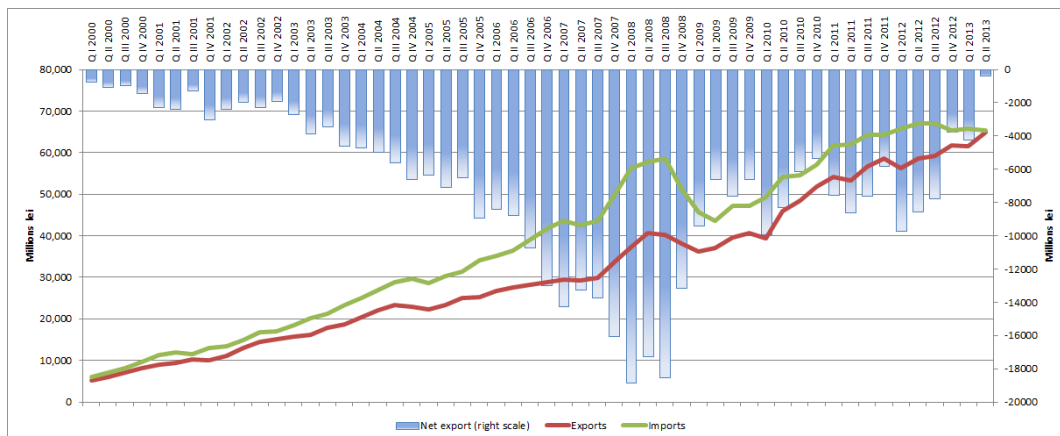
2. Recent evolution of Romania's export and its structure

After 2008, as shown in *Figure 5*, Romania's export had a positive dynamic, superior to import, which significantly reduced the trade deficit, which in 2008 peaked at 70.3 billion lei (approximately 19 billion euro) or 13.6% of GDP. According to NBR (2013), in the first two quarters of 2013, Romania's trade balance was in deficit with about 1.4 billion euro.

This improvement of the trade balance situation was brought about by a number of factors, among which we can mention:

- nominal depreciation of the national currency (between 2008 and 2012, the Romanian leu depreciated in nominal terms with approximately 20% against the euro);
- diversification of export destinations (an increase in exports of goods to non-EU countries, less affected by recession);
- relative increase of exported goods' competitiveness in terms of level of sophistication (high-tech and medium high-tech goods are predominant in the export basket when compared to 2008).

Figure 5. Evolution of export, import and net export (2000Q1-2013Q2)



Source: Romanian National Statistics Institute, 2013.

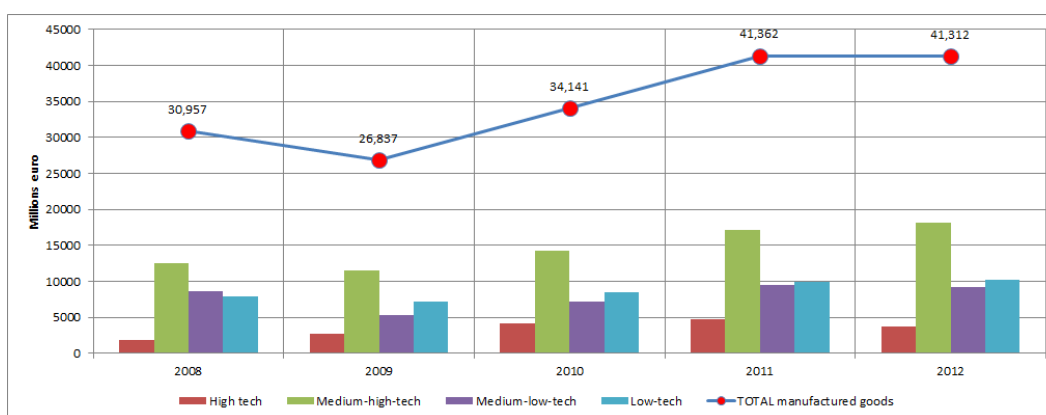
In this article we mainly focused on the analysis of export structure change in regard with the level of sophistication for the time period 2008-2012, 2012 being the last year with available data. According to the *Romanian National Prognosis Commission*, the exports division into categories of products classified by technological intensity level is the following:

Table 1. Product classification, by technological intensity level

Category name	Subcomponents
High-Tech	<ul style="list-style-type: none"> • Computers, electronic and optical products; • Basic pharmaceutical products and pharmaceutical compounds;
Medium High-Tech	<ul style="list-style-type: none"> • Chemicals and chemical products; • Machinery and equipment n.e.c.; • Electrical equipment; • Motor vehicles, trailers and semi-trailers; • Other means of transport;
Medium Low-Tech	<ul style="list-style-type: none"> • Coke oven products; • Goods from crude oil processing; • Rubber and plastics goods; • Other non-metallic mineral products; • Metallurgy industry products; • Metal construction industry products and metal products (except machinery and equipment);
Low-Tech	<ul style="list-style-type: none"> • Food; • Beverages; • Tobacco products; • Textile industry products; • Clothing; • Leather and leather products; • Processed wood products (except furniture), plaited straw and other vegetal materials products; • Paper and paper products; • Furniture; • Other manufactured goods n.e.c.

Source: own processing based on Romanian National Prognosis Commission data.

In total, exports of manufactured goods have increased in 2012 compared to 2008 with 10.35 billion euro, from 31 billion euro to 41.3 billion euro. Moreover, more than half of this growth comes from exports of medium high-tech (+5.63 billion euro) and high-tech (+1.75 billion euro) goods, as shown in Figure 6, found below.

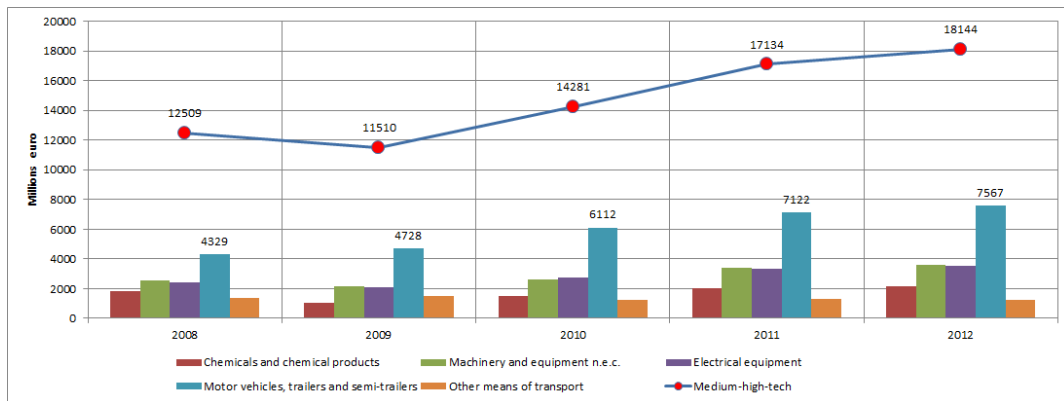
Figure 6. Export evolution in 2008-2012

Source: own processing based on Romanian National Prognosis Commission data.

High-tech and medium high-tech categories of goods cumulatively accounted for 46.5% of total exported manufactured goods in 2008, this share rising to 52.8% in 2012. In a structural representation of these groups (Figure 7), significant growths can be observed within this period for the following categories: *Computers, electronic and optical*

products (+ 1 billion euro), *Machinery and equipment n.e.c.* (+ 1 billion euro), *Electrical equipment* (+ 1.1 billion euro).

Figure 7. Evolution of medium high-tech exports in 2008-2012

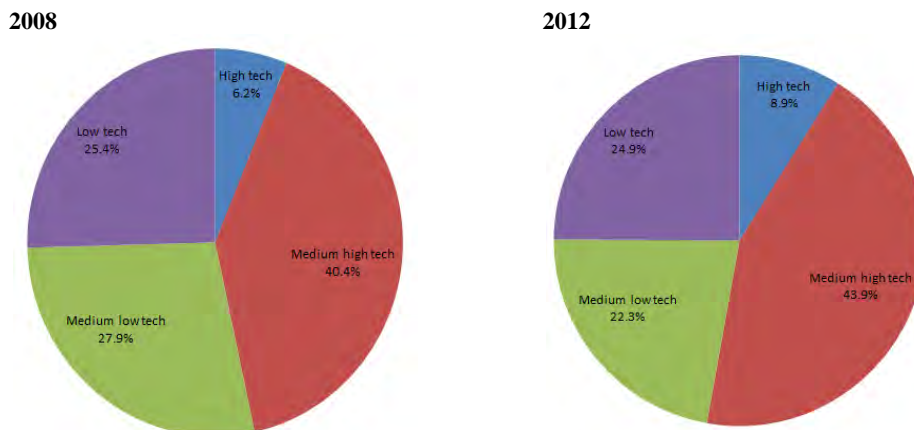


Source: own processing based on Romanian National Prognosis Commission data.

At the same time, exports of **medium low-tech** products increased by 0.55 billion euro, while **low-tech** ones rose by 2.4 billion euro. Significant growths were registered by the *Rubber and plastics goods* (+ 1 billion euro) and *Food* (+ 0.79 billion euro) categories.

This structural change of Romania's export during 2008-2012, from medium low-tech and low-tech goods toward a larger share for high-tech and medium high-tech products, includes some elements that render the effects of the continuous increase in export weak over the general economic growth.

Figure 8. Export structure by level of technological intensity



Source: own processing based on Romanian National Prognosis Commission data

On the one hand, this structural change contributes positively to GDP growth, there are foreign currency inflows into the country and Romania's products become more competitive on foreign markets. On the other hand, this growth is achieved in sectors of

activity that are not necessarily workforce intensive and are more open to process innovation (see sectors mentioned above) – for example, improvement of production processes through usage of a new technological flow that results in a greater quality of manufactured products, but also leads to a diminishment in employee number. The result is that this growth fails to engage the economy in terms of production chains expansion of local suppliers, employment increase or additional tax revenues.

In general, it is observed that in Romania the export performance registered in recent years can mostly be accounted to the foreign direct investments attracted in the pre-crisis period, especially during 2004-2008 and particularly in the motor industry or transport equipment industry, investments that improved work productivity through technology and know-how transfer, increased workforce qualification, accrued product competitiveness on foreign markets, and generated additional tax revenues for local and central authorities.

3. Conclusions

After 2008, amidst domestic demand contraction, several countries within and outside the European Union have tried to support an *export-led growth* model which would compensate the inevitable restriction of domestic demand.

In order to achieve this, some countries permitted a significant depreciation of their national currencies in order to increase competitiveness, others turned to internal devaluation, improvement of technological intensity of exported goods, diversification of export destinations, etc., depending on the pre-crisis (initial) structural conditions from which they started.

In general, it is observed that in Romania the export performance registered in recent years can mostly be accounted to the foreign direct investments attracted in the pre-crisis period, especially during 2004-2008 and particularly in the motor industry or transport equipment industry, investments that improved work productivity through technology and know-how transfer, increased workforce qualification, accrued product competitiveness on foreign markets, and generated additional tax revenues for local and central authorities.

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Innovation and regional performance in Romania

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Abstract. *Romania occupies a modest innovation position within the European Union. Since 2000 industrial restructuring in the context of economic growth, foreign direct investment and integration in the European research networks led to an increase in the polarization of research and development (R&D) activities between NUTS3 and even NUTS2 regions. The economic crisis which began in 2009 postponed the positive changes in innovative behavior. This paper highlights the growing disparities in R&D and innovation, and how it is influenced by the unequal distribution of income, measured as GDP per capita. To determine the relationship between R&D intensity and economic performance, the paper sets forth an analysis at NUTS3 level using regression analysis and correlation.*

Keywords: research and development, innovation, regional innovation performance, endogenous regional growth, regional inequalities.

JEL Classification: R11, O30.

1. Introduction

The new theory of economic growth brought into discussion the so-called "endogenous factors": creativity, innovation, entrepreneurship, creation and dissemination of knowledge, institutions, leadership and entrepreneurship. Endogenous growth theory emphasizes the link between knowledge accumulation and conventional output, relationship that formed the subject of many important studies. An example is the model for knowledge accumulation developed by Romer (2011, p. 102), which aims to highlight how resources in an economy are allocated between a sector with conventional output and a new, research and development (R&D) sector, as well as how R&D inputs produce new ideas.

The regional dimension proved important in shaping a country's ability to produce knowledge and to use it efficiently. Research on regional development is centered on the spatial dimension of economic activity. Thus emerges the idea that an increase in the volume of knowledge is associated with a concentration of activities that produce knowledge, which in turn facilitates positive externalities of new knowledge. In this context, Audretsch and Aldridge (2009, p. 208) show that both the production of knowledge (and its positive externalities) and entrepreneurship have a spatial determination. The authors also point out that these two form the basis for entrepreneurial clusters.

KIT Report (ESPON, 2013) demonstrates that the geography of innovation in the EU is much more complex than a center-periphery model and generates maps to show the spatial patterns of knowledge generation and innovation in Europe. Illustrated indicators are the degree of technological progress; scientific knowledge; innovations of product, process and organization. It analyzes the impact of innovation on: GDP, total factor productivity and the employment rate. KIT Report also discusses and quantifies the influence of diffusion of knowledge vehicles such as mobility of inventors and connectivity between regions.

The European Union has defined guidelines regarding the actions that should be taken by the central and regional authorities to promote integrative processes and innovation in regions (European Commission, 2007; European Commission, 2010a). Innovation management can be better achieved at regional level. The formation of regional clusters and partnerships between regional actors involved in research, development and innovation enhance the development potential of regions. In a recent analysis, the European Commission (6th Cohesion Report, 2014) shows that economic growth depends on entrepreneurship which is based on individual initiative and appropriate institutional environment. This enhances the message that innovation continues to show a clear spatial concentration.

Several problems were identified in the process of measuring endogenous regional growth. One of them is the lack of available data at a sub-national level; others raise concern regarding the actual method of measuring endogenous growth, in the sense of quantifying. Although there are indicators at regional level, these are limited and may not always quantify the size of endogenous growth. Several authors have successfully used in econometric analyzes labor market indicators (unemployment, employment level) as endogenous variables and as exogenous variables they used complex indicators that illustrate the economic and demographic factors, leadership, institutions and entrepreneurship.

This paper analyzes the innovation potential of Romania within the European Union, using descriptive statistical methods. Research activity is aimed at assessing regional disparities

regarding R&D and innovation in Romania. Using the available statistical data the paper tries to identify a relationship between the potential for innovation and development at regional level in Romania. Considering that a synthetic indicator of innovation effort is given by R&D expenditure, the paper analyzes the link between R&D intensity and economic performance at NUTS3 level using regression analysis and correlation.

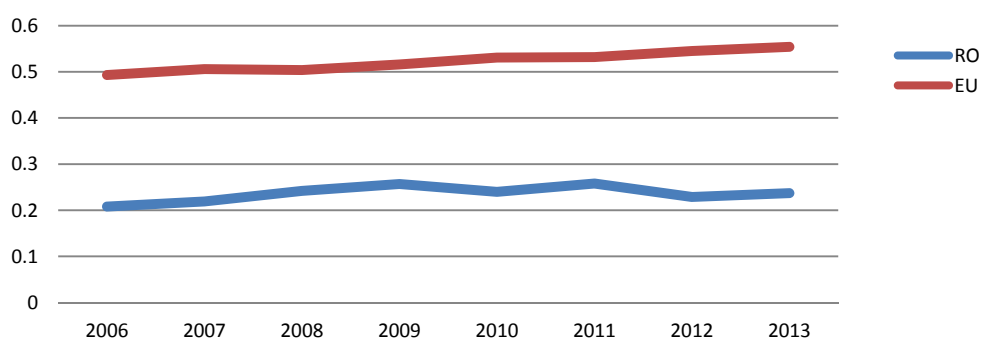
2. The dynamics of innovation in Romania from a European perspective

The European Commission conducted an analysis of the EU innovation potential (IUS, 2014), based on innovation index calculated as a composite index of 25 indicators used to measure innovation performance. On this basis Member States are divided into four groups in terms of performance:

- *Innovation leaders* - includes countries with innovation performance well above the EU average (i.e. more than 120% above the EU average), such as Denmark, Finland, Germany and Sweden;
- *Innovation followers* have a performance close to the EU average (less than 120% but more than 90% of EU). Austria, Belgium, Cyprus, Estonia, France, Ireland, Luxembourg, the Netherlands, Slovenia and the UK are the followers in terms of innovation;
- *Moderate innovators* have a performance below the EU average (between 50% and 90% of the EU's performance). Croatia, Czech Republic, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Poland, Slovakia and Spain are moderate innovators.
- *Modest innovators* – have a level of performance well below the EU average (less than 50% of the EU average): Bulgaria, Latvia and Romania.

Differences in innovation performance between EU countries increased in the period 2008-2013. At the same time, the composition of the groups formed according to innovation performance is stable as there is no movements between the groups.

Figure 1. Innovation index in Romania compared to the EU average



Source: own representation based on data from Innovation Union Scoreboard 2014, European Commission, p. 92.

In the period 2004-2008 Romania was catching-up in terms of innovation. After the crisis Romania has maintained its status of "modest innovator" but the distance from the EU average increased. Its innovation performance went down from almost 50% of the EU average in 2009 to about 43% in 2013.

The data provided by the European Commission (Table 1) shows that Romania is far below the EU average in almost all innovation performance parameters, with the exception of potential labor resources in R&D. There is a major gap in research expenditure in the business sector and also regarding intellectual assets. Firms engage in innovation activities involving mainly non-R&D expenditure and, especially small and medium enterprises, prefer to introduce new products in the manufacturing process (correlated with process innovations), undertake marketing and organizational innovations in order to increase market resilience. Favorable signals are given by the existence of fast-growing sectors, e.g. IT, which have a high workforce absorption capacity and develop services which form a significant share of total services exports.

Table 1. Innovation performance in Romania and European Union*

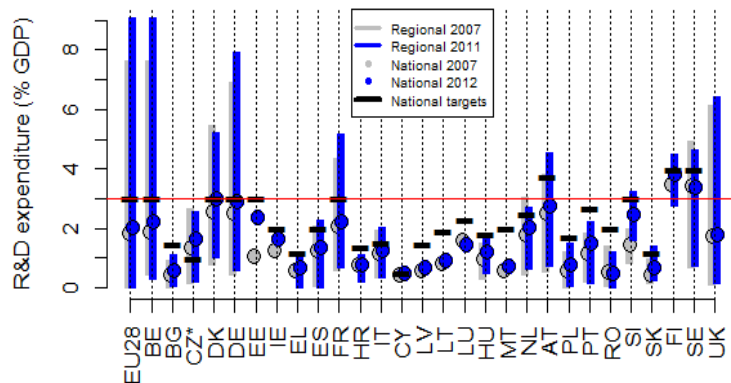
	UE27	Romania
ENABLERS		
<i>Human resources</i>		
1.1.1 New doctorate graduates per 1000 population aged 25-34	1.7	1.7
1.1.2 Percentage population aged 30-34 having completed tertiary education	35.8	21.8
1.1.3 Percentage youth aged 20-24 having attained at least upper secondary education	80.2	79.6
<i>Open, excellent and attractive research systems</i>		
1.2.1 International scientific co-publications per million population	343	177
1.2.2 Scientific publications among the top-10% most cited publications worldwide as % of total scientific publications of the country	11	3.5
1.2.3 Non-EU doctorate students as a % of all doctorate holders	24.2	2.1
<i>Finance and support</i>		
1.3.1 R&D expenditure in the public sector (% of GDP)	0.75	0.3
1.3.2 Venture capital (% of GDP)	0.277	0.137
FIRM ACTIVITIES		
<i>Firm investments</i>		
2.1.1 R&D expenditure in the business sector (% din GDP)	1.31	0.12
2.1.2 Non-R&D innovation expenditure (% of turnover)	0.56	0.46
<i>Linkages & entrepreneurship</i>		
2.2.1 SMEs innovating in-house (% of SMEs)	31.8	10.8
2.2.2 Innovative SMEs collaborating with others (% of SMEs)	11.7	2.9
2.2.3 Public-private co-publications per million population	7.3	2.9
<i>Intellectual Assets</i>		
2.3.1 PCT patent applications per billion GDP (in PPSE)	1.98	0.41
2.3.2 PCT patent applications in societal challenges per billion GDP (in PPSE)	0.92	0.21
2.3.3 Community trademarks per billion GDP (in PPSE)	5.91	2.33
2.3.4 Community designs per billion GDP (in PPSE)	4.75	0.59
OUTPUTS		
<i>Innovators</i>		
3.1.1 SMEs introducing product or process innovations (% of SMEs)	38.4	13.2
3.1.2 SMEs introducing marketing or organizational innovations (% of SMEs)	40.3	25.5
3.1.3 Employment in fast-growing enterprises in innovative sectors (% of total employment)	16.2	15.2
<i>Economic effects</i>		
3.2.1 Employment in knowledge-intensive activities (% of total employment)	13.9	6.5
3.2.2 Contribution of medium and high-tech products exports to the trade balance	1.27	0.38
3.2.3 Knowledge-intensive services exports as % of total services exports	45.3	45.2
3.2.4 Sales of new-to-market and new-to-firm innovations as % of turnover	14.4	14.3
3.2.5 License and patent revenues from abroad as % of GDP	0.77	0.38

* Innovation Union Scoreboard (IUS) 2014 uses the most recent available data from Eurostat database and other international sources. 11 indicators are from 2012, 4 indicators from 2011 and 1 indicator from 2010.

Source: European Commission, Innovation Union Scoreboard 2014, pg. 85

Investment in research and development holds a key role in the Europe’s growth strategy, Europe 2020 (European Commission, 2010b). It argues that innovation is the main actor for competitiveness enhancement. Therefore one of the five targets of EU2020 is the allocation of 3% of GDP to R&D. Figure 2 shows a complex picture of this indicator in the regions and European countries. Vertical bars show the diversity in national and regional innovation performance. These bars show the gap between the best and the worst performing region in terms of expenditure on R&D at NUTS level 2 in the Member States. The figure illustrates wide gaps in terms of R&D spending between countries and within countries. Regions of Romania are among the worst performers in Europe.

Figure 2. R&D expenditure in EU28 member states in 2007 and 2011



Source: Eurostat [rd_e_gerdreg]

* The 1% target of the Czech Republic refers only to the public sector.

3. Regional dimension of R&D and innovation in Romania

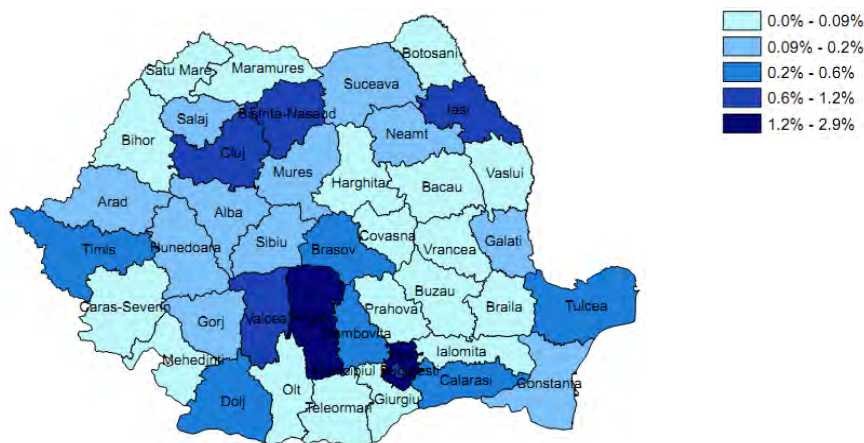
Romania's position within the EU reflects the relative homogeneity of reduced regional innovation performance. Bucharest-Ilfov region has the status of "moderate innovator" in the period 2004-2010, while the remaining regions are classified as "modest innovators". The exception is the South-Est region which managed to improve its performance in 2006-2008, but returned during the crisis to its previous modest situation.

One of the most significant indicators for the quantitative evaluation of the innovation efforts is the cost of R&D carried out by the public sector and by companies, even if this doesn't include costs of non-R&D innovation and therefore does not capture all the effort firms make to identify new growth opportunities and economic performance. This is the reason why one of the objectives of Europe 2020 is to achieve a level of 3% of GDP on R&D expenditure.

In Romania the share of expenditure on R&D in GDP was 0.75% in 1995 with a downward trend until 1999. After 2000 industrial restructuring in the context of economic growth, foreign direct investment and integration in European research networks led to major changes in the research and innovation system, and the share of expenditure on R&D to GDP ranged from a minimum of 0.37% in 2000 to a maximum of 0.58% in 2008. At the same time there has been a growing polarization of R&D activity between NUTS3 regions and even at NUTS2 level.

In Romania the R&D resources are concentrated in several counties in association with major university centers or industrial clusters in which specific output is at a technological level above average (Figure 3). Analysis of total R&D spending shows that only Bucharest covers 38% of all the R&D spending in Romania. Adding Ilfov County, the percentage rises to 55% of the total nationwide value. The city of Bucharest, capital of Romania, is the most important pole of development and has a significant influence on Ilfov county which has developed in 2012 a volume of R&D comparable to the North West (includes Cluj and Bistrita Nasaud) and Centre, taken together. Ilfov County is a representative example of a region strongly influenced by commuting population and by expansion of investments to intermediate urban areas or rural areas near the limits of the capital. It is an example of an outlier which distorts the indicators used in the analysis.

Figure 3. R&D expenditures at NUTS 3 level (% of regional GDP), 2011



Source: own computation based on data from National Institute of Statistics, Tempo-online database.

The innovation score of NUTS2 regions (Table 2) based on selected indicators from Table 1 indicates some differences that are not related to research and development activities.

Table 2. Indicators of innovation performance and GDP per capita in Romania, NUTS2 regions, 2011

NUTS 2 Region	R&D total expenditure (%PIB)	PCT patent applications per billion GDP	SMEs innovating in-house (% of SMEs)	GDP/capita (lei)
Nord-Vest	0,49%	2,2	27%	22469
Centru	0,20%	1,7	23%	24375
Nord-Est	0,30%	4,6	42%	15414
Sud-Est	0,11%	1,4	36%	21196
Sud-Muntenia	0,38%	1,3	31%	21482
București-Ilfov	1,09%	3,9	32%	65363
Sud-Vest Oltenia	0,28%	1,8	30%	19892
Vest	0,23%	1,6	17%	28890

Source: own computation based on data from National Institute of Statistics, Tempo-online database.

The positions occupied by the eight NUTS 2 regions of Romania in a hierarchy established on the basis of innovation performance indicators (Table 3) shows a different innovative orientation. Bucharest-Ilfov region is the first in the R&D expenses, which has a historical determination as the research structure had long been more developed in

Bucharest compared to other cities/regions. Dynamics of non-R&D innovation, however, is higher in other regions, for example the Nord-Est region ranks first at patent applications and the proportion of innovative SMEs, although it is the poorest region. Nord-Est situation is explained by the existence of a concentration of research and technological development activities around the university center (Iași).

Table 3. Ranks of NUTS2 regions of Romania based on innovative and economic performance indicators, 2011

NUTS 2 Region	R&D total expenditure (%PIB)	PCT patent applications per billion GDP	SMEs innovating in-house (% of SMEs)	GDP/capita (lei)
Nord-Vest	2	3	6	4
Centru	7	5	7	3
Nord-Est	4	1	1	8
Sud-Est	8	7	2	6
Sud-Muntenia	3	8	4	5
București-Ilfov	1	2	3	1
Sud-Vest Oltenia	5	4	5	7
Vest	6	6	8	2

Source: own computation based on data from Table 2.

Important factors that determine the hierarchy are the existence of industrial clusters that produce average and high-tech goods and services, and foreign direct investment (FDI). The two are highly correlated in Romania last two decades.

Bucharest-Ilfov region held 61.7% of the stock of FDI in 2011, followed by the Centru region (7.6%), Sud-Muntenia (7.4%) and Vest (7.2%), while in other regions the share varies between 2.9% and 5.4%. This concentration of resources makes the Bucharest-Ilfov region not comparable to the others. It is worth noting that the Vest and Centru occupy a modest position in the innovative performance, but have a higher level of development (measured by GDP / capita) based on effective non-innovative activities. Sud Muntenia region benefits from positive economic spillovers generated by the company Dacia-Renault, but involvement of SMEs in the area based on intensive knowledge creation and usage in the production chain is still modest. In these regions branches of multinational companies are developing. These are usually oriented on non-innovative activities in Romania, while the R&D and innovation activities are performed in the parent companies abroad.

The National Strategy for Research, Development and Innovation 2014 - 2020 estimated that public sector R&D "is dispersed, with a high degree of duplication in the institutional missions and with low inter-institutional collaboration. Often it lacks critical mass and the capacity to address interdisciplinary activities". Therefore the strategy aims to defragment the system and to support the concentration of research activities in order to increase the impact of R&D on innovation.

4. Correlation between the level of development and R&D expenditure

The statistical analysis focused on researching the link between R&D spending and economic performance (as measured by GDP or GDP/capita). This approach aims to see whether the two variables are correlated. In case of a favorable outcome, the analysis would be expanded by econometric modeling and identification of causal relations to see

to what extent the innovation effort expressed by R&D spending is a key factor of economic performance in Romania.

The analysis began with the identification of Pearson correlation coefficient of GDP at county level and the level of expenditure on R&D, both expressed in lei (the national currency). As expected, the coefficient values are quite high, over 0.9. These results can be explained by the fact that counties with a high level of production have a higher budget and can afford to spend more (in absolute terms) than other counties. The highest amounts were spent on R&D in 2011 in Bucharest, Ilfov, Cluj, Arges, Iasi and Timis, while in Giurgiu County and Mehedinti there was no spending on R&D.

To reflect more accurately the development level of counties, further in the analysis the GDP per inhabitant is used. Also the level of expenditure on R&D expressed in absolute terms is not a faithful indicator of the financial effort made in this direction. For example, in absolute numbers, Bucharest allocates more than double on R&D than Ilfov County but in relative numbers, R&D expenditure to GDP is 0.89% in Bucharest and 2.88% in Ilfov. Therefore it would be more relevant to use R&D expenditure expressed as a percentage of county GDP.

The current connection between the two variables is not very strong, but in most cases the correlation coefficient is positive, and over 0.5. This means that between the two variables there is a direct link but not strong enough. Due to the fact that the impact of R&D on GDP may not be immediate, the correlation coefficients were also computed between the current values of the GDP / capita and the R&D expenditure from previous years (lags). The coefficient values for lags do not differ significantly from the coefficient values associated to the actual values. This shows that the structure of the two variables doesn't suffer major changes over time.

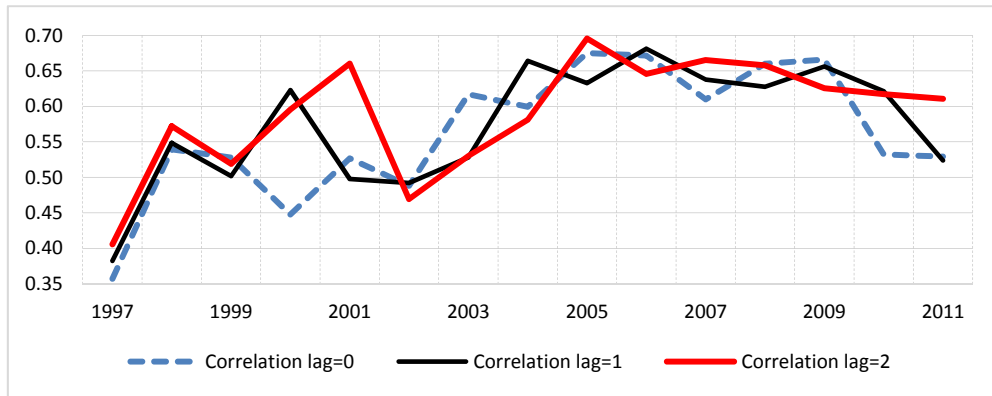
Table 4. *Pearson correlation coefficients between GDP (county level) and R&D expenditure*

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP level (lei) ~ R&D expenditure level (lei)																	
	0.89	0.93	0.94	0.95	0.95	0.97	0.96	0.96	0.95	0.95	0.96	0.96	0.97	0.96	0.97	0.97	0.97
GDP/capita level (lei/capita) ~ R&D expenditure level (%GDP)																	
Lag=0	0.54	0.53	0.36	0.54	0.53	0.45	0.53	0.49	0.62	0.60	0.68	0.67	0.61	0.66	0.67	0.53	0.53
Lag=1		0.53	0.38	0.55	0.50	0.62	0.50	0.49	0.53	0.66	0.63	0.68	0.64	0.63	0.66	0.62	0.52
Lag=2			0.41	0.57	0.52	0.60	0.66	0.47	0.53	0.58	0.70	0.65	0.67	0.66	0.63	0.62	0.61
GDP growth rate (t/t₀) ~ R&D expenditure level (lei)																	
	0.01	0.02	0.27	0.09	0.31	-0.13	0.07	-0.04	-0.01	0.31	-0.07	0.08	0.16	-0.14	0.00	0.17	
GDP/capita level (lei/capita) ~ R&D expenditure level (lei)																	
	0.33	0.30	0.28	0.35	0.36	0.40	0.39	0.37	0.39	0.39	0.41	0.39	0.39	0.44	0.41	0.40	0.41
GDP growth rate (t/t₀) ~ R&D growth rate (t1/t0)																	
	-0.13	0.23	0.02	0.07	0.11	0.05	-0.18	-0.12	-0.01	-0.22	0.32	-0.03	0.03	-0.05	-0.17	-0.10	
GDP growth rate (t/t₀) ~ R&D expenditure level (%GDP)																	
	0.04	-0.26	0.68	-0.03	0.43	0.02	0.07	0.11	0.21	0.54	0.13	-0.01	0.22	-0.04	-0.09	0.25	

Source: own computation based on data from National Institute of Statistics, Tempo-online database.

Figure 4 shows the correlation coefficients of GDP/capita and the level of R&D expenditure/GDP, current values, with one year lag (lag = 1) or two-year lag (lag = 2). There aren't notable differences between the three sets of coefficients, but there is a stronger correlation at a lag of two of R&D, i.e. a closer link between the current value of GDP/capita and value two years ago of R&D expenditure.

Figure 4. Pearson correlation coefficients between GDP/capita (lei) and lags of R&D expenditure (% GDP).

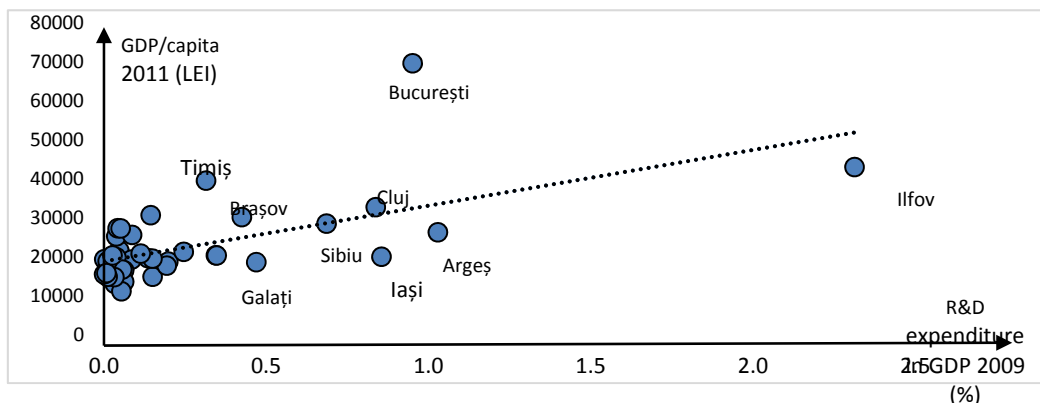


Source: own computation based on data from National Institute of Statistics, Tempo-online database.

For a better illustration of the relationship between the two variables a scatter plot was used. Figure 5 shows that the two data sets tend to follow a linear pattern, emphasized by a regression line. The graph illustrates data on the county level GDP/capita in 2011 and R&D expenditure as a percentage of GDP in 2009. The Pearson correlation coefficient between these two variables is 0.61. Most of the counties are shown on the left side of the graph, having less than 0.4% of GDP devoted to the R&D sector. Above this threshold are 8 counties: Ilfov (2.31%), Arges (1.03%), Bucharest (0.95%), Iași (0.85%), Cluj (0.84%), Sibiu (0.68%), Galați (0.47%) and Brașov (0.42%). Regression and correlation coefficient indicate that the developed counties allocate more financial resources to the R&D sector.

The analysis focused on calculating the correlation coefficients for several pairs of data sets and the results are presented in Table 4. The coefficient values indicate a very weak or even nonexistent relationship among different forms (absolute terms / relative terms) of GDP and R&D expenditure at county (NUTS 3) level.

Figure 5. The relationship between GDP/capita (lei/capita) and the R&D expenditures (% GDP).



Source: own computation based on data from National Institute of Statistics, Tempo-online database.

Conclusions

Innovation performance gap between Romania and the European Union is very high and the catching up process requires very high efforts. The challenge becomes even greater judging by the fact that the European Union declared that innovation is the main tool to increase competitiveness. In this context Romania has set as target for 2020 to spend the equivalent of 2% of GDP on R&D, significantly higher than the current level.

Large discrepancies exist also within the country, between regions. At NUTS 2 level the share of R&D expenditure in GDP ranges from 0.11% in the Sud-Est region (third worst performance of all 272 EU regions) and 1.09% in the Bucharest Ilfov. At county level, the differences are even greater. In 2012 there were two counties not investing at all in research and development (Ialomita, Bihor). In the opposite situation were the most developed counties, which spent for R&D between 0.5% and 2.9% of GDP.

Innovation still doesn't generate economic development at the regional level. Romania has not yet reached the stage of development sustained through innovation. It failed to reach critical mass of volume and quality of research and development, and technology transfer of R&D results is limited.

Analysis of the correlation between GDP per capita and county expenditures on R&D shows there is a direct link between the two. The most developed regions invest more in R&D than the less developed ones, both in absolute and relative terms.

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A multidisciplinary approach of communication

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Abstract. *Each form of communication has its specific feature which helps, in turn in creating unique designs. There are also designs which go beyond a certain format and that can be adapted to all situations, for any of the types of communication. The use of models allows the interpretation of phenomena using certain structures that link the elements and relationships that can exist between these elements. The roles that can be performed by a certain model are heuristic (to explain), organizational (to order) and forecasting (to make assumptions). Mc Quail D. and S. Windahl (Mc Quail and Windahl, 2004) state that a model is valid only to its degree of probability: it remains valid as long as it is not refuted by experience. As Yves C. shows, we must emphasize the fact that the use of a model can sometimes stop the development of a science, through the lack of feed-back or even by not considering the context that may influence the communication process modeling.*

The twentieth century was the promoter of new theoretical models of the communication process inspired by the various schools (the process school, the semiotic school, the Palo Alto school, the Oxford school, etc.) or sciences (mathematics, informatics, cybernetics, linguistics, semiotics, psychology, physics, sociology, etc.). In order to propose a universal model of communication, we highlight a few models that have influenced researchers for decades. Next, we will proceed in analyzing these general models based on an evolutionary principle, from the simplest to the most complex.

Keywords: communication; models of the communication; communication process; relationships; multifunctionality.

JEL Classification: M2; M3; O3; O4.

1.1. The linear model of Claude Elwood Shannon

The most representative communicational model is the Shannon-Weaver model that works on the principle of linearity from the transmitter and receiver (a source would prepare the message which would be left to the receiver via a transmitter along a channel). This first theory, the informational one, studies “the natural transmission of signals, the semiology of communication the structure of codes and sign systems, the pragmatics of communication, the dynamic of the relationship transmitter-receiver” (Baylon and Mignot, 2000, p. 9). During the communicational process between the two poles, the information remains invariant, translated into series of binary informational units. The quality of this external event that takes a value between 0 and 1 is called by Shannon bit, it is measurable and can be calculated:

$$Q_i = f\left(\frac{1}{p}\right)$$

Where Q represents the amount of information, while p is the probability of its appearance.

But during transmission, the information may degrade irreversibly, and can be calculated using the formula of the American engineer Hartley:

$$Q_i = \log_2\left(\frac{1}{p}\right)$$

The amount of information distributed by a pole with $\frac{1}{2}$ probability of appearance is:

$$Q_i = \log_2\left(\frac{1}{\frac{1}{2}}\right) = \log_2 2 = 1$$

In the case when in the company, the medium information has different probability of occurrence, it is calculated as follows:

$$\begin{aligned} Q_{med} &= \frac{\left[p_1 \log\left(\frac{1}{p_1}\right) + p_2 \log\left(\frac{1}{p_2}\right) + \dots + p_n \log\left(\frac{1}{p_n}\right) \right]}{(p_1 + p_2 + \dots + p_n)} = \\ &= \frac{[p_1(-\log p_1) + p_2(-\log p_2) + \dots + p_n(-\log p_n)]}{(p_1 + p_2 + \dots + p_n)} \end{aligned}$$

The sum of the probabilities of occurrence of all information is equal to 1, which means that Shannon's formula becomes:

$$Q = -\sum_{i=1}^n p_i \log p_i$$

During the 1920's, H. Nyquist and R. Hartley developed several fundamental ideas related to the transmission of information between the two poles, especially in the context of the telegraph regarded as a communication system. Over time these concepts have been developed individually, but didn't become part of a comprehensive theory. In 1940, Shannon developed the concept of channel capacity, based in part on the ideas of Nyquist and Hartley, and then formulated a complete theory. A meaningless message for a receiver does not take the form of information and the explanation approached by E.C. Shannon referred to structuring a communication system by introducing new channel concepts such as the influence of noise.

1.2. Johnson's model

Using the model proposed in 1948, W. Johnson gave up on the name used to define the actors of communication (Mr. A and Mr. B) and created within his formula, ten steps which refer to the perceptual and communicative dimension of each individual involved in the communicational process.

Not for stochastic reasons, the process of communication within the Johnson's formula is represented by a rigid approach, where even not addressed elements of other intrapersonal communication models can be found, such as: spiritual influence, the personal value systems of the actors of communication or the intangibility of the actor's personality serving to define the steps of the process. Through this dedication on the examination of the functions and possible discrepancies in each stage, Johnson provides a first approach to the existence of communication barriers.

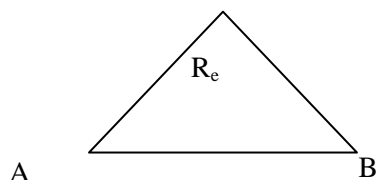
The description of the communication process by means of a formula may be represented also through a graphical representation of the model of Johnson.

Thus, Johnson, through his contribution to the study of psychological and cultural dimensions anticipates the emergence of a new paradigm, namely the organic one.

1.3. The Newcomb model

By transforming the equilibrium theory in the theory of symmetry, the communication between actors is influenced by the level of attraction of one of them simultaneously maintaining an orientation to each other and to the objects in the surrounding environment.

The Newcomb model, as can be seen in Figure 1, is based on the work of Heider where the degree of attraction is not represented, Heider thinking that when two people have attitudes of acceptance or rejection for each other or to an external referent, the components forming this relationship will be in equilibrium (both parties accept the external referent - the attitude of A-B for R_e) or unbalanced (one party accepts and the other is in disagreement with the external referent) even if this induced condition stimulates the communication.

Figure 1. *Newcomb's model*

Source: McQuail, D., Windahl, S. (2004), "Communication Models for the study of mass communication" SNSPA, p. 31.

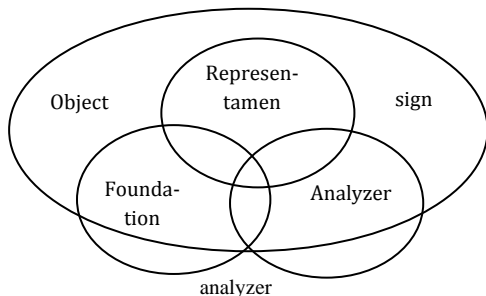
When there is a balance between the three poles A - B - R_e each participant will resist to change and if the case of imbalance different attempts will be undertaken in order to restore a "cognitive" balance.

Subsequently, in 1959 Newcomb brought, some additions to the original version, noticing the emergence of the process of communication only in certain situations (McQuail and Windahl, 2004): when there is a strong attraction between people, when the subject is important for at least one of the participant and when R_e has a common importance for both parties, testing and evaluating himself this theory.

Anticipated by the balance theory, the communication processes explained by Newcomb in his model, show that people are turning to certain sources of information in accordance to their positions, seeking information to support and certify the actual behavior. We must not believe that the trend towards consensus depicts the only cause and the only effect of communication, a multitude of solutions to these uncertainties accompanying cognitive dissonance.

1.4. The Peirce Model

Reaching across semiotics, which is analyzed as a "quasi necessary or formal doctrine of signs" (Peirce, 1990), C.S. Peirce, building on the categories of typology offered by Aristotle and Kant, believes that each process is composed of three trichotomies: the sign, the object of the analysis and the analyzer Figure 2.

Figure 2. *Items of meaning for Peirce*

Source: adapted from Peirce, C. (1990), "Meaning and Action", an anthology by Delia Marga, Humanitas, Bucharest, p. 269.

These three entities are analyzed using three others that they replace: the foundation, the representative and the interpreter, highlighting three entities “representamenul”, the object and the interpreter.

1.5. Saussure's model

Not intending to bring to the forefront a model of communication, Saussure F., through his research came out with a “structural” model which highlights the links between elements in order to understand them (Dobrescu et al., 2007, p. 317). The message becomes the most important, not the communication process or the individuals that participate in the process.

Even if he didn't define the conceptual limits of structuralism as did Popper's unitary theory, the Swiss author Saussure, focused on analyzing all firms by imposing an intrinsic link with the systematic nature of an object. Separating from the linguistic practice of studying the origin of language, he tries to offer a structural description of these firms.

In Saussure's research, the duality of language is defined as a distinct “kingdom”, composed of a physical quantity and a mental one (or an objective and a subjective one). Studying in depth the concept made Saussure try to establish a distinction between language, linguistics and speaking: “Avoiding sterile word definitions, within the total phenomenon represented by speech we first singled out two parts: language and speaking. Language is speech less speaking” (Saussure, 1972).

For Saussure represents, language is a social institution which is not subjected or described by the rules of firms in the external reality. Due to theoretical construction, language is seen as an intelligible form of language facts, subordinating to language, forming a theoretical model language is perceived as an object (corpus).

Saussure, through his two dichotomies (physical sign/mental sign and language/speech) launches a challenge regarding the study of linguistics as a whole divisible not at a functional level but only at an analytical one by binding its components to their functions. The need to study the organics of the, made Saussure state that language can not be limited to sound, or other constituent units but it can't get rid of these by a classification in any category of human facts. Thus, it cannot be a function of the speaking subject but only a structure that any participant in the communicational process can attain in time.

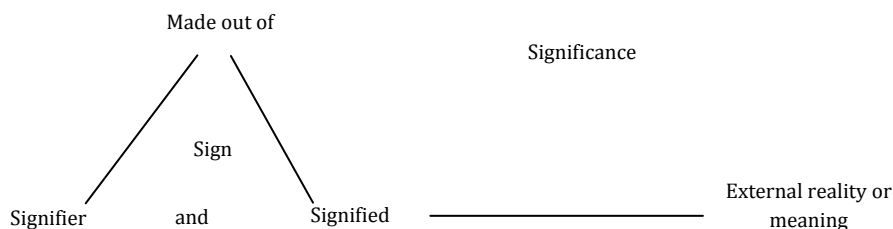
Saussure manages to make a distinction between diachrony (the study of language through time while operating on the subject as a dynamic element of change) and synchrony (studying in a particular operating point on the subject as a static element), in what concerns the study as an organic whole. The Swiss author Saussure, in what concerns the study of the functionality of language, leans more on its synchrony as it offers a certain regularity and thus can more easily provide regarding the study of Saussurean linguistics. Adopting this concept, the study emphasizes especially on the relationship between form and content as the analysis of a dynamic succession of stage would force us to provide guidance to an analysis on the “categories of ideas” in development. Following such an approach, Saussure concludes that language as a system

of signs, may be a particular case of such other systems. In terms of research in communication Saussure succeeds in making an important distinction between the written/spoken word and the mental concept or between the physical and mental sign.

Thus, the visible part of the sign is represented by the signifier, while the mental concept belongs to the signified, both belonging to the same community or linguistic cultures. The activity of encoding/decoding belongs to the communication act, according to the relationship between the sign (signifier and signified) and reality. Thus, the meaning is an active process of re-creation, interpretation, negotiation of a certain message.

Studying the relations between the parties, Saussure considers that there is a link between the signifier and the signified, but that this relation is arbitrary, Figure 3.

Figure 3. *The elements of meaning in Saussure's model*



Source: Fiske, J. (2003), *Introduction to Mass Communication*, New York: Polirrom collection Collegium series Media, p. 67.

This arbitrary feature of the elements associated with the sign gives rise to the arbitrariness of the sign itself, through a lack of a direct link between the signifier and the external reality.

Saussure proposes another dichotomy, the fourth, between the form and the content that has as its starting point the previous one. Establishing a report for each term signifier/signified, creates a mediation of language, without clearly delineating between thought and utterance, each of these terms becoming an articulus attached to an idea or it becomes the sign of an idea.

Solving the perception signifier/signified can be achieved through interdependent units in form and content but inseparable physically. The originality of this Saussurian aspect was developed using the multifunctional model of communication by Gerbner G.

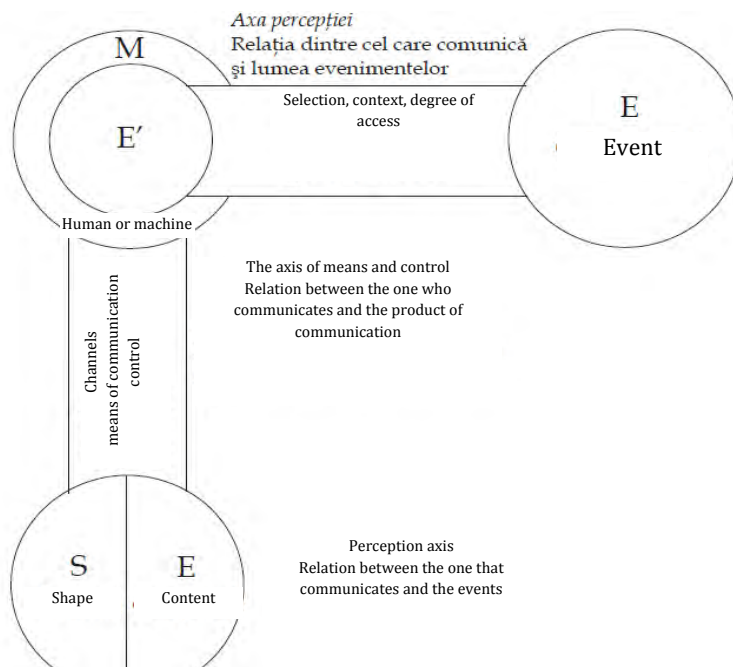
1.6. Gerbner's multifunctional model

Deepening the neuropsychological studies of W. Johnson, G. Gerbner, moves to a more detailed study of the message by sketching a model that has a greater applicability. This model can take different forms depending on the specific of the communication situation it describes, as the elements of which it is composed can be used like bricks in a building, allowing the model to describe communication processes, simple or complicated as production (messages) and perception processes (messages and events which are communicated).

Appealing to the anticipated multifunctionality and by anchoring in the context not only through the lasswellian efficiency, but also by selection, by the ongoing transformation of Johnson's message, Gerbner's model covers a wider range of applicability, taking different forms depending on the situation of communication.

The new descriptive gerbnerian model puts in antithesis two distinct things: how to issue the message and the perception of events. To this descriptive format of the multifunctional model of Gerbner was added, in comparison to the models of Lasswell and Johnson, a diagram that highlights these two dimensions of communication the perceptual one and the one depicting the means and the control, Figure 4.

Figure 4. Multifunctional model developed by Gerbner: *M perceives E as E'*



Source: McQuail, D., Windahl, S. (2004), "Communication Models for the study of mass communication" SNSPA, p. 28.

Highlighting the communication process through this chart: E means event and the subject, M, perceives the event as E' until it is transferred in the form of a message SE (where S represents linguistic means and E represents the information to be transmitted). When the pattern relates to human communication, M may be a person, and in other types of communication M can be a particular kind of machine (for example, a radiator in a heating system). Gerbner proposes a two axes analysis of the relationship between E, M and E' which is one of perception. One is "transactional" (communication), where E' is considered mainly as a function "of assumptions, views, previous experience of M, as well as other factors. How will E' be for M depends thus on factors within M or linked to it. On the other axis, called by Gerbner psychophysical (perceptual or reception), E (the event itself) represents the most important factor, creating "fair and appropriate

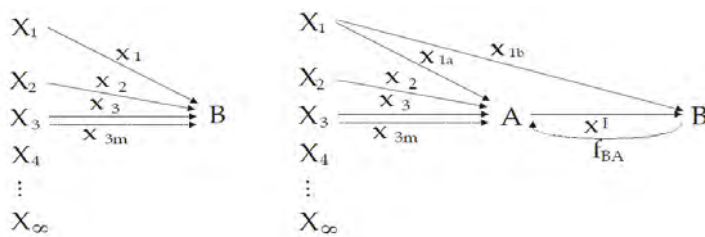
perception on favorable terms". What M perceives depends on selection, on the context in which M meets E and the extent to which M has access to this E and other Es.

1.7. The Westley-MacLean model

The need to differentiate between human and mass communication where in the latter, the feedback is minimal or delayed, and the receiver informs a variety of sources that can be chosen and to whom it may have certain attitudes, gave rise to a new model adapted from the Newcomb's ABX.

The Westley-MacLean model keeps Newcomb's notes but adds to the ABX1 diagram the objects (subjects) X_2 - X_n . Thus, the receiver B receives direct information from the object X_1 , and to the triangle ABX1 other possible ABXm triangles are added, Figure 5.

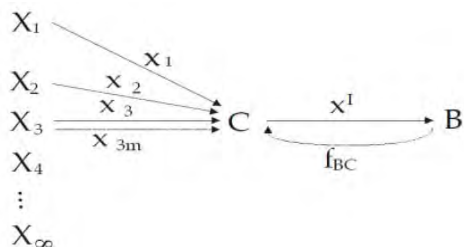
Figure 5. *The initial model of Westley-MacLean*



Source: adapted from Westley B. Malcolm, S. MacLean Jr. (1955), "Conceptual Model for Communication Research", Audio-Visual Communication Review, Winter (<http://zimmer.csufresno.edu/~johnca/spch100/notes.htm>, accessed on 12/08/2012).

This model suffered some changes by introducing a new element, channel C, which has the role of encoder and acts on B's behalf, expanding its social environment at the same time, adding an editorial - communicational function in order to meet receptor's needs of social the messages A, Figure 6.

Figure 6. *Adding the editorial-communicational function*

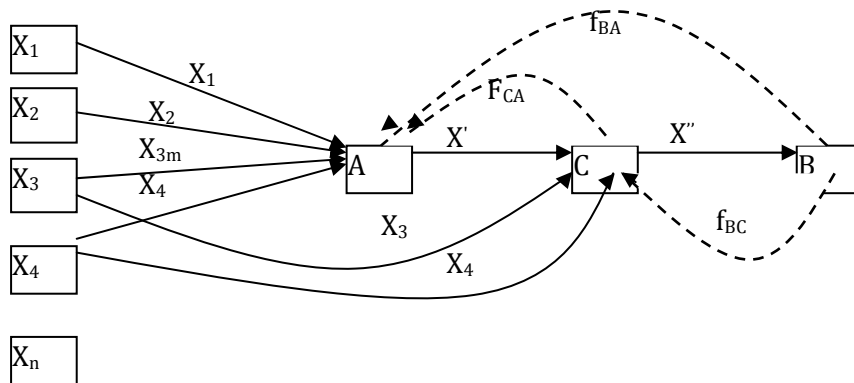


Source: adapted from Westley B. Malcolm, S. MacLean Jr. (1955), "Conceptual Model for Communication Research", Audio-Visual Communication Review, Winter (<http://zimmer.csufresno.edu/~johnca/spch100/notes.htm>, accessed on 12/08/2012).

The social source that does not resume to simple emitters relates to topics of interest represented by the multitude of objects X_m . Westley and MacLean, in this new context, appeal to three types of self-regulation: FBA, FBC and FCA which seeks answers to A's

opinion related to an important theme X_m in trying to make a separation between mass communication that has an informative and the communication that has the role of influencing, seeking the help of “gatekeepers” (social sources that select those subjects/topics of major importance in the communicational process), Figure 7.

Figure 7. Westley-MacLean's model

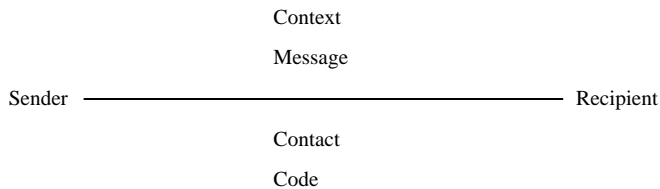


Source: adapted from Westley B. Malcolm, S. MacLean Jr. (1955), “Conceptual Model for Communication Research”, Audio-Visual Communication Review, Winter (<http://zimmer.csufresno.edu/~johnca/spch100/notes.htm>, accessed on 12/08/2012).

The difference in the light of subsequent developments through Festinger's and Westley and MacLean's models, is given by this last presentation of mass communication, which alerts on the limitation regarding the balancing of the two new elements introduced A and C which have a dominant role, and where B is available to them. This also represents the criticism of this model because an ideal communicational situation, of harmonization between transmitter and receiver control is difficult due to the implications of political, economical control, the exchange and filtering of information.

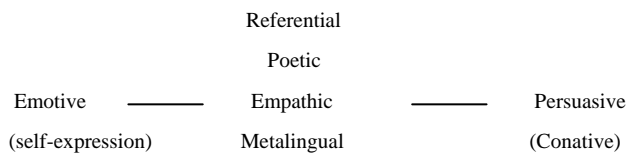
1.8. The linguistic model of Roman Jakobson

Jakobson studied the variety of functions of the message via the mathematical model of communication. The emergence of this new hybrid communicational model made a connection between structuralism and functionalism (Mukařovský J., Trubetzkoi N.) and the chart for information transmission. This model is applicable to verbal communication, Jakobson emphasizing certain factors through the following form, Figure 8:

Figure 8. *Communicational elements in Jakobson's model*

Source: http://en.wikipedia.org/wiki/Roman_Jakobson

To this scheme, Jakobson added for each factor another function, Figure 9:

Figure 9. *The functions of communication in Jakobson's model*

Source: http://en.wikipedia.org/wiki/Roman_Jakobson (accessed on 15.08.2012).'

Centered on the transmitter, the emotional function, shows its relations with the message, putting into evidence a certain state of the individual. The main function of language, the referential function, centers, in the context of communication, on an objective orientation of the message. In particular, Jakobson was concerned about the poetic function, which highlights the relations with itself, this poetic language being found even in everyday speech.

Focusing on contact, the empathic function shows open support of communication channels through ritualized forms (rules of politeness, speeches). Closely related to the code the metalanguage function requires a speech about the language itself, while the persuasive function focuses on defining the links between him and the transmitter.

1.9. The Dance F.E.X. model

Dance's helical model is newer, and we chose to present it only because it can be considered an exciting development of Osgood and Schramm's circular model.

In a debate about linear versus circular models of communication, Dance F.E.X. (1967) notices that, today, most experts refer to the circular approach as being the most suitable for the accurate representation of the communication process. But it also has weaknesses.

The circular approach suggests that the communication flow returns, thus describing a perfect circle, exactly at the point it started. The helical representation of communication helps us understand those cases where the circular model fails. She notes that the process of communication is ongoing and that what we communicate now will influence the structure and content of the communication later on.

Most models give a "frozen" aspect of the communication process, emphasizing the dynamic nature of communication (Figure 10). Like all social processes, the

communication process involves elements, relationships and contexts, all of which are in permanent change. The helical representation captures the change process in time of the various elements of communication. For example, during a conversation the knowledge increases steadily for both participants, Figure 10. They acquire throughout the conversation, more information about the topic under discussion, about the views and knowledge of the other etc.

Figure 10. *The helical model of Dance*



Source: Dance, F.E.X., "Hearing voices" in Vocate, D.R. (1994), "Different Voices, Different Minds", Hillsdale, NJ: Lawrence Erlbaum Associates, LEA's communication series, p. 198.

The spiral in Figure 10 takes different forms in different situations for different people. For some, because they are familiar with the topics discussed, the spiral tends to widen very much, while for others, who are not familiar with the same themes, the spiral extends in a slower pace. The model can be used to illustrate gaps of information, as we will see in Chapter 4 and the thesis according to which knowledge is more advantageous to those who already have more knowledge. It also can illustrate communication situations such as that of a teacher who gives lectures on the same subject; the teacher assumes that the audience becomes gradually more informed and, considering this he reformulates his lectures based on the attained by the audience.

Conclusions

First, our paper provides a new theoretical framework that incorporates multiple theoretical mechanisms. Second, it offers behavioral models that incorporate theoretical mechanisms, to social and economic actors. Third, it shows how modeling can be useful for exploring the evolutionary dynamic of communication.

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The issue of “true” money in front of the BitCoin's offensive

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Abstract. *The issue of money, beyond what is usually meant by the very words “money issue” was and still is a subject of interest for a heterogeneous public, going beyond time and being the subject of numerous studies and regulations since ancient time. Over centuries, the money had different forms, and the controversies surrounding them were numerous. Currently, one of the problems is related to the emergence and use of virtual money, seen from the perspective of private currency. The question that occurs frequently in the talks of several economists is related to the ability of virtual money to survive. History has shown that man has the capacity to find ways which can “avoid” prohibitions of various types, being able, even in the case of money to find alternatives to the official currency. Is the BitCoin that private currency which will have the longest life? And if so, how long it will run in parallel with the traditional currency? Based on these questions, this paper aims at presenting the main aspects of the BitCoin, starting from specialized literature and reaching the Romanian reality.*

Keywords: BitCoin, market, competition, private currency.

JEL Classification: B25, M00.

1. The issue of private currency

As much it would change the size or would diversify the economic terms of trade, the emergence and evolution of money reveals the features of stages of the human development. The history of economic science turns out to be an important ally in the reconstruction of the logical path of money and of the arguments enlightening the premises of private currency in market economies, whatever their stage of development. At the same time, one can identify the theoretical elements, which are necessary for understanding the emergence of new forms of money and contradictory attitudes towards private currencies.

Starting with the second half of the nineteenth century, the economists' research on private currencies, by simplifying the issue, followed three directions:

- The first one seeks the origin of private currency in the behaviour of the individual who is guided in his economic actions by self-interest (Carl Menger).
- The second one associates the private currency to the expansion of the freedom of the individual initiative (Milton Friedman).
- The third one enshrines the private currency as a privilege of a private bank (Selgin, 1988).

According to the first outlined above direction, money is seen as a natural product of human economy and also as a discovery of civilization on its historical way to better serve the people needs. Carl Menger identified the origin of money in the economic phenomena as the division of products functions, thanks to the increasing complexity and diversification of production, which allowed comparing utilities. The detailed analysis of the genesis of money led Carl Menger to a categorical conclusion: "*The origin of money (unlike the coin, which is only a variety of money) is entirely natural and only in exceptional cases contain the legislative influence.*" The exercise of the monopoly on the currency management was based on the presumed historical priority of the state, but also on the confusion legal-official, as the functions of money united economic, psychological and administrative interests: "*The fixing of a coinage so as to include all grades of value (Wertstufen), and the establishment and maintenance of coined pieces so as to win public confidence and, as far as possible, to forestall risk concerning their genuineness, weight, and fineness, and above all the ensuring their circulation in general, have been everywhere recognised as important functions of state administration.*" (Menger, 1892: pp. 239-255).

At the same time, the expansion and diversification of trade, and increased competition demanded an adequate legal framework: "*The difficulties experienced in the commerce and modes of payment of any country from the competing action of the several commodities serving as currency, and further the circumstance, that concurrent standards induce a manifold insecurity in trade, and render necessary various conversions of the circulating media, have led to the legal recognition of certain commodities as money (to legal standards). And where more than one commodity has been acquiesced in, or admitted, as the legal form of payment, law or some system of appraisement has fixed a definite ratio of value amongst them. All these measures*

nevertheless have not first made money of the precious metals, but have only perfected them in their function as money" (Menger, 1892: pp. 239-255).

Therefore, Carl Menger not only did not disputed the legislative power of the authority relating to money, but the distortion of the historical truth about the occurrence of money: *"It is not impossible for media of exchange, serving as they do the commonweal in the most emphatic sense of the word, to be instituted also by way of legislation, like other social institutions. But this is neither the only, nor the primary mode in which money has taken its origin. This is much more to be traced in the process depicted above, notwithstanding the nature of that process would be but very incompletely explained if we were to call it 'organic' or denote money as something 'primordial', or 'primalval growth', and so forth. Putting aside assumptions which are historically unsound, we can only come fully to understand the origin of money by learning to view the establishment of the social procedure, with which we are dealing, as the spontaneous outcome, the unpremeditated resultant, of particular, individual efforts of the members of a society, who have little by little worked their way to a discrimination of the different degrees of saleableness in commodities."* (Menger, 1892: pp. 239-255).

The second stated direction assumes that over time, the resourceful human being, having the desire to hold a certain freedom, used a variety of goods as money. Wherever the state issued currency of gold, silver or any other metal, but the man wanted to obtain an apparent freedom, he found means of the most varied. Thus, Milton and Rose Friedman showed in *"Free to Choose. A personal statement"* that basically what the various means used as money have in common is *"their acceptance in a particular time and place, as objects of exchange for other goods and services with the belief that others will accept them in its turn."* A long time among the goods used as money, one could find the tobacco, considered *"a basic money of Virginia and its neighboring colonies for close to two centuries, until well after the American Revolution [...]. During World War II cigarettes were widely used as a medium of exchange in German and Japanese prison camps. After World War II cigarettes were widely used as money in Germany during the period when the occupation authorities enforced ceilings on prices in legal currency that were well below the levels that would have cleared the market [...]. People resorted to barter and to the use of cigarettes as a medium of exchange for small transactions, and cognac for large ones—by all odds the most liquid currency of which we have record"* (Friedman and Friedman, 1998: pp. 202-204). Therefore, man has demonstrated over time a real capacity to adapt to market demands, by conventional or ingenious means. Through trial and error, individuals have selected each time exactly that good that best corresponded to their expectations about the exchange.

The third direction is linked to the indissoluble relationship private currency-private banks. Selgin supports the idea that a competitive banking system, i.e. without central bank, is preferable because it can create economic stability by preventing cyclical crises. This competitive system called "free banking" provides on the monetary market a monetary equilibrium without excess of demand or supply, for a certain level of prices and allows the adjustment of money supply according to the needs of individuals holding money. In the terms of "free banking", private money is official, legal money, not related

with the individual than indirectly through the bank, at a cost of transactions (Selgin, 1988).

Beyond the items used to swap, to barter, the individual has demonstrated the ability to create some own currencies that have circulated as an alternative to the official ones. In the last century, there have been observed different types of such currencies used as alternatives. Are presented below just a few of them (Rogojanu and Badea, 2014: pp. 103-114):

- QQ - Chinese currency launched in a network on the Internet. After the advent and use of this currency in China was born a black market where the virtual currency was exchanged for the real one. In 2007 there were approximated transaction amounting of nearly 6.8 billion Yuan (one billion dollars) realized with QQ. The Chinese government has intervened and in 2008 there were withdrawn large amounts of cash of the QQ market (Business Magazin, 2009 in Rogojanu, and Badea, 2014: pp. 103-114).
- M-PESA used by Kenyans to change minutes into cash. The payment for an economic good is done by transferring a number of minutes to the phone of the cash register. Every day, through the M-PESA system there were made transactions totaling 10 million dollars, which means about \$ 3.6 billion annually (Business Magazin, 2009 in Rogojanu and Badea, 2014: pp. 103-114).
- Tem - a currency used from 2010 in Volos, a Greek port city. The established system implies people to use Tem units in order to exchange products, goods and services - cleaning, cooking, repairs, teaching, baby-sitting and technical assistance. The system has been improved, and the rate of exchange Tem/ Euro is at parity, as has always been since the beginning (Dumitru, 2013 in Rogojanu and Badea, 2014: pp. 103-114).
- Sano ('a currency for barter in Siros' worth an hour of work) - the inhabitants of the Greek island of Siros realize mutual exchange of services or products and digitally record the transactions (The Epoch Times Romania, 2012).
- "Peaches" - from the end of November 2013 in Montreuil, France, people are discussing about a new currency, which is a French way of ensuring that "transactions are not lost in the banking system" and the currency is meant "to promote the local trade" (Dumitru, 2013).
- "Bees" - in Villeneuve sur Lot they are used since January 2010, when a bee had the same value as 1 euro. Every six months, "the bee" was depreciated by 2%. (Dumitru, 2013).
- In Toulouse, beside euro it is used a currency called metaphorically "soil" (Dumitru, 2013).
- In Vaucluse, euro circulates alongside the "wheel" (Dumitru, 2013).
- In Romans-sur-Isere the French are using "the measure", in Angers - "the muse" and in Brittany there have been introduced "the Heol" (Dumitru, 2013).
- In Barcelona there are issued checks in "hours", used subsequently in order to purchase goods or services. The model called "time bank" has spread to other Spanish regions. "In Malaga, the system functions exclusively online. In Vilanova i la Geltru, the locals use a variety of credit card made of paper, which uses an alternative currency, accepted by just a few stores. Some cities have begun to accept the peseta

again, these being the national currency before joining the euro zone; in the present context, the central bank in Madrid estimates that Spanish people still own pesetas amounting \$ 2.4 billion that they have not surrendered before the introduction of the euro.”(Dumitru, 2013)

- In Mataelpino city and 10 other towns in the Sierra Norte region, people are paying with “moras” (blackberries). In the capital city of Madrid are also accepted “boniatos” (sweet potatoes) and “bivs”; in Bilbao “gitas” and in Valladolid “neighbors”. In Sevilla were issued “jaras” and “cougars”, in Catalonia “the echoes” have spread and the Basque Country uses “eusko”. (Dumitru, 2013)

History shows that human ingenuity has reared on providing an alternative and shaping competition between private and official currency. In the literature, this issue have been given rise to lots of controversies, even today not being said the last word on the subject. Thus whenever we are currently discussing about the crypto-currency, we are rapidly remembering the representatives of the Austrian School, known for their works presenting the thought that the currency can be created by the market, not necessarily by the state. In the *On the Origins of Money*, Carl Menger wrote: “*Money has not been generated by law. In its origin it is a social, and not a state institution. Sanction by the authority of the state is a notion alien to it. On the other hand, however, by state recognition and state regulation, this social institution of money has been perfected and adjusted to the manifold and varying needs of an evolving commerce, just as customary rights have been perfected and adjusted by statute law*” (Menger, 1892: pp. 239-255). In the same way, Menger claimed that “*money is neither an invention of States, nor the result of a legislative act*” (Menger, 1994: p. 261).

The idea that at the origin of money the presence of state is not mandatory was subsequently taken by other representatives of the Austrian School of Economics. Thus, the intellectual biography of different authors, such as Friedrich August von Hayek, has undergone some exciting transformations, which were translated into some fundamental procurement in terms of the theory of private currency: “*Not so very long ago, in 1960, I myself argued that it is not only impracticable but probably undesirable even if possible to deprive governments of their control over monetary policy. This view was still based on the common tacit assumption that there must be in each country a single uniform kind of money. I did not then even consider the possibility of true competition between currencies within any given country or region. If only one kind of money is permitted, it is probably true that the monopoly of its issue must be under the control of government. The concurrent circulation of several currencies might at times be slightly inconvenient, but careful analysis of its effects indicates that the advantages appear to be so very much greater than the inconveniences that they hardly count in comparison, though unfamiliarity with the new situation makes them appear much bigger than they probably would be*” (Hayek, 2006: p. 99). At the same register of the renewal of theory, Hayek was wondering and asking: “*Why not to allow the competition between currencies, so you no longer need a standard currency, because people will choose the one that is better. So I got to wonder why the competition should be bordered at money of other governments, prohibiting the private initiative to produce money?*” (Hayek, 1999: p. 191)

The belief of Hayek that free competition between private producers of currency is the best way to achieve a healthy currency has generated a number of critics both outside and inside the Austrian School of Economics (Rogojanu, and Badea, 2014: pp. 103-114). Murray Rothbard himself claimed that: *“Hayek is surely correct that a free market economy and a devotion to the right of private property requires that everyone be permitted to issue whatever proposed currency names and tickets they wish. Hayek should be free to issue Hayeks or Ducats, and I to issue Rothbards or whatever. But issuance and **acceptance** are two very different matters. No one will accept new currency tickets, as they well might new postal organizations or new computers. These names will not be chosen as currencies precisely because they have not been used as money, or for any other purpose, before”* (Rothbard, 2003).

At the same time Rothbard “calms the spirits” inflamed by fear economic meltdown: *“Many people believe that the free market, despite some admitted advantages, is a picture of disorder and chaos. Nothing is “planned,” everything is haphazard. Government dictation, on the other hand, seems simple and orderly; decrees are handed down and they are obeyed. In no area of the economy is this myth more prevalent than in the field of money. Seemingly, money, at least, must come under stringent government control. But money is the lifeblood of the economy; it is the medium for all transactions. If government dictates over money, it has already captured a vital command post for control over the economy, and has secured a stepping-stone for full socialism. We have seen that a free market in money, contrary to common assumption, would not be chaotic; that, in fact, it would be a model of order and efficiency”* (Rothbard, 2005:p.83)

Therefore, it can be seen only from the few references above that concerns, both theoretically and practically, about an alternative currency, a rival to the official one, go back a long time, along with supporters or opponents, always present.

During the last years, currencies such as Bitcoin (BTC), Litecoin, PeerCoin, AuroraCoin, Dogecoin, Ripple etc. have emerged on the market and have given rise to the most heated discussion – from the theme of the competition to the official currency to the issue of various illegalities committed on the Internet using such a currency. The most visible of the above listed currencies, generically called crypto-currencies, is the Bitcoin (BTC), which is a digital peer-to-peer, decentralized currency, whose circulation is based on the principles of cryptography in order to validate the transactions and to generate the currency itself. It is worth mentioning here that over time, modern technology has been used to produce such currencies, among those who failed enumerating: Cybercash, Digicash, Flooz and Beenz (Ding and Unnithan, 2004). One of the frequently asked questions is related to the survival reasons of the BTC compared with the bankruptcy reasons related to similar currencies. Details are as numerous, as controversial. In any case, crypto-currencies have emerged naturally and spontaneously, as a natural phenomenon replicated to the online economic activities.

2. The offensive of BitCoin

2.1. General issues

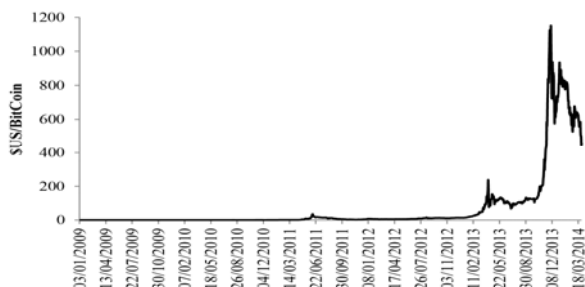
BTC appeared in early 2009, being "the work" of an anonymous entity with the pseudonym "Satoshi Nakamoto". Users get the currency through an operation called "mining", which involves programming a powerful personal computer, being in competition with other computers on the network, to "look" for fresh solutions to some new problems generated in the network.

In order to increase the confidence in BTC, over time there have been created different associations or institutions, such as: The Bitcoin Financial Association (<http://bitcoinfinancialassociation.org>), the Bitcoin Foundation (<https://bitcoinfoundation.org>) and Bitcoin Exchanges, as Bitstamp and Mt. Gox (Gonzalez, 2014: pp. 185-211), although not all of them have managed to take their duties to an end.

The novelty that comes with BTC is the use of a decentralized system; in other words, no central bank and no government are involved. The system was programmed in order to provide a limited number of currencies in a certain period of time. It is expected, based on the generation algorithm of BTC, that the total amount (21 million) provided by the system to be reached in 2025 according to some authors (Plassaras, 2013: p. 387) or in 2140, according to others (Hall, M., 2013). On July 20, 2014, on the market there were put into circulation 13.04 million of BTC, meaning about 62% of the total possible. On November 10, 2014, there were put into circulation 13,486,500 of BTC, the market capitalization exceeding 5 billion USD, or almost 4 billion Euros (<http://bitcoincharts.com/bitcoin/>). It should be noted that the rate of issuing this cryptocurrency began to fall. If in January 2009 there were released at every 10 minutes 50 BTC, starting 25 of November 2012, the rate of release of the BTC dropped to 25 for every 10 minutes of "mining" activity. It is estimated that by November 2016 the rate of release of BTC on the market will reach its half, i.e. 12.5 BTC every 10 minutes (Iwamura, M., Kitamura, Y., Matsumoto, T., Saito, K., 2014).

It is said that the BTC transactions are pseudo-anonymous; the person's identity using the BTC is private, but the achieved transaction is public. Although among BTC defenders the anonymity argument frequently appears, it has been observed that practically the anonymity is lost when converting BTC's in cash or paying for a service / good with BTC (Kirk, 2013).

The relationship between BTC and the traditional currency is still not regulated, therefore, responsible for how are flowing on the market are businesses using BTC. It should be noted that, as a private currency, used in the virtual environment, BTC has experienced in its short history a high volatility. Thus for the USA, a BTC ranged between \$ 0.05 (2010, July) and \$ 646.30 (2013) (Rush, D., 2013 and Farrell, M., 2013). Basically, the evolution of BTC exchange rate is amazing. BTC has grown from \$ 0 in 2009 to \$ 13 in January 2013, and later evolved absolutely spectacular – it recorded an increase of 8000% to \$ 1100 at the end of 2013 (Ciaian, et al., 2014), which can be seen in Figure 1.

Figure 1. Evolution of the \$ US / BTC

Source: Ciaian, P., Rajcaniova, M., d'Artis K. (2014), *The Economics of BitCoin Price Formation*, Cornell University Library, <http://arxiv.org/ftp/arxiv/papers/1405/1405.4498.pdf>

The evolution of the BTC is not spectacular only for the developed and consecrated markets, but also for those at the beginning, like the one in Romania. Thus for the Romanian market, from June to November 2014, 1BTC that ranged from 1050 to 2100 lei, the average being 1262 lei, as one can observe in Figure 2.

Figure 2. Evolution of the BTC/RON

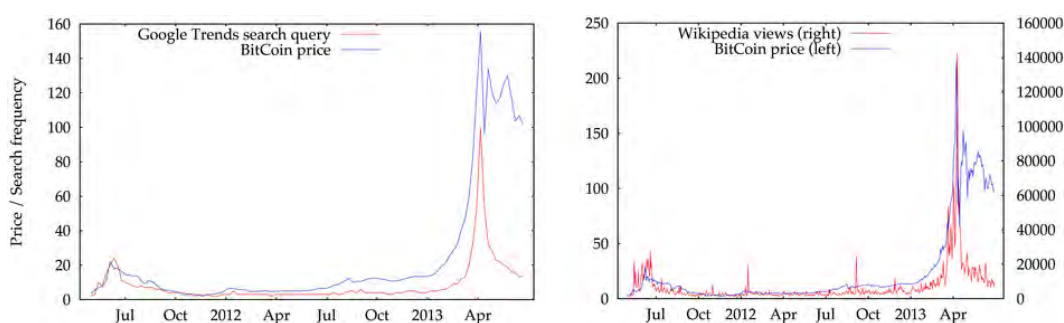
Source: <http://bitcoincharts.com/>

When it comes to BTC, controversies are the most diverse - often starting from private currency issue and its doctrinal implications and resulting in identifying the factors that influence the exchange rate for this crypto-currency. Lev Louis Grigberg, Todd G. Buchhotz, Brian Kristoufek, Van Wijk are just some of the economists who have studied the issue concerning the factors that are influencing the price of BTC, listing the market fundamentals of supply and demand of BTC, the attractiveness to investors and the development of global financial indicators (Ciaian et al., 2014).

Unlike gold, BTC has no intrinsic value. Unlike the official currency issued by a central bank, the BTC is not strictly influenced by the typical factors such as the size of GDP, inflation, interest rate or any other typical economic indicator. What influences the BTC is mainly the supply-demand relationship, and how the supply is predefined, then it means that the demand plays an important role in the fluctuations recorded in the BTC price.

The precise size of the demand is extremely difficult to be determined. Therefore, many economists have tried to identify tools and means by which they can forecast the evolution of the course. One method is as ingenious, as disputed. Ladislav Krištofiek economist at Charles University - Prague believes that if we study Google Trends and Wikipedia, we can establish the number of individuals who searched the word "Bitcoin" and this number is related to how the course of BTC evolves. Thus he discovered that these two variables - the number of Internet searches for the term "BitCoin" and the course of BTC - are bidirectional linked, as it can be seen in Figure 3.

Figure 3. Link of BTC course - number of Internet searches



Source: Krištofiek, L. (Dec. 2013), *BitCoin meets Google Trends and Wikipedia: Quantifying the relationship between phenomena of the Internet era*, *Scientific Reports* 3, Art 3415, doi:10.1038/srep03415

After many investigations, Ladislav Krištofiek concludes that beyond the typical factors, the large number of speculators that appear on this market is, in fact, the main factor to be considered when discussing the course of BTC, which is brought to the fore in the "weaknesses" alongside illegal activities which can be committed by using BTC. Unfortunately, speculators and illegal activities do not miss the legal and formal currency. Beyond the numerous discussions on the factors that are influencing the evolution of BTC course, conducted only in certain environments and beyond the fact that BTC is on the market for five years, this crypto-currency remains a mystery to most people, a substantial part of it not knowing at present what the word "BitCoin" means (Neal, 2013).

2.2. BitCoin: past, present and future

BTC has gained increasingly more use in the real economy, this currency being accepted for payment in more and more situations and in different geographical areas. Sites such as Wordpress.com, Reddit, files hosting service web, Mega, and other service providers / producers of goods began to accept besides the formal currency also one of the alternative currencies (Rogojanu and Badea 2014: pp. 103-114). The increase of the number of users was influenced both by the advantages provided by the virtual environment and by the diminishing confidence in the banking system. For example, ATMs have been installed in Cyprus, Canada, Romania, etc. and through them one can convert real currency in BTC (Abrihan, 2013 in Rogojanu and Badea, 2014: pp. 103-114). In Romania, in October 2014, as a result of the partnership between ZebraPay and ATM operators, 874 terminals spread across over 160 cities were functioning; through them payments may be made with BTC and also could convert the national currency – lei- in BTC; most terminals

were placed in hypermarkets such as Auchan, Carrefour and Kaufland (Siddique, 2014). It is interesting that even universities, as true pioneers, do not fall short in adapting to the demands of the IT environment; the first university in the world that accepts the university fees also in BTC was recorded in Cyprus and its representatives were stating that the strategy they use consists in converting immediately the alternative currency in Euros (Szoldra, 2013).

Following the acceptance of BTC by various traders and not only, the developers of mobile phone software have already created a number of applications facilitating the use of BTC to their holders (Gonzalez, 2014: p. 197).

The spread of using BTC in transaction seems to be related to the benefits BTC confers, this currency being characterized by flexibility and avoidance of transaction costs associated to foreign exchange. Beyond the strengths, as any other currency, BTC involves other aspects, as can be observed in the table below, which is not intended to be an exhaustive mean of analysis:

Table 1. SWOT analysis of the BTC

Strengths	Weaknesses
<ul style="list-style-type: none"> - Any individual who has the necessary technological elements can become a source of BTC mining - BTC saves time and physical space of those involved in transactions using the virtual environment - It is not controlled by any authority, being able to move freely and directly between people, without intermediaries imposing transaction costs. - BTC price results from the confrontation of supply and demand - Avoid bureaucracy and expenses related on monetary emission, transportation, storage, security and circulation of traditional currency - Being rarely (limited quantity), does not generate inflation 	<ul style="list-style-type: none"> - Representatives of several banks around the world believe that the investments in BTC are risky because it is not regulated by any national bank and by no government, and because of fluctuations in its value - Increased volatility on all the markets where it is used - The accessibility is conditioned by the level of education compatible with the new communication technologies - Limited trust in BTC, caused mainly by the incomplete information and by the fact that BTC is used in illegal activities - encourages gambling, tax evasion, terrorism, facilitate transactions of goods prohibited by law (drugs, weapons) - Significant initial investment and electricity generation costs for people who currently use BTC (purchase of performing equipment and the necessary software).
Opportunities	Threats
<ul style="list-style-type: none"> - None of BTC users did not set out to destroy the current monetary system, most of them is satisfied that they have found a better use of new technologies; therefore the BTC meets the requirements of the "IT generation". The new technologies find their raison d'être in the economy more than ever. - Use of the virtual environment can be an incentive for some individuals to improve their skills in using of different types of software. - BTC illustrates the free market model that spontaneously is self-arranging - BTC is compatible with the globalization of financial markets - The traditional markets have made quite a few exemptions to the monetary theory of reference, for example giving up to the standard currency, waiving parity, renunciation to the simultaneity of the pair of symbols state - currency and language - hymn - today we have currencies without a country, but also countries without their own currencies - The advantages of trading with BTC are visible, the number of those accepting BTC is increasing - restaurants, cafes, shops, universities 	<ul style="list-style-type: none"> - Increased vulnerability caused by the use of the online environment. Security breaches can lead to loss of savings in BTC. If the BitCoins are lost or stolen, there is no intermediary institution to reward the loss. - Attraction to BTC is a reason for concern for traditional, conservative and rigid markets. - Pressure from supporters of classical monetary canons, especially towards the recognition of BTC through a political act of state. - The concern of the regulatory authorities generated by the possibility of using BTC for money laundering and other illegal activities - Lack of intrinsic value for the correlation with the price of traded goods and services - The fact that the state loses by not taxing the transactions made with BTC may lead to ban using BTC - Prohibition of trading BTC in certain territories

From the above table it can be seen that the BTC presents both advantages and disadvantages. BTC defenders tend to assert that the disadvantages associated with this currency are not higher than those accompanying the formal currency. Meanwhile, traditionalists emphasize the online threats and lack of access to technology for all individuals, showing that BTC is nothing else than the currency of a generation - the IT one. As a saying circulates among specialists - "Let three economists together and you will have at least four different ideas", time will probably be the one to prove which of the sides is right.

Regarding the widespread use, we can see that even countries that initially proved reluctant to use BTC on their territory, reached the conclusion that the market and the unpredictability of human behaviour are variable worthy of consideration. Thus, in July 2014, the Central Bank of Russia announced that it is prepared to legalize BTC, despite the risks and responses recorded worldwide (Capital, 2014). Russia's reaction is probably a consequence of the fact that the use of BTC is allowed in several countries, including: Australia, Austria, Belgium, Brazil, Bulgaria, Canada, California, China (with certain restrictions), Cyprus, South Korea, Denmark, France, Philippines, Finland, Germany, Israel, Japan, Lithuania, Malaysia, Norway, Poland, Romania, Slovenia, Turkey, United Kingdom, etc. (Beigel, 2013).

However it is not to hide the fact that there are countries that have banned the use of BTC on their territory, such as: Bolivia, Ecuador, Kyrgyz Republic, Taiwan, Thailand, Vietnam and Jordan (CoinDesk, 2014).

In the past two years, both in academia and beyond have started discussions about the need to regulate BTC. Based on various fraudulent acts that can be performed through this currency and reaching the argument that taxing the transactions made with BTC can bring additional revenue to the state budget, increasingly more voices raise the question of shaping strict rules on how to use and tax the transactions with BTC.

In the USA at a close examination of the issue of taxation, it was discovered that from a legislative point of view it is quite difficult to classify BTC. Thus, to draw up a real and possible taxation system there have been proposed several versions (McLeod, 2014: pp. 379-406):

- Taxation of the transactions using BTC similar to those of barter;
- Use as standard of the model of taxation of the transactions using foreign currency;
- Reporting to the property model, where the number of held BTC can be converted to the true market value;
- Considering BTC as a financial instrument and taxing all the transactions made with BTC as when using any other financial instrument.

According to consecrated authors, it seems that none of these proposals does not fit like a glove to this crypto-currency for various reasons (McLeod, 2014: pp. 379-406), which shows that if the American government really wishes to tax transactions made with BTC, will have to find a new and innovative solution that will take into account the uniqueness and unpredictability of the BTC system.

It seems that in terms of finding an adequate system for taxation of the transactions with BTC, not only USA is concerned, but also other countries, among which we can mention:

- Canada;
- Brazil - April 2014 it was decided that BTC transactions exceeding the amount of R\$ 35,000 will be subject to financial assets regime,
- Germany - German tax introduced a 25% tax on benefits obtained, free for the first year for those who declare their transactions.
- Bulgaria - applies also the financial assets regime, the tax rate being of 10%,
- Finland - September 2013 it was decided to apply the scheme of income taxation, and in January 2014 it was concluded that BTC is a commodity and therefore will be applied the scheme for commodities,
- Australia etc. (CoinDesk, 2014)

Therefore this currency is still at the border between fiscal requirements and non fiscal ones, between legal and illegal, between real and virtual space, raising debates among economists and beyond.

3. Instead of conclusions

We live in a world where uncertainty and change are major coordinates, and in some areas the resistance to the new and the fear of change are at home. The majority of economists reject the idea of private currency. The reasons are numerous.

Spontaneously arose, perhaps from a desire to escape from the watchful eye of the state, BitCoin generated followers who gradually organized themselves for reasons of identity and recognition and rivals who tried to outlaw the BTC. BitCoin is the result of the spontaneous and voluntary actions of individuals, not the result of a decision of a statutory authority, therefore users have gradually agreed on their immediate objective - defending private, free, non-inflationary currency, which is in line with the developments in information technology, from the real dangers among which are found both aspects of reliability of technology and the consistent reality of the state canon.

The defenders assume that BTC is more than a medium of exchange among many others existing, BTC represents money generated in strictly limited quantities, and is therefore from the very beginning a rare currency. The amount of BTC cannot increase more than originally expected, but the value of BTC could, theoretically, grow no matter how much. Since we are talking about a market, the demand and supply of money are those which give the value of BTC.

On the flip side, rivals relate to the rigidity and conservatism of some theories and are trying to highlight the dangers associated with this currency, based on examples of fraud and theft that have been done using this currency and are also reaching up to the issue of prohibiting the use of BTC. Moreover, it appeared lately the idea that this currency is simply the preserve of the young generation, called the IT generation; therefore, it does not allow the access to those from other generations that are not willing to adapt.

Regardless of which of the barricade we place, one should notice that there are arguments on either side.

On one hand, the desire for freedom can push us to defend the alternative currency, and history shows that the disappearance of one alternative currency was accompanied by the appearance of another one, man being resourceful. On the other hand, it is impossible not to take into account the weaknesses and threats that accompany the BTC. We remain, therefore, in a gray area, where there have not been formulated answers for questions such as: How much BTC will survive?, Will be the BTC that currency able to benefit from a higher degree of trust than in the present, based on the growing discontent of individuals, generated by multiple imbalances in the economies of emerging states?

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Public choice and the social beneficiary

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Abstract. *Using the scientific tools for the positive-normative binomial approach, the present paper deals with the manner in which the “second best theory” represents the basis for the “public choice theory” in terms of rational allocation of resources between economy’s different components (sectors). For example purposes, it was examined the manner in which the ecological efficiency is found in the economic decision assessment system. Any development program that will be limited to the purely economic interactions, neglecting thus the repercussion on the social and ecological component is, from the start, unrealistic because not everything that is economically efficient is also socially efficient. The governmental intervention aims to correct the market failures in terms of rational resource allocation.*

Keywords: public choice theory, the second-best theory, ecological efficiency, externalities, self-organized governance.

JEL Classification: D61, D71, H23, Q57.

Introduction

This paper proposes a correlative approach for three components, inextricably linked to the economic area and to the reality subject to the profitability rush. The selection criteria of the three components are based on the fundamental problems we are facing today: limited resources, choosing the best variant (sustainable development economic altruism) and also searching for the second best choice. All these are interpreted by authors through a type of associative theory regarding resource governance (through state's control or privatization) and the process of public choice with direct consequence on the social beneficiary (the community).

It is true that such an approach can trigger controversies regarding the interference of economic policy aspects in the subjective context of choice and decision-making without specifying the instrumental relationships on which the two distinct fields are based upon. The coincidence or not, of the collective interest with the individual's interest projects the choice-action within the area reserved for the efficiency analysis for the free market with respect to the governmental authority. In both cases, the result should be perceived as socio-economic-ecologic efficiency.

1. The market mechanism can not solve the ecological crisis

"The government of persons will be replaced by the administration of things"
Saint Simon's prophecy

This subchapter does not seek to develop all the conceptions regarding the utility and availability of resources in the resource crisis context. It is confined to a few considerations regarding the optimal choice process considering the existence of several economic objectives of which the convincing alternative is the one with a socio-economic-ecological effect, perceived at maximum.

Human dependency on resources and nature- the human endowed with "endosomatic" and "exosomatic" organs (internal and external organs, according to Nicholas Georgescu-Roegen, 1979: pp. 1-2) generated, since forever, the controversy on rational-irrational results. Everything comes down, ultimately, to the election manner between objectives and assessment of the effects assumed by the option process.

"The tragedy of the commons" as formulated by Garret Hardin (1968: pp. 1243-1248), repeated and interpreted by Elinor Ostrom (1990: p. 16) confirms that people will fight among themselves when pursuing their own welfare.

Everything begins with common property where none, is in fact, the owner. Much of the world is dependent on resources that are subject potentially to the tragedy of the commons (Ostrom, 1990: p. 17) represents a signal for the policymakers which, through recommendations, cause the adoption of those optimum solutions with implications on the state's position versus the market.

The theory of the second best aims to amend the capacity of those involved in the choosing process in order to change the rules of choice such that the effects will not

present the disastrous character for the non-achiever. Nonetheless, in practice it is obvious that what is beneficial for some is, at the same time, ineffective for others. When talking about the lever for resource use, often, the economists overlook the two fundamental parameters of the economic process: the resources' structure and the use duration. Setting protection prices will shelter the exhaustible resources. But is it enough?

In this vein, Robert M. Solow argues that resources are measured in economic terms and not in physical terms, thus considering the situation of restricting the stock of resources, the emergence of other factors by substitution (substitution thesis) will ensure the continuity and evolutionary dynamics. From here, Solow shapes up the hypothesis that, the substitution is the process that supports the technological progress even in the context of limited resources.

The optimal allocation of resources for present and future is considered to be dependent on price evolution at the macro level, with all the derived consequences. Liquidation of economic inefficiency liberates the fixed capital turning it towards innovative variants or certain carriers of the progress germ. The consecrated and favorite theme of Joseph Schumpeter is the "Creative destruction" demonstrating that what is surpassed by inefficiency must be replaced by the innovative act of creation.

Considered the optimal first, why do we formulate a new variant, with the claim that it should be as optimal as the first one? Can the alternative solutions be, equally, optimal? Are we talking about competition between objectives? Who, how, and what instrument is used for measuring the optimal for each variant? What mechanism is triggered in favor of searching for another option different from the first one? What institutions or representations of collective action use their best efforts to transform the collective decision into a public choice with direct implications, solid and beneficial in socio-economic-ecological policies substantiation?

The present work aims to answer these questions without pretending to exhaust the right to debate.

There should remain no doubt regarding the confrontation situation between the objectives imposed by the moment and the belief that the future brings changes (substantial?) of the analytic objectives. Francis Bacon's old adagio *Naturae non imperatur nisi parendo* (we cannot command nature except by obeying her) demonstrates its historical validity with a stubbornness constantly certified by the constant basis of the economic growth. The obsession for the economic growth contributed to gaining a scientific authority regarding the perenity of the economic growth theme in the new paradigm of limited resources.

Following the social efficiency (community welfare), the limited resources are subject to some economic-ecological constraints. The economic fantasy to produce a good with costs as low as possible or to produce a larger quantity than resource consumption is suppressed by the absolute limit of natural resources availability. This limit is not sustainable if the resources change along with the emergence of new ones or with the substitution of the consumable ones

In this context, it is difficult to calculate and express the limit in economic terms. The power of technology however is unlimited, which essentially modifies the Malthus's law. If the technologic resort intervenes on resources, they will no longer evolve below the expected level of population needs, but according to the cause-effect logic, an innovation will lead to another improving thus the grid of population need satisfaction.

2. Optimal choice- theoretical and practical justifications

Exitus acta probat. (The result justifies the deed.)

Ovidiu, Heroides, 2,85 sq

Social profit depends on optimal choice in terms of resources allocation and the social effect will be measured using the social cost-benefit ratio. The issue of evaluation should be seen as a product of the society that seeks the best variation for allocating resources.

Assessing the social efficiency of choice is based on a triple construction: a forecasting *ex ante* approach which predicts more economic-ecological-social goals and two *ex post* approaches based on the construction of economic-ecological- social policies by connecting needs to resources (using normative-positive ratio) and for interpretation of the result obtained in time. Unfortunately, not everything turns out to be economically efficient and at the same time environmentally and socially effective.

The relationship between social choice and social beneficiary involves a two-way approach.

The first, the *theoretical* one refers to how efficient is the market, through the competitive mechanism. From this point of view, it is considered a static efficiency that reflects the obtained results at a given time by allocating resources during a certain period. For example, if a business will use fewer funds for the internal social project will finance a project for investment of materials with distant effects. Being a matter of choice the current objectives will be dropped in favor of perspective objectives.

The second approach is *practical* and refers to the static-dynamic divergence, both objectives being interpreted individually and collectively.

By interpretation, we are dealing with the welfare level at a given time and the imperative economic dynamic development. As a matter of choice, opt and forgo at the same time in favor/against certain domains, allocation will be made by slipping g resources from one area to another, from one objective to another. This way of putting the problem leads to the theoretical interpretation of the second best. Late '50 specifically 1956-1957 R. Lipsey and K. Lancaster focused on evaluating the marginal cost influence on efficiency increase/decrease within an economy where gains balance the losses.

Several remarks are, however, required:

- The example formulated by the two authors refer to two completely different markets: a perfectly competitive market (based on production of goods with social characteristics whose consumption takes place within the community without rivalry)

and the other one a monopolistic market (creating substitutable reciprocal consumption goods whose consumption is individualized depending on the consumer), the marginal cost mechanism affecting differently the marginal income obtained on the two markets.

- In any economy there is an infinite number of unequal allocations which can be optimal Pareto without the possibility of being compared
- In the aforementioned authors' example the net welfare gain is obtained by passing from a market with perfect competition to the monopolistic one arguing that the substantiation procedure of a correct socio-economic policy is made only by considering the competitive mechanism
- Consumption consequences of the two categories of goods are evaluated simultaneously at individually and collectively
- Social goods are not produce by using the competitive mechanism, the efficiency of their production can not be interpreted using the marginal cost level because the collective consumption regime may trigger increasing costs determining the state to intervene through subventions
- Instead, the production of individual consumer goods may carry along profit through prices determined by production competition.

The choice between equality and efficiency is interpreted considering two ratios: efficiency-utility and equity-income. Considering these ratios, the criterion "first-best" refers only to the efficiency in resource allocation generating social inefficiency, thus an anomaly on the market; the "second best" criterion considers dispersing the externalities on as many markets as possible diminishing thus their effects on a single market. For example economic-ecological pollution externality (as distortion) is redistributed as an effect from the goods/services market to the collective goods market. This happens when a manufacturer's decisions affect the production costs of another manufacturer who is part of the same market.

3. Ecological component of decisions.

Morality cannot be fed on failures.

Platon

Environmental protection and conservation are associated often with high costs and employment loss. In reality, the situation is different if we come to think about the employment offer for activities relating to environment protection and conservation, which cannot exceed the number of lost jobs. This increase (Bran, 2002: p. 115) proves to be superior in the field of environment services. In this context, development and trading green products provide opportunities for carrying out eco-business having as direct effect the increase in employment, previously freed from sectors or workplaces whose activity was considered to determine externalities (pollution).

The relationship eco-business, eco-development, sustainability, must be viable, must work and especially must prove to be effective. In this sense, there is an intense concern,

in theory, in doctrine but also in practice regarding the achievement of a balance point and overcoming the conflictual elements from the economy-ecological relationship with reconciliation purposes between man and nature within the global geosystem zone.

Approaching *the second best theory* in the context of optimum choice find an obvious correspondence, as an example, in the economic-ecological decision making plan. This means that, for starters, it must be understood the resources structure (dimension as size, their superior and inferior limit, quality and forecasts in time and space of use techniques). Then, knowledge by assessing the effects of resource allocation in relation to two objectives, economic and ecological. Without doubt, the profitability criterion that labels any action on the competitive market overshadows the criteria and ecological rules that hinder the optimal decision. What is however mandatory is the identification of those variables responsible for market failure, failure that will have domino repercussions on the other markets.

The dispersal of undesirable effect on several markets, by lowering their intensity on a single market causes rethinking the implementation of rules and regulations required by the institutions that govern the allocation rationality.

In this sense, along with the business theory and state's role in economy (Ostrom, 1990: pp. 70-71) formulates, with sufficient realistic and practical support, *the self-organized collective action theory*.

Are needed some references to justify this interpretation.

Firstly, formulating opinions regarding the end of the rational-legal authority that threatens to restrict state's role and thus of some certainties on trust in rules, traditions and common interests. The "endism" current (Gamble, 2001: pp. 60-61) configures the end of the nation-state also in the context of global market emergence. The transnational governance system facilitates the transition from the world states to world markets.

Secondly, the free market's sovereignty entitles to decisions that are not always in the community's interest. For this case, if the state's role narrows, the state being called in cases of deep economic morass and if its regulations oblige to a policy contrary to private economic agents' interests emerges the need for a third form of decision: self-organizing collective. It will organize its own attitude and conduct guide in terms of collective choice.

The obvious question arises in respect to the effect of the self-organized community decision for the success of relieving tensions of some rational constraints in resources allocation.

The dialogue and confrontation policies between the development concepts and ecology are not new but the way of addressing the issue, under different pragmatic conditions, necessitates a changed interpretative environment.

Deciphering the way in which the rational choice provides optimal solutions during different times and on different markets is a concern for exiting the normative and for adjusting to the reality of constraints of limited resources.

Economic rationality, as a fundamental principle, used the decision-making process of resource allocation in two different contexts: extensive and intensive. The accidental interpretations determined the inefficiency of allocation decisions turning into externalities of the first best transferred to the second best area.

The new politic-economic-ecological-social world framework is subject to new trends by changing the paradigm: ratio growth-development economic-ecological. The parameters have changed, the solutions must also be altered.

At the end of the paper “Catastrophe or New Society?” (Herrera et al., 1976: p. 163) appears a quote belonging to J. Stuart Mill “when great evils are in question small remedies do not produce a small effect, but no effect at all.” The endorsement matches, undoubtedly, the present status.

Currently, the institutions no longer correspond to reality because they are based on hierarchic and vertical structures and on political-territorial realities particular to the nation-state. The trend to narrow the state’s role contributes to the structural change both on the vertical/horizontal plan of the institutional components and for calculating the opportunity cost for the decisional act. The aim is to correctly assess the collective efficiency gains/losses.

4. “The irrationality” in rational economy

You do the deed: the logic of things will draw the consequences.

N. Iorga, *Contemplations*, 1911

Initially the rationality approach reflected the economy’s form of existence and manifestation. Currently the interpretative tendency is that the economy should reflect rationality.

The quality of the individual and of society’s decision is assessed through costs (private-social) and beneficiaries (private-social). According to the “*game theory*”, the decision for the whole set of economic and social policy depends on the possible occurrence of market *dysfunctionalities* (market failures) because of the other participant-partner’s decisions.

Considering the government’s position as that of a trader, its game (under the decision-making process regarding the economic policy) will depend on market’s failures caused by the economic action and decision freedom.

The existence of independent agents involves taking into consideration the different needs, the resources and their allocation based on competitive market principles and income distribution as basis for assessing welfare. Consequently, independent economic agents express themselves through individual decisions and the market role is to coordinate these decisions.

A turning point in addressing the rational-rationality concept is laying down the subjectivism thesis in economy.

The thesis is based on several requirements: reconsidering the needs theory, based on the appreciation that the human being part of the environment, human needs will be part from the environment's needs, then reviewing the economic rationality based on human rationality and also review the optimum allocation process exclusively defined in relation to the three fundamental value judgments from Pareto economy.

Pareto efficient allocation repositions the individual's place in the center of the activity.

Classic economic literature never minimized supporting the principle according to which perfect competition represents an optimal situation, and the modern interpretation of this principle is expressed by the fact that a perfect long term competitive equilibrium leads to proper allocation of resources: any optimal allocation of resources is the guarantee of a perfectly competitive equilibrium term.

If reality rejects the optimal allocation, does it mean that non-optimal allocation is considered as effective? The fact that non-optimal allocation is determined by the market conditions represents a denial in the *invisible hand* principle.

In opposition to Pareto allocation of resources that involves the removal of all distortions, the theory of the second best explains the situation where the existence of a distortion on a market urges to solve the distortion by spreading its effects on several markets and deliberate introduction of new distortions to counterbalance the first.

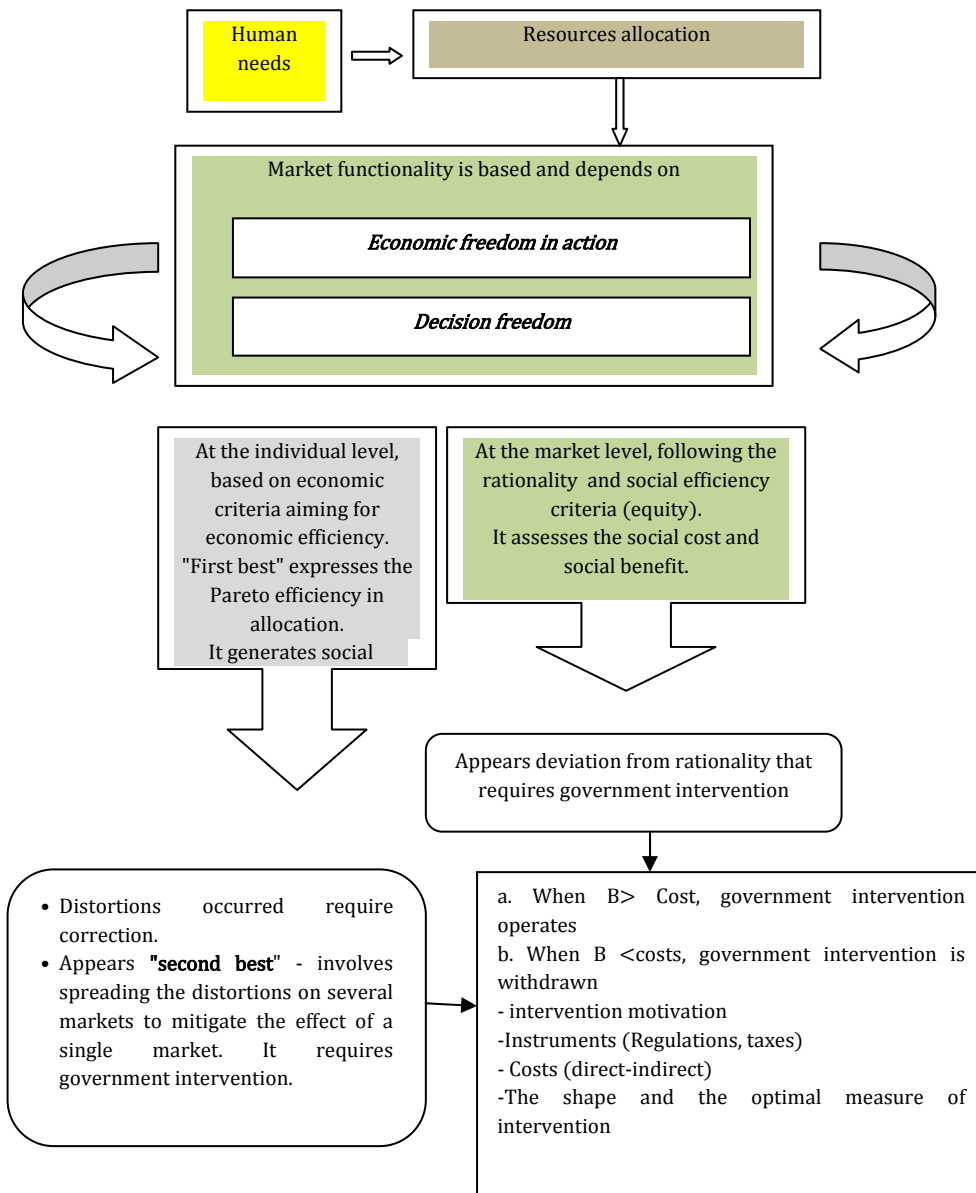
For example, the introduction of a tax on the consumer goods market will influence negatively the supply and demand. The resources will slide to another market with other goods. The increase in supply and the demand on this market will trigger the interest for introducing a new tax. Hence, the equilibrium between the two markets will be reestablished. Inserting a distortion (by government action) diminishes the effect of already existing distortions that will arise whenever the free market equilibrium breaks the equality between the marginal social cost and the marginal social benefits.

The price paid by consumers is equal to the marginal benefit and the price paid by the producer is equal with the marginal cost. The market equilibrium no longer leads to the equality between the two prices, causing the emergence of distortions that express the inefficiency and thus it requires governmental intervention. In Seneca's "Selected philosophical writings", there is a reflection: "the state will always remove those who approach it with annoying persistence". Translating the quote in terms of our approach, the state will be interested primarily in the industries or businesses that are progressing rather than in those that require and claim subsidies. Eventually, the governments control all business processes for economic strength comes from profitable, successful activities. It is true that governments can preferentially orient their options (granting tax exemptions to certain sectors of activity, by giving exclusive licenses without auctions, by governmental contracts, etc.) towards sectors bringing wealth and performance.

The explicit-implicit authority and state control in decision-making (Baumol et al., 2009: p. 59) however will not harm market freedom, which, if necessary, through the emergence of failures will request governmental intervention.

The diagram below illustrates the correlation mechanism of public choice - public decision (based on criteria) and the need for governmental intervention.

Figure 1. *The public choice process efficiency and the governmental intervention in market performance*



5. Roșia Montana mining project- economic and ecological decision

When gold talks, reason keeps quiet

W. Potocki, polish poet, 1696

Rosia Montana mining project represents a typical case of main activity that is not based on locally processed resources and does not generate a correlated economic activity. The final product of the project is gold but in Romania, there is not an outlet or a gold processing industry. The outlets for this precious metal are outside Romania that means total export of the extracted gold.

To interpret the situation of this project in terms of public choice, of decision in favor of the community and therefore a review of the allocation of financial resources manner for the benefit of Romania's national economy some clarifications are in order based on concrete figures.

At that time (since 1995) the project raised a series of question marks related to its viability, to the opportunity cost of the governmental decision, to the real profit of the residents and to the economic growth from the exploitation of these gold reserves.

The economic and financial analysis of the project highlights a number of issues regarding the losses / gains (benefits) for Romania. From the comparison of the direct and indirect benefits (economic materials - employment - revitalization) with losses for Romania (social-cultural – environmental - foreign direct investment - taxes and subsidies - reducing the country's external image) the financial risks should not be omitted (insolvency, early closure of the mine, stock speculation, environmental pollution) that affect economically and socially the relevance level of the project.

Based on the case study and on precise assessments comprised in a documentation and through analysis of the Rosia Montana mining project history (Bran et al., 2013: pp. 123, 196, 205-207), the following conclusions can be drawn:

- Between the initial assessments and the evaluations during the course of the project, a series of inconsistencies and inaccuracies arose regarding the mine construction costs: the initial capital cost from \$253 million (2001) to \$437 million (2002) to \$638 million (2006), the cost up to triple being conditioned by the procurement of the environmental agreement.
- Significant differences between the number of jobs advertised initially as an attractive figure for employment in the area (from 500 in 2002 to 560 jobs promised in 2004 to 600 in 2005 to 880 in 2010 for a period of 17 years, by revaluing the occupancy rate ultimately only 217 jobs were available in the 17 years of the mine life), thus only half (Bran et al., 2013: p. 315).
- After closing the mine project, the unemployment will increase in an area already destroyed ecologically and in terms of community (due to significant population deployments).
- It is true that, in some cases, some main economic activities may generate and entail indirect benefits by the upstream-downstream local activities; for this project however locally processed resources are not utilized, the equipment is imported and some

chemicals that could come from Romanian chemical industry are insignificant in terms of quantity.

- The fundamental element for our analysis regarding the choice and decision mechanism and the resource allocation mechanism considering the economic-ecological-social efficiency criteria is represented by obstructing, with this project, some viable alternative activities that cannot be developed in an affected area (water, soil, air); no potential investor or business man will risk an investment with significant potential (economic, agro-tourism, cultural tourism) in an area where large amounts of cyanide have been used; ignoring these issues would mean misunderstanding the psychology of investors and tourists.

By analyzing the concrete situation of Rosia Montana Mining project, by virtue of the first three subchapters of theoretical approaches, in practice the aspects of the allocation of resources on rational principles (or not!) can be verified, the emergence and development of distortions on the commodities market (gold) that reflects on other markets (food and agricultural products and cultural tourism services) requiring governmental intervention. Given that pollution is an externality is necessary to correct it by governmental intervention. Only that in this case the introduction and implementation of anti-pollution measures can themselves produce pollution.

The way in which the intervention is evaluated as effective depends on the effects on the community, on the costs - advantages ratio. Taking note of the effects of the governmental intervention, the used tools, the direct and indirect costs, it shall be decided whether the government's intervention will be to diminish distortions or it will back out because of the inefficient measures adopted.

Analyzing the natural resources as common goods we cannot overlook the fact that individuals are caught between the interests of private and public institutions, market or state (Ostrom, 1990: p. 29).

If the interests of both public and private institutional forms, which are interdependent, are conflicting with the community's socio-economic interests, then, according to public choice theory, the solution is to formulate a strategy for cooperation between the community members considering the solution imposed by the central authority. It is about developing a method for governing the commons by communities of individuals.

Only in this case, the efficiency of public choice turns out to be for the benefit of the society

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Stock market – economy growth nexus in an emerging country. The case of Romania

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Abstract. *The accelerated development of emerging stock markets in recent decades, obstructed by the economic crisis of 2008 that has not lost its pulse in the European perimeter, led to reviving interests regarding the role of stock markets within economies. The aim of this paper is to identify the nature of the linkage between stock market and economic growth in Romania. Using the VEC model, we demonstrated that before the financial liberalisation and global crisis, the domestic environment led to stock market development, but after, the evolution of this component of the nominal economy was predominantly due to the international context.*

Keywords: emerging stock market, domestic economic development, international economy, VECM, economic crisis.

JEL Classification: E44.

Introduction

Irrespective of the nature of the national financial system, it is desired that the emerging stock markets to become viable and modern, able to support sustainable economic growth. Although stock market is considered the barometer of economic activity, it seems that the position of stock market in the economy is far from being ideal. Moreover, given the fact that the literature in the field provides diametrically opposite opinions related to the nexus stock market-economic growth, we decided to study the nature of this relation in Romania. In other words, the answers that we try to offer in the following pages concern, indisputably, the contribution of stock exchange development to the economic welfare of a nation in transition.

The results of our research demonstrate that, in the period 1997-2014, the stock market exerts a higher influence on economic growth than vice-versa. The explanation relies in the fact that this period covers the global crisis and financial liberalisation, which is synonymous with higher interdependencies between domestic stock market and external environment. In conclusion, Romanian stock market is more dependent on the international environment than on the national one, but, only starting with the end of 2006.

The remainder of this paper is structured as follows. Section 2 describes the literature review. Section 3 presents the data and the methodology used. Section 4 reports our empirical results. Section 5 concludes.

Literature review

Even though there is a wide literature in the field, there is no unanimous view about the direction of the linkage between economic growth and stock market development. After the start given by Schumpeter in his work "The theory of economic development", many partisans shared the idea that financial development is "a supplier of advance" (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973). A very important critical point of view is that of Joan Robinson. The author stated in her work, "The Generalisation of the General Theory and Other Essays" the reverse of Schumpeter hypothesis: economic development creates demand for financial instruments, and not vice versa. The list of pros and cons can continue endlessly, but one particular dispute is of great interest: the one between the two Nobel prizes of 1995 and 1990. Thereby, while Robert Lucas strictly opposed the direction financial development - real sector development, his opponent, Merton Miller embraced it.

However, at present, in the literature we find four different views, namely: a unidirectional relation that highlights either that economic growth promotes stock market development or vice versa, a bidirectional relation and, not least, no connections between these two variables.

Firstly, the authors Thorsten Beck and Ross Levine “strongly reject the notion that overall financial development is unimportant or harmful for economic growth” (Beck and Levine, 2004: pp. 440). In other words, they argue that stock market development have an important role in the process of economic growth for the 40 analysed countries. Another landmark study in the relation from stock market to economic development is the one of Levine (2005). The author used five functions and two channels to emphasize the connection from stock market to economy, demonstrating that more developed financial systems ease financing constraints, and hence, long-term economic growth. In addition, Yu et al. (2012) emphasised that, in undeveloped countries, Levine’s relation “positive finance-growth” on the short-run is non-existent or very weak because of the ill-enforced legal systems and political instability. However, the authors leave room for discussion by stating that, in these countries, this tandem is possible, for certain, but only on the long-run. This opinion is also shared by Cooray (2010) who argues that the stock market promotes the long-run growth for the 35 analysed developing countries. The study of Wu et al. (2010) also reinforces the long-run positive effect of stock market development on economic development in 13 EU countries. However, the authors insistently underline the short-term negative impact of stock market liquidity on economic development; the reason is intuitive: on the short-run, financial liberalization is always linked with speculative bubbles, excessive liquidity, financial crises, higher volatility and low growth.

Remaining in the same register, Choong et al. (2010) demonstrate that stock market development is a must in promoting economic growth, especially in the presence of private capital flows. However, they do not forget to clarify that this nexus is valid only after stock market has reached a certain minimum level of development. Also the studies developed by Liu and Hsu (2006), Rousseau and Sylla (2005), N’zue (2006) proved that the stock market development had positive effects on economic growth. To conclude, the supporters of this hypothesis argue their findings through: efficient allocation of capital, risk diversification, development of entrepreneurship, adoption of new technologies etc.

Second, the critical position states that the only possible direction is from economy toward stock market. From their perspective, economic growth drives demand for financial vehicles and, hence, stock market responds accordingly (Zang and Kim, 2007). In addition, the adherents of this idea assume that, especially in developing nations, optimizing resources allocation and corporate governance through the banking sector, and not stock markets, is materialized in economic development (Stiglitz, 1985; Stulz, 2000). Furthermore, according to Luintel, capital markets are considered as being responsible for increasing information asymmetry (Luintel et al., 2008).

Thirdly, at the confluence of the two above mentioned opinions, we find a bidirectional relation between capital markets development and economic progress. In this regard, Enisan and Olufisayo (2009) show that, in the case of four sub-Saharan African countries, economic growth demands greater stock market development and greater stock market activity induces economic growth. Also the authors Hondroyiannis et al. (2005) validate

the bidirectional relation between Greek real economic activity and stock market on the long-run, but they insist to mention that economic performance is only partially related to stock market's contribution.

Fourthly, in the literature we find a neutral viewpoint. We make a digression to add that this belief comes only from the studies of underdeveloped markets. Naceur and Ghazouani (2007) argue that the development of the overall financial system, therefore the stock markets also, is unimportant in the case of MENA region. Moreover, the authors highlight that the undeveloped financial sector can even hamper the economic growth in this area. Moreover, when Shirai (2004) addresses the role of Chinese stock market in the economic development by addressing the three functions, i.e. financing role, improving firms' performance and signalling information regarding issuers to public investors through stock prices she concludes: the stock market has contributed little to financing firms' investment, the privatisation has not helped firms to improve their performance and the informational infrastructure has to be improve. Therefore, she concludes that the true state of Chinese stock market is far from being developed and, since, for contributing to economic growth. For the new EU member states, Fink et al. (2005) points out that the "artificially" inflated stock market capitalisation by a large number of listed companies, whose shares were not traded at all can explain the underdevelopment of stock markets and their lack of influence on growth. In addition, Chakraborty (2010) did not find any support for impact of stock market development in enhancing economic growth in India.

In these circumstances, the literature reviewed on the topic offers a generous unexploited niche. First, we mention the divergence of existing opinions. Second, although the literature in the field is vast, the mainly targeted markets are those from Asia, and to a lesser extent those from Eastern Europe. In our research we try to cover these gaps.

Data and methodology

We attempt to highlight the linkage between stock market development and economic growth in the case of an emerging market – Romanian market. We assume that the connection between the nominal and the real economy is a bidirectional one.

The variables that will be studied are Bucharest Exchange Trading index (BET) and Gross domestic product (GDP) – total, constant prices, reference year 2000 prices and seasonally adjusted. Both aggregate values are expressed in the national currency. We chose BET index because is the reference index of Bucharest Stock Exchange (BVB).

The frequency of the data is quarterly and the time spam of the analysis is between Q3 1997 and Q4 2014. We chose this period for several reasons. First, BET index has been launched on 19th September 1997. Second, we could analyse the stages of BVB development: from a stock market not far from the embryonic status to a stock market

with the status of frontier market (by Financial Time Stock Exchange, Bloomberg's Morgan Stanley Capital International, Standard & Poors, and Dow Jones classifications) or emerging market (by International Monetary Fund classification).

The data is collect from Thomson Reuters Datastream. The two variables are expressed in logarithms in order to stabilize the variance, i.e. \ln_GDP and \ln_BET .

In our attempt to validate the bidirectional linkage between stock market and economic growth we use a Vector Error Correction Model (VECM).

The steps and notations of the equations below are following closely the methodology of Lutkepohl (2004).

Therefore, briefly, the steps are:

First we test the stationarity of the logarithmic series to find out their integration order. To achieve this we use of Augmented Dickey-Fuller (ADF), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Phillips - Perron (PP) tests. The unit root analysis indicates that the two time series are integrated of order 1, $I(1)$.

Y_t is a VAR model of order p with the following standard form:

$$Y_t = v + A_1 Y_{t-1} + \dots + A_p Y_{t-p} + u_t \quad (1)$$

where Y_t is a $(K*1)$ vector of endogenous variables, v is a $(K*1)$ vector of intercepts, A_1, \dots, A_p are the $(K*K)$ fixed VAR coefficient matrices, and $u_t = (u_{1t}, \dots, u_{kt})'$ is an unobservable error term. It is assumed to be a zero-mean independent white noise process with time-invariant, positive definite covariance matrix $E[u_t u_t'] = \Sigma_u$. K is the number of time series variables, in our case two. The vector of endogenous variables recursively arranged, Y_t , is represented as follows:

$$Y_t = \begin{bmatrix} \ln_GDP \\ \ln_BET \end{bmatrix} \quad (2)$$

Further, we investigate the presence of equilibrium relations between the two variables by using the Johansen trace test. In performing this test, we specify the deterministic term and the number of lags. Regarding the deterministic terms, a linear time trend is included properly because both series exhibit a trending behaviour. The number of lags is chosen based on the information criteria in the VAR model. By selecting the orders minimizing different model selection criteria, we perform cointegration rank tests for different numbers of lags, and we test if a VECM specification provides a good representation of the time series.

The presence of cointegration vectors involves the use of VECM with the following specifications:

$$\Delta Y_t = \alpha \beta' Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \dots + \Gamma_{p-1} \Delta Y_{t-p-1} + CD_t + u_t \quad (3)$$

having r cointegrating vectors (in our case one) and the number of lags resulted in the VAR model minus one.

where α is a $(K \times r)$ matrix of loading coefficients, β' is the $(K \times r)$ cointegration matrix, Γ_j is a $(K \times K)$ short-run coefficient matrix for $j=1, \dots, p-1$ ($p = \text{VAR order}$), C is also a parameter matrix with suitable dimensions, D_t contains the deterministic variable (trend shift dummy).

To check if the fitted VECM provides a good representation of the time series set, we test against the residual autocorrelation, non-normality, ARCH effects, and parameter instability. Based on these tests we chose the model with the following specifications: one lag and one cointegrating vector, i.e. VECM(1,1).

The VEC analysis is finalized, in our case, with the error variance decomposition. We assume that the innovations are orthogonal and consider the VEC form with the following specifications:

$$\Delta Y_t = \alpha \beta' Y_{t-1} + \Gamma_1^* \Delta Y_{t-1} + \dots + \Gamma_{p-1}^* \Delta Y_{t-p-1} + C^* D_t^* + u_t \quad (4)$$

We report the empirical results in the next section.

Empirical results

Table 1 displays the variance decomposition of the two logarithmic series for the entire period that ranges from the third quarter of 1997 to the last quarter of 2014.

Table 1. Error variance decomposition (1997Q3-2014Q4)

Variable	Horizon	lown	lOTHER_VARIABLE
LN_GDP	1	100.0000	0.000000
	2	96.03413	3.965873
	3	88.75550	11.24450
	4	80.25741	19.74259
	5	71.89814	28.10186
	6	64.32975	35.67025
LN_BET	1	89.79560	10.20440
	2	89.73287	10.26713
	3	89.67429	10.32571
	4	89.61956	10.38044
	5	89.56840	10.43160
	6	89.52057	10.47943

Source: own computations.

From the table below we can draw several conclusions. First, it seems that there exists a bidirectional relation between national stock market and economic growth in Romania. Second, over all the period, the two variables are explained in the largest proportion by their own innovations. On one hand, the fact that stock market's influence is not the most important in determining economic development was an expected situation. In the analysed period we captured the evolution of Romanian stock exchange from a

“rudimentary” status to a more developed one, but still not with the status of “advanced and mature”. Moreover, given the fact that Romanian financial system is preponderantly a banking one, it is more likely that long-term benefits can be achieved mostly through the banking system progress and in a lesser extent through stock market progress (Mazur and Alexander, 2001; Singh, 2008). On the other hand, the fact that economic growth exerts a small impact on stock market is puzzling. Why the importance of economic growth is so small in stock market development? Moreover, why the importance of stock market innovations on economic growth is noticeably greater than vice-versa? Who is responsible for this abnormal situation?

We will try to answer to these puzzling questions, somehow discordant with the economic theory, by analysing a smaller period of time. We will employ the model on the interval between 1997Q3-2006Q3. The motivations for which we stopped at the end of the year 2006 are multiple. First, in September 2006, was listed the first international financial institution on Romanian capital market, fact that attracted the interest of international investors. Second, Romania became an EU member since January 2007 and the euphoria of foreign international investors could deter the connection between nominal and real economy. Third, in September 2006 the complete liberalization of the capital account occurred in Romania. Fourth, the remaining period covers also the global economic crisis. This is synonymous with an increased contagion of the national economy, and furthermore, a more sensitive domestic stock market to shocks from the international markets.

In Table 2 we display the empirical results for the subperiod 1997Q3–2006Q3.

Table 2. Error variance decomposition (1997Q3-2006Q3)

Variable	Horizon	lown	lOTHER VARIABLE
LN_GDP	1	100.0000	0.000000
	2	98.07887	1.921126
	3	95.63361	4.366392
	4	93.43007	6.569927
	5	91.62036	8.379641
	6	90.17615	9.823845
LN_BET	1	89.57005	10.42995
	2	77.54432	22.45568
	3	64.27809	35.72191
	4	52.94265	47.05735
	5	44.58681	55.41319
	6	38.80307	61.19693

Source: own computations.

The figures in the table above highlight also a bidirectional relation between stock market and GDP, but in terms of magnitude, the situation is different. In this subperiod, the nexus is as in text books: economic growth leads the development of domestic stock market, while the development of stock market exerts an influence on economic growth, but in a lesser extent. Here, is emphasised the fact that a financial institution develops dependently on the national economic environment.

However, the responsible for the results in Table 1 is the period between the end of the year 2006 and 2014; a period that for Romania means joining the trend of international markets: an increased number of foreign and institutional investors, an increased contagion caused by the big degrading. In this period, the feedbacks received from this component, the most dynamic of the nominal economy, acted as a seismograph for the economic evolution. Romanian stock market is considerably more sensitive to shocks from international environment. In this circumstance, we place ourselves near authors like Syllignakis and Kouretas (2010) and Pirovano (2012) who support that local stock markets are more sensitive to external shocks than to domestic ones.

Conclusions

The meaning of capital market – economy relation is not free of controversy, especially in an emerging economy in which the financial system is predominantly a banking one. In our analysis we tried to reveal the nature of the nexus between Romanian stock market development and economic growth. At first sight, when the whole period is studied, we find a bidirectional linkage between the nominal and the real economy, with more pronounced influence coming from stock market to economic growth. However, in attempting to answer the question which is the cause of this unexpected relation, we discovered that the external environment was the main driver of stock market movements beginning with the end of the year 2006.

When analysing the subperiod ranging between 1997Q3-2006Q3, the expected tandem between stock market and economic growth seems to make sense and veracity. In this sense, the connection between nominal and real economy is preponderantly unidirectional – from economy to stock market, but also with reverse impulses, although to a lesser extent. Therefore, the challenge comes, in the second subperiod, from contagion. In this time frame, the international interdependencies of Romanian stock markets, especially in turbulent times are greater, fact that determines international environment to be the driving force of domestic stock market.

These results have many implications. First, these conclusions are important to be known by investors in order to decide on the formation and diversification of the potential portfolio of financial assets. Second, given the fact that the establishment of stock exchange was and still remains an instrument of governments meant to facilitate, optimize and control economic development strategy, it is not allowed for a responsible decision maker to neglect positioning arising from analyses of this kind.

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Determinants of savings in the APEC countries

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Abstract. *The determinants of savings is the subject which is studied frequently in economic literature. Because that the saving conditions are contribute to the economic growth. This study examines the determinants of savings in the APEC countries. Panel data analysis was used for sixteen APEC member countries during the period of 2000-2013. According the analysis results that income, age dependency ratio, young population, rural population and urban population affect on savings positively. Financial depth affects on savings negatively. Inflation and old population have no significant effect on savings in APEC countries.*

Keywords: APEC, saving, life-cycle hypothesis, panel data.

JEL Classification: D91, E21, F49.

1. Introduction

There has been wide literature to examine the determinants of savings. Some of these studies analyze savings at country level (Ozcan et al., 2003; Hamadi et al., 2011; Yong et al., 2008; Agrawal et al., 2010; Horioka and Wan, 2007; Jongwanich, 2010; Athukorala and Sen, 2003) and others analyze the country group level savings (Williamson, 1968; Masson et al., 1998; Faruqee and Husain, 1998; Loayza et al., 2000; Wan et al. 2003; Cohn and Kolluri 2003; Thanoon and Baharumshah, 2005; Bhandari et al., 2007; Horioka and Hagiwara, 2011; Thanoon and Baharumshah, 2012; Das and Ray, 2012; Zhou, 2014). The reason of interest in saving conditions is that the saving has been considered as the substantial factor for investment and subsequently affects the economic growth.

Keynesian perspective discusses the investments as a factor of only influence on generating income. This perspective ignore that the investment is a substantial factor for increasing productive capacity. Considering this dual structure of investment together, it can be said that investment could increase productive capacity and generates income (Domar, 1946: 139). Domar, puts the propensity for saving on the one side of equality, and he puts growth of labor, discovery of natural resources, technological achievements on the other side of equality. In a stable economy, instable circumstances may occur by the imbalances between saving and other conditions (Domar, 1946: 144). In Domar's approach savings are substantial factor for economic growth. Solow suggests that the propensity for saving represents how much current output can be saved and invested. Consequently, the accumulation of capital can be recognized during the current period. This accumulation of capital leads how much capital would be available for the following period. Hence, increase in capital accumulation rises to the level of output and subsequently affects the growth (Solow, 1956: 68).

The aim of this study is to analyze the determinants of savings for APEC (Asia-Pacific Economic Cooperation) countries. The study used panel data analysis during the years 2010-2012. That data used sixteen APEC countries, which are Australia, Brunei Darussalam, Canada, Indonesia, Japan, Malaysia, Philippines, New Zealand, Thailand, United States, China, Mexico, Chile, Peru, Russian Federation and Vietnam.

The first section of study offers the literature review of the related studies which examine the determinants of savings. Second section includes data and methodological approach of the study. Third section provides analyzing process. Fourth section presents results of the panel data analysis. Finally last section of study provides the conclusion remarks.

2. Literature review

Williamson (1968: 205, 209) examine the determinants of savings in developing Asia. He achieves the results that corporate and government sector are not the only source of excessive savings for Asia region. Transitory income is much more effective on marginal

propensity for saving than permanent and measured income. Interest rates have more impact on the short run savings decision than the long run savings decision. Direct tax increases have a direct and negative effect on aggregate real savings in Asia region.

Masson et al. (1998), analyze potential determinants of private saving behaviors. They used data from 21 developed and 40 developing countries. They find that demographics and growth are significant determinants of private savings. Interest rates and trade have positive but moderate impact on private savings. In countries where income per capita is lower than that of the USA, increases in GDP per capita provides the growth of savings while in countries where income per capita is higher, it causes savings to reduce (Masson et al., 1998: 483).

Faruqee and Husain (1998) investigate long-term determinants of private savings in Indonesia, Malaysia, Singapore and Thailand. Analysis results show that increase in the rate of private savings of these countries are very remarkable. The study examined common experiences for strong saving performances among them. According to the results, demographic changes and increases in per capita income have an impact on regional saving trends (Faruqee and Husain, 1998).

Loayza et al. (2000) conduct an empirical study on political and non-political factors behind the differences of savings among 150 countries. Their results show that private savings increase with the growth of real per capita income. This impact of income on private savings is higher in developed countries compared to developing countries. Dependency ratio has a negative impact on private savings. Prudence caused by inflation influences private savings in a positive way. Financial policies are the instrument with moderate impact on increasing the national savings. Financial liberalization influence private savings negatively (Loayza et al., 2000: 180).

Wan et al. (2003: 416) investigate determinants of rural China's saving behavior. They find that Chinese rural areas have an undeveloped capital market structure so consumers face with liquidity constrains. If there were policy implications to refine rural capital market, consumption expansion could be helped and domestic demand could be stimulated. Also in China, urban residents are protecting with social rights by government. But these protection arguments do not exist in rural China. This situation has effects on rural savings behavior. Finally they find that cultural motives are effective in savings.

Cohn and Kolluri (2003: 1207) investigate the household saving behavior for G-7 countries in the years 1960-1999. They find that higher real interest rates and increasing of government dissaving effect household savings positively. A decline in social security supports the cause to increase household saving.

Thanoon and Baharumshah (2005), examine the saving behavior of East Asian countries. They conclude that financial crisis impact savings and determinants of savings not only in the short term but also in the long run. Additionally external savings bring a negative

impact on domestic saving rates. Interest rates have little negative impact on savings, which is significant in terms of standard significance. Demographic factors are effective in long term saving rates. Economic growth and export positively affect long term saving rates during the pre-crisis period. There is no finding related to negative effect of economic stagnation due to crisis on short- and long-term saving rates (Thanoon and Baharumshah, 2005: 262).

Bhandari et al. (2007), examine the determinants of private savings in five South Asian countries. They conclude that government expenditures and past savings have a negative impact on private savings. Financial development and increase in income per capita affect the private savings positively. Rate of dependency, localization level and real interest rates appear to have less impact on private savings in these countries (Bhandari et al., 2007: 216).

Horioka and Hagiwara (2011) analyze domestic saving rates trends in developing Asia in the years 1966-2007. They find that generally domestic savings have been high and increasing in developing Asia. But there have been important differences of these trends in each country. These differences occur by the age structure of the population, income levels and the level of financial sector development. They also estimate future saving trends in the years 2011-2030 and they conclude that Asia will maintain current saving levels despite population aging. Because population aging will be stabilized by the higher income levels of developing Asian countries.

Thanoon and Baharumshah (2012: 113) analyze the determinants of savings in Asia and they compare the findings with Latin America economies. They conclude that two country groups which have similar conditions in the scope of savings rates are affected by international capital inflows, dependency ratios and the size of the export sector. But economic growth and capital flows affect the savings in different ways between these country groups.

Das and Ray (2012) establish panel data analysis in 1990-2007 period for developing six Asian economies which have high saving rates. The variables such as high growth, low age-dependency, increasing degree of financial deepening, presence of liquidity constraint, remittances, terms of trade shock and human capital formation are leading determinants of the savings for these six countries.

Zhou (2014) examine the number of brothers who have an individual effect on the household savings rate in rural China. He finds that additional brother can reduce an individual's household savings rate to at least 5 percentage points. Brothers helping in households by sharing their risks provide them a source of informal borrowing and brothers also share household's costs of supporting parents. Sisters have a little effect on the household's saving rate. Finally he focuses that decline in the average number of brothers in households affects one-third of the increase aggregate household savings rate in urban China.

3. Data and methodology

Data used in this study to analyze the determinants of savings in the APEC countries were obtained from the World Bank Database. Dependent variable included Gross Domestic Saving as a percentage of GDP (S). One of independent variable is annual percentage GDP growth per capita ($GDPP$). This variable represents the income level. Modigliani (1966: 167) in his life cycle hypothesis suggests that if aggregate income increases progressively in a time period, it will affect saving rates positively. GDP Deflator (annual %) (INF) variable indicate inflation. In high inflation periods individuals shift to save up to avoid economic uncertainty conditions. $M2$ as a percentage of GDP ($M2$) variable represent financial depth. According to the life-cycles model, financial development has a negative impact on savings because it can increase opportunities for consumption (Masson et al., 1998: 488).

Age dependency ratio as a percentage of working population ($AGEDP$) variable is widely used to determine on savings. This variable is defined as the ratio of dependent people, who are younger than 15 or older than 64, to the working population those ages 15-64. Agenor and Aisenman (2004) find positive relationship between age dependency and savings. Kibet et al. (2009), Loayza et al. (2000), Das and Ray (2012) find negative associations between dependency and savings. Kelley and Schmidt (1996: 366) indicate that there is no indefinite relationship between dependency ratio and savings. Population aged 15-64 as a percentage of total population (PY) and population aged 65 and above as a percentage of total population (PO) variables access to the model from life cycle hypothesis. Modigliani (1966: 163) asserts that individuals save in the earlier part of their life. Thereby individuals can support their consumption by dissaving in the later part of their life. For these reasons expectations can be positive between PO and savings whereas expectations can be negative between PY and savings. Rural population as a percentage of total population (RRL) and urban population as a percentage of total population (URB) are final independent variables in the model. Generally in the rural regions saving tendency is much improved than it is in urban regions. The rural life conditions encourage individuals to save up. Main reason of this circumstance is that the rural regions provide insufficient financial facilities for individuals. Also it can be said that urban regions provide sufficient financial instruments and government protection arguments for individuals (Wan et al., 2003). By this reason urbanization can affect the savings negatively.

$$S_{it} = \beta_0 + \beta_1 GDPP_{it} + \beta_2 INF_{it} - \beta_3 M2_{it} - \beta_4 AGEDP_{it} + \beta_5 PY_{it} - \beta_6 PO_{it} - \beta_7 URB_{it} + \beta_8 RRL_{it} + u_{it} \quad (1)$$

i symbolizes country and t symbolizes time; $i = 1-16$ countries and $t = 2000-2012$ (13 years). In this study the analysis was made with the unbalanced panel data set. In this set, the number of data set and years are not equal for each country. The model was established as in Equality 1, based on the theoretical and empirical studies in literature.

4. Process of analysis

If all observations are homogenous, pooled OLS model can be used in panel data analysis. However if observations contain unit and/or time effects, it can be appropriate to use fixed effects or random effects models (Yerdelen Tatoğlu, 2012: 163-164). So, likelihood ratio (LR) test was used for the model in order to determine whether there are unit and time effects. In LR test, it is examined whether standard error of unit effect is equal to zero ($H_0: \sigma_u=0$). Additionally, LR test is also used to examine whether standard error of time effect is equal to zero ($H_0: \sigma_\lambda=0$) (Yerdelen Tatoğlu, 2012: 170). If unit and time effects are not determined in LR test, pooled OLS model can be used. However if unit and/or time effects are determined in test results, it can be concluded that the model is one sided or two sided.

Table 1. LR Test

	Unit Effect	Time Effect
χ^2	212.71	0.00
<i>prob.</i>	0.0000	1.0000

According to the results of LR test, there is an only unit effect in the model. For this reason, the model is one sided. Hausman specification test is used to determine whether unit effects are fixed or random.

According to Hausman test, if there is no correlation between error components (u_i) and explanatory variables (x_{kit}), both fixed effects and random effects estimators are appropriate. However, if there is correlation between error components and explanatory variables, random effects estimator is inappropriate. In Hausman test, null hypothesis is set up in the way that there is no correlation between error components and explanatory variables (Hill et al., 2011: 559). It can be said that random effects are appropriate when there is not a correlation between u_i and x_{kit} , and fixed effects are appropriate when there is a correlation between u_i and x_{kit} (Gujarati, 2003: 650).

Table 2. Hausman Test

χ^2	38.52
<i>prob.</i>	0.0000

According to the results of Hausman test, it is decided that unit effects are fixed. Accordingly, analysis is made in accordance with one sided fixed effects model.

Then, models were examined in terms of basic assumptions. One of these assumptions is constant variance (homoscedasticity) assumption. According to constant variance assumption, while unit values of explanatory variables change, variance of error term remains fixed. If this assumption does not occur, model includes heteroscedasticity (Wooldridge, 2012: 93). According to autocorrelation assumption, there is no correlation between error terms of independent variables (Wooldridge, 2012:353). If this assumption does not occur, it means that there is correlation between error terms of independent variables. Bhargava, Franzini and Narendranthan's Durbin-Watson Test and Baltagi-Wu

LBI Test are used to examine this assumption. Another assumption is about correlation between units. In studies such as domestic and regional economies, neighborhood effects can show spill-over in themselves. In such cases, correlations have spatial view rather than temporal view (Greene, 2012: 389). This assumption is tested through Pesaran Test.

Table 3. Tests of deviation from assumptions

Modified Wald Test	Modified Bhargava et al. Durbin-Watson Test and Baltagi-Wu LBI Test	Pesaran Test
χ^2 863.23	0.7066171	Cross Sect. Indep. 0.151
<i>prob.</i> 0.0000	0.9601869	<i>prob.</i> 0.8797

According to the results of analysis, there is no correlation among units but there are heteroscedasticity and autocorrelation problems in the model. In order to solve these problems, standard errors which are resistant to deviations from assumptions were produced by using method of Driscoll and Kraay.

5. Analysis results

Driscoll and Kraay estimator was used to solve the heteroscedasticity and autocorrelation problems. Table 4 shows analysis results.

Table 4. Analysis results

Explanatory Variables	Coef.	t-statistics	p-value
<i>GDPP</i>	0.32299	3.64	0.002*
<i>INF</i>	0.04960	1.35	0.197
<i>M2</i>	-0.61748	-7.67	0.000*
<i>AGEDP</i>	2.72988	2.92	0.010*
<i>PY</i>	7.59861	3.35	0.004*
<i>PO</i>	0.54013	1.13	0.278
<i>RRL</i>	10.8371	3.16	0.006*
<i>URB</i>	10.72757	3.29	0.005*
<i>Cons.</i>	-1645.05	-3.20	0.006*
<i>F</i>	447.46		
<i>Prob.</i>	(0.0000)		
<i>R²</i>	0.3691		

Note: (*) significant at %1 level.

According to the results of analysis, coefficient of annual percentage GDP per capita growth (*GDPP*) affects the savings positively. 1% increase in *GDPP* causes 0.32% increase in savings. This result is consistent with theoretical expectations. *M2* as a percentage of GDP (*M2*) affects the savings negatively. 1% increase in *M2* causes 0.61% decrease in savings. This result is consistent with theoretical expectations. Age dependency ratio as a percentage of working-age population (*AGEDP*) affects the savings positively. 1% increase in *AGEDP* causes 2.72% increase in savings. Population ages 15-64 as a percentage of total population (*PY*) effects on savings positively. 1% increase in *PY* causes 7.59% increase in savings. Rural population as a percentage of total

population (*RRL*) affects the savings positively. 1% increase in *RRL* causes 10.8% increase in savings. Urban population as a percentage of total population (*URB*) affects the savings positively. 1% increase in *URB* causes 10.7% increase in savings. GDP Deflator (*INF*) and population ages 65 and above as a percentage of total population (*PO*) have insignificant effects on savings.

6. Conclusions

This study examines the determinants of savings in the APEC countries. Panel data analysis was used for sixteen APEC member countries. Model was established by theoretical and empirical related studies in the saving literature.

In the APEC countries income variable affects on savings positively. While gross domestic product per capita growth increases, saving rates increase as well. Financial depth affects the savings negatively. Financial facilities improve consumption opportunities. Thereby tendency for saving decline in this phase. Age dependency ratio affects the savings positively. This result can be explained by Kelley and Schmidt (1996) evidence. They indicate that children contribute directly to household market and non-market income. Also more children encourage parents to work more. For these reasons, increase in age dependency ratio causes increase in savings. Young population affects the savings positively. It can be said that individuals save up in the earlier part of their life to maintain their consumption tendency in the later part of their life. Rural population affects the savings positively. This result can be associated with rural region conditions that provide insufficient financial facilities and deficient government protection arguments for individuals. Urban population affects the savings negatively in the APEC countries. This result is adverse to the theoretical expectations. Wan et al. (2003) asserts that culture factor impress the savings and other economic indicators. In this respect urban population affects the savings positively by cultural propensity in the APEC countries. Inflation and old population have no significant effect on savings.

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The status of Romanian agriculture and some measures to take

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Abstract. *Romanian agriculture issues have been analyzed and discussed in numerous studies and professional articles. Agriculture is an important sector for Romania, given the large agricultural area owned; the sector can contribute to the qualitative transformation of the Romania's economy. Studies on agriculture and its role in the economic development of a country are numerous and highlight the importance of agriculture for any economy. Starting from the features of the Romanian agriculture and considering the current European context, this paper presents the situation of the Romanian agriculture and the main courses of action for rural development in order to improve work efficiency in the Romanian agriculture.*

Keywords: agriculture, rural development, labor efficiency, Romania, strategy.

JEL Classification: P16, P25, Q01, Q 10.

1. Introduction

The problems regarding agriculture, labour efficiency in agriculture have been analyzed in a series of studies, articles and researches. Nobel laureate in economics Theodore W. Schultz (1979) analyzed particularly the development of agriculture, explaining the main sources of labour productivity growth in agriculture.

Th. Schultz and W.A. Lewis condemn neglecting the agricultural sector in the favor of industry by treating agriculture as a branch with lower productivity than the industry. Schultz also rejects any explanation of poverty among the employed population in traditional agriculture based on the cultural inclination of the people towards non-work and on their lack of concern for labour productivity growth. He argues scientifically the relative stagnation of the traditional agriculture by the very low marginal revenue of the investment of reproducible capital or of labour input growth. At the same time, poverty reduces savings. Even investment in human capital through education and by increasing the dissemination of knowledge is usually hindered by the low price of agricultural production in developing countries and hence by the marginal revenue that can be obtained from any extra effort. (INCE-CRECC, 2006)

This research aims to highlight the status of the Romanian agriculture, especially in terms of labour efficiency and employment, to capture the causes of the main problems facing the Romanian agriculture and to outline several courses of action to improve the results of this sector, especially in the context in which Romania, as an EU member state that can benefit from the support of European funds for development and reducing disparities in development, so that to be competitive at the European level.

The research methodology involved both qualitative and quantitative research using analysis, synthesis, sonship of ideas, retrospective, perspective and statistical method. From a theoretical perspective it turned to books, studies and articles in the field; research and reports of specialized bodies were used for the interpretation of some indicators and case studies, internationally recognized (Eurostat, National Institute of Statistics, 'Costin C. Kirişescu' National Institute of Economic Research, European Environment Agency). There were also capitalized meetings and discussions with various experts in the country, in conferences and debates on the Romanian agriculture organized by the Romanian Academy and the National Institute of Statistics.

Some studies analyze the correlation between agricultural performance and poverty reduction in different countries. Thus, DFID study (2004) highlights the correlation between agricultural development and poverty reduction through four mechanisms: agricultural performance improves rural incomes, cheaper foods are an extra advantage for both rural as well as urban areas; agricultural development contributes to generating economic opportunities in the non-agricultural sectors and agricultural development can support the transition from subsistence agriculture to the extension of production and services towards other sectors. Bresciani F. and Valdes A. (2007) analyze this correlation between agricultural development and poverty reduction through three main channels: labour market, income of farmers and prices of agricultural products. They conclude that when both the direct and indirect effects of agricultural growth are taken into account,

such growth is more poverty reducing than growth in non- agricultural sectors. This research is deepened by the OECD study which shows that the relationship between poverty and food production can be analyzed by means of price and income. Since a large part of the poor farmers depend on the income from agriculture, we could say that an increase in farm income would reduce poverty and increase quality of life. On the other hand, the decrease in food prices would make us believe that it would contribute to poverty reduction because lower food prices would support consumption expenditure of the poor. Despite these arguments, studies show that these correlations are not always guaranteed.

This is because lower food prices would reduce income and purchasing power of the poor farmers who could not remain on the market. In the end, this analysis also depends on other factors such as the system of government, the policies adopted in the economic field, the macroeconomic context, the management of agricultural activities, public spending on agriculture, investment in agriculture, which affects worker performance in agriculture and its contribution to GNP growth and poverty reduction. (Cervantes-Godoy and Dewbre, 2010)

As well as in the Romanian literature, the works of Dinu Gavrilescu (*Romanian agriculture from subsistence to efficiency*), Păun I. Otiman (*The contribution of agriculture and sustainable development to crisis mitigation and recovery of economic growth in Romania*) and Dobrotă Niță (*Government economic and social policies and agricultural product prices*) underline the importance of agricultural development for Romania and especially the increase in labour efficiency, particularly through investment in people and rural development.

Romanian agricultural development can be achieved through both infrastructure development and rural development, especially through investment in education and health of people living in villages. Thus there is an increase in quality of life and driving force for development and long term economic growth.

2. The status of Romanian agriculture

Agriculture has great importance in European economic development, being supported by a number of policies and specific strategies and by allocating the highest amount of the EU budget.

Given Romania's agricultural potential and the need to eliminate the existing gaps in relation to agricultural development in the European Union, Romania should pay particular attention to measures that support this area.

Agriculture is an important area that may be developed to the advantage of the qualitative transformation of the Romanian economy. This means restructuring the inefficient sectors in agriculture as well as making structural investments in order to achieve the quantitative level, and especially the one required by EU policy.

With an area of considerable arable land (9.4 million hectares, which is 0.45 hectares per capita) Romania ranks among the first places in the EU in terms of arable land (5th place after Spain, France, Germany and Poland), which shows great potential in gaining an important position in the European market for agricultural products.

Romanian rural areas hold two advantages: wealth of natural and human resources, but economic performance of the sector is very low.

The potential of our country remains unexploited because of poor organization of the agricultural land, of cadastral measurements that are not generalized, of reduced concerns for value-added for agricultural products and of the dependence of agricultural production on the climatic conditions.

Arable land decreased year by year, decreasing in 2012 by over 7315 hectares and perennial plantings decreased by over 8314 hectares compared to 1997 (year in which the reduction of arable and perennial land began). The cause of this situation lies in the fact that individual owners of agricultural land either not having the necessary technical and financial means, or disappointed by the lack of support received have cultivated increasingly smaller areas. The weather conditions also influence the Romanian agriculture, given the lack of infrastructure to achieve a modern agriculture, the Romanian agriculture is often dependent on weather conditions. (Anghelache, 2012)

According to World Bank studies more than a third of EU farmers live in Romania, but the value of agricultural production is only a tenth of the registered production in EU.

Employment in rural areas in 2009 reached 45.55%, almost half of the total employed population. However, Romania still has subsistence agriculture, 35% of agricultural land is owned by small and very small farms that have less than 5 hectares, and work in agriculture is mainly family type and involves the production of goods for own consumption. The products of these households are excluded from the market as they do not meet the requirements of the Community acquis on the marketing. They were attracted to the economic cycle by association and cooperation on a contractual basis to become viable, and market-oriented family farms sector is still underdeveloped. Also, the Romanian agriculture faces the following problems: land fragmentation, aging of active population, the existence of about 3 million hectares of uncultivated land, the lack of working capital for farmers, difficult access to credit. After the regranting of land started in 1990 and the lack of coherent policies to encourage the associative forms of land use, property fragmentation became a feature of the Romanian agricultural sector, thus making land use at an optimal level almost impossible.

In 2009, statistics showed a downward trend of the active population in agriculture and also an aging workforce, half of it being over 45 years. Aging trend is more pronounced in the rural areas. As 1st January 2010 the average age for total population was 39.6 years (38.1 years for men and 41 for women) while for rural areas the average age was 40.2 years. Unfortunately, most of this population is employed in subsistence agriculture, having fewer opportunities to get out of this situation and calling for increased resources to be supported. (Serban, 2012) According to demographic projections this trend will

persist due to declining birth rates and increased aging population of Romania as well as the amplification due to of migration.

Demographic measurements are multiple and profound both at the level of the entire economic system and at the regional and sectoral level because the performance of an economic system is strongly influenced by demographic structures. Therefore, the age of workers in agriculture influences the degree of openness to innovation, occupational mobility and retraining.

Aging population in the Romanian agriculture increases the risk not to renew the future workforce and have a low degree of openness to innovation, to requalification.

Even if employment in agriculture declined in 2000-2010, it remains high compared to the values of other European countries and in relation to the efficiency recorded.

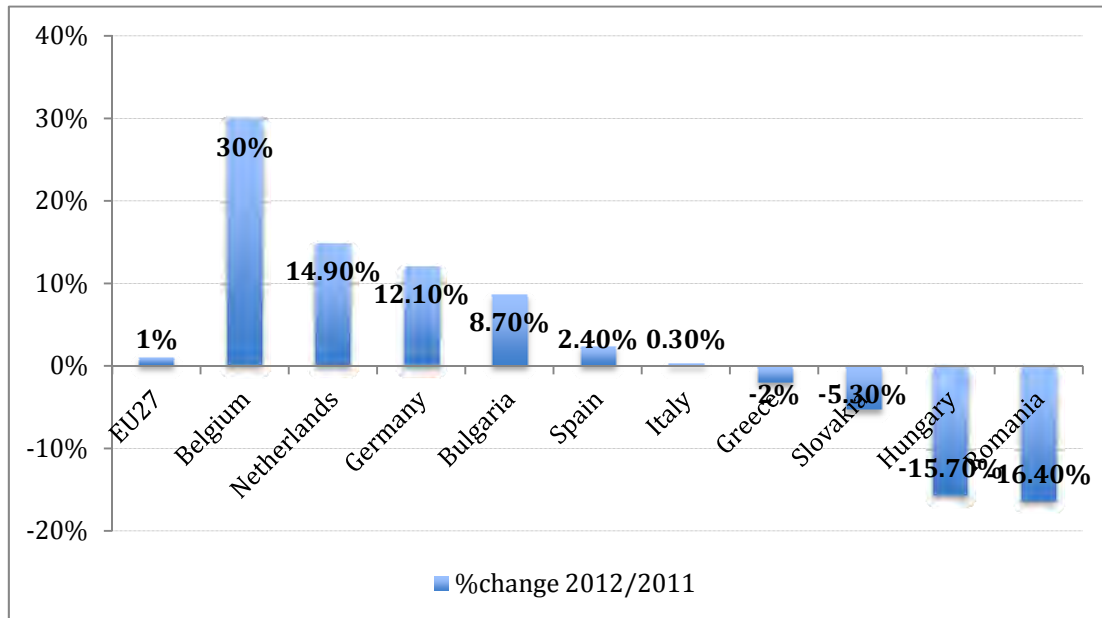
In 2010-2012, following the effects of the economic crisis there is a slight increase in employment in agriculture as a result of the redundant movement in different areas towards agriculture. In response to the current financial and economic crisis, the agricultural sector has become an occupational damper, it as happened in the 90. This is explained by the tendency of those made redundant because of the crisis to integrate among those who produce goods for own consumption, or by registering them in agriculture, given that they are performing illegal work.

In terms of labour efficiency in agriculture, we can analyze the differences between Romania and the EU at the level of the indicator *Change in real agricultural income per worker* (in the year 2012 compared to 2011).

EU27 real agricultural income per worker increased by 1.0% in 2012, after an increase of 8.0% in 2011. The increase in EU27 real agricultural income in 2012 is mainly the result of a rise in the value of the output of the agricultural sector at producer prices in real terms (+1.8%), while input costs in real terms grew (+1.6%). (Eurostat, 2012)

This indicator increased in 16 EU Member States and decreased in 11 states. The largest increases are recorded in Belgium (+30.0%), the Netherlands (+14.9%), Lithuania (+13.6%) and Germany (+12.1%), and the biggest decreases are in Romania (-16.4%), Hungary (-15.7%) and Slovenia (-15.1%).

This dramatic decrease in real agricultural income per worker in Romania can be explained by the decrease in farm income generated by the current financial and economic crisis, which has reduced the demand for some agricultural products or raw materials in agriculture and some agricultural activities as well as the low attraction of European funds, temperature dependence.

Figure 1. Change in real agricultural income per worker in 2012/2011

Source: Eurostat, <http://ec.europa.eu/eurostat>

On the other hand, Romanian agricultural prices increased substantially in 2005-2010. According to an EU report, they increased by 40% during this period in Romania, with the highest growth in the European Union (EU-27). This is explained by the increase in prices of inputs, especially under the conditions of poor agricultural industrialization and reduced organization of producers in branch organizations for food products.

These organizations interprofessional allow a comprehensive approach to the product and to the product market and are based on a system of functional relationships that creates connections among producers, processors, transporters, storers, distributors and retailers. Other causes of rising agricultural prices are the result of a combination of structural and conjunctural factors. Structural factors include increasing global demand generated by increasing incomes. At the same time, agricultural supply has not developed at the same pace, there is a large gap between the demand and supply availability. Agricultural supply is limited mainly by low yields per hectare and is under the process of decline in agricultural productivity in the long term. The action of the structural factors is amplified by cyclical events such as production shortfalls due to adverse climatic conditions, speculative actions in agricultural markets. (Alexandri, 2010)

Thus the agriculture practiced in individual holdings in Romania has not had development opportunities similar to those in most European Union countries, even if there were potential comparative advantages offered by the natural potential. Among the major problems of institutional and real convergence facing Romanian agriculture should be mentioned: the small number of commercially oriented holdings; low productivity and

quality in production; large number of farmers operating small areas, fragmented into numerous plots and which correlate to inhomogeneous production unresponsive to the quality standards required by the market; the lack of suitable and affordable investment; foodservice channels poorly consolidated or inexistent to certain products, a significant gap between agricultural imports and export; the predominance of the export of low value added products in the structure of foreign trade of agri-food products. (Oțiman, 2010)

3. Asynchrony and Incompatibilities Inherited from the years of "socialism".

Causes of Romanian agriculture involution

Many of the problems in agriculture have occurred due to the inability of Romanian agriculture to adapt to the requirements of the free market.

In the second half of the twentieth century (1945-1989), Romania and the other Central and Eastern European former socialist countries followed a different path of agricultural development, different from the way it was adopted by the western European countries. In fact, both groups of countries aimed at increasing agricultural production, agro-food independence and modernization of production processes in agriculture by learning the new achievements of agricultural science and technology. So both Western countries and the Central and Eastern Europe ones were mostly preoccupied with what experts call modernization of agriculture.

Regarding the defining elements of modernity of society and modernity of agriculture, the two groups of countries chose and acted for about 45 years on opposite paths. Western European countries continued the capitalist path of development with all its defining elements. In contrast, central and eastern European countries adopted the Soviet socialist model as the benchmark of transformation of agriculture.

Without going into political-ideological issues we mention here only the fact became historic landmark at the end of the twentieth century: the socialist way of agricultural development in Central and Eastern Europe proved to be an ephemeral historical loop. Thus, we can say that the main cause of the current state of Romanian agriculture has consisted and consists of the transition from the great socialist agriculture (state and cooperative) to the small agricultural production (farm) which is extremely broken and weakly supported by the public power. We specify that the transition from the so-called socialist forms to the capitalist agriculture was a historical necessity that can not be questioned. The way in which this process took place was not the most suitable for the specific conditions of our country. (Molanescu et al., 2012)

Many analysts in agriculture wonder if Romania's EU accession has positive effects on agriculture or, if this can influence the perpetuation of the involution of this main branch of economy.

It is known that, independent of temporal circumstances in the global economy plan, the beneficial influence of U.E. did not manifest itself either in the past as social assistance to those economically left behind. We can not expect such uncompetitive help either now or in the future.

Noting the state of underdevelopment and nonperformance of the Romanian agriculture, as well as its generalized involution in the last 10-15 years, noting the expectations of some Romanian politicians, and the firm demands of E.U. leadership, a well known economic analyst postulates harshly: „However, it is not certain that the development of agriculture and of the Romanian village prosperity will ever come (someday, it is not known when), but it is certain that if they come, they will not come from E.U., but from the changes within the economy of Romania.” (Șerbănescu, 2009)

Two other specialists make some calmer considerations regarding the beneficial influence of E.U. on the evolution of our country`s agriculture in the future. "Clearly, they say, there will be a driving effect coming from the EU agricultural policy in the future. But the substantive change to the Romanian village and agriculture can not be made under pressure and with funds from the EU and therefore we should not expect something like that. The effort of the internal factors is that it can change the current state of our country's agriculture." (Dinu and Socol, 2006)

Moreover, these views show that the development of Romanian agriculture and economy are linked to national policies and measures, to the implementation of these policies and targeted strategies, any policy or European support not having the desired effect as long as there are implementation issues and their implementation at national level.

A group of experts, led by Academician Ion Paun Otiman, has built a system of social and economic indicators by which compared the status of Romanian agriculture, since the EU accession, with the agriculture of EU founding countries, and also with the agriculture of the EU (15) for 2006-2007. (Otiman (coord.), 2011)

We present below several indicators that emphasize the level of the post-revolutionary Romanian agriculture compared with that of the EU countries. (6 as well as 15 or 25):

- The value of primary production per hectare obtained by Romanian peasants was 2.5 times lower than the one obtained by European farmers, respectively 300-350 euro/ha compared to 750-800 euro/ha.
- Gross value added in Romanian agriculture is at the half of the one of EU. (15). This value is 900 euro/ha in Romania and 2,000 euro/ha in EU countries.
- Food self-consumption in subsistence and semi-subsistence farms represented 50-52% of their production, compared to 10-12% of farms in the EU countries (15).
- The irrigation systems in 1989 and largely destroyed were restored only to an extent of 30-35%, but only about 250,000 hectares were put into service, i.e. 8% of the area designated for that purpose before 1989.
- The poor state of the living conditions extends to approximately 38% of the rural population; more than half of the rural population does not benefit from water supply from the public network etc.

The most general conclusion that can be drawn from the foregoing is that, at present, Romanian agriculture and rural state fall somewhere at the existing level in the six founding EU countries in the years 1957-1962.

Moreover, as distinguished Professor Mircea Bulgaru said „the agriculture in our country became, in fact, a market for agricultural products in Western Europe. Not protected by

the state through economic or fiscal policy, Romanian agriculture could not fulfill its function of offering the basic food and agriculture products to the population.” (Bulgaru, 2007)

In the first decades of the European Economic Community, the agricultural policy of this regional organizations were focused on the following objectives: labour productivity growth in the agriculture of member countries through the introduction of technical progress and widespread use of new discoveries in the biological science; ensuring a fair living for the rural population; ensuring security of supply of food and agriculture products for consumers in each of the member countries; ensuring reasonable selling prices to agro-food products intended for domestic consumers.

Three principles of the CAP were designed to contribute to achieving the objectives laid: a) growing and maintaining a single agricultural market; b) respecting Community preference; c) community financial solidarity.

By following these principles, CAP contributed not only to increase agricultural production in member countries, but also to maintaining a balance between urban and rural life in Western Europe in sustaining a balance between the interests of farmers and consumers. The overall effort of these measures was continuing the process of modernization of the agricultural sector and of the rural environment.

In recent decades, in the context of changes happening around the world, of the powerful trend towards globalization of the economy and of the manifestation of social-economic crisis with global touch, the objectives of the CAP have become more complex and more rigorous, as it can be seen in the following list: a) increase of agricultural products competitiveness both on the domestic EU market as well as on the global markets; b) improving food security by increasing food quality; c) ensuring social balance based on agricultural income stabilization and creating new revenue sources; d) practising European agriculture; e) health insurance in livestock farms; f) ensuring financial resources by establishing the single farm payment.

These EU objectives as a whole in the field of agriculture and rural areas are not only necessary but also feasible, as a natural continuation of the successes achieved by the Western European countries in the last half of the twentieth century.

The current situation of the Romanian agriculture and village fits better with the EU measures used in the past decades. Therefore, almost all programs and projects supporting agriculture aimed the concept of sustainable rural development, making this concept a reality requires massive internal investments that EU subsidies can only complement.

Such a development requires national efforts sustained for creating a modern rural infrastructure; for developing proper technical equipment of the rural territory (environment) and dwellings in villages; for setting a certain standard of living of the rural population comparable to the Western European one; for increasing the use of renewable natural resources in the economic cycle; for encouraging environmental and landscape protection etc.

For all of these requirements and demands to turn into tangible realities in a reasonable time (as soon as possible) sustained national effort is needed, well correlated through a strategy founded and implemented in life with perseverance and science, so as to generate simultaneously performance, competitiveness, safety and agrifood security of the population.

4. Further Steps to Encourage the Development of Romanian Agriculture

Programmes, even strategies to stop the involution of the Romanian agriculture were adopted before the EU accession and after the accession (Constantinescu, 2000). Nevertheless, results were insufficient or insignificant. Not just because of the adopted programmes and strategies, but rather because of the lack of measures to be put into practice.

Developing a strategy in agriculture must take into account several aspects.

a) **Supporting education and training** a mentality of the **Romanian peasant**, to overcome the transition from the socialist agriculture, from the cooperatist peasant to the agricultural market, to the modern agricultural farmer.

Change of agrarian structure and transition to market economy were sources of serious problems for farmers, especially for the small ones, with poor technical endowment. Most of their production is aimed for self-consumption and very little, if any, for market. (Sin, 2013)

Even if workforce recorded in the Romanian agriculture has a high share, qualified agricultural workforce has a low share. In this regard Romanian agricultural legislation has not yet introduced professional certificate in farm business nor has established structures and mechanisms to promote them. At the same time banking and financial legislation does not connect granting loans for farmers to their skill level (similar to the green certificate of EU farmers), but only according to the system of collaterals.

Human capital is crucial for the economic development potential of a region. Diversification of the rural economy also depends on the level of education, skills and qualifications of the rural employment.

The modern vision on European agriculture gives an important role to the modern farmer, a fact defined by Frenchman Bertrand Hervieu (former president of the Institute for Agricultural Research in France), as being a farmer practicing work of synthesis which is complex and specialized. This function requires new skills that are not inherited, but are rather learned. From this point of view, the farmer is a modern entrepreneur. Rural development, improving quality of life and diversification of the rural economy dependent on the modern farmer. All requirements and obligations imposed on the new type of farmer converge to achieving a higher level of professionalism. This requires a systematic, continuous and multidisciplinary education from the farmer's side. (Hera, 2009).

The professional scope of the modern farmer must exceed the field of agriculture that is needed to be mastered in depth, he also has to know the environment, both in terms of its conservation and in terms of the current challenges regarding global climate change.

b) **Rural development** - Romanian agricultural development depends on the development of a new type of village economy which involves not only the development of agriculture, but also the development of non-agricultural activities, development of industry, services and infrastructure in rural areas.

Thus, rural development is one of the most complex contemporary economic concern, because on the one hand it involves achieving a balance between the requirement of preserving a rural, economic, environmental and cultural area of a country and the trend of modernization of rural life on the other hand.

At the European Union level rural development is a priority policy, covering areas such as: agriculture and forestry, land use, natural resource management, and economic diversification in rural communities. Rural development is important for the European economy because, in addition to providing raw materials and food, it also provides recreational activities, tourist activities. (Eurostat, 2013).

In terms of the economic structure, agricultural activities occupy the largest areas in the countryside, but the development of services, particularly the agrotouristic ones, is also very important for the development of the Romanian rural area.

The jobs lost in agricultural activities can be reallocated in industrial activities, social activities and services in rural areas. In countries where there were implemented specific policies to maintain the non-agricultural population in rural areas, a number of non-agricultural activities developed smoothly. They should complement agricultural activities.

At the level of the Romanian rural area, non-farm economy (industrial enterprises in rural tourism or services) has a low share. Unlike the EU, where non-agricultural rural economy accounts for almost 60% of the rural economy, in Romania it has a share of about three times lower (21.8%).

c) **Infrastructure development.** Creating and maintaining adequate infrastructure is essential for the economic and social development of rural areas and for achieving a balanced regional development.

Romania presents discrepancies between urban and rural both in terms of physical infrastructure, as well as socially speaking. Infrastructure for transport services, telecommunications, electricity, water and waste management is essential for business development and attracting investment in rural areas. The development of public infrastructure could support the creation of new economic activities and could generate new jobs.

d) **Overcoming the low performance** of the agricultural sector, **caused, firstly, by the weather-dependent agricultural production.** This dependence increased considerably

as a result of degradation and non-functionality of the irrigation systems built during 1969-1989.

Therefore, investment in the rehabilitation of irrigation systems and equipment should be a priority investment in Romania's agriculture. Feasibility studies are needed for newly landscaped areas, that can establish technical solutions for pumping water, the cost of work, profitable investment for farmers and sources of funds needed.

e) **Consolidating small and medium land holdings in modern agricultural holdings of optimum size.** Competitiveness of Romanian agriculture is closely linked to the quality of agricultural space. Therefore, the Romanian village must be removed from closed natural economy and placed in business. The rural economy should gradually be transformed from subsistence economy to commercial economy.

From the concrete aspects of the current state of Romanian agriculture has resulted the conclusion that in the last 20 years extreme fragmentation of land, not only it has not diminished, but it has rather become bigger and more anachronistic. This fragmentation emphasizes the differences from Western European countries, where there has been a significant increase in the average area of farms.

Romania needs a competitive agriculture in the European and International market. For this it is necessary to make the transition from the state of agriculture dominated by subsistence households, to agriculture composed of private-commercial family farms possessing technical, economic and financial performance.

Efficient private family farm is not sufficiently developed, because of inadequate technical facilities and low investment capacity. Eventually profitability and yield of agricultural land do not depend so much on its size, but rather on the quality of production, farm management, and on the agricultural holding as company and its participation in market competition.

On the other hand, a strategy for consolidating agricultural land is necessary to improve the agricultural performance, aimed at mitigating the degree of fragmentation of Romanian agriculture, at concentrating land in agricultural holdings, whose average surface to reach about 30-45 ha in the next 15-20 years, that is more than 10 times higher than that currently existing in Romania. In fact, this is the average size of an agricultural holding in Western European countries like France, Holland, Denmark. Let us note that the concentration of land in Romania would be a great change, if it is envisaged that during 1991-2011 the average size of a farm increased from 2.6 ha to 3 ha. So, an increase of only 0.4 ha in the past 20 years.

f) Another strategic objective of high economic significance refers to **improving the cost structure of agricultural production.** The current cost structure and their multiannual fluctuations generate largely poor performance of the Romanian agriculture. It is about excessively high share of fixed costs in cereals. Thus, about 48% to wheat and 53% to corn are fixed costs per hectare, relating to: basic mechanical work, preparing the ground for planting, crop maintenance, harvesting. These works are carried out by autonomous economic agents (usually former machine operators) who were directly in charge of

agricultural production. They are service providers and hold the monopoly of the works in the village or community where they operate.

g) **European funds.** Attracting European funds is very important. In recent years, the most advanced countries in attracting European funds were Latvia and Estonia and the less efficient were Romania, Poland, Slovakia, Hungary and Slovenia. (Trașcă et al., 2012) Attracting EU funding in rural areas is an opportunity to develop agricultural activities, a chance for investments needed to modernize farms and support the process of rural development. But change background of the Romanian agriculture and village can not be made only through the support of European funding. The effort of the internal factors is the one that will be able to change the current state of our country's agriculture.

h) **Development of organic farming.** Organic farming in Romania is beginning playing an important role in the development of Romanian agriculture and economic development.

The market for organic products (bio) is estimated at 40 billion dollars worldwide, representing 2.5% of the global food products. Romania could benefit from this trend. Environmentalists could develop a strong agricultural sector by using organic farmland and forestry and by the advantage of using a low level of fertilizers and pesticides in the Romanian agriculture. (Tudose et al., 2011).

Thus, Romania has also got great potential to develop organic farming because it uses inorganic fertilizers significantly below the EU average. This fertilizer helps plants grow, but their excessive use can affect the environment, especially because these substances infiltrate into groundwater.

Even though the development of organic agriculture involves major efforts, both managerial and financial. This is an opportunity for Romania, especially in the current conditions when demand of organic products is growing, and markets in this area are not yet saturated.

All these measures can contribute to the development of the Romanian agriculture and can also reduce the disparities compared to the European countries and support a competitive and efficient agriculture.

5. Conclusions

The recently literature highlighted that the dominant realities of the Romanian village are marked by serious socio-economic and cultural phenomena, which Păun Ion Otiman Academician names and categorizes into six groups. (Otiman, 2011)

- 1) Deagriculturalisation, i.e. inactivity of arable land, destruction and non-use of the irrigation systems built and used before 1989, massive decay of the arable land etc.
- 2) Extreme dezootechnisation of agriculture by destroying the existing production areas and by the loss of genetic potential of animals.
- 3) Depopulation and accentuated growing aging of rural population, but especially the reduction of skilled labour among all active agricultural population.

- 4) Severe physical and social desertification of the Romanian village as a whole.
- 5) Villagers leaving their houses have led to the self-demolition of many villages, especially agricultural areas.
- 6) Severe poverty as a consequence of the foregoing processes, this impoverishment being the synthesis vector of all these.

The problems facing agricultural producers are serious and complex, with long-term implications. That is why, solutions and measures to be taken must be well grounded and organically integrated into a national transpartinic, comprehensive and long perspective strategy (Crăciun et al. 2012). The whole creative - productive capacity and all forces of this country should participate in developing this strategy, but mostly in transposing it into real life. "Romania - postulate some specialists - has a historic opportunity to exit the periphery where is located and enter the process of the second modernity, represented by the EU integration, only if it applies the strategy of burning some development stages, especially in the development of agriculture and rural economy." (Dinu and Socol, 2006)

But for the tough application of such a strategy it requires a different management to address the problems facing Romanian agriculture and especially, a concerted effort of all active forces of the country to transform agriculture into a basic branch of the Romanian economy - modern, prosperous, competitive.

Hence, a balanced conclusion of all considerations mentioned above is that among the measures promoted in the scientific literature, for the development of the Romanian agriculture of rural areas and for improving employment and labour efficiency in agriculture, we should also include new measures like: stimulation of land consolidation, infrastructure development, development of irrigation system, investment in research and innovation, professional training, diversification of rural activities, development of organic farming, supporting young farmers, attracting European funds.

In this context the pillars of Romanian agriculture should focus especially on using natural resources (agricultural land, renewable energy, climate), human capital (R & D units, vocational and higher education), attracting financial resources (credit system, subsidized), stability and long term strategies from the political and administrative decision makers. On the other hand, stimulating investment in developing agricultural and non-agricultural activities should be both considered so as to contribute to the development of rural economy.

Any development strategy in the medium or long run, aimed at increasing competitiveness and regional convergence of the Romanian economy, can not ignore the presence and future of the agricultural sector, as an important subsystem of the national economy. Any strategy targeting rural economic development must also take into account all economic and social aspects that characterize the rural areas and should take into account the macroeconomic and European strategies.

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Education and society: an institutional approach

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Abstract. *Mainstream arguments regarding education's role in society are supported mainly through the theory of positive externalities. It is considered, almost axiomatically, that education represents the main means through which it is transmitted inter and intra generational the set of values that facilitate the ordered structuring of social interactions. Based on this reasoning, education has become a holistic concept and the management of the whole educational process is the sum of initiatives oriented towards the attainment of the "social good". In practice, the functioning of public educational systems around the world widely confirms the failure of positive externality argument. The purpose of this paper is to offer a counterfactual perspective to the dominant holistic theory, and moreover, to offer a possible explanation, from an institutional view, for the failure of public educational systems.*

Keywords: institutional arrangements, education, positive externalities, society.

JEL Classification: B25, B41, H52, I28.

Introduction

The meaning of education in our society represents a subject of great interest and is constantly present in the writings of philosophers and economists. The dominant characteristic of their interpretations is represented by the approach of education from a holistic point of view, dominated by the identification and concentration on the effects that they generate for society as a whole. According to these writings, education must serve the superior objective that the social good represents, neglecting somehow the individual one.

One of the most influent visions belongs to the French philosopher J.J. Rousseau. From his perspective, education is the one that allows the individual to claim his belonging to the state, saw as a great family. On this background, public education represents one of the great duties of the government through which the children must be educated not to fulfill their own desires, but „the things that society desires.” (Rousseau, 1994). For Rousseau, education makes sense only for the accomplishment of a much more important objective than the private interests. Evidence in this matter is his attitude towards the role of family in education. Rousseau completely ignores the liberty of the individual or family in what concerns education process (Pană, 2011: p. 42).

Another influent opinion with respect to the role of education in the social plan belongs to the American philosopher, John Dewey. He underlines the importance of education for democratic societies especially, given the specific nature of them determined by the repudiation of the actions of an external (dictatorial) authority and by its existence as a form of cohabitation and manifestation of individual experiences lived in common. The representatives of democratic governments cannot attain the political, social and economic objectives that they wish if their voters, to whom they are subjected, are not educated (Dewey, 1930: p. 101). For Dewey, education is the proper instrument for social homogeneity in the absence of a dictatorial authority. Unlike the societies dominated by social class separation, democratic society must make sure that education is available to all its members in order to offer them the intellectual abilities needed by the democratic process. If not, the members of society are overwhelmed with the changes caused by the diversification of social processes, becoming incapable of perceiving them and acting accordingly.

Apparently, Dewey's opinion differs fundamentally from that of Rousseau's. While the French philosopher clearly pleads for the training role of education in favor of the state, the American philosopher presents education as a way through which the democratic society can exist. The role of education is to transmit common values aimed at stimulating the belonging of individuals to a certain social construction. Nevertheless, the two visions have a common point: education is seen as a way of creating and maintaining a certain social structure⁽¹⁾, and not from the perspective of following individual objectives. These, although accepted and seriously considered, including the case of educational initiatives, are of secondary relevance. In essence, Rousseau's and Dewey's

visions are complementary: while Rousseau pleaded for education as a means of making the transition from the authoritarian regime towards the democratic one, Dewey, in turn, pleads for using education as a means of preserving the democratic society.

The theoretical conceptualization of the positive externalities has allowed the integration of these approaches to the field of economic science, signaling at the same time, the abandonment of classical economists' ideas. While the latter were preoccupied with solving the dilemma regarding choosing between private or public education, neoclassical economists consider this subject closed. Education generates positive external benefits and that's why it must be public financed and supplied. Moreover, in order for the external effects to be as extended and concordant with the social purposes, a certain level of education must necessarily be attained. Since then, the intellectual preoccupations were mainly focus towards the identification of the most appropriate ways through which the benefits of "free and mandatory" public education can be stimulated and capitalized.

Friedman (1955, 1962), Friedman and Friedman (1998) bring some of the most influent contributions in this domain, by using the argument of preserving the values of a democratic society sustained by the theory of externalities to justify the extending of the supply of public education. Moreover, it is being tried the identification of ways through which the financing of educational services becomes more performing and, at the same time, closer to the interests of individuals and communities.

Other authors have focused especially on the contribution of education on the solid structuring of the democratic society. Lipset (1959), Barro (1999) Milligan et al (2003) argue in favor of the importance of education for the functioning of democratic processes, insisting on the powerful link that exists between the level of education and the exercise of the right to vote. Glaeser et al. (2004), Glaeser et al. (2007) go further, claiming that differences in the schooling level are reflected not only in what concerns democracy but affect even the political institutions. On the other hand, Acemoglu et al. (2005) emphasizes that there is no causal relationship between education and democracy. If it existed, then the increase in the schooling level should be reflected in an increased efficiency of the functioning of our democracies, which does not necessarily happen. Mueller (2007) proposes a serious analysis of the degree in which education generates positive externalities, by taking into account other factors, different from those mentioned by the mainstream theory such as the influence of political decisions and concentrating attention on the quality of educational services, not only on financing. In its writings, Finkel (2013) underlines the importance of civic education in forming a culture of democracy, starting from a series of studies made in some African states confronting with ethnical and political conflicts.

Positive externalities and education: a critique from the institutional economics perspective

Holistic theories regarding the prevalence of society over the individual find support in the economic science through the theory of externalities. According to this theory, education generates private benefits, but the extension of its supply and even the compulsory public education are the results of the social benefits it generates. Society as a whole gains when the citizens are better informed in the process of social cooperation, when they have to adopt decisions as voters. In this argumentative context, seeing society as an entity having its own objectives and values (superior to the individual ones), education exceeds the stage of private good, becoming a public good whose supply is indispensable to the functioning of society as a whole.

This vision is difficult to be challenged, not only because it is widespread, but especially because it is very difficult to separate the implications of formal education from those of the private education. Despite the theoretical and empirical efforts made in this direction, the results are far from conclusive. In fact, following a careful analysis, it couldn't be otherwise. The main inconvenient of this view, which represents the general critique that can be offered against it, is the approach that it uses. Methodological holism, as a means of aggregate expression of a supposed social benefit, suffers from the absence of aggregated benchmarks. Admitting that the aggregation of social benefits could ever be possible, this operation is impossible in the context of utilitarian, holistic prescriptions. Emphasizing society as a whole, individuals become simple instruments for the accomplishment of some objectives established as means of the object of aggregation and not of those who action. Another inadvertence is the use of the „purpose” or „objective” of society. This cannot exist in the absence of the individual who acts. That is why society's objectives can express, at most, expectations of individuals or groups of individuals of the way in which the process of social cooperation should take place.

In essence, society means, the reflection of social cooperation processes through which individuals act in order to achieve their own purposes. Although these processes generate what we can call moral values, formal norms or certain regularities that facilitate them, the pretention of aggregating into the general, social objectives is exaggerated and putting into practice such an endeavor is useless. The main explanation is that regularities that result from social processes target certain contextual situations. The process of social cooperation is repetitive, no doubt, but it is dynamic. This evolution is determined by the change of individual preferences but also by the context, dominated by the rules in which individual actions take place. The holistic approach is not capable of observing such evolutions, be it only for the reason that aggregation is possible after individual manifestations have occurred. In the meantime, it is possible that, after the processes of continuous and uninterrupted social cooperation, the prevalent social values to have been invalidated or modified.

Based on these arguments, one can generally criticize the positive externalities theory. This critique mainly means that is impossible to claim the existence of beneficial effects

for a third party which is not directly involved in the social cooperation process. According to theory, when someone benefits from educational services, the advantages of being educated are not exclusively his. Following aggregate view, an increased number of years spent in school tend to multiply social benefits for third parties and, as a consequence, gains for entire society will increase too. This assumption, although it could be right, is not as simplistic as it seems and its implications are not so straightforward. The third party is an acting individual that follows certain goals. The “positive” characteristic of the external effects resulted from education will be evaluated differently based on their contribution to the achievement of individual’s goals. These effects will be useful as long as they serve for achieving of individuals’ goals, whatever these might be. If not, their “positive” evaluation by associating with a presumably beneficial social objective is only a mere speculation.

Those emphasized earlier don’t deny the importance of education in social cooperation processes, hence for the existence of a society, but is only suggesting the necessity of changing the way of perceiving its significance. Education represents, in fact, a way through which individuals can achieve certain goals within the social cooperation processes. Moreover, it is a result of social cooperation processes whatever the nature of education (formal or informal) is. Education is implicated and augmented in every social interaction. With every social interaction individuals are taking, they educate themselves. Therefore, they can identify certain behavioral regularities which allow them to achieve the pursued goals. Thus education assesses institutions (rules) which are, in fact, the result of social cooperation. As a dynamic process, social cooperation can change the rules that prevail at a given moment. As a consequence of these changes, individuals notice that the old rules are not serving anymore to achieve their goals and must adapt to the new institutional framework. Education embeds other social values which are replacing or improving the old ones.

In holistic approach, the assimilation process of the new rules and modified social values is much slower because of the aggregation obsession. Orientation to old rules that has been formed through time might be a partial explanation for the slowness in assimilating the new institutions (social values). Therefore, formal education as an expression of the holistic view will tend to promote social values from the past that might have been changed meanwhile. An additional reason for the institutional rigidity might be the influence of the existing rules (formal and informal) on educational organizations.

This is how takes shape the relation between educational environment and institutional arrangements that affect individuals and organizations’ behaviors. Before elaborating, some conceptual disentanglement may be useful. The concept of institution used earlier is referring to rules that facilitate the process of social cooperation being also a result of it (North, 2003: p. 11). The neoinstitutional economics literature uses also the concept of behavior regularities in social cooperation relations that emerge in specifically recurrent

situations (Schotter, 1981). By facilitating social cooperation, institutions become rules which increase the predictability of human actions initiated in certain recurrent situations.

Based on this conceptualization, institutions differ significantly from organizations. The latter are, in fact, groups of individuals which arise and act in order to achieve certain individual goals. Organization members use in common limited resources in order to achieve their own goals. Basically, organizations capitalize on favorable circumstances in order to achieve members' goals. This suggests that organizations are influenced by the institutional framework. Moreover, organizations create their own rules or try to influence the already existing ones. Structuring members' actions inside an organization would be impossible in absence of certain internal rules. Furthermore, organizations succeed frequently in influencing the external rules framework they act within for better achievement of members' goals⁽²⁾.

Reconsidering education's significance for society is necessary by taking into account the crucial role of institutional framework which affects the individual behaviors of those who uses educational services and of educational organizations altogether. An intensive analysis based on institutional economics' concepts⁽³⁾ may provide useful explanations concerning some of the main failures of public education. The fact that beneficiaries of educational services and providing organizations manifest themselves in a certain institutional framework doesn't necessarily mean that it influences them in the same manner.

An expressive example is the early school leaving phenomenon. This arises as a consequence of institutional disparities between the set of rules that govern labor market and social relations, on the one side and those who influence educational organizations on the other. On this background some beneficiaries of public education services decide to drop the school despite the fact that education is virtually free. This is the case of the *explicit early school leaving*. Those who decide to give up schooling are seeking alternative ways to get the abilities that formal education aims to provide but fail to do so (at least in their opinion). Getting involved in social relations such as early employment might be a better solution. Institutional inadequacy creates another kind of early school leaving. Young people might decide not to abandon public schools preferring to simply get the graduation certificate or diploma. Therefore, they take advantage on the opportunities created by the formal institutions which regulate free compulsory education. Moreover, they benefit from the educational organizations' incapacity to sanction such opportunistic behaviors as a consequence of the fact that these are trapped in their own formal rules. Thus, a vicious circle is created as an outcome of the frequent public compulsory education failures to provide the presumed proper abilities.

Under these circumstances, the theoretical outcomes of education's positive externalities might not be confirmed in reality. This outcome is almost inevitable and has two main sources which are endorsing each other. The first is based on the already emphasized holistic approach that guides the main educational values that must be provided by public

education. Because of its slow adaptation to social environment's developments this is a source of institutional disparities. The second is the formal institutional framework of the educational organizations which is created to favor the achievement of members' individual goals. As in any other cases of public organizations, it reveals weak institutional constraints. Therefore, organizations' members would rather preserve it than changing it. The holistically imposed public education's goals tend to favor institutional rigidity by preserving certain institutional arrangements. This blocks institutional reform that might have a contribution to institutional disparities' contraction.

One of the most important functions of public education resides on its contribution to the stability of a democratic society. As already has been emphasized by a series of studies, the importance of education in a democratic society is based on greater involvement of educated people in the election processes. Moreover, society's members are better informed concerning the matters they have to validate or not. It considers also that informed citizens could sanction the errors of government policies due to their educated skills.

This approach based on the positive relation between the level of education and political involvement is more frequently criticized. Kam and Palmer (2008) question the mainstream theory suggesting an extended analysis based on other elements that have not been considered yet. According to them, familiar background and its influence in creating an adult personality might be at the origins of political involvement's decisions. The conventional approach is incomplete and highlights the development of unintended consequences. Its incompleteness resides not in considering the crucial role of political institutions and their influence on the behavior of political actors. Political organizations are different from the social ones only by referring to their specific goals and the institutional arrangements that guide their particular actions. The functioning of democratic processes frequently emphasizes the existence of principal-agent⁽⁴⁾ problem in the political field.

Therefore, voters could realize that their electoral options can't influence the decisions of political agents. Moreover, voters could consider that a particular candidate could be elected even if they are not voting for him or against him. Hence, they could choose not to inform themselves concerning the electoral process. The phenomenon of rational ignorance emerges. It is commonly argued that in order to diminish these negative implications for democratic society, the level of education should be increased. Surprisingly, what seems to be the solution could extend the negative implications of the rational ignorance phenomenon (Pană, 2011: p. 82). It is very likely that educated persons would better understand the deficiencies behind the processes of political agency and, consequently, would refuse to involve in democratic electoral processes. However, admitting that educated persons would become more interested in democratic processes, it doesn't mean they would be taking the right decisions in order to limit the opportunistic behavior of the political agents. Not any kind of education is appropriate for this to be happening⁽⁵⁾.

There is an alternative approach of the above mentioned phenomenon which considers that the lack of involvement in electoral processes is, actually, a form of citizens' political participation. By contrast with the previously stated approach, this one marks the possibility of citizens' involvement even in absence of high level education which means, in fact, that not involving in electoral processes is not a direct consequence of a certain level of education. A high level of education is not absolutely necessary for citizens to realize that their expectations were overestimated and the electoral promises haven't been fulfilled. On the contrary, a high level of education may prevent such overestimations. Therefore, correcting the outcomes of this phenomenon is not necessarily a consequence of a high level of education.

Education and youth involvement in political processes

In the mainstream theory, a higher level of education is beneficial because of its contribution to the development of a civic culture which is of an utmost importance for the institutional structuring of the society. In the final part of this paper some insights of this particular relation are analyzed in European Union's case, based on the existing data.

The existing studies on this matter tend to confirm the above mentioned hypothesis: the principal-agent problem in the political field may induce an indifferent behavior of youth concerning the political and electoral process. Although the commonly offered explanation is that of a particular indolence of youth when it comes to take part in these matters, there are much more profound reasons to be considered. One of the most important explanations is the institutional arrangement that governs the democratic process.

One of the main findings based on the available statistical data is that of a lowering turnout rate in the European elections. As can be seen in the table below, the turnout has constantly lowered in every EU election since 1979. One can be seen an important fall in the last three EU elections. From the Lisbon Strategy's educational benchmarks perspective this particular evolution, especially in 2004, 2009 and 2014 elections, doesn't prove the highly optimistic expectations concerning education: during 1999-2014 the voter turnout fell more than during 1979-1994.

Table 1. Turnout rate in the European elections, 1979-2014

	1979	1984	1989	1994	1999	2004	2009	2014
Turnout rate (%)	61.99	58.98	58.41	56.67	49.51	45.47	43	42.54
EU configuration	EU 9	EU 10	EU 12	EU 12	EU 15	EU 25	EU 27	EU 28

Source: <http://www.europarl.europa.eu>

The low turnout in the EU elections can be explained mainly by the growing youth absenteeism. According to a study⁽⁶⁾ of London School of Economics and Political Science (LSE), youth are more susceptible not to vote comparing to the rest of the adult population. This finding has been confirmed for most of the EU countries, excepting

Hungary and Luxembourg. This particular evolution is also valid for countries like Finland or Denmark, two of the most performing EU countries in implementing educational objectives of the Lisbon Strategy.

Those emphasized earlier are endorsed by data from 2009 EU elections. Almost 71% of youth aged 18-24 didn't vote in these elections. The highest youth absenteeism manifested in the case of students (72.4%). The rate of participation for youth unskilled workers, who are presumably lowered educated, has been higher meaning a lower absenteeism (70.4%). Data analysis reveals a surprising finding in case of Finland, a country who has a high performing educational system. Youth absenteeism in the 2009 EU elections was 69.7% which is considerably higher comparing to Sweden (41.1%) or Denmark (45.1%).

Another important finding is the negative relation between youth participation in the EU elections and graduating rates. As can be seen in the table below, whilst the graduation rates from upper secondary and tertiary education grew, youth participation rate in the EU elections decreased during 2004-2009. This suggests that although formal education must promote a high level of youth participation in the political processes of a democratic society, this isn't necessarily happening. On the contrary, data shows that youth participation is growing with age and becomes higher when young people leave educational system.

Table 2. *Level of education and youth absenteeism in the EU*

	2002	2003	2004	2005	2006	2007	2008	2009
Education rate (upper secondary or tertiary)	76.8	77.2	77.4	77.6	78.1	78.3	78.7	78.8
Absenteeism rate (%)	67%			71%				

Source: Eurostat, Education and training, Bouza, Luis – *Addressing Youth Absenteeism in European Elections*, International Institute for Democracy and Electoral Assistance, 2014.

Conclusions

Education's importance to society must be reconsidered with respect to the significance of society. For this to be happening we shall abandon the holistic approach of society which is seen as an abstract entity who's main goal achievement is of an utmost importance comparing to the individual actions. Changing the way society is perceived and seeing it as the main outcome of social cooperation relations, transforms education in an important instrument for achieving individual goals. Therefore, education evolves from the limited perception as a simple outcome to a very important tool in the process of social cooperation.

This means also reconsidering the mainstream theories concerning the social role of education based on positive externalities it generates. The starting point is accepting that individual actions take place in an institutional framework. As a consequence, the arguments of education's positive externalities seem to be more frequently contradicted.

Early school leaving phenomenon becomes more and more present across EU countries despite the large public support in financing and providing education.

Basically, public education failures are consequences of institutional disparities existing between formal and informal rules that guide public education organizations and rules formed through the social cooperation process. These are obvious deficiencies when it comes to validate the positive externalities of education.

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Notes

- (1) Comparing the society with a living organism, Dewey (1930: pp. 2-4) shows that, as the physical existence is replicated, so the traditions, customs, beliefs, institutions are transmitted from one generation to another, facilitating the existence of society. So, society exists as a consequence of the process of intergenerational transmission of past accumulations, just as life sustains itself thanks to reproduction. The role of education is that of facilitating their transfer, so that society can "live".
- (2) Schools, universities and state's agencies which regulate and finance public educational system are examples of organizations. Education laws, internal regulation policies, curriculum are examples of institutions. The regulations concerning methodology of studies, graduating courses, transfer credits are "rules of the game" in a university.
- (3) Rowan (1995), Rowan and Miskel (1999), Meyer and Rowan (2006) emphasize the influence of institutions on educational organizations' performances.
- (4) It consists in the gap existent between decision makers (political agents) and voters (taxpayers). The existing institutional framework creates opportunistic behaviors of agents against principals' interests. Sanctioning these behaviors is made possible by the election processes. However, as argued by Buchanan (1997: p. 219) "collective decisions are rarely taken by voters, by those persons who pay taxes and who supposedly benefit from the use of governmental goods and services."
- (5) Despite the last decades' growing level of education the opportunistic behavior of principals intensified. Extending governmental spending and growing public budgets are the most obvious manifestations of this tendency. The outcomes are diverse and generate microeconomic effects as rent-seeking behavior and macroeconomic implications such as weak capacity to fight against economic crises due to accumulating deficits and public debt.
- (6) EACEA 2010/3, Youth participation in democratic life, Final Report, 2013, LSE Enterprise. By subtracting youth's turnout rate from the general turnout rate during 1990-2011, the authors found negative values for most of the analyzed data.

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Financial audit – feckless for economic re-launch

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Abstract. *The credibility of financial audit suffered an important decrease upon the economic crisis has been released. Even though solutions for its improvement were conferred, such as the Green Paper code, it continues to be a feckless tool for overcoming upon the recent financial crisis. This research provides evidence about the characteristics of financial audit of listed Romanian entities and about the correlation with entities' evolution. The results emphasize that the lack of transparency in financial reporting is a key element to economic re-launch.*

Keywords: financial audit, financial crisis, economic re-launch, Romania, transparency.

JEL Classification: M42, G01, G10.

Introduction

Once that financial crisis has been released, there have been numerous doubts related with the credibility and reliability of audit reports. The European Commission, 2010 designed a document, called Green Paper, where several recommendation are made for increasing auditor's credibility. At such, the document emphasizes the supremacy of BIG 4 auditors measured at a global level and it provides evidence that smaller auditors should be encourage to act on the market. It is considered that the financial auditor should take into consideration the risks associated with the auditing activity when presenting their audit report. Consequently, the auditor's report should be more detailed in case that the risks associated with the audited company are higher. Overall, the document considers that there should be higher cooperation between internal and external audit activities, between external financial audit and corporate governance principles. In fact, the document is mainly focusing on transparency.

The literature focuses on two approaches that look at financial auditor's activity. The first approach considers that financial auditors are responsible for the financial crisis as they were not prepared to face huge financial problems (Sikka, 2009). The second perspective is based on the fact that financial auditors have to adapt to the macroeconomic environment and consequently, have to implement new techniques and methods of evaluation in order to develop their activity (Pal, 2010). The explanation is due to the fact that there were important changes in terms of market characteristics considering that the risks that financial auditor took significantly increased, while their credibility sharply decreased. In fact, we think that the opinion that financial auditor provides should ensure a minimum level of financial stability for the audited company.

One main problem that financial auditor may have when searching for a solution for financial disclosure is based on the fact that there is not a standard way of evaluation. It seems that financial auditors tend to look at previous financial statements no sooner than they found a problem in the way the actual financial statements are constructed. Moreover, they tend to appreciate the situation similar with the one found in the past, without considering the present characteristics of the audited firm (Salterio and Koonce, 1997).

The auditor opinion seems to be more reliable if is provided by a company which is part from BIG4. This is because they act at a global level and they tend to ensure higher credibility and transparency to the audit report (Reichelt and Wang, 2010). Consequently, BIG4 entities usually report any problems that can create financial distress due to their reputation and their notoriety. Their audit report can also be linked with the law enforcement and with the amount that financial auditors receive for their auditing activity (Chen et al., 2012). In fact, they have more resources which they can use in order to detect financial disclosure problems (DeAngelo, 1981).

Other elements than can characterize the financial auditors' activity and that can influence the quality of auditing reports are represented by auditors' fees and the switch of financial auditor. The change of financial auditor can be a proxy for quality, as new financial auditors tend to detect, to report and to correct the earning management found at

company level (Hubens, 2012). On the other hand, the change of financial auditor can be seen as a measure upon which the new financial auditor can fail to detect the level of earnings management (Liu and Liu, 2008). For example, the level of earnings management increases when a switch from high quality financial auditor (part of BIG corporations) to a non-high quality financial auditor is implemented. This is due to the fact that there is a change of auditor's initial opinion (Davidson et al., 2006).

Regarding the auditors' fees it is considered that they should be a proxy for quality. On the other hand, higher the auditor's fees are, higher the probability to change them is (Craswell et al., 2002).

The financial auditor's activity is also correlated with the corporate governance principles. It is considered that its role should be increased as this is the way that reliability can be ensured to corporate governance principles (Baker and Owsen, 2002).

Considering these, the present research tries to reveal what are the characteristics of financial auditor that can impact the level of financial disclosure of each entity or what type of corporate governance elements are related with financial auditor's characteristics that can mitigate the value of discretionary accruals.

The rest of the paper is structured as follows: the first part presents some information found in the main literature regarding the correlation between the value of discretionary accruals and the financial auditor or corporate governance elements, the second section refers to the methodology of research, the third emphasizes the results obtained and presents a discussion upon them, while the last part concludes and provides evidence about further research.

Literature review

There is a vast literature that looks at the correlation between financial auditor and the earnings management process. Part of the earnings management process is considered to be the value of discretionary accruals (Barth et al., 2008). The results of the researches that have already been conducted provide mixed evidence on the financial auditors' characteristics. In fact, the results are mainly correlated with the switching from national accounting regime to the International accounting measures (proxy by IFRS-International Financial Reporting Standards)

First of all, the type of financial auditor seems to be negatively related with the value of discretionary accruals (Gerayli et al., 2011, Chen et al., 2010). Firms that have a high quality financial auditor report less discretionary accruals than those that have a financial auditor that is not part of BIG 4 corporations. Contrary, the existence or not of high quality auditor has no influence upon the value of discretionary accruals in Korea (Jeong and Rho, 2004)

On the other hand, the switch from national regulation to international one is based on higher costs (Houque et al., 2010) and in general no significant difference between the value measure under national regime and international regime can be found on short term

(Sellami and Fakhfakh, 2013 found that the value of discretionary accruals decreased only six years later after the switching to international reporting elements). Other studies consider that the value of discretionary accruals will not decrease even after the adoption of IFRS (Manzano and Conesa, 2014; Yosr, 2013).

Regarding the correlation of auditor's remuneration and discretionary accruals, there seem to be a positive correlation among them. For example, when the company is having a high concentration of its own management, there is found a positive correlation between the value of discretionary accruals and the value of auditor's fees (Gul et al., 2010). The relationship is also valid when there is an increase of chief financial officer's bonuses (Alali, 2011). Moreover, the size of financial auditor tends to be strongly correlated with the persistence of discretionary accruals (Krishnan, 2003; Zhao, 2010). Contrary to their results, Tennander and Olsson, 2010 audit fees influence in a negative way the persistence of discretionary accruals if the company is audited by a BIG 4 entity, while opposite relationship was found when the entity is audited by a non-BIG 4 audit company).

Considering the change of financial auditor, there is also mixt evidence. When the change of financial auditor is known, an interesting phenomenon can be observed. On one hand, there is a decrease in the value of discretionary accruals a year before the change occurs, while no relevant influence upon it of the new auditor can be observed in the year of adoption (Becker et al., 1998). Thus, the new financial auditor can fail to ensure the level of sustainability of the new audited company (Liu and Liu, 2008)

As it was mention, the financial auditor is also correlated with the way corporate governance is implemented at company level. The literature presents that the independence of audit committee is more likely to ensure credibility to financial statements (Yang and Krishnan, 2005; Osma and Noguer, 2007), thus it can be a proxy for reducing the value of discretionary accruals.

Another corporate governance variable that can influence the value of discretionary accruals can be the size of the board of directors. Several studies (Klein, 2002; Xie et al., 2003, Sánchez-Ballesta and García-Meca, 2007) consider that larger board of directors can ensure a higher level of monitoring activities due to the fact that once the board of directors is larger there is higher probability for the entity to have more independence director. The results are contrary to those found by Jensen (1993).

We do not have to exclude the importance of CEO/chair duality. The variable is expected to have a negative influence upon the value of discretionary accruals, but the literature reports also mixt evidence (Davidson et al., 2006, Cornett et al., 2008).

Considering the Romanian market, fewer studies have been conducted upon the value of discretionary accruals. No significant evidence between the value of discretionary accruals computed using Romanian Accounting Standards and International Financial Reporting Standards was detected (Brad et al., 2014) and no influence of auditor type or od the CEO/chair duality was found out (Popa et al., 2014)

Methodology of research

In order to reveal if the value of discretionary accruals is mitigated considering financial auditor's characteristics and corporate governance variable, data related to Romanian Entities listed on Bucharest Stock of Exchange was manually collected. The companies were selected based on the fact that according to Romanian regulation, the listed entities have to report their individual financial statements using the IFRS approach starting from 2012. Considering the report issued by the Supervision Financial Authority, at the end of 2012, 71 companies have to report using this accounting framework. Based on the fact that the value of discretionary accruals is estimated using the models provided by Jones, 1991, Kotharit et al., 2005 or others and that is computed using several differences among the financial elements, the companies with a negative value of own equity and the entities that were in insolvency were excluded from the sample. As we were also interested in finding the correlation between the auditor's fees and the value of discretionary accruals, we also eliminated the entities for which the value of auditor's remuneration was not found among financial statement notes. Consequently, the dimension of our sample consists of 41 companies (values for the auditor's remuneration were found only for 2011)

Considering the fact, that the model upon which discretionary accruals was estimated is the same used as Kotharit et al., 2005, information regarding the value of current assets, the value of cash components, the value of current liabilities, the value of total debt, the value of income payable tax, the value of revenues, the value of accounts receivables was collected both for 2011 and 2012. Moreover, information about the amount of depreciation, the value of plant, property and equipment from 2012 was also extracted. Other type of financial information was the value of net profit and the value of total assets from 2012.

The value of total accruals is calculated using the formula provided by Leuz et al., 2003. This can be seen in equation (1).

$$TA_i = \Delta CA_i - \Delta Cash_i - (\Delta CL_i - \Delta STD_i - \Delta TP_i) - Dep_i \quad (1)$$

Where

TA_{it} represents the value of total accruals used for company i and reported in year t

ΔCA_i represents the value of current assets computed for company i considering a change of current assets from year t to year t-1

$\Delta CASH_i$ represents the value of cash elements for company i considering a change of current cash elements from year t to year t-1

ΔCL_i represents the value of current liabilities for company i considering a change of current liabilities from year t to year t-1

ΔSTD_i represents the value of current debt for company i considering a change of total debt from year t to year t-1

ΔTP_i represents the value of total tax payable for company i considering a change of the total tax payable from year t to year t-1

DEP_i represents the depreciation of fixed assets for company i for year t.

The value of discretionary accruals is found by subtracting the value of non-discretionary accruals from the value of total accruals. The value of non-discretionary accrual is estimated using Kotharit et al., 2005 model. The relationship is presented in equation (2)

$$TA_i = \alpha_0 + \alpha_1 \times (\Delta REV_i - \Delta AR_i) + \alpha_2 * PPE_i + \alpha_3 \times ROA_i + \varepsilon_i \quad (2)$$

Where

TA_i represents the value of total accruals used for company i and reported in year t

ΔREV_i represents the value of revenues for company i, considering the change of revenues from year t to year t-1

ΔAR_i represents the value of accounts receivable for company i, considering the change of accounts receivables from year t to year t-1

PPE_i represents the value of property, plants and equipment collected for company I for year t

ROA_i represents the value of return on assets, calculated by dividing the value of net profit to the value of total assets. The indicator is calculated for company i for year t.

As the idea of research is to provide evidence about the impact of financial auditor's characteristics and the influence of corporate governance indicators upon the value of discretionary accruals, we conduct a multiple regression model. The dependent variable is the value of discretionary accruals. Both dependent variable and independent ones are scaled by total assets. Considering the independent variables, several indicators were included into the analysis.

When the financial auditor's characteristics are encountered, we took the value of total auditor's fees for year 2011. The variable was coded *LOGAF*, considering the fact that logarithmic value of total assets have been used. Another variable is form by the type of financial auditor. The variable is coded *DAUD* and is a dummy variable. The variable has value 1 if the financial auditor is part of BIG 4 companies, while the variable has value 0 if the financial auditor is not considered to be a high quality one. We also took into account if the financial auditor changed. The variable that we used is also a dummy variable, is coded *DCHG* and it takes value 1 if the financial auditor changed and value 0 if the financial auditor did not change. The variable takes value 1 no matter what is the type of new financial auditor.

Considering the corporate governance elements, we also included some individual characteristics. One of these was the CEO/Chair duality. The variable *DCEO* takes 1 if the CEO of the company is different from the chairman of the board of directors. When the CEO of the company is the same person as the chairman of the board of directors, the variable took value 0.

We also considered the type of management system that the entity has. As a fact, if only few companies from Romanian market have a two tier management system, we decided to code the variable *DSYST*. Our variable took one if the entity that has a one tier management system, otherwise it took 0. The problem with the one tier management system is that in these case the CEO and the chairman of the board of directors can be or

not the same person, while in the case of two tier management system, there is automatically a difference between CEO and the chairman of the board of directors.

We also consider the number of executive members from the board of directors. The variable was compute considering the average values of the numbers of executive directors that the company has (the average value was calculated only when the company had a variable number of executive members from the board of directors). For coding, we used the name *EXM*. Another variable is the existence of audit committee, which is a variable that can establish the correlation between corporate governance principles and the financial auditor. As this variable is also a dummy one, the way of computed it is similar with the way the other variables were computed. As a fact, the variable, *DCOMT* took value 1 if the companies reported in its corporate governance document the existence of audit committee. Otherwise, the variable took value 0.

We also included the level of indebtedness calculated as the value of total debt divided by the value of total assets (the value of total debt plus the value of own capital and which was coded *LEV*). For the level of indebtedness, the data was quantified using financial data from 2012.

The model upon which the research was conducted is presented in equation (3)

$$DA_i = \alpha_0 + \alpha_1 \times LOGAF_i + \alpha_2 \times DAUD_i + \alpha_3 \times DCHG_i + \alpha_4 \times DCOMT_i + \alpha_5 \times DSYST_i + \alpha_6 \times DCEO + \alpha_7 \times LEV_i + \alpha_8 \times EXM_i + \varepsilon_i$$

Where *DA* is the value of discretionary accruals calculated using financial information from 2012.

Results and discussions

In order to detect if there is any significance upon the value of discretionary accruals considering financial auditor's characteristics or corporate governance principles, we firstly analyzed the correlation matrix that exists among variables. The correlation matrix is presented in table 1.

Table 1. *The correlation matrix*

Element	DA	LOGAF	DAUD	DCHG	DCOMT	DSYST	DCEO	LEV	EXM
DA	1								
LOGAF	-0.373**	1							
DAUD	-0.122	0.157	1						
DCHG	-0.197	0.121	0.044	1					
DCOMT	0.129	-0.047	0.013	0.076	1				
DSYST	-0.015	-0.346	-0.196	-0.287***	-0.336**	1			
DCEO	0.016	-0.065	0.077	0.211	0.133	-0.249	1		
LEV	-0.283***	0.268***	0.013	0.076	-0.046	0.187	-0.215	1	
EXM	-0.055	0.071	0.425***	-0.025	0.186	-0.127	0.195	-0.233	1

Where **, *** states for the level of significance at 5% and 10%.

From Table 1, it can be observed that there is no significant high correlation between variables. The highest correlation is found between the number of executive members and

the type of financial auditor. It seems that larger the number of executive members from the board of directors is, highest is the probability of having a financial BIG4 financial auditor. Between the value of discretionary accruals and the independent variables, there seems to be no significant higher correlation, so they can be considered proper proxies for estimating it. The results are provided in Table 2.

Table 2

Dependent Variable DA divided by total assets					
Constant	0.5690	0.7002***	0.6562	0.7227***	0.7371***
LOGAF	-0.1597***	-0.1937**	-0.1931**	-0.2003**	-0.1973**
DAUD	-0.0208	-0.0386			
DCHG	-0.0876	-0.0990 (p=0.1802)	-0.0978 (p=0.1870)	-0.0965 (p=0.1988)	-0.1003 (p=0.1030)
DCOMT	0.0312		0.0208		
DSYST	-0.0921	-0.1417 (p=0.1584)	-0.1182	-0.1365 (p=0.1845)	-0.1374**
DCEO	-0.0121			-0.0092	
LEV	-0.1395				
EXM	-0.0009				-0.0071
Rsquared	23.70%**	21.17%	20.62%	20.38%***	20.69%***
DW	1.80	1.77***	1.88***	1.85***	1.85***

Where **, *** states for the level of significance at 5% and 10%.

As the model where the independent variables were the logarithmic value of total assets, the type of management system and if there has been or not a change of financial auditor was the best, it form the basis for estimating the influence of the other independent variables. Moreover, the value of logarithmic auditor's fees was preferred to be used in estimation instead of the value of indebtedness as it conferred better and significant results. Each model was also checked for heteroscedasticity using the White test. In case the heteroscedasticity is found (for model five, where the number of executive members from the board of directors is included), the equation was estimated using White's heteroscedasticity-consistent covariance matrix estimator (White, 1980). The use of this correction increases the relevance and significance of the coefficients and of the entire model. Moreover, probabilities that are under 20% are also provided in Table 2 as the number of observation is relative small. Thus, the risk of rejected the null hypothesis can be increased.

Considering this, it could be seen that the value of auditor's fees is negatively related with the value of discretionary accruals. It seems that higher the value of auditor's fee, measured a year above, lower the future value of discretionary accruals is. As auditor's remuneration can be a proxy for Big 4 companies (in general, BIG 4 companies perceive higher audit fees due to their reputation (Campa, 2013), it can be said that there is an important probability that the presence of an auditor from BIG4 or of on auditor with a sort of reputation (like BDO) can mitigate the value of discretionary accruals. Opposite to this conclusion, the existence of an auditor which is especially form BIG 4 seems not to influence the value of discretionary accruals. We can than formulate that only the value of auditor's fee influence in a negative way the value of discretionary accruals. The fact that highest the value of auditor's fee is, the lower is the value of discretionary accruals can

provide evidence that the auditor's remuneration could be correlated with other variables that were not included into our analysis.

The existence of the audit committee seems not to have any influence upon the value of discretionary accruals. From our, point of view, the presence of audit committee should increase the level of transparency. It seems that for Romanian companies, there is no relevance that the existence of audit committee has an influence upon the value of discretionary accruals.

If we increase the risks associated with null hypothesis, that the coefficient associated to a variable is zero, to at least 11%, we find that the change of financial auditor a year before, influence in a negatively way the value of discretionary accruals. Our results are opposite with the results found by Becker et al., 1998.

Another variable that is statistically significant from zero and that has an influence upon the value of discretionary accruals is the type of management system that the company has. It seems that companies that have a one tier management system report less values of discretionary accruals for the Romanian market. This result is somehow confusing as a one tier management system is characterized by less transparency than a two tier management system.

In accordance with the results that refers to the management system, is also the result regarding the CEO/chair duality. Even though the coefficient is not statistically significant from zero, it seems that Romanian companies have lower value of discretionary accruals if the CEO is a different person from the chairman of the board of directors.

Considering, the number of executive members from the board of directors, the coefficient is also not statistically significant from zero. If it was, than it seems that higher the number of executive members from the board of directors is, lower the value of discretionary accruals is. That should be reliable as while the number of executive members is increasing, they can assign activities to smaller committees, which could conduct to higher transparency.

Overall, the transparency for the Romanian market is ambiguous and so are the results considering the value of discretionary accruals.

Conclusions

The purpose of this article was to provide evidence about the influence of financial auditor's characteristics and of the corporate governance indicators upon the value of discretionary accruals. The assumptions upon which the research was conducted were based on the fact that higher transparency should be correlated with a lower value of discretionary accruals. We consider that transparency should be a key element for financial re-launch.

Considering these, the research was conducted using a sample of 41 companies that are listed on the Bucharest Stock Exchange and that have to provide their individual financial statements using the International Financial Reporting Standards.

The results are mixt and reveal that there is still lot of transparency upon the Romanian market. While the value of auditor's fees seems to influence the value of discretionary accruals, no proper conclusion can be formed considering the type of financial auditor or the change of it. As a fact, higher the financial auditor's fees are a year above, lower the value of discretionary accruals is. On the other side, no statistically significant relationship can be extracted upon the other variables. Even though the same negative relationship seems to exist, the coefficients are not relevant for our research. If the coefficient would have been significantly different from zero, than the change of financial auditor and the high qualify auditing process, done by an auditor from BIG4, would have decreased the value of discretionary accruals.

Moreover, the existence of the audit committee provides also mixt evidence. This is because we considered that the existence of the audit committee should be a sign of higher transparency, thus we have expected to find a negative relationship between this variable and the value of discretionary accruals. Opposite to our assumptions are the results. Even though there is no statistically relevance for the coefficient associated with this variable, a positive relationship seems that is more reliable for Romanian market. In our opinion, this is a problem of transparency at national level.

Other transparency problems seem to be related with corporate governance variables. As a fact, a one tier management system affects negatively the value of discretionary accruals. We consider on the other hand, that a two tire management system should provide more transparency than a one tier management system. Consequently, the results are surprising.

Nevertheless, even though the CEO/chair coefficient is not valid, the evidence is that for Romanian market, the lack of CEO/chair duality seems to influence in a negative way the value of discretionary accruals. The lack of statistically relevance could be associated with transparency problems.

Considering the number of executive managers from the board of directors a negatively insignificant relation was found between it and the value of discretionary accruals.

There is also a problem the value of indebtedness seems to not influence the value of discretionary accruals. The models were also tested considering a lag value, but no relevant conclusions were obtained.

Several problems were encountered in this analysis. One of it is the fact that data have been collected manually and that the dimension of our sample is still reduced.

Overall, our results suggest that there is a lack of transparency on the Romanian market and thus, this is an impediment to the economic re-launch. In order to improve our analysis, the analysis should be conducted on a larger sample models of simultaneous equations could be used as there could be interdependency between the variables

encountered into the model. Moreover, we have to conduct the analysis considering other factors that can impact the value of discretionary accruals.

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Empirical evidence on the Ricardian equivalence in Romania

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Abstract. *The Ricardian equivalence has become one of the main research concern for many contemporary economists, in the actual context – by stepping into the second phase of a structural economic crisis. This paper is showing through an econometric model what happened in Romania between 2004 and 2012 with the households' consumption, by following the Ricardian equivalence hypothesis.*

Keywords: Ricardian equivalence, consumption, government expenditure.

JEL Classification: E03, E21, E62.

1. Research background

The Ricardian equivalence is an economic theory, which originates from David Ricardo's *On the Principles of Political Economy and Taxation* (1877). He asked in which way is better to finance the war: through new government debts, or through a temporary tax. His conclusion was that there is no difference between the two ways, because "debt is nothing else than postponed taxes". Then, after almost 100 years, Robert Barro, starting from the same dilemma described by Ricardo, asks if *the government bonds are net wealth?*

After two years, Buchanan, asked himself the same thing, but in a different manner: *is the public debt equivalent to taxation?* By observing the similarities between the hypothesis of Barro's paper and Ricardo's descriptive work, he suggests that this model should be called "Ricardian equivalence".

In other words, as Bill Mitchell from Charles Darwin University describes, if every person appreciates that the Government will spend 500\$ per capita and will collect the same amount from the population in order to cover the new debt, then, each person will cut from his consumption the amount of 500\$, generating a negative effect for the economy.

Ricardian equivalence is a different approach from the classical one, regarding the fiscal policies. Therefore, a stimulation of the aggregate demand through a new debt or through a raise in taxes would not be a successful economic policy, being viable only on a short-run, but instead, having huge negative effects over long-run (Bodislav et al., 2015).

2. Literature review

In the modern economic literature, the fact that it is not relevant the way in which a government finances its debts, was also stated by other authors, such as Patinkin (1965), Bayley (1971) or Kochin (1974). At microeconomic scale, the most similar theoretical model, which can be compared with the Ricardian equivalence is Modigliani – Miller (1958), which assumes that in a market with perfect competition conditions and without subsidies, the companies are indifferent to how they are financed – own capitals or loans. Bernheim (1987) and Seater (1993) demonstrated the ineffectiveness of the fiscal policies based on a stimulus over AD curve through governmental debts or through raising taxes, but Elmendorf and Mankiw (1999) stated that the result of the above mentioned authors were not relevant.

Ricciuti (2001) highlights that certain conditions underlying econometric models that studied the Barro-Ricardo equivalence are much too restrictive, being for us very difficult to understand if there is, or not, an approximation of the reality. The main regression models which might be considered as being the most influential ones in testing the Ricardian equivalence (RE) are: Feldstein (1982), Kormendi (1983), Seater and Mariano (1985) and Modigliani et al. (1985).

Recent authors who debated this model were Bittante (2013) and Nickel and Vansteenkiste (2008). The debate remains still open while there is no consensus between the two parties:

the ones who have confirmed the existence of the RE and the ones who vehemently contested the model.

The general conditions of RE model, as Barro (1974) describes them, are the following:

- a) Consumers have finite lives and they do care about the welfare of the next generation, having an altruistic attitude regarding their descendants.
- b) Nevertheless, they are acting as having infinite lives and they assume that the government can not postpone forever the repayment of the debt (bonds issued) and the amount that has to be repaid and its interest are equal with the bond's principal and the taxes charged, in order to pay the interest.
- c) The decrease of government savings is compensated by the increase of private savings.

By following the above conditions, according to Barro, government bonds are not net wealth. This, actually, defies Keynes' economy, by violating a classic principle of economics – this science is based on rarity and trade-offs – there is no such thing as a free dinner – in order to gain something, it is always needed to give up another.

3. Econometric evidences of the Ricardian equivalence

Main regression models, which were considered the most influential for testing RE hypothesis are the ones of Feldstein (1982), Kormendi (1983), Seater and Mariano (1985) and Modigliani et al. (1985).

The consumption function, estimated through Feldstein's multiple regression (1982) was:

$$C_t = a_0 + a_1 Y_t + a_2 W_t + a_3 SSW_t + a_4 G_t + a_5 T_t + a_6 TR_t + a_7 D_t + e_t$$

Where:

Y = disposable income;

W = net wealth measured at the beginning of the year;

SSW = future value of the social benefits;

G = government spending;

T = taxes income;

TR = transfers towards individuals;

D = net general debt.

Because these coefficients (from the above equation), are not corresponding to Feldstein's expectations, he rejects the idea of Ricardian equivalence for 1930 – 1977 period, for the economy of United States of America. Nevertheless, confidence intervals used by him are not regular, so his results should be reviewed with skepticism (Ricciuti, 2001).

Modigliani et al. (1985) have tested ER for Italy, through the following function:

$$Cp_t = a_0 + a_1 Yd_t + a_2 W_t + a_4 DEF_t + a_4 D_t + e_t$$

Where:

Cp = private consumption;

Yd = disposable income;

W = wealth, including government debt;

DEF = government deficit (inflation adjusted);

D = central bank's net debt and foreign holdings.

The results of Modigliani et al. (1985) have highlighted the fact that an increase of 4 percents of public deficit over GNP, causes a decrease of national saving of 3.4 percents (Ricciuti, 2001).

4. Econometric evidence of the ER – Romania's case

Having in mind the fact that Romania's economy is still young, the available data are not easy to gather; also, since 1990, until this year, the calculation methodology for several indicators had changed a couple of times thus it has been chosen to test the way in which householdings consumption reacts at a change in government spending. We used for this two independent variables and a dummy variable, which has the role of filtering the years with deficit (according to ER, dilemma occurs in the moment in which a deficit do exists).

The data sources were gathered from three different sources, some of them suffering a second-order transformation. These sources were:

- **Eurostat** – primary data used in Eurostat's Household saving rate report (http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/2-29042013-AP/EN/2-29042013-AP-EN.PDF). Used data series were GDI (gross disposable income) and GS (gross savings). Data were expressed in million lei.
- **The World Bank DataBank** – data series available at <http://databank.worldbank.org/data/home.aspx>- were downloaded two time series: G –Romania Consolidated Current Expenditure and Def – Romania Central Government Surplus/Deficit. The same measurement unit was used
- **National Institute of Statistics** – CPI (consumer price index) expressed in percents.

For the data gathered from the first two sources, the frequency was quarterly and for CPI was monthly. In order to have the same frequency, we had to transform this series from quarterly to monthly. Total number of observations is 32, the analyzed period starting with the first quarter of 2006 and ending with the 3rd quarter of 2012 (2004Q4 – 2012Q3).

Secondary data, processed and used in building the optimal regression model, were:

- **HHC** (households consumption), extracted as a difference GDI and GS (gross disposable income and gross savings);
- Data series which were inflation adjusted were **HHC**, **G**, **VD**, having as a starting point the year 2000;
- There were created three new chronological series, in order to stationarize the data, which are the growth rates for the three variable: **VHHC**, **VG**, **VDD** (expressed in percentages)

A. Data processing and setting the optimal regression model:

It has been used a linear regression, containing a dummy variable, and the chosen model was, as follows:

$$VHHC_t = a_0 + a_1 * VG_t + a_2 * VDD_t + a_3 * DDum_t + \varepsilon_t, t=2004q4 - 2012q3,$$

Where:

$VHHC_t$ is households consumption growth rate;

VG_t is government spending growth rate;

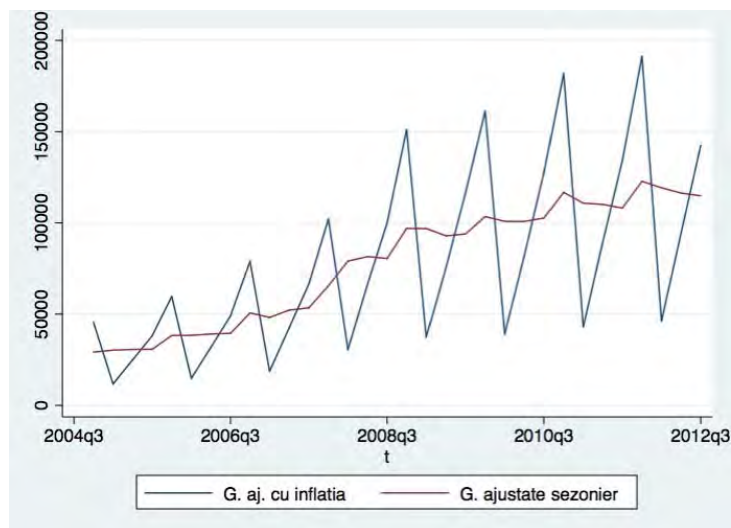
VDD_t is households disposable income growth rate;

$DDum_t$ is a Dummy variable which sets the time windows containing a deficit.

$DDum$ consists in a dummy variable generated in STATA, which equals 1 when it detects a period with deficit and equals 0 when there is no deficit. In order to avoid the multicollinearity phenomena, this variable will be automatically excluded from the regression equation, by STATA software.

In order to have a more clear idea about the evolution of government expenditure (GE) and of what happened in Romania since 2004, until the moment of speaking, the below chart expresses the evolution of GE, seasonally adjusted.

Figure 1. The evolution of government expenditure, seasonally adjusted (2004q4 – 2012q3)



Source: author (after World Bank Data).

It can be seen that the Romanian authorities are usually spending more in the last quarter of every year (q4). This fact is a normal one, because the public authorities, both central and local, use to spend at the end of the year all the incomes which are left unspent during the year, in order not to return the money to the state treasury.

The following table shows the STATA output of the regression model:

Table 1. Regression estimation

```
. regress VHHC VG VVD if DDum==1
```

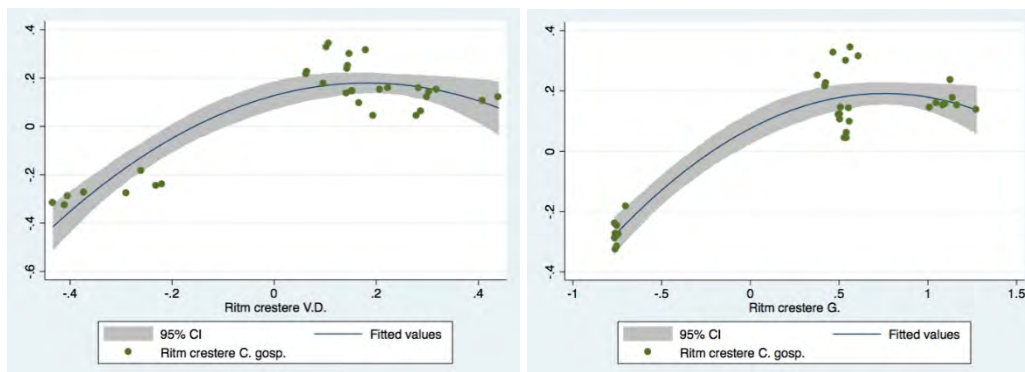
Source	SS	df	MS			
Model	.928418916	2	.464209458	Number of obs =	30	
Residual	.334406005	27	.012385408	F(2, 27) =	37.48	
Total	1.26282492	29	.043545687	Prob > F =	0.0000	
				R-squared =	0.7352	
				Adj R-squared =	0.7156	
				Root MSE =	.11129	

VHHC	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
VG	.1715031	.0572899	2.99	0.006	.0539539 .2890523
VVD	.2684648	.155121	1.73	0.095	-.0498172 .5867468
_cons	-.0110564	.0242833	-0.46	0.653	-.0608817 .0387688

Source: the author.

According to the statistics tests, we weren't able to detect heteroskedasticity or errors' autocorrelation, so the model respects all the hypothesis of the classical model.

The cloud of points, along with the regression line and the confidence interval (95%) are expressed in the following figure:

Figure 2. The relationship between VHHC - VVD and VHHC - VG

Source: the author.

5. Interpretations and conclusions

According to the estimations found in the table with the regression output, the adjusted value equation is as follows:

$$VHHC = -0.11 + 0.172 * VG + 0.268 * VVD$$

The *t* test value for the constant, shows the fact that it is not relevant for the whole model ($P > t = 0.6531$, being outside the 90% confidence interval). As respects the growth rate of government expenditures (VG) and the growth rate of the households disposable income (VVD), the significance of the two variable is relevant for a 90% confidence interval.

Between the two variable there is a positive linear relation. Households consumption change is explained by the variation of the governmental spending and the variation of the disposable income in a proportion of 73.5% ($R\text{-squared} = 0.735$). This result offers a plus of credibility to the predictive capacity of the model. If the growth rate of the governmental spending (VG) is changing with one percent point and the others variables are constant, than the growth rate of households consumption will increase with 1/6 of a percent, meaning 0.172%. The increase with one unit (a percent) of the disposable income will determine a change of 0.268 percent of the growth rate of the households consumption, *caeteris paribus*.

The results of this model are invalidating the existence of the Ricardian equivalence in Romania, for the analyzed period (2004q4 – 2012q3). Thereby, the growth rate of the governmental spendings are able to influence the growth rate of the households consumption. This result is sustaining Keynes' recovery proposal: in order to increase the consumption, it is needed to increase the governmental spending. It seems like an exogenous shock in the Romanian economy, as it was the crisis from the previous years, which did not change the nature of the problem, because the households' consumption, inflation and seasonally adjusted, dropped in the third quarter of 2012, only with 3% compared with the fourth quarter of the year 2008 (being as a start point in the crisis' evolution) A possible explanation for this cause might be the long time during which the households have adapted to this decrease of the disposable income.

Another explanation for which ER does not applies to the Romanian economy can be found in logical flaws of the model:

- the markets are perfect only in theory;
- the destination of the public funds is always changing;
- there are changes in the structure of the patrimony from a generation to another and not all the families are transferring their wealth from a generation to another (donations, conflicts etc.)

Gustave le Bon (1895), in one of his works about mass psychology, explains the way in which taxes are decided by the policy-makers and accepted by the general public. For the ones who are deciding, it is now needed always to choose the fairest tax from the theoretical point of view. It can be chosen an unfair tax, if it is the best masked, or the least burdensome at surface. An example is offered by the same author, using two types of taxes:

Tax collected daily based on consumer products and the proportional tax on revenue, „payable through a single payment”. The population will be much more receptive to the first type of tax, while the second type of tax will generate unanimous protests, even if the last tax is several times lower than the first one. The way the taxes are perceived could be one of the causes for which the test Barro-Ricardo equivalence is not conformed for Romania. Thus, the population will not realize the real increase of the taxes in future and so the predisposition for saving will be affected. The population will not choose to save the necessary amounts which have the role to anticipate a future increase of the taxes. This future increase of the taxes will have the role to finance repayment of government debt tranches.

In interpreting the model various factors should be also taken into consideration, like model imperfection due to the limited access to the data available for Romania, or the limited number of independent variables, which can influence the generation of a better overall picture.

The debate regarding Barro-Ricardo equivalence remains an open one in the scientific communities, while the papers demonstrating that exists are compensated by those disqualifying it as a viable economic theory.

Acknowledgements

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Minimum wage – labour market rigidity factor

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Abstract. *Currently setting minimum wages is a common practice that targets economic and social aspects. This paper aims to analyse the evolution of the minimum wage in Romania compared to EU Member States and the effects that it generates on employment, labour productivity, reducing social and wage inequalities etc. Given the current concerns about the importance of labour market flexibility to be able to respond to different shocks, as the economic crisis, we evaluate the minimum wage burden as a factor of rigidity in the labour market in terms of its rise and the ratio between the minimum wage and the average wage and the perverse effects on employment.*

Keywords: minimum wage, labour market rigidity, employment, labour productivity, social inequalities.

JEL Classification: J31, E24.

1. Why the minimum wage? Defining the context: globalization and the European social model

In today's society, factors such as technological progress, low transport costs and liberalization within and outside the European Union have led to increased foreign trade and investment flows across countries. Globalization **implies increased competition**, considering both low-cost economies such as China and India, and innovative economies like the United States, both developed countries like England or Germany and developing economies.

The liberalization of trade flows and **relocation of industry** have determined on the one hand *pollution effects and social crises*, as well as the promotion of some *technologies and higher yields, the creation of jobs in disadvantaged areas, improvement of the living conditions for the population, low literacy, better life chances by eradicating diseases etc.*. This is because under the pressure of the civil society, investors have got involved in various social projects, corporations have promoted better working conditions and social protection measures, environmental issues have become the subject of international law regulations, income and benefits generated at national level allowing a growing trend in rising living standards and life aspirations in the countries concerned. All this confirms the need to continue the process of globalization and strengthens the belief that not the purpose, but the methods and tools are inappropriate to the new realities (Stiglitz, 2002).

The rapid liberalization of trade and increased imports/exports can cause dislocations (disturbance) on the labour market. Also, the technological changes - an important part of the globalization process - are often suggested as an alternative explanation of the problems on the labour market.

Given the rapid accumulation of capital - both trade and technology can amplify the vicious circle of the economic growth, of jobs and of increasing productivity. If capital accumulation is slow, the economic growth is also low, trade development and technological progress may lead to unemployment and worsen income inequality.

Globalization compels the EU to adapt its pace in all sectors where competition intensifies, the labour market cannot remain outside the growth areas of the competition even if it is considered among the least globalized of the international markets.

The need for the social aspect given the intensification of globalization has become increasingly intense in the European Union. Although the focus on the social side of the European model appeared along with the European Economic Community in the Treaty of Rome, the concept of the European social model appeared later used by the European Commission President Jacques Delors in the 90s and refers to the harmonization of the economic growth and social cohesion. Although there is a wide variety of such model the EU strategy is common and it pays great attention to environmental and social issues in modernization efforts (Werner, 2006).

Intensifying competition associated with globalization, the development of new technologies and the effects they produce on jobs, aging population and slowing economic growth have made it necessary to change the orientation of the European social model from *welfare state*, which involves providing resources to guarantee the security of individuals in transitional periods, to *workfare state*, aimed at providing them with tools that enable them to deal with risks posed by the current changes. It is supported a

reduction in the passive intervention in the favour of active involvement by creating jobs, qualification, requalification activating labour market policies. However, it is kept the particular importance of certain issues concerning wage policy which should be carefully considered due to their correlation with inflation, labour productivity, and migration. The minimum wage remains in the attention of policy makers at national and EU level, bringing into question in the current period the importance of setting minimum wages in all EU countries and, in perspective, setting a minimum wage in Europe.

2. Approaches on minimum wage

Approaches on the minimum wage are contradictory. *Supporters* believe that it is a way to improve the wellbeing of individuals, especially of those with low incomes. *Opponents* consider it is a way that turns against workers excluding them from employment, reducing rather than increasing their welfare. Establishing minimum wage must reconcile social considerations with economic ones. *The social considerations* refer to **the standard of living and income inequality** that lead to pressure for increased minimum wages (pressure coming particularly from trade unions). *The economic considerations* related to **productivity, competitiveness, job creation** lead to pressures (often from employers) to maintain a low minimum wage (Rutkowski, 2003). The minimum wage set at a moderate level usually does not have the effect of lowering employment, but it has limited and transient effects on the low-income population. It tends to reduce income inequality, but the effects on poverty are lower.

The minimum wage can act as rigidity on the labour market because employers cannot lower the minimum wage to equalize the labour productivity level. Since the productivity of workers is below the minimum wage, it turns into a burden for employers reducing their competitiveness and ability to adapt to the changing economic conditions (Neumark and Wascher, 2003). In addition, a high minimum wage has negative effects on the level of employment. (Herr et al., 2009)

Beyond the direct influence on the labour market, the minimum wage may result in *tax evasion* by making employers declare lower wages, often at the level of minimum wage, in order to reduce non-wage labour costs.

Thus more productive workers receive salaries at the level of the minimum wage, while workers with low education level are the ones who really get these salaries (Tonin, 2007). Another important issue related to the minimum wage is the existence of the informal economy and the fact that the minimum wage is losing importance in these conditions, an extensive informal sector and a large number of workers limit the importance of the minimum wage in the economy, yet retaining the guiding role even in these conditions to set the salary levels.

It is estimated that the minimum wage in Central and Eastern Europe was maintained at a level too high (Lehmann and Muravyev, 2011). This differs considerably from country to country, compared to the purchasing power or average wage. The minimum wage burden is expressed most frequently by *the ratio between the minimum wage and the average wage in the economy*. The higher this ratio is the better the position of workers placed at the level of the minimum wage is, but the effects on employment are more perverse.

Taking as reference of the average wage, it is not the most conclusive basis due to the changes at the upper level of the hierarchy of income where we find the workers with the highest level of training. Such a comparison does not reflect labour market conditions facing the low-productivity workers. It is considered that the median value of the salary (half of the workers earn more than this value, half of them less) is a more relevant benchmark to analyse the impact of the minimum wage (Rutkowski, 2003).

3. Minimum wage in the European Union

Establishing a minimum wage has become a common practice in most EU countries. It is set in two ways: either it is set by the government, possibly on the basis of consultations with trade unions and employers, or established through collective bargaining (bi or tripartite) at national or sectoral level. The purpose of introducing such income is to prevent exploitation of employees by employers, to promote a correct structure of wages, to lower and protect against poverty, to reduce wage gap, and last but not least to protect and motivate employees with low incomes.

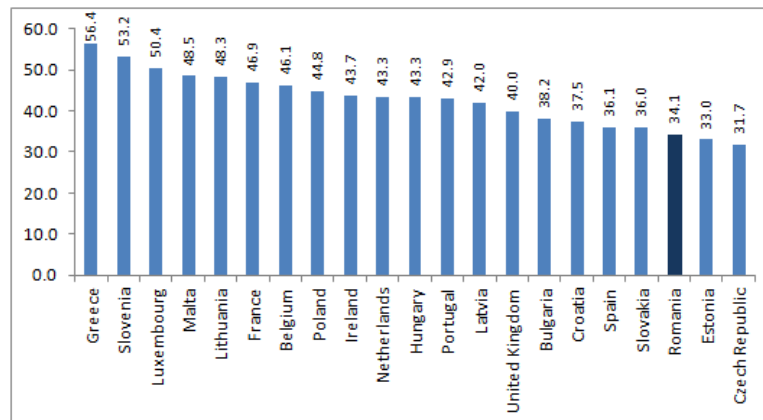
EU countries except Cyprus, have introduced mandatory minimum wage levels or levels of minimum wages set by collective bargaining (Austria, Denmark, Italy, Finland, Sweden). In July this year Germany has also decided to introduce the minimum wage starting with 2015.

The UK introduced the minimum wage in 1999, a much discussed measure in terms of the impact on employment, of its reduction. The studies undertaken at national level in the UK showed that, overall, the impact on employment has not been strong, employment was affected only in certain fields and for certain periods of time. (ONS UK, 2012)

Beyond existing or not, the most important element regarding the minimum wage is the way of setting it so as to be effective. On one hand one must ensure a minimum standard of living for workers, and on the other hand, it must be correlated with the level of labour productivity so as to not cause unemployment for workers with low productivity. The burden of the minimum wage as labour market rigidity factor is expressed most frequently by *the ratio between the minimum wage and the average wage* in the economy. The higher this ratio is the better the position of workers placed at the level of the minimum wage is, but the effects on employment are more perverse. Taking as reference the average salary is not the most conclusive basis due to the changes at the upper level of the hierarchy of income, where we find the workers with the highest level of training. Such a comparison does not reflect the labour market conditions facing the low-productivity workers.

Therefore, it is considered that the median value of the salary (half of the workers earn more than this amount, half of them less) is a more relevant benchmark to analyse the impact of the minimum salary (Rutkowski, 2003).

There is a variety of levels of minimum wages both as absolute value and as relation to the average wage. In the European Union, the minimum wage as a percentage of the average wage in industry, construction and services are between 56.4% in Greece and 31.7% in the Czech Republic. Romania records a level of 34.1% in 2013, slightly up compared to the previous years (Figure 1).

Figure 1. Minimum wage as% of the average wage, EU, 2013

Note: Data from Belgium, Estonia, France, the Netherlands and Romania refers to 2012, Greece to 2013.

Source: Eurostat Statistics, earn_mw_avgr2

It is important the relationship between the minimum wage and average income, but it must be also analysed the distribution of wages by income levels. The higher the share of people receiving a salary at the level of the minimum wage is, the greater the effect on reducing income inequality is. The low level of the minimum wage as a percentage of the average wage must be analysed in relation to the structure of employees by wage groups. In Romania, over 70% of employees have a wage level below the average wage. This aspect asks questions related to the efficiency of its social function.

4. The role of the minimum wage in reducing inequality and social exclusion

Minimum wages aim to reduce social and wage inequalities, for employees a guarantee against the risk of poverty and social exclusion.

Antony Atkinson (1998) refers to three essential aspects that are found in many definitions regarding social exclusion: 1) characteristics of time, place and specific social groups; 2) the person's inability to overcome the situation by themselves, making the difference between not wanting to work in the labour market and the impossibility of finding a job; 3) the future prospects of persons and not only the situation at the moment. The same issues are found in other definitions of this phenomenon (Castells, 2000).

Social exclusion is analysed in conjunction with redundancies as a result of stringent measures to protect employment, with temporary employment and minimum wages affecting employment for the low-skilled (Cahuc and Malherbet, 2002).

It confirms the current concerns about employment security and Rodriguez and Russo (2006) who show based on a vector autoregressive model that employment volatility increases due to increasing mobility between jobs and not the mobility between employment and unemployment.

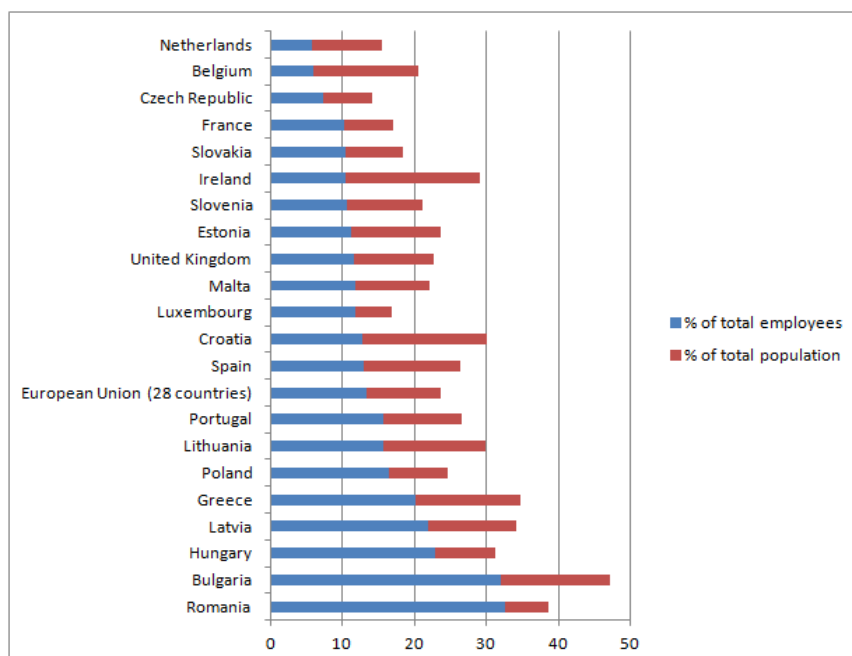
In this regard, active employment policies are effective in reducing the volatility of unemployment in countries with rigid labour markets (Gnocchi and Pappa 2009).

Reform programs must ensure investment in successful transitions on the labour market, developing appropriate skills through education and training system so as to achieve effective fight against poverty and social exclusion, reducing structural unemployment, youth unemployment and inactivity, productivity growth so that it not to transform the minimum wage into a labour market rigidity factor (European Commission, 2010).

A minimum wage set at too high a level stimulates the expansion of the informal sector, discouraging the respect for this level imposed by law or under collective bargaining, while a minimum wage set at a moderate level can be more effective in protecting the workers' incomes with little education and low income.

Figure 2 shows the relationship between the risk of poverty and social exclusion in the European Union for the entire population, compared to employees. It is noted that, of all the member states, the risk of poverty and social exclusion for employees is the highest in Romania (32.5%, while the EU average was about 13.3% in 2013). Nevertheless, the risk of poverty and social exclusion for the entire population, although high, does not place us on the same position, Bulgaria recording a higher level. In Romania the status of employee is not a powerful weapon against the risk of poverty or social exclusion. This discrepancy is correlated with the distribution of wages by income group, respectively with the high number of people who have income below the average wage.

Figure 2. Population at risk of poverty and social exclusion (% of total) EU, 2013



Note: The data for Ireland refers to the year 2012.

Source: ilc_peps02

It is estimated that the minimum wage has an active role in reducing social and wage inequalities, it effectively represents a guarantee against poverty for those employed. In Romania the risk of poverty for those who have job (in-work at risk of poverty rate) was of 21.5% in 2012, well above the EU average which was of 11.7%.

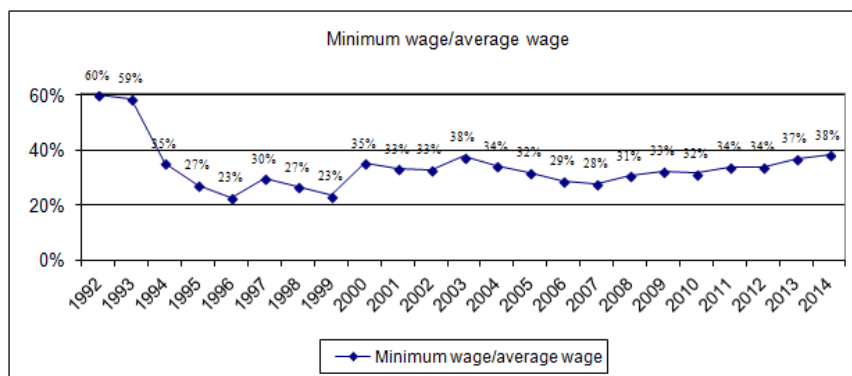
Eurostat statistics show that countries that have the highest risk of poverty also recorded the highest income inequality. Greece, Bulgaria, Latvia, Romania recorded in 2013 the highest level of inequality of income distribution in the European Union for the population under 65. Income inequality may, however, have adverse effects on the labour productivity through the lack of motivation and the disincentive to improving skills.

5. The minimum wage in Romania

In Romania the minimum wage was introduced in 1991 by wage law and *is established by Government decision, after consultation with trade unions and employers* (Wage Law no. 14 of February 8, 1991).

The statistical data published by the Ministry of Labour in Romania allows us to analyse the evolution of the minimum wage compared to the average wage in the national economy (including in agriculture). Figure 3 shows that in 1990-1995 the minimum wage decreased rapidly compared to the average salary amid economic reforms and low productivity of state enterprises. During the crisis, as in many other European Union member states, the minimum wage increased compared to the average wage, a trend that is maintained in 2014.

Figure 3. *The evolution of the minimum wage in Romania, 1990-2014*



Note: minimum wage is the one recorded at the end of the year, for 2014 were taken into account minimum and average wages in September.

Source: www.mmuncii.ro, statistics section

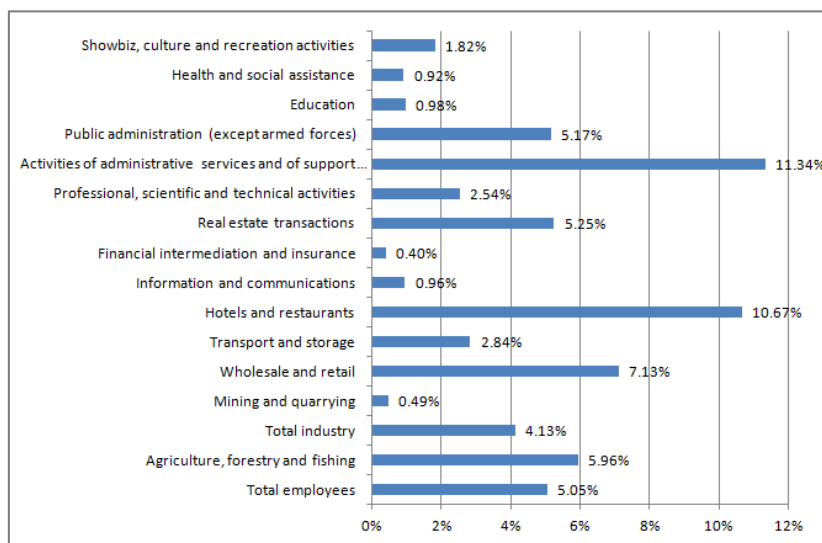
In Romania 5.05% of all employees in the month of October 2012 received a salary less than or equal to the minimum wage, with a higher share for men -5.39%, compared to women - 4.67%. Regarding the distribution of employees by *activities of the national economy* (Figure 4), it is noticed a much higher level than the national average of employees that are at the level of the minimum wage in the *service* sector. The most significant differences are in administrative services and support services (11.34%) and in

another sector of services: hotels and restaurants (10.67%). The situation can be explained in these sectors through the higher share of the informal economy and the low level of foreign direct investment (which is not generally associated with the informal economy). This refers to the situation where employers declare income at the level of the minimum wage to reduce non-wage labour costs, the wages actually received by employees exceeding this level. The size of the informal sector is the one that really determines the impact of the minimum wage in Romania and in other countries in Central and Eastern Europe.

At the opposite pole are financial intermediation, a sector where only 0.4% of the employed population is at the level of the minimum wage. This sector held on 31 December 2013, over 14% of the stock of foreign direct investment in Romania.

The existence in agriculture of a low share of employees who have earned income below and at the level of the gross minimum wage per economy is explained by the fact that in this sector the share of employees in total employment is very low, the majority of the population employed in agriculture is self-employed or unpaid agricultural workers.

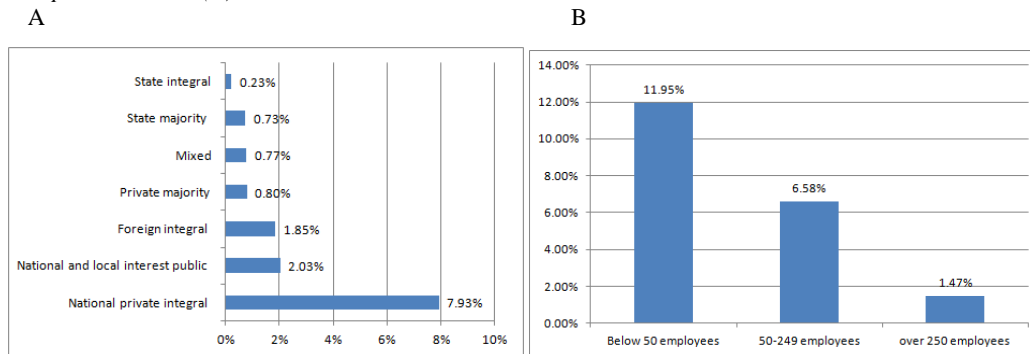
Figure 4. The percentage of employees below and at the level of the minimum wage in Romania per activities of the national economy, in October 2012



Source: calculations based on INSSE study. Distribution of employees by groups of wages earned in October 2012.

The analysis by type of ownership (Figure 5A) shows that the high incidence of minimum wage is recorded by firms in *fully private ownership* (7.93% of all employees), given that these companies hold approximately 50% of all employees in the economy. Under this form of ownership, the wages are concentrated about 89% by groups of salaries under 3000 lei. In the *state sector* is employed 6.9% of all employees in the economy, and of these only 0.2% is at the level of the minimum wage and receive gross wages under 3000 lei approx. 68%.

Figure 5. Employees below and at the level of the minimum wage per economy, by property type (A) and enterprise size class (B)



Source: calculations based on INSSE study. Distribution of employees by groups of wages earned in October 2012.

Considering the enterprise size classes shows that in companies fewer than 50 employees, 11.95% of employees is *below* or *at* the level of the minimum wage. In these companies is employed 22% of all employees in the economy.

Although these micro-size companies have a small force in the market in terms of bargaining power, investment in development, they are an important source of jobs. (Trașcă, 2014)

In large companies with over 250 employees is employed 53% of all employees in the economy and only 1.47% of them received a salary less than or equal to the minimum gross salary per economy in October 2012 (Figure 5B).

Thus, an increase in the minimum wage in Romania will particularly affect the private sector and small businesses as well as companies operating in the service sector.

5. Minimum wage and labour market rigidities. Correlations with the level of productivity

The rigidity of the labour market is a very important issue for the economies of the world, especially in times of crisis when need to face the competition requires employees and employers to increase their capacity to adapt to market needs. The rigidity of the labour market is a complex issue and requires interrelated approaches involving multiple conditionings.

With regard to labour market rigidities, it can be emphasized the fact that there is no precise definition, the concept is defined by the speed of adjustment to shocks (Pissarides) and by listing or evaluating its effects (Solow, 1998). The labour market rigidities issue has gained importance in recent years because it causes slow adjustment to changes in the global economy and investment opportunities. For Romania, which is preparing for the entry into the Monetary Union, the problem becomes more acute given that by giving the monetary policy to the European Central Bank and setting the exchange rate of the euro, increases the need to know **to what extent the current labour market rigidities may be obstacles** to future shock absorption and the necessary **measures to mitigate them**, by increasing the degree of labour market flexibility.

The minimum wage is a factor of rigidity in the labour market because it prevents the rapid adjustment to changing conditions. For employers the burden of the minimum wage imposes the analysis of the efficiency of new employment through *comparisons with the level of productivity*: if the productivity of workers is below the level of the minimum wage, the employers may decide to dismiss (if employment protection measures allow it) or not to hire new staff. If the minimum wage is set at a higher level, the negative consequences are greater in terms of employment opportunities for people with low productivity, especially *young people and those with low education*. They may be included in unemployment and / or may be excluded from the formal labour market and willing to accept employment in the informal economy. The presence of *active employment measures* tend to reduce these effects of the minimum wage as they offer redundant workers the possibility (due to the higher salary level of productivity) to raise, by improving skills, the level of productivity to levels that allow minimum wage employment (Neumark and Wascher, 2003).

In Romania, the Romanian mentality that has conditioned from the inside our country's economic development has influenced the transition to the market economy, this being unprepared to face many challenges and new elements brought by the market economy (Dinu and Brateș, 2013):

- giving up state dependence to provide employment and to obtain income;
- changing consumer behaviour as a result of growth and diversification of goods, which followed shortly after 1989;
- periods of social unrest amid economic restructuring, which involves understanding the importance of education and training for the access to employment;
- the social effects of transition, increased social inequalities and increasing poverty and vulnerability of groups generated particularly by the high rates of unemployment and declining purchasing power (and the erosion of savings);
- the possibility to migrate in the countries of the Western Europe.

In this regard, on the mentality of the population, we can mention the frequent wage claims with no coverage in productivity gains. The low levels of wages are the consequence of low productivity of the labour that remains at a very low level, although it recorded the highest growth rate in the period 2000-2010 in the European Union. However, productivity per person employed in 2013 amounted to slightly more than half the EU average (51.7%), although the progress is significant compared to 2001, when it was at the level of 23.5% over the same mean. The unions did not support the placement of workers in continuous training programmes to increase productivity as a prerequisite for wage increases, but on the contrary militated for increases in salaries uncorrelated with labour productivity growth and to maintain loss-making enterprises to avoid unemployment (the power of trade unions has been and remains high: the degree of unionization was 80.2% in 1991, 45.1% in 1998 and 32.8% in 2009 according to ICTWSS).

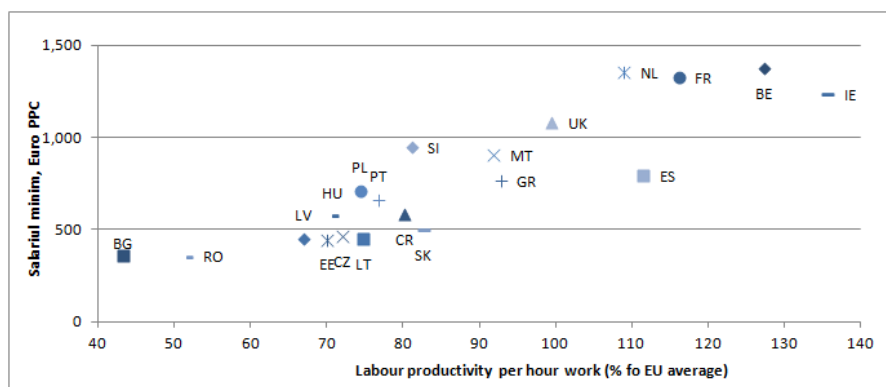
The minimum wage in euro at purchasing power parity varies considerably from country to country due to the differences in the quality of life, labour productivity etc.. It is between 1559E in Luxembourg and 354E in Romania. Levels below 500E also record the Baltic States, the Czech Republic and Slovakia.

In Figure 6 is shown the correlation between the minimum wage (Euro to PPS) and the level of labour productivity (per worker) in the year 2013. There is a direct correlation

between the two variables, countries with low levels of minimum wage also having low levels of labour productivity. Countries which are characterized by the lowest labour productivity and also the lowest minimum wage are Bulgaria and Romania, and those with the best results and the best correlation between productivity and minimum wage are Ireland, Belgium and France.

This aspect helps us to conclude that minimum wages are correlated with the level of productivity, so that the minimum wage is not a factor increased by the rigidity in the labour markets.

Figure 6. Correlations between labour productivity and minimum wage, EU, 2013



Source: Eurostat Statistics.

The low levels of minimum wages could fuel the vicious circles of low labour productivity because employees consider the wages unjustified for further efforts, either in work or in training and qualification. Thus, efforts to increase productivity encounter the strongest barrier, the human factor which is capable, when motivated to mobilize and effectively organize other factors of production.

6. Conclusions

The changes that have affected the economies of the world in recent decades determined by increased competition generated by globalization and integration in the European Union, by technological advance and the knowledge economy, have brought to the forefront of the labour market a new challenge, which is to tackle *rigidities* that affect the sound operation and resource allocation. The challenges that the labour market, workers and employers will have to answer are inequality of access and chances on the national labour market and becoming more global, discrimination and marginalization, exclusion and inequalities of all kinds. In this sense, all labour market mechanisms should be put in line with the economic realities and the need for smart, sustainable and inclusive growth (Europe 2020, European Commission, 2010).

Increasing the minimum wage produces contradictory effects. On the one hand it increases budget revenues due to increased tax base and, on the other hand, it increases non-wage labour costs for employers. When employers pay wages at the level of the minimum wage, the additional costs caused by increasing them may lead to either profit

reduction or higher prices for the final consumers or, in the worst case scenario, the lockout of the company. Each of these three possible answers to increasing the level of the minimum wage produces effects on budgets by lowering revenues and/or putting additional pressure on social protection systems in the case of business closure. Therefore, the policy of increasing the minimum wage and setting its size must be carefully managed to not generate adverse effects on budget revenues and employment.

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Regional convergence. Case of Romania

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Abstract. *Regional convergence represents a major objective of economic development. The regional imbalances lead to failure of this objective. This paper presents a number of methods developed for the analysis of economic inequalities in Romania. The purpose of this study is to show the degree of convergence (or divergence) of the eight development regions of Romania, during 2000-2010. Mainly, sigma-convergence and beta-convergence are used. Considering that convergence is more visible at regions level, it is desired to see if the differences deepened between the regions, in the analyzed period.*

Keywords: economic convergence, regional convergence.

JEL Classification: R11, O47.

1. Introduction

Economic convergence by reducing development disparities, is the purpose of the European model.

The main concern of studies of convergence is to see whether poorer countries catch up with richer ones over a period of time. Various methods are used to measure convergence, given the complexity of regional growth. Beta convergence was introduced by Barro and Sala-i-Martin, along with sigma indicator. The two concepts are closely related, convergence beta is necessary for sigma convergence but not sufficient (Iancu, 2009). In case of sigma convergence distribution of income should be reduced.

Regional convergence process in the European Union has become a quite interesting subject, especially in recent years as one of the basic principles of regional policy. The purpose of regional development is to increase quality of life. The European Union wants to stimulate regions of the Member States through regional development programs and strategies, thus helping to reduce disparities between regions.

Another way to achieve the convergence and reduce regional disparities is the effective use of structural funds.

The causes that may underlie the widening disparities between regions are:

- Economic sectors with low productivity that are part of the economic structure;
- A small part of the population have higher education;
- Research and innovation potential decreased due to insufficient allocation of funds from the state budget, on the one hand and on the other hand, migration of skilled and educated people to more developed regions (Talmaciu and Borza, 2011).

This paper presents some of the tools used to analyze inequalities in Romania, focusing mainly on the beta convergence and sigma between development regions of Romania, in the period 2000-2010.

2. Literature review

Many studies on the subject of convergence or divergence, referring to the neoclassical theory of economic growth. Solow-Swan model is based on the appearance of exogenous growth. Beta convergence is of two types: absolute (occurs when all regions converge to the same steady state) and conditional (on long term, the regions which have the same initial conditions obtained the same level of Gross Domestic Product or GDP per capita). It manifests a process of economic convergence absolute if, as income levels approaching steady state, growth rate is reduced. Also, the assumption of absolute convergence means that between countries, the poorest will grow faster than initially richer by the same long-term equilibrium. If conditional convergence, there must be a negative relationship between economic growth rate and the initial level of income (Marinas, 2007).

The Mankiw-Romer-Weil brought Solow-Swan model improvements by including human capital. The model starts from the assumption that countries are structurally different. The same author states that conditional convergence is met if Member States

converge to the equilibrium level, economic and structural characteristics of economies lead to different equilibrium levels. Endogenous economic growth presents models with or without research and development (AK model, designed by Romer in 1986, model of Lucas in 1988).

There are also so-called groups convergence (convergence-clubs). The convergence process is multipolar, not one unit for all countries and regions (Iancu, 2009). Income per capita of the countries that have structural similarities (government policies, technologies, preferences) converge in the long run, if their initial conditions are similar (Galor, 1996). Compared to conditional convergence, where convergence does not depend on the initial conditions, the group's convergence occurs if the initial conditions are similar in terms of preferences, policies etc.

New economy models support the idea geographic economic divergence. Myrdal (1957) argues that overcrowding and lack of complementary factors flows are missing from neoclassical theory. Krugman (1991) explains that the absence of the convergence is either based on constant yields scale hypothesis, or the fact that the neoclassical model does not take into account the externalities between producers and consumers. Specific models of the new economic geography make reference to the fact that the main determinant of long-term regional development are transport costs. Regional concentration of workers and divergence are explained by the low costs of transporting goods.

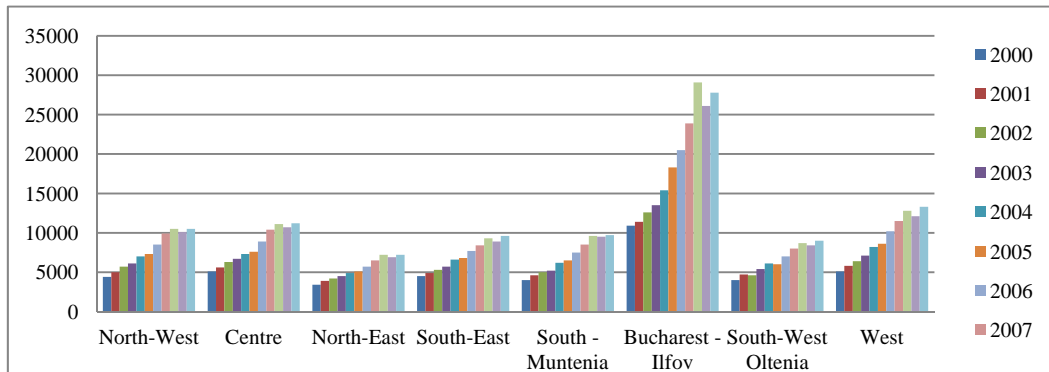
Sigma convergence can be calculated using several measures such as the coefficient of variation, Lorenz curve, Gini index, Atkinson index, Theil index etc.

3. Regional disparities in Romania

To determine the degree of disparity is used both territorial dimension and the period considered in the analysis. The role of territorial space is recognized in the literature on regional convergence. Generally understanding, regional convergence studies focus on the catching-up: the less developed regions make great efforts to catch up with the rich ones (Antonescu, 2012).

The eight development regions were created after joining the European Union (2007). The indicator used to determine economic development is GDP / capita. Economic growth has followed a direction from West to East. It is noted that underdeveloped areas focus in the North-East, on the border with Moldova and on South, along the Danube and have a number of characteristics: inability to attract foreign direct investment, mainly rural activities and unemployment.

Among the more developed regions is Bucharest-Ilfov, West and Central region, occupying the first three places on GDP/capita. These had a positive trend during the period under review.

Figure 1. Regional GDP/Inhabitant- PPS/Inhabitant

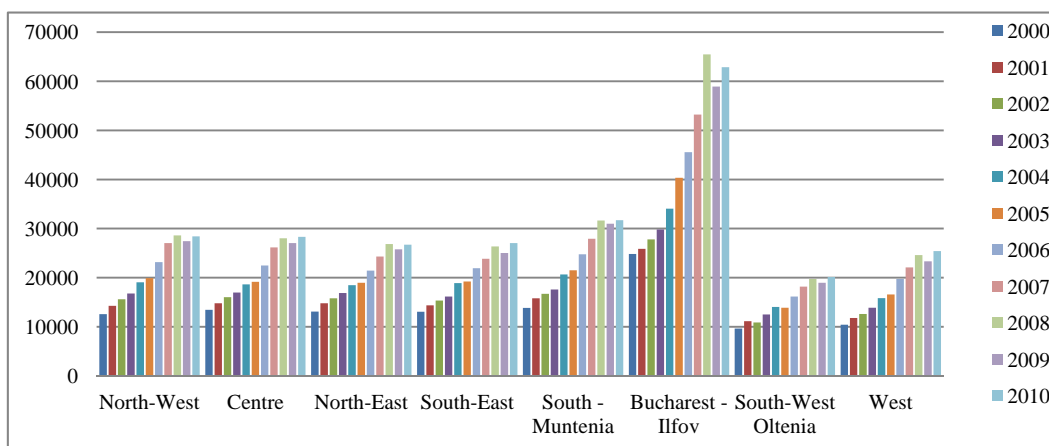
Source: Eurostat database.

North-East, South-West Oltenia, South East and South-Muntenia are at the opposite side, recording indicator values below the national average.

Of course, the population plays an important role. Romania has a population decreasing in all regions. Regarding population density as inhabitant / km², in the period analyzed, it is observed that the Bucharest-Ilfov has a level of over 1250 inhabitants / km², and the West region at around 60 inhabitants/km².

Regarding the contribution of each region to the GDP, it can be said that the smaller parties are brought by the South-West Oltenia and West. One explanation would be that the West region occupies a smaller area than the other regions.

The Bucharest-Ilfov region is the most developed region. Both in this region and in the South-Muntenia region and the West side of the country, the number of employees in the industrial sector and the services is higher and is characterized by higher labor productivity than in agriculture.

Figure 2. GDP millions PPS-NUTS 2

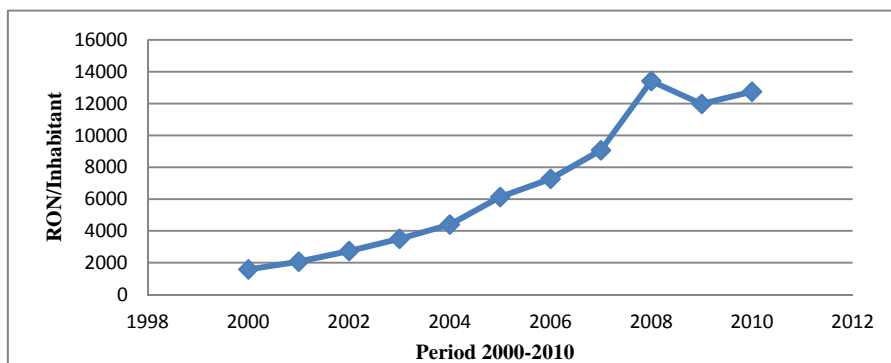
Source: Eurostat database.

The gap between the regions is based on location, size of foreign direct investments in developing regions and lack of competitive ability of enterprises (especially in the east of the country). The faster growth in the regions surrounding municipalities shows a center-periphery structure type. This is based on labor migration, investment and government intervention in the developed regions (Ceașescu, 2012).

Study reveals lack of convergence between regions, differences between income regions tend to grow, some of which are poles of attraction for labor and capital (Bucharest-Ilfov).

Sigma convergence is an index of divergence. Between 2000 and 2008 convergence decreases between the 8 regions, i.e. regions diverge. Only in 2009 there is convergence between the NUTS 2 regions of Romania.

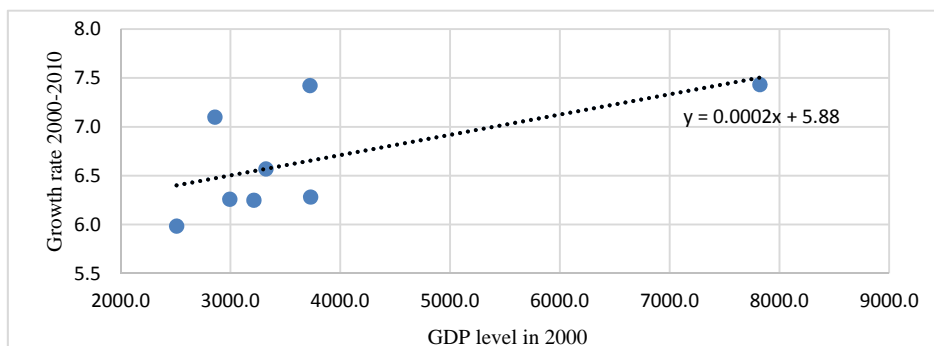
Graph 1. Convergence index (Standard deviation)



Source: Own calculations based on National Institute of Statistics.

Beta convergence regression is the growth rate of GDP according to its initial level (2000). Poor regions should have higher growth rates than the rich ones. Thus, the more the level of GDP is lower, the growth rate should be higher. Regression coefficient should be negative. The equation shows a positive relationship between the two variables, indicating that between NUTS 2 regions of Romania there is not a relationship of convergence but of divergence.

Graph 2. Beta convergence 2000-2010 between NUTS 2



Source: Own calculations based on National Institute of Statistics.

It is observed a process of increasing inequalities between regions and counties of Romania, during 2000-2010. This process is explained Lorenz curve from 2010 to 2000, the area between the diagonal and the Lorenz curve is wider in 2010. This instrument was used to express the unequal distribution of GDP among the Romanian counties and indicates a tendency for divergence. Also in the period, the Gini coefficient is not high (0.19 to 0.25). Indices for measuring inequality (Theil, Atkinson) explain regional disparities in the proportion of 71.67-82.24% (Neagu, 2013).

4. Conclusions

Reducing regional disparities is intended to be achieved through economic and social cohesion. Using inputs more efficiently, increasing their mobility, income in the region may increase thus serving the purpose of regional integration.

In the period 2000-2010, Romania went through a process of divergence, especially noticeable in the regions. Poor regions should have higher growth rates than rich ones, which never happened.

Development regions of our country are among the most underdeveloped regions in the European Union, being employed in the development environment, the Bucharest-Ilfov region is only at the intermediate level. By far, the North-East is the poorest region, GDP/capita accounting for 27% of the EU27 average.

Acknowledgements

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The exchange rate volatility in the Central and Eastern European Countries

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Abstract. *The present research aims to model the volatility of the currencies from Romania, the Czech Republic, Hungary and Poland in the period 2005-2014, by identifying a robust econometric model, as well as to determine the empirical values of the long term volatility and expected volatility at the end of the analyzed period. The results obtained have confirmed the validity of the GARCH (1,1) model and the unconditional volatility expressed in annual terms is relatively close for all four currencies, respectively between 8% - 10.6%. However, the values expected for the end of 2014 show significant deviations from the long term volatility, with the largest deviation registered in the case of the RON.*

Keywords: volatility, heteroskedasticity, GARCH models, mean reversion.

JEL Classification: C58, F31, G17.

1. Introduction

The onset of the economic and financial crisis represented a major shock for the Central and Eastern European (CEE) countries' economies and generated severe consequences for the main macroeconomic variables. The crisis coincided with the need to adjust some imbalances such as the budgetary imbalance or that of the current account balance, the latter one correction taking place in the context of a significant depreciation of these countries' currencies. These evolutions determined an exchange rate volatility increase, with potential additional negative effects on these countries economic environment.

Modelling the exchange rate volatility represents an important objective for the economic policy makers, but also for the other participants at the economic activity. For example, this influences the degree of achievement regarding the nominal convergence criteria, given that one of them refers to the maximum permissible deviation of the exchange rate within two years of observation. Also, the banking system can be affected in many ways by greater than expected exchange rate volatility, for example, the Value-at-Risk models based on which the minimum capital requirements are determined, use as input estimates of this variable, and further an underestimation of the exchange rate risk can lead to an insufficient level of equity which is essentially a buffer to cover unexpected losses.

Considering the exchange rate data series' properties, respectively the volatility variability in time, it is very important to identify a long term level of it, but also to determine a current value of this indicator in order to be able to anticipate the future evolutions, in the presence of the mean reversion feature.

Given all these, the present research aims to model the exchange rate volatility of the Romanian, Czech, Polish and Hungarian currencies against the Euro, and, implicitly, to determine the long term volatility, if the estimates confirm its existence, and also to calculate the conditional volatility at the end of the period. This paper's contribution to the literature's development will consist in the precise numerical determination of these values, beyond confirming the validity of the model used.

This paper is structured as follows: the next section presents the previous approaches in the literature on exchange rate volatility modeling in CEE countries, followed by the model description, and later the presentation of the data used and the results obtained. The last section exposes the conclusions and the implications of the empirical estimates.

2. Literature review

A feature of the exchange rate series is the volatility variability in time, so it is necessary to use a model that takes into account this aspect. The GARCH models (the Generalized Autoregressive Conditional Heteroskedasticity), introduced by Bollerslev (1986) are used in analyzing financial time series such as stock prices, inflation rates or exchange rates. The importance of these models is the distinction between the conditional and the

unconditional variance. The unconditional variance is independent of time, while the conditional variance depends on past events that are contained in the information available at time $t-1$.

Over time there have been proposed various extensions of the GARCH model – IGARCH (Integrated Generalized Autoregressive Conditional Heteroskedasticity), EGARCH (Exponential General Autoregressive Conditional Heteroskedasticity), GARCH-M (GARCH in Mean) etc., but the empirical studies have showed that the classical GARCH model is suitable for analyzing the exchange rate volatility. Thus, Hansen and Lunde (2005) analyzed the performance of ARCH and GARCH class models in terms of their ability to describe variance. They used the DM-USD exchange rate and the IBM stocks' return in order to compare about 300 variations of GARCH models and showed that the performance of the classical GARCH (1,1) was not exceeded in case of the exchange rate series.

A topic of interest in the literature is represented by the analysis of the exchange rates volatility in the newest members of the European Union, namely the Czech Republic, Hungary, Poland, Slovakia and Romania. Thus, Kocenda and Valachy (2006) have compared the exchange rate volatility under various currencies regimes for the first four countries, utilizing a TGARCH model (threshold GARCH). By estimating the conditional volatility it was showed that an exchange rate regime shift induces a slight volatility increase. Also, the external shocks do not have a uniform impact on different currencies; these differ among countries, the volatility being determined by specific national reasons.

Fidrum and Horvath (2008) have extended the analysis by introducing Romania and have modeled the exchange rates based on GARCH and TGARCH models. Their main conclusion was the volatility persistence in the case of all five currencies during the period January 1999–May 2007; the chosen interval was determined by the Euro introduction. Also, the authors have noted that none of the five currencies have experienced currency crisis in the analyzed period. At the same time, the exchange rate is more volatile if it is further from the implicitly target rate, which suggest the existence of variation corridors in some of these countries, but which suffer from lack of credibility.

Trenca and Cociuba (2011) investigated the EUR/RON exchange rate evolution in the period 2005-2011 based on three models GARCH, TGARCH and GARCH-M. They found a distinct evolution on two intervals: during 2005-2007 the Romanian RON continuously appreciated, respectively 2007-2011 when the currency was characterized by depreciation and when the volatility was slightly superior to the one from the previous period, reaching a maximum level during the financial crisis, i.e. 2008-2009. As a result of the analysis performed, the authors have shown the suitability of using GARCH models to characterize the exchange rate because of the properties presented by this financial series – serial correlation, non-stationary, heteroskedasticity etc.

The EUR/RON exchange rate volatility was analyzed also by Begu, Spătaru and Marin (2012) through GARCH and EGARCH. In the period January 2009–October 2012, the daily conditional volatility was very persistent, the negative shocks contributed to a variance increase, while the positive ones lead to a variance decrease. Testing various models, they concluded that the GARCH (1,1) adequately describes the EUR / USD exchange rate.

Another way of analyzing the EUR/RON volatility is by comparing it to other currencies' volatility. Thus, Pelinescu (2013), using a database consisting of daily records from the period 05.01.2000-31.08.2012, which was modeled through various GARCH models, found that the Romanian RON behaves differently compared to other currencies, namely the crisis impact on volatility was felt less than in the case of the dollar, zloty and koruna. The shock experienced by the RON was caused to the change of the reference implicit basket (initially, 75% euro and 25% dollar and later 100% euro).

Therefore, we can conclude that the GARCH models are suitable for analyzing exchange rates series, being widely used in empirical analyzes. The contribution of this research is to determine the explicit numerical results for the long-term volatility and for the current expected volatility. The importance of obtaining concrete numerical results is given by the fact that exchange rate volatility is widely used in risk management in the banking system, in order to determine the minimum capital requirements. We will also highlight how much time is needed to correct the volatility deviation from its long time mean in the case of model used.

3. The methodology

For the analysis of the exchange rate volatility we will use a GARCH (1,1) model, proposed by Bollerslev in 1986:

$$\sigma_n^2 = \gamma V_L + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2 \quad (1)$$

where σ_n^2 represents the expected variance for the next day; V_L is the long term variance and γ is the weight assigned to this; u_{n-1}^2 denotes the squared return of the most recent observation which has a weight equal to α , σ_{n-1}^2 represents the previous variance, weighted with β . Between γ , α and β there is the following relation $\gamma + \alpha + \beta = 1$.

Thus, by specifying the GARCH (1,1) model in the form described above, the current expected variance can be determined based on the most recent observation u_{n-1}^2 and on the latest previous variance σ_{n-1}^2 , the associated weights being econometrically estimated. The more general GARCH (p,q) estimates σ_n^2 based on the most recent p recent return observations, respectively on the last q variances, but the most widely used specification remains the classical GARCH (1,1).

Denoting $\omega = \gamma V_L$, the relation (1) can also be written as follows:

$$\sigma_n^2 = \omega + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2 \quad (2)$$

this being the form used for estimating the parameters. After estimating the parameters ω , α and β , the long term variance can be calculated:

$$V_L = \frac{\omega}{1-\alpha-\beta} \quad (3)$$

In order to have a stable GARCH (1,1) it is necessary to $\alpha + \beta < 1$; otherwise the weight assigned to the long term variance (γ) would be negative.

If the GARCH model is stable, the variance tends to its long time value (V_L), which is known in the literature as mean reversion. If the parameter ω is equal to zero, the above mentioned phenomenon does not characterize the series, so it is not appropriate to use a GARCH model. An alternative would be the use of an EWMA model (Exponentially Weighted Moving Average), which is, in fact, a particular case of the GARCH model, having the following parameters $\gamma = 0$, $\alpha = 1 - \lambda$ and $\beta = \lambda$.

In order to estimate the parameters, we will use the maximum likelihood method, assuming that the daily returns follow a normal distribution with the mean equal 0 and variance v . Considering the probability density function for the normal distribution:

$$f(x) = \frac{1}{\sqrt{2v}} \exp\left(-\frac{u_i^2}{2v}\right) \quad (4)$$

the likelihood of m observations occurring in the order in which they are observed is:

$$L = \prod_{i=1}^m \left[\frac{1}{\sqrt{2\pi v}} \exp\left(-\frac{u_i^2}{2v}\right) \right] \quad (5)$$

Using the maximum likelihood method, the best estimate for the variance v is the value that maximizes equation (4).

Maximizing an expression is equivalent to maximizing the logarithm of the expression.

$$\ln L = \sum_{i=1}^m \left[-\ln v - \frac{u_i^2}{v} \right] \quad (6)$$

or equivalent:

$$\ln L = -m \ln(v) - \sum_{i=1}^m \frac{u_i^2}{v} \quad (7)$$

We will estimate the parameters ω , α and β so that the sum obtained through relation (6) or (7) is maximized, which implies using an iterative algorithm.

At the same time, based on the estimated parameters and the long time variance thus determined, we can calculate the expected variance after t days based on the following formula:

$$E[\sigma_{n+t}^2] = V_L + (\alpha + \beta)^t (\sigma_n^2 - V_L) \quad (8)$$

where $E[\sigma_{n+t}^2]$ represents the expected variance after t days.

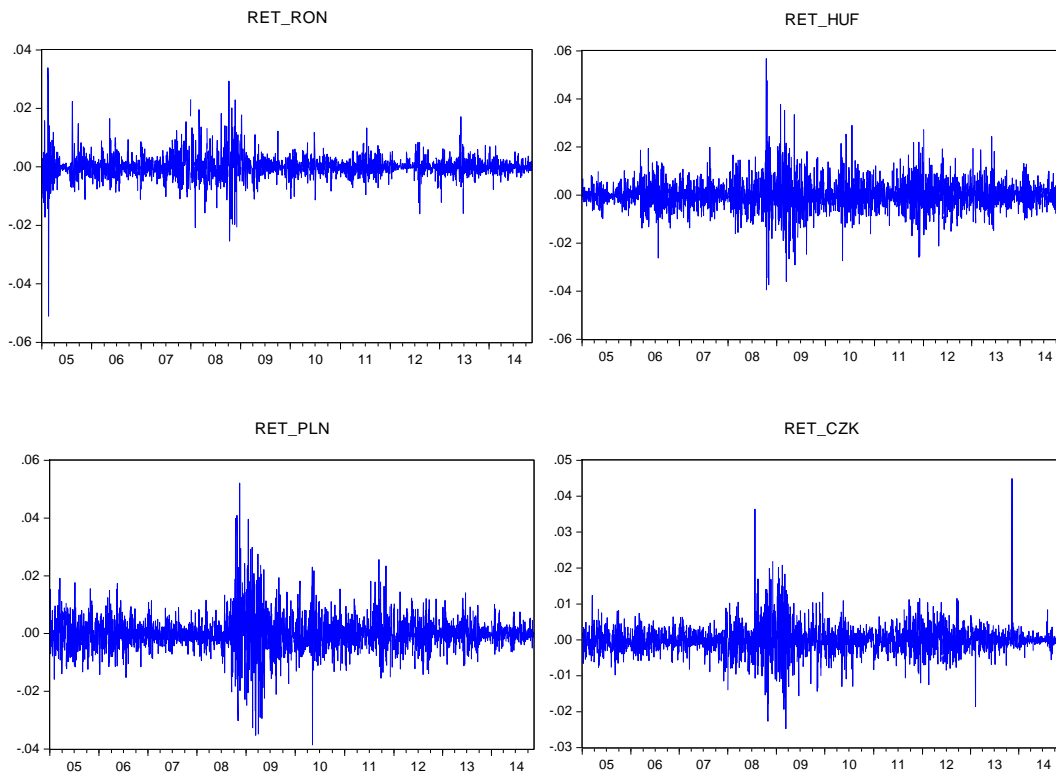
4. Data and empirical results

In the empirical analysis, we have used the exchange rate against the euro of the currencies from Romania, the Czech Republic, Hungary and Poland, respectively the following currency pairs: EUR/RON, EUR/CZK, EUR/HUF, EUR/CZK, for the period 01/03/2005-11/12/2014. The database has consisted of 2510 daily registrations, obtained from the National Bank of Romania's website, which were processed to logarithmic returns, as required by the model, based on the formula:

$$ret_X = \ln \left(\frac{X_t}{X_{t-1}} \right) \quad (9)$$

where X is the name of the initial series, respectively the exchange rate series.

Graph 1. *The exchange rate returns evolution*



Source: NBR, own calculations.

The statistical analysis confirms the presence of heteroskedasticity, and also the volatility clusters in the considered series, as it can be observed in the above graphics.

Table 1. Descriptive statistics:

	Ret_RON	Ret_HUF	Ret_PLN	Ret_CZK
Mean	4.78E-05	8.98E-05	1.37E-05	-3.74E-05
Median	-0.000112	-9.25E-05	-0.000249	-6.73E-05
Maximum	0.033856	0.056795	0.052089	0.044883
Minimum	-0.051064	-0.039443	-0.038604	-0.024748
Std. Dev.	0.004238	0.006665	0.006341	0.004115
Skewness	0.037232	0.418044	0.510303	0.751081
Kurtosis	18.6818	9.495183	10.57383	14.90942
Jarque-Bera	25699.11	4481.633	6103.268	15057.48
Probability	0.000000	0.000000	0.000000	0.000000

Source: NBR, own calculations

It can be seen that in all series, the mean tends to 0, which is consistent with the assumptions made by the model. Based on the historical data, the highest volatility was recorded by HUF (a standard deviation of 0.66% - equivalent to an annual volatility of 10.58%), while the standard deviation of CZK had a minimum level among the analyzed currencies, respectively 0.4115%, which corresponds to an annual volatility of 6.53%.

All four series have positive skewness, indicating the presence of heavy tails to the right, respectively a tendency of depreciation registered by the analyzed currencies relative the euro. Also, in practice, if the value of this indicator lies in the interval (-1,1), it can be considered that the analyzed series is not far from the symmetrical distribution, which is the case of the considered series.

Another feature of these series is the excess kurtosis, indicating a higher probability of occurrence of extreme values than that indicated by the normal distribution, the highest value being recorded in the case of the EUR/RON exchange rate return series (18.68). Thus, we could anticipate a greater volatility of the Romanian currency, compared to the others. The minimum value for this indicator is present in the case of the HUF, respectively 9.49, but this is also greater than the one corresponding to the normal distribution.

The Jarque-Bera test confirms the results provided by the other indicators, namely the fact that the distributions of the exchange rates returns analyzed are far from the normal distribution. Thus, the assumption that the data follow a normal distribution is a simplifying one, and relaxing it could represent a future research direction, for example by using a Student distribution.

Table 2. The results of applying the GARCH (1,1) model

	RON	CZK	HUF	PLN
α	0,1715	0,1269	0,0956	0,0855
β	0,8227	0,8564	0,8958	0,9059
γ	0,0058	0,0167	0,0086	0,0086
Long term volatility - daily	0,668%	0,506%	0,668%	0,567%
Long term volatility - annual	10,601%	8,039%	10,609%	8,998%

Source: NBR, own calculations.

Through the method of maximum likelihood, based on an iterative algorithm, we estimated the parameters of GARCH (1,1) in the case of the exchange rates returns EUR/RON, EUR/CZK, EUR/HUF and EUR/PLN, according to relation (2). The results obtained are summarized in the table above, α representing the weight associated to the squared return from the previous day, respectively of the last information available, β denoting the weight associated to the previous day variance, while γ is the weight of the long term variance. We note that in the case the EUR/RON exchange rate, the latest observation has the greatest influence on the next day conditional volatility, among the four series considered (the maximum value for the alpha parameter is 0.1715, followed by CZK - 0.1269 and HUF - 0.0956, while in the case of the PLN this value is minimum - 0.0855). Regarding the results obtained for beta, the highest value characterizes the zloty - 0.9059, followed by the forint - 0.8958 and the koruna - 0.8564, the leu recording the lowest value for this parameter - 0.8227. It can be noted that in the case of all series, the stability condition is verified ($\alpha + \beta < 1$). The weight associated to the long term variance, determined based on the relation $\gamma = 1 - \alpha - \beta$, takes values between 0.0056 and 0.0167, the lowest being in the case of the RON and the highest for the CZK, while those determined for PLN and HUF registered approximately the same values for this parameter, respectively 0.0086.

Based on the estimated parameters, α , β and ω , we have determined the long time variance according to equation (3), the volatility being calculated as the variance squared root. It should be noted that the results returned by the algorithm are daily, and in order to determine the annual volatility we have to apply the following transformation:

$$\text{Annual volatility} = \text{Daily volatility} * \sqrt{252} \quad (10)$$

It is found that the highest long time volatility is recorded in the case of the EUR/HUF exchange rate volatility (10.609%), a close value characterizing the EUR/RON exchange rate (10,601%), followed by the PLN, approximately 9%. Among the analyzed currencies, the less volatile is the CZK, approximately 8%.

Another point of interest is the determination of the conditional volatility, expected in the following day. Thus, the maximum value appears in the case of the EUR/PLN exchange rate, the expected daily volatility being equal to 0.642% - the equivalent annual volatility is 10.19%, followed by the HUF - a daily volatility of 0.335% and annual of 5.31%, CZK - daily volatility 0.318% and annual of 5.04% and RON - daily volatility of 0.713% and annual of 2.75%. It should be noted that in the case of the leu, the expected volatility is the most remote from the long time volatility, among the analyzed series, the difference, expressed in annual terms, being equal to 7.85 pp. The smallest difference between the conditional and the unconditional volatility is registered in the case of the CZK, respectively 3 pp. In the case of the PLN, the conditional expected volatility is larger than the long time volatility with about 1.91 pp., while for the other currencies, the conditional volatility is smaller than its long time value.

Based on the estimated parameters and the long time variance, we have determined, according to equation (9), the time interval in which the spread between the conditional and unconditional volatility will be reduced to half. As expected, the deviation from the long time variance will correct in the longest period in the case of the EUR/RON exchange rate, as the difference between the unconditional and the conditional variance will halve in about 118 days, while for the EUR/CZK, the deviation will correct in the shortest time, respectively in about 41 days. For the other two currencies, the difference between the long time variance and the current one will be reduced to half in about 80 days.

5. Conclusions

The present research has aimed to model the volatility of the currencies from Romania, the Czech Republic, Hungary and Poland, given the presence of heteroskedasticity in the series or more concrete to determine numerically the long time variance and current variance based on estimating a robust econometric model. The results have confirmed the validity of the GARCH (1,1) model for all the analyzed currencies, and the values obtained for the long time variance, belong to the interval 8% and 10.6%. These values are compatible with the nominal converge criteria related to the exchange rate which allows $\pm 15\%$ fluctuations from the central parity for a period of at least two years of participation in the ERM Mechanism, but the proper choice of the initial level should not be ignored.

Also, the current volatility is above the long time average only for the zloty, while the leu, the forint and the Czech crown have significantly lower expected volatilities than the long time level, the biggest difference being recorded in the case of the RON. Thus, it is expected a volatility increase in the case of the leu, forint and Czech crown, with major implications on the capital requirements calculated by the banks to cover the exchange rate risks. Also, it should not be ignored the effect that a volatility increase could have on the debtors in foreign currencies unhedged to exchange rate risks, as well as the additional uncertainties that would accompany such an evolution.

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A study of the impossible trinity in Romania

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Abstract. *Using a VECM and a Taylor type rule it was shown that the central bank kept the autonomy of the monetary policy as the policy rate was modeled primarily based on the evolution of the inflation rate. Forgoing the exchange rate stability is not possible due to the large volume of foreign currency loans and also to other factors. The inclusion in the central bank's objective function of a variable linked to the exchange rate may cause a conflict between inflation targeting and exchange rate management. Therefore, the best approach seems to be the use, in addition to the policy rate instrument, also of FX interventions. As for the liberalization of capital flows, the decision is at least questionable, given that, on one hand, foreign capital ended up holding a significant share in the economic activity and on the other, the macroprudential measures that authorities began to implement might have limited effects.*

Keywords: trilemma, monetary policy, exchange rate, policy rate, capital flows, Taylor rule.

JEL Classification: C12, E52, E58.

Introduction

The management of the national economy in a time of crisis is a difficult task, especially today when economies are interconnected. Empirically, it can be seen a noticeable development in the degree of financial integration as the dominant perception was that opening an economy to capital flows is the sure way to prosperity. Thus, two of the variables of the international financial system evolved as shown in the table below:

Table 1. *The evolution of exchange rate regimes and capital mobility*

The exchange rate regime	Gold Standard	Bretton Woods	Hybrid: Fixed and Flexible	Flexible
Capital flows	Free	Regulated	Regulated, but in a lesser degree	Free



As controls on capital mobility became more relaxed, practice has shown that one of the consequences was the emergence of conflicts between the fixed/stable exchange rates and monetary policy autonomy, so today exists the following constraint:

- maintaining the autonomy of monetary policy involves forgoing either the free capital flows or the exchange rate stability;
- maintaining exchange rate stability involves forgoing either the free capital flows or the autonomy of monetary policy;
- allowing free capital flows involves forgoing either the autonomy of monetary policy or the exchange rate stability.

This state of affairs became known as *the impossible trinity (or the trilemma)*.

1. The impossible trinity in Romania

Romania also faces this trilemma. According to the obligations accepted upon joining the European Union (EU), the country is obliged to allow free capital flows. In addition, the significant amount of liabilities denominated in EUR implies that the RON/EUR exchange rate needs to be stable. Finally, the objective of the central bank i.e. to ensure and maintain price stability requires the existence of an autonomous monetary policy. Since the free capital flows cannot be restricted, it should be made a choice between the autonomy of the monetary policy and exchange rate stability. In order to see what each choice implies, we will analyze each component of the trilemma.

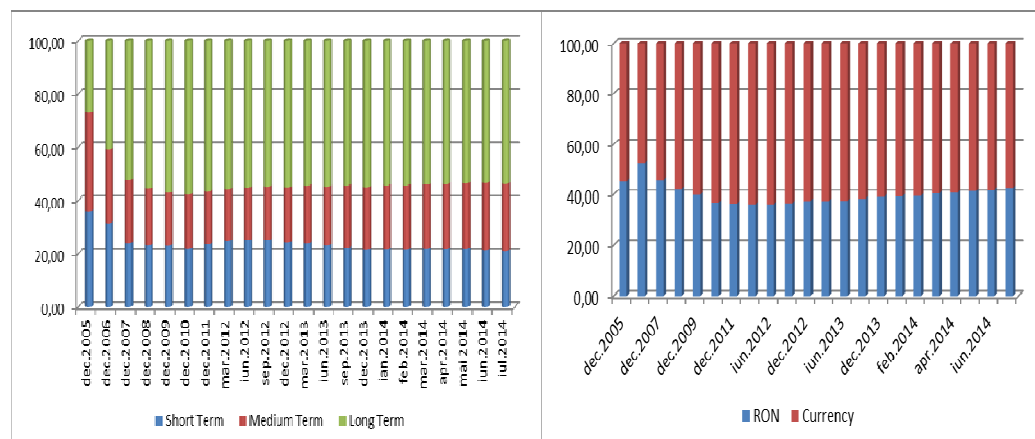
1.1. The exchange rate stability

The exchange rate raises the problem of determining when it deviates from the equilibrium value and what to do in that case. If the exchange rate is undervalued, then no interventions are required, because the capital inflows will assure the return to the equilibrium level. Moreover, Gala (2008, cited in Gabor 2010: p.13) shows that undervalued currencies allow investment-led growth models, which lead to the development of trade with the external sector. The typical examples in this respect are the countries from East Asia and, in particular, China. In the other case, however, an

overvaluation requires action. After Demir (2009: pp. 672-692), overvalued currencies can support growth episodes based on consumption and increased current account deficits, which will be financed through short-term debt. Gabor (2010: p. 14) shows that short-term foreign loans in Eastern Europe highlight the dangerous link between an overvalued exchange rate and credit booms.

No doubt that in an emerging economy like that of Romania, the exchange rate plays a more important role than in advanced economies, because of the mismatch between the currency denomination of a significant amount of debt and the incomes of the borrowers. This reality does not allow the central bank to ignore exchange rate movements. In particular, it presents interest the banking sector in Romania, and, according to the Financial Stability Report published by the National Bank of Romania, the credit structure is as shown in the charts below:

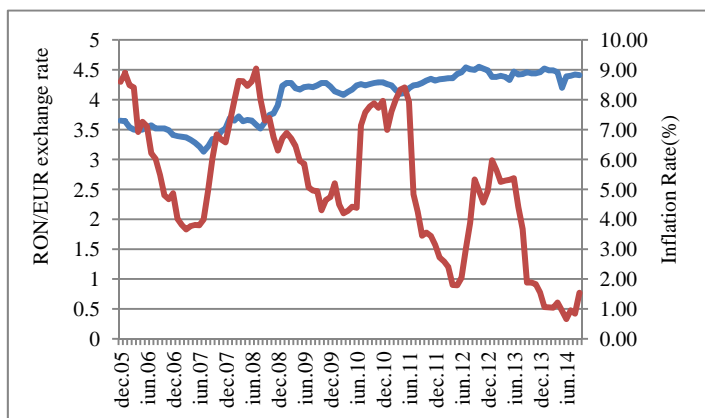
Figure 1. Loans granted to the private sector by denomination and maturity



Source: NBR's Financial Stability Report data, 2014.

It can be seen that a significant share of these loans was given on medium or long term, so it becomes even clearer that ignoring the exchange rate movements cannot be an optimal approach, given the difficulties that borrowers would have with repaying the debt in the event of a depreciation. This observation is supported also by the fact that foreign currency lending was riskier than that in RON, as the NPL ratio of the loans denominated in foreign currency exceeded that of the loans denominated in RONs since August 2013 (23% versus 20.7% as of August 2014).

From the central bank's point of view, at least in the medium and long term, the consensus is that between exchange rate stability and inflation there is a correlation which involves a depreciation of the currency that registers a higher inflation as a result of the loss of purchasing power. In other words, exchange rate stability is also an anti-inflationary factor, as shown by the chart below:

Figure 2. *The evolution of the RON/EUR exchange rate and the inflation rate*

Source: NBR, author's calculations.

It can be seen that since late 2008, the exchange rate stability played an important role in anchoring the inflation expectations of the public, as the inflation rate registered a downward trend (excepting the shocks caused by measures such as the increase of the value added tax by 5%, from 19% to 24% in June 2010). In fact, this correlation is obvious, given that the Romanian economy is open, small and euroised.

The conclusion that these issues cannot be ignored by the central bank is supported also by Caraiani (2011: p. 36) who, after investigating several types of monetary rules that include a variable for the exchange rate, concluded on the basis of the estimated coefficients for that variable that the central bank has responded to its movements. The importance that the central bank attaches to the exchange rate can also be seen in the report drafted by the International Monetary Fund's experts at the completion of the first and second review missions of the standby agreement signed in 2013. The report states that *"the exchange rate remained largely stable, in part due to the central bank support for the currency"* and although *"the real exchange rate remains broadly in line with fundamentals ... the NBR should allow the exchange rate to adjust with market conditions and limit interventions in the support of the RON"* (2014: p. 7 and p. 15).

2.2. The free capital flows

The idea of free capital flows derived from the finding that the liberalization of the international trade was beneficial for the general welfare, so it was thought that a similar approach to capital movements will bring the same results. Estimations were that foreign capital will enter a country until profitable investment opportunities are exhausted so that there can be no excessive capital inflows or outflows. These potential benefits of the free capital flows became a pillar of the international politics since the 1980s, but the practical experience of developing countries raised more and more questions. The literature contains many studies regarding their effects and a summary is made by the International Monetary Fund. Thus, according to some, the free capital flows bring benefits (Edwards, 2001; Arteta, Eichengreen and Wyplosz, 2001 quoted by IMF, 2010: p.8) and it seems

that the economies more developed financially and institutionally benefit more than others, while others show that free capital flows do not lead to a stronger economic growth (Rodrik, 1998 quoted by IMF, 2010: p.8), while Prasad, Rajan and Subramaniam (2007 quoted by IMF, 2010: p.8) believe that countries which avoid foreign capital can enjoy a growth premium. Since 2010, even the IMF has begun to accept the need of certain tools and/or institutional mechanisms to manage the volatility of capital flows. Such tools are macroprudential measures and capital controls. Ostry et al. (2010: p. 15) consider that if prudential measures are not sufficient, then capital controls can be used to reduce the risks associated with their volatility. Nier et al. (2015) show that emerging economies have less means to control capital flows, so it would be more appropriate to implement prudential measures that improve the resilience of national financial systems.

Romania has committed to liberalize capital flows in accordance with those stipulated in Article 56 of the Treaty establishing the European Community, which prohibits any restriction on the movement of capital between Member States and between Member States and third countries. Consequently, in this regard there is no room for maneuver, so the analysis will be limited to a brief discussion of their effects.

In Romania, capital inflows were driven by the existing opportunities to purchase assets in the Romanian economy, the interest differential between local and home interest rates and the existence of an excess of liquidity in advanced economies.

The crisis has shown that these capitals are volatile, which questions how useful they can be to ensure the so-called sustainable growth, given that their purpose is to make profit and not necessarily to help the economy. Thus, after five years of net capital inflows, in 2009 they reduced significantly (outflows totaling EUR 8.8 billion), which forced the authorities to enter into a financing agreement with the IMF, EU and the WB. Capital inflows resumed in 2010 (up to EUR 2.3 billion), in 2013 totaled EUR 2.6 billion and in the first seven months of 2014 amounted to EUR 1.3 billion.

It is also important to see what role has the Romanian capital in generating economic activity. For instance, in the banking sector, which is the main source of financing the economy, foreign banks held constantly over 85% of banking assets between 2007 and 2013. As of end July 2014, this share fell to 81%. According to some data released on September 4, foreign investors have a vital position in determining the specialization trends in the Romanian economy, given that more than 72% of the turnover of large and very large companies in the industry is produced by the subsidiaries of multinationals. Moreover, out of the 100 largest exporters, which provide over 52% of total exports, 96 are foreign-owned companies and from the total 34 sub-branches of industry, 25 leading companies are with foreign capital. Under this conditions, Romania ended up being very dependent in many respects of the European markets (2/3 of economic flows, financial sector controlled by groups in the EU, etc.), making the industrial and economic activity subject to decisions "*which frequently are not taken here*" (Dăianu, 2014: p. 29). In terms of how the profits are divided between labor and capital, the remuneration of the employees accounts for only 37.1% of the gross value added at national level, being the

lowest percentage in the European Union, where the average is placed at 53.6% (Chirca, 2014).

Given these figures, the question is whether the acceptance of free capital flows was the right decision, as, after some authors, there is no reason for emerging economies to allow such freedom, opinion with which I tend to agree.

2.3. The autonomy of monetary policy

The autonomy of monetary policy will be judged based on how the central bank adjusted the policy rate to respond to inflation. To investigate how the central bank modeled the policy rate, the following data is used: NBR's policy rate, inflation deviation from the target, calculated as the difference between registered and targeted inflation and the economic sentiment indicator (ESI) as a measure of the deviation of GDP from its natural level. Using ESI as a benchmark for economic activity is supported by the correlation coefficient between ESI and GDP (quarterly averages), which has the value of 0.6 (Appendix 1). In short, the ESI is a combination of five indicators that measure the confidence of producers and consumers from five economic sectors: industry (40% weighting), services (30%), consumers (20%), construction (5%) and retail trade (5%). These weights are based on two criteria, namely the "representativeness" of the industry and the correlation with the reference variable, in this case GDP.

A Taylor-type relationship will be used:

$$i_t = \gamma + \rho x i_{t-1} + \alpha x (\pi_t - \pi^*) + \beta x (y_t - y^*) \quad (1)$$

where i_t is the interest rate in period t , ρ is the autoregressive coefficient, π_t is the inflation rate, π^* is the desired rate of inflation, and $(y_t - y^*)$ is the GDP gap.

The key policy parameters α and β are both assumed to be greater than zero. They indicate how much the central bank allows the policy rate to respond to fluctuations in inflation and output. The larger the value of α , the more responsive the central bank is to the deviation of inflation from its target; the larger the value of β , the more responsive the central bank is to the deviation of GDP from its natural level. Traditionally, the focus is on inflation and for a change of 1% of its level the central bank should adjust the policy rate by $\alpha\%$. Thus, if inflation rises over the target or GDP over its natural level, which can be seen as an overheating of the economy, the policy rate increases. In the opposite situation, the policy rate decreases. The autoregressive coefficient ρ is calibrated at the value of 0.9. Thus, the analysis highlights the estimation coefficients for the ESI and inflation deviations and controls for a certain degree of persistence in the policy rate.

Two equations will be monitored:

$$Policy_rate = 0.9 x Policy_rate (-1) + \gamma + \alpha x Dev_Infl \quad (2)$$

$$Policy_rate = 0.9 x Policy_rate (-1) + \gamma + \alpha x Dev_Infl + \beta x Gap_ESI \quad (3)$$

By moving the term $0.9 x Policy_rate (-1)$ to the left side of the equations and using the Eviews software we obtain:

Figure 3. Results for equations (2) and (3)

Dependent Variable: POLICY_RATE-0.9*POLICY_RATE(-1)					Dependent Variable: POLICY_RATE-0.9*POLICY_RATE(-1)				
Method: Least Squares					Method: Least Squares				
Date: 06/05/15 Time: 13:56					Date: 06/05/15 Time: 13:58				
Sample (adjusted): 2006M01 2014M12					Sample (adjusted): 2007M01 2014M12				
Included observations: 108 after adjustments					Included observations: 96 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEV_INFL	0.096387	0.013723	7.023668	0.0000	DEV_INFL	0.102527	0.012669	8.092760	0.0000
C	0.483877	0.035412	13.66440	0.0000	GAP_ESI	0.008926	0.003005	2.970761	0.0038
					C	0.470033	0.034701	13.54541	0.0000
R-squared	0.317590	Mean dependent var	0.638194		R-squared	0.434576	Mean dependent var	0.600812	
Adjusted R-squared	0.311152	S.D. dependent var	0.347734		Adjusted R-squared	0.422416	S.D. dependent var	0.339964	
S.E. of regression	0.288608	Akaike info criterion	0.370853		S.E. of regression	0.258369	Akaike info criterion	0.161898	
Sum squared resid	8.829253	Schwarz criterion	0.420522		Sum squared resid	6.208190	Schwarz criterion	0.242034	
Log likelihood	-18.02608	Hannan-Quinn criter.	0.390992		Log likelihood	-4.771118	Hannan-Quinn criter.	0.194291	
F-statistic	49.33191	Durbin-Watson stat	1.188619		F-statistic	35.73916	Durbin-Watson stat	1.442838	
Prob(F-statistic)	0.000000				Prob(F-statistic)	0.000000			

For both equations the estimated coefficients have a positive sign and are significant at 1% level (t-test) and the null hypotheses of the coefficients are rejected (p-value less than 5%). Regarding the validation of the regression models, in both cases the probability associated with the F-test shows that the models adjust well the sample data. Since the coefficient of determination R^2 is higher in the second case (43% vs. 31%), we will check whether the second model used is valid by testing the errors' correlation, their heteroskedasticity and if they are normally distributed. The value of the determination coefficient is affected by the period under review, which includes both economic growth and recession and can be considered as a sign that the central bank also included in the objective function other variables than inflation deviation and GDP gap.

The errors' correlation was tested using a Breusch-Godfrey test and the p-value is less than 5%, indicating that it cannot be eliminated the hypothesis that correlation exists. The heteroskedasticity test calculates a p-value of 5.07%, which means that it can be accepted that the errors are not heteroskedastic. As for checking if the errors are normally distributed, a Jarque-Bera test was used and the result shows that this hypothesis can be rejected, as p value is less than 5%.

Figure 4. Error correlation tests' results for equation (3)

Breusch-Godfrey Serial Correlation LM Test:				Heteroskedasticity Test: Breusch-Pagan-Godfrey					
F-statistic	973.2861	Prob. F(2,104)	0.0000	F-statistic	3.079133	Prob. F(2,93)	0.0507		
Obs*R-squared	102.5225	Prob. Chi-Square(2)	0.0000	Obs*R-squared	5.962121	Prob. Chi-Square(2)	0.0507		
				Scaled explained SS	12.22120	Prob. Chi-Square(2)	0.0022	Jarque-Bera	25.86203
								Probability	0.000002

These results imply the use of a more complex model, which makes use of the long-term relationship between the variables. In this respect, it was tested whether the relationship between the variables can be highlighted with a vector error correction model (VECM). For this, it was tested the stationarity of the series and if relations of cointegration are present. The assessment of the series' stationarity was based on the search for the presence of unit roots. In this respect, it was used an Augmented Dickey-Fuller test, which is based on a regression equation which includes a constant (intercept). Associated p-values (0.8353, 0.3117 and 0.2399) show that the hypothesis of a unit root existing

cannot be excluded for any series, so we can say that these series are non-stationary. The cointegration was tested using the Johansen test. Results show that the lack of cointegration hypothesis can be rejected on the basis of p-value (0.1% and 0.28%) which are both less than 5%. The results are presented in Appendix 2.

The presence of cointegration and the non-stationary nature of the series allow the use of a VECM. Using this model is justified because it will generate for the cointegrated variables series that will evolve together. Otherwise, the series will evolve independently, each according to its stochastic trend and, therefore, inconsistent with historical data. According to the estimation (Appendix 3), the relationship between the policy rate and the other variables is:

$$D(\text{Policy_rate}) = C(1) \times (\text{Policy_rate}(-1) - 2.18305209268 \times \text{Dev_Infl}(-1) - 0.313023976688 \times \text{Gap_ESI}(-1) - 4.20276989541) + C(2) \times D(\text{Policy_rate}(-1)) + C(3) \times D(\text{Policy_rate}(-2)) + C(4) \times D(\text{Dev_Infl}(-1)) + C(5) \times D(\text{Dev_Infl}(-2)) + C(6) \times D(\text{Gap_ESI}(-1)) + C(7) \times D(\text{Gap_ESI}(-2)) + C(8). \quad (4)$$

According to the VECM design, the equation has two components: the cointegration relation:

$$C(1) \times (\text{Policy_rate}(-1) - 2.18305209268 \times \text{Dev_Infl}(-1) - 0.313023976688 \times \text{Gap_ESI}(-1) - 4.20276989541)$$

and the modelling of the dependant variable according to its historical values and the evolution of the other variables: $C(2) \times D(\text{Policy_rate}(-1)) +$

$$C(3) \times D(\text{Policy_rate}(-2)) + \\ C(4) \times D(\text{Dev_Infl}(-1)) + \\ C(5) \times D(\text{Dev_Infl}(-2)) + \\ C(6) \times D(\text{Gap_ESI}(-1)) + \\ C(7) \times D(\text{Gap_ESI}(-2)) + \\ C(8).$$

Based on this design, the unit roots are eliminated and the VECM has integrated some persistence, which allows the discarding of the autoregressive coefficient.

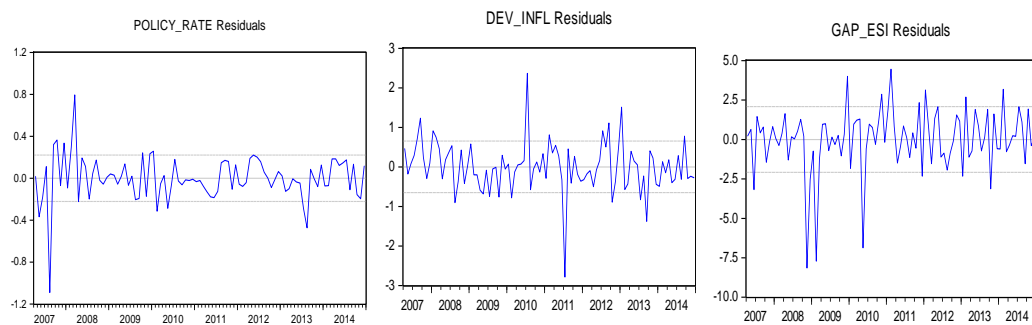
The analysis reveals that the coefficient C(1) is significant (p-value below 5%) and negative, which indicates the presence of long-term correlation and that the two variables influence the dependent variable (Appendix 4). The Breusch-Godfrey test shows that the hypothesis of error correlation can be eliminated (p-value above 5%). Also the heteroskedasticity test calculates a p-value of 13.93%, which means that the errors are not heteroskedastic (see Figure 5).

Figure 5. Error correlation tests' results for equation (4)

Breusch-Godfrey Serial Correlation LM Test:				Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.030663	Prob. F(2,83)	0.3613	F-statistic	1.572579	Prob. F(9,83)	0.1370
Obs*R-squared	2.253708	Prob. Chi-Square(2)	0.3241	Obs*R-squared	13.54818	Prob. Chi-Square(9)	0.1393
				Scaled explained SS	54.47581	Prob. Chi-Square(9)	0.0000

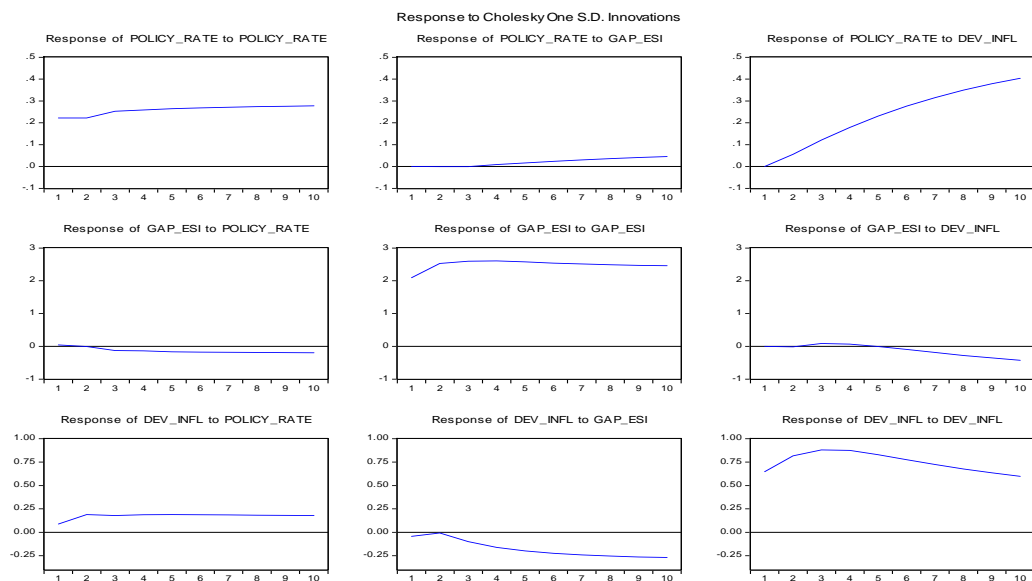
The visual inspection of the errors shows no signs of autocorrelation. With certain isolated exceptions, the lack of errors' autocorrelation is confirmed by the autocorrelation functions, i.e. by maintaining the estimated values within the confidence intervals of +/- 5% (Appendix 5).

Figure 6. VECM equations' residuals



The consistency of the relationship between the policy rate and the two explanatory variables is confirmed by the impulse response functions (positive sign, see Figure 7). The magnitude of the estimated response to the inflation deviation from the target is superior to the one corresponding to the proxy variable used for the economic activity (ESI), which shows that central bank's monetary policy was in line with its fundamental objective.

Figure 7. The impulse response functions of the VECM



3. Conclusions

The impossible trinity remains an actual issue. In the case of Romania, given that allowing free capital flows is a commitment assumed with the accession to the EU, the trilemma comes down to deciding what is discarded: the autonomy of monetary policy or the exchange rate stability. Research has shown that the central bank kept the autonomy of the monetary policy as the policy rate was modelled primarily based on the evolution of the inflation rate. Forgoing the exchange rate stability is not possible due to the large volume of foreign currency loans and also to other factors. Consequently, the central bank tried to achieve both goals most likely by including in its objective function a variable for the exchange rate. Such an approach may cause a conflict between inflation targeting and exchange rate management. If the central bank decreases the policy rate to counter deflationary pressures, the consequence is that this may depreciate the local currency, inducing the risks described in chapter 2.1. Further, these risks may not allow the central bank to cut the policy rate to the desired level, limiting the central bank's reaction. In contrast, if the cut of the policy rate is accompanied by a direct intervention on the exchange rate, then the former can be properly set. Therefore, an interim conclusion that can be drawn is that the best approach would be to use, in addition to policy rate instrument, foreign exchange interventions to increase the efficiency of the response to exchange rate fluctuations. The data presented in this article supports such a finding.

Due to the liberalization of capital flows, foreign capital ended up playing a decisive role in the economy, judging by its share in industry and exports. One of the consequences of this matter was a low wage level compared to the EU average. This raises the question whether the acceptance without many questions of the recommendation of allowing free capital flows was the right choice. Moreover, according to some authors, there is no reason for emerging economies to allow such freedom, opinion with which I tend to agree.

Overall, in Romania's case, the central bank can't forgo the autonomy of monetary policy or the exchange rate stability, so it should use, besides the policy rate instrument, also instruments to support the currency. As for the liberalization of capital flows, the decision is at least questionable, given that, on one hand, foreign capital holds a significant share in the economic activity and thus has the important decisions and on the other, the macro-prudential measures that authorities began to implement might have limited effects.

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Appendix 1

ESI & GDP correlation = 0.6 (using Excel)

Quarter	AVG ESI	Dev_ PIB
2007Q1	10,70	1,49
2007Q2	9,63	1,40
2007Q3	9,93	1,43
2007Q4	10,03	3,01
2008Q1	9,13	3,51
2008Q2	8,40	1,97
2008Q3	7,07	0,45
2008Q4	0,30	-1,54
2009Q1	-14,00	-6,13
2009Q2	-17,73	-0,81
2009Q3	-17,67	0,54
2009Q4	-16,40	-0,23
2010Q1	-13,03	-0,70
2010Q2	-14,73	0,26
2010Q3	-16,20	-0,94
2010Q4	-12,30	1,16
2011Q1	-5,77	0,24
2011Q2	-4,93	-0,19
2011Q3	-6,07	1,33
2011Q4	-7,27	-0,31
2012Q1	-4,57	-0,57
2012Q2	-2,37	1,62
2012Q3	-5,07	-0,96
2012Q4	-5,33	0,19
2013Q1	-4,97	1,28
2013Q2	-4,43	1,40
2013Q3	-3,47	0,92
2013Q4	-4,70	0,89
2014Q1	-3,33	0,73
2014Q2	-2,57	-0,37
2014Q3	0,13	1,76

Appendix 2

The Augmented Dickey-Fuller test results for *Policy_rate*, *Gap_ESI* and *Devl_Infl*

Null Hypothesis: POLICY_RATE has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.723611	0.8353
Test critical values:		
1% level	-3.494378	
5% level	-2.889474	
10% level	-2.581741	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GAP_ESI has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.942504	0.3117
Test critical values:		
1% level	-3.501445	
5% level	-2.892536	
10% level	-2.583371	

Null Hypothesis: DEV_INFL has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.113465	0.2399
Test critical values:		
1% level	-3.492523	
5% level	-2.888669	
10% level	-2.581313	

The Johansen cointegration test results for *Policy_rate*, *Gap_ESI* and *Devl_Infl*

Date: 02/18/15 Time: 13:38
 Sample (adjusted): 2007M03 2014M12
 Included observations: 94 after adjustments
 Trend assumption: Linear deterministic trend
 Series: POLICY_RATE DEV_INFL GAP_ESI
 Lags interval (in first differences): 1 to 1
 Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.268030	42.52037	29.79707	0.0010
At most 1	0.117385	13.19085	15.49471	0.1080
At most 2	0.015343	1.453404	3.841466	0.2280

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values
 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.268030	29.32952	21.13162	0.0028
At most 1	0.117385	11.73745	14.26460	0.1209
At most 2	0.015343	1.453404	3.841466	0.2280

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Appendix 3

Vector Error Correction Estimates

Date: 02/27/15 Time: 11:46

Sample (adjusted): 2007M04 2014M12

Included observations: 93 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1		
POLICY_RATE(-1)	1.000000		
GAP_ESI(-1)	-0.313024 (0.10281) [-3.04466]		
DEV_INFL(-1)	-2.183052 (0.47744) [-4.57241]		
C	-4.202770		
Error Correction:	D(POLICY_RATE)	D(GAP_ESI)	D(DEV_INFL)
CointEq1	-0.026062 (0.00692) [-3.76732]	0.016514 (0.06524) [0.25313]	0.027531 (0.02042) [1.34806]
D(POLICY_RATE(-1))	-0.007603 (0.10194) [-0.07458]	-0.253109 (0.96131) [-0.26330]	0.318280 (0.30094) [1.05762]
D(POLICY_RATE(-2))	0.092444 (0.10197) [0.90656]	-0.594739 (0.96162) [-0.61848]	-0.177246 (0.30104) [-0.58879]
D(GAP_ESI(-1))	-0.006709 (0.01147) [-0.58499]	0.214348 (0.10815) [1.98197]	0.031581 (0.03386) [0.93280]
D(GAP_ESI(-2))	-0.008330 (0.01156) [-0.72093]	-0.003913 (0.10897) [-0.03591]	-0.044627 (0.03411) [-1.30823]
D(DEV_INFL(-1))	0.029293 (0.03605) [0.81259]	0.003842 (0.33995) [0.01130]	0.320932 (0.10642) [3.01566]
D(DEV_INFL(-2))	0.024840 (0.03708) [0.66997]	0.234804 (0.34964) [0.67156]	0.060739 (0.10946) [0.55492]
C	-0.052987 (0.02487) [-2.13019]	-0.116695 (0.23457) [-0.49749]	-0.001196 (0.07343) [-0.01629]
R-squared	0.318061	0.062076	0.152621
Adj. R-squared	0.261901	-0.015164	0.082836
Sum sq. resids	4.178669	371.5953	36.41722
S.E. equation	0.221722	2.090863	0.654552
F-statistic	5.663509	0.803673	2.187037
Log likelihood	12.30993	-196.3734	-88.36484
Akaike AIC	-0.092687	4.395126	2.072362
Schwarz SC	0.125171	4.612984	2.290220
Mean dependent	-0.057312	-0.089247	-0.014301
S.D. dependent	0.258079	2.075188	0.683472
Determinant resid covariance (dof adj.)		0.089927	
Determinant resid covariance		0.068659	
Log likelihood		-271.3288	
Akaike information criterion		6.415673	
Schwarz criterion		7.150944	

Appendix 4

Equation (3) coefficients

System: UNTITLED

Estimation Method: Least Squares

Date: 02/23/15 Time: 15:11

Sample: 2007M04 2014M12

Included observations: 93

Total system (balanced) observations 279

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.026062	0.006918	-3.767318	0.0002
C(2)	-0.007603	0.101941	-0.074578	0.9406
C(3)	0.092444	0.101973	0.906558	0.3655
C(4)	-0.006709	0.011468	-0.584992	0.5591
C(5)	-0.008330	0.011555	-0.720930	0.4716
C(6)	0.029293	0.036049	0.812592	0.4172
C(7)	0.024840	0.037077	0.669967	0.5035
C(8)	-0.052987	0.024874	-2.130189	0.0341

Determinant residual covariance 0.068659

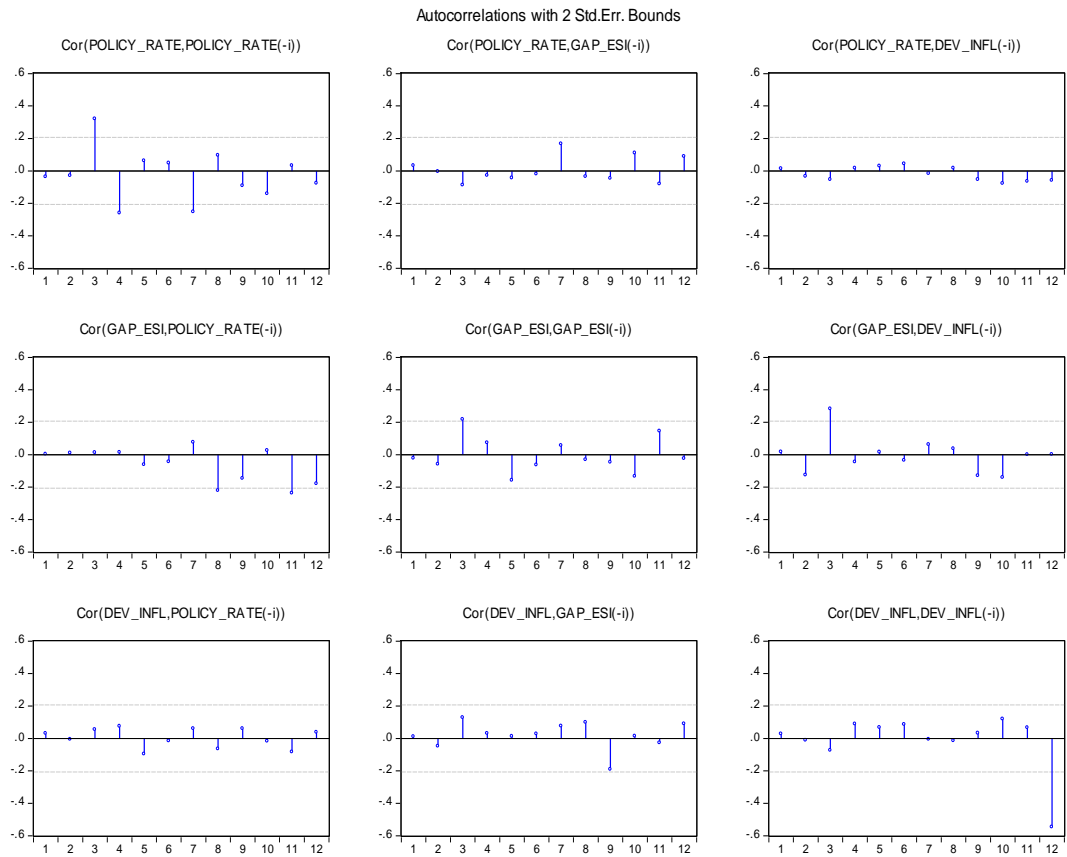
Equation: $D(\text{POLICY_RATE}) = C(1) * (\text{POLICY_RATE}(-1) - 0.313023976688 * \text{GAP_ESI}(-1) - 2.18305209268 * \text{DEV_INFL}(-1) - 4.20276989541) + C(2) * D(\text{POLICY_RATE}(-1)) + C(3) * D(\text{POLICY_RATE}(-2)) + C(4) * D(\text{GAP_ESI}(-1)) + C(5) * D(\text{GAP_ESI}(-2)) + C(6) * D(\text{DEV_INFL}(-1)) + C(7) * D(\text{DEV_INFL}(-2)) + C(8)$

Observations: 93

R-squared	0.318061	Mean dependent var	-0.057312
Adjusted R-squared	0.261901	S.D. dependent var	0.258079
S.E. of regression	0.221722	Sum squared resid	4.178669
Durbin-Watson stat	2.070184		

Appendix 5

Corellogram for equation (4)



Governance process improvement and development by audit consolidation

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Abstract. *The necessity of governance process improvement for reaching strategic objectives represents a condition in the given macroeconomic context for society's development reforms continuation. Starting from the legal framework ruling audit activities and from the role of specialized structures within the Ministry of Finance whose purpose is "the carrying out of audit missions of national interest with multi-sectorial implications", one can easily observe the permanent preoccupation for increasing and improving the quality of audit activities, fact which is also demonstrated and enforced by literature.*

The paper analyses using a holistic approach the audit system and its importance for the management accountability in organizations, especially of public ones. The analysis supports administration process optimization and contributes to the consolidation of (internal) audit activities within organizations.

The used research method is participative observation. This qualitative approach has a major role, by allowing the description and analysis of (internal) audit activities and the consolidation of its importance in the sustainable development of both the economy as well as the public administration by continuous improvement of governance processes.

The results of the research will generate a set of conclusions about the importance of audit activities for the governance processes. Also, some propositions will be made, which help public audit fulfil the requirements of the Public Finance Ministry, and improve the governance and management of public entities.

Keywords: audit consolidation, governance processes, strategy and sustainable development.

JEL Classification: G3, H83, M4.

1. Introduction

The governance structures have as main purpose the management of organization by means of specific processes and the assurance of their sustainable development. Thus, through their relationship with the organization, but also with the environment where it performs its activity, some of them of a hierarchical nature, the governance structures are meant to ensure the conceptual, strategic, formal and operational support, as well as with elements such as vision or organizational culture, which will define the organization and its place in the social and economic environment. This is valid both for the private entities and for those in the public sector.

An especially important place is occupied by audit in these structures, both the internal and the external type. Starting from the legal framework, corroborated with the specialty literature, which define and establish audit as an integral and essential part of the governance structures, offering it the instruments necessary for reaching the objectives (Dumitrescu and Dumitrescu Peculea, 2014: 103), audit acts at all levels of the organizations through missions, in order to be able to bring plus value to the organization, seen as a whole. The early detection of the possible problems, as well as the identification of the improvement possibilities for the activities, thus constituting the main concern of audit (Allegrini et al., 2009: 1-3).

The modernization of audit presupposes the consolidation of its position within the governance structures, as well as its redefining as guaranteeing factor of sustainable development of organizations. Also, it is important to redefine the image of audit, especially in the public sector, into what it represents, namely, a management support activity, an attribute thereof, which, by means of its actions, aids in the organization development, and, therefore, a migration of the employees' perception, from a coercive instrument to a constructive one.

2. The relations of audit with the organization in the context of the governance structures

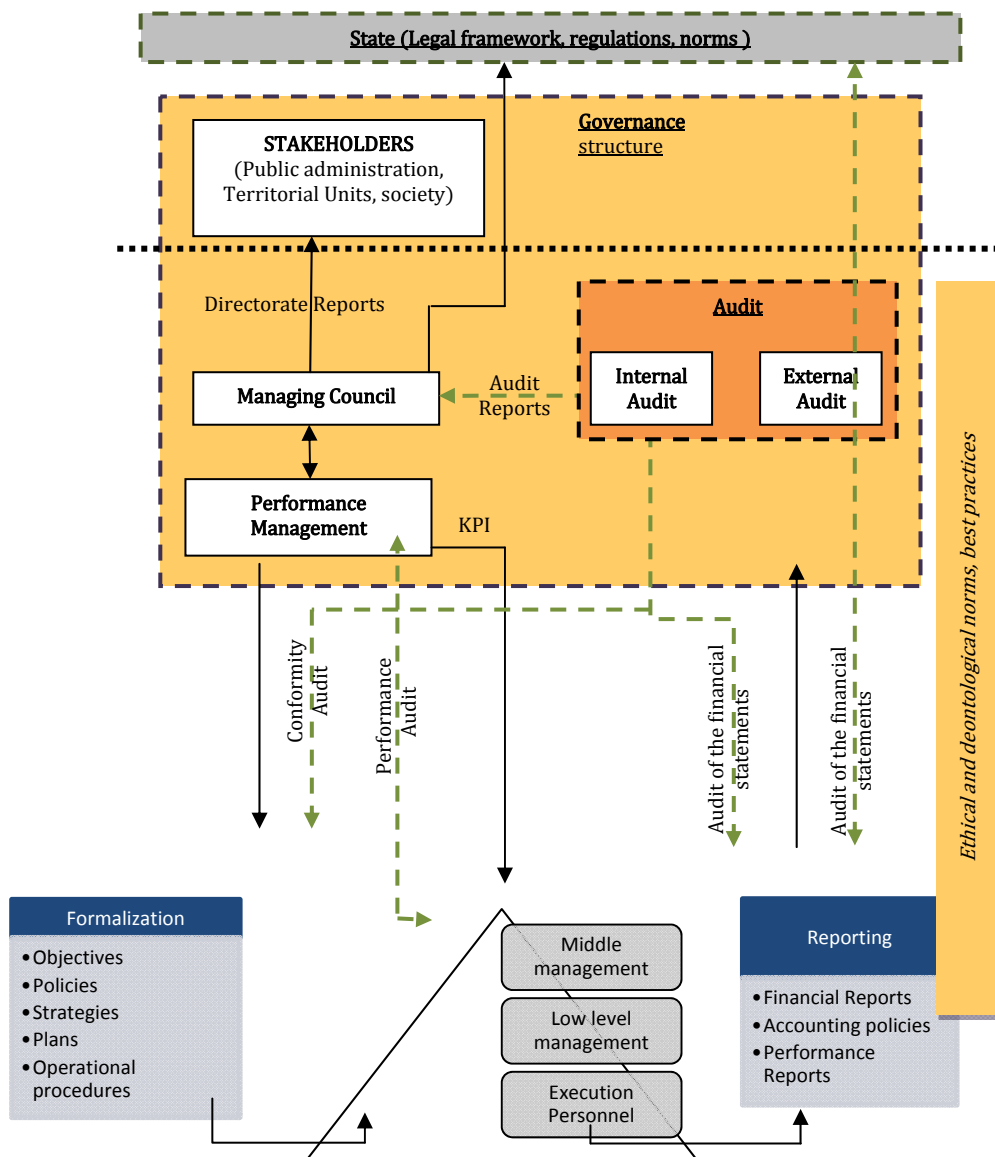
International Audit Standards (ISA) define audit as an independent activity of objective insurance and counseling, meant to add value and improve an organization's operations and processes. Using a systematic and methodical approach, this activity evaluates and improves the efficacy of risk management, control systems and governance processes (ISA; OUG 75/1999; Law 672/2002). Each audit compartment elaborates internal norms regarding the carrying out of audit activities. These norms are being elaborated according to audit standards for private entities, respectively, methodological norms for public institutions, as well as the code for ethical conduit of the internal auditor and best practices in the field.

The modern 21st century organization is complex, with actions and interactions at all levels. In this context, the existence of structures which to manage the development processes, both at the conceptual and at the strategic level is absolutely necessary, such as to ensure the sustainability of the organization's evolution (see also Abdel-Meguid et al., 2013: 283-307). In this sense, the complex structures need well-designed verification and

control organisms, which to benefit of the entire power conferred by the previously mentioned regulations (ISA; OUG 75/1999; Law 672/2002).

In the model presented in Figure 1, the environment is represented in a simplified manner by the state and the good practices in the organization’s field activity. For the purposes of the paper it is enough to restrict the model to these two components.

Figure 1. Functional model of governance within organizations



Source: Based on Ghita (2009).

The evolution in time and the development of any organization creates structures similar to the one in the figure. Of course, depending on the specific of the organization, differences may emerge. Thus, in case of companies in the private field, instead of „Stakeholders” we will have shareholders (see Anand and Moloney, 2004: 223-292). This structure represents a layered model in six layers set over a core, which is reached by adding a new layer over what already exists, as the organization develops and faces new problems and challenges.

In such a structure, the core is always formed of management and internal processes, represented in the lower part of the triangle figure. The first layer is added from the initial stages of the organization’s development, the need to formalize the activities. This is materialized through the formulation of objectives, policies, strategies, plans and operational procedures, which are sent and implemented hierarchically in the entire organization. Together with the formalization of activities emerges the need to report results. We must mention the fact that here we do not refer directly to accounting because there is a legal requirement, according to which accounting must be organized from the first day of existence of the organization, but to the need of management to use the data from accounting (financial reports) in order to determine the degree of achieving the objectives (Vera-Munoz, 2005: 115-127). To the financial reports, as evaluation report for the degree of reaching the objectives, the performance reports are added.

The third layer is represented by the adoption of the ethical standards, of the deontological norms and of the good practices in the organization’s activity field. The deontological and ethical norms are just as important in the public administration and in the private environment, but acts differently. Also, in this stage, the organization begins the process of alignment and certification to the professional standards in the activity field (Fulop and Crisan, 2013: 5-12). The fourth layer is represented by the contracting of the activities of verifying the financial situations by means of the external audit. Until this moment, we could not speak of a governance structure within the organization. Together with the adding of the fourth layer, they start to come into being.

With the introduction of the fifth layer, the one corresponding to the internal audit, the governance structure begins to shape. There are here major differences between the public and the private sector, both with respect to the instruments used and to the fields covered, public internal audit covering a much wider range of activities than the private one, also including performance audit (Fulop and Crisan, 2013: 5-12).

With the institutionalization of internal audit, the governance structure becomes final. At the same time, due to the actions of internal audit, a new concept emerges, that of performance management. We do not refer here to the institutionalization of performance management, because this does not happen in reality, except in case of the very large organizations (in general, multinational companies), but rather to certain sets of measures and actions oriented towards performance maximization within the organization. Among them, is the formulation of key performance indicators – KPI and the establishment of a performance reporting system according to the performance indicators previously set.

By means of its positioning within the organization, audit, both the internal and the external, is an essential component of the governance structure. Internal audit has, especially in the public sector, connections with all organization compartments and has the necessary instruments to reach the objectives. The instruments that internal audit has available are:

- Regularity audit – which focuses on the effects of the actions undertaken within the organization.
- Conformity audit – by means of which is verified if the operations performed in the organization are according to the internal regulations, with the standards and good practices in the field, but also with the legal provisions.
- System audit – by means of which the correct and efficient functioning of the systems within the organization is verified.
- Audit of the financial statements – is the most commonly seen form of audit. It is, in fact, also a form of the conformity audit, but it is treated separately, due to the legal requirements and to the implications on the activity of the organization.
- Performance audit – form of audit which evaluates the efficiency, efficacy and economicity of the activities performed within the organization.

Audit analyzes and evaluates all processes and activities taking place within the organization and formulates observations and proposals with respect to the possible non-conformities and problems that might appear, but also to the possibilities of improving them, which it formulates in the form of reports addressed to management. The independent and objective nature of the audit activity guarantee, together with professionalism, the moral probity and the ethical behavior of the auditor, the pertinence of these observations. Thus, by implementing the recommendations, audit is in a position to generate plus-value for the organization, through the fact that it ensures the conditions for its sustainable development.

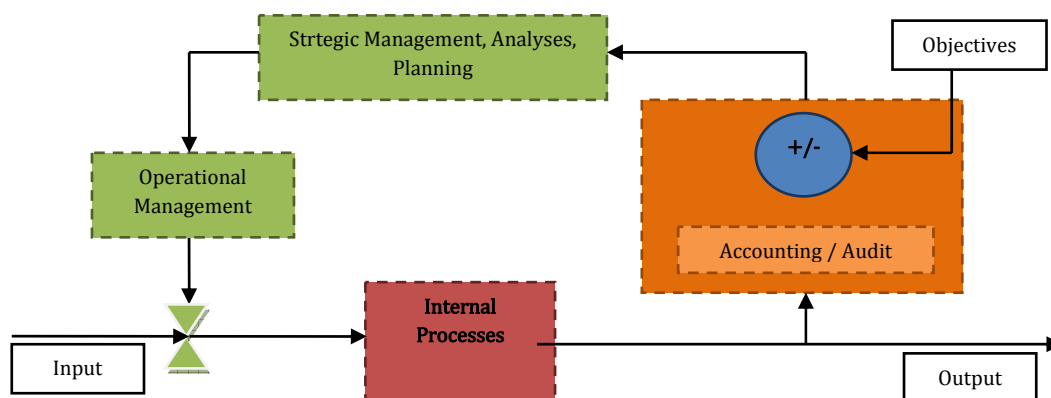
3. Modernization of internal audit and the sustainable development of organizations

The development of organizations can be considered like a train climbing or descending from a hill. The downhill train is helped in accelerating by its weight, due to inertia, while the same weight of the train has a braking effect while going uphill. Analog for organizations, during periods of economic growth, the inertia (the size of the organization) from the development process has an accelerating effect, while during crisis periods the same size of the organization possibly has a braking effect on it. In both cases, of the train and of the organization, it is the responsibility of the crew (for the organization, we refer to the layers forming the governance structure) to be able to use for their advantage the positive effects of this inertia, in order to successfully pass the climbing sectors, respectively the crisis periods.

For those organizations that found a development pace that allows them the flexibility and adaptability adequate to changes in their environment, we speak of sustainable development. This is also the main objective of governance: the management of the organization such as to ensure sustainable development. The structure presented in Figure 1

is a functional one, which presents the relations audit has within the governance structure, but also with the organization, in general, also indicating the instruments it uses and there they are employed. From the process point of view, this structure is equivalent to the much simpler structure presented in Figure 2.

Figure 2. *Organizational process control*



Source: Based on Dumitrescu, A. (2012).

Figure 2 presents an adjustment circuit with a feedback loop between the output and the input in the organization. Thus, in the process relationship, audit is on the reversed reaction loop, together with management (both strategic and operational). The financial and audit reports are used by strategic management for analysis and planning, as well as for adjusting the objectives (Magrane and Malthus, 2010: 427-443). Therefore, audit has the duty to make a statement on the sustainability of the evolution process of the organization, thus ensuring both optimum performance and long term development, regardless of the economical context.

Audit modernization is, in these conditions, a process whose main objective must be the consolidation of the position within the organization and the development of the specific instruments. The specific objectives of the audit modernization process comprise:

- Increasing the efficiency of the audit work.
- Assurance of access to professional staff of the highest quality.
- Exploitation of the opportunities offered by information technology and communications.
- Increasing the responsibility of employees in audit.
- Consolidation of the independence of the internal public audit activity within the organization, this activity can provide a pro-active value added service (Davies, 2009: 41-73; see also Davies, 2001: 77-96).

By reaching these objectives, the modernization of the audit activities and work is achieved, as well as an adequate support for management, for grounding decisions and long term development strategies of organizations. Thus, audit finds its utility not only in

the current verification actions is performed, but also in what concerns the governance of organizations, increasing their value (Allegrini et al., 2009: 1-3).

4. Conclusions

Considering the favorable context which Romania's economy seems to have achieved, organizations, both those in the private sector and those belonging to the public sector, will be able to take advantage of varied development opportunities. Still, the lessons learned following the financial crisis that has just passed, urge us to be cautious in elaborating development strategies. In this sense, the role of audit, especially of internal audit, is to guarantee the sustainability of the development process and to ensure the necessary support for management in grounding decisions and in maximizing the organizations' performance.

Acknowledgements

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Analysis of the evolution of foreign direct investment in the European Union, amid the global economic crisis

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Abstract. *A particularly important role in global economic growth is played by foreign direct investment. The host country receiving the investment attracts new, updated technologies, efficient management and as such can provide a strong impetus for economic growth.*

This paper presents the analysis of FDI flow and stock from EU member countries in the period 2000-2013, by groups of countries, sectors and branches of the economy, as well as an international comparative analysis of trends in foreign direct investment in Romania and other countries performed in order to identify similarities and disparities.

Keywords: foreign direct investment, investment flow, investment stock, international financial and economic crisis.

JEL Classification: F21, F43, O160.

Introduction

Investment is the engine of economic development of a country, through its contribution to economic growth through positive effects on the balance of payments, creating new jobs, increasing national budget revenues, through providing access to modern technologies, etc. At its turn, FDI can generate positive effects on the economy, involving upstream and downstream industries, creating jobs, through the effect on budget deficits and thus accelerating economic growth, becoming a requirement for governments.

The impact of FDI on economic growth has been a research topic for many authors. Most of them found a positive impact of FDI on economic growth in developed and developing countries. While FDI inflows in economic sectors have different effects on economic growth, there is a lack of literature on the analysis of the impact of FDI on economic growth by sector. There is a major current concern of specialists from the European Union and beyond, in developed countries and even more in least developed countries for FDI issues and their effects on sustainable development of different national economies, whereas, under current conditions, FDI is an important source of funding, creating jobs, raising the level of technology used, etc.

The issue of foreign direct investment constantly offers new challenges for scientific research, being a dynamic field, with new aspects that require proper adjustment of the methods of investigation and analysis. The vast literature on FDI is a strong argument in this respect. Except for the years of crisis, FDI showed an upward dynamic, reorientation and restructuring by countries, sectors and industries.

1. Analysis of the FDI flow and stock in the European Union

For the proposed analysis, we are going to analyze the latest international statistical information available. Thus, in international statistics (UNCTAD), foreign direct investment are measured by two important variables: FDI flow and FDI stock. Both FDI flows and stocks concern FDI inflows and outflows to or from a country or region. FDI flow measures the amount of FDI entering a country during a period of one year, while the stock of FDI is the total production capacity owned by foreigners in the host country.

Addressing FDI as a flow and stock indicator, worldwide, by countries of origin and destination, offers the possibility to determine which countries are more concerned about exporting and respectively importing FDI, which highlights their ability to achieve profits on both the account of outflows and inflows of foreign capital as well as on the account of simultaneous inputs and outputs of foreign capital. Thus, countries may be divided into net FDI-exporting countries and net FDI-importing countries, both as a size of flow and stock.

The statistics are less relevant in the case of FDI stock measures due to registration difficulties arising from: frequently changing size of the share of foreign capital in total capital of a company; the impact of mergers and acquisitions, bankruptcies and outputs.

The literature considers that countries that have an annual export volume of FDI (output of the national economy) less than 1 billion USD are countries with modest capital export potential. Romania, which during the crisis had no more than 274 million USD of FDI outflows in 2008, belongs to this category.

Table 1. FDI flows in the E.U. in the period 2008-2013

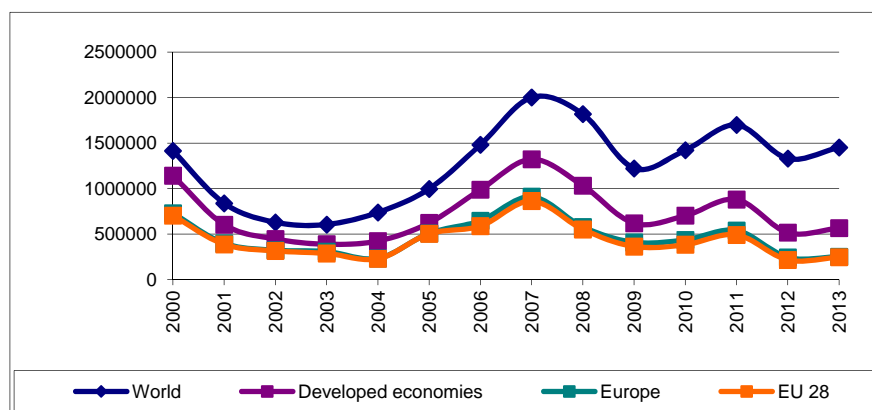
-million dollar-

Region/ economy	FDI inflows						FDI outflows				
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012
World	1818834	1221840	1422255	1700082	1330273	1451965	1999326	1171240	1467580	1711652	1346671
Developed economies	1032385	618596	703474	880406	516664	565626	1599317	846305	988769	1215690	852708
Europe	577952	408924	436303	538877	244090	250799	1045129	431433	591326	653000	299478
EU28	551413	363133	383703	490427	216012	246207	983601	383598	483002	585275	237865
Austria	6858	9303	840	10618	3939	11083	29452	10006	9994	21878	17059
Belgium	193950	60963	77014	119022	-30261	-2406	221023	7525	24535	96785	-17443
Bulgaria	9855	3385	1525	1849	1375	1450	765	-95	230	163	345
Czech Republic	6451	2927	6141	2318	7984	4990	4323	949	1167	-327	1790
Cyprus	1414	3472	766	2384	1257	533	2717	383	679	2201	-281
Croatia	5938	3346	490	1517	1356	580	1405	1273	-152	53	-36
Denmark	1824	3917	-11522	13094	2831	2083	13240	6305	-124	12610	7976
Estonia	1731	1840	1598	340	1517	950	1114	1547	142	-1452	952
Finland	-1144	718	7359	2550	4153	-1065	9297	5681	10167	5011	7543
France	64184	24215	33628	38547	25086	4875	155047	107136	64575	59552	37195
Germany	8109	23789	65620	59317	13203	26721	72758	69639	126310	80971	79607
Greece	4498	2436	330	1143	1740	2567	2418	2055	1558	1772	677
Ireland	-16453	25715	42804	23545	38315	35520	18949	26616	22348	-1165	18519
Italy	-10835	20077	9178	34324	93	16508	67000	21275	32655	53629	7980
Latvia	1261	94	380	1466	1109	808	243	-62	19	62	192
Lithuania	1965	-14	800	1448	700	531	336	198	-6	55	392
Luxembourg	16853	19314	39731	18116	9527	30075	14809	1522	21226	7750	3063
Malta	943	412	924	276	4	-2100	457	136	130	4	-42
Netherlands	4549	38610	-7324	21047	9706	24389	68334	34471	68341	39502	267
Poland	14839	12932	13876	20616	6059	-6038	4414	4699	7226	8155	727
Portugal	4665	2706	2646	11150	8995	3114	2741	816	-7493	14905	579
United Kingdom	89026	76301	49617	51137	45796	37101	183153	39287	39416	106673	34955
Romania	13909	4844	2940	2522	2748	3617	274	-88	-21	-33	-112
Slovakia	4868	-6	1770	3491	2826	591	550	904	946	713	-73
Slovenia	1947	-659	360	998	-59	-679	1468	262	-207	118	-272
Spain	76993	10407	39873	28379	25696	39167	74717	13070	37844	41164	-3982
Sweden	36888	10093	140	12924	16334	8150	30363	26202	20349	29861	28951
Hungary	6325	1995	2202	6290	13983	3091	2234	1883	1148	4663	11337

Source: UNCTAD, WIR 2014.

The countries with the highest volume of FDI inflows, in 2013, were Spain (39,167 million USD), United Kingdom (37,101 million USD), Ireland (35,520 million USD) and Luxembourg (30,075 million USD). Competitiveness can be achieved both through FDI inflows and FDI outflows.

Chart 1. Evolution of FDI inflows in the period 2000-2013 in world, developed countries, Europe and the EU 28 countries



Source: own calculations based on UNCTAD, WIR 2014 data.

From Chart 1, we can see that in the EU countries, in the period 2000-2013, the highest value of FDI inflows was recorded in 2007 (2,001,987 million USD). In the developed countries in the period 2000-2013, the highest value of FDI inflows was recorded in 2007 (1,322,795 million USD).

Table 2. Average growth/decline in FDI inflows to EU countries, in the period 2000-2013

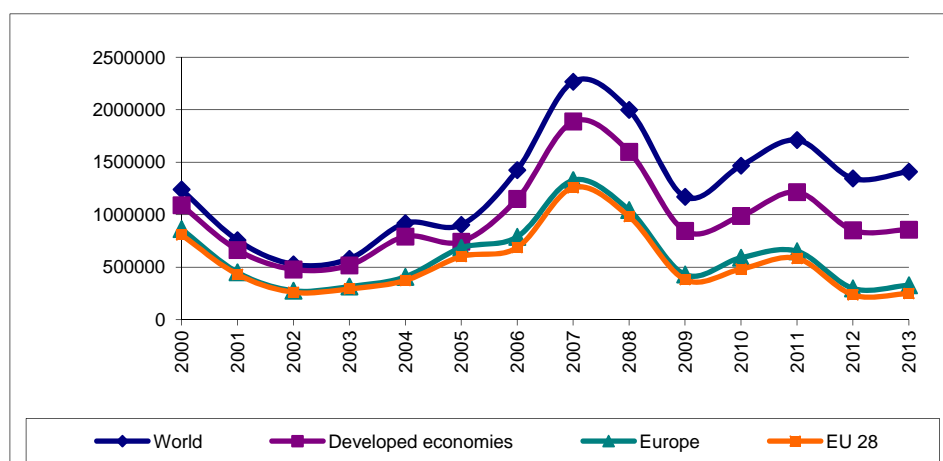
Region/economy	Average/decline growth
Austria	198.59
Belgium	-185.07
Bulgaria	33.38
Czech Republic	-36.21
Cyprus	-24.74
Croatia	0.40
Denmark	-2,441.56
Estonia	42.94
Finland	-761.45
France	-2,951.92
Germany	-13,196.59
Greece	112.18
Ireland	749.25
Italy	241.00
Latvia	30.41
Lithuania	11.71
Luxembourg	2,313.49
Malta	-206.26
Netherlands	-3,035.85
Poland	-1,191.00
Portugal	-270.87
United Kingdom	-6,522.83
Romania	196.92
Slovakia	-163.80
Slovenia	-62.45
Spain	-31.42
Sweden	-1,175.64
Hungary	25.15

Source: own calculations based on UNCTAD, WIR 2014 data.

In the period 2000-2013, FDI inflows increased by an average of 25.15 million USD to Hungary, to Romania with 196.92 million USD, 198.59 million USD to Austria and to Bulgaria with 33.38 million USD. The greatest average decrease in the period 2000-2013 was recorded in Germany (down 13,196.59 million USD), while in the United Kingdom, FDI inflows fell by an average of 6,523 million USD and in Sweden FDI inflows decreased by 1,176 million USD.

From Chart 2, we see that among the EU countries in the period 2000-2013, the highest value of FDI outflows (1,258,246 million USD) was recorded in 2007. In the developed countries in the period 2000-2013, the highest value of FDI outflows was also recorded in 2007 (1,889,274 million USD).

Chart 2. Evolution of FDI outflows in the period 2000-2013 in world, developed countries, Europe and the EU 28 countries



Source: own calculations based on UNCTAD, WIR 2014 data.

Table 3. Average growth/decline in FDI outflows from EU countries, in the period 2000-2013

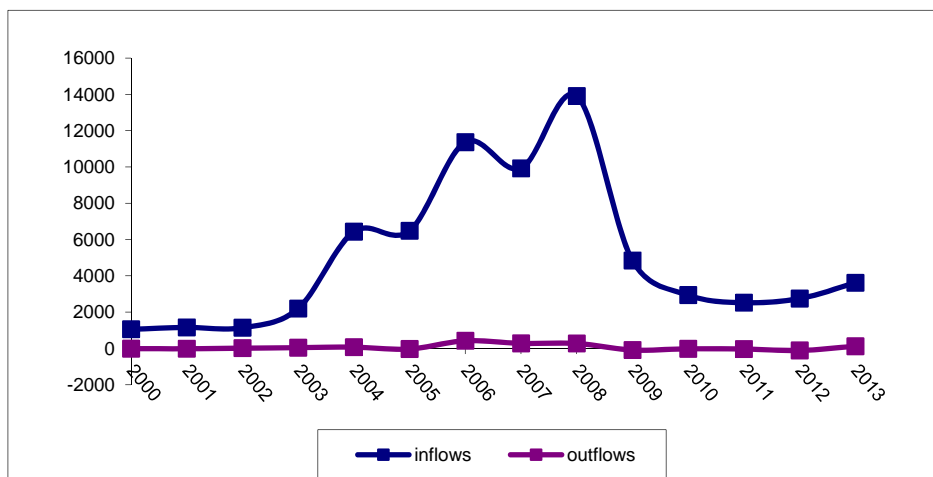
Region/economy	Average/decline growth
Austria	648.5
Belgium	-20,285.6
Bulgaria	13.6
Czech Republic	-14.8
Cyprus	10.5
Croatia	250.1
Denmark	-1,336.9
Estonia	22.7
Finland	-1,538.1
France	-13,846.4
Germany	76.3
Greece	-212.6
Ireland	1,401.7
Italy	1,921.3
Latvia	25.6
Lithuania	7.5
Luxembourg	1,663.5
Malta	-2.1

Region/economy	Average/decline growth
Netherlands	-2,938.7
Poland	-3,74.6
Portugal	-515.8
United Kingdom	-16,612.2
Romania	10.2
Slovakia	-35.6
Slovenia	-0.5
Spain	-2,475.3
Sweden	-586.6
Hungary	126.8

Source: own calculations based on UNCTAD, WIR 2014 data.

In the period 2000-2013, FDI outflows increased by an average of 126.83 million USD for Hungary, by 1,663.5 million USD for Luxembourg, Austria by 648.5 million USD and for Bulgaria by 13.56 million USD. The greater average decrease in the period 2000-2013 was recorded in Spain (2,475.3 million USD). In the United Kingdom FDI outflows fell by an average of 16,612.2 million USD and in Sweden FDI outflows fell by 586.6 million USD.

Chart 3. Evolution of FDI inflows and outflows in Romania, in the period 2000-2013



Source: own calculations based on UNCTAD, WIR 2014 data.

For Romania, the higher FDI inflows was recorded in 2008 (13,909 million USD), and the highest value of FDI outflows was recorded in 2006 (423 million USD). The lowest value of FDI inflows was recorded in 2000 (1,057 million USD).

The international economic and financial crisis triggered in 2008 in Romania has had an impact on both FDI inflows and outflows. Compared to 2008, in 2009 inflows have decreased by 9,065 million USD and have fallen further, so that their volume in 2013 reached 3,617 million USD.

Table 4. Balance of inflows and outflows of FDI in the EU, in the period 2008-2013

-million dollar-

Region/economy	Total FDI inflows	Total FDI outflows	FDI balance
0	1	2	3=1-2
World	8945250	9107165	-161915
Developed economies	4317151	6360243	-2043092
Europe	2456945	3349094	-892150
EU28	2250895	2923800	-672905
Austria	42641	102329	-59688
Belgium	418282	306054	112229
Bulgaria	19440	1588	17852
Czech Republic	30811	11196	19614
Cyprus	9826	6007	3819
Croatia	13227	2356	10870
Denmark	12228	49176	-36948
Estonia	7977	2659	5318
Finland	12570	41734	-29164
France	190536	420951	-230415
Germany	196758	486835	-290077
Greece	12715	7853	4861
Ireland	149445	108118	41327
Italy	69344	214202	-144858
Latvia	5118	799	4319
Lithuania	5430	678	4751
Luxembourg	133616	69996	63620
Malta	460	678	-219
Netherlands	90976	248347	-157371
Poland	62283	20370	41913
Portugal	33276	12976	20300
United Kingdom	348978	422923	-73945
Romania	30580	140	30440
Slovakia	13540	2618	10922
Slovenia	1909	1427	482
Spain	220514	188849	31665
Sweden	84529	169007	-84477
Hungary	33886	23534	10353

Source: own calculations based on UNCTAD, WIR 2014 data.

By analyzing the statistics presented above, it is clear that developed countries are net exporters of FDI. The EU-28 is net exporter of FDI, with 672 billion USD. Romania is by distance the largest net importer of FDI (30,440 billion USD). Capital exporting EU-28 countries, which are also independent of FDI are Germany, France, Netherlands, Italy, Sweden, United Kingdom, Denmark, Finland and Malta. The remaining EU member states are importing foreign capital, are dependent of foreign direct investment and vulnerable to crisis. In the analyzed period there are no countries with a balanced volume of FDI.

The analysis carried out shows that Romania has many inputs and fewer outputs of FDI, which shows that it lacks the capacity to export capital.

Table 5. Balance of stock of FDI inflows and outflows in the EU, in 2000 and 2013

-million dollar-

region/ economy	FDI inward stock		FDI outward stock		Input-output balance stocks	
	2000	2013	2000	2013	2000	2013
World	7511300	25464173	8008434	26312635	-497134	-848462
Developed economies	5681797	16053149	7100064	20764527	-1418267	-4711379
Europe	2471019	9535639	3776300	12119889	-1305281	-2584250
EU 28	2352810	8582673	3509450	10616765	-1156640	-2034092
Austria	31165	183558	24821	238033	6344	-54474
Belgium	0	924020	0	1009000	0	-84980
Bulgaria	2704	52623	67	2280	2637	50343
Czech Republic	21644	135976	824	4361	20819	131615
Cyprus	2846	21182	557	8300	2289	12881
Croatia	2796	32484	738	21384	2059	11100
Denmark	73574	158996	73100	256120	474	-97123
Estonia	2645	21451	259	6650	2386	14801
Finland	24273	101307	52109	162360	-27837	-61053
France	390953	1081497	925925	1637143	-534972	-555647
Germany	271613	851512	541866	1710298	-270253	-858786
Greece	14113	27741	6094	46352	8019	-18611
Ireland	127089	377696	27925	502880	99163	-125184
Italy	122533	403747	169957	598357	-47424	-194610
Latvia	2084	15654	23	1466	2061	14188
Lithuania	2334	17049	29	2852	2305	14198
Luxembourg	0	141381	0	181607	0	-40226
Malta	2263	14859	193	1521	2071	13338
Netherlands	243733	670115	305461	1071819	-61728	-401704
Poland	34227	252037	1018	54974	33209	197063
Portugal	32043	128488	19794	81889	12250	46599
United Kingdom	463134	1605522	923367	1884819	-460232	-279297
Romania	6953	84596	136	1465	6817	83131
Slovakia	6970	58832	555	4292	6415	54540
Slovenia	2893	15235	768	7739	2125	7496
Spain	156348	715994	129194	643226	27155	72768
Sweden	93791	378107	123618	435964	-29827	-57857
Hungary	22870	111015	1280	39613	21590	71402

Source: own calculations based on UNCTAD, WIR 2014 data

From Table 5, we can notice the following:

- in developed countries a negative balance of the stock of input-output was recorded, totaling 4,711 billion USD, which reveals that the largest amount of FDI stock is made between developed countries;
- in 2013, countries with net outflows of FDI stock are: Germany, France, Netherlands, United Kingdom, Italy, Ireland, Denmark, Belgium, Finland, Sweden, Austria, Luxembourg and Greece. Compared with 2000, excluding the United Kingdom, all the States have increased FDI exported to other countries economy;
- in some developed countries in 2013 compared to 2000, the volume of FDI outflows is greater than the volume of inflows, which shows the increased ability of these countries to export capital (Austria, Belgium, Denmark, Greece and Luxembourg);
- the largest share in total world inflows and outflows is held by developed countries, as follows: 75.6% of inflows in 2000 and 63% of inflows in 2013, respectively 88.7%

and 79% of outflows. Although declining, these percentages are very high, foreign direct investment being concentrated in the top manufacturing sectors;

- weighting the EU-28 countries in 2000, inflows counted for 31.3% in 2000 and 33.7% in 2013, while the share of outflows was 43.8% and 40.3% respectively, which shows a slight increase in inputs and a slight decrease in FDI outflows;
- with regard to Romania, we find a big discrepancy between the very high inputs and the outputs, from 6,817 million USD in 2000 to 83,131 million USD in 2013.

Analysis of global trends in FDI flows can also be performed in terms of the ratio of the two main forms, namely international mergers and acquisitions and new investment (greenfield).

Presently, a growing number of countries entered the competition to attract foreign investment flows. To create a favorable investment climate, they conducted a series of reforms aimed at abolishing administrative, regulatory and institutional barriers which limits investment inflows. The flow of foreign direct investment is constantly growing worldwide.

2. Evolution of FDI by group of countries and economic activities

One area of research aims to know the country of origin of FDI, whose goal is the structural issues related to the level of development of their home countries of FDI in Romania. Particular attention will be paid to EU countries with which our country has had and still has economic relations in accordance with legal-institutional and functional regulations of the Community acquis.

Table 6. Evolution of FDI annual inflows, by groups of countries, in the period 2000-2013

-million dollar-

region/ economy	Years							
	2000	2005	2008	2009	2010	2011	2012	2013
World	1415017	996714	1818834	1221840	1422255	1700082	1330273	1451965
EU	702875	503509	551413	363133	383703	490427	216012	246207
Developed economies								
Austria	8501	10784	6858	9303	840	10618	3939	11083
France	43250	84949	64184	24215	33628	38547	25086	4875
Germany	198277	47439	8109	23789	65620	59317	13203	26721
Italy	13375	23291	-10835	20077	9178	34324	93	16508
Netherlands	63855	39047	4549	38610	-7324	21047	9706	24389
Spain	39575	25020	76993	10407	39873	28379	25696	39167
Developing economies								
Bulgaria	1016	3920	9855	3385	1525	1849	1375	1450
Czech Republic	4985	11653	6451	2927	6141	2318	7984	4990
Poland	9445	10293	14839	12932	13876	20616	6059	-6038
Romania	1057	6483	13909	4844	2940	2522	2748	3617
Hungary	2764	7709	6325	1995	2202	6290	13983	3091

Source: UNCTAD, WIR 2014.

The data presented in Table 6 shows the following most significant trends regarding developments in terms of annual FDI inflows in the period 2000-2013:

- the most dynamic period of annual inflows, both global and EU was recorded in 2000-2008, when maximum levels of the volume of FDI are achieved, at both global and EU levels, as well as in countries with developing economies and developed economies;
- it should be noted the volatile nature of FDI in almost all countries and groups of countries, showing sensitive variations from one year to another, the largest variations recorded especially in countries with relatively lower level of development;
- countries that have recorded less sensitive negative effects due to external economic crisis also proved greater withstanding in terms of the degree of volatility of FDI;
- countries with developing economies recorded high dynamics of FDI; it is the case in Romania, which in 2000 had an annual inflow of 1,057 million USD and in the year when international economic and financial crisis broke they recorded their peak of 13,909 million USD, and in 2013 they have reached the 3,617 million USD threshold.

To link FDI as flow size and FDI as stock size, knowing that investment inflows are affected by the outflows of a country, but also by the types of FDI (greenfield, mergers and acquisitions and development) as well as a whole series of bankruptcies of foreign-owned companies, we consider it necessary to analyze the value volume of the stock of FDI in Romania and in other countries in the same period as well.

Table 7. Evolution of FDI stock, by groups of countries, in the period 2000-2013

- million dollar -

Region/ Economy	Years							
	2000	2005	2008	2009	2010	2011	2012	2013
World	7511300	11739048	15679509	18427630	20370690	21117234	23304429	25464173
EU	2352810	4778719	6702000	7470577	7313818	7481550	8019942	8582673
Developed economies								
Austria	31165	82551	148131	172636	161168	153096	162946	183558
France	390953	888935	904660	1038905	990418	973069	1029834	1081497
Germany	271613	476011	667748	701186	716704	737076	788098	851512
Italy	122533	237474	327911	364427	328058	355126	363624	403747
Netherlands	243733	479420	645601	644253	586076	608264	624380	670115
Spain	156348	384538	588901	632246	628341	628950	644677	715994
Developing economies								
Bulgaria	2704	13851	44059	49225	47231	47381	49240	52623
Czech Republic	21644	60662	113174	125827	128504	120569	136442	135976
Poland	34227	90877	164307	185202	215639	203111	235113	252037
Romania	6953	25816	67910	72008	70264	71344	78010	84596
Hungary	22870	61110	88003	98803	90775	85431	103484	111015

Source: UNCTAD, WIR 2014.

Table 7 highlights the large volume of stocks in EU countries. Thus, in 2013, France recorded 1,081 billion USD, 851 billion USD in Germany, 715 billion USD in Spain,

while the 84.6 billion USD recorded by Romania only helped at ranking the last but one, just ahead of Bulgaria in terms of volume of FDI stock.

We can see that the volume of FDI stock in Romania was about 3 times lower than in Poland, 1.6 times than in the Czech Republic, 1.31 times than in Hungary and 12 times than in France. These differences between Romania and the above mentioned countries, to which we should also add developed EU countries such as Germany, Spain, the Netherlands, are determined by specific conditions of the difficult transition in Romania, marked by a series of negative aspects of the institutional legislation framework, which suffered of instability, unpredictability and poor transparency.

Table 8. Average annual share of the groups of countries in total FDI, by economic activity, in periods 1990-1992 and 2010-2012

-%-

Sector/Industry	1990-1992				2010-2012			
	World	Developed countries	Developing economies	Transition economies	World	Developed countries	Developing economies	Transition economies
Total	100	74.8	24.4	0.8	100	57.7	37.3	5.0
- Primary	100	62.2	31.4	6.3	100	44.7	47.1	8.3
Agriculture	100	2.0	98.0	0.0	100	9.2	84.5	6.3
Mining, quarrying and petroleum	100	65.3	28.1	6.7	100	46.2	45.5	8.4
- Manufacturing	100	70.0	29.6	0.4	100	47.0	49.1	3.9
Food, beverages and tobacco	100	75.1	24.3	0.6	100	61.2	34.3	4.5
Textiles	100	75.6	24.4	0.0	100	27.5	67.2	5.3
Wood and wood products	100	82.5	17.4	0.1	100	5.2	61.2	33.6
Chemicals and chemical products	100	77.0	22.9	0.1	100	76.7	21.2	2.0
Metal and metal products	100	81.1	17.1	1.8	100	7.2	58.4	34.4
Machinery and equipment	100	89.3	10.7	0.0	100	71.7	24.3	4.0
Electrical and electronic equipment	100	65.4	34.3	0.4	100	73.0	24.4	2.6
Motor vehicles and other transport equipment	100	79.3	20.7	1.8	100	58.1	35.0	6.9
- Services	100	79.7	20.1	0.2	100	61.7	33.3	5.0
Trade	100	86.9	13.0	0.1	100	48.5	40.9	10.6
Finance	100	89.3	10.7	0.0	100	83.2	14.2	2.5

Source: own calculations based on UNCTAD, WIR 2014 data.

From Table 8, the following relevant aspects can be noticed:

- developed countries hold the largest share of total foreign direct investment, in both the period 1990-1992 and in 2010-2012 (74.8% and 57.7% respectively);
- developing countries have recorded an increase in the share of total FDI volume from 24.4% in the first period, to 37.3% in the second;
- countries with economies in transition have increased the share from 0.8% to 5.0% respectively;
- in *manufacturing*, there is a reduction of the share in total FDI in developed countries from 70.0% to 47.0% and a growth in developing countries from 29.6% to 49.1%,

which shows a more dynamic orientation of FDI to this group of countries as a result of their attractiveness in terms of the existence of cheap and skilled labor force, of attractive raw material resources and the process of relocation of industries from developed countries to developing countries;

- Services accounted for the largest share in total FDI in the period 1990-1992 in developed countries (79.7%) and in 2010-2013 it fell to 61.7%. An increasing trend of the services also had developing countries, from 20.1% to 33.3%, and transition economies (0.2% and 5.0%, respectively).
- Countries with economies in transition have relatively modest share of foreign direct investment in all sectors, but the trend is growing.

In the current economic climate, in which world economies are facing budget deficits that have reached historic levels (cases of Portugal, Italy, Greece, Spain are most relevant), the austerity measures imposed by governments produce deep social effects, the need to attract investment becomes urgent. The world economy is going through a difficult time and it is far from surpassing the point of economic crisis. Governments in the euro area affected by economic instability and rising budget deficits, lack the fiscal and monetary levers to attract new, internal funds, being obliged to resort to external borrowing and the level of external debt is continuously growing.

Conclusions

Through analysis of FDI flows over the last decade it may be noted that during the crisis FDI tend to refocus from developed countries (as countries of origin) to the developing states. Targeting FDI to developing countries during the crisis is determined by the higher growth rates in these regions, the dynamic reforming framework in improving business environment to attract a larger volume of FDI in the economy. In 2007 the highest value of inflows and outflows of foreign direct investment was recorded, following that from 2008 it would see a decrease. Even if developing countries and those with economies in transition have recorded particularly high dynamics during 1990-2012, the highest share in total FDI currently is held by the group of developed countries.

In the long term, there has been a refocus of FDI to the group of developing countries to an extent greater than that of countries with economies in transition. In countries with economies in transition, the main source of growth dynamics in the secondary sector was the privatization of public sector assets, and the high shares of services are due to poor development of the sector and its attractiveness for foreign capital profitability.

Regarding the evolution of FDI by sector, we see that developed countries have the largest share of total FDI. There is a stronger orientation of FDI to developing countries, due to their attractiveness in terms of the existence of cheap and skilled labor force, of attractive raw material resources and the process of relocation of industries from developed countries to developing countries.

The effects of the recent crisis have affected the development of primary, secondary and tertiary sectors by reducing the flow of FDI directed to them.

A trend outlined in the last decade, and which during the recent crisis became even more pronounced, is the gradually moving global of FDI flows to services, especially in recent years in the primary sector.

In our opinion, both macroeconomic and punctual approaches of FDI on national economies should be based on the principle of economic efficiency in the broadest sense of it, which requires in addition to effects and financial costs of the parties (stakeholders) to also include externalities, both positive and negative which FDI generates on short, medium and long term.

Acknowledgments

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Types of international cooperation at the local level Bucharest city hall case study

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Abstract. *International cooperation at the local level is not an area widely covered by the literature. Nevertheless, international cooperation is the backbone of international relations at this level.*

The present article describes different types of cooperation such as bilateral cooperation with or without a formal framework and multilateral cooperation within international organizations, international projects and multilateral agreements.

A comprehensive analysis regarding the types of international cooperation in which Bucharest City Hall is involved is carried out.

Keywords: cooperation, agreement, bilateral, multilateralism, Bucharest City Hall.

JEL Classification: H79.

Introduction

The rapports which are established within an international society are, in general, named international relations. The notion of international relations applies to a number of categories of social rapports which have in common the fact that these *rapports exceed the borders of one state.*

Hence, the following categories appear:

- 1) Rapports between states and between states and other entities from the international society, such as *international organizations.*
- 2) *Rapports between individuals and legal persons from different states* (Beșteliu, 1998: p. 2).

International relations is a relatively young discipline, less than a century old, many of its most important questions and concepts have deep roots in intellectual history. From Classical Greece to the British Empire, Ming China to modern America, leaders, advisers, academics and students have wrestled with *problems of war, trade, culture and diplomacy* (Cox, 2012: pp.16).

Within *the field of international relations*, the field of international cooperation can be also found. The two fields are closely intertwined.

The history of these fields can be traced to *ancient times*, all the way to the first treaty in the history of mankind, the peace treaty between Hittites and Egyptians called the *Treaty of Kadesh* (1259 BC). The treaty established amongst others a cooperation policy in case of aggression by other forces.

Cooperation starts with a situation where *"each actor's policies (pursued without regard for the interest of others) are regarded by others as hindering the attainment of their goals"*. Cooperation takes place *"[...] when actors adjust their behaviour to the actual or anticipated preferences of others, through a process of policy coordination."* (Keohane, 1984).

Moreover, *"(international) cooperation describes interactions to achieve common objectives when actors' preferences are neither identical (harmony) nor irreconcilable (conflict)"* (Paolo, 2015: p. 3). At present, the local territorial collectivities claim to play *an increasingly significant role in European context, being encouraged even by the states to which they belong, in the context of recognizing autonomy as an efficient management system of the public affairs* (Manda and Nicolescu, 2014: pp. 98).

Local authorities recognize that international cooperation has a special role and, *cooperation is the best tool to tackling common interest issues from global issues* such as climate change to *regional issues* such as the EU Strategy, in the Danube Region.

There are several types of cooperation: *bilateral cooperation and multilateral cooperation.*

In Romania, bilateral and multilateral cooperation is regulated by *Law no. 215/2001 regarding local public administration.* According to the provisions of Law no. 215, both types of cooperation are possible, only with the approval of the Romanian Ministry of Foreign Affairs and with the approval of the Romanian Ministry of Regional Development and Public Administration. Also, in the cases of bilateral cooperation through agreements or of multilateral cooperation through accession to an international organization, it is necessary that the Local Council (in the case of Bucharest – the General Council of Bucharest) adopts a decision in this respect.

Bilateral cooperation

Bilateral cooperation refers to the relations involving two groups or countries.

At the local level, *bilateral cooperation emphasizes the ties between two cities, usually, in two different countries, but, not necessarily.* According to the *Romanian legislation*, two cities from Romania can sign a cooperation agreement as well.

By bilateral cooperation between two local collectivities is understood that relation established between the authorities of each party *around common local development goals and within which the executive authority becomes the central protagonist of the relationship.* This type of relationship relates to the solving of local interest problems (local public services, territorial management, health, sport, culture etc.), the authorities having flexibility in what concerns the scheduling and running of the cooperation process (Manda and Nicolescu, 2014: pp. 104-105).

The reasoning behind, entering such agreements is tackling common interest issues through *exchanges of knowledge and experience, exchanges of information, technical consultation, exchanges of experts, organization of workshops, meetings, etc.* (Friendship and cooperation Agreement between the City of Amsterdam and the City of Paris, Amsterdam, 2013).

Bilateral cooperation is the most common used type of cooperation by Bucharest City Hall. Bilateral cooperation can take place within a *formal framework*: cooperation/collaboration or twinning agreement. A list of agreements signed by Bucharest can be found in Appendix 1.

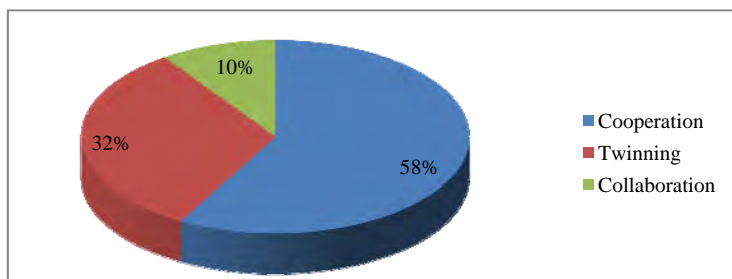
Bilateral cooperation can also take place without the existence of a formal framework. After the fall of the communist regime, Bucharest signed its first *Twinning Agreement with Athens*, in 1993, by the Decision of the General Council of Bucharest no. 46/1993.

Thus, between 1993 and 2015, Bucharest signed 31 agreements:

- 18 cooperation agreements;
- 10 twinning agreements;
- 3 collaboration agreements.

The distribution between twinning, cooperation and collaboration agreements can be found in Figure 1:

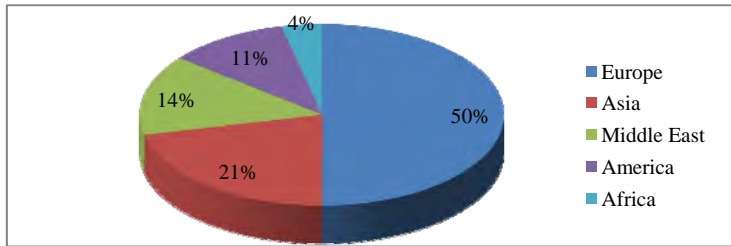
Figure 1. *Types of agreements signed by Bucharest*



As one can see in Figure 1, the cooperation agreement is the most used type of agreement. Regardless of the type, all agreements employ cooperation methods such as experience and delegations' exchanges. Moreover, there is not a type of agreement that is more powerful or effective than the other. *All types of agreements have equal value.*

From a geographical point of view the situation is the following:

Figure 2. Geographical dispersal of cooperation agreements signed by Bucharest



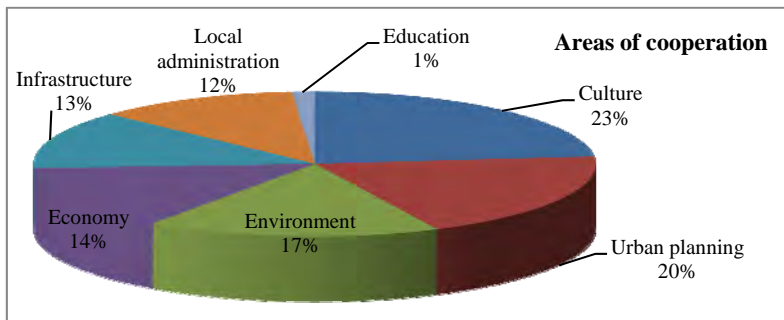
Since Bucharest located in Europe, it is only natural for our city to expand its relationships with *European cities.*

The most common areas of cooperation can be found in the table below:

Areas of cooperation bilateral agreements signed by Bucharest

No.	Area of cooperation	City – number of agreements
1.	<i>Culture</i>	Athens, Amman, Atlanta, Beijing, Belgrade, Bern, Chisinau, Damascus, Hanoi, Istanbul, Izmir, Ottawa, Nicosia, Moscow, Paris, Pretoria, Rome, Vienna - 18 agreements
2.	<i>Urban planning</i>	Athens, Ankara, Belgrade, Bern, Chisinau, Damascus, Hanoi, Istanbul, Izmir, Montreal, Ottawa, Paris, Pretoria, Rome, Vienna - 16 agreements
3.	<i>Environment</i>	Athens, Ankara, Belgrade, Bern, Chisinau, Damascus, Izmir, Montreal, Ottawa, Nicosia, Moscow, Paris, Rome, Vienna - 14 agreements
4.	<i>Economy</i>	Amman, Atlanta, Beijing, Belgrade, Hanoi, Istanbul, Nicosia, Moscow, Paris, Rome - 10 agreements
5.	<i>Infrastructure</i>	Athens, Amman, Bern, Chisinau, Istanbul, Izmir, Montreal, Ottawa, Rome, Vienna - 10 agreements
6.	<i>Local Administration</i>	Athens, Ankara, Istanbul, Izmir, Ottawa, Nicosia, Paris, Rome - 8 agreements
7.	<i>Education</i>	Beijing - 1 agreement

Figure 3. Areas of cooperation - Bucharest



Culture is the most common area of cooperation that can be found in more than half of the agreements signed by Bucharest between 1993 and 2015. Culture is the most frequent area of cooperation because culture exceeds any barriers such as linguistic barriers, educational barriers or religious barriers.

Culture is followed by *urban planning, environment and infrastructure* because these are the most common issues major cities face.

The evolution of the bilateral agreements can be found in the figures below:

Figure 4. Evolution of bilateral agreements signed by Bucharest

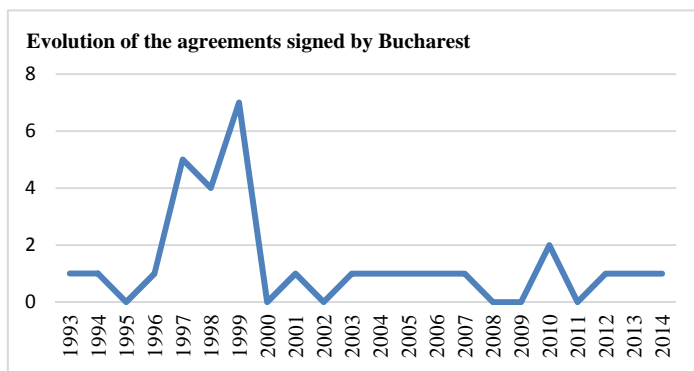
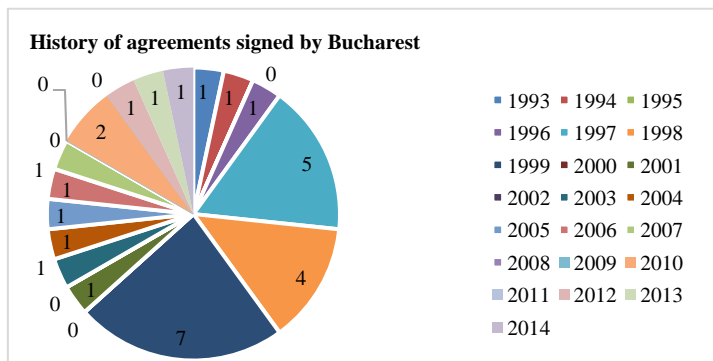


Figure 5. History of Agreements signed by Bucharest



In the beginning, one agreement/year was signed. The most prolific period, in the history of international cooperation for Bucharest City Hall was between *1997 and 1999*. In 3 years, Bucharest entered *16 agreements*. Afterwards, the number of agreements signed decreased and now it stabilized at *one agreement/year*. Usually, the years when no agreements were signed were the years before and when elections were being held.

Unfortunately, despite such a large number of agreements, some of these agreements are not very active anymore. The reasons behind this are diverse:

- *Changes of the geopolitical context* for instance in the cases of the Friendship and Cooperation Agreement between Bucharest and *Damascus* or the Twinning Agreement between Bucharest and *Pretoria*.

- *Changes of political regimes and priorities* (for example: the Cooperation Agreement between Bucharest and *Paris* (signed in 1996) was less active during the previous mayor's mandate. The former mayor of Paris preferred collaborating within the International Association of the French Speaking Mayors (AIMF), an organization presided by Paris. At present, Bucharest and Paris are seeking to re-establish the cooperation ties).
- *The impact of the economic crisis* which affected the bilateral relations with cities that are located far away from Bucharest (for instance the Cooperation Agreements between Bucharest and *Ottawa, Hanoi* or *Montreal*), etc.

At this time, the most *active agreements* signed by Bucharest are: the Cooperation Agreement with *Vienna*, the Cooperation Agreement with *Rome*, the Twinning Agreement with *Beijing*, the Twinning and Cooperation Agreement with *Ankara*, the Cooperation Agreement with *Istanbul* and the Memorandum with *Seoul*. Also, Bucharest and *Paris* have plans to reactivate the Cooperation Agreement that was signed in 1996.

As it was mentioned above, bilateral cooperation can exist outside the scope of a formal framework.

The reasons behind this *informal cooperation* are the same as the reason behind *formal cooperation*. In this respect, Bucharest has a very active relationship with *Sofia*. The two capital cities support each other in areas such as: EU Strategy regarding the Danube Region, cultural exchanges and other common interest issues. Other examples include *Budapest, Ingolstadt*, etc.

Multilateral cooperation

Multilateralism can be defined as “*the practice of coordinating national policies in groups of three or more states*” (Keohane, 1990: p. 731).

Hence, by extrapolating Keohane's definition at the local level, *multilateral cooperation means implicating more than three cities*.

Moreover, “*multilateralism refers to a system in which it is expected that states will act as a group, through negotiation and IOs*” (Birkin, 2006: p.10).

The main form of multilateral cooperation is represented by active membership of a city within an international organization.

“*International organisations are entities established by formal political agreements between their members that have the status of international treaties; their existence is recognised by law in their member countries*” (OECD, 2005).

Bucharest is a member of a series of **international organizations**: *global organizations, regional organizations and/or organizations specialized* on a specific area of cooperation such as energy, e-government and so on.

Bucharest is a member of the following *international organisations*:

- *The International Association of the French Speaking Mayors (AIMF)* – since 1990;
- *The World Association of Major Metropolises (METROPOLIS)* – since 1991;

- *The Union of Central, South and Eastern European Capitals* (UCSEEC) – since 1995;
- *Energy Cities* – since 2008;
- The Union of Capitals of the European Union (UCEU) – since 2009;
- *The World e-Governments Organization of Cities and Local Governments* (WeGO) – since 2012;
- *Città de Bio* – since 2014;
- *Major Cities of Europe* – the ITC Users Group – since 2014.

AIMF is a large association with more than 200 member cities and since Bucharest is a member of *AIMF* for 25 years, of course, the city has had a very active presence within this organisation, culminating with Bucharest being the host of the XXVI General Assembly of *AIMF*, in 2006.

Also, throughout the years Bucharest had an active presence within *METROPOLIS*.

Unfortunately, the European organisations such as *UCSEEC* and *UCEU* are in the brink of disbanding due to a lack of interest or participation from some of the members.

Bucharest ceased to be a member in two international organizations due to excessive fees and lack of benefits: *Eurocities* (Decision of the General Council of Bucharest no. 165/2012) and *Polis* (Decision of the General Council of Bucharest no. 263/2013).

Multilateral cooperation can take place within *European projects* as well. Bucharest was/is a partner city in the following *EU projects*:

- *CAPRICE* (Decision of the General Council of Bucharest no. 177/2009) on mobility from 2009-2012 - partner cities: *Berlin* (lead partner), *Paris*, *Vilnius* and *Warsaw*;
- *I-SPEED* (Decision of the General Council of Bucharest no. 19/2010) on sustainable tourism from 2010-2012 – the partnership was coordinated by the City of *Venice* (Italy) and composed of 9 partners from 9 European countries: the City of *Warsaw* (Poland), the *National Association of Municipalities* in the Republic of Bulgaria - *NAMRB* (Bulgaria), the *Region of Crete* (Greece), the *Region of Hedmark* (Norway), the *Region of Galicia* (Spain), the *County of Powys* (Great Britain), *Province of Rome* (Italy) and the *Nantes Urban Community* (France);
- *DELI* (Decision of the General Council of Bucharest no. 31/2014) on migration from 2014-2015 – partners: *Council of Europe* (lead partner), *Cartagena*, *Dublin*, *Getxo*, *Lisbon*, *London – Lewisham*, *Munich*, *Reggio Emilia*, *Rotterdam* and *Vienna*.

The aim for these projects was to solve issues such as mobility, migration, etc. by exchanging information and experience between the partners mentioned above.

Multilateral agreements represent another form of multilateral cooperation. A multilateral agreement is *an international agreement involving three or more parties*. For example, the *GATT* (*General Agreement of Tariffs and Trade*) has been, since its establishments in 1947, seeking to *promote trade liberalization through multilateral negotiations*.

In the case of Bucharest, examples of multilateral agreements include:

- *The Covenant of Mayors* (Decision of the General Council of Bucharest no. 99/2011) which represents “the mainstream European movement involving local and regional authorities, voluntarily committing to *increasing energy efficiency and use of*

renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO₂ reduction objective by 2020. The Covenant was signed by 5744 authorities by 2015;

- *The Paris Declaration 2015, entitled “In response to the challenge of global climate change, a European commitment and local solutions” and which is supported by cities such as Amsterdam, Athens, Bordeaux, Bucharest, Budapest, Dublin, Helsinki, Lisbon, London, Madrid, Milan, Rome, Sofia, Vienna, Vilnius, Warsaw and so on;*
- *The Vienna Declaration 2015, named “A strong voice in Europe” and which focuses on urban agenda and the systematic involvement of the 28th capital cities in EU policies*

The main difficulty with multilateral agreements is getting all the interested parties to agree with the text, changes proposed by others and so on. In the cases of the Paris and Vienna Declarations from 2015, *3-4 months* were necessary for drawing up the final version of the Declaration. Another weakness of this type of cooperation could be *the lack of accountability*. The Covenant is signed on a voluntary basis and there are more than 5.000 signatories which makes it very hard to keep track of each city’s commitment and even *harder to enforce penalties in case of a breach*.

“Nevertheless, in the context of profound socio-economic and political transformations of Romania’s last decade, the municipality of Bucharest has generated and intensified different forms of bilateral or network cooperation” (Manda and Nicolescu, 2014: p. 117).

Conclusions

Regardless of the type of *international cooperation*, the *cities* around the world are facing *similar challenges and issues*. By gathering together to tackle common interest issues, by exchanging information and knowledge, by supporting each other, half the battle is already won and the cities can work on ensuring their citizens a high quality life.

The biggest challenge in the case of international cooperation is *maintaining the level of commitment* by all the parties involved. As it was explained above, priorities change for each city, making obsolete an agreement or an international organization.

The management of each city has to take into account the history shared with a partner (city, cities or international organization) and act accordingly. Each agreement or each statute contains *provisions in case one party is interested in dissolving the cooperation framework*. Bucharest used this mechanism and it no longer a member of two international organizations.

Cities need to intensify their cooperation relations in order to become *stronger*. By being united, cities gain *more power* in order to influence and have a real say on global issues, policy issues, European issues, etc.

Cities have a *tremendous potential* and should use it to solve *common interest issues*.

What *Franklin D. Roosevelt* said more than 50 years ago still applies today *“Competition has been shown to be useful up to a certain point and no further, but cooperation, which is the thing we must strive for today, begins where competition leaves off.”*

Truer words were never spoken. Yes, indeed, cities are competing for resources such as funding, investments and touristic attractiveness, but, only, by *engaging in collective collaborative processes, the cities can overcome the challenges ahead.*

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Appendix 1

Twinnig, cooperation and collaboration agreements signed by Bucharest

Twinning agreements

1. Protocol Bucharest - Athens, 20.05.1993
2. Twinning Protocol Bucharest - Atlanta, 19.09.1994
3. Joint Statement regarding the Twinning Agreement Bucharest - Pretoria, 20.10.1997
4. Twinning and Cooperation Bucharest - Ankara, 20.06.1998
5. Twinning and Cooperation Bucharest - Amman, 19.06.1999
6. Twinning Protocol Bucharest - Chisinau, 4.11.1999
7. Twinning Protocol Bucharest – Montevideo, 2003
8. Twinning Protocol Bucharest – Nicosia, 12.03.2004
9. Twinning Protocol Bucharest – Beijing 21.06.2005
10. Twinning Protocol Bucharest – Bangkok, 2010

Cooperation agreement

1. Cooperation Protocol Bucharest – Paris, 20.07.1996
2. Friendship and Cooperation Agreement Bucharest – Athens, 17.01.1997
3. Cooperation Protocol de Bucharest – Izmir, 23.07.1998
4. Memorandum regarding Cooperation and Friendly Exchanges Bucharest – Beijing, 23.11.1998
5. Memorandum of Cooperation Bucharest – Zhenjiang Province, 28.11.1998
6. Project of a cooperation agreement Bucharest– Damascus, 17.12.1998
7. Cooperation Agreement Bucharest – Ottawa, 22.02.1999
8. Friendship and Cooperation Bucharest - Damascus, 19.06.1999
9. Project of Cooperation Protocol Bucharest – Belgrade, 7.07.1999
10. Friendship and Cooperation Protocol Bucharest – Hanoi, 30.08.1999
11. Cooperation Protocol Bucharest– Belgrade, 22.09.1999
12. Cooperation Agreement Bucharest – Montreal, 29.06.2001
13. Cooperation Agreement Bucharest – Istanbul, 28.04.2006
14. Cooperation Protocol Bucharest – Rome, 26.06.2007
15. Cooperation Protocol Bucharest – Vienna, 14.12.2010
16. Memorandum of understanding regarding the friendship and cooperation between Bucharest and Seoul, 2012
17. Cooperation Agreement Bucharest – Baghdad, 2013
18. Cooperation Agreement Bucharest – Bern, 09.10.2014

Collaborations

1. Protocol regarding the development of collaboration relations Bucharest – Chisinau, 03.06.1997
2. Collaboration Agreement Bucharest– Moscow, 22.06.1997
3. Agreement Bucharest - Beijing, 28.08.1997

Short-run determinants of the USD/PLN exchange rate and policy implications

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Abstract. *This paper examines short-run determinants of the U.S. dollar/Polish zloty (USD/PLN) exchange rate based on a simultaneous-equation model of demand and supply. Using a reduced form equation and the EGARCH model, the paper finds that the USD/PLN exchange rate is positively associated with the real reference rate in Poland, real GDP in the U.S., the real stock index in Poland and the expected exchange rate and is negatively influenced by the U.S. real federal funds rate, real GDP in Poland, and the real stock index in the U.S. Hence, monetary policy is effective in influencing the USD/PLN exchange rate.*

Keywords: exchange rates, interest rates, real GDP, stock indexes, EGARCH.

JEL Classification: F31, F41.

1. Introduction

The Polish zloty/U.S. dollar exchange rate has experienced fluctuations like most other currencies in transition economies. During its early transformation from a socialist to a market economy, the zloty had declined significantly against the U.S. dollar from 0.0506 in 1989.M1 to 4.6369 in 2000.M10. The adoption of a managed floating exchange rate regime in April 2000, the joining of the EU in May 2004, relative political stability, improvements in international trade, and economic growth had made the zloty stronger as evidenced by the change in the exchange rate against the U.S. dollar from 4.6369 in 2000.M10 to 3.9360 in 2004.M5 and 2.0674 in 2008.M7. In the recent global financial crisis, the zloty depreciated as much as 75.65% against the U.S. dollar from 2.0674 in 2008.M7 to 3.6314 in 2009.M2. After the global financial crisis, the zloty has been less volatile and reached 3.2475 per U.S. dollar in 2014.M9.

This paper attempts to examine the short-run determinants of the USD/PLN exchange rate based on a simultaneous-equation model consisting of the demand for and the supply of the Polish zloty versus the U.S. dollar. An analysis of the literature indicates that few of these studies have applied demand and supply analysis in determining the USD/PLN exchange rate in the short run. Monetary models of exchange rates are based on the validity of purchasing power parity in the long run. A study of the short-run determinants of the U.S. Dollar /Polish zloty exchange rate would provide policymakers with more insights into the behavior of the USD/PLN exchange rate.

2. Literature survey

There have been several studies examining the determinants of exchange rates for Poland or related countries. Dibooglu and Kutan (2001) revealed that nominal shocks were mainly responsible for real exchange rate changes in Poland whereas real shocks were major reasons for real exchange rate changes in Hungary. These results suggest that monetary policy played an important role in affecting real exchange rates in Poland and that increase in productivity and diversification of exports due to privatization and direct foreign investments played significant roles in real exchange rate changes in Hungary.

Ardic, Ergin and Senol (2008) compared forecast performance for six CEE countries including Poland based on three forecast error criteria and six models, namely, random walk, uncovered interest parity, monetary models, ARIMA(2,1,0) and VAR(2). They found that all the structural and time series models performed better and had smaller forecast errors than the random walk model.

Błaszkiwicz-Schwartzman (2009) found that appreciation of the Polish zloty was attributable to productivity shocks in the tradable good sector. The elasticity of real appreciation was reduced by distribution services as the substitution effect was greater than the wealth effect.

Kelm (2010) indicated that changes in exchange rates and tradable good prices in Poland could not be fully explained by the purchasing power parity (PPP) hypothesis because deviations of real exchange rates from the long-term PPP path were influenced by real

interest rate differentials and currency risk. Changes in exchange rates and real shocks due to foreign direct investment inflows and total factor productivity caused price fluctuations.

Keblowski (2011) examined exchange rate movements for four Central European countries, namely, Poland, the Czech Republic, Hungary and Romania. He found that real exchange rates of the Polish zloty, the Czech koruna and the Hungarian forint versus the euro exhibited long-term relationships and can be explained by the spreads of credit default risk premiums and real interest rate parities. The long-term relationship for the Romanian leu can be rejected. There were some common patterns found among these four countries. These currencies were undervalued during the 2003-2004 period and overvalued during the 2007-2009 period. The Polish zloty and the Hungarian forint were close to their steady-state values after the recent financial crisis, and the Romanian leu and the Czech koruna were overvalued continuously after a short period.

Shevchuk (2014) studied the nominal exchange rate (units of the domestic currency per U.S. dollar) for Poland, the Czech Republic and Hungary. For Poland, the positive coefficient of the money supply in Poland, the negative coefficient of real GDP in Poland, and the positive coefficient of U.S. real GDP were significant at the different levels. The positive coefficient of the domestic interest rate was insignificant at the 10% level. The negative coefficient of the foreign interest rate was significant in the level form and insignificant in the difference form. The recent global financial crisis caused the zloty to depreciate against the U.S. dollar.

Dąbrowski and Wróblewska (2014) showed that the Polish zloty was a shock absorber and that financial shocks played important roles and explained approximately 30% in real exchange rate changes as exchange rate deviations from its long-term equilibrium value have been overshadowed by financial shocks during global financial crises.

3. The model

Extending previous studies, we can express the demand for and supply of the Polish zloty versus the U.S. dollar in the foreign exchange market as:

$$PLN^d = W(\varepsilon, Y^{US}, R^{PL}, S^{PL}, \varepsilon^e) \quad (1)$$

- + ? + +

$$PLN^s = X(\varepsilon, Y^{PL}, R^{US}, S^{US}) \quad (2)$$

++ ? +

where

PLN^d = demand for the Polish zloty;

PLN^s = supply of the Polish zloty;

ε = the USD/PLN exchange rate (units of the U.S. dollar per Polish zloty);

Y^{PL} = real GDP or income in Poland;

- R^{US} = the real interest rate in the U.S.;
 S^{US} = the real stock index in the U.S.;
 ε^e = the expected USD/PLN exchange rate;
 Y^{US} = real GDP or income in the U.S.;
 R^{PL} = the real interest rate in Poland;
 S^{PL} = the real stock index in Poland.

We expect that the demand for the Polish zloty has a negative relationship with the USD/PLN exchange rate, a positive relationship with real GDP or income in the U.S., the real stock index in Poland, the expected USD/PLN exchange rate, and an unclear relationship with the real interest rate in Poland. The supply of the Polish zloty is expected to be positively associated with the USD/PLN exchange rate, real GDP or income in Poland and the real stock index in the U.S., and an unclear relationship with the U.S. real interest rate.

As real GDP or income in the U.S. rises, Americans tend to import more goods and services from Poland and increase the demand for the Polish zloty. When real GDP or income in Poland rises, Polish people tend to import more goods and services from the U.S. and increase the supply of the Polish zloty in exchange for the U.S. dollar.

The traditional view maintains that an increase in the domestic interest rate would cause the currency to appreciate due to capital inflows for higher returns on domestic assets whereas the revisionist view argues that a higher domestic interest rate would cause the currency to depreciate due to a higher default probability, a weaker financial position and a higher exchange rate risk premium (Dekle et al., 2002; Huang et al., 2010).

A higher real stock index in Poland tends to attract American investors to purchase the Polish stocks and to increase the demand for the Polish zloty. Conversely, a higher real stock index in the U.S. tends to attract Polish investors to buy U.S. stocks and increase the supply of the Polish zloty in exchange for the U.S. dollar. (Lee et al., 2011)

Solving for the equilibrium values of the two endogenous variables simultaneously, we can express the equilibrium exchange rate as a function of all the exogenous variables:

$$\bar{\varepsilon} = F(R^{US}, R^{PL}, Y^{US}, Y^{PL}, S^{US}, S^{PL}, \varepsilon^e) \quad (3)$$

? ? + - - + +

According to comparative static analysis, a change in any one of the exogenous variables is expected to have an impact on the equilibrium USD/PLN exchange rate:

$$\partial \bar{\varepsilon} / \partial R^{US} = -W_{R^{US}} / |J| > 0 \text{ or } < 0 \quad (4)$$

$$\partial \bar{\varepsilon} / \partial R^{PL} = -X_{R^{PL}} / |J| > 0 \text{ or } < 0 \quad (5)$$

$$\partial \bar{\varepsilon} / \partial Y^{US} = -X_{Y^{US}} / |J| > 0 \quad (6)$$

$$\partial \bar{\varepsilon} / \partial Y^{PL} = -W_{Y^{PL}} / |J| < 0 \quad (7)$$

$$\frac{\partial \bar{\varepsilon}}{\partial S^{US}} = -W_{S^{US}} / |J| < 0 \quad (8)$$

$$\frac{\partial \bar{\varepsilon}}{\partial S^{PL}} = -X_{S^{PL}} / |J| > 0 \quad (9)$$

$$\frac{\partial \bar{\varepsilon}}{\partial \varepsilon^e} = -W_{\varepsilon^e} / |J| > 0 \quad (10)$$

where $|J| = (W_{\varepsilon} - X_{\varepsilon}) < 0$ is the Jacobian for the endogenous variables.

4. Empirical results

The data came from the *International Financial Statistics*, which is published by the International Monetary Fund. The USD/PLN exchange rate measures units of the U.S. dollar per zloty. Hence, an increase means an appreciation of the Polish zloty or a depreciation of the U.S. dollar. The real interest rate in the U.S. is represented by the federal funds rate minus the inflation rate in the U.S. The real interest rate in Poland is represented by the reference rate (policy rate) minus the inflation rate in Poland. A change in the federal funds rate or the reference rate is expected to affect most other interest rates, which are considered by investors in purchasing or selling some financial assets in the U.S. and Poland. Real GDP in the U.S. is measured in billions at the 2009 year, and real GDP in Poland is measured in billions at the 2005 price. The expected exchange rate is represented by the average USD/PLN exchange rate of past four quarters. The real stock index in the U.S. is represented by the Wilshire 5000 price index adjusted by the CPI. The real stock index in Poland is represented by the WIG20 index adjusted by the CPI. Real GDP and stock indexes are expressed on a log scale. The USD/PLN exchange rate, the expected exchange rate, the real federal funds rate and the real reference rate are expressed in a linear form due to negative values before or after a log transformation. The sample consists of quarterly data ranging from 1999.Q1 to 2013.Q4 and has a total of 60 observations.

The DF-GLS test on the regression residuals is employed to determine whether these time series variables are cointegrated. The value of the test statistic is estimated to be -4.6775, which is greater than the critical value of -2.6054 in absolute values at the 1% level. Therefore, these variables have a long-term stable relationship.

Table 1 presents the estimated regression and related statistics. The EGARCH method is applied in order not to impose any restriction on the parameters and to yield a positive conditional variance. Approximately 82.35% of the variation in the equilibrium USD/PLN exchange rate can be explained by the seven right-hand side variables. The mean absolute percent error of 5.4854% suggests that the forecast error is relatively small. All the coefficients are significant at the 1% level. The equilibrium USD/PLN exchange rate is positively associated with the real reference rate in Poland, real GDP in the U.S., the real stock index in Poland, and the expected exchange rate. It is negatively affected by the real federal funds rate in the U.S., real GDP in Poland, and the real stock index in the U.S.

Specifically, a 1 percentage-point increase in the U.S. real federal funds rate would reduce the USD/PLN exchange rate by 0.0081 whereas a 1 percentage-point increase in the real reference rate in Poland would raise the USD/PLN exchange rate by 0.0033. The impact of a change in the real federal funds rate is 2.45 times greater than a change in the real reference rate in absolute values. When the real refinancing rate replaces the reference rate, its positive coefficient of 0.0018 is significant at the 1% level and slightly less than the coefficient of 0.0033 when the reference rate is used in Table 1. The value of R^2 is 0.8249. Other results are similar.

A \$1 billion increase in the log of the U.S. real GDP would raise the USD/PLN exchange rate by 0.1302 whereas a 1 billion increase in the log of the Polish real GDP would reduce the USD/PLN exchange rate by 0.0100. The effect of a change in U.S. real GDP is much greater than the effect of a change in real GDP in Poland.

Table 1. *Estimated regression of the USD/PLN exchange rate*

Dependent variable: USD/PLN exchange rate	Coefficient	z-statistics
U.S. real federal funds rate	-0.0081	-7.9351
Polish real reference rate	0.0033	2.8941
Log(real GDP in the U.S.)	0.1302	3.0130
Log(real GDP in Poland)	-0.0100	-3.4670
Log(real stock index in the U.S.)	-0.0426	-4.2100
Log(real stock index in Poland)	0.0867	11.0418
Expected USD/PLN exchange rate	0.5929	9.8331
Constant	-1.2347	-2.9925
R^2	0.8235	
Mean absolute percent error	5.4854%	
Sample period	1999.Q1-2013.Q4	
Number of observations	60	
Methodology	EGARCH	

Notes: All the coefficients are significant at the 1% level.

The USD/PLN exchange rate measures units of the U.S. dollar per Polish zloty.

A one unit increase in the log of the real stock index in the U.S. would reduce the USD/PLN exchange rate by 0.0426 whereas a one unit increase in the log of the real stock index in Poland would raise the USD/PLN exchange rate by 0.0867. The impact of a change in the log of the real stock index in Poland is 2.04 times greater than the impact of a change in the log of the U.S. real stock index. If the expected exchange rate rises by 1, the actual exchange rate would increase by 0.5929. These results are consistent with the Dornbusch (1976) and Frankel (1979) models that a higher real interest rate in Poland causes the zloty to appreciate versus the U.S. dollar.

5. Summary and conclusions

This paper has examined the determinants of the USD/PLN exchange rate in the short run based on a simultaneous-equation model consisting of the demand for and supply of the Polish zloty. A reduced-form equation is estimated by the EGARCH method. The paper finds that a higher Polish real reference rate, a higher U.S. real GDP, a higher Polish real stock index, and a higher expected exchange rate would raise the USD/PLN exchange

rate whereas a higher U.S. real federal funds rate, a higher Polish real GDP, and a higher U.S. real stock index would reduce the USD/PLN exchange rate.

There are several policy implications. It seems that demand and supply analysis of exchange rates in the short run works reasonably well as it can explain approximately 82.35% of exchange rate movements and the forecast error is relatively small. Policy rates, real GDP, stock indexes and the expected exchange rate in the U.S. and Poland play significant roles in exchange rate movements in the short run. Holding other factors constant, potential increase in the federal funds rate in the future would reduce the USD/PLN exchange rate. Recent more percent increase in the Polish stock index relative to the U.S. stock market index after the global financial crisis would cause the USD/PLN exchange rate to rise. Recent increase in Polish real GDP would reduce the USD/PLN exchange rate whereas recent increase in U.S. real GDP would raise the USD/PLN exchange rate.

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The use of behavioral economics in promoting public policy

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Abstract. *Behavioral economics is a recently developed area of science which brings together information from the fields of economics, sociology and psychology. The knowledge which has resulted from this approach allowed decision makers to make improvements upon the way in which public policy is promoted by the government, by taking into consideration the natural preferences of individuals for certain types of behaviors. This paper will first present a comprehensive literature review of the results, which have been obtained in the study of nudges. However, in an effort to best show the practical value of a public policy, that includes nudges, the main focus of the paper will be the Behavioral Insight Unit. Also known as the Nudge Unit, this organization has collaborated with different branches of the British government and has helped them implement policies ranging from reducing medical prescription errors to improving commitment to job centers or even improving tax collections.*

Keywords: Public policies, behavioral economics, nudge, unemployment.

JEL Classification: J24, G01, O34, Q01.

The use of the principles of behavioral economics in regulating preferences and decisions of individuals is becoming a continuously growing global trend. Behavioral economics methods are used often in the shaping of public policies that are based on the actual behavior of individuals and not hypothetical one. Countries like the United States and Great Britain already successfully implemented such policies, opening up new ways of thinking and regulating public policies based on studying the behavior of individuals and introducing the concept of choice architecture.

Behavioural economics, a relatively new branch of the economic discipline, seeks to identify and explain the way in which individuals make decisions. Established at the intersection of economics with other social sciences, it takes into account theories derived from psychology and sociology in studying of human economic behavior. Moreover, researchers are interested in studying the motivations and factors determining seemingly irrational behaviors (loss aversion, anchoring, overconfidence, framing, herd mentality, etc.) observed in different socio-economic backgrounds.

The evolution of behavioral economics

In many respects, behavioral economics is positioned in contrast with the standard economic theory - especially through its controversial in nature in raising a number of relevant questions with philosophical implications, methodological and historical. Being characterized by many of its theorists as a new economic science that uses methods and analytical techniques from psychology to the study the decision-making processes and economic behaviors in order to grow “the explanatory and predictive power of economic theory by providing it with more plausible psychological motivations” (Weber and Dawes, 2005, p. 91).

The opposition to the neoclassical mainstream is especially obvious when regarding the claim that individuals seek to maximize their utility and economic gain in any case, due to the fact that the behavioral approach generally attributes a slightly irrational behavior characteristically to all individuals, which from a scientific perspective can be determined by a number of factors (judgmental biases, mental accounting, manipulation techniques, etc.). All aiming to contribute to rethinking the standard image, *homo economicus*, ultra-rational individual who is constantly in possession of all the information and is able to perform all calculations to maximize economic gain regardless of his environment.

It should be noted that behavioral economics does not imply a rejection of neoclassical economic approach based on utility maximization, balance, and efficiency - on the contrary, this approach is considered useful, by providing economists with a theoretical framework that can be applied in formulating and hypothesis for testing on various types of economic behavior and much more. (Camerer and Loewenstein, 2002)

The term “behavioral economics” was first used in 1958 (Johnson 1958), as an umbrella term that combines elements from several disciplines and research areas. However, some researchers believe that the ideas of new directions date even from the time of Adam

Smith's writings (1759), Alfred Marshall (1890), Vilfredo Pareto, Tarde (1892), Veblen (1899), Mitchell (1914) or Keynes (1936).

Among the researchers who achieved remarkable in the field of behavioral economic in the recent decades, we can remember economists like George Katona, Irving Fisher and Herbert Simon, whose efforts in explaining the term “bounded rationality” (Simon, 1987, p. 222), which defines the limited capacities of an individual in the decision-making process, were awarded the Nobel Prize just a few years later.

However, the economists Richard Thaler and Sheffrin Hersch (1988) showed through extensive laboratory research and experiments that people are generally less interested in their welfare in the long term, rather seeking to gain immediate rewards for themselves, reacting more easily and more widely to various external stimuli than to their own inner projection of a future welfare that could be eventually achieved.

Other common concepts associated with the study of behavioral economics have as a central focus constraining the choices of individuals, in order to “protect” them from certain cognitive biases that might impair them from achieving the expected utility.

In this respect, Mathew Rabin (2008) identifies several weaknesses of the “standard economy”, pointing out that, when individuals have to choice from a set of (x, y), they do not always make use of their absolute freedom and are influenced by different manipulation techniques, often choosing x when desired y. He also emphasizes three very important hypotheses about behavioral economics:

- 1) Loss-aversion overtakes the pleasure of winning;
- 2) Individuals' disposition concerning personal interest may appear due to various issues, such as fairness, altruism or even revenge;
- 3) In uncertain circumstances, misconceptions and judgmental biases (including those generated by too much or too little information) can lead to errors.

Moreover, Akerlof and Shiller argue the need for a government to maintain an active role in economic policy and guiding the human behavior and decision-making process. They consider government intervention to be necessary, noting that just allowing the markets and socio-economic mechanisms to function without regulating them will simply not be enough.

Behavioural economics represents a new direction of economic thinking opposed to neoclassical economics. This is because the approach to the subject is less influenced by the assumptions made in order to build the economic model and more than the current processes that govern human behavior.

One of the key issues of behavioral economics is how it can be used to improve the decisions of individuals and organizations. The idea of offering a helping hand to guide the decision-making process has come to be known as a Nudge (push), due in no small part to the book with the same name written by Thaler and Sunstein. A nudge is defined as ‘an aspect of choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives.’ (Thaler and Sunstein, 2008).

Governments around the world design more “nudges” to encourage people to live healthier and more responsible. To better understand how widespread the phenomenon, the paper presents further activity and measures applied by Insight Behavioral Unit (Unit understanding of the behavior) in the UK.

The ‘Nudge’ Unit

Behavioural Insights Team (BIT), also informally known as the Nudge Unit, was born in 2010 at the initiative of the ruling coalition at that time in the UK. It was created following the success of the MINDSPACE report which highlighted the importance of using the lessons learned from behavioral economics in the implementation of public policies.

The Mindspace report proposed a methodology, called “test, learn and adapt”, which was comprised of nine steps and emphasized the importance of using empirical methods in order to validate decisions. (Institute for Government, 2010)

The steps in the methodology will be presented below (Behavioural Insight Unit, 2013):

Test:

- 1) Identify two or more public policy interventions to compare
- 2) Determine the desired result of changing public policy and how it will be measured
- 3) Decide whether the random test to be conducted will be made at the individual, institutional or geographical level
- 4) Determine the sample size
- 5) Randomly assign each sample unit to the control or treatment group
- 6) Apply those public policies to the selected sample
- 7) Learn
- 8) Measure results and determine the impact of policy interventions
- 9) Adapt
- 10) Modify public policies based on the results obtained in the previous
- 11) Return to point 1 so as to better understand what works and what does not

Using behavioral economics to reduce tax evasion, errors and debt

In order to analyze, in better detail, human behavior concerning how people report income, whether they pay on time, BIT used the “test, learn and adapt” methodology to check if there are some key elements that can influence people's attitudes towards taxes. In this regard a series of eight tests was proposed, which are to be described below, and are based on a number of key ideas proposed by the specific behavioral economics literature and are associated to the concept of Nudge.

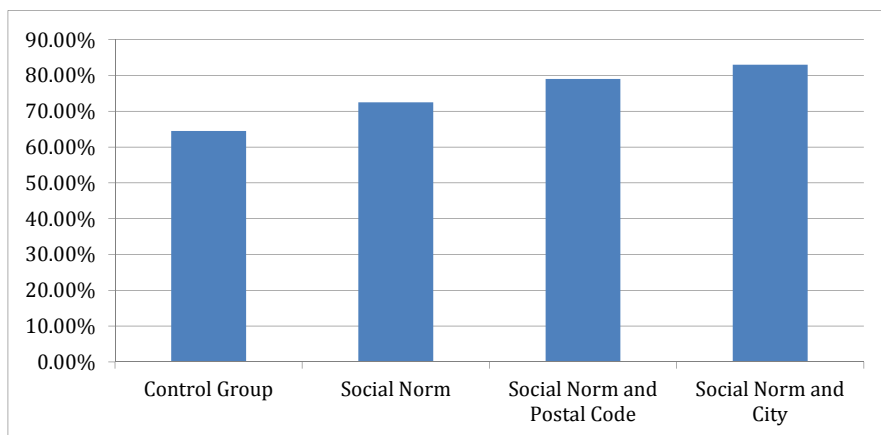
- Make it easy: the process should be simple so as not to create barriers (Dohrmann and Pinshaw, 2009)
- Highlight key messages: people don't use all of the information they are presented with and give greater importance to certain elements (Kahneman, 2011, pp. 363-376)

- Use a personal style: use less formal language to increase the likelihood that people consider the message in question as relevant to them (Behavioural Insights Kingdom, 2012)
- Promote honesty: use certain formulations during the interaction, remind the person that it is important to be honest in what they declare (Shu et al., 2011)
- Use social norms: pointing to the fact that most people have a certain behavior will increase the likelihood that the person to whom it is addressed in turn adopt that behavior (Schultz et al., 2007)
- Reward desired behavior
- Highlight of risk of dishonest behavior: point out the negative impact that a dishonest behavior can have on the person and on others (Kleven et al., 2010)

Test 1: Use social norms

This test is based on a number of other studies which have shown that the use of social norms provided satisfactory results when trying to promote a certain type of behavior. (Schultz et al., 2007) To increase the rate of collection, BIT researchers have modified the information letter sent to some taxpayers so that some would receive a standard text and others a text which contains the sentence “9 out of 10 people pay their taxes on time” with some variation in terms of people referenced. (Behavioural Insights Kingdom, 2012)

The results can be seen in the table below and show a significant increase when compared to the control group for which there is no reference to any social norm.

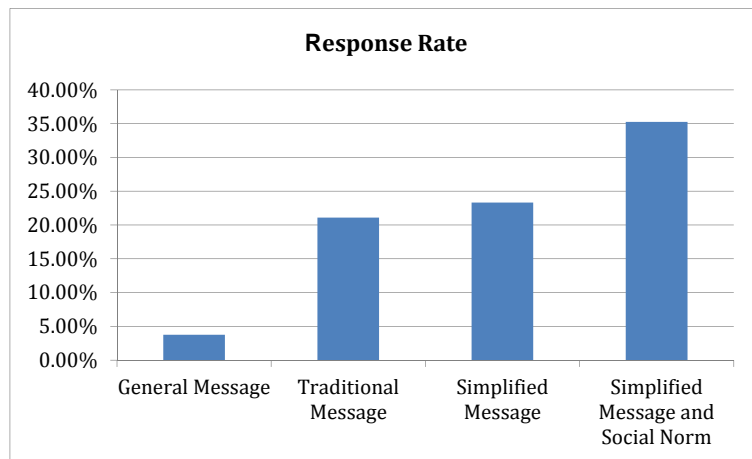


Source: Behavioural Insights Unit, 2012, p. 23.

Test 2: Highlighting key messages and social norms

The starting hypothesis for this second test applied by the BIT was that, by using clear and simple messages that highlight what is desired from the person and what are the implications should the message be ignored, the number of those who declare their income on time may be increased. The methodology was similar to the first test, except that the sent message changed. The control group received a traditional letter and the treatment group received a simplified message. Actual results can be seen in the table

below, however, it should be mentioned that in all cases the data showed significantly better results for the simplified message when compared to the classic message.



Source: Behavioural Insights Unit, 2012, p. 25.

Test 3: Use salient images

This test seeks to determine whether certain images may be used in order to increase the response rate. To do this, the traditional letter sent to car owners who have not paid their taxes was modified as follows: the control group received the traditional letter, the first treatment group received a simplified letter and the second treatment group received the simplified message along with a picture of the car for which no tax was paid. Data from this test yet to be made public. (Behavioural Insights Kingdom, 2012)

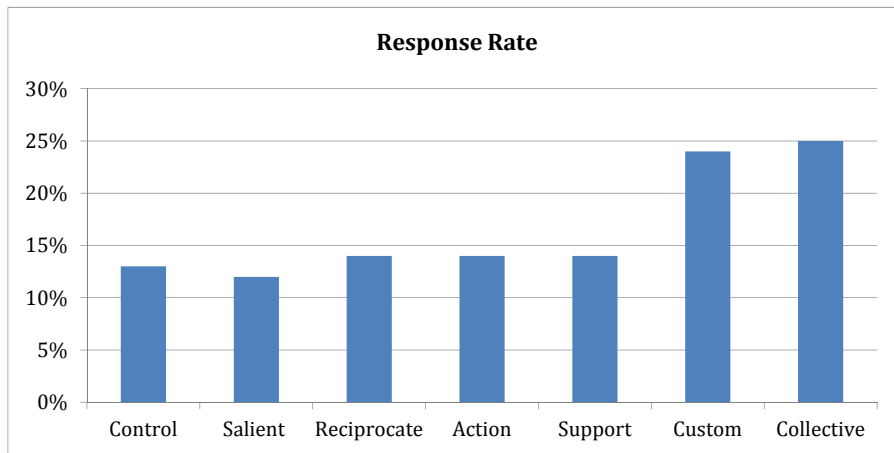
Test 4: Better Presentation of Information

The starting hypothesis for this test is that presenting information in a clear manner may increase the number of those who comply with the instructions (Dohrmann and Pinshaw, 2009). In order to increase the number of people who get in touch with tax authorities so as to solve a specific issue, a test was conducted which divided, at random, a sample of 39,000 people who received one of several variants of a letter (Behavioural Insights Kingdom, 2012):

- Control group: a simple letter with a phone number.
- Sent message: a letter containing a summary at the end of the letter along with the key information.
- Reciprocity: a letter explaining the services provided by the tax authorities and how they can help solve the problem.
- Action: a letter requiring a person to choose a particular day when to get in touch with tax authorities.
- Support: Letter reiterating the readiness of the authorities to help.
- Custom message: the message is formulated so that it resembles a personal message and asks the person to not miss the opportunity to get in touch with authorities.

- **Collective message:** the message is formulated so that it resembles a collective message and asks the person to not miss the opportunity to get in touch with authorities.

Again, the results are more in favor of personalized messages that speak directly to the taxpayer.



Source: Behavioural Insights Unit, 2012, p. 27.

Test 5: Using custom text messages

This test seeks to determine whether, by using a text message, either simplified or a more complex one that takes into account certain identifying details of the person to whom it is addressed, may or may not increase the number of people who pay their taxes. Similar to Test 3, the final data is being collected and have yet to be published yet. (Behavioural Insights Kingdom, 2012)

Test 6: Prompting honesty

This test seeks to verify the hypothesis that people when they are asked explicitly to be honest in their statements are more likely to declare the truth. To check whether this happens or not, part of Manchester city residents, who requested a specific exemption from property taxes, received a letter asking them to confirm this request. Again, there were 3 types of letters, a standard letter of information for the control group, a simplified letter and a simplified letter asking them from start for their signature to confirm the information that they would declare.

It is worth mentioning that the differences between the 3 groups are not significant, the proportion of those who continued to seek tax relief was 78%, 72% and 75% respectively. (Behavioural Insights Kingdom, 2012)

Test 7: Varying the tone of letters

This test verifies whether by using different styles of communication one can increase the number of people who file their tax returns. The test uses 3 letters: one to inform, a simplified one that warn that it is the; last chance and a last letter to encourage cooperation. Again, the final data has not been collected and is yet to be released. (Behavioural Insights Kingdom, 2012)

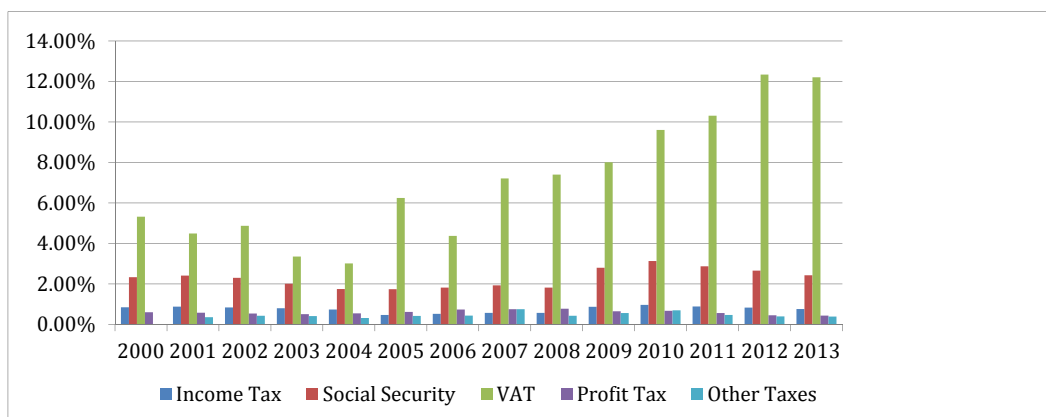
Test 8: Using beliefs about tax

This test seeks to ascertain whether there are significant differences in behavior, concerning the payment of taxes, between individuals and businesses. To do this, BIT researchers applied the aforementioned tests in the interactions between the state and companies. The procedure is similar to the variants presented and the data is still being collected. (Behavioural Insights Kingdom, 2012)

Losses due to tax evasion, collection errors and uncollected amounts are valued at about 40 billion pounds annually in the UK and improving the collection should be an important matter for the authorities. The results obtained from the application of the above tests are encouraging, test 1 helped gather £160 million in the period in which it was conducted, test 2 brought in an extra £1 million and the third test helped Manchester City to save about 240,000 pounds. (Behavioural Insights Kingdom, 2012) In the following a short presentation of the situation in Romania will be made and, even though it is clear that there are major differences regarding the causes, one need to remember that significant results can be achieved by making a few key changes.

Tax Evasion in Romania

Tax evasion is a particularly important issue for Romanian society due to the very high level it has reached. According to the annual report published by the Fiscal Council, should Romania collect all taxes due, at their maximum level, budget revenues should be above the level of the European Union, as a percentage of GDP (Consiliul Fiscal - România, 2013).



Source: Consiliul Fiscal - România, 2013, pp. 128-129.

As can be seen from the above data, the problem of tax evasion in Romania is growing. However, it cannot be said that there is a strategy to combat tax evasion and, even if there can be found certain regulatory changes towards that purpose, their impact is difficult to measure and difficult to determine which strategies are directed towards which category. Also, it is quite difficult to achieve a comparison with other countries because of the difficulties encountered in the case of Romania can somewhat different, the biggest problem being the efficient collection of VAT, with the others being secondary.

Conclusion

The issue of tax evasion is a particularly serious for most countries of the world and its economic impact is felt even more so in a period of economic contraction when budget revenues decrease. The difficulties experienced by Romania can be alleviated by programs aimed at reducing tax avoidance and, even if changes are required at the level of in the entire system in order to reduce losses from VAT, one must remember that significant results can be achieved using small changes, based on certain behavioral changes. To this point we have presented above results obtained by BIT in the UK who have contributed to revenue growth simply by changing how they addresses taxpayers.

Acknowledgements

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New paradigms imposed by the global financial crisis

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Abstract. *The global financial crisis that erupted in 2008 was a welter of complex phenomena, some of them unprecedented. The amplitude of the crisis and its impact on the real economy caused major unprecedented problems in public finance. Therefore, the confidence in government's ability of management and financing was weakened, especially in the European countries. The paper analyzes several paradigm shifts imposed by the negative effects of the crisis felt both in the financial system and in the real economy.*

Keywords: financial system, financial crisis, paradigm, theory of efficient markets, deregulation.

JEL Classification: B00, E00, G01.

Introduction

Over time, the occurrence of anomalies in the economic area, financial and economic crisis respectively, has led to the emergence of new paradigms or new ways to analyze and perceive various economic phenomena. Any paradigm identifies the nature of the new arising problems, formulates economic policy objectives and establishes suitable instruments for achieving them (Hall, 1993).

The economic and financial crisis of 2008 is the first global crisis that occurred after the Great Depression of the '29 – '33. This is probably the most complex crisis of all times, not necessarily in terms of its effects, but in terms of the causes that had generated it. The complexity of its causes resides in the fact that the turbulences were caused by two types of factors that have complemented each other: factors that had been causes of financial crises in the past, such as the emergence of speculative bubbles, expansion of credit, indebtedness or inadequate regulation and supervision, and new elements and developments, such as the emergence of complex financial products, characterized by a high degree of opacity, excessive exposure to the risk of most players in the financial market, the unprecedented growth of interdependences between financial markets and institutions both nationally and internationally or the widespread use of risky debt-investment schemes (Moldovan and Popa, 2012).

The origins of the crisis are to be found in the subprime mortgage market of the United States. Problems then extended across the entire US financial system, along with worldwide contamination of financial markets. The financial crisis has triggered recessions in many economies of the world, and later, the complexity of financial and economic phenomena has triggered a sovereign debt crisis, especially in European countries.

The crisis has highlighted the fact that the regulation and supervision of financial markets had failed to keep pace with the needs imposed by their rapid and unprecedented development. Therefore, several deficiencies arose regarding proper assessment of risks incurred by financial institutions, the soundness of financial institutions and management of systemically important financial institutions.

From the ideological point of view, the crisis has triggered a heated debate on the ability of self-regulation of markets and state intervention opportunity, and even put into question the soundness of the capitalist system.

Furthermore, the complexity of the problems imposed by the crisis in public finance has caused discussions on state intervention under such circumstances, and undermined confidence in government's ability to properly manage the budget deficit and public debt issues.

Paradigms of the past

One of the most persistent economic paradigm is the one induced by the *efficient markets hypothesis*, according to which, within in the market, competing interests of economic agents interact in such a way that the result is a balanced and efficient system. As Adam Smith argued, an "invisible hand" intervenes and regulates markets so that they tend towards equilibrium.

Scholars have developed this theory and have issued another hypothesis, which says that since markets are self-regulating, asset prices are fair and justified, precisely encompassing all information relating thereto (Bachelier, 1900). This hypothesis basically refutes the emergence of overvalued financial assets, as the value of an asset is always correctly assessed by rational economic agents, based on existing information, and the change of an asset's price is always determined by the emergence of new information regarding the asset.

These ideas have been embraced with enthusiasm by the economists at the University of Chicago, who have been the devotees of market fundamentalism or "laissez-faire" policies and who have argued that markets are, by their nature, rational, efficient and able to regulate themselves (Roubini and Mihm, 2010). Beyond these issues, efficient markets hypothesis has referred to the fact that financial markets always allocate available funds to the most profitable investment projects, thus helping to maximize welfare. Moreover, it has even been argued that financial markets have the ability to regulate themselves and the authorities should not have interventions in financial markets (Greenspan, 2007).

Despite the fact that the efficient market hypothesis has become widely accepted and many governments have implemented ultra-liberal policies, studies have shown that it is not sustainable. For example, Robert Shiller has demonstrated in the early 80s, that stock prices are more volatile than stated by the efficient market theory, and sudden movements are driven by irrational impulses of the market. Therefore, the following financial theories have tried to explain developments in financial markets based on investors' behavior (theories of behavioral economics and behavioral finance).

According to the efficient market hypothesis, it has been considered for a long time that the economy is able to regulate itself, moving towards a steady state, and thus being characterized by stability and full employment. It has been believed that when wages became too high, the economy was contracting and alongside with increasing unemployment salaries began to decline. Moreover, alongside with the reduction of wages, firms began hiring, which led to the revival of the business cycle.

The Keynesian theory has come to contradict this assumption, arguing that employment is determined by the aggregate demand for goods and services, so that when wages fall and employment decreases, demand decreases, which causes a certain reluctance of investors for making investments, which emphasizes increasing unemployment. Under these circumstances, consumers will increase savings at the expense of consumption, which will cause an even steeper decrease of demand. According to Keynes, the economy

will reach a balance of underemployment and when aggregate supply becomes greater than aggregate demand, firms will have to reduce prices, which will lead to lower profits.

Keynes has proposed that the way out of recession is the government's intervention to stimulate aggregate demand and thus increasing employment.

Despite the fact that in the postwar period many governments have implemented Keynesian policies to prevent or stop recessions, they have been criticized by monetarists, who believed that economic instability is exclusively due to fluctuations in the money supply.

Milton Friedman, the most imposing figure of the Monetarist School, has imposed pretty much its influence on economic thought in the 1970s and 1980s, and economic policies have ignored most of Keynes's ideas, keeping only the one on state intervention in order to stimulate aggregate demand (Roubini and Mihm, 2010). Thus, from the 1930s to early 2010, economic policy was made either based on Keynesian perspectives on macroeconomics, or based on monetary policy as basis for economic development policies, in line with the Friedman's theories of the 1970s (Bodislav et al., 2015, pp. 107-113).

The authorities' intervention within the economy was also highly criticized by the Austrian School, according to which lax monetary policies, regulations and state intervention in the economy disrupts the smooth operation of the free market. The devotees of this ideology believe that the government should not intervene not even in cases of economic crises, but must leave shaky banks and other companies to collapse so that ultimately only strong economic agents survive. State intervention to rescue bankrupt financial institutions and other companies represents, according to the Austrian School, a socialization of losses, which will increase public debt and deficits. This will compromise the long-term economic growth, and the state could even default, the only solution to this situation being the money printing, but with negative effects on price stability.

The Austrian School also argues that overregulation of markets is the only cause of economic crises, and after a crisis, the tendency of strictly regulating would only worsen the situation. The explanation of this view is that actions such as deposit insurance or government interventions to ensure liquidity help to strengthen banks' risk appetite, although the immediate effect is to provide safety to depositors.

The optimal solution for an economic or financial crisis requires a combination of short-run Keynesian interventionism with long-run Austrians' hypothesis of "creative destruction" (Roubini and Mihm, 2010). Thus, in the context of a financial crisis, lending of last resort is necessary, since its absence would worsen the problems of the financial system and would push the economy into severe recession. On the medium and long run, however, the Austrians seem to be right. Saving bankrupt entities using public money, socializing losses and accumulation of budget deficits can not be sustained for long periods. Therefore, bankrupt companies should be allowed to fail, since otherwise moral hazard leads them to increasingly assume more and more risks.

New paradigms imposed by the crisis

The severity of the crisis has prompted a number of changes both in the economic theory and the economic paradigms considered to be valid. The crisis has generated new paradigms regarding markets' ability of self-regulation, monetary policy, fiscal policy and public finance sustainability, sustainability of the financial system, promoting sustainable economic development and the global dimension of necessary policies to be applied in order to promote stability and growth.

Regulation and supervision

Relatively high incidence of financial crises in the 80's - 90's should have fire alarm signals concerning the validity of efficient markets hypothesis and market fundamentalism. Unfortunately, the emergence of a global crisis was needed to determine awareness of the importance of regulation and supervision of financial markets.

Markets rarely reach the equilibrium postulated by the above hypothesis, as market participants and policymakers may have wrong conceptions and judgements that significantly affect prices, so as to determine the emergence of bubbles, which inevitably lead to crises (Soros, 2009). The assumption that financial crises are some unusual anomalies, impossible to explain and very unlikely has proved false, history showing that they are part of the economic reality.

After the crisis, one of the most criticized aspects was market fundamentalism, "laissez-faire", according to which interventionism should be minimal and market activity should not be affected by excessive regulation or supervision. However, the events have shown that if the state does not regulate and supervise financial markets properly, financial instruments' sophistication combined with excessive liquidity causes excessive exposure to risk, artificially raising the prices of assets and the emergence of speculative bubbles, which burst and cause imbalances in the entire financial system, with severe implications on the real economy (Moldovan, 2012).

It became clear that microprudential regulation and supervision are needed to avoid excessive exposure to risk of financial companies and to enhance their resilience in cases of potential systemic shocks. Microprudential measures are expected to reduce the costs of possible future financial crises, but they must be complemented by macroprudential policies in order to determine the avoidance of pro-cyclical imbalances accumulation.

Reassessment of the monetary policy

Loose monetary policy was another factor that contributed to the financial crisis, as it caused the emergence of a speculative bubble on the US real estate market. Such phenomena have also occurred in European countries. Even in emerging countries such as Romania unrealistic price increases in real estate and stock markets have been recorded. It is clear that the emergence of speculative bubbles would not be possible if not supported by monetary expansion, so that monetary policy plays an important role in this respect.

The crisis has reignited the debate on the role of monetary policy, namely, if it must be designed so as to prevent the emergence of speculative bubbles, or just to help eliminate the negative effects after their burst. Prior to the crisis, the predominant view had been that speculative bubbles could not be identified in real time so that the only solution was to adopt measures to diminish the negative effects of such bubbles after their burst, although it was clear that such an approach encourages moral hazard and excessive exposure to risk (OECD, 2011).

However, the crisis has caused a paradigm shift regarding the role of monetary policy in avoiding bubbles. Thus, monetary policy should avoid cheap credit if it enhances the artificial increase of prices for certain categories of assets (Stark, 2010). Specifically, monetary policy should seek monetary equilibrium that does neither inhibit economic activity, nor potentiate inflation and artificially rising asset prices.

Moreover, central banks should include in their policies considerations regarding financial stability. For example, the European Central Bank has incorporated financial variables in its monetary policy framework, although it is unclear to what extent they influence monetary policy decisions (Svensson, 2010).

Reforming the fiscal system

The seriousness of problems arising in the financial system imposed unprecedented government intervention in order to save the bankrupt financial institutions or to restore financial stability through capital injections, guarantees or asset purchases. All these interventions, combined with diminishing budget revenues and increasing costs due to the recession have put great pressure on government budgets in many countries. The global financial crisis has converted into a sovereign debt crisis in the many economies, especially the ones in the euro area (Greece, Ireland, Spain, Portugal and Italy), affecting their ability to recover. There have even been concerns about a possible collapse of the euro zone, given the gravity of the problems that some European economies have faced.

The turmoil manifested in recent years showed that a public debt lower than 60% of GDP, such as the Maastricht criteria require, is not necessarily sustainable and additional fiscal burden indicators are required in order to establish the fiscal sustainability (Adam, 2014).

Moreover, fiscal consolidation programs in the medium and long run have been necessary, in order to balance state budgets. Fiscal austerity was a pro-cyclical policy which has deepened the recession or hindered economic recovery.

Many European countries are pressed, on the long run, by high spendings for health insurance and pension services, and all these represent additional challenges for fiscal consolidation. Moreover, the debts accumulated during the crisis will also determine additional pressure.

The paradigm shift regarding fiscal policy assumes that it should be characterized by well-designed fiscal rules in order to become sustainable, transparent and counter-cyclical. Therefore, it is aimed at creating fiscal space during periods of economic

growth, when the state budget revenues are higher, and its use in times of recession, when budget revenues decrease. Also, government spending must be conditioned and prioritized according to their efficiency, while revenues should be increased by improving collection by reducing tax evasion.

In several European countries, the authorities have created independent fiscal councils to oversee tax compliance and to support the government in the process of achieving long-term sustainability of public finance. An important role of an effective fiscal council is to issue independent views in its attempt to promote transparency of fiscal policy decisions.

Since the debt crisis raised concerns regarding governmental default, assigning a zero risk to sovereign debt, as it was considered under the rules of Basel II and III, became questionable (OECD, 2011).

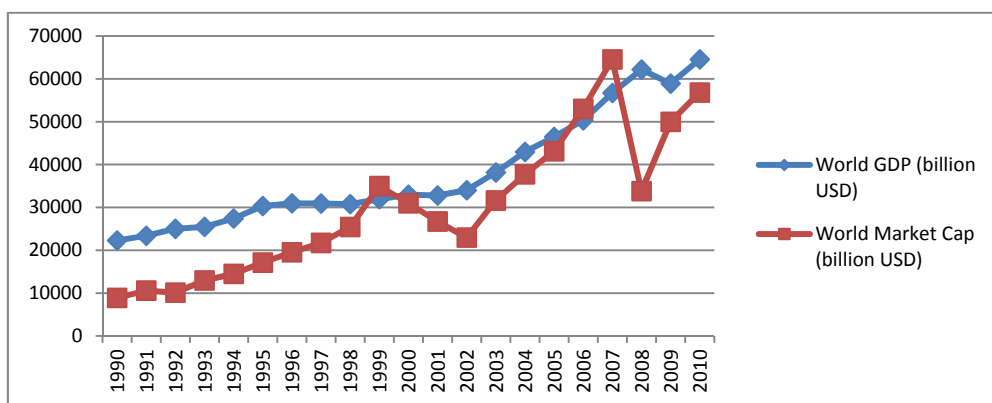
Beyond all this, it is necessary that fiscal policies are combined with appropriate monetary, structural and social policies, so that economic and social costs are reduced in the case of an austerity fiscal policy.

Sustainability

Until the latter part of the XXth century, the financial sector was largely considered as a means of financing the real economy, but then it became more like an end in itself or a framework whose main purpose was to find rapid gains. The shortcomings of this transformation are that nominal economic expansion was relatively artificial and did not bring significant productivity gains, contributing less than expected to increasing the living standards of people and reducing poverty or pollution (Moldovan, 2012).

The figure below shows that the dynamic of global equity markets was much higher than that of global GDP, and in some years the value of equity markets even exceeded the global production of goods and services. It should be noted that equity markets are only part of the size of the global financial system, which also includes bond markets and other financial instruments, such as futures or other sophisticated financial instruments.

Figure 1. Evolution of stock market capitalization and global GDP



Source: World Federation of Exchanges, <http://www.world-exchanges.org>; World Bank.

The recession that followed the global financial crisis, coupled with fiscal issues, have led to problems in resource allocation, both in the private and the public sector, which put pressure on sustainable development policy and the sustainability of investment, production and consumption activities (Pisano et al., 2012). The crisis has broken the equilibrium between state and market, and globalization has accelerated the tension between growing and sustainability (Popa and Trașcă, 2014).

Under these circumstances the need for a paradigm shift became clear, in order to determine the integration of sustainability determinants into the organization and functioning of the entire economic system, including the financial system.

Concerns about economic sustainability have been manifested since the second half of the XXth century, but the crisis has also raised concerns regarding the sustainable development of the financial system. Therefore the former activities and tendencies that have led to the artificial development of the financial system should be eliminated and replaced with items that promote sustainable development in the financial field.

The literature does not present an universally accepted definition of financial system's sustainability, but it is clear that it relates to achieving its fundamental role, namely efficient financing of the real economy, and a healthy, not artificial growth. This requires effective regulation and supervision, so that excessive exposure to risk, overrating of assets, and speculative bubbles will be avoided in the future.

International coordination and cooperation

Given the fact that financial markets and world economies have become highly interconnected and globalized, the problems they face have also become global. Thus, for global problems global policies are needed, and these can be implemented only through international coordination and cooperation between countries.

International authorities should consider integration mechanisms for the national policies so that they can be coordinated so as to promote global economic growth and financial stability. Such mechanisms involve collaboration and communication to set priorities and minimize side effects that may occur due to the application of certain policies at national level.

Conclusions

The severity and complexity of the phenomena that took place in the global economy over recent years have led to a series of changes in the approach, treatment and necessary tools to address these problems.

The efficient markets hypothesis has become widely undermined and the regulation and supervision of financial markets have come to be regarded as very important for achieving and maintaining financial stability.

At the same time, monetary policy has been revised so that it takes into account a number of financial stability indicators, in order to determine the avoidance of speculative bubbles.

Regarding fiscal policy, a counter-cyclical policy is desirable, allowing the creation of fiscal space during economic growth that can be used in times of recession. Also, fiscal consolidation at national level represents a challenge for many countries.

Finally, economic and financial globalization has triggered global issues and their resolution requires international communication, cooperation and collaboration.

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Are financial audit elements and corporate governance policies solutions for the economic crisis?

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Abstract. *The implementation of high quality financial audit and the adoption of corporate governance policies are considered to be important factors that can contribute to the economic re-launch after the recent financial crises. It is expected that their existence should have a positive impact upon financial performance. As a fact, the present research underlies the dependencies between financial performance, financial audit and corporate governance elements for the companies that are listed on the Bucharest Stock of Exchange. The results of the research are mixt, showing in fact that the actual solutions are not enough for ensuring the ideas of overcoming upon the financial crisis.*

Keywords: financial audit, corporate governance, financial performance, financial crisis.

JEL Classification: M42, G34, G10.

Introduction

The release of financial crisis imposed for a deeper analysis of financial statements both at national and international level. Moreover, there was an increase upon the need of certifying the financial performance by an accredited person. It is considered that financial auditor, especially if is one of the BIG 4 companies, can ensure higher credibility to the auditing process and to way financial statements are constructed. For example, when the auditor is from BIG 4 corporations, there is higher quality of information disclosure and the future uncertainly associated with cash flows is mitigated (Chang et al., 2009). This behavior is linked with the fact that BIG 4 auditors have much more resources in order to ensure integrity of possible disclosure financial information (DeAngelo, 1981). Consequently, the companies that have a high quality of their financial auditor (the audit is performed by a BIG 4 entity) have a higher degree of transparency of their financial auditors' report (Khurana and Ratman, 2004). Other researches proved that the presence of financial auditor can positively influence the amount of foreign investment that companies can attract (Covrig et al., 2007; DeFond et al., 2011). Considering these, there is evidence that the performance of the company is correlated with the type of auditor (studies such as those conducted by Dimitropoulos et al., 2013; Ahmed et al., 2013 proved that there is less earnings management, more timely loss recognition and more value relevance when the financial auditor is from BIG 4).

On the other hand, the existence of corporate governance principles and their implementation at the company's level can also significantly influence its evolution. The literature provides evidence that firms with weaker governance structures have higher agency problems, which result in lower financial performance compared with the one obtained by firms that have a stronger corporate governance structure (Core et al., 1999). Moreover, entities that are more inclined to fraud financial statements have in general a weaker corporate governance system (Farber, 2005).

Based on these aspects, the present research tries to reveal if the existence of high quality financial auditor and the existence of corporate governance principles can affect, in a positive way, the financial performance obtained by Romanian companies that are listed on the Bucharest Stock of Exchange. As a fact, the research tries to reveal if these elements are enough or not in order to ensure the re-launch after the financial crisis.

The rest of the paper is structured as follows: the first section presents some approaches related with financial crisis and corporate governance principles or financial auditor that are found in the literature, section two provides information about the database and the methodology of research upon which the study is conducted, section three focuses on the results and discuss the results of the research, while section four concludes and presents future possibilities of research.

Literature review

The main literature emphasizes that the role of financial auditors in the context of financial crisis was uncertain. The explanation is that they were not prepared to face huge financial problems such as those that were revealed when the financial crisis released (Sikka, 2009). In fact, it seems that during the financial crisis companies are more

inclined to change their non- BIG 4 auditor to a BIG 4 one rather than changing their BIG 4 auditor to a non –BIG 4 company. (Hubens, 2012). This situation is due to the fact that companies seek for new financial auditor when they want their financial performance not to be influenced by bad news. The change of financial auditor is also a phenomenon that takes place when the company has lower financial performance (William, 1988) or when it suffered losses in previous years (Francis, 1984). The reasons of choosing a BIG 4 company as financial auditor lies on the assumption that higher credibility and higher reliability is conferred to financial statements (Chia et al., 2007, Reichelt and Wang, 2010).

Another element that is related with financial auditor is the amount paid for the auditing process. At such, an indicator for financial auditor is conferred by the audit fees. The auditor's remuneration is influenced by individual characteristics of audited company, such as indebtedness ratio, size, complexity of its activity and the risk that is associated with the auditing process. Due to this, it seems that BIG 4 auditors perceive higher remuneration for their entire activity (Campa, 2013). On the other hand, the amount request by financial auditor can be a reason to change him due to different audit fees level (Craswell et al., 2002) or due to the law balling effect (Simon and Francis, 1988).

When it comes to corporate governance and financial crisis, failure of several companies and banks is associated with weaknesses in corporate governance regarding the safeguard of the entity, the risks correlated with it and the remuneration system that was not reliable for the entity (Kirkpatrick, 2009). The independence of the board of directors is considered to be essential in order to ensure proper governance polities and the supervision of managers's activities (Cohen and Hanno, 2000). Prior research has link the deficiencies on corporate governance with the release of Asian Economic Crisis and with the low enforcement of it (Wong and Fan, 2005). Another research proves that when CEO is similar with the chairman of the board of directors, when the percentage of the external board members is below the percentage of internal board members, when there are fewer experts on the audit committee and when they have fewer meetings the company has a low quality of corporate governance system and its more inclined to manipulate its financial statements (Farber, 2005).

The literature also establishes a relationship between auditor's remuneration and corporate governance elements. While some studies reveal that the auditor's fees are positively correlated with the independence of the board of directors (Carcello et al., 2002), other researches present that there is no correlation between the corporate governance variables and financial auditor's ones (Ditmann et al., 2008). In fact, the CEO/chair duality influences in a negative way the amount that is paid to financial auditor. Mixt results are also found when the company is having an audit committee. Positive results were detected between auditor's remuneration and the existence of the audit committee (Voller et al., 2013). Other research (Cohen and Hanno, 2000) emphasize that a negative relationship exist among auditor's fees and the existence of the audit committee due to the fact that the risk related with the auditing process are mitigated.

Another important issue upon which the literature presents information is the link between financial performance and the corporate governance principles. While higher performance is expected to be obtained when there the principle of corporate governance

are properly applied, when the company is having a financial auditor from BIG 4, no relevant assumptions can be made.

Regarding the Romanian market, there are few studies that search for the correlation between financial performance, financial auditor and corporate governance variables. One of them found no relevance of the CEO/Chair duality and the high quality financial auditor when financial performance is encountered (Brad et al., 2014). The authors based their explanations of the fact that Romanian market is characterized by a lack of transparency in financial reporting.

Methodology of research

The present research tries to provide evidence about the relationship between financial performance, financial auditor's characteristics and corporate governance indicators. In order to achieve the objective of research, data regarding the companies that have to report using IFRS from 2012 were collected. The reason of choosing this sample lies on the fact that once the new accounting approach is implemented, higher degree of transparency in accounting reporting is expected (Daske, 2006). The number of companies that have to comply with reporting individual financial statements using the International accounting measure was, at the end of 2012, 71. From this sample, we have eliminated the companies that have a negative value of their shareholder's capital, the companies that had opened their insolvency procedure in transition period or in the year of adoption.

From the remaining sample, data regarding the financial audit remuneration (which was coded by *LOGAF*) was also collected. As a fact, the entities that have not provided information about this aspect were also excluded from the analysis. Thus, we had data only for 41 companies. These entities are listed on the Bucharest Stock of Exchange, both art first and the second category. The data is collected using both financial information and information related with corporate governance elements from individual company's site. The information is collected for year 2011 as in 2012 and 2013 the information regarding auditors' fees was not found after checking the financial statements of each company. Regarding the information collected, data about the return on assets of each company, which represent the measure of financial performance, (coded *ROA*), the indebtedness ratio computed by dividing the total amount of debts to own capital (coded *LEV*) and the numbers of executive members (*EXB*) was collected.

In the study, other dummy variables have also been used. The first one refers to CEO/chair duality and is coded *DCEO*. The variable takes 1 if the CEO is different from the chairman of the board of directors. The second dummy variable that we used is the type of management system that the company has. As a fact, if a company has a one-tier management system then the variable took 1, otherwise it took 0. The variable is coded by *DSYST*. The third dummy variable refers to the auditor type. If the financial auditor is part from BIG 4 corporations then the value 1 was given to the financial auditor variable, which was coded *DBIG4*. In all other cases, the variable took 0. The fourth dummy variable that was encountered into the analysis is the existence of the audit committee. The variable was coded *DCOMT* and took value 1 if the company had declared in its corporate governance document that is having an audit committee. The last dummy variable that was incorporated into the analysis is the variable that provides evidence

about the financial auditor's change. The variable took 1 if there is a difference between the financial auditor that the company had in 2010 and the financial auditor that the entity reported in 2011. The value 1 does not depend on the quality of financial auditor that the entity has. The variable was coded *DCHG*.

In order to obtain a correlation among financial performance, financial auditor and corporate governance, a model of simultaneous equation was conducted. The model is presented into system (1) formed from equation (1) and (2)

$$\begin{cases} LOGAF_i = \alpha_0 + \alpha_1 \times DCEQ + \alpha_2 \times DSYST_i + \alpha_3 \times DBIG_i + \alpha_4 \times DCOMT_i + \alpha_5 \times \\ \times ROA_i + \alpha_6 \times EXB_i + \varepsilon_i \\ ROA_i = \beta_0 + \beta_1 \times DCEQ + \beta_2 \times DCHG + \beta_3 \times DBIG_i + \beta_4 \times DCOMT_i + \beta_5 \times \\ \times LEV_i + \beta_6 \times LOGAF_i + \nu_i \end{cases} \quad (1)$$

Where ε_i and ν_i are the error terms and i refers to each company that is included into the sample.

In order to solve the structural equations found in system (1), firstly the type of each equation has to be identified. As two variables are missing from each equation and considering the fact that the number of endogenous variable is two, each equation is exactly identified (Gujarati, p. 762).

The solution of the equation is based on estimating the reduce form of each equation and after that on estimating the standard equations considering the fitted values. The reduced form of our equations is presented in system (2) formed from equation (3) and (4)

$$\begin{cases} (1 - \alpha_5 \times \beta_6) \times LOGAF_i = \alpha_0 + \alpha_5 \times \beta_0 + (\alpha_1 + \alpha_5 \times \beta_1) \times DCEQ_i + \alpha_2 \times DSYST_i + \alpha_5 \times \\ \times \beta_2 \times DCHG_i + (\alpha_3 + \alpha_5 \times \beta_3) \times DBIG_i + (\alpha_4 + \alpha_5 \times \beta_4) \times DCOMT_i + \alpha_5 \times \beta_5 \times \\ \times LEV_i + \alpha_6 \times EXB_i + \alpha_5 \times \nu_i + \varepsilon_i \\ (1 - \beta_6 \times \alpha_5) \times ROA_i = \beta_0 + \beta_6 \times \alpha_0 + (\beta_1 + \beta_6 \times \alpha_1) \times DCEQ_i + \beta_2 \times DCHG_i + \beta_6 \times \\ \times \alpha_2 \times DSYST_i + (\beta_3 + \beta_6 \times \alpha_3) \times DBIG_i + (\beta_4 + \beta_6 \times \alpha_4) \times DCOMT_i + \beta_5 \times LEV_i + \\ + \beta_6 \times \alpha_6 \times EXB_i + \beta_6 \times \varepsilon_i + \nu_i \end{cases} \quad (2)$$

For an easily understanding, both equation (3) and (4) is divided by $(1 - \alpha_5 \times \beta_6)$. Each coefficient is replaced by another variable and thus, the structured form is obtained. This is presented in system (3) composed from the equations (5) and (6)

$$\begin{cases} LOGAF_i = \gamma_0 + \gamma_1 \times DCEQ + \gamma_2 \times DSYST_i + \gamma_3 \times DCHG + \gamma_4 \times DBIG_i + \gamma_5 \times DCOMT_i + \\ + \gamma_6 \times LEV_i + \gamma_7 \times EXB_i + \sigma_i \\ ROA_i = \lambda_0 + \lambda_1 \times DCEQ + \lambda_2 \times DCHG + \lambda_3 \times DSYST_i + \lambda_4 \times DBIG_i + \lambda_5 \times DCOMT_i + \\ + \lambda_6 \times LEV_i + \lambda_7 \times EXB_i + \omega_i \end{cases} \quad (3)$$

Based on the model presented in equations (1)-(6), the research was conducted considering some hypotheses of research. These are:

H1: Higher financial performance is expected if there is a difference between the CEO of the company and the chairman of the board of directors. (Veprauskaitė and Adams, 2013)

H2: Higher performance is expected if there is a change in financial auditor (Hubens, 2012)

H3: Higher performance should be obtained if the financial auditor is part of BIG Corporation (Reichelt and Wang, 2010)

H4: Higher performance should be obtained if the company reports the existence of an audit committee (Bouaziz, 2012)

H5: Higher the indebtedness ratio is, lower the financial performance is.

H6: Higher the audit fees are, higher the financial performance is.

Results and discussions

The purpose of research was to reveal if there is any correlation among financial performance, financial auditor and corporate governance principles considering Romanian market. In order to provide evidence about it, firstly the correlation matrix was constructed. It is presented in Table 1.

Table 1. Correlation matrix

Element	ROA	LOGAF	DCEO	DSYST	DBIG4	DCOMT	DCHG	LEV	EXB
ROA	1								
LOGAF	0.2147	1							
DCEO	-0.1588	-0.0653	1						
DSYST	-0.0129	-0.3465**	-0.2497	1					
DBIG4	0.1670	0.1578	0.0777	-0.1961	1				
DCOMT	-0.0300	-0.0474	0.1334	-0.3369**	0.0139	1			
DCHG	-0.0421	0.1213	0.2101	-0.2877**	0.0442	0.0759	1		
LEV	-0.1796	-0.1910	0.2983***	0.1250	0.1936	-0.1050	0.0947	1	
EXB	0.1778	0.0706	0.1953	-0.1276	0.425*	0.1866	-0.0259	0.059	1

Where *, **, *** states for the level of significance at 1%, 5% and 10%.

From table 1 it can be seen that the highest correlation can be detected between the number of executive members from the board of directors and the type of financial auditor. According to this result, it can be said that larger the number of executive directors a company has, the larger is the probability that that company is going to choose a BIG4 company as financial auditor. As this value is closer to 0.4 and smaller than 0.5, all variables were included into the analysis. Consequently, in order to solve the simultaneous equation model, a summary statistics for the variables encountered into the analysis is presented in Table 2.

Table 2. Descriptive statistics

Element	ROA	LOGAF	DCEO	DSYST	DBIG4	DCOMT	DCHG	LEV	EXB
Mean	0.027	4.754	0.6341	0.902	0.243	0.487	0.1707	0.670	4.658
Max	0.157	5.521	1	1	1	1	1	3.882	9
Min	-0.110	4.079	0	0	0	0	0	0.032	3
Std. D.	0.055	0.382	0.487	0.300	0.434	0.506	0.380	0.912	1.542
Skew	-0.169	0.153	-0.557	-2.712	1.192	0.048	1.750	2.182	1.041
Kurt	3.739	2.153	1.310	8.358	2.422	1.002	4.063	7.050	4.066
JB	1.131	1.386	6.997	99.325	10.290	6.833	22.861	60.569	9.360
Prob	0.567	0.500	0.0302	0	0.005	0.032	0.0001	0	0.009

From Table 2 it can be seen that more than a half of the companies from our analysis have the CEO different from the chairman of the board of directors. It can be seen that almost 90% of the entities have a one tier management system. Less than a quarter of the companies included into the analysis have a financial auditor from BIG 4 companies. Only 7 companies changed their financial auditor between 2010 and 2011. Considering the mean of LEV indicator, it can be observed that the companies that we have included into the analysis are higher indebted as the mean ration of total debts divided by own shareholder is up then 50%. The average number is around 67%. That means that the amount of debts is around 40% from all the resources that the company has. Regarding the number of executive members from the board of directors, in general there are up to 3 members. It had to be mentioned that where the number of executive directors from the board was provided by an interval, the average value was taken into consideration for the present research.

By analyzing the variables encountered into the analysis, it can be observed that they do not follow a Gaussian distribution due to the fact that the null hypothesis of Jacques Bera test is based on the fact that the variable is having a normal distribution.

Regarding the financial performance, there are companies which had a negative performance during 2011. As a fact, the minimum value is -11%, while the maxim value is around 15.7%.

After presenting both the correlation matrix and some particular features of each variable, the reduced form of the equations was established and after that the structured form of it (which is found on system (1) –composed by equation (1) and (2)) was estimated. The results are presented in table 3.

Table 3. *The results of simultaneous equation model*

Dependent variable : ROA (return on assets)		
Element	Coefficient	P Value
Constant	0.0229	0.6896
DCEO	-0.0127	0.0001*
DCHG	-0.0015	0.5626
DBIG4	0.0268	0.0000*
DCOMT	-0.0039	0.1436
LEV	-0.0113	0.0000*
LOGAF_FIT	0.0032	0.7890
Rs squared	80,73%	
DW	1,99	

Where * states for the level of significance at 1%.

The results are estimated using White test adjustment for heteroskedasticity.

The *LOGAF_FIT* consists on the variable that has fitted values for *LOGAF* (auditor's fees) and that were estimated using the reduced form of the simultaneous equation model.

Considering the results, it can be seen that the existence of CEO and of the chairman of the company as two different persons influence in a negative way the financial performance. The explanation is related with the fact this variable is correlated with the type of management system that the company has. On the other hand, it has to be considered that the difference among CEO and the chairman of the company reflects in fact higher transparency of financial statements, which could be translated in reliable information about financial performance (less earnings management, more timely loss

recognition and more value relevance). Thus, based on the assumptions that were made, H1 is rejected as no correlation with the transparency principle was encountered.

The change of financial auditor seems to have no influence upon the financial performance, measured to the value of return on assets. This is due to the fact that the coefficient associated with the change of financial auditor is not statistically significant from zero. As a consequence, H2 is also rejected.

On the other hand, it can be observed that there is a positive correlation between the financial performance obtained by a company and the type of financial auditor that the entity has. Due to this, the following assumption can be made: a high quality financial audit implies higher financial performance as high quoted auditors are more trustworthy than the others. Considering this, H3 is accepted.

Regarding the existence of the audit committee, the results are ambiguous. Besides the assumption that higher financial performance should be obtained once the existence of audit committee is reported, the results prove that there is actually a decrease of financial performance if the level of significance is increased at 14.36%. This can be done as the dimension of our sample is quite small (only 41 companies). The results are opposed with our expectations (H4 is rejected) and also contrary to the results found on main literature.

As we have expected, the results of indebtedness influence negatively the financial performance. Thus, higher the indebtedness ratio is, lower the financial performance is. Consequently, the results prove that H5 is valid.

The last hypothesis of research was also rejected as there is no statistical significance of the coefficient associated with auditor's fees even though the fitted value from the reduced form of simultaneous equation model was used in the analysis.

Summarizing, the results of the research prove that there is not enough relevance for financial audit elements and for corporate governance ones that they are important features that can contribute to financial re-launch even though the goodness of the model is revealed by having a R-squared of 80,73% and by having no autocorrelation between variables and the residual terms.

Conclusions

The present research tried to reveal if the elements related with financial audit and those related with corporate governance principles are solutions that can ensure the financial re-launch of Romanian companies considering the recent financial crisis. The research is conducted using a sample of 41 companies from the Bucharest Stock of Exchange that provide evidence about the remuneration of their financial auditor. The study is conducted using financial information from 2011 and the results are provided considering a simultaneous equation model, where both equations are exactly identified. They are presented considering the reduced form of the model encountered and by including the fitted variables of endogenous variables.

The results are ambiguous considering what the main literature provides to us. As a fact, it seems that there is a negative correlation between the financial performance and the difference between CEO and the chairman of the board of directors. The explanation is

due to the fact that once the CEO/chair duality is not found at company level, higher degree of transparency of financial statements is expected. Considering this approach, the results provide evidence that there are less earnings management, more timely loss recognition and higher value relevance for Romanian companies if there is a difference between CEO and chairman of the company. The conclusion is based on the fact that the managers have fewer ways to manipulate financial statements in order to gain private benefit. Negative influence is also found for the indebtedness ratio, result that is in accordance with the one found by Opler and Titman, 1994. The existence of the audit committee seems to provide evidence of a negative influence upon financial performance if the level upon which we reject the null hypothesis is increased around 15%. The results are contrary with the results found into main literature (Hubens, 2012)

Regarding the type of financial auditor that the company has, it can be concluded that higher the quality of financial auditor is, higher the financial performance is or in other words, we expect higher financial performance if the company is audited by a BIG 4 entity. The second variable that is related to auditing process and which is proxy by financial auditor's fees is not statistically significant in the relationship with financial performance (measured by return on assets).

Based on the estimation, it can be concluded that there is no enough relevance that the existence of financial auditor's variables and the implementation of corporate governance principles are solutions for Romanian entities for the re-launch upon financial crisis. In order to improve the results, we consider that several other corporate governance indicators can be included in future research. Moreover, further research should be done on a larger sample (the small dimension of our sample- only 41 entities represents one problem of the research conducted), should avoid the lack of transparency that is found on Romanian market and should include other estimation techniques in order to provide better results.

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The kids are alright? A note on parental satisfaction in Germany

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Abstract. *In social sciences, research of satisfaction presents mixed or negative effects of parental satisfaction (e.g. Powdthavee 2009, Hansen 2012), while recent findings show that socio-economic differences matter (e.g. Myrskylä/Margolis 2014, Pollmann-Schult, 2014). Here, we use long run German panel data with fixed effects regressions and interaction terms to analyze the effects of birth on parental satisfaction. At first, in contrast to other authors, we present a positive and significant effect of becoming parents. Second, we present gender-specific results of unemployed parents. While unemployed fathers perceive lower levels of satisfaction in general, unemployed mothers have higher levels of satisfaction in the Western part, but lower in the Eastern part of Germany. We conclude that different regional employment schemes drive these results.*

Keywords: satisfaction, children, (un-)employment.

JEL Classification: I31, J13, J64.

¹ This paper is the private opinion of the author.

Introduction

Satisfaction research analyze inter alia if and how sociology-demographics can influence the level of everyday life satisfaction. From a specific economic point of view, satisfaction is an equivalent to the economic concept of utility (e.g. Frey and Stutzer, 2002, Frey, 2008). We start the analysis with the central question if and how children or in general fertility have an effect on parental satisfaction. In recent surveys Powdthavee (2009), and Hansen (2012) discuss both positive and negative effects of having children or getting parents. Interestingly, the larger part of the papers present negative effects on parental satisfaction. If we turn to neoclassical textbook knowledge of population economics (e.g. Becker, 1965, Becker and Lewis, 1973) fertility should be a result of a cost-benefit analysis. Therefore they should calculate their optimal number of children: Based on direct and opportunity costs, males but especially females should maximize over the household to provide labor supply to the market (no children) or to the household (any children). We assume that a high market wage should lower household supply, and maybe the number of children, and vice versa. Second, older children should be less costly than babies in terms of caring intensity. Therefore, our hypothesis is that the given number of children in a given household is the result of an optimization. A larger number of children should increase the level of utility or satisfaction.

As a key result, the number of children has a positive impact on satisfaction. Using terms of interaction, we find gender and regionally mixed results of perceived unemployment: While unemployed fathers perceive lower levels of satisfaction in general, unemployed mothers have higher levels of satisfaction in the Western part, but lower in the Eastern part of Germany. We conclude that different regional employment schemes drive these results.

The structure of the paper is the following: After the introduction section, section number two gives a brief discussion of the empirical literature. In section three data set and empirical strategy is presented. The results are reported in section four, while a conclusion is drawn in section five.

Literature review

Recent studies present mixed or negative effects of children on parental life satisfaction (e.g. Powdthavee, 2009, Hansen, 2012). For instance Di Tella et al. (2001, 2003) show an ongoing decline with the number of children for a set of 12 European countries (with Eurobarometer). Cross country analyzes, such as Margolis and Myrskylä (2011) (with World Value Survey), or Aasve et al. (2012) (with European Social Survey) use global data and present rather mixed evidence for parental satisfaction. For instance, Herbst and Ifcher (2011) show an ongoing long-run effects of higher parental satisfaction in the US (with US General Social Survey and Needham Life Style Survey). Hansen et al. (2009) show that gender-specific differences exist between parents and non-parents. Here, male satisfaction is not effected by children, while women report lower effects of childlessness (with Norwegian Life Course, Ageing and Generation data). Here, those women who

have no biological opportunity to get pregnant, because of infertility report lower levels of life satisfaction than mothers (McQuillan et al. 2007). Tsang et al. (2003) show that young children, who do not attend to school increase parental stress and therefore lower satisfaction. Hagstrom and Wu (2014) show ethical differences in satisfaction for a set of pregnant women (with US Behavioral Risk Factor Surveillance System data). Myrskylä and Margolis (2014) show that the age of the parents matters, as well (with German SOEP data). Clark et al. (2008) show a timing effect of parental satisfaction. Before and after the birth satisfaction is inverse u-shaped. This effect is driven by adaption. Similar results are presented by Myrskylä and Margolis (2014). However, the temporary reduction is explained by marital stress because of family roles (Dew and Wilcox 2011 with US National Survey of Families and Households data). In the long run humans adapt any lifetime event, any way if positive or negative (Frijters et al. 2011 with Australian HILDA data). Pollmann-Schult (2014) shows that parental satisfaction can be decomposed in different stress types, such as financial costs (with German SOEP data).

Data and method

The German SOEP data is the largest panel data in Germany (see Wagner et al., 2007). We use several waves from 1984 to 2007 with 19,749 individuals and an average panel participation of 5.7 years. We limit the data towards those in the ages 18 to 60 years who get children over the time-span. Children are observable till the age of 16 in a parental household. The left-hand variable is life satisfaction.

Table 1. *Descriptive*

	Mean	Std. Dev.	Min	Max
Satisfaction	7.0270	1.7607	0	10
1 Child	0.4942	0.4999	0	1
2 Children	0.3468	0.4759	0	1
3 and more Children	0.1191	0.3239	0	1
Unemployed	0.0798	0.2710	0	1
1st Ch*UE	0.0400	0.1959	0	1
2nd Ch*UE	0.0242	0.1538	0	1
3rd Ch*UE	0.0108	0.1033	0	1
HH Income	2,409	1,397	0	35,000
Secondary School	0.3191	0.4661	0	1
Upper Sec. School.	0.0404	0.1970	0	1
A-Level	0.1496	0.3567	0	1
Other School	0.1124	0.3158	0	1
No School Degree	0.0606	0.2386	0	1
Still in School	0.0119	0.1083	0	1
Eastern Germany	0.2029	0.4022	0	1

Source: GSOEP 1984-2007.

It is a likert-scale from 0 (lowest level) to 10 (highest level of satisfaction). As controls we use the number of children (1, 2, 3+ with reference no children), (un-) employment, household income, education, years and German regions. See table 1 for the descriptive statistics. These variables are used in the estimation equation (1) below:

$$\text{Satisfaction} = a_0 + \text{Children}_{it} + \text{Unemployed}_{it} + \text{Children}_{it} * \text{Unemployed}_{it} + \text{Controls}_{it} + \text{residuum} \quad (1)$$

We try four different models, separated for man and women each. In models I and we use simple OLS and fixed effects estimations for Germany, as a whole. The models III and IV use fixed effects splitted for Western and Eastern Germany. For a theoretical discussion of the estimation techniques see (Greene, 2012).

Results

At first life satisfaction for males and females is relatively similar. Table 2 shows that the highest magnitudes are around the levels 7 and 8 with over 50 percent of the distribution, each.

Table 2. *Life satisfaction by gender*

Scale	0	1	2	3	4	5	6	7	8	9	10
Male	0.45	0.35	1.08	2.27	3.34	11.15	11.28	22.93	30.56	11.40	5.17
Female	0.47	0.37	1.06	2.56	3.47	12.32	10.73	21.71	29.41	11.93	5.94

Source: GSOEP 1984-2007.

It is obvious that the OLS estimations (model I) are not the best specification. However, even this specification proves the hypotheses discussed above. Having children in the parental household, effects satisfaction of male and female parents. The effect is the largest for fathers. Here the number increases satisfaction. For mothers, we find a u-shaped effect. Of course, actual unemployed lowers satisfaction in general. When we turn towards the interaction term, we present lower satisfaction for unemployed fathers, but higher for unemployed mothers. However, this interaction is not significant. Household income and a high level of school education increase satisfaction in general, while the dummy for Eastern Germany lowers satisfaction. We take this last coefficient as a reason to split the analyzes into a Western and an Eastern part.

Again in model III for Western Germany, we find the same positive effect on parental satisfaction. We reassess the result of an increasing effect for fathers and a u-shaped distribution for mothers. However, significance is less robust for women than for men. Unemployment itself remains strongly negative, while the interaction between children and unemployment remain mixed, but not significant. All controls are identical in their directions.

For Eastern Germany (model IV) the direction of the coefficients differ. Fathers show an inverse u-shaped effect for a higher number of children. Now, mothers have an increasing effect. However, only the third children is statistical significant. When we turn to the interaction effect, the structure differs. However, the interactions remain not significant. The controls remain stable.

Finally, the hypotheses is proved. The presence of children increases parental satisfaction. All interactions show a mixed effect. Unemployed fathers loose satisfaction in the Western and Eastern parts of Germany. While men receive on the average higher wags, unemployment is a stronger burden for fathers. Unemployed mothers have higher satisfaction in the Western Germany, but lower in Eastern Germany. This leads to the conclusion that women face different employment schemes in German regions. In Western Germany a more traditional male bread-winner marriage is still more common, than in the Eastern part. Here women have traditional higher employment rates because of a more labor orientation in the former GDR.

Table 3

	Model I		Model II	
	OLS Male	OLS Female	Fixed Male	FE Female
	Germany (all)	Germany (all)	Germany (all)	Germany (all)
Children (Ref No)				
1 Child	0.2309***	0.2441***	0.1723**	0.2148***
	0.0406	0.0418	0.0752	0.0790
2 Children	0.2281***	0.2936***	0.1907**	0.2002**
	0.0409	0.0421	0.0768	0.0802
3 and more Children	0.1663***	0.2131***	0.2225***	0.2136**
	0.0448	0.0457	0.0827	0.0861
Unemployed (Ref No)	-1.1652***	-0.7821***	-0.7210***	-0.4485***
	0.1429	0.1340	0.1501	0.1522
Children*UE (Ref No)				
1 Child*UE	-0.1358	-0.0497	-0.1344	0.0455
	0.1513	0.1397	0.1579	0.1556
2 Children*UE	-0.1518	0.0507	-0.1287	0.0316
	0.1562	0.1431	0.1638	0.1587
3 + Children*UE	-0.2335	0.0044	-0.2250	0.0865
	0.1704	0.1562	0.1881	0.1736
Income	0.0002***	0.0002***	0.0001***	0.0001***
	0.0075	0.0074	0.0001	0.0001
Education (Ref Primary)				
Secondary	0.1102***	0.1058***	0.0316	0.0533
	0.0200	0.0195	0.0773	0.0872
Upper Secondary	0.0991***	0.1840***	-0.0243	0.1475
	0.0331	0.0405	0.1148	0.1323
A-Level	0.2124***	0.1555***	0.0921	0.2621**
	0.0228	0.0244	0.1019	0.1234
Other School	-0.0315	0.0663**	0.0476	-0.0491
	0.0253	0.0264	0.0958	0.11027
No School Degree	-0.0462	-0.1637***	0.0663	-0.2045
	0.0370	0.0341	0.1109	0.1369
Still in School	0.6335	0.4275***	0.1624	0.2428
	0.0533	0.0595	0.1325	0.1507
Region (Ref West)				
Eastern Germany	-0.5840***	-0.5673***	-0.6831***	-0.3852**
	0.0207	0.0199	0.14258	0.1565
Years	Ok	Ok	Ok	Ok
N	54,131	58,672	54,131	58,672
R ²	0.0989	0.0792	0.0684	0.0438
robust standard errors, * p<0.1, ** p<0.05,*** p<0.01. Source: SOEP 1984-2007				

Table 4

	Model III		Model IV	
	FE Male	FE Female	FE Male	FE Female
	West Germany	West Germany	East Germany	East Germany
Children (Ref No)				
1 Child	0.1992**	0.2221**	0.1131	0.1680
	0.0813	0.0927	0.2019	0.1467
2 Children	0.2311***	0.2166**	0.1579	0.2274
	0.0833	0.0941	0.2036	0.1477
3 and more Children	0.2786***	0.2271**	0.0864	0.2881
	0.0896	0.0996	0.2166	0.1701
Unemployed (Ref No)	-0.7730***	-0.3971*	-0.5268**	-0.5463***
	0.1807	0.2060	0.2593	0.2057
Children*UE (Ref No)				
1 Child*UE	-0.2296	0.0706	-0.0358	0.0587
	0.1931	0.2119	0.2676	0.2092
2 Children*UE	-0.2077	0.0245	-0.0618	0.0715
	0.1996	0.2150	0.2770	0.2178
3 + Children*UE	-0.1742	0.2152	-0.3591	-0.0677
	0.2261	0.2341	0.3247	0.2441
Income	0.0001***	0.0001***	0.0002***	0.0002***
	0.0001	0.0001	0.0001	0.0001
Education (Ref Primary)				
Secondary	0.0689	0.1002	-0.0714	-0.1527
	0.0903	0.0914	0.1472	0.2601
Upper Secondary	0.0246	0.0888	-0.1964	0.1932
	0.1207	0.1475	0.3277	0.3044
A-Level	0.1289	0.2525*	0.0018	0.1022
	0.1124	0.1444	0.2442	0.2652
Other School	0.0559	-0.0329	0.1135	-0.2988
	0.0983	0.1191	0.3867	0.2397
No School Degree	0.0423	-0.1780	0.3423	-1.009**
	0.1162	0.1404	0.3089	0.4925
Still in School	0.2507	0.3490**	-0.0387	-0.2134
	0.156	0.1769	0.2657	0.3111
Years	Ok	Ok	Ok	Ok
N	43,391	46,514	10,740	12,158
R ²	0.0410	0.0168	0.0789	0.0655

robust standard errors, * p<0.1, ** p<0.05, *** p<0.01. Source: SOEP 1984-2007

Conclusions

In this paper we showed if and how the number of children can effect parental satisfaction. The hypotheses was that a higher number of children should lead to higher utility or satisfaction. We tried to include theory of population economics into the spectrum of satisfaction research. At first, in contrast to other authors, we present a positive and significant effect of becoming parents. Second, we present gender-specific results of unemployed parents. While unemployed fathers perceive lower levels of satisfaction in general, unemployed mothers have higher levels of satisfaction in the Western part, but lower in the Eastern part of Germany. We conclude that different regional employment schemes drive these results. At first, in contrast to other authors,

we present a positive and significant effect of becoming parents. Second, we present gender-specific results of unemployed parents. While unemployed fathers perceive lower levels of satisfaction in general, unemployed mothers have higher levels of satisfaction in the Western part, but lower in the Eastern part of Germany. We conclude that different regional employment schemes drive these results.

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Technological revolution, labor markets and income distribution in the knowledge economy

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Abstract. *The concept of knowledge-based economy is a new model of economic development.*

In this article I am analyzing the defining elements of the knowledge economy in Europe and Romania, in terms of the technological revolution, the labor market and income distribution.

In order to perform this analysis, I will use the following economic indicators: the scientific research spending, the number of patents and the Gini index. To effectively compare the economic indicators that define the knowledge economy in the EU and in our country, I will test a series of econometric equations that describe the correlations between the Gini indexes and the determinant factors of the technological progress. Due to the complexity of interactions there will be used autoregressive tools. The comparison of the different forms of econometric estimation will take into consideration the results of similar studies in the literature, respectively the specific conditions in Romania. There will be analyzed the implications of new technologies on labor market and the income dynamics in the Romanian economy. On the other hand, there will be taken into account the impact of the current global economic crisis on the economic indicators analyzed.

The conclusions of the analysis will be reported to the requirements of the EU's strategic programs, in particular the "Europe 2020".

Keywords: technological revolution, knowledge based economy, economic crisis.

JEL Classification: 8E, 18D, 20B, 20I.

1. Introduction

The foundation of the knowledge economy concept was created by Peter Drucker.

In 1966, he described the difference between the manual worker and the knowledge worker: a manual worker uses his hands to produce “things”, and a knowledge worker uses his intelligence to produce ideas, knowledge and information.

The “knowledge of economy” is a concept that can define a “knowledge economy”, this focusing on the production and management of knowledge, or “knowledge based economy”, which refers to the use of tools to produce economic benefits (Drucker, 1969).

The phrase was popularized by Peter Drucker in his book *The Age of Discontinuity* (Drucker, 1969). A key principle used is that education and knowledge are considered productive assets of a business, as they are the primary elements valuable in making a product or service.

The difference between the two perspectives comes from how the knowledge is perceived: product (knowledge economy) or instrument (knowledge based economy). This difference does appear only in theory. Both approaches are interdisciplinary, involving economists, programmers, IT engineers, mathematicians, chemists, psychologists and sociologists.

The knowledge economy is a component of the knowledge society. Thus it is ensured that the change rules and practices are applied successfully in the industrial economy. The safety of life and cultural diversity indirectly influences the economic environment. They provide optimal conditions for the development of education and thus of science. Therefore, education and science are areas whose development has a direct impact on the economy based on knowledge.

The entrepreneur is the mediator, who will turn invention into innovation. Innovation depends on the emergence of new social needs - economic. To become innovation, invention must be accompanied by research on how to use, so costs are minimal. It is therefore necessary to have some contractors who provide value an invention to meet a social need. (Roşca et al., 2006)

Also, another aspect that you should understand very well, is the human cost that it involves innovative transformations. Justify this idea from Joseph Schumpeter's statement quoted in Harry: “Innovation is really a process of creative destruction” (Harry, 2006, p. 18).

Technological revolution supports the development of the knowledge society, which, however, can mean the destruction of social relationships. In this context, the question arises: “Is there no risk of destabilization an entire generation for the name changes?”

2. Literature review

A widely accepted fact is that today we live in an era of economic globalization, technological revolution and new technology-based communication.

Based on these processes, the Lisbon Treaty indicate the need to modernize deep and competitive European economy and establishing, among others, the ambitious goal of building by 2010 a knowledge-based society.

The EU industrial policy objective is to increase the competitiveness of European industry so that it can maintain its role as drivers of sustainable growth and employment in Europe.

As described in the introduction the knowledge based economy is a relatively new concept in economics. The technological revolution and the income distribution also have a major impact on the development of this type of economy.

The revolution is defined in the Explanatory Dictionary of the Romanian Language as a “step in developing the profound social changes that occur in all areas of life. “Technology as defined in DEX is “the ensemble of processes, methods, operations etc. used to obtain a product”. If we combine the two definitions in order to find out what is the technological revolution we would come to the conclusion that it is a “process that determines contemporary radical changes in the productive forces, the accelerated development of science and technology, by improving technological processes”.

The technology has an important role in the information transfer and the age we live in is accelerating this process. This transfer is important because information, material-immaterial realities through combination, hierarchy and organization are the “basic human intrusion into the world without and within.” (Stoica, 1997)

Information is not knowledge, but knowledge can be built only on a foundation based on information.

The concept of information society has been regarded as an invention of computer scientists and computer manufacturers in order to sell their products. The initiative our Government had by making a bid for all kinds of computer products shows that the information society is “an essential structure, the only way to bring the values of humanity and global requirements in each social group and each individual and the path to efficient solutions for solving problems or production resources.” (Stoica, 1997)

The information society helps to solve problems of social conscience, such as those from professional or coagulated human relations in chat sessions or discussion groups on various topics such as love or friendship.

Working in frontier areas of information technology means working to streamline the transfer of information, and in this case the man redesigned information systems. Information is knowledge; knowledge is power and the ability to plan for the future. The future has a size based on the information and the best way to get into it is when you combine what we know and what we hope or want to achieve.

As the progress in science and technology revealed the limits of scientific rationalism as a method of validation of knowledge and proved that “information revolution” does not show a clear causal link, supported by logic between technological change and social change, the new company started to be called “knowledge society”, based on

reconsidering the type of knowledge that underpins the economic and social development. (Roşca and Cotigaru, 2006)

Joseph Stiglitz has developed the concept of “knowledge economy”. (Stiglitz, 1999) He believes that in the process of reducing the “knowledge gap”, the investment in the most advanced technologies matters, but what is more important is the cultural and institutional change, including changing the way to think of individuals, the effort to develop their skills and confidence in using their own powers. “It's hard to describe this change: an acceptance of change, the recognition that the poverty in which they lived centuries was neither inevitable nor necessary and recognition of the centrality of knowledge and education in general and in particular science and technology”. (Stiglitz, 1999)

In the past students' participation in class was equivalent to a full-time job. Students were helped by family or scholarships and loans, the students who had jobs were few. Today, most students work to pay their education and living expenses. Precisely for this reason the students' time for study is low so maybe they will require a longer period of time till they graduate.

In order to ease this problem with the studies we have technology. Today many universities facilitate the learning process through the use of computer and an Internet connection.

In some European universities the courses are conducted online via video chat, in Romania some teachers use computer presentations that they send to their students afterwards so that even those who cannot attend the classes have the materials needed for study.

3. Analysis

In my analysis in order to see the impact of technology on income distribution on the labor market in the knowledge based economy I used: the scientific research expenditure, the number of patents and the Gini index. These economic indicators were correlated using a panel data model because:

“The panel has a two-dimensional structure –it includes data with a dimension in time and an individual dimension. Each observation (y_{it}) corresponds to some specific units (individual) i , $i = 1, \dots, N$, in a given time t , $t = 1, \dots, T_i$, where N is the number of units recorded and T_i is the number of records in time realized for the i unit.

Eg. The unemployment Alba, Arad, ... 2014-January, February, ... “ (Baltagi, 2005)

In my case I found y_{it} record on unit i at time t and k explanatory variables $x_{1,it}$, $x_{2,it}$, ..., $x_{k,it}$, where i represents the country in my analysis I chose to do the analysis, t the period from 2003 to 2012, k the 28 countries under consideration.

I chose this model because in this analysis I could clearly highlight the advantages of using data for Panel:

- It allows the analyze of individual dynamics and the effects of ordering through time of the events (separation of individual effects and /or in time).
- It allows the control of heterogeneity that is induced by the invariant variables over time, or in the transverse structures, whether these variables are observable or not (dormant).
- The models make it possible, for example, to do a better examination of the dynamics of adjustment and allow the study of more complex behaviors.
- Econometric the number of comments, meaning the degrees of freedom increase, which leads to an increase of the power tests, of the consistency and efficiency of estimators and reducing the collinearity between variables. Is also reduced or eliminated the distortion induced by the aggregation activities, the companies or individuals. (Baltagi, 2005)

Of all the types of analysis models the best one that fits this situation represents the individual random effects model because:

- the records are randomly selected from a population of size; Most often, the information is available only for the samples and not for the entire population;
- the sample size (N) is high;
- the number of records in time (T) is relatively small.

In terms of the income inequality analysis we used two explanatory variables: the scientific research spending and the number of patents. To measure the income inequality we used the Gini index.

Most of the existing studies in the literature have concluded that the costs of scientific research have led to an uneven distribution of income in the host countries. These expenses can promote the income inequality by lowering wages of unskilled workers compared to those qualified.

The level of development (GDP per capita) is used in the model because the income inequality depends on the country's economic structure, which is related to the level of development.

The level of education holds especially for the supply side of the labor market. Clearly, the higher the wage inequality is the bigger the qualification bonus is, thus increasing the pressure on education to produce more skilled workers. We expect a higher tuition rate to increase the supply of skilled workers. This in turn should reduce wage inequality by increasing the supply of highly qualified labor force.

The basic form of the estimated model is:

$$\text{GINI}_{it} = b_0 + b_1 * \text{RD}_{it} + b_3 * \text{GDP} + b_2 * \text{PAT}_{it} + \alpha_i + \varepsilon_{it}$$

where RD is spending on scientific research and PAT number of patents, GINI is a variable used in the testing of income inequality.

The analysis covers the period 2003-2012 and uses data for the 28 Member States of the European Union. The main data sources were Eurostat database and the World Bank.

The number of patents reflects the work of a country in terms of innovation. Patents also indicate a country's ability to exploit information and translate it into potential economic gains. In this context, the indicators based on patent statistics are widely used to assess the inventive performance of countries.

About the European Union

In the empirical analysis we tested the correlation between the Gini index of GDP, with the number of patents and R & D expenses. As for the econometric equation with all the 3 influencing factors (GDP, patents, R & D) has not proved to be consistent, I correlated separately the intensity of the correlation on each factor.

The influence of GDP on income inequality

The var analysis on the panel of all the countries from the U.E. reveals the following econometric equation:

$$\text{GINI_EU28} = 39.21569882 + 1.031320975*\text{GINI_EU28}(-1) - 1.324771447*\text{GINI_EU28}(-2) - 0.01773378415*\text{GDP_EU28}(-1) - 0.07068614028*\text{GDP_EU28}(-2)$$

We can observe an oscillatory dynamics of the Gini index on the 2 lags, respectively a strong inertial tendency (the attached coefficients for the lag 1 and 2 are more attached than the influence of the GDP). Instead the GDP has a significant influence in regard to the statistical tests, both the coefficients attached to the two lags having negative values. This means that the EU countries are situated on the right side of the Kuznetz curve. In other words the EU as a whole represents a developed economic and social area in which the growth of the macroeconomics results is accompanied by lowering the inequality of income distribution.

The explicit form of the autoregressive vector shows us that the inverse correlation between Gini and GDP is strong but fluctuating and with a low-trust degree.

The influence of the number of patents on income inequality

This econometric equation still reveals the oscillating and inertial tendency of the Gini index dynamics.

$$\text{GINI_EU28} = 60.45054391 + 1.634621694*\text{GINI_EU28}(-1) - 2.438822905*\text{GINI_EU28}(-2) - 6.564619968\text{e-}005*\text{PAT_EU28}(-1) - 3.990077599\text{e-}005*\text{PAT_EU28}(-2)$$

In terms of the intensity correlation of the number of patents with the Gini index we can observe that the influence is very low (6.56×10^{-5} or 3.9×10^{-5} , the coefficients of the 2 lags) and with a degree of very low confidence. What is interesting is the meaning of the correlation, this indicating a negative relationship on both lags which would mean a very small contribution to the increase of this indicator to the increase in the income inequality.

Influence of the R & D expenditure on the economic development

It can be seen that the costs of research and development have the greatest impact on income inequality (the attached coefficients 1.25 on the lag 1 and 4.55 on the lag 2 compared with the previous equations, significantly exceeding the coefficients attached to the lags of the Gini index).

$$\text{GINI_EU28} = 58.31604935 - 0.6750831353*\text{GINI_EU28}(-1) - 0.6141033486*\text{GINI_EU28}(-2) + 1.250421013*\text{RD_EU28}(-1) + 4.549608398*\text{RD_EU28}(-2)$$

Moreover the signs of the coefficients of the 2 lags show that the upward dynamics of the two charges contribute to a significant increase in income inequality (especially on the lag 2).

This trend is explained by the fact that the investment in research and development is accompanied by structural changes in the labor market for highly skilled professions, where wage levels are high.

This phenomenon clearly proves the strong transition of the EU countries to the stage of an economy of knowledge.

About Romania

In which regards Romania we can see that our country is part of the overall trends in the EU. However there are certain peculiarities in the manifestation of the dynamic determinants of the income inequality examined above.

The GDP influence on income inequality in Romania is given by the following econometric equation:

$$\text{GINI_RO} = 18.64680575 + 0.6478218051*\text{GINI_RO}(-1) - 0.2003762412*\text{GINI_RO}(-2) + 0.1005925099*\text{GDP_RO}(-1) - 0.03403098932*\text{GDP_RO}(-2)$$

This equation shows a lower inertia trend of the Gini index with respect to the one revealed for the whole EU (the attached coefficients are 0.647 for the first lag and 0.200 for the second lag), but the oscillating trend remains. Moreover the Student test shows a high failure rate for the two coefficients of the two lags for the Gini index. This indicates a transient state regarding the stability on income distribution in Romania. This transient state is observed in terms of the GDP influence, positive on the first lag (0.100) and negative on the second lag (-0.03). Under these conditions the tendency of the EU developed countries of diminishing the income inequality based on the measure of the GDP growth in Romania is still unclear.

The influence of the number of patents on income inequality in Romania is described by the following econometric equation:

$$\text{GINI_RO} = 20.10726118 + 1.007314383*\text{GINI_RO}(-1) - 0.5943399469*\text{GINI_RO}(-2) - 0.2387560581*\text{PAT_RO}(-1) + 0.2502758673*\text{PAT_RO}(-2)$$

This time the inertial tendency of the Gini index is clearer and more pronounced (the first coefficient is 0.007 and the second coefficient is -0.59, with much higher probabilities of

guarantee). As for the influence of the number of patent the trend at European level persists with a slight tint on further increasing the likelihood coefficients and guarantee of results.

The influence of R & D expenditures on the Gini index in Romania is described by the following equation:

$$\text{GINI_RO} = 28.27236148 + 0.3859320818 * \text{GINI_RO}(-1) - 0.5245432193 * \text{GINI_RO}(-2) + 21.39889129 * \text{RD_RO}(-1) + 0.3017684252 * \text{RD_RO}(-2)$$

This time it returns to the weak inertia trend of the Gini index (coefficient 0.385 on the first lag and -0.524 on lag 2) but this confirms the positive influence trend of R & D expense reported for the whole EU. Moreover the associated coefficient with the first lag is unusually high (21.39) this indicating significant modern technology transfers to Romania accompanied by unprecedented structural changes in the labor market in our country.

4. The Europe 2020 Strategy

Regarding the Europe 2020 Strategy this should focus on three priorities:

- Smart growth - developing an economy based on knowledge and innovation.
- Sustainable growth - promoting a more efficient economy in terms of resource use, greener and more competitive.
- Inclusive growth - promoting an economy with a high rate of employment, able to ensure economic, social and territorial cohesion.

These three priorities are mutually reinforcing and provide an overview of Europe's social market economy for the twenty-first century.

A single stronger market, deeper and more comprehensive is vital for growth and job creation. However, the current trends show signs of lower integration and disenchantment regarding the single market. The crisis has added temptations of economic nationalism. The vigilance of the Commission and the sense of responsibility they showed; all Member States have prevented a drift towards disintegration. However, it requires a new momentum - a genuine political commitment - to relaunch the single market by the rapid adoption of the initiatives mentioned above. Such political commitment will require a combination of measures to fill the gaps in the single market.

Every day businesses and citizens are faced with the persistent reality of the bottlenecks which affects the cross-border activities despite the legal existence of the single market. They realize that the networks are not sufficiently interconnected and that the enforcement of single market remains uneven. Often, for the same transaction, businesses and citizens still need to deal with 27 different legal systems. While our companies still face the daily reality of fragmentation and diverging rules, their competitors from China, the US or Japan can fully benefit from the strength they were given by their large home markets.

The single market was conceived before the arrival of Internet, before information and communication technologies became one of the main drivers of growth and before services became such a dominant part in the European economy. The emergence of new services (e.g. in areas such as content and media, health, smart energy measuring) shows huge potential, but Europe will only exploit this potential if it overcomes the fragmentation that currently blocks the flow of content online and access of consumers and businesses.

To gear the single market towards the objectives of the Europe 2020 Strategy it is necessary to have functioning and properly connected markets, where competition and consumer access can stimulate growth and innovation. On the basis of the Directive regarding services there must be created a single market that must ensure in the same time the quality of service provided to consumers. The full implementation of the Directive regarding the services could increase by 45% the volume of trade in trade services and foreign direct investment by 25%, resulting in an increase in GDP of between 0.5% and 1.5%.

5. Conclusions

This article analyses the relationship between the income inequality and the investment in R & D and the number of patents for the period 2003-2012 relative to the strategy “Europe 2020”.

The results obtained at the level of the 28 European Union countries and in our country clearly show a pattern similar to the developed countries and those developing in terms of the investment in research and development has a direct influence over the GDP. I found a nonlinear effect: short-term income inequality is increasing with the increasing investment in R & D, but this effect diminishes over time with continued growth of these investments.

The increases in GDP per capita are associated with reductions in income inequality in all analyzed countries. This is an important result because one of the main targets of European policies is to increase the standard of living, thus increasing GDP/capita. Another major objective is to reduce income inequality. This study shows that these two objectives are not divergent; on the contrary, the policies concentrated on the increase of the individual welfare will result in a more equitable income distribution.

Another important conclusion is that research has a strong impact on income inequality. Although income inequality is a complex problem that requires multiple solutions, the policies relating to investment in this segment are among the most powerful levers available to countries in order to reduce inequality in the future. It is also clear that people with higher levels of education have a competitive advantage in the labor market in both good economic times and in bad. Therefore, policies that focus on achieving a higher level of education aimed at ensuring better jobs and, over time, could reduce income inequality.

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The effects of competition regulations on mobile telecommunication markets

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Abstract. *This paper is based on the classic economics hypothesis that the presence of a reduced number of suppliers on a market can provide them a larger negotiation power towards consumers, thus being able to abuse this power in the disadvantage of consumers. Because the telecommunications market is characterized by a reduced number of operators due to its specific features, the present paper wants to analyze what are the implications on consumers, for the perspective of the costs they endure and what effects have the regulations on this market for the consumers from Romania.*

The paper analyzes how the reduction of interconnection tariffs affects the price structure of mobile communications, penetration rate of mobile communications, the degree of usage of these services and the evolution of the number of operators in the market, comparing the evolution of these variables before and after the 2009 European Commission proposals.

Also the paper aims to determine the demand equation for mobile communications services through a panel model that analyzes 21 of the member states of the European Union, to identify the main factors that have influence on the demand and also to determine the price elasticity of demand.

Keywords: competition regulation, panel model, demand equation, consumer surplus, telecommunication.

JEL Classification: C23, D12, D22, D43, L96.

1. Introduction

This paper is based on the classic economics hypothesis that the presence of a reduced number of suppliers on a market can provide them a larger negotiation power towards consumers, thus being able to abuse this power in the disadvantage of consumers. Because the telecommunications market is characterized by a reduced number of operators due to its specific features, the present paper wants to analyze what are the implications on consumers, for the perspective of the costs they endure and what effects have the regulations on this market for the consumers from Romania.

To measure this effects a panel model was used to determine the demand function for voice services at European level. Also more panel models were used for determining the average European price so that it can be compared to the price levels from Romania and afterwards to be used in determining the consumer surplus.

2. Literature review

This approach was used by several authors that wanted to analyze the competition on certain telecommunication markets. Hausman (1997a) estimated an income elasticity of demand of 0.193 for the first thirty mobile communications markets in U.S.A. Lee and Lee (2006) obtained values between 0.625 and 0.655 for income elasticity of demand for mobile telecommunication market in South Korea. Waverman et al. (2005) estimated a value of 1.95 for the income elasticity of demand for a sample of high income countries.

Also these papers have estimations for the price elasticity of demand. Hausman (1997b) found a value of -0.506, Lee and Lee (2006) estimated values between -0.482 and -0.643. Waverman et al. (2005) estimated a price elasticity of -1.50. Also Hausman (2013) estimated price elasticity of demand of -0.27 for fixed-line services and of -0.524 for mobile communications.

3. Research context

Competition in mobile communications can be manifested in two ways: access and services. Access is based on the infrastructure of the operators, while services refer to the services offered by the operators. When this industry first started to develop, to ensure proper competition, the regulators usually offered licenses for at least two operators, but as the industry progressed and were identified more spectrums, the competition gained new aspects. Thus the regulations under these circumstances must assure an optimal level of competition in this sector, and too many regulations can lead to the mitigation of innovation, raising of costs and can affect the consumers' welfare due to the risk of inefficient allocation of resources, especially of spectrum.

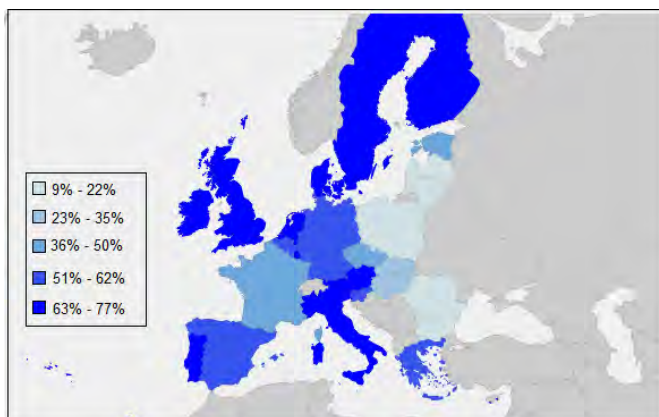
The regulation of interconnection tariffs still draws much attention from the specialized institutions, both in developing and developed countries, thus the regulation raising problems on establishing the optimal level of such tariffs.

In most of the cases, the regulators considered these tariffs the result of a monopoly power since every operator set them individually, independently of the other. Thus the regulations tried to orient the level of these tariffs accordingly to the costs that are generated by these services.

The interconnection tariffs are regulated in many countries, and often these are set according to an annual calendar so that the investors have a better predictability of the business environment. Under these circumstances, the regulation of the interconnection tariffs is better to be realized at national level, according to the specific of each country.

Figure 1 shows the penetration rate of mobile telecommunication in year 2000. The countries were divided in 5 intervals according to their level of penetration. It can be observed that Romania has a penetration rate similar to other Central and Eastern European countries (between 9% and 22%) while the entire Western and Nordic countries have a penetration rate above 30%.

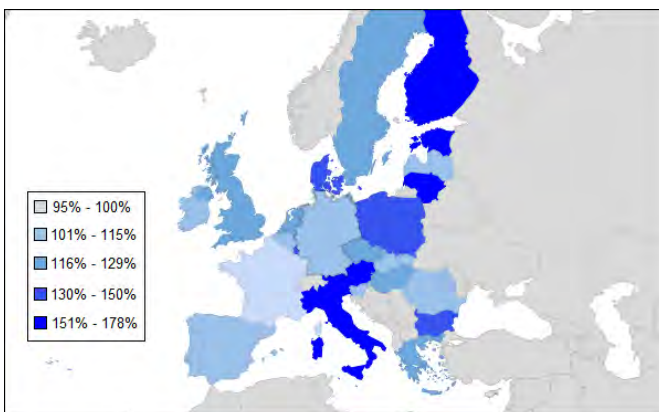
Figure 1. European Union mobile penetration rate in 2000



Source: own processing based on International Telecommunications Union data.

In 2012 it can be observed a significant change at European level in mobile penetration rates. It can be observed that only two countries have a level under 100% for this indicator (France and Cyprus). Also it is noticeable that western countries are not on the first category of penetration, most of them now spread in the first three categories of penetration rate grouping, having values between 97% and 130%.

Figure 2. European Union mobile penetration rate in 2012



Source: own processing based on International Telecommunications Union data.

Due to the chosen indicator (the number of active SIM cards to a hundred inhabitants), the modifications surprised by the two figures may suggest two aspects of the evolution of mobile telecommunication market at European level between 2000 and 2012: mobile communication market has reached a certain level of “maturity” (1) and that consumers start to orient to other services provided by mobile operators (especially mobile internet) (2).

4. Methodological aspects

Although mobile telecommunications appeared at different periods in the EU member states and evolved differently, the development of new technologies allowed reaching a certain “maturity” at national level. More than that, even though there are differences between the groups of countries (Western Europe and Central and Eastern Europe), the telecommunication sector faces a series of regulations that all operators from EU members states must respect. Since the regulations affect all operators, an analysis of the entire EU level will generate comparable results.

The variables used in the model are GDP per capita as a proxy for income, the level costs with mobile services (approximated by the Average Revenue Per Minute – ARPM hereafter), and penetration rate of mobile communication (measured as active SIM card on 100 inhabitants) as a proxy for demand.

For GDP per capita it was used the exchange rate approach because the infrastructure and the equipment in the telecom industry is produced in other country than the selected sample, thus they are traded in other markets and this equipment has a significant impact on the costs’ structure. The data was extracted from Eurostat database, for the 2002 -2011 interval, with an annual frequency.

For the cost analysis, the best proxy used in the literature is the ARPM registered by the mobile telecommunication companies. The data series for informational society, implicitly the series for telecommunications, in Eurostat database have a structural inconsistency due to the fact that in 2010 a part of the indicators monitored by Eurostat changed, so that some of them are measured until 2009 and some of them start from 2010. ARPM series has values only for 2010 and 2011. Hence, in order to fill the series for the rest of the period was elaborated a methodology for calculating this indicator based on the other available data: total revenues were reported to the total number of minutes, weighting for the value that the voice services in the total services provided by operators (voice, SMS, MMS), taking account for each country’s specific.

Penetration rate indicator also presented structural incoherencies in Eurostat database because of the methodology change in 2010, hence was preferred the series from International Telecommunication Union whose methodology was the same in the selected period.

The reason for which were included only 21 countries is because for the excluded countries (Italy, Poland, Latvia, Malta, Luxembourg, Croatia and United Kingdom) one or more indicators were not in the aforementioned databases and they could not be calculated from other data sets.

Regarding the number of mobile operators in each country, the series covers only 2002 - 2009 interval, but taking account for the national evolutions we can assume that their number has not changed in 2010-2011 because the markets already reached certain level

of stability and saturation. However, assuming that the number of operators has not changed during 2010-2011 can lead to erroneous conclusions, thus this variable must be treated with certain doubt. Also the data available for the number of mobile operator does not present a consistency over the selected period, which means that the Eurostat has centralized values based on different national methodologies.

For elaborating the model was used the approach proposed by Hausman (2013). In the first step was estimated the demand equation for mobile services in order to obtain values for both the price elasticity and the income elasticity of demand. In this equation the penetration rate is the dependent variable, thus the equation shows how the penetration rate changes when the other variables change. In the second step three models were estimated to determine the price of the mobile communications in each country as a response to the influence of the average European price and income. Based on the values estimated for price and for price elasticity was calculated the consumer surplus for 2011 for Romania.

Due to the lack of data, the newest available data cover only the year 2011.

5. Econometric analysis

Because there are significant differences between the penetration rate in the countries within the sample and most of them have values over 100% for estimating the equation was used fixed effects in order to isolate the country specific factors. To test if the fixed effects are preferred to the random ones the Hausman test was used. The test had a values of 142.209, confirming the accuracy of using fixed effects.

To estimate the fixed effects model, the generalized method of moments (GMM) was used because the estimators are consistent and eliminate the influence of fixed effects. The exogenous variables from the model are GDP per capita and ARPM registered by the operators (in the existing literature ARPM is considered by researchers a better approximation of the costs bore by consumers than the cost of a hypothetical call at a certain distance – assuming that costs are correlated with the distance). To specify the instruments for GMM it was used the GDP per capita. Also as a price instrument it was used the approached developed by Hausman and Taylor (which was used in a series of academic papers and has come to be known as “Hausman instruments”). The main idea behind this approach is that the best instrument for price is given by the variable costs. However, most of the time, such data are not available for researchers in order to elaborate a quantitative analysis. In this case the prices from other countries should be correlated with the price from the studied country due to similar costs structures, and these prices are independent of the stochastic error since there are no correlations between the demand shocks. The price instrument for each country was the average of the other 20 countries. All the countries have a similar behavior from the point of view of the costs, due to the highly competitive industry telecommunication equipment and the new technologies that are rapidly implemented by all the operators.

Table 1 presents the results for estimating the demand equation. The dependent variable is the penetration rate of mobile communication. To obtain robust errors and to isolate the heterogeneous effects from each country's level, it was used for estimation the White cross-section weighting. The dependent variables are the GDP per capita to reflect income and the ARPM used to reflect price. Because the equation was estimated using

logarithm values, the coefficients represent price elasticity. The coefficient's value is -0.24 estimated with a high probability (t statistic -6.48). Also the GDP per capita coefficient, 0.847, is estimated with a high probability (t statistic 7.17), which means that the income elasticity of demand is 0.847

Table 1. Parameters' values for the demand equation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.058008	1.177813	-2.596344	0.0102
LOG(GDP)	0.847429	0.118083	7.176584	0.0000
LOG(ARPM)	-0.240973	0.037152	-6.486224	0.0000

Source: Own calculation.

In the next step, in order to determine the price equation for the 2002 – 2011 period, was elaborated another model. The dependent variable is the ARPM and is the same variable used in the previous model. Also to isolate the heterogeneous components from national level was used the fixed effects. The exogenous variables used were GDP per capita, the average of the ARPM in the other countries and the number of mobile operators (both as absolute value and also as difference to emphasize on the evolution). The results are presented in Table 2.

Table 2. The results for the three models for price equation

Endogenous variable: LOG(ARPM)			
Exogenous variables	Model 1	Model 2	Model 3
C	5,632* (1,59)	5,279* (1,73)	4,948* (1,518)
LOG(ARPMED)	0,727* (0,064)	0,783* (0,064)	0,766* (0,053)
LOG(GDP)	-0,543* (0,153)	-0,494* (0,162)	-0,456* (0,144)
OP	0,066* (0,017)	-----	-----
D(OP)	-----	0,011** (0,016)	-----

* Statistically significant for 1%. ** Statistically not significant.

Source: Own calculation.

The model estimated without accounting for the number of operators generated statistically valid results. The coefficient for the average price in the other countries has a high value of 0.766 and has a high significance (t statistic 14.21) which means that a decrease of the average price in the other countries by 1% leads to decrease in the analyzed country by 0.766%

All the three models generated significant coefficients, but the model that uses the difference for the number of mobile operators to estimate the impact price has not generated a statistically significantly coefficient for this variable. Also due to the close results obtained for the other two models and because of the structural inconsistencies of the number of operators' data set, the number of operators was not used to estimate the price equation, thus the chosen model in model 3.

For calculating the consumer surplus were used the coefficients determined with the aforementioned models for price elasticity and the price estimated by the price equation.

The formula to calculate consumer surplus using a logarithmic model (according to the approach proposed by Hausman, 2013) for the demand equation is:

$$\Delta CS = \frac{p_2 \times q_2 - p_1 \times q_1}{1 - \varepsilon} \quad (1)$$

Where ε represents the price elasticity of demand (expressed in absolute terms), p_1 and q_1 are the actual price and actual quantity from the considered period (2011 in this case), whereas p_2 and q_2 are referring to the forecasted values using the model. For the forecasted quantity was used the following substitution:

$$q_2 = q_1 \times \left(\frac{p_2}{p_1}\right)^{-\varepsilon} \quad (2)$$

Replacing equation (2) in equation (1) and rearranging the expression, the modification on consumer surplus can be written as follows:

$$\Delta CS = \left(\frac{p_1 \times q_1}{1 - \varepsilon}\right) \left[\left(\frac{p_2}{p_1}\right)^{1 - \varepsilon} - 1\right] \quad (3)$$

For the forecasted value of the price I used the inferior limit of the approximation (calculated value – one standard error), and for the price elasticity of demand was used the value of the coefficient estimated in the demand equation of -0.24 (in absolute terms). For q_1 were used data from National Authority for Management and Regulation in Communication of Romania (ANCOM) regarding the total voice traffic in 2011. From the calculations, due to the reduced level of prices for mobile communication in Romania compared to the other member states, the consumers registered a consumers surplus of approximately 68 million Euros.

6. Conclusions

The mobile communication market in Romania, although it is characterized by a small number of operators, it does not affect the consumers, due to the existence of several factors, such as technological progress that impacts massively the dynamic of the industry, maintaining a high degree of competition. In this case, it is difficult to identify the effects experienced by the consumers between regulation of the telecommunications market and its natural dynamics. As it concerns the cost of the services, Romania was ranked second in the European market, being exceeded only by Lithuania.

Likewise, the rapid evolution of mobile communication penetration in the last 10 years and its stabilization around 110% in recent years and the strong decrease of costs show that the market for voice services has reached a certain "maturity", consumers turning to other services that operators provide, such as data packets.

Under these conditions, the reduced costs brought to mobile consumers (strictly for voice services) from Romania, in 2011, generated a consumer's surplus of over 68 million Euros. But the low level of costs is not entirely due to the regulations in the field of telecommunications. Although the level of utilization of the communication services has increased and the price has decreased, the correlation between these variables and the reduction of interconnection tariffs is poor. The acceleration of costs reduction has not

determined acceleration of the utilization level or of the price reduction. These conclusions are supported by empirical analysis in the member states studied.

The explanation of this phenomenon lies at the basis of this industry's structure. Price regulation affects in a small amount the structure of operators' costs because they diffuse much of the costs incurred by consumers to other services (the "water bed" effect). Moreover, another factor that can contribute to this explanation, that is not included in the data presented, is the implementation of new technologies that allow more efficient use of network and radio spectrum, thus contributing to a large extent of cost reduction. Another element that cannot be neglected is the diversification of the services offered by the operators, especially services based on Internet protocol, services that have a greater price elasticity compared to voice services. Therefore the indicators analyzed (average revenue per minute) tend to decrease in relevance to performance analysis of mobile communications industry as a whole. A better indicator of this is the average revenue per active user.

In conclusion, the regulations in mobile communications have led in part to a decrease in costs supported by consumers and an increase in use, but these effects are not due to regulation (lowering the cost of interconnection), only to a little extent. These regulations should rather aim the structural aspects, those related to the specific industry, degree of concentration and the ability of operators to achieve economies of scale so that the limited resources (radio spectrum) to be efficiently used, generating beneficial effects for both consumers and operators.

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National convergence policy in education. Case study Romania

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Abstract. *Through this study we aimed to analyse Erasmus experience, examples of good practices and perspectives on their under-represented areas of study. Erasmus mobility shall be carried out in all of the study areas. However, I found out that there are fields of study less represented.*

The purpose of research was the provision of information on implementation and impact of the Erasmus program on mobility carried out by the under-represented fields of study.

The investigation was intended to direct beneficiaries of programs: students. Information we have obtained made it possible assessing the impact (nature of the effects on beneficiaries, the manner in which they were produced, etc.) and formulation of the main development directions of the programs.

Keywords: European policy, Erasmus, cohesion policy, LLP- life long learning programme, under-represented areas.

JEL Classification: I23, I28.

1. Context and evaluation methodology

The study on Erasmus mobility to under-represented areas was funded by the European Commission.

We have identified, together with our colleagues from other Agencies, the institutions in which mobilities were conducted for these areas in order to promote mobility, by examples of good practice.

The four areas of study under-represented at European level are: Architecture, Education, Life Sciences, Mathematics and Informatics.

Those countries which have participated in the study were: England, Austria, Denmark, France, Germany, Greece, Ireland, the Netherlands, Poland, Romania, Slovenia and Sweden.

1.1. Methods and assessment tools

So we used a set of methods which provide both quantitative information, as well as qualitative, in order to capture programs reality under multiple aspects

1.2. Activities carried out under the project:

- we conducted, together with the research team, a study on the number of universities with Erasmus mobility to the 4 areas of study, in each participating country;
- we made, together with the team of research, case studies about former Erasmus students that have had a mobility within the framework of the under-represented study areas and who are currently employed.

2. The results of study. Investigation lot description

National Agencies established in all participating countries are directly responsible for carrying out the Program. This implies and requires performance of contracts with the participating universities in the program and the distribution of funds allocated for decentralised actions: greater mobility for students, teaching staff mobility, intensive projects and organising mobility. National Agencies constitute the interface between the European Commission and universities and coordinate promoting and conducting program.

Universities have a major role in and for promoting Program to the students, making bilateral interuniversity agreements and ensuring academic recognition of studies carried out.

I have selected, together with the colleagues from the other National Agencies, participating universities in the respective country, taking into account the student mobility on the under-represented fields of study. Selected universities that participated in the study have filled in a questionnaire and have selected two case studies regarding former Erasmus students and who work in under-represented areas. At final Conference, which took place in Vienna, have been participated all universities selected and have been highlighted examples of good practice arising from collective experience in all universities, in order to increase mobility in the under-represented areas of study.

I have selected, together with the research team, universities that took part in the study, in order to assure:

- geographic representation at national level;
- universities representativeness, on each field of study;
- universities representativeness, taking into account their size.

Number of questionnaires applied was 96, and the number of Erasmus students who participated in the study conducted by the research team that I've initiated and led, it was about 13 500.

2.1. The survey questionnaire

I used survey questionnaire in order to obtain information from the programs beneficiaries.

Research has proposed, in a first stage, the identification of two institutions, for each of the four areas of study in the 12 countries participating in the project: Architecture, Education, Mathematics and Informatics and Life Sciences.

Some Agencies have selected and a third university for participation in research.

But I mention that some agencies have experienced difficulty in selecting universities, in particular in Mathematics and Informatics.

Some universities have sent several answers. For example, in many cases, in the field of "life sciences" has been sent separate answers to the subdomains: biology, chemistry and physics. All answers were included in the study. A small number of universities did not reply to the questionnaire, and they were not invited to participate in the conference.

Distribution of the total number of questionnaires, depending on field of study, is:

- Architecture: 23.
- Education: 28.
- Mathematics and Informatics: 22.
- Life Sciences: 23.

The questionnaire includes four sections, namely:

- Section A: identifying university and the field of study;
- Section B: general aspects of university and participation in the Erasmus Program within the respective study field;
- Section C: quantitative aspects concerning the students selection, promoting Erasmus Program, academic recognition and institutional supervisor's role at the university level;
- Section D: general aspects on the progress of mobility on the mentioned study areas, the role of institutions and their motivation.

Next, we analyse the sections referred to.

Section B: general aspects regarding university and participation in the Erasmus action within the study in question

Universities participating in the study have varied, in size and type. Three universities have more than 60 000 students. Apart from these, the maximum number of students from participating universities is 35 000, and minimum of 350. Twelve universities have less than 2 000 students.

12 universities are monodisciplinary, most having as a field of study, Education; 4 universities, have as a field of study, Architecture, while a university has, as field of study, Mathematics and Informatics.

Section C: quantitative aspects concerning the students' selection, promoting Erasmus Program, academic recognition and institutional supervisor's role at the level of university

There were established two types of questions: for most questions was determined that each response to be associated with a numeric rating from 1 - totally against, to 4 - totally agree; for the other questions, the answer was "Yes" or "No". For 61% of the questions with "Yes/No", the answers were "Yes". For 67% of the answers to the questions with positive tint, the responses were "4 or 3".

Answers have been varied, 47% being "4".

- The students selection:

Most universities have indicated that it has been relatively easy to select students who have studied in the under-represented areas of study.

- The language studies:

In most cases, host universities have offered intensive language courses for Erasmus students. There have even been some universities who organised such courses before performing mobility. In the field Mathematics and Informatics, teaching was done in English, in most partner universities.

- European Credit Transfer and Accumulation System (ECTS) and academic recognition:

Most universities replied that ECTS has been used and the credits obtained being included in the transcript of records and validated by the University of origin.

- Practical experience (the practice, the period included in the Erasmus mobility):

The practice has been included in the period of mobility. Almost 50% of the respondents have specified that the period of practice has benefited from academic recognition.

- "Outgoing" and "incoming" Erasmus students:

More than 70% of universities have mentioned that Erasmus students that have benefited from the mobility have been "mentors" for the new selected students. "Incoming" students have benefited from the same assessment as the other students.

- Academic support:

More than three-quarters of the answers have referred to support academic granted to the Erasmus students. Universities have encouraged participation in the framework of the Erasmus Program and they have ensured a real support to the program directors, in all faculties.

- The institutional coordinator:

The relationship between International Relations Department and Dean (responsible for the academic) was considered, to a large extent, as being good. In general, the institutional coordinator has contributed to the achievement of the students' selection, helping them in the performance of contracts and the curriculum establishment.

- The relationship with partners:

Generally, relations with partners have been carried out through the department established at the central level. Most universities have been satisfied about the collaboration with partners; more than 60% of partner universities have monitored students progress and academic recognition of studies carried out.

- Teaching Staff mobility (TS):

Half of the given answers have considered that teaching staff mobility have been significant on the respective study field. About 50% of them have considered insignificant these greater mobility.

The "extremes" have been Education Sciences – in general, achieving significant mobility and Architecture and Life Sciences – generally achieving greater insignificant mobility. Teaching staff mobility were correlated with student mobility. Most of them were considered as teaching staff mobility have been given an opportunity to visit Erasmus students and discuss university curricula.

Section D: quantitative aspects concerning the students' selection, promoting Erasmus Program, academic recognition and institutional supervisor's role at the university level

- Difficulties encountered:

More than half of the answers have pointed out that there have been no administrative difficulties. More than 40% of respondents have emphasized that they have had no linguistic difficulties, while 67% of them have denied any difficulty concerning academic recognition of studies carried out.

Financing has been regarded as representing the largest disadvantage, in this respect, 31% of the answers being "4" ("considerable obstacle").

2.2. Case studies

Case studies involving former Erasmus students who have performed greater mobility to their areas of the under-represented study and that currently are employed.

The purpose was to identify and promote examples of good practice for mobility carried out in the framework of the under-represented study areas and determine how a period of Erasmus study contributes to the labour market employment, after graduation.

Each graduate has made a declaration regarding the Erasmus mobility, which has been carried out, from the point of view of the employee.

Employers were required to make a statement on the way in which Erasmus mobility has contributed to the graduate employment.

Two students and two employers, which have had the most interesting statements for the four under-represented study areas, were invited to participate in the Conference and to give a speech there.

- Consideration of case studies themselves:

Together with the research team, I have requested each university participating in the study, to present two case studies.

Not all the countries participating in the project were able to submit two case studies for under-represented study areas.

In total, there were 95 case studies.

A small number of universities sent more than two case studies: it was a special case for Mathematics and Informatics.

In both cases, Mathematics and Informatics and Life Sciences, case studies have been about students who were graduated for a short time and who, after graduation, have employed in the university.

A few case studies have been incomplete. They have been referred to difficulties in obtaining employer declaration. Some National Agencies have indicated that the reasons it would be that Erasmus mobility would not have been an important condition for employment. For a very small number of cases (less than 2%), the employer refused to release statement.

After a careful evaluation of the results obtained from all case studies, it has been established the participation of the most interesting of them to the Conference.

▪ Students:

Three different aspects are the results of the student statements on the Erasmus experience:

- Erasmus mobility helps when applying for a job. Responses to the four areas of study were similar, in the field of Architecture mentioning, however, the most significant role of an Erasmus mobility;
- it was welcome the curriculum knowledge opportunity and the chance to study aspects of the field in question, aspects which are not applicable to the University of origin;
- they highlighted the importance of possibility to improve linguistic knowledge;
- Employers.

Some employers have written required statements ascertaining big differences. Most declarations have been short, especially those made in the field of Life Sciences.

Two aspects of the Erasmus action have been mentioned by a significant number of employers, these being:

- more than a third were referred to the importance that it may have, for a student, the experience of a different culture;
- more than a quarter said that Erasmus experience represented a factor in employment, in particular in the fields of Mathematics and Informatics and in Education.

▪ For each field of study:

- employers in the field of Architecture have been concerned that students to be adaptable and open to new ideas; they referred to the importance of knowing a different culture;
- employers in the area of Education have considered the importance of the experience gained in performing an Erasmus mobility, but have not talked very much about the language competence;
- employers in Mathematics and Informatics field appreciated Erasmus mobility as "added value" being concerned especially in the knowledge of English language skills by candidates;
- employers in the field of Life Sciences were concerned that students to be adaptable and open to new ideas.

- Institutions:

Statements have been received from 52 institutions, more than 60% of them making reference to:

- differences between programs of study – In particular, for Architecture and Life Sciences;
- the positive effect on personal development (maturity and independence) – 100% of the Architecture part, and almost three-quarters of the responses given in the fields of Education, Mathematics and Informatics and Life Sciences have not considered this to be important.

More than 40% of the institutions have indicated as important and improving language skills.

- Other issues mentioned:

- the Erasmus students contribution to achieve the positive image of the University of origin;
- on the return, Erasmus students share their experience to the prospective students;
- Erasmus mobility contribute to achieving and maintaining partnerships between universities.

There are the two aspects that are important:

- 1) Students and universities have emphasized the importance to improve language skills, while employers do not seem to be interested, especially this.
- 2) The employers in the field of study of "Life Sciences" have stressed the importance of adaptability and openness to new ideas, while students do not have mentioned at all this.

3. Conclusions and recommendations

3.1. Conclusions

The first objective of the project was to identify and disseminate examples of good practice, in the areas of study with a relatively small number of student mobility if we take into account their importance.

The other objective consisted in the identification of methods for removing obstacles from increasing the number of mobility.

In addition to initial problems, the project has identified a number of questions that were not originally anticipated.

The most important conclusions related to critical issues (positive achievements have been already mentioned) refer to:

- lack of communication between institutions and graduates;
- difficulties in locating graduates: for example, for Life Sciences, Mathematics and Informatics; frequently, the only ones graduates which the institutions could find were those who are still studying or working in the university;
- lack of information on what can provide the Erasmus Program; for example, language training, not only outside, but also in the framework of higher education establishments;
- the novelty situation in which the colleagues in a specific field of study and employers meet to discuss problems encountered.

3.2. Recommendations

1. Conducting studies and bilateral or multilateral conferences similar to this study. There is a real opportunity to do more in reuniting all the parties concerned, in the framework of meetings, in a fundamental domain for the future of Europe.
2. Promoting "Erasmus brand": all parties involved must encourage and identify the ways in which Erasmus students to promote the Program; students should be encouraged to mention Erasmus in their CVs; value added within Erasmus, "the Erasmus factor", should be promoted opposite employers; it should be attracted the support from professional organisations to promote mobility.
3. Involvement of the business environment in the Erasmus Program. More specifically, although it is considered that the Erasmus experience endows graduates much better with a view to his employment, educational institutions do not collect data in support of this statement, and is difficult for the employers to be involved in such research, which represents a challenge.
4. Organisation of courses aimed at language training in the institution of origin, so as to be covered all subjects. Language courses in the country of destination should be available fully with ECTS credits.
5. More flexible programs of study.
6. Resolving, by the institutions of higher education, the issues related to the academic recognition, for the management of "The Study Agreements" and by implementing ECTS.
7. Organising, in the countries of origin of future Erasmus students, more intensive and short-time foreign languages courses.
8. Promoting, by the institutions of higher education, the role of the "Academic Champion" in relation to the Erasmus program.

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