

The Confusion of Methods

Wealth is an individual goal, disputed in an inter-subjective transactional context, certified by efficiency. When it turns into a political goal, wealth becomes a referendum theme resolved by the counting of votes.

Among the most perverse forms of pragmatism, the top-down change of the order stands out from afar. In its present form, top-down change has become the natural expression of politics. The understanding of things seems to stem from reason only where reason is a means of convincing us that the explanation of the possible is the same as the possibility of antinomically defining reality.

It's in this manner that, in the preceding years of economic crisis, the themes of individualism and the market came to be comfortably tolerated as indicated by the acceptance of solutions suggested by the antinomic themes of interventionism, in order to save the market from its own excesses and to invest public funds in the resuscitation of the imminent egoism in the functioning of competitive markets. What conceals the lack of ideological coherence, as well as that of epistemic consistency, is the appeal to the Enlightenment process of offering change, originating in Aristotelian philotheistic thinking, where order is the expression of vertical dependence.

Regardless of the horizon of significances used in sustaining the motivations of political ideologies pertaining to the solutions to this crisis, the offer is ultimately identical: the individualists (in the role of market fundamentalists) cancel the public economy's debt of covering the failures of the private economy, while the interventionists (in the role of strategic planners) are adhering to cleaning the market through the temporary nationalization of losses.

We find ourselves in the exceptional circumstance of obtaining the same result through diametrically opposed methods of dealing with the problems of the economy. But the accepted result is predefined, and its consequence is the actual reformulation of the problem. In other words, the result is to the antinomic political ideologies a fixed given, the only thing left to do being the repositioning of the terms of the problem.

Changing the problem of the economy in order to reach the established result is the source of the prolonging of the crisis, and may even bring about the possibility of making it a permanent crisis. Providentially, for the demiurgic ambitions of political ideologies, the crisis saves them from allocating too large a resource for an identity of scope, after giving them the chance for cutting the costs for methodological identity to the maximum. Top-down change thus became the correct path.

It came to the point where the methods which have shaped for three centuries the mistaken path of antinomic identities, have been discarded in the wastebasket of inefficient social control. In a simple manner, political ideologies have gathered under the flag of the pragmatic principle of “the end justifies the means”. After all, the direct expression of the goal of power are the methods for controlling liberty, and they – just like money – have no smell, although they can have colors, forms, and various sources. The common methodological background of political ideologies, highlighted by the crisis, needs though the reproductive framework of the crisis. If there were a premise for imagining the conclusion of the crisis, this situation can only entail for political ideologies the acceptance of some – rather derisory - costs, while expecting the inverse effects of the methods used for coming out of the crisis: the immediate spillover into another crisis.

Around the methods of the top-down change and of erasing the identity of means, which are called upon by political ideologies during a crisis, there is a stimulated silence which holds a double cause: on the one hand, the fear that in the end the presence of political ideologies in the perimeter of economicity will be shown to be unnatural, and on the other hand, the gross disparity in the means utilized for a purpose which does not belong to economicity. And this because holding political power by any means justifies the interest in the individual control of the circuits of wealth, whereas the purpose of economicity is to be a means for inter-subjectively opening access to the same circuits.

Political power wants the control of wealth, when wealth is the object of a different dispute, that of legitimacy imparted by productiveness and not one of political whims. Wealth is an individual goal disputed in an inter-subjective context certified by efficiency. When it turns into a political goal, wealth becomes a referendum theme resolved by the counting of votes.

The greatest enemy of Economics is Political Economics. The top-down management of the economy is the consequence of the universal preference for political ideologies for the crisis, as only this makes top-down change possible.

Marin Dinu

Contents

Economics of Sustainable Development. Competitiveness and Economic Growth Dorel Ailenei, Liviu-Cosmin Mosora	5
The Particularities of the Economic Crisis in the Knowledge-Based Society Ion Ivan, Marius Popa, Dragoş Palaghita, Bogdan Vintilă, Mihai Doinea.....	13
Adverse Selection Models with Three States of Nature Daniela Marinescu, Dumitru Marin	33
Sustaining an Effective ABC/ABM System Gary Cokins, Sorinel Căpuşneanu	47
Consequences of the Budget Deficit in the Current Crisis in Romania. Implications on the Labor Market Gabriela Molănescu, Mirela Ionela Aceleanu.....	59
Portfolio Risk Analysis using ARCH and GARCH Models in the Context of the Global Financial Crisis Oana Mădălina Predescu, Stelian Stancu	75
Costs of Adopting a Common European Currency. Analysis in Terms of the Optimum Currency Areas Theory Aura Gabriela Socol	89
Human Capital, Geographical Location and Policy Implications: The Case of Romania Cosmin-Gabriel Bolea, Jesús López-Rodríguez, Andres Faiña	101
Statistical – Econometric Analysis of the Correlations between the Social Security Budget and the Main Macroeconomic Aggregates in Romania Emilia Țițan, Cristina Boboc, Simona Ghiță, Daniela Todose	117
Effects of the Current Economic Crisis on the Fiscal Variables in EU Countries Iulian Viorel Braşoveanu, Laura Obreja Braşoveanu	127
The Image of the Tourism Destination – a Supporting Element in the Development of the Regional Tourism Brand. Study Case: Muntenia Aurelia-Felicia Stăncioiu, Nicolae Teodorescu, Ion Părgaru, Anca-Daniela Vlădoi, Codruța Băltescu.....	139
Economic Crises and the Complexity of Animal Spirits Modeling Grigore Piroșcă	153
An Epistemological Perspective on the Quality of Life Concept George Șerban-Oprescu	171
The Natural Rate of Unemployment and its Implications for Economic Policy Monica Dobrescu, Claudia Paicu, Silvia Iacob	181
Estimation of Inflationary Expectations and the Effectiveness of Inflation Targeting Strategy Amalia Cristescu, Mădălina Ecaterina Andreica	195
The Impact of Investments and Gross Value Added upon Earnings Larisa Aparaschivei, Maria Denisa Vasilescu, Nicolae Cătăniciu	207

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021/210.63.08

Data base indexation:
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International Consortium for the Advancement
of Academic Publication (ICAAP)
<http://www.icaap.org>
CNCIS B+

www.econometeoreticasiaplicata.ro; www.ectap.ro

Reception of texts: economia.ta@edeconomica.com

ISSN 1841-8678 (Print)
ISSN 1844-0029 (Online)

Economics of Sustainable Development. Competitiveness and Economic Growth*

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Abstract. *Economic growth is one of the most important issues of humanity. Both in national economies and world economy, recession and prosperity periods are regularly succeeding with different amplitudes. But beyond these fluctuations and their effects, the results are important: performance and economic growth. Because of the problematical issue of economic growth, the authors are trying to critically reflect on the economic growth concept and on its implications on the praxis area. Although there is a large literature about economic growth modeling, it is intriguing that there still are some serious obstacles for conceptualization and praxis. Only the simple fact that the economic growth process needs serious thinking on the time dimension is sufficient for understanding the real difficulties of this problematical issue. As for the economic growth praxis, a clear analysis of the interests system within an economy is needed. Without trying to find miraculous solutions for the economic growth issue, the authors suggest a clear and correct analysis of this important subject.*

Keywords: economic growth; economic time; economic equilibrium; macroeconomic fluctuations; economic development.

JEL Code: E32.

REL Codes: 8E, 8H.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?“, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

From the human progress perspective the most important issue is economic growth. Nations prosper when important performances in economic growth are recorded. Moreover, worldwide power differences arise first of all because of uneven worldwide economic growth. Growth has been rising over most of modern history.

There are enormous differences in standards of living across parts of the world. Average real incomes in countries such as Germany and France appear to exceed those in countries such as Bangladesh or Kenya by a factor of about 20. But, as with worldwide growth, cross-country income differences are not immutable.

The most striking examples of large changes in relative income are growth miracles and growth disasters. Growth miracles are episodes growth in a country that far exceeds the world average over an extended period. Some growth miracles are Japan, South Korea or Ireland.

Growth disasters are episodes where a country's growth falls far short of the world average. Two very different examples of growth disasters are Argentina and many of the countries of sub-Saharan Africa. In 1900, Argentina's average income was only slightly behind those of the world's leaders. But its growth performance over most of the twentieth century was dismal, and it is now near the middle of the world income distribution. Sub-Saharan Africa countries have been and have remained extremely poor, unable to ignite the economic growth process.

The various differences in living standards have had enormous implications on wealth, over time. These differences are associated with major disparities in nutrition, literacy, infant death, life expectancy and other wealth indicators.

Considering the significant impact that the growth process performances have on wealth, the fact that the effort made in this area has had a cyclical evolution is quite surprising.

1. Economic growth issues

Given the importance of the economic growth process and the problems that it involves, it is necessary to try to find a different approach. Despite the various definitions given to the notion of economic growth, there are two elements that stand out as a common denominator: *the subject and the time factor*.

From the *subject's* perspective, economic growth appears as a process located either at a microeconomic level – business, market, economic activity area (e.g.: the growth of agricultural production), either at a macroeconomic

level (national economy, multinational economically integrated system, or world economy). In the related literature, most often, the notion of economic growth is used with a macroeconomic meaning, extra-specifications being made for different microeconomic aspects. This is where the first difficulty of correctly approaching the problems of economic growth occurs: *the need for a complete conceptualization of the subject of economic growth. Thus, the conceptualization of economic growth may begin only after the emergence of the Keynesian theory, even though there have been other concerns in the economic theory regarding problematic areas connected to economic growth⁽¹⁾*. As such, the herein paper begins its cognitive intercession over economic growth with models having Keynesian origin. Only after completely defining the concept of macroeconomics and theoretically describing the main correlations among macroeconomic variables can the problem of economic growth be correctly approached. As in any major scientific problem, the main question was too easy to be able to succeed in defining the inner side of the problem: *what is growing?*

The merits of Keynes' *General Theory* are obvious when it comes to define the macroeconomic conceptual frame and, implicitly, the problem of economic growth. Nevertheless, an important flaw in conceptualizing the reference frame of economic growth will later on be revealed: *methodological cohesion*. By sacrificing the connections to the microeconomic domain, the Keynesian paradigm might not be able to comprise in its problematic area the domain of "growth engines". Since the theoretical lode from which the Keynesian paradigm has developed was nevertheless based on the capitalist ideology (that viewed private initiative and implicitly the market system as the main driving force of the economy), an introduction of the markets system within the conceptual frame of economic growth analysis was essential. Thus, John Hicks' contribution, through the IS-LM model, creates a methodological basis that is absolutely necessary in designing economic growth models with a Keynesian paradigm. However, further completion of the *Disequilibrium Theory* has pointed to the persistence of methodological flaws in the Keynesian paradigmatic frame, flaws that were to seriously affect the performances of economic growth modeling through this channel.

Another major difficulty in conceptualizing economic growth is given by its connections to other problematical domains. As a macroeconomic phenomenon, the process of economic growth is tightly connected to other major macroeconomic problems:

- *Economic equilibrium*. It is obvious that an economic growth that lacks macroeconomic equilibrium will amplify the tensions and disequilibria in a national economy, by destabilizing it. This is why economic

growth models cannot abstract from the macroeconomic equilibrium hypothesis. The conceptual difficulty in this respect consists in defining the mechanisms that ensure the stability of the equilibrium in a process of economic growth;

- *Cyclic aspects.* This phenomenon refers to the economic activity fluctuations around an ascendant trend in the long run. The connection between cyclic aspects and economic growth is given by the respective trend, which is actually the economic growth process. Although it may seem simple, this conceptual connection reveals another obstacle: the methodology of separating the cyclic component from the economic growth trend;
- *Economic development.* There are significant differences between economic growth and economic development. Economic growth refers to the augmentation of various aggregate macroeconomic indicators. Economic development involves much more cognitive dimensions. *Development must be imagined as a multidimensional process that involves major changes in social structures, in people's attitudes and in national institutions, by pursuing the acceleration of economic growth, the reduction of inequality and the eradication of poverty.* From this perspective, the failure of some of the first models of economic growth⁽²⁾ in explaining (and creating the background for some macroeconomic policies) economic growth in developing countries.

The *temporal dimension* of economic growth conceptualization involves even greater difficulties than that of defining the subject. The notion of economic growth usually refers to *the long or very long run*. This is where numerous problems related to approaching the time variable come up:

- Time represents an effective reality dimension, not just a reference, as proved by Albert Einstein's *Theory of Relativity*. Furthermore, in the very dynamic economic space, the temporal variable needs many touches. By working with small fragments of time for a long period, the economic theory has actually been avoiding a rigorous conceptualization of the temporal variable. By using the concepts of *very short* (market time – so that market participants do not have the time to adjust), *short* (in which installed production capacity remains constant) the traditional economic theory avoids approaching the problem of change (inherent in the rigorous use of the temporal variable). Not even the use of concepts such as *the rolling curve of average cost in the long run* (in the case of scale efficiency) has conceptualized economic time, but used it as an alternative for the

framework given by the short time (immutable). However, the approach of the economic growth notion makes the elusion of conceptualizing the temporal variable impossible, mostly because of the change that it brings along. Defined with such thinking efforts, the conceptual frame of macroeconomics was not prepared for Heraclites' axiom *everything flows*⁽³⁾. *To consider economic growth means to have the intellectual resources to consider the future.*

- The approach of the long term that corresponds to the economic growth subject involves a certain detachment from current economic problems. But detachment can be a luxury since glory, daily existence are connected to finding solutions for current problems. As such, economic growth represents an unappreciative problem for the daily statute of any economic researcher, only when current problems seem to indicate the occurrence of serious crises: food resources restrictions (Malthus), or energy crisis (Meadows). Anyhow, validating economic growth models also involves a long term, sometimes too long. From this perspective J. M. Keynes was being honest when he gave a famous reply to his critics: *in the long run, we will all be dead.*
- The insertion of the temporal variable in economic analyses implied a difficult transition from the deterministic paradigm to the stochastic one. Only the massive insertion of the stochastic factor in the framework of economic theory has created the premises for a rigorous approach of the temporal variable that is compatible with economic growth conceptualization. Nevertheless, the actual use of probabilistic variables does not necessarily involve solving the problem of conceptualizing the temporal dimension of economic growth. Tinting is still needed concerning novelty appearance, through combinations that are specific to the stochastic frame. When and how change occurs on a trajectory of economic growth. The appearance of a powerful mathematical support given by the Theory of Catastrophes, the Theory of Chaos or the Theory of Dissipative Structures has yet created a sufficiently large framework in order to test possible changes in the economic growth trajectories.
- From the viewpoint of empirical approaches that are specific to some economic phenomena that involve a long term, some time was needed in order to curdle the framework of chronological series econometrics and implicitly to build statistical data bases, which are necessary for the long run analysis.

2. The praxis of economic growth

The difficulties in putting into practice the visions regarding economic growth may be approached similarly to those of a conceptual nature.

From the perspective of economic growth's subject it is obvious that, in order to implement measures of stimulating economic growth, it is absolutely necessary that a coherent image of the national economic system exist: macroeconomic flows, indicators and variables. Only after the emergence of the Keynesian theory could the subject of macroeconomic policies be brought into discussion from a modern perspective and the grounds for projecting some economic growth policies were set. Nevertheless, the theoretical frame was not complete, without a system of macroeconomic indicators, able to measure economic flows, macroeconomic variables and results. This is because governments' interferences in the national economic system needed a rigorous sizing of the instruments and a highly precise evaluation of the macroeconomic variables. From this perspective, the Keynesian theory takes credit for having offered an important ground in setting up The System of National Accounting. Although put into practice at the beginning of the '50s, this system that elaborates macroeconomic statistical indicators has gone through several rounds of transformations and improvements, the form used currently by OECD and the Eurostat being completed only in 1992. Without a rigorous and uniform methodology for statistical indicators, the effects of applying some economic policy measures implemented by the governments of different countries could not be accurately estimated and conclusive international comparisons could not be made.

Another difficulty in economic growth praxis is connected to the actual manifestation mode – macroeconomic policies. Theoretically defined as an assembly of measures through which the government interferes in order to modify certain variables and parameters of the national economy, the economic policy appears at a conceptual level as a set of solutions for macroeconomic problems. In order to become an instrument for governmental interference, the economic policy bears a certain dose of doctrine and sometimes ideology⁽⁴⁾. Taking into account Max Weber's saying according to which: *politics represents the area of power, meaning the system through which a social group imposes its will over the other society members*, it follows that the effective projection of macroeconomic policies requires a consensual basis among those governing, respectively the accomplishment of an equilibrium of interests at a social level. Most often, consensus and equilibrium of interests are difficult to attain because of the fact that there are different views regarding the area of economic reality that is subject to interference. This means that, although

apparently simple, economic policy involves more than just a simple application of some recommendations of normative economic theories; the judgment according to which an economic theory corresponds to many types of economic policies being very accurate. Furthermore, economic policies involve advantaging some social groups and only rarely maintaining at the same level the utility of other social groups according to the Pareto optimum social principle. In a democratic system, maintaining a convenient equilibrium of interests at a social level implies projecting some strategies and a system of instruments through which the economic policies can be applied. This means that the implementation of economic policies is often assessed according to the manner in which different instruments of governmental interference in the economy through various economic strategies are used.

From a temporal perspective, the praxis of economic growth involves the reconciliation of short and medium term interests with long term interests. But this is difficult to attain even for a single individual, all the more for a group or for the whole society. Often engaged in solving current economic problems, the government will not pay sufficient attention to the medium and long term horizon. This is because the subject of economic growth is not really profitable for politicians. They must come up with solutions for current economic and social problems, to offer visions about the present or future immediately, not waste their efforts with what will be. Political parties that govern a country often combine their economic policies according to the election calendar and not the real needs of the economy, creating the so-called election cycle effect (Jula, 2008). If politicians are willing to sacrifice the efficiency of implementing short and medium term economic policies, the chances that they will be seriously preoccupied with the long term problems are quite slim. A serious approach of the economic growth problem involves a great dose of responsibility: to think thoroughly of the next generations. This involves a certain visionary spirit. But from a practical viewpoint, few will overlook your spending of current resources for future visions. However, the visionary spirit: simple-mindedness, curiosity or even madness are qualities that are not really compatible with the profile of a successful politician. This is why there have been few serious concerns (truly believed in) for economic growth.

3. Conclusions

Most often, the aspect of economic growth has been included in the work agendas of politicians when there were serious gaps in macroeconomic performances of a certain country in relation to the average level of a group of more developed countries, or when serious threats regarding future

development of some national economies were foreshadowed (resources weariness, demographical disequilibria, excessive pollution etc.). Preoccupied with elaborating catching-up policies, or with avoiding some obstacles to future development, governments were sometimes bound to concern about the policies of economic growth.

Notes

- (1) For example, in chapter III of the *Wealth of Nations*, Adam Smith approaches the problem of differences in progress and of abundance of different nations. Even the population law of Malthus can be regarded as a precursor subject for the knowledge area of economic growth. Karl Marx can be viewed as another precursor of the economic growth aspect, because of his analysis of the dialectical process of progress in the economic area.
- (2) Both the models of economic growth of Harod and Domar, as well as Robert Solow's model do not manage to yield satisfactory results in the tests and applications in some Third World countries.
- (3) Long term makes it impossible to avoid Heraclites' paradox, according to which you *cannot bath twice in the water of the same rive*.
- (4) Simon Kuznets correctly grasped these aspects when he defined economic growth as: "the increasing capacity of a country to growingly supply different economic goods, capacity which is based on high technologies and on institutional and ideological adjustments".

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The Particularities of the Economic Crisis in the Knowledge-Based Society*

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Abstract. *The paper presents the characteristics of the informational society and the requirements for the transition towards the knowledge based society. The informational society and the advantages it brings are described. The concepts of informatics system and informational system are described. Their roles and functions are identified. The functioning principles of the informatics systems are presented. The factors that lead to the evolution from the informational society towards the knowledge based one are identified and analyzed. The main trends in the knowledge based society are identified. For each of these trends we identify the short and long run effects and the implied*

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

consumptions of resources. Knowledge is seen in the new society as the main source of competitive advantage. Ways of transmitting knowledge are presented. The efficiency and applicability are discussed. In the knowledge based society the end-users have higher expectations regarding the products and services than before. The paper discusses the factors that lead to the structural re-equilibration in the knowledge based society. Research concepts are developed in the direction of adapting informatics applications to the target group exigencies. The paper details the quality characteristics of computer applications that are tailored to the requirements of the target group and a quality system for such applications is presented. The paper examines the benefits obtained by adapting computer applications to the target group exigencies.

Keywords: economic crisis; knowledge based society; informatics applications; fluctuation; model.

JEL Codes: F41, G01.

REL Code: 10A.

1. Knowledge-based society

Societies appeared as a form of collaborative work between individuals in order to reach goals greater than those individually achievable. Most of the tasks that are executed in a society are not one-man jobs but greater projects that need large teams. This is valid in the animal world, not only for humans. Ant colonies and bee hives are the most common examples one can think of. These work together to ensure the well being of the colony and the persistence of the species. Human society evolved along with the individuals. As people grew smarter, they realized the advantages a society brings to individuals:

- security is given by the fact that all individuals in the society follow the same rules that are created to please all; as a group, the military power of the entity increases considerable and there are fewer threats it must fear; due to the fact that not all individuals obey the laws of the society, entities that punish delinquents are created; those working in these entities must lower the number of delinquents and punish those that already exist;
- easier life is made possible in a society as individuals don't have to do all works necessary for a household; in societies individuals specialize in doing a certain task; with specialization comes a high improvement in the efficiency of work;
- better life is achievable because due to the high efficiency of the specialized workers, it is possible for one individual to benefit of more services and products; individuals have a wide range of products and services to chose from as each individual tries to obtain revenue to invest in products and services he can't produce.

The list is not exhaustive as there are much more advantages.

Human society advanced through ages and modern times involve high productivity, environmental care, knowledge based innovation. The industrial revolution meant a huge increase in productivity made possible by the replacement of humans in the manufacturing process with automated machines. This led to an increase in the quality of life.

The appearance of computers allowed an even more rapid development of the society. Informational society is based on information. The fluxes of information are very large and must be shared by multiple entities. Companies are the base entities that produce products and services in societies. These function according to many internal rules that are obeyed by all employees. Documents are exchanged between employees and these are a proof and a mean for them to realize their tasks. An informational system is represented by all the information, no matter the form it is in, and the paths on which it travels within the company. Each company has an informational system that allows the

managerial team to take decisions easily and assess the company's situation at all times. Informational society has some characteristics:

- clarity in the work process that is given by guidelines and the paths the information goes on; each employee knows what he must do and how to do it; the documents that are used as support for information inside the company prove that an employee fulfilled his tasks; the situation of the company is clear at all times because there are many documents that can be used to determine it;
- precision is another characteristic of the informational society; as all information is clear, there are no doubts about the precision of data (Galin, 2004);
- information is used in the decision making process; the management team has to take good decisions based on clear and precise economic data; the information within the company and also from the environment make it possible; if the management team analyses all the available data and has enough experience, the decision will lead the company further in the economic environment.

The informational society brings advantages related to the efficiency of work, communication and security. As all actions are documented, the path followed by one can be reconstructed and mistakes can be identified. The efficiency is increased as each is specialized and has documented work that he can use to improve. Communication through documents within companies improves the management system and allows the team to take decisions more rapidly. The security within the company is increased as all actions are documented and a malicious person would be easily identified.

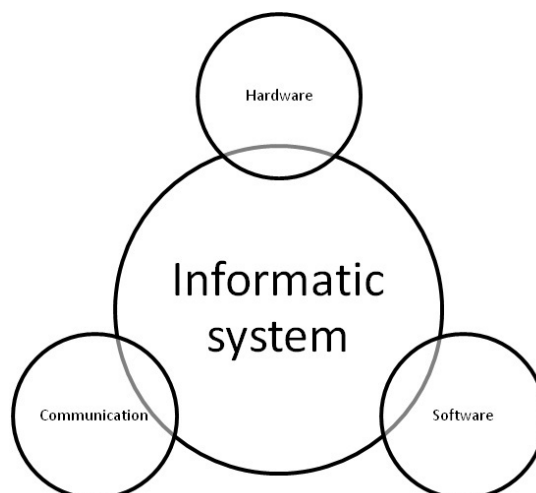


Figure 1. *Informatics system's components*

The informatics system is a set of hardware and software that is support for the informational system. The role of the informatics system is, therefore, to support the informational system. The informatics systems are formed of three components:

- hardware is the physical representation of the system; hardware includes computers, servers, printers, scanners, cameras;
- software is formed of the computer programs and data used by people to solve their problems; software includes operating systems, utilities, antivirus, text editing tools, image editing tools, multimedia players;
- communication possibilities are given by the connection to the Internet; communication possibilities are measured in bandwidth; the need of communication is given by the type of information one wants to send to another; if the information is plain text its size can be reduced using compression tools; audio and video information's size can also be reduced using compression with or without quality loss; information is coded in various forms and thus the communication needs of companies differ.

The informatics systems respect the following functioning principle: input data is insert in the system; input data is validated; input data is processed; results are displayed; results are stored along with input data.

Factors that lead to the evolution from the informational society towards the knowledge based one are:

- a new source of innovation and competitive advantage was needed as the traditional ones were exhausted; the advantages brought by the informatics systems were no longer a source of competitive advantage as all companies implemented such systems;
- high amounts of information have accumulated over time and the owners wanted to have some advantages for owning them; information is extensive and usually no real advantage can be obtained from the raw form; knowledge is therefore a refined form of information that has real value because it brings competitive advantage to the owner;
- the evolution of systems designed for the aid of decision making process and the continuous need of the management for valuable information; as information warehouses grew larger and larger the complexity of decision support systems also increased to be able to exploit to the maximum the available input data.

Knowledge society brought not only innovation through knowledge but also new trends.

Knowledge workers are a new category of labor (Wikipedia, 2010). They are very good people at interpreting data from a specific area (Huang, 2009, pp. 430-438).

Being well prepared can come up with good solutions of problems in a very short time. The training of these individuals allows them to adapt easily to new situations and resolve them quickly and efficiently. The one person with knowledge of working longer, it becomes even more efficient and can solve a wide range of issues while lower. Knowledge workers must be in permanent contact with each other to ensure that the transfer made both explicit and tacit knowledge. By making these knowledge transfers they become better and better in the quick resolution of problems.

The society acknowledges the seriousness of climate issues facing the planet and tries to take measures to remedy the situation. Courses of action are: preventing undesirable effects caused by existing climate changes and improve the existing situation. Primary method of improving the situation which would be applied is reducing emissions.

Virtualization business process involves passing the information flow of business processes of traditional forms of physical support in virtual form without physical support. Documents circulating in companies of any transaction that occurs are now automatically handled by computer systems.

The emergence of global markets is a direct consequence of technological development. The development of global markets is possible because there are no boundaries for access to information. This allows virtual stores to present products in an interactive and users can buy regardless of location, culture or occupation. Limitations imposed by boundaries were often causes of major conflicts in history. When a market becomes saturated, producers are looking for other markets to sell their product. Manufacturers' benefits lowers because of costs incurred by market research, product transport, rent paid for storage facilities, product quality losses incurred during transportation. Virtual markets do not have these disadvantages, the manufacturer presents the product line through a web application. Customers access the application and place orders, products are selected from stock company and the customer order is delivered. This way are avoided many of the costs incurred by a new real market access. Access time is also very low for both producer and customer. Lower cost of production also leads to lower final price and thus to greater customer satisfaction.

Energy conservation is a knowledge-based society ongoing concern of equipment manufacturers. Both industrial equipment manufacturers and electronics manufacturers realize the need for energy conservation and renewable energy orientation (Richard, 2002). Development of hybrid cars, developing technologies to reduce energy consumption in electronics, improved production technologies for renewable energy are areas where you go. Car makers are gradually closing the fuel-intensive models and incorporated into

automotive components leading to lower consumption and better performance. The transition from traditional engines to hybrid engines is achieved for both business models and for the top ones. Hybrid engines use electricity to move the car in normal traffic conditions. If you need high performance engine then it is in operation and the traditional one. In normal traffic conditions traditional engine generates electricity to operate the electric motor. The effectiveness of this combination is very high, fuel consumption recorded was much lower than cars operating exclusively with traditional engines. Reducing energy consumption in electronic equipment is also an ongoing concern. For computers, the largest energy consumers of the system are processors and video cards.

Resource intensive process outsourcing is imposed as a cost reduction measure. Companies increasingly rely on outsourcing more resource-intensive processes to other companies, specialized in that type of process. Outsourcing leads to a saving of resources for the company concerned. The principle of specialization is increasingly applied by market players to reduce costs. Companies fail to perform specialized tasks faster and consume fewer resources. Quality of services provided by specialized companies is also higher than the same service in the domestic version. Outsourcing also brings potential advantage to concentrate efforts on key objectives for the company long term, where most trials are outsourced, the company management has more time to analyze data and make decisions on the direction and future goals.

Developing citizen oriented applications appears as a necessity in society based on knowledge (Ivan, 2009). Development of database technology, multimedia and communications enables development of applications oriented citizen. This new class and applications is central to the citizen, the requirements and needs. These applications are made only after detailed study of the target group. Citizen oriented applications are distributed applications to be available online as permanent and also to enable rapid updates to reflect reality for all users simultaneously. The development of these applications requires changes in the development cycle classic to reflect the needs and demands of users and ensure a high level of quality. Citizens, given their diversity, are considered to be persons without prior training in informatics and so applications must be made so that they may use without problems. Citizen orientation is of high priority for areas in which people use very large applications. E-government, e-vote, pay taxes are areas where almost all citizens are involved and use the applications made available by the administration.

In the new society knowledge is seen as the main source of competitive advantage. Knowledge workers are very valued due to the advantages they

bring to the company. The products and services are innovated and small touches are given to them through knowledge.

Knowledge is tacit and explicit. Explicit knowledge is the one that the owner can express through words, images, figures. Tacit knowledge consists of inexpressible information that only the owner uses and has no means of transmit it directly. Explicit knowledge can be transmitted through courses, trainings, presentations, discussions, workgroups. The degree in which the explicit knowledge was transmitted can be measured through tests. The tacit knowledge can be acquired by one only through deep observation but there is no mean of evaluating the acquiring process or the correctness of acquired knowledge.

2. The stage of development and generalization of citizen oriented informatics applications

Citizen oriented informatics applications are spread mostly in the domains where the interaction with the users is crucial and their number is very large. The domains with the highest interest in the citizen oriented applications are:

- e-government is the interaction process between the state and its citizens; as all the citizens within the state interact with it, the citizen oriented informatics applications are favored by the large number of users; in the interaction process, the communication with the citizens must be clear and simple as not all the state's citizens have the same education; the interaction with the citizens is influenced by the logic and the characteristics of the graphic interface but, even more important, the messages that are delivered to the users; these must use a narrow vocabulary of simple words; the messages must be clear and clearly state what is the source of the problem and what steps the user must follow to solve it; the graphic interface must be light and the navigation through forms must be logical or on the basis of the users' options;
- e-vote is another domain in which a very large part of the population is active; e-voting assumes the execution of the electoral choice using means of electronic data transmission; e-voting must ensure the authenticity of the vote, the anonymity of the voter and the impossibility of a person to vote multiple times; taking into consideration the very large number of mobile devices, these are a good support for the e-voting informatics applications;

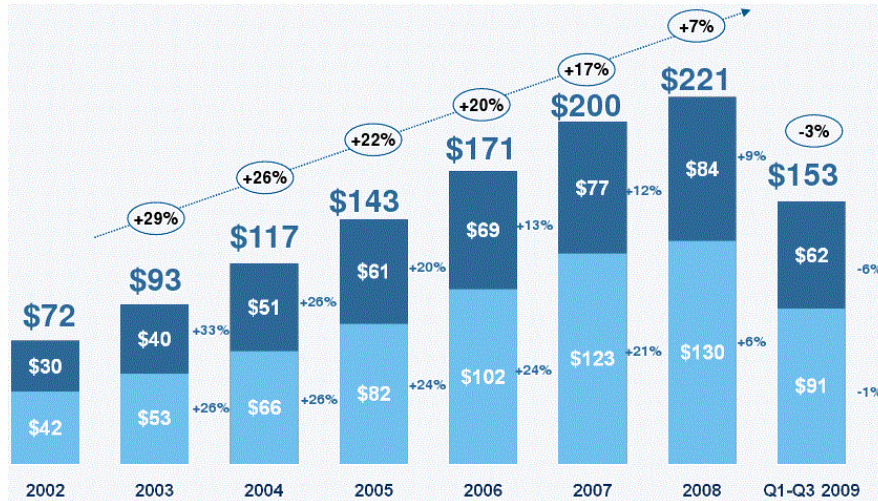


Figure 2. E-commerce evolution (billion \$)

- e-commerce appeared with the Internet and records growths every year (Figure 2); virtual stores are more and more appealing for the users as they have advantages over the traditional stores:
 - the offer of products is wider; as virtual stores don't have to keep all products in stock they can have a more diversified product offer than the traditional stores;
 - they are accessible regardless the location of the user; the user needs only access to a computer connected to the Internet in order to access the virtual store; this situation is very favorable for the cases when the closest traditional store that sells the product is far away from the customer and this one can't travel;
 - the product prices are smaller as the virtual stores eliminate many of the expenses caused by rents, human resources, stocks, marketing;
- the online bidding platforms are more and more popular among those wanting to buy and sell products; the number of users of these platforms and the number of finalized transactions grew very much in the last ten years.

Even if there are many domains that are interested by the citizen oriented informatics applications their generalization is not complete.

3. Security characteristics for informatics applications

In order to adapt IT applications to information security requirements, the target group has an important role as it ensures safety and validity of transactions. Applications suited for knowledge-based society need a high degree of security to be tailored to user requirements.

Security is achieved through the ability to protect systems resources, both logical and physical. Security is a condition of a system resulting from the establishment and maintenance of measures to protect the system. Information security is defined in CSRC (2010) as the ability to protect information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to ensure confidentiality integrity and availability.

Availability is the process to ensure maintenance of services and operational systems in the event of failure. A distributed system must ensure high availability so that there is no period in which application data is not accessible by users who wish solving problems or need information provided by the computer. To ensure availability requires:

- existence of procedures and policies to ensure transparency in the event of a failure, this is ensured by:
 - redundancy is represented by the existence of information systems and facilities to provide secondary data warehouses that can retrieve all tasks distributed system where it becomes non-operational, secondary data warehouses must be located in other geographical areas not to be subject to the same risks as the main system, but this approach is costly and is applied only to critical systems;
 - clustering systems is a less expensive, being implemented by servers such as Windows Server 2008, Linux and Novell Open Enterprise Server; clustering is the presence of networked systems providing acquisition tasks to other systems if one system is in a failure condition; clustering addition that offers a cheaper solution to achieve scalability and system redundancy guarantees to the complexity of tasks;
 - fault tolerance is the ability of a distributed system to continue operation in case of interruption of the nature of hardware; fault tolerance is obtained by fitting the hardware side components that are designed to take over all tasks principal components when they fail or become unusable; there are many ways to ensure fault tolerance including ensuring continued operational processes by maintaining a constant supply of electricity through the use of UPS equipment and power generators, providing spare parts

requirements by implementing the strategy N+1 as are reflected by the availability of N components in current use and one spare to replace any component that fails;

- risk assessment to counter the undesirable effects caused by quantifying threats present in the operating environment of distributed systems.

The availability of distributed systems is affected by MSDN (2010):

- inadequate testing leading to the omission of usage scenarios that cause destabilization of the system, lack of testing leads to a large number of software defects that contribute to lowering the affordability;
- lack of monitoring and review process leads to:
 - omission implementing some features of the distributed system;
 - failure of policies imposed by the project software development leading to the situation as disastrous for the proper functioning of computer components products distributed system;
 - failure to comply predetermined development of project specifications;
- operating errors that are caused by incorrect use of modules distributed resulting in physical or logical damage to hardware or software involved in these modules;
- coding errors that lead to situations of unavailability through source code access to areas not adequately manage situations arising;
- interaction with third-party distribution system causing damage by providing data in formats not recognized or attempting to access system features distributed in a manner - inappropriate; another aspect of interaction with the third service consists of attempts to access the services of nature private or no distribution system;
- operating conditions characterized by the nature of the environment in which distributed processes are carried out; operating conditions refer to operating systems that is implemented distributed systems, security systems in place to manage humidity, fire prevention and other factors risk of human nature;
- hardware failures are characterized by destruction or failure of certain components that make up the distributed system;
- low security causing unauthorized access to protected software resources of the system or physical access to the physical parts making up the distributed system;
- natural disasters that are specific to geographic locations of distributed system components such as hurricanes, earthquakes, fires or floods.

From an economic perspective availability ensures the online presence of information in the distributed application online. The user gains confidence in the reliability of the application by attaining a high level of availability of the

information presented by the distributed application. Also an important factor associated with a high level of availability is ensuring continuous usage of services provided without extra cost.

Integrity is the provision of information from tampering or destruction and includes non-repudiation and authenticity. Authenticity is necessary to ensure that data, information and transactions are genuine. Non-repudiation means that nobody can deny or issue a transaction receipt with the possibility of negating it. The authenticity and non-repudiation in electronic commerce are applied by using digital signatures. Integrity is ensured at:

- data level which refers to keeping the integrity of information contained in the database system; in order to complete this objective it is necessary to:
 - determine the logic structure of database entities;
 - identify data types that must be inserted in order to maintain structural homogeneity of the information stored in the database;
 - maintaining a stable form of the database structure in order to keep table relationships and data storage logic;
- information system by developing procedures and functionality that are designed to prevent cyber attacks that target distributed application destabilization, these include:
 - input sanitation to protect the system from code-injection attacks that have destabilizing effects on the database by making unauthorized changes in the tables and entities stored in them;
 - removing areas of source code that have the elements of uncertainty about the exposure of information which improve the chances of the attacker to damage software product.

In terms of economics the integrity feature gives a uniform behavior of operations on data. This is perceived by users as the validity of results obtained from accessing product information. By providing a high degree of integrity of data and of the information system the preservation of existing users is ensured and could potentially increase their numbers.

Confidentiality means preserving authorized restrictions on access and publication, including the means to protect privacy and property rights to personal information. Confidentiality is ensured in distributed applications at:

- data level to protect information stored in the database through user input validation in order to prevent attacks that use code injection; by managing requests to the database by removing harmful content that causes destruction of information in the database;
- user level via secure Internet transmissions between client and web server which hosts the product information; user-level privacy is important from the point of view of the data that the user manages or

inputs in the operation cycle of the software product; this data is represented by access keys, personal data or other data directly addressing the target software application;

- product operation level by reference to situations in which an attacker gains access to information regarding the used database system, web server version which hosts the software application, infrastructure components used for product development; a risk factor which leads to loss of confidentiality is stack exposure due to errors generated by poor product management.

From the economic point of view a high level of confidentiality of personal data is an advantage to users because it provides a guarantee that the software application manages all operations safely and without risk of disclosure.

4. Cost analysis

The economic environment is very complex. Building an economic model that treats all possible situations is impossible. There are many conditions that generate fluctuations that can affect the economic models: very large natural disasters, discovery of new deposits of rare resources, wars, tensed political situations. The structural equilibration is influenced by solving the problems that caused the imbalance in the first place. For solving global problems the collaboration between many states is required. As the users' requirements are greater than before in the knowledge based society, the developed citizen oriented informatics applications must respect them. Ways of adapting the applications assume redesign of the graphic interface, code optimizations, new modules, database optimization, adoption of a distributed model. All modifications done to the applications must lead to increases in productivity for the users and economies of resources in the maintenance process. The developing costs of the informatics applications are very important. Balance must be obtained between the consumption of resources and the delivered results. The cost analysis aims many aspects: performance, development, security, maintenance.

Performance is the extent to which a distributed system uses resources available for carrying out the tasks required by users. Performance is analyzed for the functional and non-functional requirements. Thus to assess the performance level functional requirements are analyzed by the time and accuracy of results obtained by users from the application of algorithms to implement distributed systems to solve a set of predefined problems. It aims to achieve swift calculations necessary to obtain the results required by the user and their reliability. Performance of non-functional requirements is evaluated following the levels of quality characteristics of software processes analyzed

during the effective operation of the distributed system. To quantify the values of quality characteristics it is necessary to determine the optimal levels at which the system operation is to be recorded.

These levels are considered an optimum reference configuration of application performance. To determine the extent to which performance is recorded at these levels there is periodically made a comparative analysis for each feature that will result in some performance indicators measuring percentage recorded in the period under review compared to baseline defined optimal performance.

PERFF indicator is defined as the functional performance and PERFNF represents the non-functional performance of the distributed system.

$$PERFF_i = \frac{TMin_i}{TMax_i}$$

where:

$TMin_i$ - the minimum time required to make transaction i ;

$TMax_i$ - the maximum time needed to make the transaction i .

$$PERFNF = \frac{\frac{C_1}{CO_1} + \frac{C_2}{CO_2} + \dots + \frac{C_{ncp}}{CO_{ncp}}}{ncp}$$

where:

C_j - measured level of quality characteristic j ;

CO_j - the optimal level of quality characteristic j ;

ncp - the number of features as recorded in the measurement of performance.

The optimal functioning of the application is set as a basic configuration in the testing process. The use cases define all the application functionalities and determine individual measurements for each. Thus the formula for calculating the performance of the application for configuration k is determined using the formula:

$$PERFNF_k = \frac{\frac{C_{k1}}{CO_{k1}} + \frac{C_{k2}}{CO_{k2}} + \dots + \frac{C_{kncp}}{CO_{kncp}}}{kncp}$$

where:

C_{kj} - the measure of the quality characteristic pattern k associated j ;

CO_{kj} - the optimal level of quality characteristic j associated to pattern k ;

$kncp$ - number of features as recorded in the measurement of the performance associated to pattern k .

To optimize performance measuring distributed systems it is necessary to establish a set of common characteristics as $MPCC = (CCP_1, CCP_2, \dots, CCP_{npcc})$ and a number of distinct sets of quality characteristics associated with each configuration $MMPDC = (MDPC_1, MDPC_2, \dots, MDPC_{ncp})$ where $MDPC_k = (PDC_1, PDC_2, \dots, PDC_{npdck})$; $npdck$ is the number of distinct quality characteristics of pattern k . Figure 3 is an outline of quality characteristics to measure the performance of a distributed system containing a number of different configurations, each having associated a set of ncp quality characteristics.

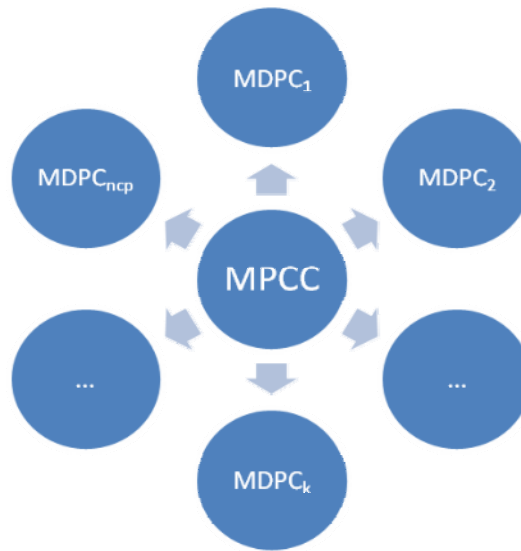


Figure 3. *Performance quality environment*

Ensuring a high level of performance is accompanied by high costs of development that are not justified in practice. To determine the extent to which financial investment in optimizing distributed software is efficient a cost optimization analysis needs to be performed.

Optimizing costs according to Gartner (2010) are practices, skills and behavior adopted by an organization to reduce costs, minimize costs while preserving quality of software systems developed and maintained steady growth potential of the organization. The aim is to optimize organizational costs, the level of team-level software developers and source code.

Optimization of organizational costs has to identify administrative and production areas of the organization which has the highest costs and to intervene by minimizing or eliminating costs:

- of supporting auxiliary operations with no profits;
- with staff that doesn't affect profit generating activities;
- the availability of materials and equipment not necessary for the proper conduct of business processes and software development;
- transport of employees; for this purpose to identify ways to decrease the number of business trips if possible address situations through video-conferences or through the internal computer network;
- with third parties making bids to obtain the best price for materials and equipment needed.

Cost optimization in the development teams must follow a plan to reward developers of software based on recorded performance and also implement a value system matrix value in Table 1.

Table 1

Features	Feature Level				
	Weak	Mediocre	As expected	More than expected	Very good
C_1	X				
C_2			X		
C_3					X
...	...	...	...	...	...
C_{i-1}	X				
C_i			X		
$C_{and 1}$		X		X	
...	...	...	...	...	...
C_{n-2}			X		
C_{n-1}	X				
C_n				X	

where the characteristics and expectations are quantified based on experience, responsibilities and dedication of software developers. Based on these characteristics the plan is established and the developer motivation over time is determined. If the individual is ineffective, i.e. has a negative slope of progress, it is necessary to remove him because the costs caused by his work outweigh the benefits to the organization.

Cost optimization of source code quality maintenance requirements imposed by the security solution architects is determined as minimizing the time and funds related to debugging activities. Also, if they are to achieve a high quality source code it is less likely paying for damages and penalties to users for faulty developed computer security systems.

The optimum timing for improving the software system is determined by technological advances made in computer security that lead to fighting the last type of threat.

Figure 4 presents the elements that consolidate the decision making on improving the software system.

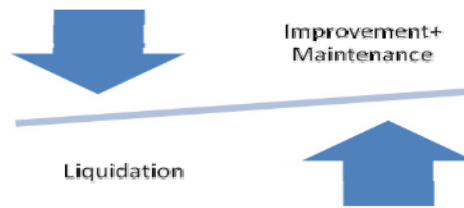


Figure 4. System factors

According Uclouvain (2010), a time frame $T = (t_1, t_2, t_n)$ is considered and with each time t there is only one technological improvement. Thus, the cost of technology is represented by a function with parameters:

$$(\Pi_t, Q_{t,k}, S_{t,k})$$

where:

Π_t - cost of implementing a new security model;

$Q_{t,k}$ - cost of maintenance of the old security system until the end of $k > t$;

$S_{t,k}$ - liquidation value of the old security system at the end of $k > t$.

It is considered that as time goes on maintenance cost increases and the liquidation value falls, as follows:

$$Q_t < Q_{t+1} \text{ and } S_t > S_{t+1}$$

The cost of replacing security technologies at the time k is given by the following equation:

$$TEC(\Pi_t, Q_{t,k}, S_{t,k}) = \Pi_t + Q_{t,k} - S_{t,k}$$

The aim is to minimize the cost of such replacement and is calculated for all times $k > t$ according to table 2.

Table 2

Choice of optimal improvement cost					
k_1	k_2	...	k_i	...	k_m
$TEC(\Pi_t, Q_{t,k_1}, S_{t,k_1})$	$TEC(\Pi_t, Q_{t,k_2}, S_{t,k_2})$		$TEC(\Pi_t, Q_{t,k_i}, S_{t,k_i})$		$TEC(\Pi_t, Q_{t,k_m}, S_{t,k_m})$

The aim is to find:

$$TEC_{optim} = \min_{i=1..m} \{TEC(\Pi_t, Q_{t,k}, S_{t,k_i})\}$$

Cost optimization is an important economic issue in any IT project, especially where it is necessary for software cost optimization without affecting the overall quality of the system in question.

5. The imbalance generated by profit maximization iterative optimization model

The iterative optimization model is represented by developing improvements starting from an initial version V_1 , an intermediary version V_i and a final version V_k according to the schema presented in Figure 5.

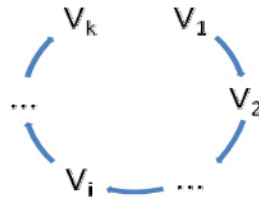


Figure 5. Iterative optimization model

In application developed in the knowledge based society, optimization is a continuous process such that with each improved version of the application it is necessary to observe improvements in the informatics application behavior. In Figure 6 the evolution of application versions $V_1, V_2, \dots, V_k$ is presented along the set of time moments $M_1, M_2, \dots, M_k$.

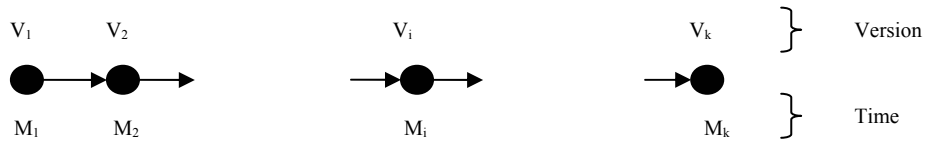


Figure 6. Application version evolution

In this way the following relation is respected:

$$V(V_{i+1}) > V(V_i)$$

$$\forall i = 1..n-1$$

where:

$V(V_{i+1})$ – application value at M_{i+1} moment;

$V(V_i)$ – application value at M_i moment.

Imbalances created by using the iterative system are determined by iterative propagation of quality characteristics as those that satisfy the requirements of the target group at the M_1 time frame, however, until the final M_k time frame get deprecated and not properly deal with users' expectations. Imbalance thus generated leads to poor performance of distributed applications and loss of market share to other products that are up to date. If the quality characteristics are monitored at every step of the iterative optimization process and are reviewed to determine their validity then are created the conditions to obtain a version of the application that has a high performance.

In economy, using the iterative optimization model for profit maximization imbalances might occur because, even if, on short term, it seems to function well, in the long run the imbalance is unavoidable. The system's stability is very strong and doesn't allow the immediate manifestation of unfavorable factors. Maximizing profit is not sustainable in the long run as there are domains that work well a short period with less resources, but doesn't last in the long run and lead to the collapse of the system.

An application that didn't suffer adaptations to fulfill the users' requirements compared with an application that has been adapted in this scope has a lower performance level, developing costs are lower as they don't include the adaptations and the maintenance costs are high. The structure of the application is clearer as adaptation includes reorganization of modules and code optimization. The complexity of the modified application is higher as the requirements that are reached are higher. The performance indicator is computed as a report between the application's performance and the performance obtained before the adaptation. The quality characteristics of the adapted applications are the same as for the unmodified applications, the difference being in the very high levels that are obtained. Applications' adaptation brings many benefits: more users, greater users' satisfaction, rapidity, economy of resources.

Conclusions

Knowledge based society highlights the explicit or tacit knowledge people possess. People become real valued containers for the companies because they attract numerous advantages. In knowledge based society the innovation of products and services is made on the basis of knowledge gathered in time. Informational systems are support for the management team of the company. These deliver information on which basis the management team takes quick and correct decisions. The informatics systems are support for the informational systems. These ensure the rapid processing of documents and

their immediate transmission. In knowledge based society appear trends towards the protection of the environment, developing low energy consumption technologies, process virtualization. The citizen oriented informatics applications are of great interest for domains as e-government, e-vote, e-commerce, bidding portals. Security is a very important issue for the informatics applications. As the speed of data transmissions is very high through the Internet any security breach can have disastrous effects. Costs analysis is vital for projects as it shows if they are viable or not. Investing into an unviable project is loss of time and money with no results. While developing citizen oriented applications a balance must be obtained between the resource consumption and the obtained results. Both in economy and the development of informatics applications can appear imbalances when using the iterative system.

Acknowledgements

This article is a result of the project „Doctoral Program and PhD Students in the education research and innovation triangle”. This project is co funded by European Social Fund through The Sectorial Operational Programme for Human Resources Development 2007-2013, coordinated by The Bucharest Academy of Economic Studies.

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Adverse Selection Models with Three States of Nature*

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Abstract. *In the paper we analyze an adverse selection model with three states of nature, where both the Principal and the Agent are risk neutral. When solving the model, we use the informational rents and the efforts as variables. We derive the optimal contract in the situation of asymmetric information. The paper ends with the characteristics of the optimal contract and the main conclusions of the model.*

Keywords: adverse selection; asymmetric information; informational rent; optimal contract.

JEL Codes: C61, D82, D86.

REL Code: 7J.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

Introduction

One of the most important researches of economic theory from the last 40 years is represented by the *theory of incentives*. This theory has been developed also as a necessity to explain some failures of the classical models from microeconomic theory. The information became an extremely costly good in real economies and the asymmetric information between contractual partners may generate some distortion of the results with respect to optimal Pareto results. Asymmetric information is present in almost all economic activities: there are incentives to work hard, to produce high quality goods, incentives to invest or to save, to reveal the correct characteristics to other partners. The *adverse selection* models were built in this context; they model situations where the decisions of player (named the Agent) having private information depend on this private information and could negatively affect others participants; the party making the contractual offer and who doesn't know the Agent's private information is attempting to reduce this informational disadvantage.

The pioneering article studying the classical approach to the adverse selection problem is Mirrlees (1971). After this article, the initial adverse selection models were developed in many theoretical and empirical ways. Some important contributions belong to Green and Laffont (1987), Myerson (1979), Dasgupta, Hammond and Maskin (1979), who studied the Revelation Principle; the problem with a continuum of types has been studied by Baron and Myerson (1982). A general characterization of necessary and sufficient conditions for the existence of a second best optimum was given by Guesnerie and Laffont (1984); Jullien (2000) and Rochet and Stole (2002) extended the classical models and introduced the type-dependent and random participation constraints; Armstrong and Rochet (1999) analyzed aspects regarding multidimensional asymmetric information.

There has been a considerable theoretical analysis of different models in this theory of incentives and this analysis advanced also in the empirical area. The empirical studies are various and refer to almost all economic activities: nonlinear pricing (Musa, Rosen, 1978, Maskin, Riley, 1984), credit rationing (Stiglitz, Weiss, 1981, Bester, 1992, Harris, Raviv, 1992), optimal taxation (Mirrlees, 1971, 1986, Roberts, 2000, Saez, 2001), labor contracts (Chari, 1983, Green, Kahn, 1983, Grossman, Hart, 1983), regulation (an entire book of Laffont and Tirole, 1993), insurance contracts (Fluet, Parnnequin, 1997, Sloan, Norton, 1997, Stiglitz, 1997, Villeneuve, 2000, Brunner, Pech, 2006, Resende, Zeidan, 2010).

Recent research shows that the models became more and more complex, most of them being mixed models with moral hazard, signalling or screening. Fudenberg and Tirole (1990) proposed a mixed model where the Agent's actual

choice regarding the effort is an endogenous adverse selection variable at the renegotiation stage and this aspect generates inefficiency. This problem was partially solved by Matthews (1995) and Ma (1994). Page (1991, 1997) presented a mixed model with moral hazard and adverse selection, and Jullien and Salanie (2007) extended the moral hazard model for the situation where the Agent's risk aversion constitutes his private information, such that the model presents also an adverse selection problem. Such approach was also used by Reichlin and Siconolfi (2004); they generalized the pure adverse selection model of Rothschild and Stiglitz, including some moral hazard variables. Mylovanov and Schmitz (2008) studied a two period moral hazard model, where the Agents are risk neutral, with limited liability and three identical activities.

In the paper we present an adverse selection problem with three states of natures, where the partners from the Principal-Agent model are both risk neutral. The Principal's profit depends on Agent's costly effort and also on some exogenous factors, not correlated with Agent's behaviour; these factors are referred as "nature states". This problem was also studied by Marinescu, Miron and Marin (2010) from the perspective of a hazard moral model followed by adverse selection with three states of natures.

The paper is organized as follows. In Section 1 we present the main assumptions of the model and the optimization problem that must be solved for deriving the optimal contract. In Section 2 we use a transformation of variables and we obtain an equivalent model with informational rents-efforts as variables. Section 3 contains the analysis of the model in the situation of asymmetric information and in the last part of the paper we summarize the main features of the optimal contract and we propose some possible extensions of the model.

1. The model in the situation of asymmetric information

Consider a Principal-Agent model and suppose that, after signing the contract, the Agent observes (knows) the market conditions – if these conditions are good or bad. We denote by θ the parameter that characterizes the market conditions, with the possible values $\theta \in \{\theta^G, \theta^M, \theta^B\}$. A high level of this variable, $\theta = \theta^G$, indicates a favourable situation for the business (for Agent's activity), while $\theta = \theta^M$ corresponds to a medium situation (a medium state of nature), and $\theta = \theta^B$ (bad situation of unfavorable situation on the market) implies some decisions regarding the effort with a higher cost than the other ones. It is obvious then that $\theta^G > \theta^M > \theta^B$.

The Agent will exert a level of total effort denoted by E , but this effort level cost more when the market conditions are bad.

Therefore, $E = \theta + e$, where the Agent's decision regarding the effort level e is costly, but θ doesn't. The Agent will choose the costly effort e , with respect to the information he gets from θ .

The Agent, after signing the contract, observes the true value of the variable θ (θ^B, θ^M or θ^G). The Principal observes the total decision E . Because he cannot distinguish between the market conditions, the Principal doesn't know the effort level exerted by the Agent. This means that the later could exerts a high level of effort or a medium or low level of effort.

With adverse selection, the Principal has to offer the same menu of contracts to all types of Agents and has to anticipate that each type of Agent chooses the contract he prefers. Without loss of generality, the Revelation Principle says that the Principal can restrict the menu to a set of direct revelation mechanisms so that the optimization problem is significantly reduced.

A contract is represented by the couple

$$(w, e) \equiv (w, E),$$

where:

- w – is the Agent's wage;
- e – is the costly effort for the Agent;
- E – is the total effort, $E = e + \theta$;
- θ - represents the market conditions.

In such a situation with asymmetry of information, we denote the menu of contracts by $\{(w^G, e^G), (w^M, e^M), (w^B, e^B)\}$. These contracts correspond to the three states of nature (market conditions), with the respective probabilities π^G, π^M and π^B from the interval $(0,1)$ and with $\pi^G + \pi^M + \pi^B = 1$.

The menu of optimal contracts is derived solving a nonlinear optimization problem that corresponds to a maximization of Principal's final expected payoff (meaning the difference between gross expected payoff and the expected wage), subject to the participation and incentive compatibility constraints.

Suppose that the Principal's profit is equal to total effort E . Then, $e = E - \theta$.

We also assume that both Principal and the Agent are risk neutral.

Therefore, for a given value of θ (a given market characteristic) and for the contract denoted by (w, e) , the Agent's utility function is $w - v(e)$, where:

$v(e)$ represents the disutility of effort, with the well-known properties: $v'(e) > 0$, $v''(e) > 0$, $v(e) > 0$ and $v(0) = 0$

We can now write the Principal's optimization problem as follows:

$$\begin{aligned}
 (P) \quad & \max_{w^G, w^M, w^B, e^G, e^M, e^B} \left\{ \pi^G [e^G + \theta^G - w^G] + \pi^M [e^M + \theta^M - w^M] + \pi^B [e^B + \theta^B - w^B] \right\} \\
 \text{s.t.} \quad & w^G - v(e^G) \geq \underline{u} \\
 & w^M - v(e^M) \geq \underline{u} \\
 & w^B - v(e^B) \geq \underline{u} \\
 & w^G - v(e^G) \geq w^M - v(e^M + \theta^M - \theta^G) \\
 & w^M - v(e^M) \geq w^B - v(e^B + \theta^B - \theta^M) \\
 & w^G - v(e^G) \geq w^B - v(e^B + \theta^B - \theta^G) \\
 & w^M - v(e^M) \geq w^G - v(e^G + \theta^G - \theta^M) \\
 & w^B - v(e^B) \geq w^M - v(e^M + \theta^M - \theta^B) \\
 & w^B - v(e^B) \geq w^G - v(e^G + \theta^G - \theta^B)
 \end{aligned}$$

(with all variables satisfying the sign constraints – non negativity constraints).

2. The transformed model – using the variables: informational rents and costly effort levels

In this section we propose a way of solving the model that differs from the analysis presented by Marinescu Miron and Marin (2010).

We first introduce some other notations.

Let U^G, U^M, U^B be the Agent's utility levels obtained in each state of nature. Therefore, we can express these *informational rents* as:

$$\begin{aligned}
 U^G &= w^G - v(e^G) \\
 U^M &= w^M - v(e^M) \\
 U^B &= w^B - v(e^B)
 \end{aligned}$$

In the above optimization program we replace the original variables $(w^G, w^M, w^B, e^G, e^B, e^M)$ with the new ones $(U^G, U^M, U^B, e^G, e^B, e^M)$.

Another assumption that doesn't restrict the generality of the model is that the parameter values θ^G, θ^M and θ^B (the states of nature) are satisfying the following condition:

$$\Delta\theta = \theta^G - \theta^M = \theta^M - \theta^B > 0$$

This means that the spread of uncertainty is the same between these three values.

Proposition 1. The function $f : [0, \infty) \rightarrow \mathbb{R}$, $f(e) = v(e + \Delta\theta) - v(e)$ is a strictly positive and strictly increasing function.

Proof

We use the usual properties of the effort cost function $v(\cdot)$, i.e. $v(e) > 0$, $v'(e) > 0$, $v''(e) > 0$ and $v(0) = 0$.

From the property of the monotonic function $v(\cdot)$ it is obvious that $f(e) > 0$, and from the convexity of this function we have also:

$$f'(e) = v'(e + \Delta\theta) - v'(e) > 0$$

We use all these assumptions for transforming the problem (P) into an optimization problem with other variables.

With this change of variables, the Principal's objective function can be rewritten as:

$$\max_{U^G, U^B, U^M, e^G, e^M, e^B} \left\{ \pi^G [e^G + \theta^G - v(e^G)] + \pi^M [e^M + \theta^M - v(e^M)] + \pi^B [e^B + \theta^B - v(e^B)] - [\pi^G U^G + \pi^M U^M + \pi^B U^B] \right\}$$

This expression shows that the Principal's objective is maximizing the expected social value minus the expected informational rent of the Agent.

The participation constraints are now represented by the usual sign constraints for the variables U^G , U^B and U^M :

$$U^G \geq 0$$

$$U^B \geq 0$$

$$U^M \geq 0.$$

The upward and downward (local and global) incentive compatibility constraints are written using the function $f(\cdot)$ as follows:

$$U^G \geq U^M + f(e^M - \Delta\theta) \quad (1)$$

$$U^M \geq U^B + f(e^B - \Delta\theta) \quad (2)$$

$$U^G \geq U^B + f(e^B - \Delta\theta) + f(e^B - 2\Delta\theta) \quad (3)$$

$$U^M \geq U^G - f(e^G) \quad (4)$$

$$U^B \geq U^M - f(e^M) \quad (5)$$

$$U^B \geq U^G - f(e^G) - f(e^G + \Delta\theta) \quad (6)$$

We show how the constraint (1) is obtained from the incentive compatibility constraint:

$$w^G - v(e^G) \geq w^M - v(e^M + \theta^M - \theta^G)$$

The right-hand side of this relation is then:

$$\begin{aligned} w^M - v(e^M + \theta^M - \theta^G) &= w^M - v(e^M - \Delta\theta) \\ &= w^M - v(e^M) + v(e^M) - v(e^M - \Delta\theta) \\ &= U^M + f(e^M - \Delta\theta) \end{aligned}$$

The constraint (3), written in terms of informational rents and efforts, represents a transformation of the upward global constraint:

$$w^G - v(e^G) \geq w^B - v(e^B + \theta^B - \theta^G)$$

The right-hand side of the above relation is then:

$$\begin{aligned} w^B - v(e^B + \theta^B - \theta^G) &= w^B - v(e^B) + v(e^B) - V(e^B - 2\Delta\theta) \\ &= U^B + v(e^B) - v(e^B - \Delta\theta) + v(e^B - \Delta\theta) - v(e^B - 2\Delta\theta) \\ &= U^B + f(e^B - \Delta\theta) + f(e^B - 2\Delta\theta) \end{aligned}$$

We obtained in the same way all other constraints.

The major technical difficulty of the Principal's program is a great number of the constraints imposed by incentive compatibility and participation of Agent. We show that the downward constraints (the last three constraints) can be ignored when solving the optimization problem. Then we check if the optimal solution satisfies these constraints.

We begin by determining which of the participation constraints are the relevant ones.

Proposition 2. If $U^B \geq 0$, then $U^M > 0$ și $U^G > 0$.

Proof

Using that $f(e) > 0$ and the first two constraints we have:

$$U^M \geq U^B + f(e^B - \Delta\theta) > 0$$

and

$$U^G \geq U^M > 0.$$

Therefore, if the participation constraint for the least favourable state is satisfied, then all other participation constraints are satisfied.

3. The optimal contract in the situation of asymmetric information

We are now interested in deriving the optimal solution for the program presented in the above section, assuming that this program has feasible solutions. Before we proceed, we need to proof one more proposition. The following Proposition describes the well-known condition from the literature “the *implementation condition* or the *monotonicity condition*”.

Proposition 3. If the set of feasible solutions (the set of incentive feasible contracts) of the program (P) is nonempty, then the following condition holds:

$$e^G + \theta^G \geq e^M + \theta^M \geq e^B + \theta^B$$

(*implementability condition*).

Proof

Adding two local (upward and downward) constraints we get:

$$U^G \geq U^M + f(e^M - \Delta\theta)$$

$$U^M \geq U^G - f(e^G)$$

Then:

$$f(e^G) \geq f(e^M - \Delta\theta)$$

The function $f(\cdot)$ is strictly increasing and so, the above relation yields to:

$$e^G \geq e^M - \Delta\theta = e^M - (\theta^G - \theta^M) \text{ or } e^G + \theta^G \geq e^M + \theta^M$$

The same is done, using (2) and (5):

$$f(e^M) \geq f(e^B - \Delta\theta)$$

or

$$e^M \geq e^B - \Delta\theta = e^B - (\theta^M - \theta^B),$$

Then:

$$e^M + \theta^M \geq e^B + \theta^B$$

We finally get:

$$e^G + \theta^G \geq e^M + \theta^M \geq e^B + \theta^B$$

This condition shows that, the higher value of the parameter characterising the state of market is, the higher the final payoff is.

More than this, if the conditions (1) and (2) are satisfied, then the constraint (3) also holds.

Indeed, adding (1) and (2) yields:

$$U^G \geq U^B + f(e^M - \Delta\theta) + f(e^B - \Delta\theta)$$

But, from the implementability condition $e^M + \theta^M \geq e^B + \theta^B$ and then:

$$U^G \geq U^B + f(e^B - \Delta\theta) + f(e^B - 2\Delta\theta)$$

The results derived above allow us to rewrite the reduced optimization program as follows:

$$(P') \max_{U^G, U^M, U^B, e^G, e^M, e^B} \left\{ \pi^G [e^G + \theta^G - v(e^G)] + \pi^M [e^M + \theta^M - v(e^M)] + \pi^B [e^B + \theta^B - v(e^B)] - \right. \\ \left. - [\pi^G U^G + \pi^M U^M + \pi^B U^B] \right\}$$

s.t.

$$U^G \geq U^M + f(e^M - \Delta\theta) \quad (1)$$

$$U^M \geq U^B + f(e^B - \Delta\theta) \quad (2)$$

$$U^B \geq 0$$

This is the final form of the program we solve further.

First, we show that all the remaining constraints are binding at the optimum.

Proposition 4. At the optimum, the informational rent corresponding to the least favourable state satisfies $U^B = 0$.

Proof

Suppose that this is not true. Assume that $U^B > 0$. Let $\varepsilon > 0$ be an arbitrary small scalar such that $U^B - \varepsilon \geq 0$.

We have $U^G \geq U^M \geq U^B > 0$ and then we could reduce the informational rents of the other types of Agent such that the relevant constraints continue to hold:

$$U^G - \varepsilon \geq U^M - \varepsilon + f(e^M - \Delta\theta)$$

$$U^M - \varepsilon \geq U^B - \varepsilon + f(e^B - \Delta\theta)$$

$$U^B - \varepsilon \geq 0$$

In this case, if $(U^G, U^M, U^B, e^G, e^M, e^B)$ represents the optimal solution, then the feasible solution $(U^G - \varepsilon, U^M - \varepsilon, U^B - \varepsilon, e^G, e^M, e^B)$ is better than the optimal solution (in the sense that the corresponding value of the objective function is higher than the corresponding value of the supposed optimal solution) and gives the Principal an extra payoff equal to ε . And this is a contradiction.

So $U^B = 0$ it is optimal.

Therefore, in the least favourable state of nature the participation constraint is binding, the Agent obtains the outside opportunity level of utility exactly.

A similar result is true for the incentive compatibility constraint (2).

Proposition 5. The incentive compatibility constraint given by (2) is binding at the optimum.

Proof

Suppose it is not. Assume that $U^M > f(e^B - \Delta\theta)$.

Therefore, we can decrease by $\varepsilon > 0$ the informational rents U^M and U^G ; the program's constraints are indeed satisfied, but the objective function's value is increased by $(1 - \pi^B)\varepsilon$. But this is again a contradiction.

Hence, $U^M = f(e^B - \Delta\theta)$. This means that the informational rent associated with the parameter value θ^M is strictly positive and higher than the corresponding rent associated with θ^B .

Proposition 6. The constraint $U^G \geq f(e^B - \Delta\theta) + f(e^M - \Delta\theta)$ is binding at the optimum.

Proof

Suppose it is not, i.e. $U^G > f(e^B - \Delta\theta) + f(e^M - \Delta\theta)$

Then, the feasible solution $(U^G - \varepsilon, U^M = f(e^B - \Delta\theta), U^B = 0, e^G, e^M, e^B)$ (the optimal solution is modified) is better than the optimal solution in the sense that the objective function's value is increased by $\pi^G \varepsilon$. But this is a contradiction.

Hence, for the state of nature that corresponds to θ^G , the Agent gets a strictly positive informational rent, given by:

$$U^G = f(e^B - \Delta\theta) + f(e^M - \Delta\theta), \text{ with } U^G > U^M = f(e^B - \Delta\theta).$$

Substituting the results given by the last three Propositions, $U^B = 0$, $U^M = f(e^B - \Delta\theta)$ and $U^G = f(e^B - \Delta\theta) + f(e^M - \Delta\theta)$ into the reduced program (P') , this problem is transformed into an unconstrained maximization problem, with concave objective function; we denote this new problem by (P'') :

$$\begin{aligned} (P'') \max_{e^G, e^M, e^B} F(e^G, e^M, e^B) &= \pi^G [e^G + \theta^G - v(e^G) - f(e^M - \Delta\theta) - f(e^B - \Delta\theta)] + \\ &= \pi^M [e^M + \theta^M - v(e^M) - f(e^B - \Delta\theta)] + \pi^B [e^B + \theta^B - v(e^B)] \end{aligned}$$

The necessary and sufficient conditions are:

$$\frac{\partial F}{\partial e^G} = 0 \text{ or } \pi^G [1 - v'(e^G)] = 0 \quad (7)$$

$$\frac{\partial F}{\partial e^M} = 0 \text{ or } -\pi^G f'(e^M - \Delta\theta) + \pi^M [1 - v'(e^M)] = 0 \quad (8)$$

$$\frac{\partial F}{\partial e^B} = 0$$

or

$$-\pi^G f'(e^B - \Delta\theta) - \pi^M f'(e^B - \Delta\theta) + \pi^B [1 - v'(e^B)] = 0 \quad (9)$$

From (7) it follows immediately that:

$$v'(e^G) = 1 \quad (10)$$

Compared with the full information setting, asymmetric information doesn't affect the effort level corresponding for the characteristic θ^G . So the second best effort is efficient for this parameter value.

The first order condition (8) yields to:

$$v'(e^M) = 1 - \frac{\pi^G}{\pi^M} f'(e^M - \Delta\theta) < 1 \quad (11)$$

This equation gives the second best effort $\bar{e}^M$ associated with the state of nature θ^M .

The relation (9) can be rewritten as:

$$v'(e^B) = 1 - \frac{\pi^G}{\pi^M} f'(e^B - \Delta\theta) - \frac{\pi^M}{\pi^B} f'(e^B - \Delta\theta) < 1 \quad (12)$$

This last equation yields to the second best effort level $\bar{e}^B$ in the case of the least unfavourable state of nature.

We can now check that the optimal solution derived above satisfies also the ignored constraints.

Proposition 7. The second best optimal informational rents:

$$U^G = f(e^B - \Delta\theta) + f(e^M - \Delta\theta),$$

$$U^M = f(e^B - \Delta\theta),$$

$$U^B = 0,$$

satisfy also the downward (local and global) incentive constraints.

Proof

We substitute the above expressions of the informational rents into each ignored incentive constraint. We then have:

i) The constraint (4):

$$U^M \geq U^G - f(e^G)$$

becomes:

$$f(e^B - \Delta\theta) \geq f(e^B - \Delta\theta) + f(e^M - \Delta\theta) - f(e^G)$$

or

$$f(e^G) \geq f(e^M - \Delta\theta)$$

The function $f(\cdot)$ being strictly increasing, it follows that:

$$e^G \geq e^M - \Delta\theta$$

But this is true, from the implementability condition $e^G + \theta^G \geq e^M + \theta^M$.

ii) The constraint (5):

$$U^B \geq U^M - f(e^M)$$

becomes:

$$0 \geq f(e^B - \Delta\theta) - f(e^M)$$

or

$$f(e^M) \geq f(e^B - \Delta\theta)$$

The function $f(\cdot)$ being strictly increasing, it follows that:

$$e^M \geq e^B - \Delta\theta$$

and this is an equivalent relation to the implementability condition:

$$e^M + \theta^M \geq e^B + \theta^B$$

iii) The constraint (6) is a consequence of (4) and (5). Adding (4) and (5) we get:

$$U^B \geq U^G - f(e^G) - f(e^M) \geq U^G - f(e^G) - f(e^G + \Delta\theta),$$

where the last inequality was written using the implementability condition and the monotonic property of $f(\cdot)$.

Hence, we obtain:

$$U^B \geq U^G - f(e^G) - f(e^G + \Delta\theta), \text{ and this is exactly the constraint (6).}$$

4. Conclusions

We derived in the last section the necessary and sufficient condition for the optimal solution in the situation of asymmetric information. We can now summarize the main features of the optimal menu of contracts in the following theorem:

Theorem. Under adverse selection with three states of nature, the optimal menu of contracts entails:

A. No effort distortion for the most favourable state of nature (θ^G) with respect to the first best level $\bar{e}^G = \tilde{e}^G$. This efficient level is given by (10):

$$v'(e^G) = 1$$

B. A downward distortion for the characteristics θ^M and θ^B . The equations (11) and (12) yield to the second best effort levels $\bar{e}^M$ and $\bar{e}^B$, where:

$$\bar{e}^M < \tilde{e}^M \text{ and } \bar{e}^B < \tilde{e}^B$$

These effort levels are inefficient with respect to the corresponding first best levels, for both states of nature (the medium one and the least favourable one).

C. The optimal (second best) informational rents are given by:

$$\bar{U}^G = f(\bar{e}^B - \Delta\theta) + f(\bar{e}^M - \Delta\theta)$$

$$\bar{U}^M = f(\bar{e}^B - \Delta\theta) < \bar{U}^G$$

$$\bar{U}^B = 0$$

The Agents acting in good or medium market conditions get strictly informational rents, while the Agent who acts in an unfavourable state of nature gets no informational rent

D. The second best optimal transfers are respectively given by:

$$\bar{w}^G = \bar{U}^G + v(\bar{e}^G)$$

$$\bar{w}^M = \bar{U}^M + v(\bar{e}^M)$$

$$\bar{w}^B = v(\bar{e}^B)$$

While the Agents acting in a good or medium market conditions get a level of transfer higher than their disutility of costly effort, the Agent acting in an unfavourable state of nature gets a transfer exactly equal to his effort disutility.

Acknowledgements

This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/1.5/59184 "Performance and excellence in postdoctoral research in Romanian economics science domain".

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Sustaining an Effective ABC/ABM System

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Abstract. *The purpose of this paper is to describe the Activity-Based Costing (ABC) and Activity-Based Management (ABM) system and techniques to sustain them as a permanent and repeatable production reporting system, not just for one-off analysis. A comparison is made between ABC/ABM modeling software that extracts source data and business systems that include ABC/ABM modeling features. There are presented the stages of updating, running and rerunning the ABC/ABM system. The resulting information calculated and provided by the ABC/ABM system are analyzed and interpreted in terms of a multidimensional data analysis. The article ends with the authors' conclusions about the benefits of continued operation of sustaining the ABC/ABM system.*

Keywords: Activity-Based Costing; Activity-Based Management; system; multidimensional data analysis; update.

JEL Codes: M41, M15.

REL Codes: 14I, 14K.

1. The ABC/ABM system. Conceptual approach

The Activity-Based Costing system is used to determine product, channel and customer costs needed to gain insights and make business decisions. This system is commonly used as a supplement to the existing system's financial accounting system of a company. Most organizations that use the ABC system have two systems:

1. The official costing system, which is used to prepare external financial reports for investors and regulatory agencies;
2. The Activity-Based Costing system, which is used for internal decision making and management activities.

The ABC system(1) can be defined as a methodology that measures the cost and performance of cost objects, activities and resources based on cause-and-effect relationships. Cost objects consume activities and activities consume resources. Resource costs are assigned to activities based on their use of those resources, and activity costs are reassigned to cost objects (outputs) based on the cost objects' proportional use of those activities.

ABM(2) is defined as a discipline focusing on the management of activities within business processes as the route to continuously improve both the value received by customers and the profit earned in providing that value. ABM uses activity-based cost information and performance measurements to influence management action.

In short, ABC calculates the math (that converts data into information), and ABM deploys the math's resulting information for analysis, insights and decisions.

Sustaining an Activity-Based Costing (ABC) system goes beyond fulfilling its initial implementation success factors to avoiding the factors that in some cases cause companies to abandon (sometimes temporarily) maintaining the system. Most experts agree with the idea of regularly refreshing the calculation of ABC data contained in the enterprise's database. The Activity-Based Costing model assignment structure should be regularly modified as relationships change. The source input data and its extraction typically remains the same (unless new data sources are added).

2. Individual ABC/ABM Model vs. integrated ABC/ABM System

In many enterprises, a well-designed ABC/ABM model that is regularly updated is sufficient for their informational needs. An off-line ABC/ABM model implementation allows enterprises to significantly improve their management costs information without affecting the daily transactional information system. The ABC/ABM system gathers and applies non-financial

information (e.g., resource and activity driver quantities) to re-assign incurred resource expenses into calculated costs.

The commonly accepted approach for organizations of any size – small to large – is with commercial ABC modeling software (e.g. SAS' SAS ABM) that extracts transactional data from business systems (e.g., general ledger, production management). In some cases, an ABC module may be included with enterprise resource planning (ERP) software. (Calculating ABC in a spreadsheet is problematic because there are multiple levels of cost re-assignments and not all have a direct column-to-row relationship. Spreadsheets, like Excel, are also not scalable in size.)

It is eventually valuable to integrate a permanent and repeatable ABC/ABM system (Figure 1) into the daily management accounting and ultimately with the entity's management system. In effect, the ABC/ABM system expands beyond its traditional role of management accounting reporting and becomes a primary source of information to improve product and customer rationalization, profitability performance, and planning, and to reduce or eliminate non-value-added by activities to improve productivity. In short, all input data collection is defined to satisfy the ABC/ABM system requirements, such as the general ledger chart of accounts, cost center structure, inventory/cost of sales accounting procedures, interdepartmental charges, accounts payable practices and payroll distribution costs, and any other facet of the cost accounting system. No major changes are needed with the business process data processing systems (Figure 2) because these transactional systems are supporting the effort of collecting, storing and processing the data used in the managerial accounting reporting.

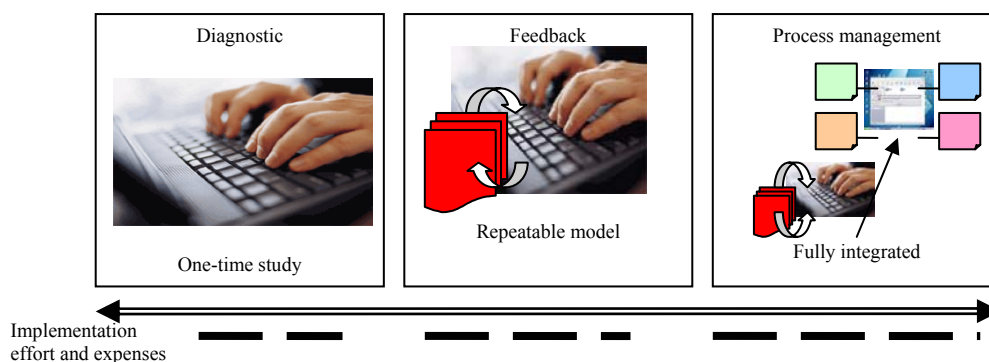


Figure 1. *Stages of implementing an ABC/ABM system*

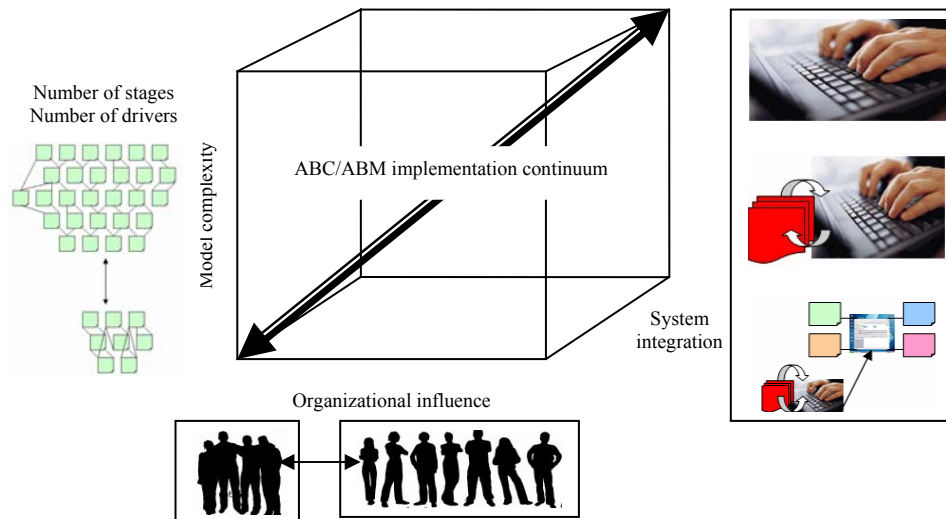


Figure 2. Diagram of a higher-level integrated ABC/ABM system

3. Updating, refreshing and rerunning the ABC/ABM system

Enterprises that have successfully implemented an initial “pilot” ABC/ABM model, although designed with less granularity (i.e., more summarized) and acceptable but not with perfect cost accuracy, will benefit by improving their activities’ and cost drivers’ dictionary of descriptions based on their initial learning. The initial ABC/ABM model can be iteratively revised with disaggregation (e.g., work activities into sub-activities; product families into individual products).

If the approach, methods and assumptions used in the initial run of the pilot system are not fully documented, this makes the reconstruction of later stages (i.e., iterations) more difficult. Preparation and loading of all data can be a difficult task because often the source input data comes from multiple and disparate databases that use various software languages. Hence, the source data is disconnected and non-similar. But these obstacles are surmountable through automation.

As a rule, to earn acceptance from employees and managers, any new information that is not already collected for business process management should be collected. For missing but required data, estimates from the fewest (ideally most knowledgeable) employees can be collected. Remember that all ABC cost assignments will normalize to 100%. Therefore reasonable estimates from informed employees are adequate for reasonably accurate costs. The dominant determinate of cost accuracy comes from the ABC model cost assignment relationships. Cost driver quantities are secondary influencers. If the cost driver quantities (or %s) are reasonable, with a good ABC model cost structure design, the final cost objects’ costs should be accurate enough for the decisions that use the cost information.

Most companies that develop an integrated and automated ABC/ABM systems proceed further to regularly re-running it. Re-running the model is a periodic event (e.g., monthly or quarterly). This means that the pilot system will eventually become a permanent production system. The ABC/ABM model will have to be manageable, reliable and repeatable. The resource expense data (e.g., from the general ledger) must be complete for the period. It is 100% accurate. However not all resource and activity drivers need to be refreshed each period unless the time period's quantity distribution is sufficiently different than the ABC model's existing distribution from a past period. This reduces the administrative effort to maintain the model without introducing significant error. Remember that the level of detail and accuracy depends on the type of decision being made with the cost information. Few if any decisions require 99.9% accuracy – and most much less.

In practice, all data in the final model should not be discounted entirely, even when he went from being a pilot system to a permanently production system (Figure 3). This figure shoes a diagram of a high-level, integrated ABC/ABM system.

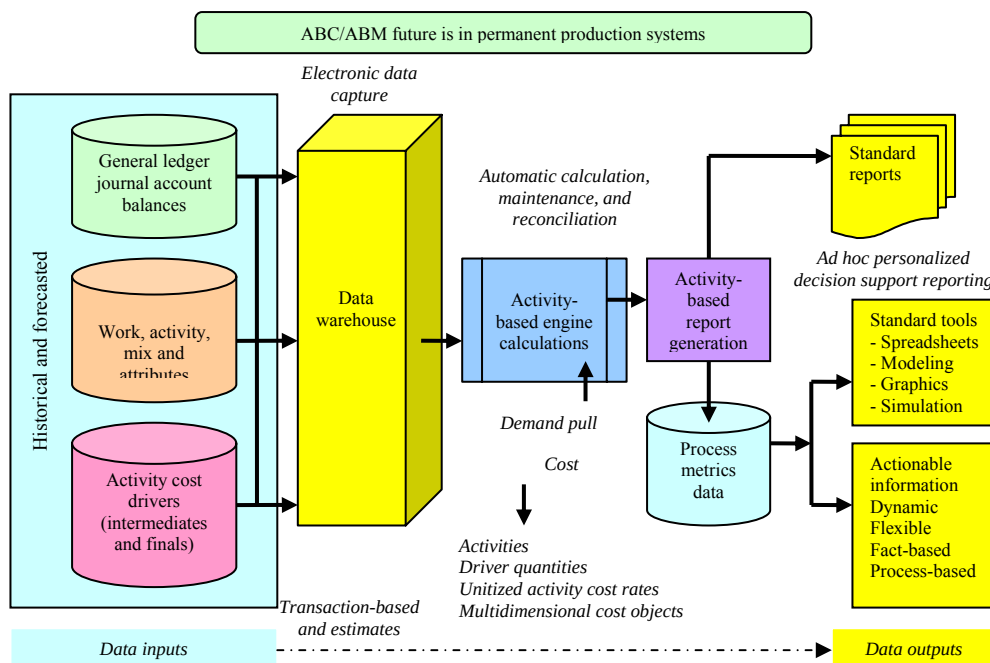


Figure 3. ABC/ABM production system

An ABC/ABM model is built modular (Figure 4). For an ABC management accounting specialist, the model must fully reconcile in its monetary amounts. That is, the total monetary amount of resource expenditures must be equal to the expenditure record log of activities; then those two equivalent totals must also be the same total costs of the final cost objects. In short, an ABC model is full absorption costing that complies with costing's "causality principle" from its resources through activities to its final cost objects. It models a consumption view of how cost objects place demands on the resources' capacities. Tracing and assigning costs according to the flow of costs from resources through activities and eventually into cost objects will accurately capture the diversity of cost objects. Tracing captures the distribution in which the employees' time is estimated to their work activities, all during the same period of time. To reduce the administrative effort, it is advisable for a knowledgeable functional representative to estimate the time distribution for his/her co-workers. This relieves employees from this burdensome work, and the representative's estimates will rarely introduce any significant cost inaccuracy.

There is a popular ABC/ABM principle that states, "It is better to be approximately correct rather than precisely inaccurate". That is, it is better to be roughly right than exactly wrong. Although it may be counter-intuitive to many, precision with input data does equate to accuracy of the calculated costs. The accepted 80/20 law of Pareto applies to ABC modeling, and enterprises cannot afford to construct a perfect and precise ABC model. It will be excessively over-designed well past diminishing returns of extra cost accuracy for the incremental administrative effort. If some managers believe they require more accuracy, then through sensitivity analysis, it can be determined what one driver (or cost assignment relationship) will yield the highest incremental improvement. The model does not need to be improved everywhere – just locally. Before refining the model for more accuracy, always ask the user, "Is the climb worth the view?" That is, will the user make a different decision with just a little more cost accuracy?

When parts of the organization's events and costs behavior in the next period of time (e.g., the sales mix by product and the time distribution of the employees' work activities) are almost identical as in the past (existing) period, then, as previously mentioned, it is acceptable to repeat using some of the earlier cost driver data without the need for revision.

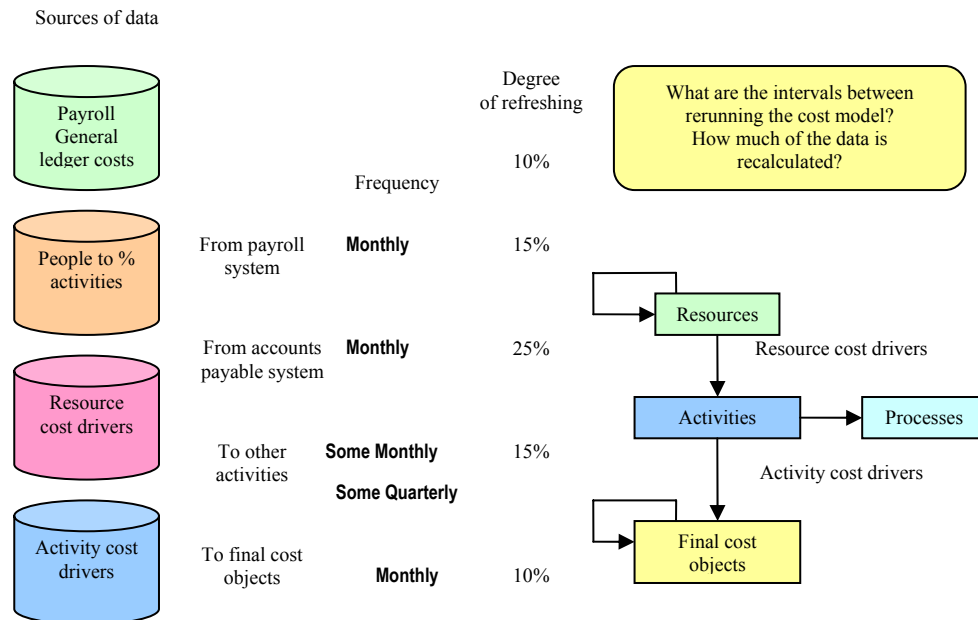


Figure 4. Modular approach of refreshing cost data

Figure 4 shows that only the data that should be replaced, excluding the general ledger expenses which all are new, are those that significantly change and are not constant between successive time periods. This practice will not significantly degrade the accuracy of the costs from the calculations. This ability to retain reasonable accuracy eases the otherwise huge amount of administrative effort that would be required to update the current model. The result of this practice is each time period's ABC model's costs provides reasonably accurate information for users to gain insights and make decisions with the least administrative effort.

For next period changes to the past period model (except for the obvious new period's total resource expenses), the changes should be justified by these three conditions:

1. The number of employees hired or removed or the employees' time distribution on work activities would have changed significantly.
2. There is a substantial change in the consumption distribution profile of the final cost objects (e.g. products) consuming activities. This includes any additions and abandonment of products, services or customers.
3. New activities within a business process are initiated or existing activities are eliminated.

In practice, management accountants will typically download the expense balances from the general ledger's accounts of expenditure management log record with automated links. This interface of a journal register maintains credibility for end users that might discredit the results of the model where balances do not reconcile with the "official" record spending register. This interface takes into account both direct costs and indirect costs of activities.

The processing time for resource and activity drivers can be significantly reduced. Commercial ABC/ABM software provides automated collection of data in ways that are simple and noninvasive to employees. Much source data can be directly downloaded from a business system. Where that is not the case, for most data providers, they can receive electronically (via e-mail or through their organization's communication network) an online entry form for either or both resource and activity cost driver quantities (or %s). The only task is to collect reasonably good driver quantity data from the functional estimators. For resource drivers, this would include how much time (or the percent distribution totaling 100%) employees are spending on their specific work activities (from the "activity dictionary") over the defined period. For activity drivers, this would include how many "units" (or the % distribution) that final cost objects consumed of the activity. The data for both types of cost drivers will then be returned electronically to the ABC/ABM model as input for the model's calculation.

This technology solves any problems, inconsistencies, or lack of responses. Firstly, if the employee's responses are not reported per pre/agreed scheduled due dates for the input form, a notification of the non-completed form will be transmitted to the non-respondent's supervisor (which is an incentive for an estimator to complete and submit them).

4. Multidimensional data analysis

One of the key objectives of an ABC/ABM system is to provide managers and employees with knowledge about their organization's economic and cost structure and to stimulate them to ask profound questions about the cost behavior of their organization. ABC/ABM is a focusing method providing cost transparency and visibility. As organizations put more emphasis on learning and discovery, managers and employees will be encouraged to explore more unanswered questions than through traditional and standard reports. Standard reports do not provide answers quickly enough. Most managers and employees are impatient when it comes to discover and learn – they want immediate answers and do not want to wait for the next reporting period. Luckily for them, the union between an ABC modeling system and multidimensional exploration software provides immediate answers.

Multidimensional analysis allows visualization of the same costs by multiple categories such as: products, customers, distribution channels (e.g. wholesale, retail), sales regions, sales types (e.g. promotion, standard, special), etc. Multidimensional reporting enables end users to separate, mix, sort, forecast, pivot and sum up data on organizational and the ABC model's structure's categories. It can perform calculations instantaneously. One of the ideal applications of the ABC system is the cause-effect analysis of profit (or loss). For example, which customers are more or less profitable – and why?

Commercial ABC/ABM software includes a multidimensionality feature that turns a day's effort of analysis into minutes for the employees accustomed to work with standard reports for end of month. This allows them to interactively explore and analyze the organization's costs at the enterprise level and at the cost driver level. For the first time, managers can really understand what it means to really run a business.

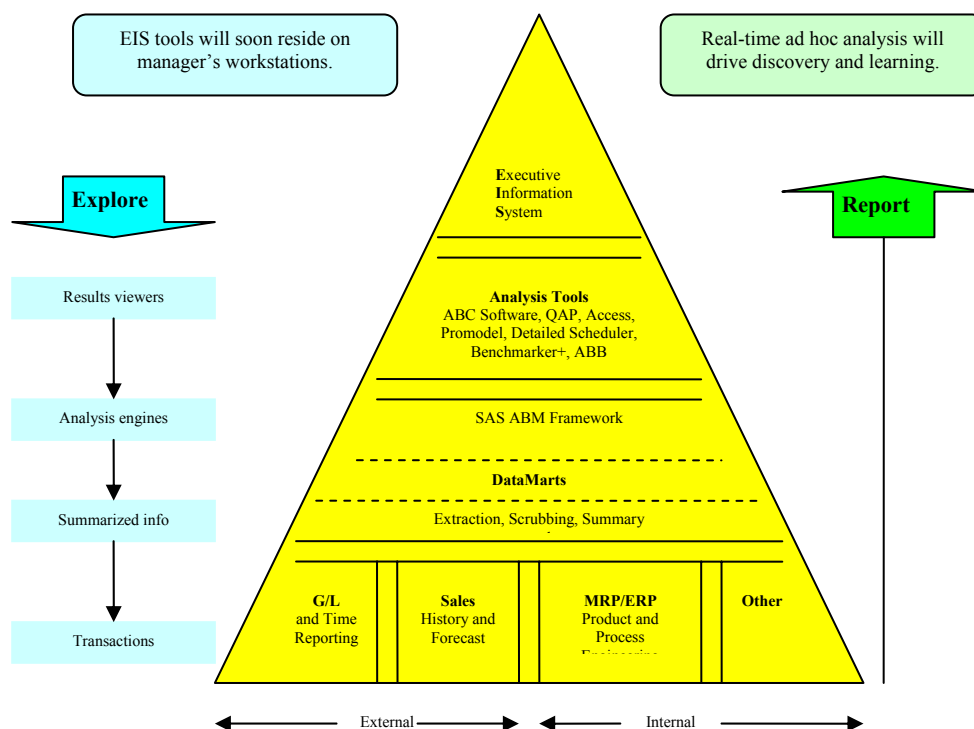


Figure 5. Multidimensional ABC system

Figure 5 shows a pyramid of software tools with the source data at the base. In the Information Age, the employees will use analytical tools and executive information systems (EIS) to analyze data. The ABC/ABM system is a modeling tool, not a complete solution. Its information brings visibility to problems and their symptoms for which solutions can be derived, researched, and implemented. Software like On-Line Analytical Processing (OLAP) for query and drill-down reporting is an essential tool in the tool box, along with other tools like regression and correlation analysis.

In the future, as ABC/ABM software is designed for the casual user, analysis for the business will expand from dedicated analysts to all managers and employees with computer workstations and laptops in the network. Instead of the few analysts who spend their time analyzing and trying to communicate conclusions, managers and employee teams will spend a part of their time browsing and analyzing data using multidimensional software. They will navigate intuitively with the ABC data system that matches their mental model in the chain of activities and costs flow through the internal and external supply chain buildup. Proficiency with OLAP will be common.

5. Advantages and disadvantages of the ABC/ABM system

The ABC/ABM system helps managers to properly manage the indirect costs (by activity) and to understand the profitability of products, channels and customers. It therefore provides a powerful tool for making decisions.

Advantages of implementing the ABC/ABM system include:

- Correct determination of costs associated with products, services, customers, distribution channels, etc;
- A better determination and understanding of the activity costs behavior;
- Allows cost calculation of processes, and supply and value chain flows;
- It integrates well with other programs providing continuous improvement;
- It makes visible non-value and low-value added activities;
- It supports the performance management dashboards and balanced scorecards;
- It facilitates benchmarking by assuring comparability.

Disadvantages of the ABC/ABM system include:

- Implementing an ABC/ABM system is a project that initially requires some dedicated resources. Once implemented, such a system must be maintained, and its model's cost assignment structure will need

revisions. Source input data (e.g., resource expenses, cost driver quantities or %) must be collected, verified, and entered into the system.

- Managers are still accustomed to use traditional systems that cost less to operate.
- Activity-Based Costing information can be easily misinterpreted and should be used with care when it is used for analysis and in making decisions. Before taking any significant decision using Activity Based Costing data, managers must identify which costs are truly relevant to those decisions.
- Reports generated by these systems are typically not in accordance with generally accepted accounting principles (GAAP). Therefore, an organization using ABC/ABM will have two cost systems – one for internal use and one for preparing external reports. For example, there will be two different costs for the same product, which can be confusing unless the employees are educated as to why a difference exists.

6. Conclusions

In conclusion, the objective of an ABC/ABM system is to provide knowledge to managers and employees, not just basic data. Standard reports usually do not provide answers, but ideally should lead to questions. Both standard reports and software programs are two-dimensional environments with limitations. The objective is to assist employees to shift from being reactionary to being active participants where they can intelligently create and shape the future of their organization. In conclusion, the ABC/ABM pilot system needs to become repeatable with credibility so that it can lead to operational improvements and better strategic decisions about rationalizing products, services, channels and customers. Having ABC/ABM reporting systems that communicate in monetary terms (e.g. Euros, dollars, lei), the language of business, will serve to operationalize process-based thinking.

Notes

⁽¹⁾ The CAM-I Glossary of Activity-Based Management, version 3.0, edited by Paul A. Dierks and Gary Cokins, (Bedford: CAM-I, 2000).

⁽²⁾ Idem.

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Consequences of the Budget Deficit in the Current Crisis in Romania. Implications on the Labor Market*

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Abstract. *In the current economic activity conditions, in which the need of financial resources is usually higher than the existing funds, the elaborations of budgets at any level is one of the primary issues, particularly as regards the principle of budgetary balance.*

Approaches regarding sizing budgets deficits, means of financing and particularly sizing public debt get a series of touches of precise nature for different economies. Actual economic, financial, social and administrative conditions put up a series of problems which impose an extremely serious approach of the potential adverse impact by sizing of budget deficits and public debt over the real possibilities of non-inflationary financing.

In Romania, in the highly complex framework in which the economic activity takes place, in the attempt to show the place held by the budget deficit, a special role is assigned to determine the share of public financial deficit in the consolidated budget revenue and expenditure.

Currently, knowledge and concern for reducing the budget deficit are still of great importance, especially as Romania is facing great difficulties in economic development.

Amid deepening structural crisis phenomena, increasing budget deficits financed over a non-inflationary limits comes as an additional factor that contributes to imbalances of the economy. In addition, where

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

budgetary expenditures are targeted to satisfy, primary, the redistribution function and to state subsidies, because of the lack of a real multiplier coefficient, the state budget deficit worsens.

Influences such as introducing economic disturbance in the mechanisms which cause them to increase budget deficits can be summarized and grouped into two broad categories: economic influences and psychological influences.

Regarding economic influences, we can say that they act strongly and strictly determined by how meanings used to cover budget deficit. The modalities used are subject to an analysis by direct or indirect influence on the mechanisms that generate economic stability and economic development effort.

For example, on the short-term, the budget deficit reduces the national saving, leads to decreased supply of market funds, which increases the interest rates. In this context, the volume of investment decreases, the consumption is reduced, affecting the volume of economic activities and employment.

The psychological influences combined with the economic boost caused by budget deficits act directly on financial markets, leading to falling down the values of capital markets and the depreciation of the currencies sometimes sudden for the national currency. Even if the depreciation of the exchange rate is often a method used to equilibrate the commercial balance, an uncontrolled amplification of budgetary deficits can sometimes lead to monetary depreciation. These, over a certain level, can neutralize the benefits obtained in the external plan by strong worsening of the internal imbalances, mainly through the increased inflationary pressures in the economy.

So, in current circumstances, when you want to identify and encourage those branches and sub-branches of national economy which can be developed in the global economy, one of the basic decisions regarding the interpretation of economic processes is the adoption of a dynamic and creative concept which considers both requirements to use the fiscal levers in economic development policy and the possibility of modifying the structure of budgetary revenues and expenses.

Keywords: budget deficit; economic and financial crisis; fiscal levels; deficit financing; labor market.

JEL Codes: E62, H6, J21.

REL Codes: 8K, 13F, 8G.

Approaches regarding the sizing on budget deficits, the means of finance and especially the size of public debt have a series of specificity colors for different economies, especially in the current economic downturn. The globalization allows the liberalization of capital flows, of the investment, trade and labor ones, in the context of the intensified international competition. This makes economic developments in one country to influence and be influenced by economic developments in other countries. Thus, the effects propagated by the current crisis in various economic sectors affects the confidence in the financial system, in the market mechanisms, leading to the installation of uncertainty about the future in the economy. All these may lead to widening the budget deficit, which requires the identification of new opportunities for the income structure and budget expenditure.

The current global economic crisis has important consequences regarding the relevance of the economic theories. This crisis involves giving up the paradigms of modernity obsessed by immediate efficiency, by the immediate financial gain and requires a review of the economic theories and processes (Dinu, 2010, p. 267).

According to the dictionary of economics the budget deficit is a negative balance of the public budget between the received income and the expenditures made by the end of the budget execution (The Staff of the Department of Economics and Economic Policy, 2001, p. 155). The deficit which is based on the difference between the total public expenditure incurred by payments through transfers and the ones for purchase of goods and public services and the amount of tax income is considered the primary deficit.

If to the primary deficit there are added the interest payments on the state loan, noted in the budgeted as public expenditure, there is obtained the total deficit.

Causes and consequences of the budget deficit

The budget deficit has now become a common phenomenon in many countries, on the background of the public expenses amplification. In Romania, the budget deficit has been lately one of the most difficult problems faced by the economic policy.

In the present circumstances of economic activity, where the financial need is greater than the available funds, the budget elaboration at all levels is one of the primary issues, in particular in keeping the principle of budget balance. In most cases, the budget balance is not achieved automatically through covering the budgetary expenses with the income expenses. In this case we can say that the budget is elaborated with the financing deficit.

When the state budget is related to an economy that ensures full use of labor, we can speak about the cyclically adjusted budget, which represents the surplus or deficit that will exist if the economy ensures the full use of labor meaning that if the national income equals with the potential national income.

The total deficit recorded in one year may be divided into two parts:

- structural deficit, which occurs when the cyclically adjusted budget is in deficit;
- cyclical deficit, which is the total budgetary deficit minus the structural deficit.

The existence of the budget deficit is due to several causes, such as: decreased production of goods and services in the economy, increased spending in order to achieve certain social programs, increasing the invisible sector activity of the economy; the increase of marginal costs of the social production, the of excessive monetary emission and which is not accompanied by economic growth. On the other hand, the budgetary income and expenditure levels are also affected by the business cycle stage. When the economy is contracting, the budget is heading towards the deficit as a result of reducing the amount of the collected income.

Regarding the acceptance or otherwise of the concept that the budget deficit is “harmful” to the economic and social life, there are some controversies over time which have varied significantly.

Basically, over time, economists' views on the effects of the budget deficits on the economic performance of a state were related to two main approaches. On the other hand, it was considered that the deficits resulting from the reduction in marginal rates of the tax have an incentive effect on the labor productivity. On the other hand, the budget deficits have been considered a cause of the economic stagnation and its instability (Romer, 1988, p. 63).

Amid the worsening economic imbalances, the proponents of the state intervention in the economic adjustment mechanisms, in particular by using an increased volume of public spending, have proposed a number of approaches which are mainly a redefinition of the concept of balanced budget and they are trying to propose a number of theories on the role of the budget deficits to stimulate the economic growth processes. Thus, even in theory and in practice, it was proposed the subordination of the financial balance in favor to the general economic equilibrium, considering that the financial balance is just one component of the latter. From this general idea the theory appeared, first formulated by William Beveridge, and called “systematic deficit theory” according to which it can be reached the overall economic balance through the budget deficit.

The theory of systematic deficit is likely to lead to a balanced economic growth, but in practice it is limited, on the one hand, by the borrowing capacity of the state, and, on the other hand, by the efficiency use of the state, on economic principles, of resources. In addition, based on the principle that the private economic decision is better than the administrative decision (for investment), it results that a fiscal policy focused on reducing the level of taxes (with favorable effects in stimulating the consumption and private investment) must be accompanied by the reduction of the volume of expenditure (mainly the function of the redistribution of subsidies) and not by their increase.

The increasingly use of budgetary levers as a means of intervention in the economy, as well as the difficulties in the annual balancing of the state budget have led to the idea that the budget should not be balanced every year, but only on one economic cycle. Because the surpluses from the favorable times are going to cover the deficits in unfavorable times, the proponents of these approaches consider the budget deficits as a means to achieve the economic balance and to revive the development process.

The tax policies proposed by the Chicago school monetarists, primarily by the American professor Milton Friedman, who focused on reducing the tax in parallel with the reduction in public expenditure aiming at the liberation of the private initiative and at the reshaping of the state's role in the economy, were applied successfully in some developed countries in the early 80s or in other countries with less developed economies in the 90s.

If there are some economies in recession, with structural problems and which must confront in parallel some seemingly contradictory aspects, such as the relative shortage of real resources in the economy – the societal mentality focused on the existence of some extensive protection systems – the sizing problem of budget deficits and of public debt is very strongly addressed and falls in a very limited budget range of options.

The sizing of budget deficits and of public debt is part of the overall budget strategy, which in very restrictive economic conditions should meet a basic choice, meaning the one for the economic development, but also to take into account the possibility of inflationary financing of government deficits.

The sustainability of the fiscal and budgetary policies is an issue extensively discussed in the specialized literature and the public decision-making process. The arguments that come to support this claim are numerous. On the one hand, it is considered that ensuring the sustainable development requires, simultaneously, economic, social development and environmental protection, and the fiscal and budgetary policies, due to their redistributive character, influence the sustainable development by the manifested effects on the economic growth or on the investment in human capital

(Gupta, Keen, Clements, Fletcher, Mani, 2002, p. 1). Other economists highlight the importance of the sustainability of the fiscal and budgetary policies in achieving the economic growth and also the importance of the existence of some budgetary constraints which ensure long term sustainability. On the other hand, the international bodies such as the International Monetary Fund (IMF) or The Organization for Economic Cooperation and Development (OECD) have paid attention to these issues, as well to analyzing methods and monitoring of the sustainability of fiscal and budgetary policies or of public debt as the industrialized countries are increasingly confronted with difficulties more and more generated by increasing levels of debt (Horne, 1991, pp. 1-5). However, the problem of unsustainable or excessive indebtedness has not been fully resolved. In most Member States of the European Union the aspects about the sustainability of public finances are already formed by priority public policy. This is because the debt policy is quite costly in terms of the interest expenditure and of the reallocation of public funds between different categories of expenditure. Moreover, in the current context it is required a reform of welfare state since the majority of EU countries are facing the aging population and rising unemployment problem, which requires the development of social programs (Raffelhüschén, 1999, pp. 167-170).

The approaches on the budget deficit sizing, on the means of finance and especially on the size of public debt become specific for different economies. The concrete conditions existent from an economic, financial, social, administrative point of view raise some problems that require a very serious approach of the potential negative impact of a sizing of budget deficits and of public debt over the real possibilities of non-inflationary financing.

In Romania, in the quite complex field in which the economic activity takes place, in an attempt to highlight the place held by the budget deficit, a special role is assigned to the determination of the share of public financial deficit in the expenditure and income of the general consolidated budget.

The general consolidated budget is an instrument of the budgetary and fiscal policy by which are related not only the income and expenditure of the state budget (the central budget and local budgets), but also their connections, especially the budget deficit, with the scanty sold of the current account of the payment balance, with the gap between investment and savings.

Currently, knowing the budget deficit and the concern for its reducing are still of great importance for Romania, especially since our country is facing great difficulties in the economic development. On the other hand, as a member of the European Union, Romania must comply with the condition imposed by the European Community Treaty on limiting the budget deficit to 3% of the Gross Domestic Product (GDP) and the public debt to 60% of GDP by 2010.

The analysis of some statistical data regarding Romania's budget deficit

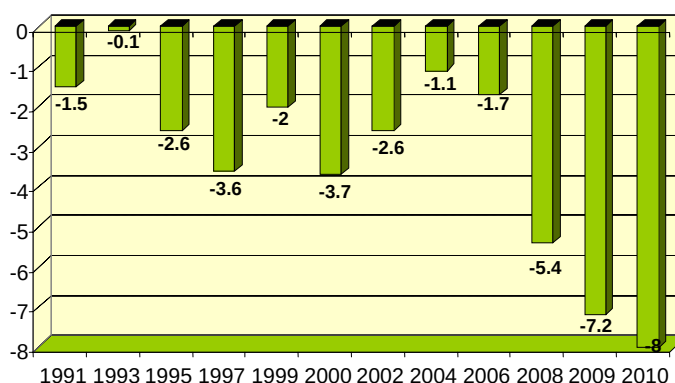
Next, we present some statistical data on the budget deficit development and on its share in GDP in 1991-2010, and also the structure of the general consolidated budget, in 2008-2010. The level and evolution of the consolidated general budget deficit as a share in GDP are presented in the table and chart below:

Table 1

The evolution of the consolidated general budget (% of GDP), in 1991-2010

Year	1991	1993	1995	1997	1999	2000	2002	2004	2006	2008	2009	2010
Consolidated general budget deficit	-1.5	-0.1	-2.6	-3.6	-2	-3.7	-2.6	-1.1	-1.7	-5.4	-7.2	-8

Source: BNR reports and data supplied by the Ministry of Public Finance.

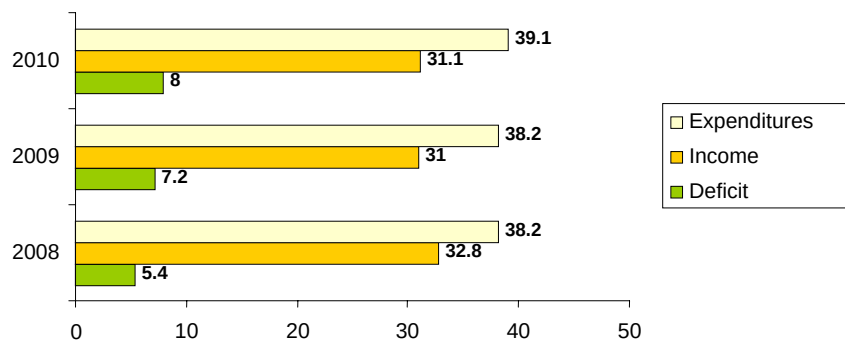


Source: Graphic based on the data presented in the Table 1.

Figure 1. *The consolidated general budget (% of GDP), in 1991-2010*

According to the chart above, it is shown that the level of the consolidated general deficit fluctuated from -1.5 % GDP, in 1991, to -5.4% GDP, in 2008, reaching -7.2% in 2009. In general, the evolution of the consolidated general budget deficit highlights its appearance on an upward path. In recent years, this increasing trend of the budget deficit has been influenced by the increased capital expenditures necessary for the projects initiated by the government, particularly by the increase of the expenditures on goods and services at the expense of the investment expenditure, due to the capacity reduction of funding by income from direct foreign investment, especially amid the current financial and economic crisis.

Regarding the structure of the consolidated budget in 2008-2010, there is an increase in the share of expenditure amid the cutbacks of the budget income.



Source: BNR reports and data provided by the Ministry of Finance.

Figure 2. Consolidated budget structure (% of GDP) in 2008-2010

The level of the consolidated general deficit of Romania increased significantly in 2008-2010 from 5.4% of GDP in 2008, 7.2% of GDP in 2009 to 8% in 2010. Among the reasons that were behind this, we mention: the economic production decrease, excessive expenses in carrying out some social programs, the black economy increase, the budget income decrease amid the economic crisis, institutional factors (budgetary procedures and laws, bureaucracy), and political instability.

The budget deficit implications on the labor market

In the specialized literature there are several opinions according to which the budget deficit impact on the economy can be analyzed. On the one hand, there are taken into consideration the short term effects on consumption and long-term effects on national savings and investments, on job creation. On the other hand, there is highlighted the long-term neutrality hypothesis of the budget deficit by financing it on account of the contracted public debt. Thus, the budget deficit is, on the one hand, a result of the reduced economic activity volume, which leads to a lower income for all the people, which means a decrease in the tax base and thus a decrease in the budget income. On the other hand, a high budget deficit may mean reducing the government investment, with impact on the jobs and on the government spending policies in the employment field. By the measures that are intended to finance the budget deficit, such as the increased taxation, reduced budget spending, increasing

public debt, we can highlight the impact on the labor market in the short and long term.

Thus, on the short-term, the budget deficit reduces the national saving, leads to decreased supply of market funds, which increases the interest rates. In this context, the volume of investment decreases, the consumption is reduced, affecting the volume of economic activities and employment.

The number of registered unemployment in 2008-2010 shows a decline of the economic activity volume, which has implications on the income and budget expenditures. The number of unemployed has reached at the end of 2009 to 709.4 thousand persons, with 306 thousand more people than at the end of 2008 the unemployment rate being of 7.8%. A higher number of unemployed is, on the one hand, less revenue to the budget, and on the other hand, higher spending with social protection and assistance.

Table 2

The evolution of the number of employees and unemployed in 2008-2012

Year	2008	2009	2010	2012
Number of employees (thousand of persons)	5,046.3	4,774.3	4,665	4,735
- Annual percentage change (%)	3.3	- 5.4	- 2.3	1
Unemployed at the end of the year (thousand of persons)	403.4	709.4	760	690
Unemployment rate (%)	4.4	7.8	8.5	7.6

Source: The National Institute of Statistics (2008, 2009), The National Commission for Prognosis (2010, 2012).

According to data from the National Institute of Statistics and the National Commission for Prognosis, in the following period there is expected a slightly increase in the number of employees, and therefore a reduction in unemployment rate amid the expectations for the economic recovery.

The long-term effects of the budget deficits are analyzed in terms of how they affect the economic growth and the welfare of the individuals (Ball, Mankiw, 1995, pp. 10-12).

Given that the production is determined by the existing production capacity which, in turn, is influenced by the capital stock, provided that the increase of the budget deficits generates the decrease of the investment, the capital stock will grow at a slower pace. If this situation perpetuates for a longer time, the economic capacity to produce goods and services will decrease substantially. Also, the increasing of financial asset flows to foreign investors, as a result of increased budget deficits, also determines, however, the

expatriation of an important part of the national income as interest, profit or rent.

Moreover, when the budget deficits determine the reduction of the capital stock, the marginal productivity of labor declines, because each employee has less work, while the marginal productivity of the capital increases due to its rarity. Therefore, such a situation will lead to lower real wages and will increase the profit rate.

Another channel through which the budget deficits affect the economy on the long-term is taxation. In fact, the problem starts with choosing the best method of financing the deficit. The financing through public debt will generate, in the future, additional taxes which will affect the taxpayers, directly, by reducing the available income, and, indirectly, through loss of utility generated by taxes distorting the economic activity. Also, unless taxes increase it can proceed to the reduction of government spending, but then there will be problems establishing those categories of expenditure that will be “sacrificed”.

One of the largest categories of government spending, with direct link to labor market development, is social security contributions (pension expenditure). The social insurance budget records since 2006 annual deficit, in 2009 reaching the highest deficit, about EUR 1.5 billion. The annual pension costs constituting the largest category of government spending, their share in GDP is 8%, with a growing trend in the coming years.

These increases of expenditures with pensions are determined primarily by the aging of the population and by the reduction of the active population. Forecasts show that in 2050, at 100 active citizens, there will be 149 inactive citizens, and the population over 65 years old will exceed 5 million inhabitants, compared to 3 million, as it is currently, the long-term effects being the labor decrease and insufficient economic resources necessary to support the elderly.

The most important issue of the social security about this trend refers to the ratio of people productively employed and the retired persons. The number of employees begins to decline in comparison to the number of retired persons, with serious consequences for the social security.

For Romania, such a social security report, with less than one active person to a retired one, shows that we are in a profound crisis of the social security which does not have the solution in pension reform, even if it may be necessary, but by the redoing the ratio between the employed people and the retired ones by direct and strong stimulation of job growth, particularly in the private business sector, through a series of policies that promote investment, without causing major inflationary phenomena. If we consider that in the near future the increased investment will be organically linked to the Cosmo-technique technologies that create fewer jobs, maybe such an

employees/pensioners report will be judged in qualitative terms, by the quality of labor productivity.

One way to overcome the problem of public financing of the pension system and of unemployment benefit programs is supported by the economists Orio Giarini and Mircea Malița, by supporting the voucher system and implementing a private public partnership for managing the labor and education system through punctual investments in knowledge creation, during the entire life (Giarini, Malița, 2005, pp. 144-145).

To improve the employment situation in our country, with significant effects on the budget income, we must correlate the objectives of any employment policy with the ones of the macroeconomic policy, in line with The New European Strategy called “Europe 2020: An European strategy for smart growth, sustainable and favorable for inclusion”. This strategy with a new horizon of ten years aims to create more jobs and to ensure better living conditions.

The objective of increasing the employment rate in Romania is influenced, mainly, by: the favorable development of economy, the increasing of education level and by the expanding access to forms of lifelong learning, by ensuring some effective transition into the labor market, especially by implementing the active employment measures, ensuring the access to benefits and social services in a way that does not reduce the attractiveness of working.

Measures of financing the budget deficit in Romania

The influences that are causing the increase in budget deficits can be summarized and grouped for a better understanding of the phenomenon into two broad categories: economic and psychological influences.

The psychological influences combined with the economic ones act directly on the financial markets, leading to loss of values on the capital markets and to depreciations, sometimes sudden currencies. Although certain exchange rate depreciation is a method often used to equilibrate the trade balance, an uncontrolled amplification of the budget deficits can sometimes lead to currency depreciation. They, over a certain level, neutralize the gains obtained on an external level by strong worsening of the internal imbalances, especially by highlighting the inflationary pressures in the economy.

Regarding the economic influences, we can say that they also act strongly about senses strictly determined by the used ways to cover the budget deficit. The modalities used are subject to an analysis, by the direct or indirect influence that is generated on the economic mechanisms and on the economic stability.

The problem of budget deficit financing, of choosing the best finance option is the subject of much debate among economists. In this regard, in the specialized literature we find the following ways to finance the deficits: tax increase financing, financing by reducing the budget spending, financing by issuing currency and financing by public debt.

This presentation of modalities of financing does not also represent a hierarchy of the “best” alternatives in terms of a cost-benefit analysis. Each of these variants is characterized by the advantages and disadvantages depending on the economic background in which they are used.

Thus, the financing method of the budget deficit by increasing tax translates into increasing the amount of taxes to reduce the budgetary imbalances. Due to influences, in general negative, in the economic activity, in almost all cases an increase in taxation, by the direct effect of defalcation of financial resources from the private economic decision for investment or consumption to the redistributive state consumption leads to a weakening of the development effort, by weakening the ability to invest and reduce the solvable demand of intermediate and ultimate consumers, with an unfavorable effect on the market supply-demand ratio.

The funding of excessive budget deficits by reducing the public expenditure may be an appropriate solution; however, it is effective only in the short term. Practicing a restrictive budgetary policy, at least by reducing the government consumption can have positive results on the public financial balance. Promoting such long-term policies will be followed, surely, by negative consequences that will affect the economic growth. The problem arising when promoting a restrictive budgetary policy refers to the categories of budget expenditure that will be reduced.

In this context, there may be difficulties related, on the one hand, to the social impact of such a policy and, on the other hand, to the discussions that will be held at government level between its ministries, in which each representative will try to protect the interests they represent.

A restrictive budget policy can be implemented in crisis situations, when countries face with excessive public deficits which usually lead to higher inflation, to exchange rate fluctuations and which affect the whole economic system. In such cases, it must be followed the rationalization of public expenditure by reducing the unproductive spending and increasing the spending for investment in infrastructure and in human capital (Lenain, 2000, p. 139).

Amid the deepening of some structural crisis phenomena, the increase of budget deficits over the financeable limits in a non-inflationary manner comes as an additional factor that contributes to significant imbalances in the economy. In addition, where budgetary expenditures are directed towards the

satisfaction of, first, the redistribution function of the state and for grants, in the absence of a real multiplier coefficient, the state budget deficit worsens.

Another method used to cover budget deficits, which may have profound negative impact on the correlations in the financial and real economy, is the additional issuance, uncovered, by the national currency. This will only lead to an uncontrolled and unwarranted increase in money supply, immediately aggravating the inflationary phenomena in the economy.

If the public power can not adjust the public expenditure at the income levels or if by making such expenditures it is desired the achievement of better results in employment field, there arises the problem of financing the budget deficit, which can be done either by issuing currency or by state loans.

The process of monetization of the budget deficit is clearly inflationist until the economy is heading towards a new long-term equilibrium, with a high price level. If the government decides to maintain this policy for a longer period it will result in a corresponding increase in money supply, i.e. a continuation of inflation.

The eloquent example regarding the deficit monetization is represented by Mexico, which in the 80s promoted a policy by which the monetary base increased by 80-90% per year, resulting in an inflation increase of 100-130% per year in that period.

Deficit financing by public debt requires resorting to internal or international market loans (Dornbusch, Fischer, 1997, p. 451) to cover the budget deficit.

If we analyze the problem of using loans by the state to finance the budget deficit it can be considered that the primary element that must support the decision consists of the need that the "profit" made on medium and long term by funding the public expenditure to be large enough to cover the debt service. It should also be covered the loss of utility that the market supports by depriving it of the resources used to cover the deficit, and the public policy decision-makers must maintain their credibility after the use of state loan.

By the state loan, the government meets its short-term deficit without any tax increase but, because there must be paid the interest on debt, it may be observed that a large part of the future tax income will be used for service debt and not to finance future public goods and services.

In Romania, the financing of the budget deficit was achieved mostly by contracting state loans, both from the resources of external and internal origin, meaning by internal and external market loans and by the temporary support from the general account of the State Treasury. On the internal market, the resource suppliers to finance the budget deficit are the banking and non-banking sector, and also the population, by subscribing to the state bonds issues, such as

Treasury certificates, state bonds in RON or foreign currency, issued by the Ministry of Public Finance.

The state loans in the external market are represented by: foreign government loans and Treasury bonds with foreign currency interest.

The effective Romanian authorities conduct to budget deficit was contradictory and did not follow strictly the law, either when it was restricted, or when it became lax.

The formation of the unique State Treasury account with the National Bank since July 1993 paved the way for non-inflationary financing of the budget deficit.

However, the financing of the budget deficit by loans from the temporary availability of the General Account of the Treasury, even in the short term, has the advantage of low cost, in the long term has significant disadvantages which consist of increasing liquidity and refinancing risk, with negative impact on the management of public debt, especially when volatility is high.

Unfortunately, while Romania's economy is facing economic depression, it is found in the government decisions making that there have not been taken the necessary steps to apply a policy of boosting investment in order to revive the economic development. Furthermore, we are witnessing a process that is particularly worrying: the aggregate consumption systematically exceeds the aggregate production.

On the other hand, Romania has had a pro-cyclical fiscal policy based on unrealistic estimates of income and on public spending increases which have led to the accumulation of significant macro-economic imbalances manifested by a current account deficit and high inflation rate.

The budget income has been over-estimated, and the expenses realized beyond the available resources were not channeled towards productive activities, being geared mainly towards staff costs and expenditure on goods and services.

If this trend continues, there is an imminent danger for Romania to sink more and more into poverty and under-development, to get further away from civilization. The responsible government should be the first to notice this and take the necessary measures. To ignore the financial policy measures to stimulate the investment process is to disregard the current fundamental requirement of the revival of the economic development.

Regarding the external debt, it is clear that if at the beginning of 1990 it was almost fully repaid ahead of schedule, over time it has grown very rapidly.

Table 3

External vulnerability indicators in Romania (%)

Indicators /Years	2002	2003	2004	2005	2006	2007	2008
External Debt (% of GDP)	33.4	33.9	35.4	39.1	42.1	47.5	49.1
External Debt (% of exports)	94.7	97.5	98.4	117.8	131	155.7	159.1
External debt service (%of GDP)	8.8	7.2	8.2	17.1	20.3	21.5	19.9
External debt service (% of exports)	24.8	20.8	22.8	51.5	63	70.3	64.4

Observation: for 2008 - data corresponding to quarter I

Source: Data processed from the work Current account deficit 2009, National Bank of Romania Conference.

It can be seen that the foreign debt, as a percentage of GDP, registered a continuous growth throughout the analyzed period. The coverage of the external debt and its service both through exports and international reserves has deteriorated quite rapidly, leading to a continuous deterioration in recent years, of the indicators of vulnerability.

Amid the emergence of some problems in the functioning of economic mechanisms in general, the sizing of the volume of public debt (both internal and external) is essential to determine its influence on the overall economic correlations. Increasing the volume of public debt over a certain threshold determined by the economic affordability for short, medium and long term has an important contribution to the worsening of the economic imbalances, with negative impacts on both the financial economy and the real economy.

It is clear that the failures that occurred and take place in the national economy in the context of its restructuring affected, in turn, the very implementation of the budget. The budget deficit is unquestionably caused by the hardship that many businesses have during the crisis; most of them incurred losses, which were reflected in the dynamics of budget income.

In this context, the efficiency of the fiscal policy implies that, along with increasing state income, the social justice to be ensured.

At present, when Romania is trying to define its role and its place in the world, when it is wanted the identification and encouragement of those branches and sub-branches of the national economy which can be developed in the global economy, it is required the use of some tax boosts in line with EU requirements and taking account of the other macro-economic policies that can be adopted to overcome the current economic situation. Thus it is consecrated the theory that in times of crisis it is desirable to be ensured an increase in

budget expenditures which aim at a revival of the economic activity, to help increase employment and reduce unemployment.

The economic growth pattern must be reconsidered, given the experience of the past years, where the growth in our country was based on consumption, which did not allowed to achieve sustainable economic growth and should target investment in sectors with high added value.

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Portfolio Risk Analysis using ARCH and GARCH Models in the Context of the Global Financial Crisis*

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Abstract. *This paper examines both the benefits of choosing an internationally diversified portfolio and the evolution of the portfolio risk in the context of the current global financial crisis. The portfolio is comprised of three benchmark indexes from Romania, UK and USA. Study results show that on the background of a global economic climate eroded strongly by the effects of the current financial crisis, international diversification does not reduce risk. Moreover, using ARCH and GARCH models shows that the evolution of portfolio volatility is influenced by the effects of the current global financial crisis.*

Keywords: global financial crisis; diversification; volatility; ARCH model; GARCH model.

JEL Code: G01.

REL Code: 11B.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

1. Introduction

The sub-prime credit problem that started in the United States during 2007 affected the financial sector in other countries, especially Europe. Deterioration of this sector led to the collapse of national financial systems in different parts of the world, the result being a severe global financial crisis. The magnitude of the recent financial crisis is considered to have no precedent since the *Great Depression*, the International Monetary Fund (IMF) referring to this global recession as “*The Great Recession*”. A study developed by the IMF in 2009 stated that the recent financial crisis has “*revealed important flaws in the current global architecture*”. The IMF managing Director, Dominique Strauss-Kahn, has underlined, in May 2009, the necessity of a “*new global framework*” that can ensure a better coordination of national policies (Moshirian, 2010, pp. 5-6). Thus, any national policy must be strongly related with global policies in order to avoid another global financial crisis. However, not few have been those that questioned if a global financial system is desirable. In order to clarify this debate we must first understand the role of the financial system for the economy. The financial system represents the link between investors and private or public entities. Through this system the economy grows, the consumers also grow their capacity to consume, risks are shared and individuals confront with a smaller volatility on the market. All these correlations extend to the level of the global financial system, a system that works as a powerful and efficient mechanism when the economy is characterized by stability. Whereas the potential of the financial system certainly exists, words like *moral hazard* or *adverse selection* remind us that the economic theory has identified the reasons why financial markets do not always work perfectly, the failure of one or more markets generating losses for the other ones under the conditions of a global financial system. The recent financial crisis, as well as past episodes, teaches us very clearly that the capital flows guided by financial markets can represent something very different from an efficient and optimal allocation of savings towards the right investment projects. Increasing interconnections of financial institutions and markets lead to highly correlated financial risks, liquidity pressures and depletion of bank capital. Although the recent crisis originated in the United States, due to a highly integrated global economy, the financial markets around the world collapsed and the use of sophisticated financial instruments along with massive international capital flows facilitated its rapid spread across markets and borders (Claessens, Kose, Terrones, 2010).

Modern portfolio theory relies on the study developed by Markowitz (1952). Rubinstein (2002) appreciated that Markowitz’s research represents the first mathematical formalization of the diversification concept of investments,

emphasizing the fact that even though diversification reduces risk, it can not eliminate it completely. So, through diversification risk can be reduced without having any effects on the portfolio expected return. Thus, sub-perfectly correlated securities represent the “*right candidates*” to be included in a portfolio. Solnik (1974), among others, extended the initial CAPM (Capital Asset Pricing Model) and suggested that international diversification leads to better results than domestic diversification. However, financial integration leads to a significant correlation of security returns, the benefits of international diversification being greatly reduced (Aloui, 2010).

Taking all these aspects into consideration, the present paper aims to analyze the evolution of the risk of an internationally diversified portfolio in the context of the current financial crisis. The remainder of the paper is organized as follows: Section 2 presents theoretical aspects related to the volatility measurement of financial time series using ARCH and GARCH models; in Section 3 we report the empirical results of our study and in Section 4 we provide a summary of our conclusions.

2. Measuring volatility in financial time series: the ARCH and GARCH models

Philip Fransens (1988) noted that in the case of financial time series “various sources of news and other exogenous economic events may have an impact on the time series pattern of asset prices. Given that news can lead to various interpretations, and also given that specific economic events like an oil crisis can last for some time, we often observe that large positive and large negative observations in financial time series tend to appear in clusters” (Gujarati, 2004, p. 856).

In practice, linear time series models are incapable to explain a number of important features common to financial data, such as:

- *Leptokurtosis* – the tendency for financial asset returns to have distributions that exhibit fat tails;
- *Volatility clustering* or *volatility pooling* – the tendency for volatility to appear in bunches on financial markets. Thus large returns (of either sign) are expected to follow large returns, and small returns (of either sign) to follow small returns. One of the explanations for this phenomenon, which seems to characterize financial return series, would be the fact that the information arrivals which drive price changes occur in bunches.
- *Leverage effects* – the tendency for volatility to rise more following a large price fall, rather than following a price rise of the same magnitude.

Campbell, Lo and MacKinlay (1997) defined a non-linear data generating process as one where the current value is related non-linearly to current and previous values of the error term:

$$y_t = f(e_t, e_{t-1}, e_{t-2}, \dots) \quad (1)$$

where e_t represents an independent and identically distributed (*iid*) error term, and f is a non-linear function. According to the three researchers, a more specific form of the non-linear model is given by the following equation:

$$y_t = g(e_{t-1}, e_{t-2}, \dots) + e_t \sigma^2(e_{t-1}, e_{t-2}, \dots) \quad (2)$$

where g is a function of past error terms, and σ^2 is the variance term. Campbell, Lo and MacKinlay characterize models with non-linear g as being non-linear in mean and those with non-linear σ^2 as being non-linear in variance. Models can be linear in mean and variance (the classic regression model, ARMA models) or linear in mean, but non-linear in variance (GARCH models) (Brooks, 2010, pp. 380). The most commonly used financial models to measure volatility are the non-linear ARCH and GARCH models.

2.1. The autoregressive conditional heteroscedasticity model (ARCH)

One of the fundamental hypotheses of the classical regression model is the *homoscedasticity* or the hypothesis of constant error variance: $\text{var}(e_t) = \sigma^2(e_t)$, where $e_t \sim N(0, \sigma^2)$. The opposite case is known as *heteroscedasticity*. In the case of financial time series it is unlikely that the variance of the errors will be constant over time and hence it is preferred to consider a model that does not assume constant variance and which can describe how the variance of the errors evolves. As we mentioned earlier another important feature of financial series is known as *volatility clustering* or *volatility pooling*. This characteristic shows that the current level of volatility tends to be positively correlated with its level during the immediately preceding periods. Using the ARCH model (Engle, 1982) represents one of the modalities through which a phenomenon of this nature can be parameterized. In order to understand how this model works, a definition of the conditional variance of a random variable e_t is necessary. Thus, the conditional variance of e_t , denoted σ_t^2 has the following form:

$$\sigma_t^2 = \text{var}(e_t / e_{t-1}, e_{t-2}, \dots) = E[(e_t - E(e_t))^2 / e_{t-1}, e_{t-2}, \dots] \quad (3)$$

Since $E(e_t) = 0$, equation (3) becomes:

$$\sigma_t^2 = \text{var}(e_t / e_{t-1}, e_{t-2}, \dots) = E[e_t^2 / e_{t-1}, e_{t-2}, \dots] \quad (4)$$

Equation (4) states that the conditional variance of a zero mean normally distributed random variable e_t is equal to the conditional expected value of the square of e_t . In the case of the ARCH model, the autocorrelation in volatility is modeled by:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \times e_{t-1}^2 \quad (5)$$

The above model is known as ARCH(1) and it shows that the conditional variance of the error term σ_t^2 , depends on the immediately previous value of the squared error. Equation (5) represents only a part of the model, since nothing has been specified about the conditional mean. Under the conditions of the ARCH model, the conditional mean equation (which describes how the dependent variable y_t varies over time) can take almost any form. One example of a full model would be the following one:

$$y_t = \beta_1 + \beta_2 \times x_{2t} + \beta_3 \times x_{3t} + \beta_4 \times x_{4t} + e_t \quad (6)$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \times e_{t-1}^2 \quad (7)$$

where $e_t \sim N(0, \sigma^2)$.

So the model given by equations (6)-(7) can be extended to the general case, where the error variance depends on q lags of squared errors, a model known as ARCH(q):

$$y_t = \beta_1 + \beta_2 \times x_{2t} + \beta_3 \times x_{3t} + \beta_4 \times x_{4t} + e_t \quad (8)$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \times e_{t-1}^2 + \alpha_2 \times e_{t-2}^2 + \dots + \alpha_q \times e_{t-q}^2 \quad (9)$$

where $e_t \sim N(0, \sigma^2)$.

Since σ_t^2 represents the conditional variance, its value must be strictly positive (a negative variance at any point in time is meaningless). So all the coefficients in the conditional variance equation must be positive: $\alpha_i \geq 0, (\forall i = 0, 1, 2, \dots, q)$. A natural extension of the ARCH(q) model is the GARCH model.

2.2. The generalized autoregressive conditional heteroscedastic model (GARCH)

The GARCH model has been developed independently by Bollerslev (1986) and Taylor (1986). This model allows the conditional variance to be dependent upon previous own lags, so that the simplest equation form of the conditional variance is:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \times e_{t-1}^2 + \beta \times \sigma_{t-1}^2 \quad (10)$$

This is a GARCH(1,1) model and the conditional variance can be interpreted as a weighted function of a long term average value (dependent on α_0), of the information related to the volatility during the previous period ($\alpha_1 \times e_{t-1}^2$) and of the variance during the previous period ($\beta \times \sigma_{t-1}^2$). The general form of the GARCH(q, p) model, where the conditional variance depends on q lags of the squared error and p lags of the conditional variance is:

$$\begin{aligned} \sigma_t^2 = & \alpha_0 + \alpha_1 \times e_{t-1}^2 + \alpha_2 \times e_{t-2}^2 + \dots + \alpha_q \times e_{t-q}^2 + \beta_1 \times \sigma_{t-1}^2 + \\ & + \beta_2 \times \sigma_{t-2}^2 + \dots + \beta_p \times \sigma_{t-p}^2 \end{aligned} \quad (11)$$

or

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^q \alpha_i \times e_{t-i}^2 + \sum_{j=1}^p \beta_j \times \sigma_{t-j}^2 \quad (12)$$

In academic literature a GARCH(1,1) model is considered to be sufficient in capturing the evolution of the volatility. A GARCH(1,1) model is equivalent to an ARCH(2) model and a GARCH(q, p) model is equivalent to an ARCH($q + p$) model (Gujarati, 2004, p. 862).

The unconditional variance of the error term e_t is constant and given by the following equation:

$$\text{var}(e_t) = \frac{\alpha_0}{1 - (\alpha_1 + \beta)} \quad (13)$$

as long as $\alpha_1 + \beta < 1$. For $\alpha_1 + \beta \geq 1$, the unconditional variance of the error e_t is not defined (non-stationarity in variance), and $\alpha_1 + \beta = 1$ represents Integrated GARCH or IGARCH (unit root in variance).

3. Empirical results

3.1. Data and descriptive statistics

We selected three benchmark indexes from 3 different countries, namely Romania (BET), UK (FTSE100) and USA (S&P500). We chose these indexes because according to the Pearson correlation coefficient the 3 analyzed markets are not perfectly correlated, representing thus the “*right candidates*” to be included in the portfolio (Table 1). However, Aloui (2010) underlined in a recent paper that this coefficient is not the best indicator for measuring market interdependence. He stated that this coefficient can not make a clear distinction between large and small returns, or between positive and negative returns. Moreover, the Pearson correlation estimate is constructed on the basis of the hypothesis of a linear association between the financial return series under consideration, whereas their linkages may well take non-linear causality forms. The solutions that can solve these problems are found in the transformations that can be applied to non-linear models (logarithms) or by using GARCH models. Thus, the study developed in this paper aims to analyze both the benefits of choosing an internationally diversified portfolio and the evolution of the portfolio risk in the context of the current global financial crisis.

Table 1

	BET	FTSE100	S&P500
BET	1.00	0.26	0.43
FTSE100	0.26	1.00	0.58
S&P500	0.43	0.58	1.00

We computed a database containing daily returns over the period January 4, 2005 to May 5, 2010, being registered 1,297 observations using the following formula:

$$r_{it} = \ln\left(\frac{p_{it}}{p_{it-1}}\right) \times 100\% \quad (14)$$

where r_{it} represents the continuously compounded return of security i at time t , p_{it} represents the price for security i at time t , $i = \overline{1, n}$ and $t = \overline{1, T}$ ($n = 3$ and $T = 1297$). We chose a 0.5 weight for the investment in the BET index, a 0.25 weight for the investment in the FTSE100 and a 0.25 weight for the investment in the S&P500, being preferred a passive strategy of portfolio management.

Table 2

Descriptive statistics for the daily index returns

	BET	FTSE100	S&P500	Portfolio
Min	-0.135461	-0.092646	-0.094695	-0.088843
Max	0.105645	0.093842	0.109572	0.087974
Mean	0.000011	0.000049	0.000080	-0.000003
Standard Deviation	0.021893	0.014304	0.015155	0.014761
Skewness	-0.665793	0.062484	-0.029192	-0.446707
Kurtosis	8.364870	11.03812	12.24093	9.151124
Jarque-Bera	1651.241 Prob. 0.000000	3492.551 Prob. 0.000000	4615.061 Prob. 0.000000	2087.874 Prob. 0.000000

The results show that the riskiest market is the national capital market, the less risky being the UK market. The portfolio risk is moderate in comparison to the risks registered on the markets. The biggest return is obtained in the case of the S&P500 index, the lowest one being obtained by the chosen portfolio. According to the skewness and kurtosis indexes, all data series are asymmetrical and exhibit excess kurtosis. The Jarque-Bera statistics are highly significant for all return series for a significance level of 1%, being confirmed the assumption that the series are not normally distributed.

In Figure 1 is illustrated the variation of the daily returns over the period January 4, 2005 to May 5, 2010. We can observe from the graphics that the returns were fairly stable over the period January 2005 to September 2008. After this date all return series manifested instability especially due to the effects of the global financial crisis. Moreover, we can observe that the series present two specific features of non-linear models (*volatility clustering* and *leverage*).

In order to analyze portfolio risk we first estimated a non-linear model with the capacity to capture the evolution of portfolio volatility over the specified time horizon, and the model most commonly used in financial applications of this nature is GARCH(1,1). Before estimating the model we had to detect any ARCH effects in the portfolio return series. Thus we performed the Engle (1982) test. We chose a number of five lags and using the “*least squares method and ARMA*” we estimated an ARMA(1,1) model in order to perform afterwards the heteroscedasticity test. According to the test results there are ARCH effects in the portfolio return series (Table 3).

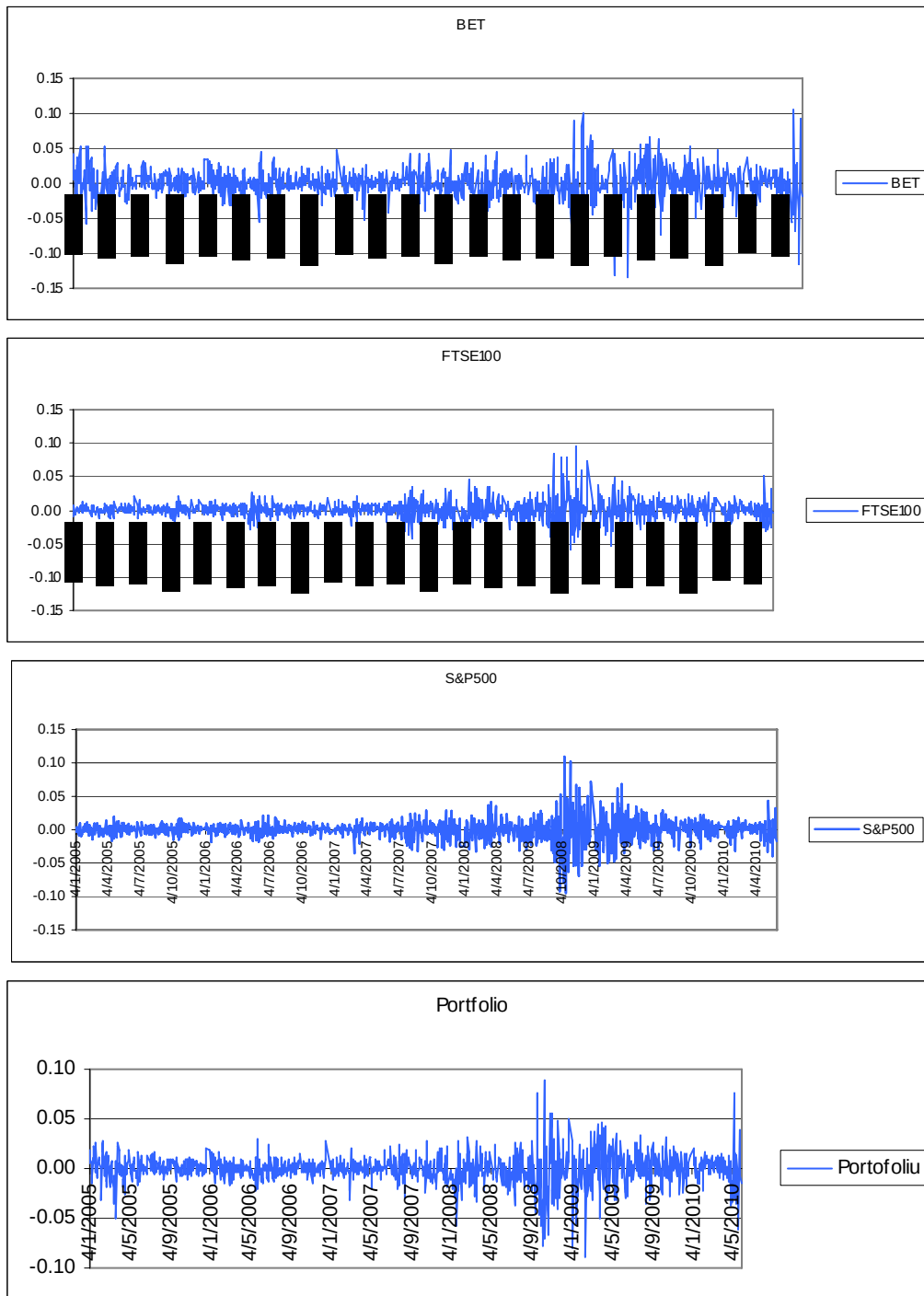


Figure 1

Table 3

Heteroskedasticity Test: ARCH			
F-statistic	49.01776	Prob. F(5,1285)	0.0000
Obs*R-squared	206.7917	Prob. Chi-Square(5)	0.0000

3.2. Estimation results

Using the “ARCH method” we estimated the GARCH(1,1) model (the results are shown in Table 4). The coefficients of the squared error and of the conditional variance are highly statistically significant (for a significance level of 1%, 5% and 10%). As expected, in a typical GARCH model for financial data the sum of the coefficients is close to 1. The coefficient of conditional variance is almost 0.9 and this implies that the shocks to the conditional variance are persistent and that large changes in the conditional variance are followed by other large changes and small changes are followed by other small changes. The variance intercept coefficient is very small and the coefficient of the squared error is 0.1.

Table 4

Dependent Variable: PORTFOLIO				
Method: ML - ARCH				
Sample: 1 1297				
Included observations: 1297				
Convergence achieved after 14 iterations				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000879	0.000269	3.263635	0.0011
Variance Equation				
C	1.44E-06	3.74E-07	3.860082	0.0001
RESID(-1)^2	0.108449	0.010648	10.18496	0.0000
GARCH(-1)	0.891154	0.008593	103.7114	0.0000
R-squared	-0.003570	Mean dependent var		-2.57E-06
Adjusted R-squared	-0.003570	S.D. dependent var		0.014761
S.E. of regression	0.014787	Akaike info criterion		-6.060756
Sum squared resid	0.283384	Schwarz criterion		-6.044818
Log likelihood	3934.400	Hannan-Quinn criter.		-6.054775
Durbin-Watson stat	1.806960			

In order to validate this model we had to verify whether the squared errors presented ARCH effects. Thus, we analyzed both the correlogram of the squared error series and the results of the ARCH test. According to the correlogram there are no additional ARCH terms, a result confirmed also by the ARCH test for the significance levels of 1% and 5% (Tables 5 and 6).

Table 5

Heteroskedasticity Test: ARCH			
F-statistic	1.895668	Prob. F(5,1286)	0.0922
Obs*R-squared	9.452893	Prob. Chi-Square(5)	0.0923

Table 6

Sample: 1 1297								
Included observations: 1297								
Autocorrelation		Partial Correlation			AC	PAC	Q-Stat	Prob
*		*		1	0.129	0.129	21.486	0.000
				2	-0.009	-0.026	21.587	0.000
				3	0.018	0.023	22.029	0.000
				4	0.023	0.018	22.741	0.000
				5	0.006	0.002	22.792	0.000
				6	0.021	0.021	23.355	0.001
				7	0.039	0.034	25.363	0.001
				8	0.016	0.007	25.707	0.001
				9	0.021	0.019	26.297	0.002
				10	0.027	0.020	27.238	0.002

Based on the estimated volatility equation, we generated the historical series of conditional volatility. Volatility can be measured through variance or standard deviation. So, the portfolio volatility (measured through standard deviation) is presented in the graphic below:

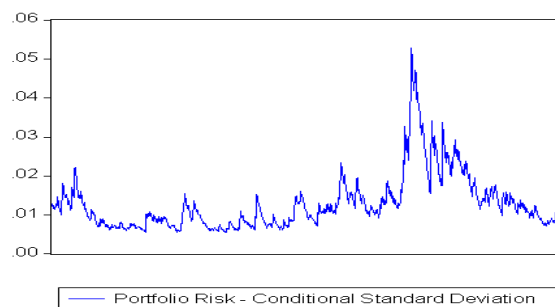


Figure 2

According to Figure 2 there are more volatile periods than others over the analyzed time period. The most pronounced volatility can be noted between 2008 and 2009 (the highest peak), being observed a slight fall in the next period and then in May 2010 (the end of the chosen time horizon) it can be observed another abrupt increase in the volatility. This evolution of the portfolio

volatility is attributed to the effects of the current financial crisis that has put a print on the financial markets around the world. In order to confirm this conclusion we analyzed the daily returns of the indexes over the period 2008-2009 (Figure 3).

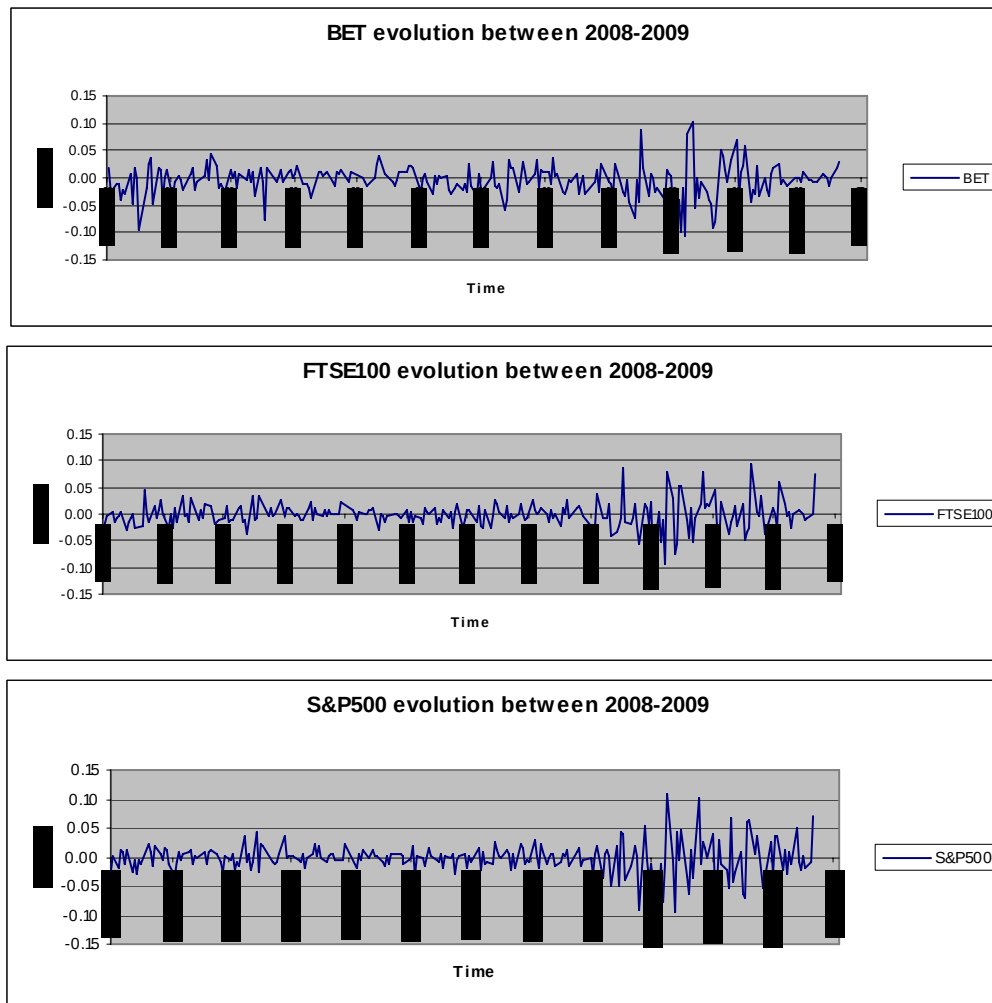


Figure 3

As it can be observed in September 2008 (20 September-12 October 2008 the speculative crisis in the US) represents the moment when the evolution of the return series starts to present considerable fluctuations. Moreover, the fall-winter of 2008 represents also the period when the crisis extended in Europe.

4. Conclusions

Studies of the transmission of return and volatility shocks from one market to another as well as studies of cross-market correlations are essential in finance, because they present numerous implications for capital allocation. As it was emphasized in this paper, at first sight some markets may seem slightly correlated, so international portfolio diversification can be in this case an optimal solution. However, on the background of a highly integrated global financial system, eroded strongly by the effects of the current crisis, international diversification does not reduce portfolio risk.

Using in this paper the ARCH and GARCH models we have been able to analyze the evolution of the risk of an internationally diversified portfolio, being chosen three benchmark indexes from three different countries, namely Romania (BET), UK (FTSE100) and USA (S&P500) to be included in the portfolio. We chose a 0.5 weight for the investment in the BET index, a 0.25 weight for the investment in the FTSE100 and a 0.25 weight for the investment in the S&P500. Starting from this portfolio we used the Engle (1982) test in order to track any ARCH effects in the portfolio return series. Taking into consideration that these effects were detected, we were able to estimate a GARCH(1,1) model. The estimation results showed that the volatility is persistent because the coefficient of the conditional variance is 0.9 and this means that the shocks to the conditional variance are persistent and that large changes in the conditional variance are followed by other large changes and small changes are followed by other small changes. On the basis of the estimated volatility equation we generated the historical series of the conditional volatility. The graphic of this series shows that there are more volatile periods than others, the most pronounced volatility being observed over the period 2008-2009. This evolution of the portfolio volatility is attributed to the current financial crisis, a fact confirmed by the graphics of the daily index returns over the period 2008-2009.

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Costs of Adopting a Common European Currency. Analysis in Terms of the Optimum Currency Areas Theory

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Abstract. *This analysis presents a theoretical approach of the possible costs related to a national economy which desires to be part of a monetary union. The analysis is made in terms of the classical optimum currency areas theory, which represents the basis of the monetary union process. The objective of this theory was to make a monetary union possible. This theory shows that the countries can obtain net benefits as a result of having a common currency, thus being able to avoid the possible adjustment problems. As a matter of fact, its great merit is that it identified certain properties of the countries being part of a monetary union, these properties representing real alternative tools for losing the independence of the monetary policy.*

Keywords: the classical optimum currency areas theory; monetary union; asymmetric shocks.

JEL Codes: F15, F36.

REL Codes: 8M, 20H.

Introduction

Although the problem of the monetary unions is more present than ever, both for the developed countries which have already joined the Euro Zone, and also for the less developed states which are preparing to meet the criteria for being accepted, this topic has been put forward for a long time in the economic literature. Thus, the classical optimum currency areas theory – a theory which represents the basis of the monetary union term, has come out in 1961 in an article presented by Robert Mundell (who is considered to be „the father” of the theory referring to the optimum currency areas). The objective of this theory was to make a monetary union possible.

The optimum currency areas (*OCA*) theory is based on the above mentioned Robert Mundell’s contribution (1961), although the problem has been reviewed and added by many other economists, such as Robert McKinnon (1963), Peter Kenen (1969) etc. The *OCA* theory makes researches referring the costs and the benefits related to adopting a common currency, being mainly focused on costs, their minimization depending on certain conditions which are characteristic to the economies of the member countries (the criteria related to the optimum currency areas).

The benefits refer especially to the import of credibility of the monetary union’s central bank, which lowers the inflationary expectations and, inherently, the level of inflation. The costs are, first of all, related to the effects of giving up the independence of the monetary policy and the mechanism of the exchange rate, as tools for adjusting the possible asymmetric shocks among the members of the monetary union. The lower the need to adjust the rate of exchange, the lower costs for taking part to the monetary union, and thus the monetary integration is favorable for the members. The theory shows that the countries may obtain net benefits as a result of having a common currency, thus being able to avoid the possible adjustment problems.

Costs of adopting a common European currency

The main problem in the case of the monetary unions is related to the costs of this process. Adopting a common currency brings several benefits, but these benefits must be higher than the costs. As for the costs, the most important of them are placed at a macroeconomic level and they occur as a result of giving up the independence of the monetary policy.

At a *microeconomic* level, we may identify two main costs. The first category refers to the operational costs, which are necessary for adjusting the systems to the new currency. The second category is represented by strategic challenges which consist in re-defining competition and in the occurrence of specific risks. Such risks may be caused by an unfavorable rate of a country

which joins the monetary union. The mentioned economy may join the union with a depreciated currency, thus discovering an increasing competition, and also pressures on prices through expensive imports, or with an appreciated currency and with the risks of losing competition until adjustments are performed by means of other tools (for example, joining the Euro Zone with a too high rate of exchange would determine a lower competition of the exports, and this will negatively affect the process of economic growth; on the contrary, a rate of exchange for which the currency would be depreciated in relation to Euro would generate the increase of inflation).

As we have previously mentioned, the most important costs of joining a monetary union are encountered at a macroeconomic level. Generally, at this level, the costs occur as a result of the fact that, when taking part to a monetary union, the countries lose important tools of the economic policy, respectively those which are specific to the monetary policy, namely the handling of the interest charge and of the exchange rate. These costs are felt if the asymmetric shocks occur. What does it actually involve? The central bank can no longer change the exchange rate of its own currency and it cannot determine the quantity of national currency in economy; moreover, the member states will influence more or less the process of making decisions, depending on several factors, and this situation may be perceived as a negative one for the states with a lower influence.

The extent of the costs related to losing the tools of economic policy depends on the differences among the countries. In case these differences are encountered both in the economic structure, and also in the legal and institutional systems, those economies should have alternatives to the monetary tools in order to adjust the shocks. What is important to know is which the nature and the probability of the asymmetric shocks are and also what alternative tools could be used in the absence of the exchange rate or of the interest charge (Socol and Socol, 2007).

The particularities or the criteria identified by the optimum currency areas theory represent conditions which should be met by the states which desire to be members to a favorable monetary union. The existence of these conditions makes the occurrence of the asymmetric shocks less probable or, in case of occurrence of such shocks, it provides efficient adjustment tools. In other words, the costs increase when shocks of the demand or of the offer occur, and they affect the economies which take part to the monetary union in a different manner, when there are different preferences for unemployment and inflation, or legal differences, or differences between the rates of growth, or when the adjustment mechanisms are not operational (there are no systems for adjusting the shocks, the institutions of the labor market operate in a different manner, or there are still differences among the fiscal systems). We will continue with the presentation of three of them, which are considered to be significant in the economic literature (for a detailed analysis, see de Grauwe, 2007).

A. The occurrence of the symmetric shocks

Let us take two countries (X and Y), which are member to a monetary union. For various reasons, the aggregate demand (AD) in country X may reach a high level in a different manner if compared to the aggregate demand in country Y. For example, a shock in demand determines a decrease of the aggregate demand in X and an increase of the aggregate demand in Y. In order to illustrate the effects of different changes in the aggregate demand, we will use the aggregate demand – aggregate offer analysis model (AD-AS) (de Grauwe, 2003).

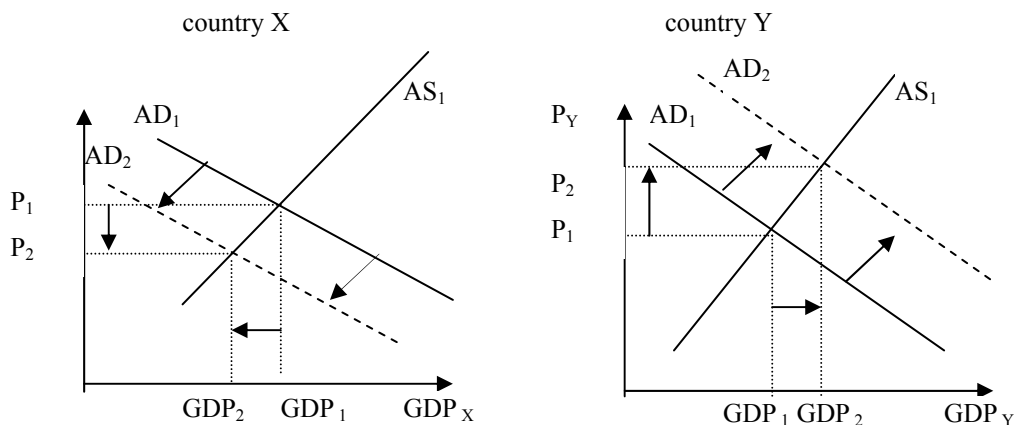


Figure 1. Changes in the aggregate demand

An asymmetric evolution of the aggregate demand would determine different consequences in X if compared to Y. Thus, a decrease of the aggregate demand in country X from AD₁ to AD₂ will determine the decrease of the real output, and this will inherently determine the decrease of the employment level (the increase of unemployment). Within a short time, country X will encounter the situation of “twin deficits” (the presence of the budget deficit at the same time with the current account deficit) (Figure 1). Budget deficit, as the economy of country X is now entering a recession period, and this requires additional budget expenses (for example, the budget expenses for stimulating the increase of the output or additional costs with the unemployed persons). Current account deficit, as the national output decreases, but the consumers’ costs are not decreasing to the same extent; as a result, the additional domestic demand will be satisfied by means of additional imports. The decrease of the aggregate demand in country X determines a decrease of the national output, and also a decrease of prices (deflation). The level to which the prices decrease, respectively the level of the real output, depends on the slope of the curve for the aggregate offer (its elasticity) (Socol and Socol, 2007).

In country Y, an increase of the aggregate demand is equal to an increase of the real output and, inherently, an increase of the employment degree (decrease of unemployment). Unlike X, Y will record a budget surplus and, also, a current account surplus. The increase of the demand stimulates the increase of the output, on the one hand, and also the increase of prices (inflation). We can notice that a shock of the demand creates different problems to the two countries. In the absence of the possibility to use the rate of exchange⁽¹⁾, an automatic balance of the two countries' economies is possible if the wages in X and in Y are flexible, and the labor movement is high⁽²⁾.

Why flexible wages? In country X the stimulation of the aggregate offer is necessary now; if wages were flexible enough, the unemployed persons would accept wages which are lower than the previous ones, and this would allow the producer to increase his output and, at the same time, with a lower cost with wages, he will be able to lower the selling price; the decrease of prices determines the increase of demand for the Romanian products, as they gain competitiveness. In Y, the increase of output supposes an increase of labor demand, and this will result in an increase of wages and prices. The external demand for its products will lower, as they lose their competitiveness while prices get increased.

Why high labor movement? The country X encounters problems related to the increase of unemployment now. If labor were mobile, then the unemployed persons from X could migrate in Y, where the labor demand is excessive. The level of the expenses lowers, and the current account deficit gets decreased. In Y, wages get decreased, as a result of the increase in labor offer; inflation lowers.

Thus, if the two conditions were met, then the balance between the two economies could be "automatically" obtained. In case one of the two conditions is not practically achieved, then the adjustment of the shock in terms of demand can be exclusively obtained by means of the relative increase of prices in Y (a higher inflation) if compared to X, so that the products of the country X could become competitive. As a result of the increase in exports, the aggregate demand will get increased in X. Thus, the problems of unemployment and of current account deficit could be solved. Y can solve the problem of inflation, by promoting restrictive monetary and fiscal policies, but it will not solve the problem of the excessive current account.

In order to lower the excessive current account a higher and higher inflation is necessary. As X and the Euro Zone constitute a monetary union, it gives up the possibility to use the rate of exchange for adjusting the shock of the demand (by depreciation). As a consequence, the problems related to unemployment and to current account deficit can only be solved by means of deflation. Such a problem – inflation or current account unbalance – can be solved by means of re-assessment of rate between the currency in country Y and

the currency in country X. Thus, by depreciating the currency in country X, the aggregate demand gets increased in this country, while it gets decreased in Y; in X, the problem of unemployment will be solved, while in Y the inflationary pressures will thus be avoided; in both countries, the problem of the current account deficit/excess will be solved (de Grauwe, 2007).

B. Different preferences of the countries for inflation and unemployment

A possible cost of introducing a common currency is determined by the fact that the countries may have different preferences with reference to inflation – some of the countries have a higher adversity towards inflation than others.

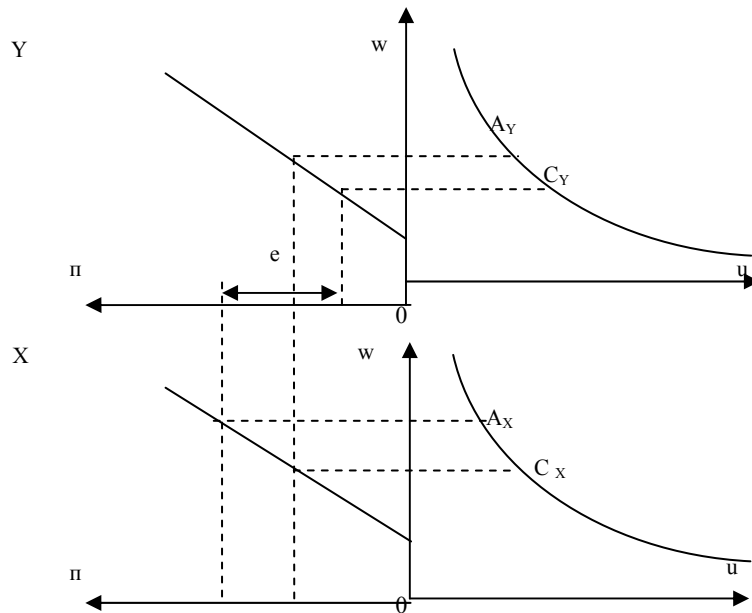


Figure 2. *The choice inflation-unemployment on a short term*

Figure 2 (the right side) presents the Phillips curves for a country Y and a country X. The following analysis is only valid when the Phillips curve on a short term is stable (the governments may choose between a higher inflation and a lower unemployment, for example; at present, the critiques referring to the stability of the Phillips curve are known and accepted; according to them, when the inflationary expectations are getting increased, the Phillips curve are moving upwards, and the authorities can no longer choose various inflation-unemployment combinations). The vertical axis shows *the rate of change referring to wages (w)*, and the horizontal axis shows *the rate of unemployment (u)* (Socol and Socol, 2007).

Figure 3 (the left side) presents the relation between the changes of the wages and the changes of the prices, this relation being written as it follows:

$$w^* = \Pi^* + q^*, \quad (1)$$

where,

w^* = the rate of wages increase;

Π^* = the inflation rate;

q^* = the growth rate of labor productivity.

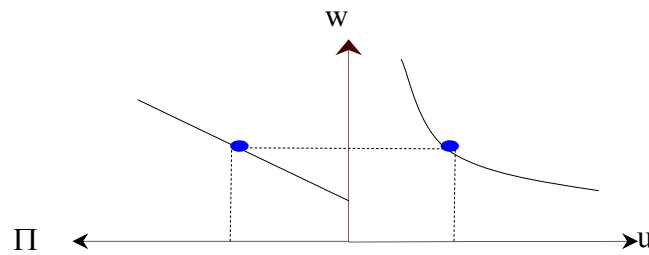


Figure 3. *The relation between the changes of the wages and the changes of the prices*

According to relation (1), we may write as it follows:

$$W_Y^* = \Pi_Y^* + q_Y^* \quad (2)$$

$$W_X^* = \Pi_X^* + q_X^* \quad (3)$$

Moreover, according to the purchasing power parity (PPP) theory, between X and Y we may write the following relation:

$$e^* = \Pi_X^* - \Pi_Y^*, \quad (4)$$

where

e^* = the depreciation rate of currency x in relation to currency y.

Relation (4) shows that, when the inflation rate is higher in X than in Y, in order not to lose the products competitiveness, the country X should depreciate its currency (x) in relation to the currency y. But if X and Y constitute a monetary union, then the rate of exchange can no longer be used as a policy tool; as a result, $e^* = 0$, and this means that the inflation rate in Y and in X should be equal.

In case the inflation rate in X is higher than in Y, under the terms of a fixed rate of exchange, the products of the country X lose their competitiveness. We assume that the countries Y and X have different preferences for inflation and unemployment (Figure 2). X chooses to be placed in point C_X , while Y chooses the combination which is specific to point A_Y ; thus, X prefers a lower unemployment and a higher inflation, while Y chooses the reverse combination, namely a lower inflation with a higher cost for unemployment. The cost of a monetary union between X and Y consists in the fact that both X and Y should

accept other inflation-unemployment combinations, respectively the placement in other points of the Phillips curve, even though they are less suitable. As long as the inflation rates are different, a fixed rate of exchange between the currency x and the currency y is not sustainable.

In order to keep the fixed rate of exchange between the currency x and the currency y, the inflation rates in the two areas should be equal ($e^* = 0$). Thus, X is moving on the Phillips curve up to point A_X , while Y should choose point C_Y . In this way, W_Y^* increases, and W_X^* decreases; according to relation (1), Π_Y^* will increase in Y, and Π_X^* will decrease, and thus the inflation rates in the two areas will become equal (Socol and Socol, 2007).

According to the economic theory, the Phillips curve is vertical on a long term (Figure 4), and the intersection between the Phillips curve on a long term and the horizontal axis represents the natural rate of unemployment. In other words, on a long term, unemployment is determined by the natural rate of unemployment and it depends on inflation, and the authorities can no longer choose between inflation and unemployment. Thus, *on a long term*, in the case of a monetary union, X and Y can equalize their inflation rates by establishing a fixed rate of exchange between currency x and y, without any costs in terms of unemployment; taking into account the fact that, at least on a short term, the inflation-unemployment trade-off exists, we may say that, for the countries recording high inflation rates, joining a monetary union suppose, *on a short term*, the acceptance of a higher unemployment.

Thus, we may draw the conclusion that the differences among the countries regarding the preferences for inflation and unemployment do not constitute a major obstacle in achieving a monetary union, as, on a long term, the authorities cannot choose an optimum combination between inflation and unemployment.

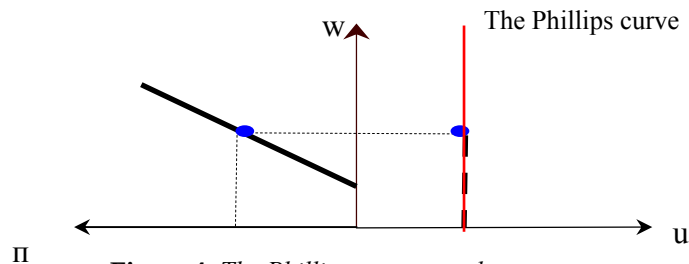


Figure 4. *The Phillips curve on a long term*

Another possible cost occurred as a result of introducing a common currency is given by the possible productivity differences among the countries which are members to the monetary union. We assume that the productivity rate (q^*) is higher in Y than in X (Figure 5).

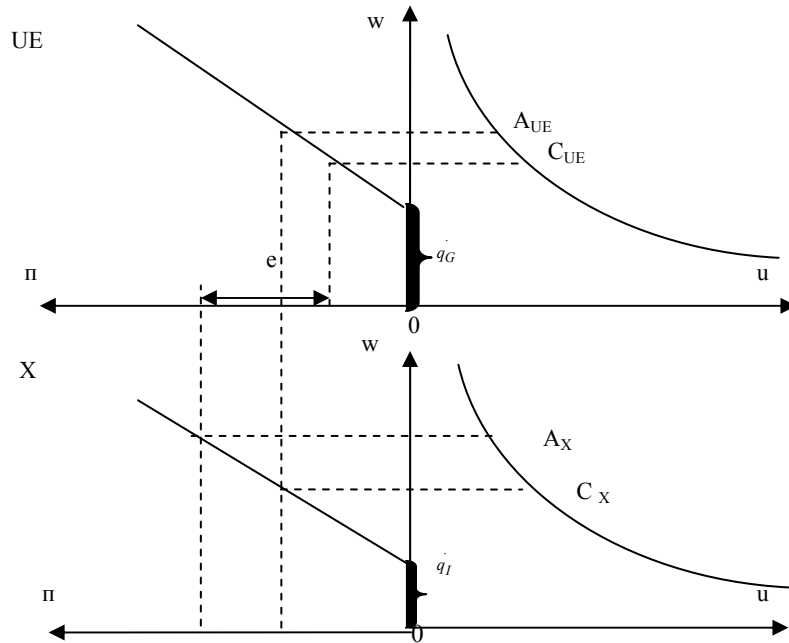


Figure 5. Costs determined by the productivity differences

$$W_Y^* = \Pi_Y^* + q_Y^* \Rightarrow \Pi_Y^* = W_Y^* - q_Y^*$$

$$W_X^* = \Pi_X^* + q_X^* \Rightarrow \Pi_X^* = W_X^* - q_X^*$$

If X and Y constitute a monetary union, then $e^* = 0$, where

$$e^* = \Pi_X^* - \Pi_Y^* \Rightarrow \Pi_Y^* = \Pi_X^*$$

then

$$W_Y^* - q_Y^* = W_X^* - q_X^* \text{ or}$$

$$W_Y^* - W_X^* = q_Y^* - q_X^*$$

If the productivity rates are different in the two areas (lower in X) and they decide to constitute a monetary union, then the increases of the nominal wages in X should be lower than those recorded in EU. If, for various reasons, this does not happen, then costs occur.

C. Differences among the fiscal systems of the countries

Joining a monetary union supposes that the involved countries accept some constraints with reference to the modality of financing the budget deficits. Due to the differences among the fiscal systems, the countries use different financing combinations by means of indebtedness and monetary financing of the budget deficits. The budget constraint is as it follows:

$$G - T + rB = dB/dt + dM/dt,$$

where:

- G = the level of the government expenses;
(minus the payments with interest for the government debt);
- T = taxation revenues;
- r = interest charge for the government debt;
- B = the government debt;
- M = the monetary base.

The budget deficit includes the primary deficit ($G - T$) and the payments with interest for the government debt (rB); it can be financed either by indebtedness (dB/dt), or by increasing the monetary base (dM/dt). A reasonable government will use different revenues sources so that it could equalize the marginal costs for increasing revenues by means of these sources; in case the marginal cost for increasing revenues by means of increasing taxation exceeds the marginal cost for increasing revenues by means of inflation (seniorship), a government chooses the variant of increasing inflation. Thus, generally, the countries with under-developed fiscal systems consider an advantage to increase their budget revenues by means of inflation (seniorship), as the costs for increasing the budget revenues by means of increasing taxation are higher than the costs for increasing the budget revenues by means of inflation (Burda, Wyplosz, 1997).

As a conclusion, the less developed countries which join more developed countries in a monetary union should increase taxation in order to finance their deficit. But the increase of taxation in the less developed countries will result in losing from welfare.

Conclusions

Thus, the analysis from above outlines the significant differences existing among countries. Moreover, we can mention here the legal differences, differences between the rates of growth, or when the adjustment mechanisms are not operational (there are no systems for adjusting the shocks, the institutions of the labor market operate in a different manner, or there are still differences among the fiscal systems).

In order to adjust these differences, the countries may use various tools of economic policy, or the exchange rate tool. According to the optimum currency areas theory, in most of the cases, the countries have tools available which are alternatives to the rate of exchange. But joining a monetary union is not desirable as long as its costs are higher than the benefits, and the differences among the countries are big, thus making the objective of minimizing the costs difficult (de Grauwe, 2003).

The differences among the countries exist, but the problem is to what extent these differences are relevant, so that their presence could prevent the achievement of

a monetary union. There are significant differences among the countries, which do not disappear in a monetary union. Giving up the exchange rate tool may be considered a cost of the monetary union. And changing the rate of exchange is a strong tool which is available to the countries which desire to eliminate the major macroeconomic unbalances, with lower costs in terms of output and unemployment.

We should mention that handling the rate of exchange does not permanently affect the real variables (output and employment). Moreover, *the experiences of several countries show that, when depreciation is used in a systematic manner, the result is the increase of inflation, without gains in terms of output and employment.* Moreover, in such cases, the macroeconomic instability gets increased, due to the inflationary expectations of the private economic agents, who expect new depreciations. The depreciation is not a flexible tool and it is neither less expensive.

As a consequence, the changes of the nominal exchange rate only temporarily affect the competitiveness of a country's industries. Thus, the nominal depreciations only temporarily result in real depreciations. On a long term, the changes of the nominal rate of exchange do not affect the real rate of exchange of a country's currency.

To conclude, on a long term, the rate of exchange (the tool which is given up by joining a monetary union) does not solve the problems generated by the characteristics which are specific to the goods market from various countries. *The solutions to the problems generated by the structural differences among the countries are related to the structural policies, and not to the monetary policies.* Handling the cash or the rate of exchange cannot solve the problems generated by the structural differences among the countries, at least not on a long term. The differences among the countries exist, but the problem is to what extent these differences are relevant, so that their presence could prevent the achievement of a monetary union.

Aknowledgement

This article represents the dissemination of research financed by Social European Fund, contract no POSDRU/89/1.5/S/59184 *Postdoctoral research performance and excellence in economic sciences in Romania*, Academy of Economic Studies, Bucharest.

Notes

- (1) We initially assumed that the two countries are part of a monetary union.
- (2) Solution proposed by Robert Mundell.
- (3) The relation defines the rate of change for the prices which keep the profits unchanged.

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The Effects of Economic Geography on Education in Romania*

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Abstract. *This paper evaluates the role that geography plays in determining the distribution of educational attainment levels among Romanian counties. We provide evidence that, in Romania, educational levels are higher in those counties with greater market access. This finding corroborates the theoretical predictions of the Redding and Schott's (2003) model and proves that remoteness is a penalty for the economic development and convergence of the Romanian counties.*

Keywords: Economic Geography; Education Attainment Levels; Romania.

JEL Codes: R11, R13, R14, F12, F23.

REL Codes: 16D, 16E, 16F, 16I, 16J.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

1. Introduction

There is a wide scholarly agreement of the impact of Human capital on economic growth, however there is little consensus on the exact contributions of the different measures and indicators of human capital to economic development (Levine and Renelt, 1992, Rodriguez-Pose and Vilalta-Buffi, 2005). However, the relationship between human capital and economic geography and its implications for economic development is far less studied. Redding and Schott's (2003) pioneering paper extend a standard two-sector New Economic Geography model to demonstrate that being located on the economic periphery can reduce the return to skills, thereby reducing incentives for investment in human capital accumulation. Lopez-Rodríguez et al. (2007) applied Redding and Schott's (2003) model to estimate the relationship between educational attainment levels and market access for a cross regional sample of NUTS 2 regions in Europe, showing that the model's predictions hold in the case of Europe. The literature of New Economic Geography lacks this type of empirical studies and to the best of our knowledge there are not studies at the country level on the Redding and Schott's (2003) model.

In this paper we derive the structural equations which relate human capital endowments and geographical location of Redding and Schott's (2003) model and estimate them for a sample of 42 Romanian regions in the year 2006. The results of the estimations give validity to the forces put at work in Redding and Schott's (2003) model for the case of Romania and show that there is a spatial structure of educational attainment levels across Romanian counties. The results show the importance of market access in explaining Romanian human capital levels. In fact between 45% and 59% human capital levels is explained by the region's market access.

The rest of the paper is structured as follows: Section 2 briefly describes the model. Section 3 shows the approximation to the empirical estimation and describes the data used in the analysis. Section 4 contains the results of the econometric estimations. Finally, Section 5 has the conclusions and the main policy implications.

2. The model

The theoretical framework presented in this paper is a short version of the Redding and Schott (2003) New Economic Geography model.

We consider a world in which we have R locations and each location have a mass of consumers L_i . We assume that consumers are endowed with one unit of labour which is offered inelastically with zero disutility and that consumers

choose endogenously whether to invest or not in becoming skilled. In the decision of becoming skilled a worker has to compare the costs of education to acquire those skills with the future benefits of being skilled, which for the purposes of this paper can be summarized in the higher wages skilled workers perceive.

Therefore, the decision of an individual (z) at location $i \in \{1, \dots, R\}$ to become a skilled worker would be given by the wage differential between the two options, difference of wages of a qualified worker versus an unskilled one, and the costs associated with educate himself.

In this paper we skip the modelling of the demand side which is not necessary for the theoretical premises of our empirical investigation. Therefore, we focus on the agriculture and manufacturing equilibrium conditions (supply side), to characterize endogenously the relationship between geographical location and human capital accumulation.

The profit function of a typical firm at location i can be given by the following expression:

$$\Pi_i = \sum_{j=1}^R \frac{P_{ij}^M x_{ij}}{T_{ij}^M} - (w_i^S)^\alpha (w_i^U)^{1-\alpha} c_i (F + x_i), \quad (1)$$

where: P_{ij}^M is the price at location j of one unit produced at location i , w_i^S is the wage of skilled workers with a share (α) in the total costs, w_i^U is the wage of unskilled workers with a share ($1-\alpha$) in the total costs, c_i is a marginal input specific to each location representing a technology index. F is a fixed cost of production and $x_i = \sum_{j=1}^R x_{ij}$ is the total output produced by the company for all markets it serves.

Once we solve for the first order conditions of profit maximization, the expression in the manufacturing sector implies:

$$(w_i^S)^\alpha (w_i^U)^{1-\alpha} = \xi c_i^{-1} (MA_i)^{\frac{1}{\sigma}}, \quad (2)$$

where: $\xi = \frac{\sigma-1}{\sigma}$ is a constant, c_i is the parameter that reflects differences in technology between locations, $MA_i = \sum_{j=1}^R (T_{ij}^M)^{1-\sigma} E_j G_j^{\sigma-1}$ is the market access at

location i and σ the elasticity of substitution between varieties of manufactured goods.

The equation (2) gives us the equilibrium value for the wages of skilled and unskilled workers.

Therefore, this new equilibrium implies a higher critical level for the skill parameter (a_i^*) above which individuals prefer to invest in education and become skilled and thus we will have a lower supply of skilled workers. In this derivation we assume that the number of individuals with higher and higher levels of skills decreases as we move further away from those thresholds.

We can express the derivative of the wage of unskilled workers as follows:

$$\frac{dw_i^U}{w_i^U} = -\frac{\phi}{(1-\phi)} \frac{dw_i^S}{w_i^S}. \quad (3)$$

This intuitive explanation is based on the fact that a decrease in market access modifies the initial equilibrium conditions in the manufacturing sector, which experience a decrease in size. This decrease in size, frees more skilled labour than the ones that are initially demand in the agricultural sector.

So to re-establish the equilibrium, the nominal wage paid to skilled workers must decrease and that nominal wages paid to unskilled workers must increase in relative terms. Therefore as the wages of skilled workers decrease this reduces the incentives to invest in becoming skilled.

3. Data and Econometric Specifications

The equation (2) in last section relates for the manufacturing sector wages of skilled and unskilled workers with locations' market access. This equation can be translated quite easily into a regression equation by applying logs and considering the different educational attainment levels as the dependent variable. Therefore we can estimate the following equation:

$$\ln(E_i) = \beta_0 + \beta_1 \ln(MA_i) + v_i, \quad (4)$$

where: E_i represents the educational attainment level in region i , MA_i represents the market access for region i and v_i represents the disturbance term. Equation (4) is going to be our benchmark estimation and checks for the relationship between secondary and tertiary educational attainment levels and market access. Educational attainment levels for the benchmark estimations are defined based on the percentage of each Romanian region's population that has attained secondary and tertiary education which will be labelled in the econometric

estimations as *log Higher Education* and in the percentage of each Romanian region's population that has attained primary education which will be labelled in the estimations as *log Lower Education*. The Romanian institute for National Statistics (INSSE) provides us with these data for the year 2006. We have also carried out an alternative estimation to the one show in equation (4) based on a different definition of the dependent variable. The alternative will consist of ranking educational attainment levels accordingly with the level of education achieved in the counties, i.e., we assign the value 1 when low educational attainment levels are the most predominant, 2, if medium and high educational attainment levels are the most predominant and then estimate an ordered probit model.

The dependent variable in the regression equation is the logarithm of educational attainment levels. We define two different types of educational attainment levels. In first place we consider the percentage of each Romanian region's population that has attained secondary and tertiary education which will be labelled in the econometric estimations as *log Higher Education*. In second place we define a new educational attainment level variable which takes in the percentage of each Romanian region's population that has attained primary education which is labelled in the estimations as *log Lower Education*. Both higher and lower educational attainment levels data are taken from the Romanian National Statistical Institute (INSSE) and refer to the year 2006.

Regarding to the main independent variable in expression (4) it is the regions' market access. We built this variable for each Romanian county as a weighted sum of regional GDPs in the surrounding locations where the weighted scheme is the distance measured in Kms between the capital cities of each Romanian region. GDP data is taken from the Romanian office for National Statistics (INSSE) and the data on bilateral distances comes from the website www.travelworld.ro. Regions internal distance is modelled proportional

to the square root of the regions' area following the expression $0.66\sqrt{\frac{Area}{\pi}}$

where "Area" represents the size of the region expressed in km² (see Crozet 2004, Head and Mayer, 2000, and Nitsch, 2000) for a discussion of this measure of internal distance).

4. Economic Geography and Educational Attainment Levels: Estimation results

Table 1 provides us with 2006 data on the percentage of individuals in each Romanian region that has attained primary education (labelled as lower education) or secondary and tertiary education (labelled as higher education). The highest percentages of individuals with higher education are reach in the so called

economic centers of Romania; Bucharest, Iași, Timișoara, Cluj-Napoca, Constanța, Brașov and Craiova where also the country's main universities are. The percentages figures on higher education in these regions are well above the country's average (8.55%) being Bucharest the region which ranks at the top (18.19%). On the other site, the Romanian regions located far from the above poles of growth in the so called *Romanian economic periphery* such as Piatra-Neamț, Târgu Mureș, Tulcea, Satu Mare, Botoșani, Vaslui, Olt, Teleorman have figures on higher education below the country's average (6.97%).

Table 1

Educational Attainment Levels in Romania (2006)

Region/County	Lower Education	Higher Education	Region/County	Lower Education	Higher Education
Bacău	10.07	5.95	Mehedinți	8.75	6.43
Botoșani	10.44	4.77	Olt	9.28	4.88
Iași	9.91	12.74	Vâlcea	8.85	5.97
Team	9.50	1.97	Arad	8.48	7.87
Suceava	11.25	6.79	Caraș-Severin	8.68	8.37
Vaslui	10.66	6.12	Hunedoara	8.59	7.19
Brăila	8.00	5.32	Timiș	8.25	12.17
Buzău	8.62	4.67	Bihor	9.12	9.43
Constanța	8.55	9.97	Bistrița-Năsăud	9.93	5.40
Galați	9.12	7.81	Cluj	7.46	14.67
Tulcea	4.45	4.40	Maramureș	8.80	6.49
Vrancea	8.69	4.24	Satu Mare	9.68	5.32
Argeș	4.58	7.98	Sălaj	9.25	5.21
Călărași	9.09	4.46	Alba	8.58	6.88
Dâmbovița	9.32	6.19	Brașov	7.76	10.41
Giurgiu	8.92	2.80	Covasna	8.97	5.59
Ialomița	9.22	5.25	Harghita	8.95	6.01
Prahova	7.99	6.10	Mureș	8.85	3.95
Teleorman	8.10	4.22	Sibiu	9.06	10.63
Dolj	8.46	8.91	Ilfov	0.90	3.02
Gorj	9.95	8.03	București	5.91	18.19
	Computations including București			Computations excluding București	
Average Ed. A.	8.55	6.97	Average Ed. A.	8.61	6.70
Minimum Ed. A.	0.90	1.97	Minimum Ed. A.	0.90	1.97
Maximun Ed. A.	11.25	18.19	Maximun Ed. A.	11.25	14.67
Ratio max/av	1.32	2.61	Ratio max/av	1.31	2.19
Ratio max/min	12.49	9.23	Ratio max/min	12.49	7.44

Source: author's elaboration based on INSSE data.

Table 2

Market Access and Educational Levels: Baseline Estimations Romania (2006)

Dep. Variable	<i>log Higher Education</i>			<i>Log Lower Education</i>		<i>E_{i,j}</i>
Regress.	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.09* (0.16)	1.20** (0.16)	2.14** (0.16)	4.49** (0.07)	4.54** (0.09)	1.57** (0.10)
MAGDP06	0.25** (0.03)	0.22** (0.04)		-0.15** (0.02)	-0.17** (0.02)	0.11** (0.02)
Dist.Timisoara			-0.0007 (0.000)			
D _{i,j}						0.20** (0.06)
Est.	OLS	IV	OLS	OLS	IV	OLS
Inst. variables						
First stage R2		0.62			0.62	
R2	0.59	0.58	0.09	0.59	0.59	0.27
J-Statistic						
Prob (F-statistic)	0.00	0.00	0.00	0.00	0.00	0.00
N.obs.	42	42	42	42	42	84

Note: Table displays coefficients and Huber-White heteroscedasticity robust standard errors in parenthesis, ** indicates coefficient significant at 0.01 level, “First stage” R2 is the R2 from regressing market access on the instruments set, Instruments: Distance to Timișoara and region size.

Source: author’s elaboration.

Table 2 presents the results of estimating equation (4) on the sample of 42 regions in Romania for the year 2006. In Column 1 we regress Log Higher Education on market access for the set of 42 Romanian regions. The results of the OLS estimation show that the coefficient of market access has the expected sign and is statistically significant at the 1% level. The results also show that doubling regions’ market access would increase secondary and tertiary education attainment levels by 25%. The null hypothesis that the coefficient on market access is equal to zero is easily rejected at conventional significance levels using a standard F-test, and the model explains over 59% of the cross-regional variation in secondary and tertiary educational levels.

In column 4 we summarize the results of regressing the percentage of population with primary education (labelled as *Log Lower Education* in the table) against market access. The results of the OLS estimation indicate that an increase in regional market access is negatively correlated with the percentage of population who has primary education. This result constitutes an indirect way of checking the theoretical predictions of the model.

A potential shortcoming of the previous analysis is the one referring to the endogeneity of the market access measure, i.e., good market access can be

correlated with other determinants of the level of educational attainment of the Romanian regions and therefore cause inconsistent and biased estimates. To avoid problems of endogeneity between human capital levels and regional market access, the paper presents instrumental variables estimates in columns 2 and 5. These estimations are based on the existence of a set of instruments that are strongly correlated with the original endogenous variables but asymptotically uncorrelated with the error term. Furthermore, they should also be variables that are not driven by an unobservable third variable the authors suspect might be jointly affecting market access and human capital levels. Once these instruments are identified, they are used to build a proxy for the explanatory endogenous variables which consists of their predicted values in a regression on both the instruments and the exogenous variables⁽²⁾.

In this paper we propose to use mainly accessibility variables as instruments, since they are highly correlated with our market access variable but also non contemporary correlated with the errors. We instrument market access with distance from Timișoara and with the region size in a similar vein as Breinlich (2006). The first instrument capture market access advantages of regions close to the geographic centre of Romania. The second instrument captures the advantage of large regional markets in the composition of domestic market access.

Columns 2 and 5 present the results for the corresponding instrumental variables estimation. Instruments are highly statistically significant and have the expected signs in the first stage. Distance to Timișoara and regions size explains 62% of regional market access. Since the instruments represent quite a distinct source of information and are uncorrelated, we can trust them to be reliable instruments. In the second-stage estimation we again find positive and highly statistically significant effects of market access on educational attainment levels although its effects are lower than in the OLS estimations. The market access coefficients change from 0.25 to 0.22 in the regression of log higher education against market access (column 2) and from -0.15 to -0.17 in the regression of log lower education against market access (column 5).

For comparison purposes, column 3 reports the result of regressing log higher education against distances from Timișoara instead of using market access. The result provides evidence of the negative correlation between secondary and tertiary educational attainment levels and regions distance from Timișoara and therefore back our results.

5. Conclusions and Policy Lessons

This paper provides an empirical estimation of the Redding and Schott (2003) model in a national setting such as Romania. The results obtained in the econometric estimations allow us to corroborate the main forces at work in the Redding and Schott (2003) model showing that market access plays an important role in the configuration of the spatial structure of educational attainment levels across Romanian counties.

Our investigation on the effects of economic geography on educational attainment levels in Romania delivers a message for policy-makers and for policy action in general. We have proved that being located in the economic periphery of the country implies that human capital levels in those areas will be hampered, therefore in order to solve the problem these areas are facing (lack of human capital investment) and to put them back on track policy measures should be designed to cope with this lack of incentives to invest in human capital. Perhaps one of the most important policy action that can be carried out is to improve infrastructures (e.g. roads, ports, etc.) which will bring closer together the economic periphery and the economic center of the country and which in the case of Romania are still very much lagging behind.

Notes

- (1) By first nature geography we refer to the physical geography of a country (natural endowments, climate conditions, access to ports, airports, navigable rivers and so). Second nature geography refers to the economic geography, i.e. how far a country or region is from its consumer markets and from its input suppliers.
- (2) The statistic reported in ordered probit models to check the significance of the estimated coefficient is z-statistic instead of t-statistic from OLS.

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Statistical – Econometric Analysis of the Correlations between the Social Security Budget and the Main Macroeconomic Aggregates in Romania*

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Abstract. *This paper analyses the correlation between social security budget and the main macroeconomic indicators (like GDP, monthly average gross earnings, unemployment) in Romania during the period 2000 – 2009. Romania faces a more severe economic recession than originally anticipated. Although the implementation of anti-crisis program was able to lead to normalization of financial conditions, the contraction of economic activity is higher than initial projections. Because of the great policy debate in Romania about the impact of the reduction of pensions and salaries and increases of taxations on the reduction of budget deficit, we have explained in our paper the basic sides of the balanced budget debate. There are three basic sides to the balanced budget debate. The traditionalists argue for a reduction of the budget deficit since it harms the economy. Another group holds the Ricardian view of government debt in believing that there is no real harm done to the economy by the national debt. A third group claims one way or another that the budget deficit is not*

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

an adequate measure of fiscal policy. We will argue which of these views is most reasonable, based on a study case.

The study is based on official data published by the National Institute of Statistics, with the specification that they are transformed into real values in order to assure the data comparability. The methodology used is the correlation analysis, the factorial analysis and the regression analysis, in order to evaluate the impact of some macroeconomic policies on the budget deficit. Three hypotheses on macroeconomic policies are discussed in the paper and their influences on the budget deficit. The main problem in Romania was that the macroeconomic policies didn't give enough attention to budget deficit in order to keep it under control. This is the main cause of the actual unfavourable economical situation in Romania, with a huge budget deficit, with a decrease in economic activity, with increases of inflation and unemployment.

Among the variables used in the study we mention: total incomes, total expenditure, budgetary deficit, unemployment rate, monthly average net earnings, average number of pensioners and social allowance recipients, monthly average pension of pensioners and social allowance recipients, economically active population, monthly average inflation rate.

By analysing the correlation between all the studied variables we observe that there is a strong correlation between monthly average pension and monthly average net earnings. Increases in the level of earnings will determine the increase of budget deficit. At first view the macroeconomic policy adopted by the actual government in Romania (the cut with 25 % of salaries in the budgetary system, VAT increase) will have as a result the decrease of budget deficit. Since the monthly average net earnings is correlated with unemployment and inflation rate, the reduction of the general level of earnings will determine the increase of unemployment and inflation. Therefore this policy should be applied with caution, taking in parallel measures to compensate its adverse effects. The impact of some of the macroeconomic policies on budget deficit is studied using two regression functions. After an econometric analysis we shall conclude about the influence of the dependent variables of these functions on the Romanian budgetary deficit.

Keywords: social security budget; gross domestic product; correlation coefficient; regression analysis.

JEL Codes: E01, E2, H55, H61, H62.

REL Codes: 3B, 8B.

Introduction

Romania faces a more severe economic recession than originally anticipated. Although the implementation of anti-crisis program was able to lead to normalization of financial conditions, the contraction of economic activity is higher than initial projections. The total revenues continued to decline in 2010 due to lower incomes collected from VAT, social contributions and non-tax revenue. Due to the significant decrease of the budget revenues the budget deficit increases. Because of the great policy debate in Romania about the impact of the reduction of pensions and salaries and increases of taxations on the reduction of budget deficit, we have started our paper by explaining which are the three basic sides of the balanced budget debate. Then we have analysed the correlation between social security budget and the main macroeconomic indicators (like GDP, FDI, unemployment) in Romania during the period 2000 – 2009. Three hypotheses on macroeconomic policies are discussed in the paper and their influences on the budget deficit.

1. Balanced budget debate

The budget deficit is defined as the difference between what the government spends (salaries, defence spending, aid programs, and other cash outflows) and what the government collects (take the form of taxes). When the government spends more than it collects, a budget deficit exists. The opposite of a budget deficit is a budget surplus.

There are three basic sides to the balanced budget debate. The traditionalists argue for a reduction of the budget deficit since it harms the economy. Another group holds the Ricardian view of government debt in believing that there is no real harm done to the economy by the national debt. A third group claims one way or another that the budget deficit is not an adequate measure of fiscal policy.

Traditionalists claim that when the government runs a budget deficit, it is spending more than it is collected. Therefore national savings decreases and investment also decreases. Lower investment leads to lower long-term economic growth and comes with higher domestic interest rates, which decreases net exports. Based on this logic, a budget deficit is a drain on the long-term economy.

Ricardian view of the budget deficit takes a much less negative position on this issue. Supporters of this view claim that a budget deficit represents trading taxes in the future for taxes today. Since the public is adjusting its spending and savings schedules to account for the necessary future increases in taxes, the budget deficit should have little long-term effect on economic growth.

The third position claims that the budget deficit is not a reasonable measure of fiscal policy. While these economists do believe that the government can affect spending, savings, and investment, they also believe that the budget deficit is simply an incomplete measure of these variables.

Which of these views is most reasonable? There is likely a bit of truth in all of them. The best view of the budget deficit comes from understanding the major positions on the issue and creating some sort of compromise between the traditional, Ricardian and fringe viewpoints.

2. Data description

The study is based on official data published by the National Institute of Statistics. The variables used in our correlation analysis are:

- Total incomes (million RON);
- Total expenditure (million RON);
- Budgetary deficit (million RON);
- Unemployment rate (%);
- Monthly average net earnings (RON);
- Average number of pensioners and social allowance recipients (thousand persons);
- Monthly average pension of pensioners and social allowance recipients (RON);
- Economically active population (thousand persons);
- Monthly average inflation rate (%).

All values are transformed in real values in order to assure the data comparability.

The investigation period of time is 1991-2009.

3. Empirical analysis

The methodology used is the correlation analysis, the factorial analysis and the regression analysis. The goal of this study is to evaluate the impact of some macroeconomic policies on the budget deficit.

By the graphical representation (Figure 1) it is observed that starting with 2005 year the budgetary deficit increases very quickly attaining unsustainable values. All the other indicators show that Romania was in a growth period. Salaries, pensions, active population increase while the unemployment and number of pensioners decreases. The main problem in Romania was that the macroeconomic policies didn't give enough attention to budget deficit in order to keep it under control. This is the main cause of the actual unfavourable economical situation in Romania, with a huge budget deficit, with a decrease in economic activity, with increases of inflation and unemployment.

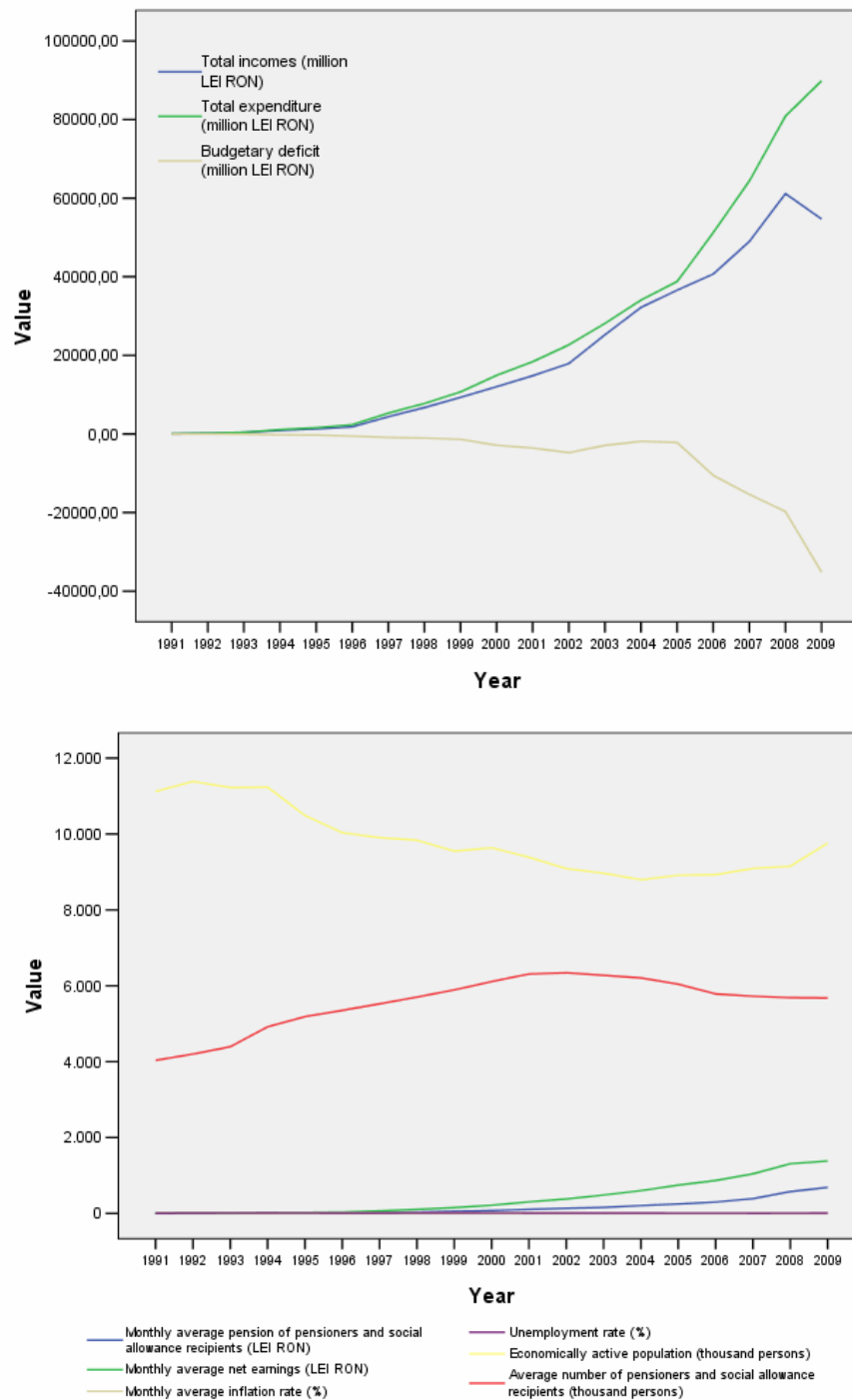


Figure 1. The evolution of macroeconomic indicators (1991-2009)

Table 1

Matrix correlation between macroeconomic aggregates

Correlations										
		Total incomes (million LEI RON)	Total expenditure (million LEI RON)	Budgetary deficit (million LEI RON)	Monthly average pension of pensioners and social allowance recipients (LEI RON)	Average number of pensioners and social allowance recipients (thousand persons)	Economically active population (thousand persons)	Unemploy- ment rate (%)	Monthly average net earnings (LEI RON)	Monthly average inflation rate (%)
Total incomes (million LEI RON)	Pearson Correlation	1	,983**	-,818**	,956**	,489*	-,694**	-,550*	,993**	-,694**
	Sig. (2-tailed)		,000	,000	,000	,034	,001	,015	,000	,001
	N	19	19	19	19	19	19	19	19	19
Total expenditure (million LEI RON)	Pearson Correlation	,983**	1	-,910**	,991**	,423	-,606**	-,504*	,997**	-,651**
	Sig. (2-tailed)	,000		,000	,000	,071	,006	,028	,000	,003
	N	19	19	19	19	19	19	19	19	19
Budgetary deficit (million LEI RON)	Pearson Correlation	-,818**	-,910**	1	-,942**	-,221	,329	,335	-,877**	,469*
	Sig. (2-tailed)	,000	,000		,000	,364	,169	,161	,000	,043
	N	19	19	19	19	19	19	19	19	19
Monthly average pension of pensioners and social allowance recipients (LEI RON)	Pearson Correlation	,956**	,991**	-,942**	1	,358	-,527*	-,474*	,983**	-,601**
	Sig. (2-tailed)	,000	,000	,000		,132	,020	,040	,000	,006
	N	19	19	19	19	19	19	19	19	19
Average number of pensioners and social allowance recipients (thousand persons)	Pearson Correlation	,489*	,423	-,221	,358	1	-,911**	,060	,439	-,820**
	Sig. (2-tailed)	,034	,071	,364	,132		,000	,808	,060	,000
	N	19	19	19	19	19	19	19	19	19
Economically active population (thousand persons)	Pearson Correlation	-,694**	-,606**	,329	-,527*	-,911**	1	,299	-,634**	,817**
	Sig. (2-tailed)	,001	,006	,169	,020	,000		,214	,004	,000
	N	19	19	19	19	19	19	19	19	19
Unemployment rate (%)	Pearson Correlation	-,550*	-,504*	,335	-,474*	,060	,299	1	-,533*	,187
	Sig. (2-tailed)	,015	,028	,161	,040	,808	,214		,019	,444
	N	19	19	19	19	19	19	19	19	19
Monthly average net earnings (LEI RON)	Pearson Correlation	,993**	,997**	-,877**	,983**	,439	-,634**	-,533*	1	-,666**
	Sig. (2-tailed)	,000	,000	,000	,000	,060	,004	,019		,002
	N	19	19	19	19	19	19	19	19	19
Monthly average inflation rate (%)	Pearson Correlation	-,694**	-,651**	,469*	-,601**	-,820**	,817**	,187	-,666**	1
	Sig. (2-tailed)	,001	,003	,043	,006	,000	,000	,444	,002	
	N	19	19	19	19	19	19	19	19	19

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

By analysing the correlation between all the studied variables we observe that there is a strong correlation between monthly average pension and monthly average net earnings. Increases in the level of earnings will determine the increase of budget deficit.

At first view the macroeconomic policy adopted by the actual government in Romania (the cut with 25 % of salaries in the budgetary system) will have as a result the decrease of budget deficit. Since the monthly average net earnings is correlated with unemployment and inflation rate, the reduction of the general level of earnings will determine the increase of unemployment and inflation. Therefore this policy should be applied with caution, taking in parallel measures to compensate its adverse effects.

The same conclusions could be formulated by analysing the graphical representation (Figure 2) of all variables by using Factorial analysis (Principal Component Analysis).

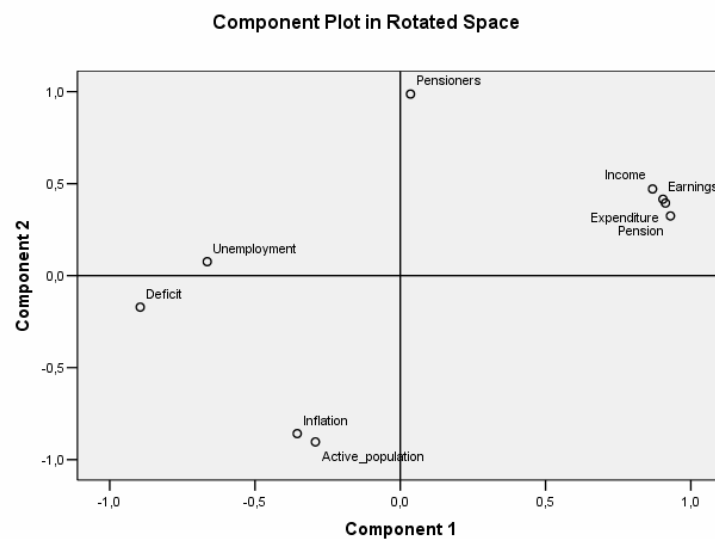


Figure 2. *The plot of variables on correlation circle determined by the two first principal components (which explain 88% of the initial variation)*

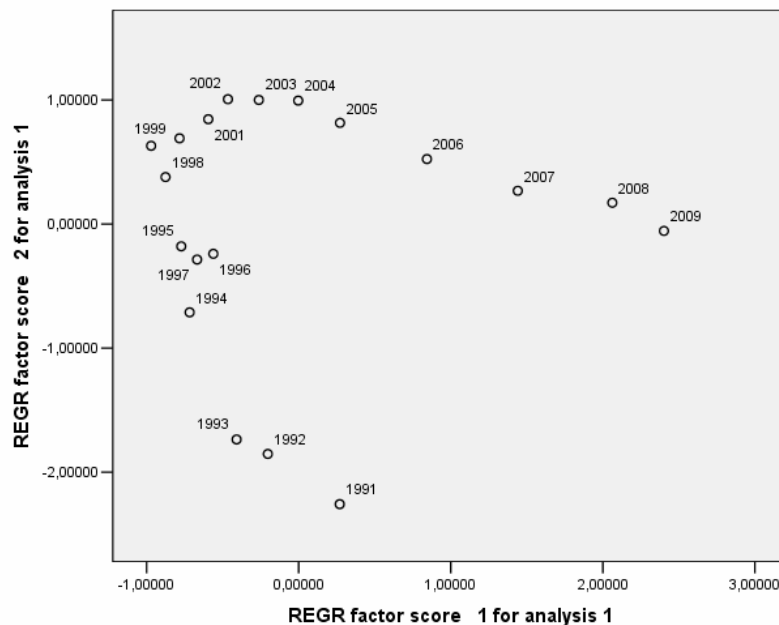


Figure 3. The evolution of the main macroeconomic indicators represented on the determined by the two first principal components

During the period 1991-2004 the main variations were observed in active population, number of pensioners, inflation. In fact this was the period of transition, the period of the reconstruction of the economy. From 2005, Romania didn't well exploited the economic boom such that to continue to be on the ascending trend in economic development and to keep stable the inflation, the unemployment and the budgetary deficit (Figure 3).

In order to study the impact of two macroeconomic policies on budget deficit, two regression functions are determined.

First of all, we analyse the dependency between budget deficit and monthly average net earnings (LEI RON) and monthly average pension of pensioners and social allowance recipients (LEI RON). The regression equation is:

$$Deficit = -306 - 104.5 \times Pens + 27.8 \times Ern \quad R^2 = 0.96; F = 179.44$$

(-0.47)
(-8.39)
(5.08)

The coefficients of variables monthly average pension and monthly average earnings are significant with a probability of 99%. The model could be validated with a probability of 99%. Therefore, if the monthly average net earnings decreases with 1 RON then the budgetary deficit increases with

27.83 RON, when all the other factors remain stable. This means that this measure is not good. If the monthly average pensions decreases with 1 RON then the budgetary deficit decreases with 104.5 RON, when all the other factors remain stable. But the budget deficit is 35,173 RON. In order to attain the equilibrium of the budget the average level of pensions should be reduced by 350 RON, which gives an average level of pensions of 350 RON. The policy of reducing the average level of pensions, correlated with other measures, could equilibrate the budget.

Secondly, we analyse the dependency between budget deficit and the unemployment rate and the number of pensioners. The regression equation is:

$$Deficit = - \underset{(-2.53)}{2.79} \times NPens + 1279 \times \underset{(1.7)}{ur} \quad R^2 = 0.4; F = 5.65$$

The coefficients of variables unemployment rate and the number of pensioners are significant with a probability of 90%. Therefore, if the number of pensioners decreases with one thousand persons then the budgetary deficit decreases with 2.79 RON, when all the other factors remain stable. Using only this measure it is impossible to attain the equilibrium of the budget.

4. Conclusions

The macroeconomic policies in Romania didn't give enough attention to budget deficit in order to keep it under control. This induced the actual unfavourable economical situation, with a huge budget deficit, with a decrease in economic activity, with increases of inflation and unemployment. The correlation analysis shows that there is a strong correlation between monthly average pension and monthly average net earnings. Our analysis reveals that the measure of decreasing the monthly average net earnings in order to reduce the budget deficit is not good. The policy of reducing the average level of pensions have to be correlated with other measures in order to equilibrate the budget. Also, reducing the number of pensioners will induce a decrease of the budgetary deficit, but this measure only cannot equilibrate the budget.

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Effects of the Current Economic Crisis on the Fiscal Variables in EU Countries*

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Abstract. *Our paper aims to capture the effects of the current economic and financial crisis on fiscal variables, the 27 EU Member States, based on macroeconomic developments until 2010 and projected for 2011. Starting from the economic recession, from the increase of unemployment and the relative stability of prices in the EU overall (macroeconomic developments that characterize the current crisis), we analyze the effects of those developments on the public revenues and expenditures, on the conventional deficit and public debt, which are macroeconomic variables that comprise the pentagon of economic macro stabilization.*

Keywords: economic recession; unemployment; inflation; budgetary deficit; public debt.

JEL Code: E6.

REL Codes: 8B, 8E, 8F, 8G, 8K.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

1. Introduction

The current crisis might be described as an initial period of economic downturn which generated pressure on unemployment rate. The most sensitive fiscal variable to these macroeconomic disequilibrium is the consolidated total public revenue, which suffered a strong setback. Consolidated total public expenditure could not be adjusted according to these decreases in revenue. The result was the increase in consolidated national government budget deficits, which in turn resulted in significant increases in public debt for EU countries.

In addition to these general trends among EU member states, we can also emphasize that there is *a relative price stability* overall EU and a reduction of the current account deficit, due to the overall reduction of private consumption and, as a consequence, of the imports.

An important factor of stability is keeping inflation under control, which maintains the purchasing power of people in these difficult and uncertain times. There are some states from EU that have even a negative change in consumer prices. Unfortunately, Romania is the worst in this respect, with the highest inflation rate among the EU-27 states.

In a general economic context, the objectives of the economic policy, which compose the economic macro-stabilization pentagon, are the following: obtaining economic growth, price stability, decrease of unemployment rate, sustainability of public finance (sustainable budgetary deficit and public debt), decrease of current account deficit over GDP, even a surplus. Achieving simultaneously these objectives is almost impossible, even in the case of the developed countries. Economic policy decisions might choose between this set of objectives, one of them being priorities, the others being sacrificed.

In the context of the current economic crisis, economic policy objectives might be:

- economic recovery and population protection;
- budget deficits and public debt are instruments used by the state to support priority objectives (see the model of Germany and France). Compliance with the Maastricht nominal criteria, regarding public finance, is not more a short-term objective, but medium and long term.

IMF solution, trying to ensure macroeconomic balances precisely based on the public finances, does not generate any effects of economic growth or reducing unemployment rate, but exactly the opposite. It is also the case for the policies implemented by Romania in 2010.

Our opinion is that our country's fiscal policies implemented in 2010 are subordinated to the lack of necessary funds and access to them, that implied a monopol position on this sector of the IMF.

We believe that the considerable efforts of a big part of population, involved by the austerity policy of the authorities from Bucharest, do not find any justification in reducing, the most probable, the consolidated general government budget deficit by one percentage point (pp) comparing with 2009 (almost a slight reduction in the deficit in 2010 compared to 2009), and this is the case of a scenario of economic decline of only 1.9% (which is unlikely to be achieved), which means that the deficit target is seriously threatened by a possible economic decline more pronounced.

These austerity measures are harsh and inappropriate, and generate an increase of the distance from the moment our country will join the euro area and the real income convergence of Romania to the euro area is already a fairy tale for children.

It is not insignificant the fact that our country is the last in the EU-27 regarding GDP per capita at purchasing power parity, being exceeded by Bulgaria since 2010, according to IMF data.

In this article we propose an analysis of current economic and financial crisis on fiscal variables, in the context of 27 EU Member States, based on macroeconomic developments for 2010 and projections for 2011.

2. Economic recovery and population protection

For 2009, all member states, excepting Poland, had negative real GDP growth rate.

Table 1

Real GDP growth rate in 2009

Country	$\Delta\%$ realGDP		Country	$\Delta\%$ realGDP		Country	$\Delta\%$ realGDP
PL	1.2		EA 16	-4.0		BG	-5.9
CY	-0.7		UE 27	-4.1		HU	-6.5
EL	-1.1		NL	-4.5		FI	-6.9
FR	-2.2		DK	-4.5		SI	-7.4
MT	-2.2		SE	-4.6		IE	-7.5
BE	-2.9		UK	-4.6		RO	-8.0
PT	-2.9		IT	-4.7		EE	-13.7
LU	-3.6		CZ	-4.8		LV	-18.0
ES	-3.7		DE	-5.0		LT	-18.1
AT	-3.7		SK	-5.8			

Source: European Commission.

Former Soviet countries Estonia, Lithuania and Latvia have the highest rates of economic setbacks. Compared to these severe data, Romania is far away, yet our country was among the last seven EU states on the basis of this decline.

Other international developments confirm that this crisis, a financial one at the start, becomes an economic one and is characterized by a decline of GDP for most countries: Norway -1.4%, Switzerland -1.9%, USA -2.6 %, Japan -5.2%, Turkey -4.5% and Croatia -5.8%.

If we look to cumulative results from 2008 and 2009 of economic crisis on real GDP relative variation, we obtain the following data for UE-27:

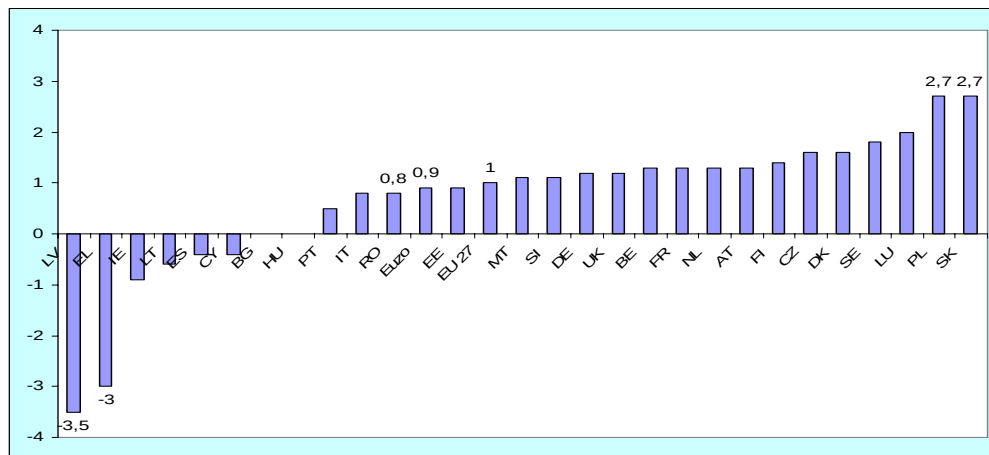
Table 2

Real GDP growth rate 2009/2007

Country	2009-2007	Country	2009-2007	Country	2009-2007
LV	-21.8	UK	-4.0	BE	-1.9
EE	-16.8	DE	-3.8	FR	-1.8
LT	-15.8	LU	-3.6	AT	-1.8
IE	-10.3	EA 16	-3.4	BG	-0.3
FI	-6.0	UE 27	-3.3	MT	-0.1
HU	-5.9	PT	-2.9	SK	0.2
IT	-5.7	ES	-2.8	EL	0.9
DK	-5.6	NL	-2.6	CY	3.0
SE	-4.8	CZ	-2.4	PL	6.3
SI	-4.2	RO	-2.3		

Source: author's calculations.

According to estimates for 2010 of the European Commission (Eurostat data), the EU economy will escape from the period of economic decline, as a whole (EU-27 average). For 2011, the EU-27 is expected a more consistent recovery, GDP will grow, according to forecasts, by 1.7% and for the euro area by 1.5%.



Source: European Commission.

Figure 1. Relative changes of real GDP for 2010

For the EU-27, average value forecast of this indicator is 1%, and for the euro area 0.9%. What is interesting is that for Romania the forecast value indicate a 0.8% increase, but this value is determined without considering the latest decision of wage reductions and tax increases.

Latest IMF prognose for our country considers an estimation of -2%, which in our opinion shows the “efficiency” of the taken measures. In the EU, countries for which the forecast for 2010 implies an economic decline are Latvia (-3.5%), Greece (-3%), Lithuania, Spain, Cyprus and Bulgaria.

Regarding the labor market, although the Community market has proved more resilient to the crisis than expected (largely due to short-term policy measures, reforms of the past and preserve jobs in some Member States) in all 27 EU Member States the unemployment rate increased in 2009 compared to that recorded in 2008, unemployment representing a negative effect of this economic and financial crisis.

Table 3

The rise of the unemployment rate 2009 / 2008

State	Change		State	Change		State	Change
DE	0.2		SI	1.5		HU	2.2
LU	0.5		FR	1.7		CZ	2.3
NL	0.6		CY	1.7		SK	2.5
BE	0.9		EL	1.8		DK	2.7
MT	1		FI	1.8		IE	5.6
AT	1		EU-27	1.9		ES	6.7
IT	1.1		EU zone	1.9		LT	7.9
PL	1.1		PT	1.9		EE	8.3
RO	1.1		UK	2		LV	9.6
BG	1.2		SE	2.1			

Source: Braşoveanu, Obreja (2009).

According to estimated values, in 2010 and 2011 the unemployment rate is:

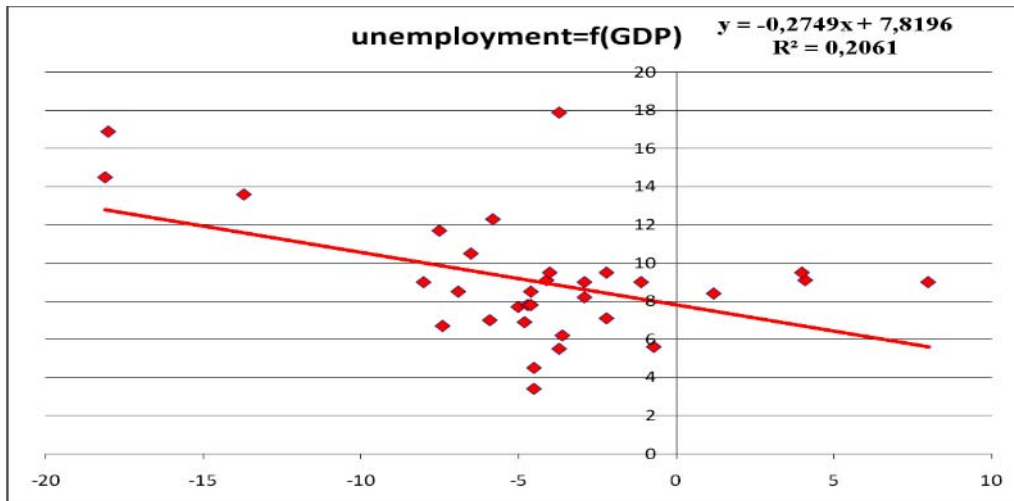
Table 4

Unemployment rate for 2010 and forecast for 2011

State	2010	2011	change
European Union (27 countries)	9.8	9.7	-0.1
Euro area (16 countries)	10.3	10.4	0.1
Belgium	8.8	9	0.2
Bulgaria	7.9	7.3	-0.6
Czech Republic	8.3	8	-0.3
Denmark	6.9	6.5	-0.4
Germany	7.8	7.8	0
Estonia	15.8	14.6	-1.2
Ireland	13.8	13.4	-0.4
Greece	11.8	13.2	1.4
Spain	19.7	19.8	0.1
France	10.2	10.1	-0.1
Italy	8.8	8.8	0
Cyprus	6.7	7	0.3
Latvia	20.6	18.8	-1.8
Lithuania	16.7	16.3	-0.4
Luxembourg	6.1	6.4	0.3
Hungary	10.8	10.1	-0.7
Malta	7.3	7.2	-0.1
Netherlands	4.9	5.2	0.3
Austria	5.1	5.4	0.3
Poland	9.2	9.4	0.2
Portugal	9.9	9.9	0
Romania	8.5	7.9	-0.6
Slovenia	7	7.3	0.3
Slovakia	14.1	13.3	-0.8
Finland	9.5	9.2	-0.3
Sweden	9.2	8.8	-0.4
United Kingdom	7.8	7.4	0.2

Source: European Commission.

It is expected that this imbalance will be stabilized for 2011, with the economic recovery process. If we consider the expected change in unemployment in 2011/2010, 14 of its values are negative, three are zero and the remaining 10 are positive but small. Greece is the exception to these trends, Eurostat data for this country anticipating a large increase in unemployment, even in 2011, 1.4, which would lead to an unemployment rate of 13.2%.



Source: Authors' Calculations.

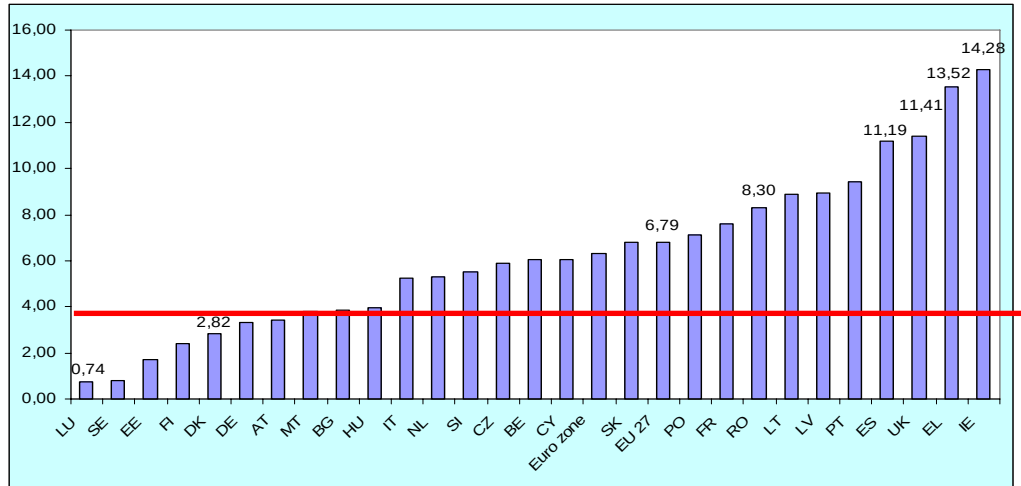
Figure 2. *Correlation between unemployment rate and economic growth*

In Figure 2 we analyzed the linear correlation between unemployment and economic growth. The correlation is negative and the coefficient of dependent variable is -0.275. Based on R^2 signification we can say that 20.61% on the unemployment evolution is due to the evolution of real GDP growth rate.

In particular, labor market conditions will remain unfavorable, the unemployment rate is somewhere around 10% in the EU, even higher by about 0.5 percentage points in the euro area (according forecasts).

3. Budgetary deficit and public debts

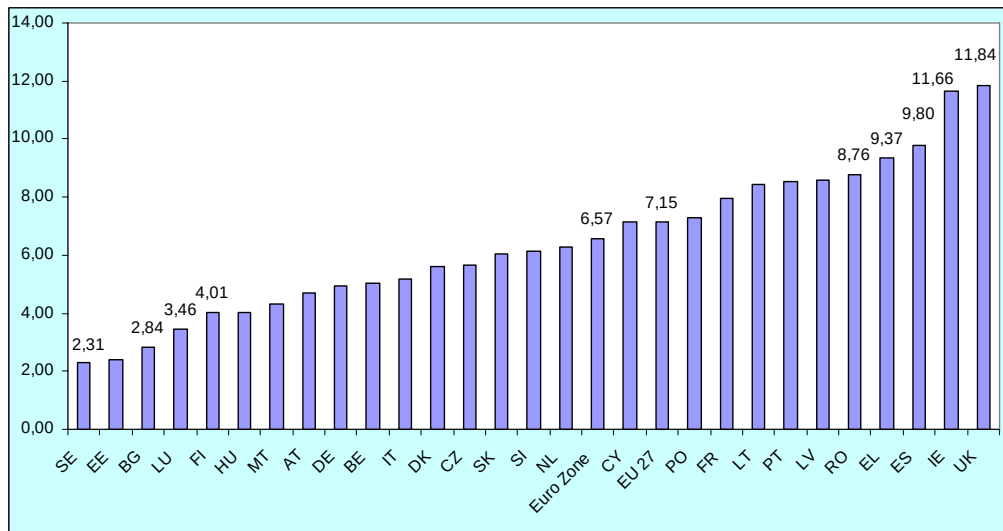
Public finance was also negatively affected by the current crisis. The public deficit tripled in 2009 for EU/27 area, reaching 6.79% of GDP from 2.25% in 2008. This damage was caused, in part, by operation of automatic stabilizers and discretionary measures taken to support the economy, but also reflects a stronger than usual fall in revenue in response to economic downturn.



Source: European Commission.

Figure 3. Public deficit (% GDP) in 2009

Forecasts are more pessimistic for 2010, deficits continuing to grow to around 7.15%.

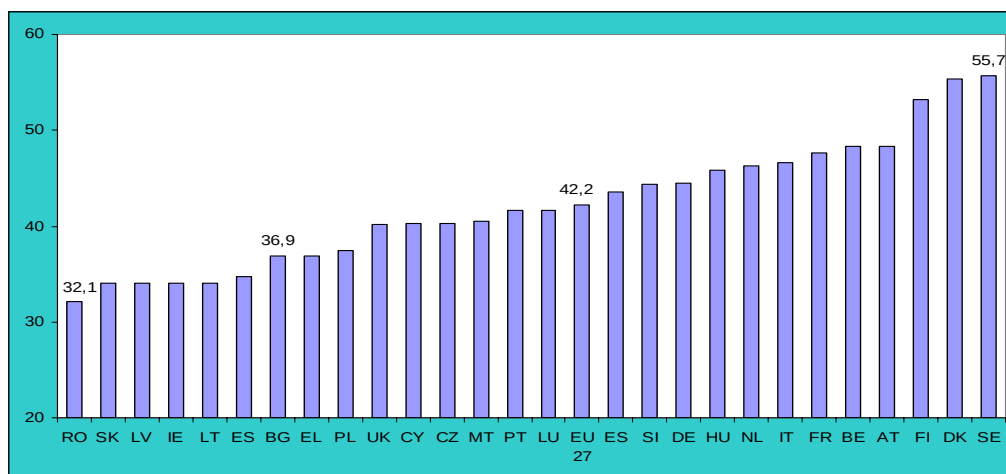


Source: European Commission.

Figure 4. Public deficit (% GDP) in 2010

In 2011, deficit is expected to decline in the EU-27 slightly below 7% of GDP, as the economy recover and temporary measures are no longer applied.

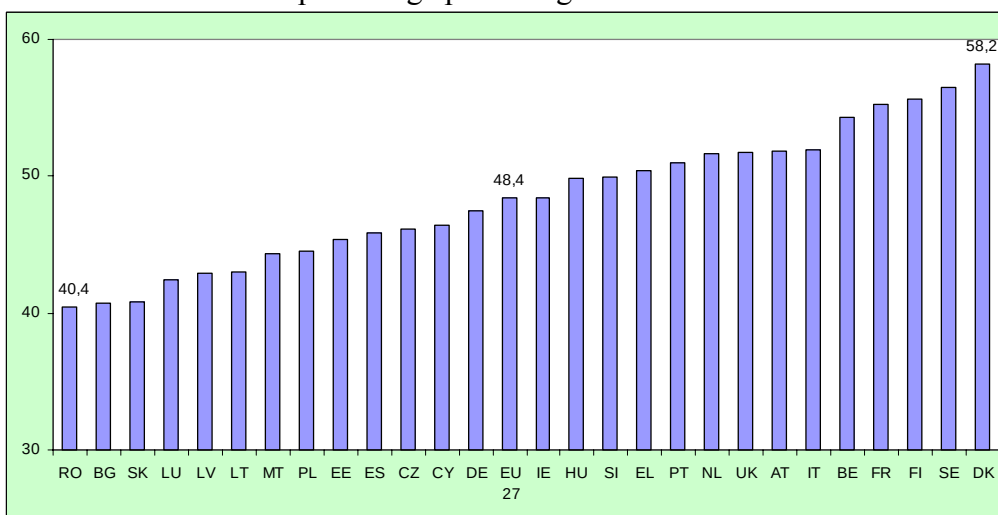
The Romania's critical situation is due to an inability to increase the budgetary revenues and to reduce public spending. Our country has the lowest share in GDP of the EU, for both revenues and spending.



Source: European Commission.

Figure 5. Public revenues on GDP in UE for 2009

Comparing to the EU-27 average, in our country public revenues are more than 10 percentage points lower, while the Nordic countries have public revenues more than 23 percentage points higher.



Source: European Commission.

Figure 6. Public spending on GDP in UE for 2009

Comparing to the EU-27 average, public spending in Romania is 8 p.p. below and comparing to Denmark with about 18 p.p. below. And even sadder is that these costs are very small in relation to actual funding needs of Romania (infrastructure, education, health, scientific research, environmental protection).

In these circumstances, public debt to GDP will continue to grow during 2010-2011, continuing the increase from the period 2009 to 2008:

Table 6

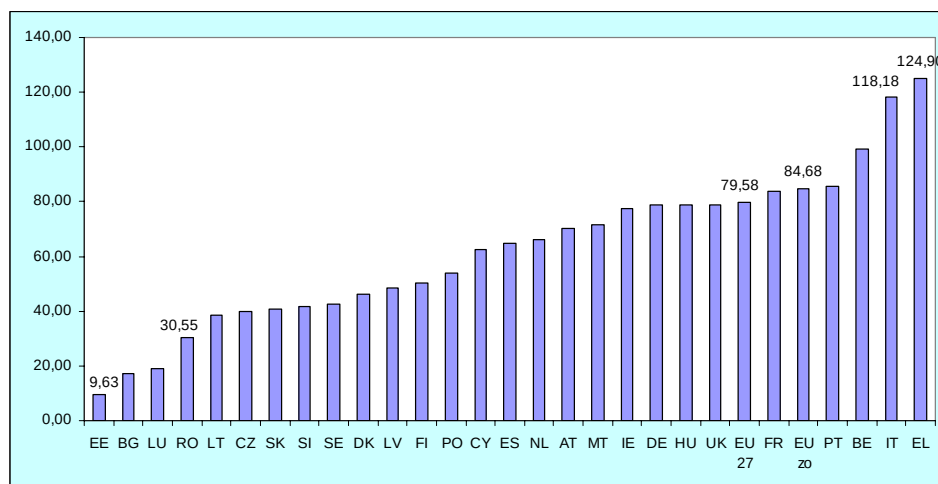
Increase of public debt to GDP ratio in 2009 compared to 2008

Country	$\Delta(\text{Debt/PIB})$	Country	$\Delta(\text{Debt/PIB})$	Country	$\Delta(\text{Debt/PIB})$
DK	0.2	AT	6.5	PT	11.1
BG	1	CZ	6.5	UE 27	11.5
LU	1.5	SK	6.9	SI	12.6
NL	1.6	DE	7.2	EL	13.4
EE	2.8	FI	7.2	LV	13.7
SE	4.1	BE	7.4	LT	14.3
PL	4.5	RO	8.2	ES	14.6
MT	4.7	FR	8.7	UK	16.6
CY	4.8	IT	8.8	IE	21.7
HU	6.2	Euro Zone	8.9		

Source: European Commission.

We observe that our country has a public debt to GDP that grew by 8.2 percentage points, more than three percentage points comparing with EU 27 average and over 12 p.p. comparing with Ireland.

For 2010, there are forecasted the following values for share in GDP of public debt:



Source: European Commission.

Figure 7. Public debt in UE for 2010

Romania is among the latest countries in a hierarchy of public debt (the last four of the EU-27). For 2011 our country is expected to reach a value of 35.87%. For Romania, the debt over GDP ratio is not a problem, but the growth of public debt, the use of these loans and the level of public debt sustainability are seriously problems.

4. Conclusions

In the context of the current crisis, European economic perspectives are uncertain and subject to some considerable risks. The recovery process is dependent on Member States' strategic measures and their effectiveness.

From this perspective we believe that our country will have serious problems in 2011 regarding economic recovery, managing inflation, unemployment, public deficit and public debt. We believe that the current fiscal policy measures increase the risk of aggravating the crisis and uncertainty about macroeconomic developments in our country.

As far as we are concerned, the solutions for the economic and financial crisis should be directed to:

- stimulating economic growth through government spending, in the context of drastic decrease of private demand;
- increase of budget revenues in GDP (by reducing tax evasion, underground economy, by increasing the absorption of EU funds, by increasing collection of resources through a higher tax for those with above-average income and wealth);
- allocation of spending for priorities of sustainable development (infrastructure, education, health, scientific research, social welfare, environmental protection).

Acknowledgements

This work was supported by CNCSIS - UEFISCDI, project number PN II – RU PD 650 (postdoctoral program)

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Abbreviations and symbols:

EU-27 = European Union after 1 January 2007, with 27 Member States

Member States EU-27: AT = Austria, BE = Belgium, BG = Bulgaria, CY = Cyprus, CZ = Czech Republic, DE = Germany, DK = Denmark, EE = Estonia, EL = Greece, ES = Spain, FI = Finland, FR = France, HU = Hungary, IE = Ireland, IT = Italy, LT = Lithuania, LU = Luxembourg, LV = Latvia, MT = Malta, NL = Netherlands, PL = Poland, PT = Portugal, RO = Romania, SE = Sweden, SI = Slovenia, SK = Slovakia, UK = United Kingdom

Euro Zone (EA 16) = BE, DE, EL, ES, FR, IE, IT, LU, NL, AT, PT, SI, SK, FI, MT, CY.

The Image of the Tourism Destination – a Supporting Element in the Development of the Regional Tourism Brand Study Case: Muntenia*

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Abstract. *Nowadays, tourism destinations are increasingly determined to convey an unique and competitive identity within the consumer's mind. Despite the fact that a growing attention has been paid to the destination brand, in practice there is an inconsistency and sometimes an inexplicable lack of empirical academic studies, thus in some countries (without “a tradition in tourism”) there have been developed, shortly, artificial tourism brands without any substance and argumentation based on real images/perceptions of the tourists/prospects. This work aims to highlight the role that the tourism destination image plays in the development of the own brand and to identify the main tourism attractions and forms of tourism associated with each historical region of Romania.*

Keywords: tourism destination; tourism image; regional tourism brand; forms of tourism; destination marketing.

JEL Code: M31.

REL Codes: 14F, 14G.

* The other regions will be presented in the following issues.

Introduction

Considered to be one of the most important activity sectors at a global level, the tourism involves also other connected services such as transport systems, information and communication technologies, alternatives for recreation and relaxation (Dobrea, Ștefănescu, 2008, p. 40). In 2010, the travel and tourism industry generated 9.3% from the global GDP and assured around 236 million workplaces (World Travel & Tourism Council, 2011). For 2010, the same organization forecasted for Romania a direct contribution of this sector of 1.9% from GDP and the direct industry employment was estimated to be at 267.000 jobs.

All historical regions of contemporary Romania (Muntenia, Oltenia, Banat, Crișana, Transylvania, Bucovina, Maramureș, Moldavia and Dobrogea) are considered to be, in the same degree, micro-destinations with high tourism heritage, having numerous natural, artistic, cultural, historical and gastronomic attractions, fact that confers the tourists from worldwide unique, unforgettable experiences, that these may want to repeat.

1. Conceptual framework

The changes in the tourism sector, due mainly to the competition between the tourism products/destinations, as well to the more complex requirements and expectations of all categories of tourists, especially high-income tourists, constrain tourism destinations to become brands administrated exclusively from a strategic perspective.

The brand destination was defined by Ritchie & Ritchie (1998, p. 103) as “a name, symbol, logo, word mark or other graphic that both *identifies* and *differentiates* the destination; furthermore, it conveys the *promise* of a memorable travel *experience* that is uniquely associated with the destination; it serves to *consolidate* and *reinforce the emotional binding* between visitor and destination”.

The importance that destination brand gained during the time was anticipated one decade ago by Morgan & Pritchard (2001, p. 214), that stated: “the battle for customers in tomorrow’s tourism industry will not be for price, but for the customers’ hearts and minds – in essence, the branding (...) will be the key to succes”.

Brand identity and brand image are necessary ingredients for a successful destination brand (Qu et al., 2010, p. 2). While the identity is created by the sender (the destination marketer plays in this case a critical role) and it is supported by all or just a part of the tourism (natural and/or artificial) attractions, histories, people, with other words, elements that might later

become motivations of choice, the image is perceived by the receiver and it is supported by the previous experiences and communication strategies of the sender (adapted after Kapferer, 1997, p. 32). Between these two concepts, in most of the cases, there are some differences due to the fact that tourists within their selection process of the tourism destination take into account characteristics such as natural monuments, climate, infrastructure, art monuments, etc., and/or intangible characteristics such as freedom, security, relaxation, energy, etc. Thus, the determination of the target market is essential in destination marketing, since certain aspects of a destination may be positive for a segment and negative for another (Fan, 2006, p. 11).

A sensitive issue of the destination marketing is represented by the fact that the brand identity must remain constant, while the destination image can change over the time due to external/objective factors, or must be renewed after a certain period of time – due to internal/subjective factors (adapted after Mazurek, 2008, p. 31).

Henderson (2007, p. 262) defined the destination image as being “multidimensional, with cognitive and affective spheres (...) an amalgam of the knowledge, feelings, beliefs, opinions, ideas, expectations and impressions that people have about a named location”.

The relationship between brand identity and brand image is mutual (Figure 1). The brand image is a reflection of brand identity and plays an important role in its building. Based on the projected brand identity and through the communication strategies elaborated by the destination marketer, the tourist creates in his mind a destination image, image that is an important factor for the future option. The satisfaction or dissatisfaction that the tourist feels regarding a purchased tourism product depends mainly on the expectations that he had from the destination, on destination image previously held by him and how he perceived the performance at the destination (Pike, 2002, p. 543).

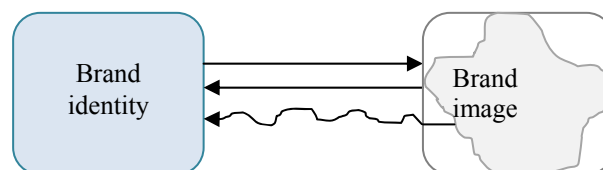


Figure 1. *The relationship between brand image and brand identity*

Keller (1993, p. 4) classifies the brand associations into three major categories: attributes, benefits and attitudes. According to the author, attributes are those descriptive features that characterize a brand. In other words, an

attribute is what a tourist thinks the brand is or has to offer and what is involved with its purchase or consumption (Qu et al., 2010, p. 3). The benefits that may arise are represented by the personal value that tourists associate with brand attributes in the form of functional, symbolic and experiential attachments – namely, what tourists think the brand can offer them. Brand attitudes are tourists' overall assessments of the brand and represent the underlying mechanism for the consumer behavior (e.g., brand choice).

Therefore, in order to build a destination brand, the marketer must take into account both cognitive and affective skills. Thus, he/she must establish the form/forms of tourism that prevail, and subsequently the appropriate tourism product or products, especially since the tourism destination is not a mere city, but a region (country).

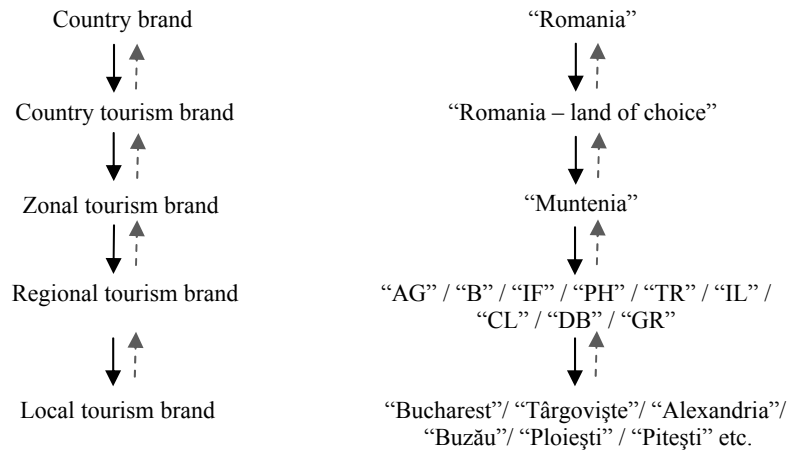
In the context of the current global economy, tourism destinations are in a permanent territorial competition. Since many destinations offer the same product (same territory, same infrastructure, same public education system), they must identify, valorize and promote their competitive (and/or unique) advantages that they held, in order to compete at global level for investments, tourism, political power, etc. (Messely et al., 2010, p. 20).

A region with an effective brand emphasizes elements such as: nature, landscapes, good weather, relaxing ambiance, accessibility, infrastructure (all form the artistic image), and also historical traces, art monuments, regional culture (customs and traditions, spectacles and events), tourism reception facilities (hotels, motels, restaurants, bars, etc.), regional gastronomy (all form the psychological image), stimulates the regional economy (through own products and services that are offered and consumed) and may contribute to the sustainable development of the whole region.

As the national identity „is not anything else than a summum (and, at the same time, a syntheses) of the regional identities (Moțoc, 2011, p. IV), the national brand too has to constitute itself as a summum and a syntheses of individual / local and regional brands, in order to support the development of a nation (or of a community) by pointing out, by converging themes, the common values, principles and beliefs“ (processed after Brad, 2011, p. V).

Stăncioiu et al. (2009, p. 287) highlight the great importance that “the family of brands” holds in order to create the identity of a region as a tourism destination. Due to the existence of a great variety of forms of tourism that can be practiced in our country, in the elaboration of the strategy for Romania's tourism brand, seen as tourism macro-destination, it is necessary to pass through the following successive stages (starting with the country brand): the country tourism brand, the constituent regional tourism brands, local community brand, individual tourism brands (Figure 2). The regional brands

(e.g., Muntenia brand) are influenced by the local brands, namely by the individual brands (Figure 3). The individual tourism brands must be starting points in the building process of the regional brands, which will constitute essential elements, absolutely necessary for the country tourism brand.



Source: adapted after Stăncioiu A.-F., Pârgaru, I. Mazilu, M. (2009): “Brandul destinației – câteva repere conceptual-metodologice în marketingul destinației”, *Proceedings of the The Second International Tourism Conference “Sustainable Mountain Tourism – Local Responses for Global Changes”*, Eșelnița, Drobeta-Turnu Severin, published by Universitaria Publishing House, Craiova, 2009, p. 288.

Figure 2. Family of tourism brands of Muntenia tourism brand

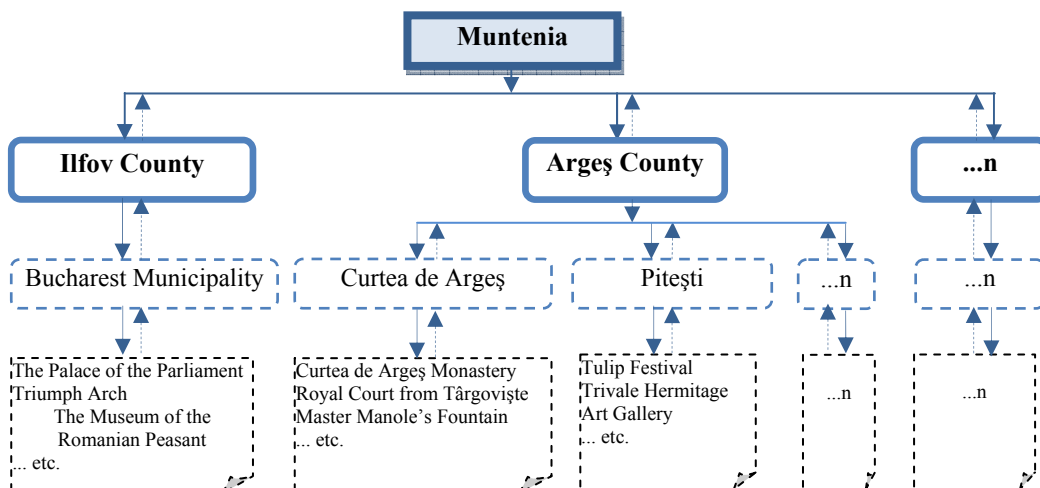


Figure 3. The regional tourism brand of the micro-destination Muntenia

To enhance the image of a tourism destination, starting from the peculiarity of the perceived image by the residents of various tourism regions, this study is necessary to be carried on with the perceived image of the foreigners (whether tourists or visitors, i.e. temporary users), of non-visitors (those that do not wish to visit the destination in the following period of time from emotional and rational reasons), then of return visitors (those that keep in mind particular images and later compare them to the existing image) and ending with the perceived images of the professionals who record, analyze and then create artistic or psychological images (adapted after Stăncioiu et al., 2009, p. 285).

The sum of the above mentioned perceptions builds the tourism destination image. The importance of an accurate analysis of the destination image arises from the fact that the following stages in the strategic planning of the destination, namely the audit (destination audit and marketing audit), the market segmentation and targeting, the SWOT analysis (of the destination and of every market segment), the determination of positioning objectives (for destination marketing and branding), and then, considering the tourism products provided by the main competitors (competitor analysis), the determination of the marketing objectives to attract each settled target market must all be performed in the same time as they are common to both the marketing planning of the tourism organization and the elaboration of the destination brand strategy.

2. Methodological framework

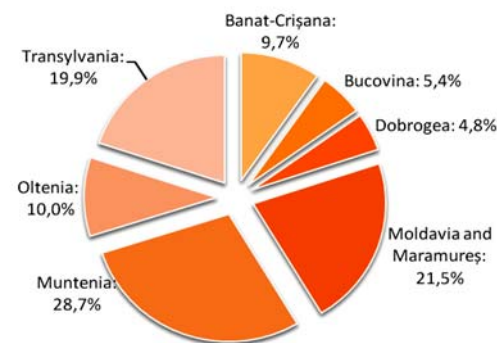
The aim of the research, assuming that the country brand includes the brand regions under its umbrella, was to identify to what extent perceptions of the residents from different regions of Romania regarding each region may help in the construction of its identity and image, and also in the elaboration of the destination marketing strategy. The knowledge of the respondents regarding the other tourism micro-destinations of Romania, their feelings and sensory experiences provide a great opportunity to have an overview of their perceived and/or experienced identity in the places that they have visited.

Thus, it was intended to identify the main forms of tourism for each region and the representative tourism attractions, that young people aged 20-24 years, actual and potential tourists, associate them with different micro-destinations of Romania (Muntenia, Oltenia, Banat, Crișana, Transylvania, Maramureș, Bucovina, Moldavia, Dobrogea). In October-December 2010 – January 2011, a statistical survey was conducted within more Romanian university centers (Bucharest, Brașov, Sibiu, etc.). In order to ensure the representativeness, four regions (Banat, Crișana, Moldavia and Maramureș) were merged into two, namely Banat-Crișana and Moldavia and Maramureș.

The main objectives of the research were:

- a) to identify the predominant form of tourism for each historical region of Romania, no matter of origin of the respondents;
- b) to identify the representative form of tourism for the selected destination taking into account the region of origin of the respondents;
- c) to highlight the tourism potential (natural and anthropic) of the historical region;
- d) to identify some representative tourism attractions that may contribute to the (artistic and psychological) image of the tourism micro-destination.

The sampling unit was represented by 1887 young people, aged between 20-24 years, persons with ongoing studies. In terms of age category and territorial distribution for Romania, according to the methodology established in the speciality literature, the sample is representative (Figures 4a and 4b).



Source: INSSE (2008/2009)

Figure 4a. The distribution of the population with age between 20-24 years old within the historical regions of Romania

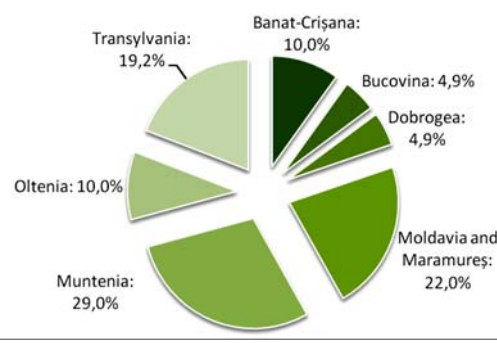


Figure 4b. The distribution of respondents by region of origin

The method used was the statistical survey and the instrument was the semistructured written questionnaire completed by the respondent.

In order to deal, as efficiently as possible, with the complex problem of the Romania's macro-destination image, the research will be presented in detail for each tourism micro-destination.

3. Case study: micro-destination Muntenia

Located in the southern part of the country, the tourism micro-destination Muntenia is geographically confined as follows: by the Carpathians to the North (bordering on Transylvania region), by Olt River to the West (bordering on Oltenia region), by the Danube River to the South and to the East (bordering

on Bulgaria and Dobrogea region) and by Milcov, Putna and Siret rivers to the North and East (bordering on Moldavia region) and incorporates three landforms (mountains, hills and plains). The area covers the counties and territorial units below: Argeș, Brăila, Călărași, Dâmbovița, Giurgiu, Ialomița, Ilfov, Prahova, Teleorman and the Bucharest Municipality. Among the major cities of this historical region are: Bucharest, Alexandria, Brăila, Buzău, Călărași, Giurgiu, Pitești, Ploiești, Slobozia and Târgoviște.

According to the classification of the forms of tourism proposed by the World Tourism Organization (WTO/UNO) in 1979, which starts from the reasons guiding the choice of tourism destination (business and professional tourism, medical spa tourism, cultural tourism, leisure tourism, visiting friends and relatives and other forms of tourism), respondents were able to select the main form of tourism prevailing in that region.

The following figures resulted: 40.3% of the respondents considered *the leisure tourism* as being specific for this region, 23.9% chose for such form of tourism *visiting friends and relatives*, 15.9% selected *the cultural tourism*, 11.0% chose *business and professional tourism*, 5.2% opted for *other forms of tourism*, while as little as 3.7% considered *medical spa tourism* to be representative (Figure 5).

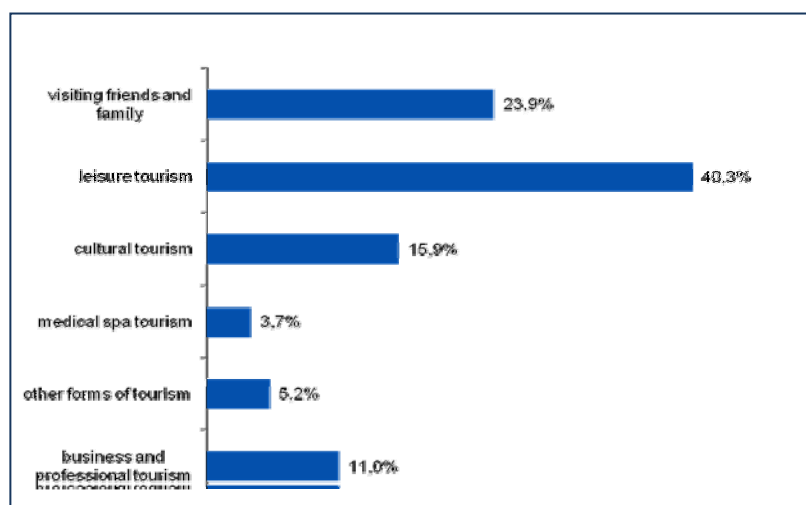


Figure 5. The distribution of the forms of tourism for the micro-destination Muntenia

Taking into consideration the regions of origin of the respondents, it may be noticed that *leisure tourism* is constantly top-ranked as the main form of tourism in this historical region, being often followed by cultural tourism and visiting friends and relatives (Figure 5). The last place belongs in general to the medical spa tourism. Given the regional structure above, things look as follows (Table 1):

- 1) Muntenia as region of origin:
 - 38.1% of the respondents considered as the representative form of tourism for their region of origin *the leisure tourism*;
 - 27.1% opted *visiting friends and relatives*;
 - 15.5% selected cultural tourism;
 - 11.7% chose business and professional tourism;
 - 3.9% of the respondents – other forms of tourism;
 - 3.7% opted for medical spa tourism.
- 2) Oltenia as region of origin:
 - 44.4% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 15.3% opted for *cultural tourism*;
 - 13.9% chose business and professional tourism;
 - 12.5% selected other forms of tourism;
 - 11.1% of respondents – visiting friends and relatives;
 - 2.8% opted for medical spa tourism.
- 3) Banat-Crişana as region of origin:
 - 42.8% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 22.0% opted for *cultural tourism*;
 - 19.8% chose visiting friends and relatives;
 - 7.7% selected the business and professional tourism;
 - 4.4% of respondents – other forms of tourism;
 - 3.3% opted for medical spa tourism.
- 4) Transylvania as region of origin:
 - 46.4% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 19.7% selected *visiting friends and relatives*;
 - 11.9% chose business and professional tourism;
 - 8.1% chose medical spa tourism;
 - 7.7% of the respondents – cultural tourism;
 - 6.2% opted for other forms of tourism.
- 5) Bucovina as region of origin:
 - 39.1% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 21.8% opted for *cultural tourism*;
 - 14.7% chose visiting friends and relatives;
 - 11.2% of the respondents chose other forms of tourism;
 - 8.8% selected business and professional tourism;
 - 4.4% opted for medical spa tourism.

- 6) Moldavia and Maramureș as region of origin:
- 42.5% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 23.9% selected *visiting friends and relatives*;
 - 14.2% chose the cultural tourism;
 - 9.7% of the respondents chose other forms of tourism;
 - 6.7% opted for business and professional tourism;
 - 3.0% of the respondents chose the medical spa tourism;
- 7) Dobrogea as region of origin:
- 39.5% of the respondents considered as the representative form of tourism for Muntenia region *the leisure tourism*;
 - 23.3% opted for *cultural tourism*;
 - 16.3% chose business and professional tourism;
 - 13.9% selected visiting friends and relatives;
 - 4.7% of the respondents opted for the medical spa tourism;
 - 2.3% of the respondents chose other forms of tourism.

Table 1

**The distribution of the responses by forms of tourism
and by region of origin of the respondents (%)**

Region of origin of the respondents \ Forms of tourism	Business and professional tourism	Other forms of tourism	Medical spa tourism	Cultural tourism	Leisure tourism	Visiting friends and relatives
Muntenia	11.7	3.9	3.7	15.5	38.1	27.1
Oltenia	13.9	12.5	2.8	15.3	44.4	11.1
Banat - Crișana	7.7	4.4	3.3	22.0	42.8	19.8
Transylvania	11.9	6.2	8.1	7.7	46.4	19.7
Bucovina	8.8	11.2	4.4	21.8	39.1	14.7
Moldavia and Maramureș	6.7	9.7	3.0	14.2	42.5	23.9
Dobrogea	16.3	2.3	4.7	23.3	39.5	13.9

The respondents' choice of *leisure tourism* as the representative form of tourism for the micro-destination Muntenia can be mostly explained by the presence of the famous Prahova Valley mountain resorts that provide a natural landscape for relaxation and revigoration.

References made by respondents to the natural and anthropic tourism resources of the tourism micro-destination Muntenia are illustrated by order of relevance in Figure 6.

Natural and anthropic tourism resources above may represent the core of the future tourism product/products, depending on the form of tourism that the tourism destination marketer plans to develop after the identification of the needs and wishes on the target markets.

A. NATURAL POTENTIAL	% of respondents
topography: Bucegi Mountains, Făgăraș Mountains, Muddy Volcanoes, Bărağan Plain, Ialomicioara Cave, etc.	15.6
climate/climatic elements: cold environment, drought, heat, mountain air, etc.	1.9
hydrography: Danube River, Argeș River, Amara Lake, Salt Lake, Urlătoarea Waterfall, etc.	5.0
flora and fauna: Retezat National Park, Bucegi National Park, etc.	4.0
natural monuments: Sphinx, Babele.	1.1
B. ANTHROPIC POTENTIAL	% of respondents
historical traces and art monuments: Peleş Castle, Peleşor Castle, Chindia Tower, Palace of the Parliament, The Royal Court of Târgoviște, Poienari Fortress, Triumphal Arch, Snagov Palace, etc.	9.7
elements of ethnography and folklore: folk music, sculpture camp from Măgura, gastronomy, customs and traditions, folk dances, Teleormanul Folk Ensemble, etc.	2.8
museums and memorial houses: The Clock Museum, The "Grigore Antipa" National Museum of History, The National Museum of Geology, The Museum of the Romanian Peasant, The Amber Museum (Buzău), The Petroleum Museum from Ploiești, "George Enescu" Memorial House, "Iulia Hașdeu" Memorial House, "Liviu Rebreanu" Memorial House, etc.	1.9
cultural – artistic institutions: Romanian Athenaeum, Romanian Opera, Odeon Theatre, monasteries (Dealu Monastery, Curtea de Argeș Monastery, Suzana Monastery, Zamfira Monastery, Pasărea Monastery, Ghighiu Monastery), etc.	7.5
events: Tulip Festival, sports contests.	0.1
contemporary constructions: Vidraru Dam, Paltinu Dam, botanical gardens, zoological gardens, recreation lakes, industrial exploitations (natural gas, petroleum), recreation centers, shopping centers (malls), ski slopes, harbors, university and business centers, parks, luxury hotels, etc.	6.3
economic units: Dacia Pitești, factories, refineries, etc.	0.4
human settlements: Bucharest, Curtea de Argeș, Târgoviște, Buzău, Pitești, Sinaia, Bușteni, Slănic Prahova, Sărata Monteoru, Alexandria, Ploiești, Valea Călugărească, Amara, Băile Pucioasa, Videle, Brăila, Călărași, Câmpina, Snagov, etc.	32.4
C. MISCELLANEOUS	% of respondents
personalities: historical (Vlad Țepeș, Mihai Viteazul, Mircea cel Bătrân, Neagoe Basarab), cultural-artistic (I.L. Caragiale, Panait Istrati, Ion Barbu, Fănuș Neagu, Liviu Vasilică), etc.	1.1
other elements/aspects: people (hardworking, bright, hospitable), affiliation (home, grandparents, family), recreation, crowd, agriculture, etc.	10.2

Source: adapted after Minciu, R. (2001). *Economia Turismului*, Uranus Publishing House, p. 161.

Figure 6. Structure of the tourism potential of Muntenia region

In conclusion, the micro-destination Muntenia benefits from a better appreciation in terms of its anthropic potential as respondents often referred to towns/resorts in Prahova Valley such as Sinaia, Câmpina, Bușteni, Breaza, Comarnic, but also to attractive landscapes and emblematic towns in the region for their portfolio of cultural and artistic attraction points: Bucharest, Buzău, Curtea de Argeș, Pitești, Ploiești, Târgoviște.

Correlating the results concerning the form of tourism that is most specific to the micro-destination Muntenia (leisure tourism) with the results concerning the perception of the respondents regarding the anthropic tourism potential that is often attributed to Prahova Valley and taking into consideration factors such as age and education of respondents and lifestyle of the Romanian people in general, one may conclude that the marketer's task is quite difficult as he/she has to balance the artistic impression that is conveyed by such tangible features as the pleasant environment, relaxing atmosphere and infrastructure with the highly-psychological image characterized by such intangible elements as local culture, sports activities, in other words, "many other things to do" (activities, participation to events, manifestations, etc.), all giving the tourist the feeling of belonging and therefore prompting his/her dynamic involvement in the life of the visited community.

Research limitations

The research addresses only a particular category of the population, i.e. the young people with ongoing studies, aged between 20 and 24 years, and more precisely the current and prospective tourists who may feel like exploring the huge diversity of Romania's landscapes during holidays.

Respondents could select from a range of six forms of tourism (business and professional tourism, spa tourism, cultural tourism, leisure tourism, visiting friends and relatives and other forms of tourism). Apart from these, other forms of tourism may be in place, even a combination of the forms mentioned above (e.g. scientific and cultural tourism, business and cultural tourism and so on); some of them are likely to be considered as umbrella tourism (e.g., the medical spa tourism and cultural tourism).

Another limitation of this research is the fact that, in order to be conclusive, such research should be conducted on a constant/regular basis since the trends in the customer expectation and demand are increasingly higher and complex due to environmental changes and evolutions and to the competitive scramble between tourism destinations.

Conclusions and proposals

After the analysis of the main form of tourism specific to the micro-destination Muntenia (leisure tourism) and of the most frequent associated word, the image perceived by Romanian inhabitants' mind is rather artistic (natural landscape) than psychological. The destination marketer should therefore pay greater attention to those "close to heart" images urging involvement and "hearted" images in which one could interact and not only to the artistic impression.

Similar researches are recommended among other categories of public of various age and educational background that all represent one large segment of the population – the inhabitants – as it was for the appraisal of Muntenia's image as tourism micro-destination, all the more for the assessment of Romania's image of tourism destination (considered in the meanwhile to be a "puzzle of micro-destinations"). Furthermore, to build a "solid" tourism brand for Romania, further surveys among other types of public, namely among strangers (whether tourists or visitors, i.e. temporary users), non-visitors (those that do not wish to visit the destination in the next period due to emotional and rational reasons), return visitors (those who keep in mind particular images and further compare them to existing image) and professionals who record, analyze and then convey technical or humanitarian impressions and assumptions (adapted after Stăncioiu et al., 2009, p. 285) are needed. All such studies should be conducted for each micro-destination of Romania.

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Economic Crises and the Complexity of Animal Spirits Modeling*

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Abstract. *The rationale of this research goes into the origins of the economic crises from a different way of economic thinking, hence the professional interest on bringing again into the light the concept of animal spirits, used for the first time from classic liberals like David Hume, developed by doctrine founder John Maynard Keynes, and captured as groundbreaking economic crisis hypothesis in Nobel Prize laureates' books like George Akerlof. A familiar account of the last financial crisis underlines the collapse of confidence and evaporation of trust which led to failure of corporate governance and easy money policy. Nor were these problems of recent origin; they were rooted in deep structural changes in the economy that date back many years. Financial innovations overheated the world economy and gained steam because of irrational exuberance over a risk free better future. Considering the evidence analyzed in this paper work, this approach of economic crisis through animal spirits puts forward new highlights of economic thought.*

Keywords: animal spirits; economic crisis; financial innovations; risk bank; subprime credit.

JEL Codes: B41, E44.

REL Codes: 1F, 1Z, 2B, 3D, 3F.

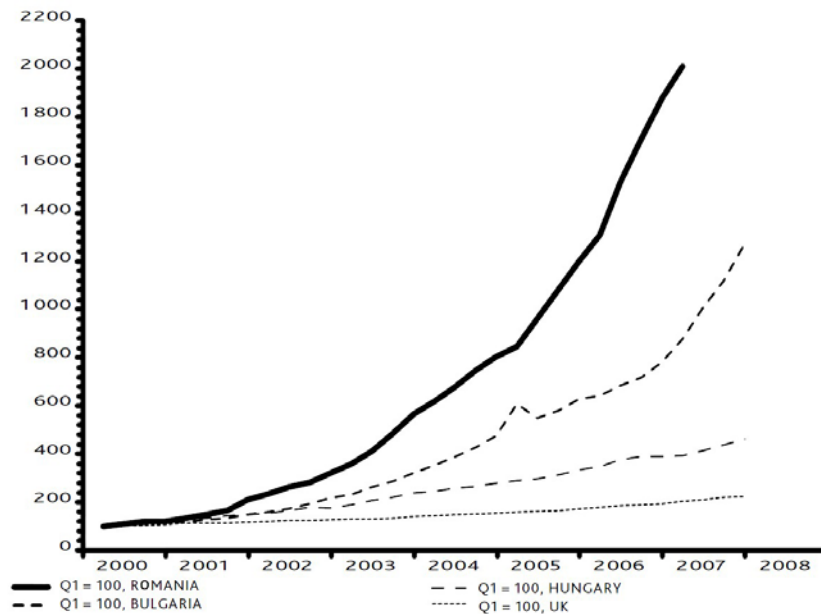
* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

A synopsis of the 2007 economic crisis

Crises are ruled by bursting bubbles, when the gap between the real price of an asset and its market value get an outstanding unsustainable level. This means that a speculative crimson tide finally burst along with the loss of the profits of an entire economic cycle. The bubble hold hands with general rise in debt, because market participants are eager to do whatever it takes to have the money that allow them to be part of the boom (Figure 1). Therefore the credit activity rise as well, and the central banks have to decide which politics is fitting best with the market conditions. Speculative bubbles need to be filled with money, and this is possible on the assumption that rising credit should provide the amount of money to sustain the growth of the bubble, therefore the rise of prices, and eventually of the inflation (Roubini, Mihm, 2010, pp. 22-64, 78-120). Of course, there are speculative bubbles when the rise of prices is not a consequence of credit expansion, but of rising anticipation of market participants, just how in dotcom crisis has happened (Chorafas, 2009, pp. 34-92).

In the summer of 2007 the sudden mania for flipping real estate which had begun in the early 2000 came to an end all over the world, once two hedge funds of Bear Sterns have run into bankruptcy. It was the beginning of the end of a spectacular era, one about people unfortunately thought that will last forever. Businesses and market participants ran out of money and the lack of money made things to go out of balance. It is not difficult to point out who is to blame for crisis, because the aftermath is always easier to understand than the solution to something bad that has just happened.

The get-rich-quick schemes supported by the big American investment banks could be one of the major causes. In the '90 investment banks made mostly property capital business, meaning that the principal amount of capital used in market transaction was constituted from their very own money, white-collars brokers being satisfied by gaining fees from consulting, management advisory, legally consulting, mergers or takeovers advisory and the like. There was of course an important field where investment banks ran supremacy, the stock market.



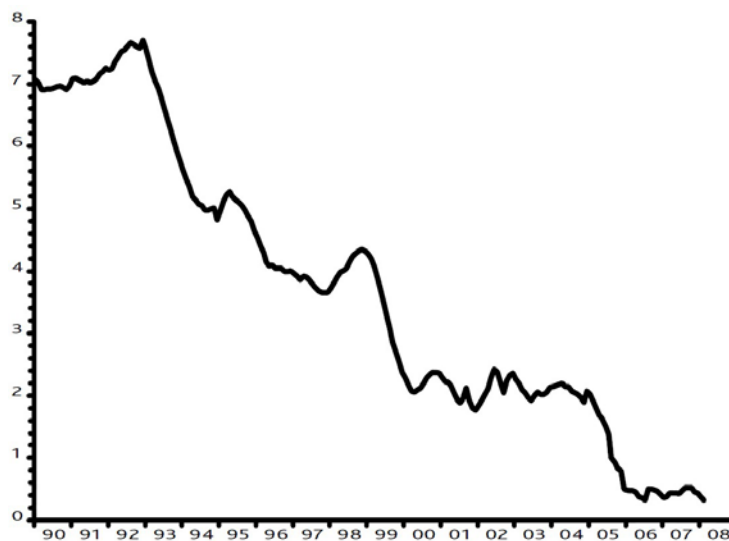
Source: Turner, 2008.

Figure 1. *European debt*

From one year to another, their power rose, as the most shares got in or out from the investors portfolios have passed through these banks' accounts. This particular field from their activity has evolved from the early 2000, up to the point of knowing the investment banks only for the investment consultancy. Because of the financial crisis of 2007, there is no clear view over the efficiency of investment consultancy. Probably all got well because of the tremendous rush for get-rich-quick formulas, which made people irrational exuberant for an easy brighter future. With or without investment advisory, people invested a lot of money, because they were willing to do this. Investment banks like Goldman Sachs, JP Morgan, Merrill Lynch, Bear Sterns or Lehmann Brothers got richer, while investors got richer or confident to get rich in near future. At least nobody complained as long as stock market was in continuous expansion and there were opportunities to cover current losses. It is impressive however how much money had common people and where they came from. People had begun to use their houses as cash machines. If someone needed money, he simply made a mortgage on the house and took a loan. On the assumption that real estate market could only go up, in time the debtor hoped to make another loan, and another, every time the value of the house gained some percents. There weren't many of them who have taken into account the possibility that real estate

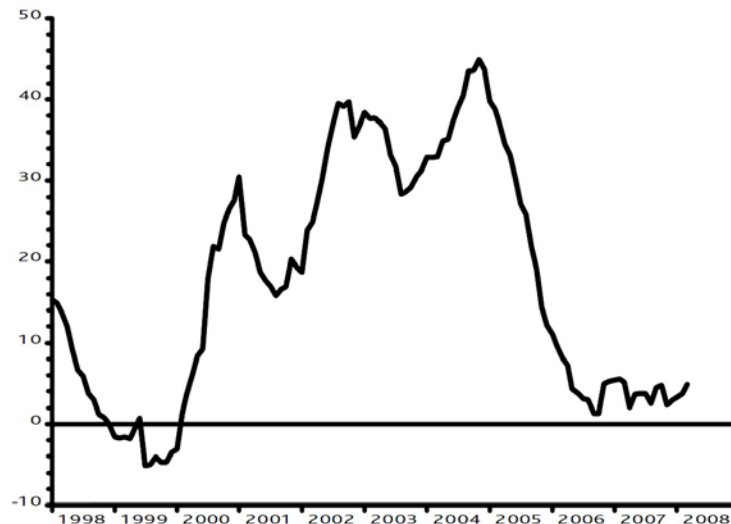
market could go under. People were living beyond their means, but this thing could not last forever. Highly motivated from bonuses, brokers were very persuasive and made people with low credit score to borrow money along with relaxing terms of return, but with pervasive conditions of paying back the money after a year, or a year and a half. Brokers had incentives to do that, but the people who borrowed the money and lived beyond their means didn't even ask themselves for how long could last that (Figures 2, 3). For that instance though, the living beyond the means supported an artificial economic growth (Roubini, Mihm, 2010, pp. 70-142, Krugman, 2009, pp. 27-67, 102-145).

Bubbles need easy money, but leverage as well. Without both of them the bubbles can not expand and not be bubbles in the economic sense. There must have been a source for the money of financial crisis. In the middle 2000 conditions of a crisis as deep as the depression of the '30 began to make the sum of all fears to come true. Then as now, the economy faced the same background: speculative bubble in real estate and stocks, financial innovation, minimal regulation. Fed did little to stem the speculative tide and so did the others central banks from all over the world.



Source: Turner, 2008.

Figure 2. *US Saving ratio*



Source: Turner, 2008.

Figure 3. *US Equity loans*

Market little understand securities like collateral debt obligations (CDOs) and others alike have hidden the risks and allowed some investors, but mostly the investment banks, to get richer on the short run. There was a matter of time until eager to get rich quickly investors wanted to mark their profits. Sooner or later, the economy was to go under. The bubble burst when the supply of houses exceeded the demand for houses (Shiller, 2000, pp. 12-39, 49-100).

Financial innovation – originate & hold vs. originate & distribute

Before '70 a mortgage loan has been made between borrower and the bank. In order to obtain lower monthly rates of return, people might be tempted to choose long time contracts of paying back the money, but for the loaner, as bank, this is not an advantage at all, and even implies some important risks. It is true that the longer is the contract of loan, the greater will be the amount of money returned by the debtor, but during that time anything could happened. Thus, a bank would be very interested to borrow money, but to have them back as soon as possible, having a little less money back, but sooner, therefore with a higher utility. A solution has not been late to be found. A SPV-special purpose vehicle was invented in order to fulfill everyone's expectations:

- people who needed money have just obtained it;
- the lending bank recovered the loan sooner, risk free;

- the investment bank received the fees for consultancy transaction between lender bank and the investors who have bought the SPV as a common share on the stock market;
- investors as stock market participants were pleased to own solid shares backed up from strong real assets like houses, which could only go up.

The common name of SPV has changed in the most specific CDO, marking an important difference between the old and the new way of making financial business. As long as investment banks were doing proprietary trading, their business was to originate & hold, meaning to originate, generate a business from ground zero, then holding the business along with others who put money altogether, for future returns. But holding a business proves to be sometimes the harder part of a business plan, and also the riskiest. So the business has evolved into generate & distribute, generating a business but then letting it go, to someone else willing to accept its risks (Shiller, 2000, pp. 23-89, 102-145, Roubini, Mihm, 2010, pp. 4-48).

Collateral debt obligation is like a sausage. People borrowed money making mortgages on their houses. Investment banks bought the mortgages from the creditor financial institutions or from the lender banks, and put them together into a single financial instrument, a collateral debt obligation. The debtor didn't know that the creditor did that, and they could not do anything about it, anyway (Roubini, Mihm, 2010, pp. 22-28). For example, a collateral debt obligation of one million dollars could be the sum of four mortgages of 250,000 dollars. But just like some sausages are not to be known what they are made from, a CDO was made from many and different mortgages the owners of CDOs couldn't possibly know about. In other words, they enter in a world of moral hazard and awful asymmetric information. A CDO could be a sum of four mortgages, but of a hundred as well. More than this, there was CDOs of the second, and of the third grade. A CDO of the second grade is a CDO made from other CDOs of the first grade, and a CDO of the third grade is made from several or many other CDOs of the second grade. As it can be seen, it is almost impossible to track the origin a CDO, to evaluate it, to monitor the risk, to settle a standard. Thus, CDOs were called Chernobyl Death Obligations. They were fencing the law ever since, and must be prohibited if not highly regulated. CDOs were indeed a financial innovation, but a deadly one, just as atomic bomb. Other financial innovation were granted with trust and promoted by poor regulation:

- interest-only mortgages;
- negative amortization loans;
- teaser rates and NINJA loans (no income, no job or assets for debtor);
- option adjustable-rate mortgages;
- credit default swap insurance from governments.

There were little understand mechanism by the market participants, or even by the financial institution which have been using them, but there was also a common thought that someone, especially the golden boys of Wall Street, City of London or other financial centers, know what they were doing with other peoples' money. Nevertheless, the CDO was the flagship of all this rogue financial instruments. Its structure was as follows:

- equity;
- mezzanine;
- senior.

These types of shares were pies, tranches for banks, after the probability of paying back the loan in advance. Senior was the best shares, with high probability of returning the debt, therefore with AAA rating. But the rating agencies extended the rating of senior shares to equity and mezzanine too, so the entire CDO used the AAA rating, hiding the truth about the risks and sending erroneous data to the market. The rating trap became more dangerous when CDOs were replaced with CDOs of second grade, with tens or hundreds of CDOs, or with CDOs of the third grade, formed by hundreds of CDOs of the second rank. That moment rating activity lost its role of guardian of risk and investors remained defenseless. If that weren't bad enough, there is a interest conflict between who will need the rating and who is paying for it. The most appropriate would be that investors should pay for the rating, not the issuer of the bonds, because they take great comfort in having stocks with good rating scores. It might be the best that investors would pay for the rating, but it still remains the problem of clandestine passenger: some other investors than the ones who paid for them could use the ratings (Krugman, 2009, pp. 65-102, Shiller, 2008, pp. 49-89, Roubini, Mihm, 2010, pp. 34-80).

The use of insufficient tested new financial instruments in United States took place along with low interested rates between 2001 and 2003, what made investors from all over the world to sent their money in America, with low concern about the risk of investments. Fed raised the interest rate between 2004 and 2006, but it was already too late, the money kept coming in United States, feeding the bubble (Taleb, 2007, pp. 24-106).

Subprime credit as a new type of animal spirits

In 1739, David Hume published *A Treatise of Human Nature*, where he used the term of animal spirits in order to trace the origins of human decision making as major field of human nature (Hume, 1739, pp. 62-98, Rogojanu, 2010, pp. 48-62). But the most important economist who has written about animal spirits was John Maynard Keynes who used it in *The General Theory of Employment Interest and Money*. Keynes was interested to find that something

like an engine which determines people rather to act than not to act in the real life. He finally captured the conclusion that aggregate economy might be driven by human sentiments, feelings, like optimism or pessimism. Without animal spirits and using only mathematics and strong economic analysis, people should probably react very shy and doubtful, or even they would not react at all. In other words, animal spirits are the very core of human decision making: “Most, probably, of our decision to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits – a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities” (Keynes, 1936, pp. 161-162).

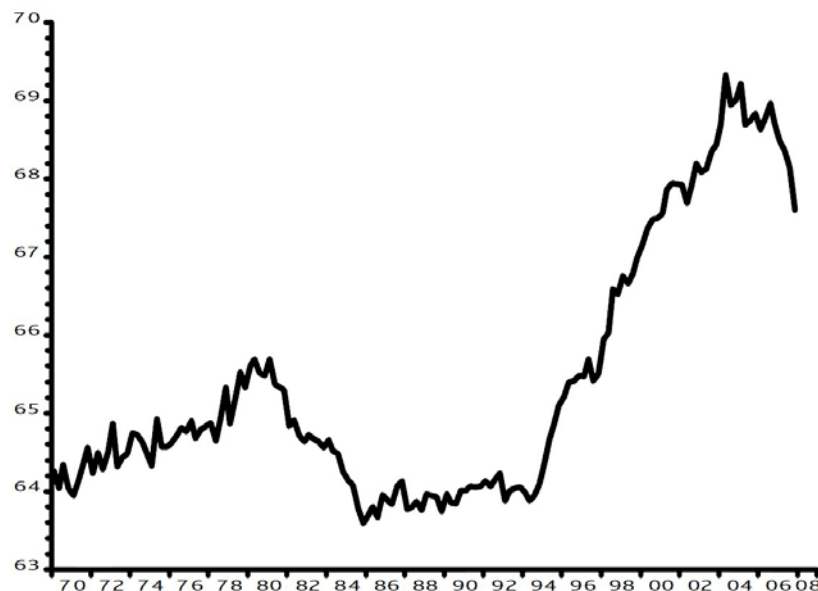
Perhaps Keynes was somehow able to foresee what was going to happen. Subprime borrowers behavior was certainly spontaneous, because otherwise they probably would have thought about consequences on the long run. The present utility of having a lunch is bigger than the utility of having the same lunch next day or next week. But this present utility could be even bigger when the one who has the meal hadn't that kind of meal before. People with unstable and low incomes, therefore also with bad credit scores, have encountered historical opportunities to live a life they normally wouldn't afford to live, but only to dream about. The subprime debtor became a member of a new social class. After all, a subprime borrower has probably thought that he wasn't the only one, so there must have been a logical algorithm somewhere to allow everybody to get richer. Unfortunately, Keynes has pointed out that there is no free meal too, but few gave him credits for that.

John Stuart Mill has been one of the first great modern economic thinkers who had written about economic crises and especially about those crises related on speculative bubbles. According to Mill, a bubble has its ground zero when a market for an innovative product just entered the economic scene. But along with the genuine products, there are always counterfeits because the demand exceeds the supply for the innovative product. This means that people expectations about the future supply of the innovative product will be overrated, because the genuine supply is bigger than normal one predicted, having also counterfeits products included. Shortly the supply will exceed the demands, and the rising price of the innovative product will lose some steam because first counterfeits are already revealed and people lose the trust even in the genuine ones, not knowing which is real, but knowing for sure that there is somewhere a fake. Its price was artificial therefore the market will have a correction and the bubble will burst. The most proper way to explain Mill's approach is to take a look over dotcom crisis from 2000-2001 and over the real estate market evolution from all over the world beginning from 2002-2003 (Rogojanu, 2010, pp. 221-245, Münchau, 2010, p. 201).

In the early 2000 informatics technology (IT) registered a tremendous expansion and technical progress which pushed forward globalization and erase boundaries between countries. IT was a main vector of this new economic age and new opportunities that anyone could hardly imagine few years ago were announcing a glamour super-technologies future where every market participant should have had a laptop connected to internet. This thing has pretty much happened today, but ten years ago IT boom was too advanced for the world economy. A mild recession of nine month fired the fake IT programmers and optic fiber contractors, but the huge stocks of IT inventory has been bought at fire sale prices and used later. There must have been an IT boom at the beginning of this millennium, but not by far one so big. Fake programmers and IT engineers made market participants that the IT is a field bigger than it was in reality and the dotcom bubble grew up to the point when junk bonds of young IT companies have not been able to be sold to anyone.

In the mid 2000, having deregulation, low interest rates and financial innovation, people transformed a traditional strong asset like real estate market into a risky real asset and eventually in a fake one. First of all owners of houses have discovered that they use their houses as cash machines. Couple of years they did well, because the real estate market was on a rising tide and banks lone them money for greater value of the houses. For that particular reason people became interested in houses not for shelter of a home, but for assets suitable of mortgages and new loans. A house rush appeared to come, so many people managed to find money to invest in real estate market (Figures 4, 5). Finding the money wasn't difficult, because credit was lax and interest rate was low. But the growth from this field was artificial, because people didn't need houses, but assets for mortgages. However, real estate bubble would have not been soon lethal without subprime system of credit. If a person is able to answer to all banking requests of a loan, then it could be said that the person is a prime borrower, or debtor, because he is in the first class of debtors. This first class, a prime class, is one of risk free, or lowest risk possible, because the debtor is a person with stable income and high financial score. After the prime class of credit there are of course the second class, the third, and so one, but what really matters is that all of them are subprime, meaning outside the security of the prime criteria. Normally the bank wouldn't lone money to people with bad credit scores, but financial institutions and credit brokers have found in the subprime debtors a new client target, for what was called later NINJA loans. This way the subprime debtors became prime debtors for a while. They enjoyed relaxing terms of paying back the money for a year, or more, but at the end of that period they had to pay all, the principal and the interest up to date. Meanwhile, the financial institutions sold their debts to investment banks

as CDOs, and then investment banks posted the CDOs on the stock market, as shares of hedge funds, convincing investors to buy it, using their reputation to promote them. Hedge funds and retirement funds from all over the world rushed to buy shares backed up by American real estate. But when they finally had to pay the loans, subprime debtors didn't manage to do it, and the investment banks didn't pay the dividends. People became anxious and banks had to execute the subprime debtors. The problem was that all this became a fire sale and the real estate market crumbled, letting investors from all over the world with bonds whose assets were worth much less (Shiller, 2008, pp. 90-142, Zandi, 2009, pp. 87-186).



Source: Turner, 2008.

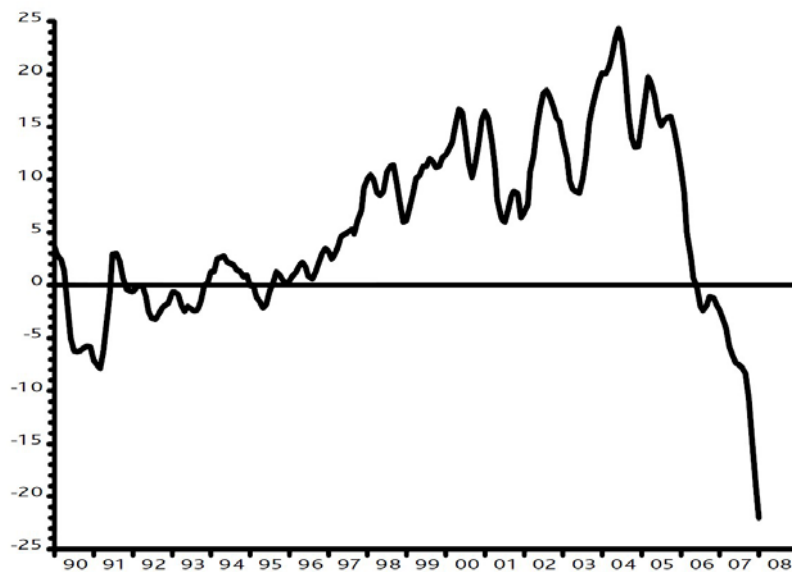
Figure 4. *US Homeownership*

First of all, animal spirits mean need for investments. Up to one point, animal spirits are able to explain some economic behavior of market participants. But sometimes the need for investments become a rush for investments. Hyman Minsky, in his book *Stabilizing an Unstable Economy*, has presented an interested hypothesis, The Financial Instability Hypothesis. According to this hypothesis, there are three kinds of debtors in a credit equation:

- hedge borrowers, who are able to pay the interest and the principal as well;
- speculative borrowers, who are able to pay for sure only the interest. They use to make financial speculations with others' people money

and they will pay the principal only if they win the speculative game, in other words the bet;

- Ponzi borrowers, the most dangerous. Their incomes can cover neither the interest nor the principal. They take comfort in selling their future incomes, betting that these incomes will be bigger and in continuous growth.



Source: Turner, 2008.

Figure 5. *US House prices*

During the boom, the number of hedge borrowers decreases while the percent of speculative and Ponzi borrowers increases. Ponzi borrowers are the first casualties of the financial crisis, because when credit dries out, financial institutions have to accept desperate measures like fire sale, in order to pay their bills. Fire sales make Ponzi borrowers to lose the bet on their future growing incomes, making the crisis deeper. The problem with fire sale is that the prices of assets are getting lower faster than the real shortage of the debt. A good example of that risk is what happened during the Great Depression: between October 1929 and March 1933 the real value of assets grew with 40 percent even the nominal value dropped with 20 percent. This is a nightmare come true, because people have to pay back much more money than the value of the assets in that moment (Minsky, 2008, pp. 99-145).

Risk bank and the lender of last resort

Recent crisis shared much in common with past crises. Greed, foolishness, exuberance are always to blame for crises, but every time people press the trigger and unleash the crisis, different origins requesting different approaches come to light. This time it seems that the pervasive bonus incentive system for unsustainable good economic results on the short run made market participants blind to side effects on the medium and long run. Therefore people took risks beyond their inventory of risk management. More than junk loans and junk investments, there was a antagonistic conflict between investors and boards of listed companies. The last ones wanted to hold the shares and to transform them into strong low-yielding long run securities, while common people with couple of bonds wanted to get rid of them as quickly as possible, as risky high-yielding short run shares. This lack of consensus regarding the future of investments was in fact a proof of corporate governance failure (Taleb, 2007, pp. 23-128, Turner, 2008, pp. 12-48, 56-88).

A central bank has a vital role in the economic mechanism. Related on the central bank are the politics regarding money supply, interest rate and inflation control. The central bank controls the money supply through operation on the open market, buying or selling short-term government debt. In fact, what is commonly known as adjusting the interest rate is not about adjusting or changing anything at all. If there is a risk of higher inflation, then the central bank will simply offer some millions in short-term government debt, in order to restrain the amount of money from the market. The commercial banks will have in their accounts less money than central bank intended to withdraw from the market, therefore they will have to borrow money from the other central banks which have deposits on central bank. The demand for money will grow, and the same thing will happen with the interest rate, a fund rate actually, used by commercial bank for loans made to each other with money deposited in central bank accounts, hence the expression that central banks raised interest rate.

If additional supply of money is required on the market, central banks can do the opposite thing to offer more money to market participants. Commercial banks will not need additional money anymore; therefore the fund rate between them will be lower. Sometimes this new low could be dangerous if the interest rate will reach a value near zero. Central banks do not lend money to commercial banks, but to sellers of government debt, in order to lend the money forward to the banks. But if the interest rate is zero, it might be said that little incentive will be found in order to have deposits to the commercial banks (Krugman, 2009, pp. 101-209, Read, 2009, pp. 29-59).

A bank is in peril of collapsing from two main reasons:

- Loans offered to market participants bring back fewer money than current debts of the bank;
- Bank runs, hence the necessity of accepting fire-sale rescue plans.

More than this, a bank has to return the money it clients asked for, as liabilities payable on demand. But it simply can not do the same thing to the clients who borrowed money from it for long run commitments, because its assets are not payable on demand too. It is possible that things would do fine for a time, but if couple of banks experiences bank runs, then the immediate repercussion over the trust in the banking system will be a bank panic, because of the mismatch of bank assets and liabilities. Once the bank panic burst, even strong solvable banks are in danger of bank runs. To understand bank runs it might be important to understand first of all why banks still use to hold assets that can not be costlessly and quickly liquidated. In order to support this issue, economists Bruce Champ and Scott Freeman made a model of demand deposit banking.

They assumed that here is a financial market where people are trading product y . The analysis is based on the assumption that product y is not traded when people are young. Another assumption is that there are two types of market participants, type 1, one who use the y product in the next period after youth, and type 2, one who use the product in the second period of time after youth. During the childhood nobody knows what type of market participant will going to be. This could be revealed only when an individual person will be mature and will know if will use the product y sooner or later. For simplifying the analysis, the two authors further considered that there is a probability of 0.5 for a market participant to be included in type 1 population, or in type 2 population, not knowing about the others what are their types. Therefore the model will be constructed on the hypothesis that exactly half of each generation belongs to each type (Champ, Freeman, 2004, pp. 23-109, 230-254).

Market participants have to choose between two assets, storage and capital. Storage an asset has the meaning of storing the asset in a basement, warehouse, or account, if the asset is money. Storage pays a rate of return 1 over one period, no matter if this happens in the first period after youth, or during the second. Capital starts to produce interest only in the second period, an interest $X > 1$. During the first period there is no interest, nevertheless the capital can be sold for v^k . Selling capital before its maturity period does not allow the owner to exploit the maximum from an investment; therefore the owner might be tempted to issue fake titles of capital. Thus, capital sold before its maturity period has to be verified with additional costs θ , with $\theta > X - 1$. All these assumptions about assets lead the analysis around the rates presented in the following table:

Table 1

Rates of return for storage and capital		
Effective rates of return to:	One period	Two periods
Storage	1	1
Capital	$v^k - \theta$	X

For capital producing X goods, market participants will pay the present value of X goods. The present value of X is X divided by one-period rate of return from the alternative use of capital, therefore people will pay at most $X/1 = X$ goods in a present time for capital which will worth X goods in future. Therefore $v^k \leq X$, but because $\theta > X - 1$, then $\theta > v^k - 1$ or $1 > v^k - \theta$. As a conclusion, the one-period rate of return for storage exceed the same period returns for capital. If $1 > v^k - \theta$ is not true, then return payment of capital will exceed return over storage in both periods, hence the lack of interest for storage on the long and on the short run as well. A higher probability that $v^k \geq X$ will arise and without taking into account the cost to avoid fake capital titles, some market participant might find short run investments more attractive than the long run safer investments. Thus, the model is based on the assumption that $1 > v^k - \theta$.

The reason people made savings is the greater utility they hope to achieve in the future. In this model economy market participants do not know when they will consume the goods. People have to choose between storage and capital, which is difficult because of need of liquidity. If a market participant owns capital and decides to sell it after one period, he will receive only $v^k - \theta$, instead a better alternative of storage interest rate of 1. However, if the market participants prefer to hold the storage to consume it in the second period, he receives only rate of return 1 instead of X offered by capital alternative. A person who does not know his type at the moment of choosing the assets cannot have secure arguments of receiving the best rate of return. Thus, the rationale of this model should be a solution to grant the best rate of return for a market participant whatever his type would be (Champ, Freeman, 2004, pp. 232-246).

Animal spirits and the investment banking

An intermediary institution, like a bank, could offer a solution by giving each person the rate of return 1 after one period if it turns out that he is type 1 and the rate of return X after two periods for type 2 individuals. Market participants will make a huge deposit to this intermediary institution, letting it to hold their money and to manage the future rate of returns for each period. The intermediary institution will know for sure which person is from type 1 and which from type 2 in order to keep the money for demand deposits, which from

originate bank runs. It is not difficult to clearly views over the market participants' intentions. If a type 1 person pretends that he is in fact type 2, he would be able to consume X instead 1, but only later with a lower utility. If he is type 2 and pretends to be type 1 having access to other type 1 person's demand deposit, then he will gain only 1 instead of X . In fact the intermediary might be a bank whose principal activity should be the providing of liquidity. On the assumption that there is more randomness for an individual than for an aggregate economy, the bank will know to some extent the fractions of depositors who will withdraw the money after one period, or after two periods. Nevertheless, if more than one type 2 persons pretend to be type 1 and want to withdraw early, the bank must sell its capital in order to meet the promises made to its clients. Any client should get 1, but the bank has to sell capital at the price of $v^k - \theta$, which is less than 1, hence the first loses of fire sale. After the bank paid all type 1 deponents and the lying type 2 deponents as victims of bank panic, the bank might not be able to pay anything for type 2 investors who kept calm.

It has come into the light that moral hazard is a speed vector for irrational exuberance on the financial markets. Governments make deposit insurance in order to protect the depositors which will find great comfort in that, especially if bank's investments are targeting risky assets. Having deposit insurance, depositors might not be interested in monitoring the risk and the solvability of the bank. They will only be interested in higher returns, therefore the rush of banks for riskier assets that pay higher returns instead of safer assets that pay lower returns (Farmer, Guo, 1994, pp. 79-129). The problem of moral hazard is strongly related to one of the most critical aspect of animal spirits: the blindness of market participants related to short lasting of economic growth. In other words, analyzing risk bank is like a beauty contest where the audience is impressed by the most beautiful models in that very moment, not into the future. Depositors will be interested in riskier assets for high-yielding returns instead of safer assets on the long run. This is the very animal spirit of the banking investments. People are tempted to hope that economy will everlasting grow, finding dangerous incentives to invest much and riskily on the assumption that nothing wrong could ever happen. George Akerlof and Robert Shiller embedded in *Animal Spirits* the most important economic issues of animal spirits:

- social limits of profit;
- monetary illusion;
- changes into economic equity;
- legends instead facts and figures;
- corruption;
- exuberance and overconfidence.

All these features of animal spirits were backing up false financial economic models people used to gain steam in their economic decisions (Akerlof, Shiller, 2009, pp. 48-59), (Howitt, McAfee, 1992, pp. 40-99).

Investments are always in the shadow of risk. Payments are to be made in the future along with future specific uncertainty. Should depositors find out that their bank's assets are not strong enough to meet its liabilities, they will be afraid enough to cause a bank run and a fall in the value of the bank's portfolio because of the fire sales. Both banks and investors need to be protected against risk. Banks can simply hold larger fraction of their portfolios in safer assets, and can also make attractive offer to depositors giving them the chance to become shareholders. The switch between depositors and shareholders enables bank to have a greater positive net worth W , as illustrated in the following balance sheet:

Table 2

A bank's balance sheet		
Assets		Liabilities
Reserves	γH	H
Interest-bearing assets	$(1 - \gamma)H + W$	W
Capital	$H + W$	$H + W$

The equity holders invest W in return for a share of the bank's value. Depositors have the first claim on the assets, because of the demand deposits. When losses occur, the board will have to redirect resources subtracted from bank's net worth, not from deposits. Only after the net worth falls to zero, the deposits will be in peril. As a conclusion, it might be said that shareholders are the most exposed to the risk (Champ, Freeman, 2004, pp. 248-256). It only depends to some extent could be the risk taken, and how many shareholders are aware of it. This risky exposure might be softening if some of the following economic features could be integrated into economic models, along with the previous animal spirits features (Akerlof, Shiller, 2009, pp. 190-223, Mathews, 1984, pp. 45-90):

- opportunity to learn from experience;
- opportunity to make contacts with market maker, policy-maker, other market participants;
- reputation;
- synergy with other businesses from the same field.

The two first features can be subsumed in a Δ_c^k indicator along with θ and ρ^k in order to adjusting return for the capital in the first period in the previous example. It will be a cost indicator and it should be subtracted from v^k . Δ_c^k is a cost because there are transactional costs and cost of research for creating and maintaining a functionally network between market participants for sharing

experience and information. For the long run an important indicator suitable to be integrated into the model could be reputation of capital which from market participants is expecting returns, presented as Ω^k . Reputation could be either bad or good, hence the representation of it with both the signs. One of the most important indicators which should be taken into account is the rating. After all, the rating agencies have played a distinctive role into the financial crisis by covering the real facts and figures over the economic background and particularly over solvency of major banks or over the security of leading companies' assets. The rates for storage and capital should be adjusted as follows:

Table 3

Rates of return for storage and capital taking into account rating, reputation and experience		
Effective rates of return to:	One period	Two periods
Storage	1	1
Capital	$\nu^k - \theta - \Delta_c^k - \rho^k$	$X(1 \pm \Omega^k)$

Introducing new variables such cost of creating the network, rating and reputation, a new matrix for the rates of return should be available for market participants. From the return of the capital on the short run ν^k will be subtracted not only θ , as a cost already explained, but Δ_c^k and ρ^k as well. This means that, on the short run, ν^k is not only exceeded by 1, but is exceeded by far, because transactional costs such as network and rating could only decrease the profits expected by a person who wanted to transform capital into liquidities after one period. On the long run there are new issues introduced into the model, such as reputation Ω^k , but the weak link in the people's economic thinking was their expectations on the short run, not on the long run.

Conclusions

The new model for rates of return for storage and capital could be a useful indicator for preventing bank runs and further bank panics. The model might be proved useful also for making investors understand that there could not be such a gap between real assets value and their nominal value. The gap is supported by fading lucky stories, hence the hopes of get-rich-quick schemes and the irrational exuberance which has allowed the crisis to burst. On the short run market participants have to accept that there can be hardly higher returns from the capital because of several types of cost which are sometimes hard to be spotted and then integrated into the economic decision making. Targeting high returns on the short run could only be risky, just as financial crisis of 2007 has proved. Introducing variables such as cost for network of sharing information

and experience, rating and reputation is just an example of how complex financial analysis should be. Nevertheless, on the short run rate of returns for capital should be far lower than the rate of returns for deposits. If market participants would have been aware of that, there are reasons to claim that crisis might have been milder or even avoided.

Animal spirits are determinant factors for economics, but unfortunately not yet for economic thinking. Economists should start to review their inventory theoretic knowledge and evolve in their way of economic thinking because economic crises have already evolved. Avoiding an appropriate answer to this new quest should be a confirmation that economic science by itself is in crisis (Dinu, 2010, pp. 318-323, 339-346).

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An Epistemological Perspective on the Quality of Life Concept*

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Abstract. *Any researcher interested in defining the concept of quality of life faces a difficult epistemological task in terms of harmonizing a concept that seems by its very nature subjective and dispersed. Therefore, at present one can not speak of a universally accepted definition of quality of life but a series of different approaches to the concept based on hypothesis, assumptions and methods of analysis and research. From this viewpoint, the main aim of the present paper is to analyze two most known approaches on the concept of quality of life, so as to highlight the epistemological difficulties and challenges inherent to these approaches. Nevertheless, this paper does not seek definitive answers to the epistemological dilemmas, but set into the limelight these difficulties for further encouraging debate on these questions which might advance the state of research.*

Keywords: utilitarianism; epistemology; capabilities; quality of life.

JEL Code: I31.

REL Codes: 2B, 18F.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

1. Introduction

The quality of life is a relatively new concept emerged from the pressing need for a better understanding the complexity of human action from the perspective of its ends: prosperity, welfare, and wellbeing, as concepts transcending mere economic meaning and define a much more complex state of the individual. Although in its inception the concept may be located in economic studies, in a relative brief period of time, it stirred the interest of many scholars from various fields such as sociology, ethics, law, to name just a few, thus acquiring a strong interdisciplinary character. The concept has been validated not only as pure scientific notion, but also as defining element in public policy. One of the most recent proofs in this respect is the foundation in 2008 of the “Sarkozy commission” led by two of the most influential contemporary economists (Amartya Sen and Joseph Stiglitz), with main aim to re-define the measuring methods, from a more qualitative approach of living standards and welfare of people. On the other hand, defining such a complex concept as quality of life is not an easy task, as argued by Nussbaum and Sen (Nussbaum, Sen, 1993, p. 4): “The search for a universally applicable account of the quality of human life has, on its side, the promise of a greater power to stand up for the lives of those whom tradition has oppressed or marginalized. But it faces the epistemological difficulty of grounding such an account in an adequate way, saying where the norms come from and how they can be known to be the best. It faces, too, the ethical danger of paternalism, for it is obvious that all too often such accounts have been insensitive to much that is of worth and value in the lives of people in other parts of the world and have served as an excuse for not looking very deeply into these lives”.

Under these circumstances, the development of various definitions and approaches is a natural result. In the light of so many definitions and approaches, the main epistemological difficulty resides in combining such an array of perspectives on a concept which by its very nature seems subjective and dispersed. The researcher, disciple of traditional epistemology true to scientific objectivity, is faced with the dilemmatic perspective of sacrificing objectivity for accuracy.

From this viewpoint, the main aim of the present paper is to analyze two most known approaches on the concept of quality of life, so as to highlight the epistemological difficulties and challenges inherent to these approaches. Nevertheless, this paper does not seek definitive answers to the epistemological dilemmas, but set into the limelight these difficulties for further encouraging debate on these questions which might advance the state of research.

2. The utilitarian approach

As Sen observed, “Utilitarianism was for a very long time the «official» theory of welfare economics in a thoroughly unique way” (Sen, 2008, p. 5). In this context, the utilitarian approach might be considered as the dominant approach in the philosophy of science for almost two centuries, as the result of, on the one hand, utilitarian philosophy initiated by Bentham and perfected by Mill, and, on the other hand, of registered progress in economic science through inclusion and use in analysis on large scale of the concept of economic utility and mostly marginal utility under its original diverse denominations. This new kind of analysis emerged from the epistemological necessity to offer a viable alternative to the holistic approach with often times inductivist tinges based on the generalization of behavior and economic variables specific to theories initiated by economists traditionally encased in the classical current, fact which, in the end, generated a crisis of the specifically economic instruments and methods. Thus, marginal analysis not only allowed for the pure economic science to surpass the gripe generated by the ascension of holistic currents which foresaw the collapse of free economy, but also created the necessary parameters to develop a new branch in economic science – welfare economics.

In the utilitarian approach, quality of life essentially depends on the level of welfare of the individual, where welfare is defined as the pleasure or desire satisfaction one obtains from using goods or, in broader terms, resources. This simple definition succeeds to elegantly solve two apparently incompatible methodological problems for any social science: the universality of a scientific theory, on the one hand, and individualism which is specific to human behavior, on the other hand.

As the universality of theory entails the identification of a common measure unit, applicable to any case, this definition oriented utilitarian approach towards the interpretation of welfare which would allow a direct relation between the quantity of goods an individual possesses and his or her welfare status. This relationship has been generated by the following rationale of simplifying character which appears to be an eloquent example of the nomological-deductive method described in the Popper-Hempel-Oppenheim model: welfare depends on the satisfaction of the individual, whereas the satisfaction of the individual derives from the consumption of goods. Consequently, welfare is in a relation of direct proportionality with the capacity of the individual to acquire goods. Clearly, this reasoning does not imply that two individuals with a similar quantity of identical goods have the same level of welfare, because in the case of the two, the utility of consumption of the same

type of goods may differ, but, on the other hand, this reasoning shows the path towards better welfare - acquiring and then, consumption of goods.

The ever present temptation offered by the identification of a common feature of a quantifiable financial instrument by means of income and consumption to assess welfare was much too strong not to be followed and to waste time with the appraisal of certain methodological malfunctions that could ultimately and essentially alter the result of the research. Hence, in this way we may explain why important advocates of welfare such as V. Pareto, F.Y. Edgeworth or A. Marshall focused mainly on the way individuals may obtain resources and the way the respective are distributed at the level of society. Under the present circumstances, it becomes obvious that Pareto efficiency or the function of utility does not represent something else than analysis instruments of welfare derived from the above detailed rationale, used as such.

Regrettably, the utilitarian approach of welfare economics and quality of life as they were conceived by traditional economists of welfare eventually fell into the trap of holism as hard as it sought to avoid it. Focusing on the aggregate welfare lost sight of the special character of the utilitarian – the individualist methodology in which the way welfare is distributed among the members of society ought to be decisive. Besides, one of the main criticisms brought to the utilitarian approach is precisely this aggregate feature, the lack of importance regarding the ways in which wealth is distributed among the members of society thus leaving utilitarianism somewhere in between the sum of total of human happiness and average individual happiness.

In fact, the expected fallacy of utilitarianism was instilled, involuntarily, by J.S. Mill from its very inception through what scholars, starting with *Principia ethica* by G.E. Moore use to call the naturalistic fallacy. Mill's confusion between individual desire and desirability, hard as it is to understand for an economist with a sharp methodological sense, showed the restrictions in analyzing aggregate welfare thus directing this approach to the general assumption that the quality of life is reflected exclusively in the subjective state of the person. Following this reasoning, utilitarianism was faced with the apparently insurmountable problem: it cannot warrant the drawing of adequate protective boundaries around the essential interests of individuals, and it does not allow them the space to pursue the personal concerns which give meaning to their lives. This dilemmatic situation further transcends the area of quality of life by Sen who argues: "The utilitarian calculus based on, say, happiness can be deeply unfair to those who are persistently deprived, such as the traditional underdogs in stratified societies, oppressed minorities in intolerant communities, precarious sharecroppers living in a world of uncertainty, sweated workers in exploitative industrial arrangements, subdued housewives in deeply

sexist cultures. The hopelessly deprived people may lack the courage to desire any radical change and often *tend to adjust their desires and expectations to what little they see as feasible*. They train themselves to take pleasure in small mercies. The practical merit of such adjustments for people in chronically adverse positions is easy to understand: this is one way of making deprived lives bearable. But the adjustments also have the incidental effect of distorting the scale of utilities” (Sen, 2008, p. 6).

Presently, for a significant array of researchers, utilitarianism is brought to the forefront under the overshadowing of cold and pragmatic approach, trapped into an intransigent and narrow-minded approach, in which, from one point forward, someone’s happiness may be reached through someone else’s unhappiness and in which quality of life is reduced to a simple problem of distribution of resources and monetary calculus of income and expenses.

2. The capabilities approach

Utilitarianism has received numerous criticisms over time, but perhaps the most powerful critics, those who have managed to irrevocably shake the foundations were those made by John Rawls and Amartya Sen, who, in the end, succeeded to change the utilitarian approach in quality of life with the capabilities and functionings approach showing that, as Sen points: “the value of the living standard lies in the living, and not in the possessing of commodities, which has derivative and varying relevance” (Sen, 1987, p. 25). The individual must not track welfare in the classical sense which can be financially measured, but a superior condition opposed to the current one, which is given neither by the quantity of owned goods, nor by the level of welfare and hence cannot be limited to the evaluation through resources, as Sen confirms: “The central feature of well-being is the ability to achieve valuable functionings. The need for identification and valuation of the important functionings cannot be avoided by looking at something else, such as happiness, desire fulfillment, opulence, or command over primary goods” (Sen, 1985, p. 200). Subsequently, capabilities and functionings approach, according to Sen, renders resources into a much more complex notion, that of capabilities, which transcend economic significance and acquire an interdisciplinary character. In the present overarching, the concept of quality of life undergoes a change of significance via a definition entailing a person's ability to do valuable acts or reach valuable states of being (Nussbaum, Sen, 1993, p. 30). Sen continues, arguing that “The approach is based on a view of living as a combination of various «doings and beings», with quality of life to be assessed in terms of the capability to achieve valuable functionings” (Nussbaum, Sen, 1993, p. 30). The connection between functionings and

capabilities is more clearly established by way of defining capabilities as: “the various combinations of functionings (beings and doings) that the person can achieve”. Capability is, thus, a set of vectors [or n-tuples] of functionings, reflecting the person’s freedom to lead one type of life or another... to choose from possible livings’ (Sen, 1992, p. 40) or, to put it differently, “Functionings represent parts of the state of a person – in particular the various things that he or she manages to do or be in leading a life. The capability of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose one collection” (Nussbaum, Sen, 1993, p. 31).

At first glance the progress of such an approach is quite obvious: analysis concentrates on the individual personality, expanding at the same time the area of significance of living standards and quality of life much beyond possession or resource accumulation. In fact, the real progress made by this approach is given by the revaluation of the concept of quality of life by calling the following reasoning: quality of life derives from emotional states and these states are not limited to material means (Alkire, 2009, p. 3)

Nevertheless, once with the progress and the extension of the term, there follows the methodological paradox of how can one commensurate and compare interpersonally, the elements which give value to the quality of life, since “they can not be mechanically reduced to a single common denominator, such as happiness or utility” (Alkire, 2009, p. 3). Moreover, for the accuracy of argumentation, we should highlight the fact that the capabilities approach confronts itself with two evaluation shortcomings: one at the level of the element aggregation which composes the living standard and another regarding the tangible assessment of these elements. This difficulty is also observed by Sen (Nussbaum, Sen, 1993, p. 32), who argues: “In an evaluative exercise, we can distinguish between two different questions: (1) What are the objects of value? (2) How valuable are the respective objects?”

One of the most frequent solution is suggested by Alkire, who points: “Rather, the capability approach is applied differently depending on the purpose of the measure, the place and situation (or, if comparability is required, the places to be compared), the level(s) of analysis, the data available, the institutions it will guide, and the kind of analyses that the measure will catalyze or inform. The methods by which it is applied are, similarly, plural. The concrete purpose of the application provides necessary definition” (Alkire, 2009, p. 7). This solution solves the problem of quantification transferring it into the area of public policy and methodological instrumentalism which suggest that any solution is good as long as it is applicable. This way: “The identification of a space does not foreclose the possibility of using different indicators – including subjective and resource indicators – to better understand

quality of life. Capabilities can also be analyzed using quantitative, qualitative, participatory, and subjective data, and using administrative, census, survey, and institutional data” (Alkire, 2009, p. 7). This manner of approach has been otherwise suggested by Sen, who argued: “While the identification of value-objects and the specification of an evaluative space involve norms, the nature of the norms must depend on precisely what the purpose of the evaluation is” (Nussbaum, Sen, 1993, p. 35).

Also, the previously proposed solution maintains that the quality of life concentrated on the individual as fundamental unit of analysis, but one remark is promptly added in order to rescue from the assumption that this solution is in any way subordinated to methodological individualism: “The capability approach adopts what Robeyns (2008) calls ethical individualism, but does not adopt other kinds of individualism (to which many, rightly in our view, would object) which she calls ontological and methodological individualism” (Alkire, 2009, p. 8). Not only is this form of individualism different from ontological individualism, which assumes that society is made up of a collection of individuals who dispose of certain properties, and from the methodological one, which argues that any social phenomena may be explained through human action, but it is the only form of individualism that proves to be applicable to capabilities approach. It is clear thus, that there is an elevated form of individualism, as approach opposed to holism, which “does not allow the achievements of a group to be celebrated without taking note of deprivations and unfreedoms that certain members of the group may quietly suffer” (Alkire, 2009, p. 8).

Thus, in an almost imperceptible manner, the capabilities approach enters in the shallow waters of ethics and value judgments, by means of a mechanism directly transient from the phenomenon that David Hume observed a while ago: “In every system of morality, which I have hitherto met with, I have always remarked that the author proceeds for some time in the ordinary way of reasoning, and establishes the being of a God, or makes observations concerning human affairs; when of a sudden I am surprized to find that instead of the usual copulations of propositions, is, and is not, I meet with no proposition that is not connected with an ought, or an ought not. This change is imperceptible; but is, however, of the last consequence. For as this ought, or ought not, expresses some new relation or affirmation, ’tis necessary that it should be observed and explained; and at the same time that a reason should be given, for what seems altogether inconceivable, how this new relation can be a deduction from others, which are entirely different from it.” (Hume, 2000, p. 334).

But which is ultimately the danger in judgment values? Supporters of capabilities approach would answer that none, demarcating themselves categorically from the traditional epistemological vision. While, traditional epistemology and especially positivist would answer that the greatest danger with value judgments lies in the disappearance of the criterion of demarcation between science and common knowledge; supporters of capabilities approach argue that we have come to that point where scientific progress is no longer possible if one does not accept value judgments as viable working hypothesis. The adepts of capabilities approach argue for their position by two means: on one hand, they attack the difficult, artificial and abstract character to be applied of logic positivism by using, among other, Duhem-Quine hypothesis of the impossibility of individually testing one possibility (Nussbaum, Sen, 1993, p. 143) and, on the other hand, by supporting choice of hypothesis, essentially of the operators used in the analysis of quality of life, cannot be pursued if not appealing to value judgments. This argument suggests that no social science can be disinterested, as value judgments reside in the larger interest depleted over one economic theme in disfavor of another. In other words, always “assumptions are impregnated in value”, because they are the result of a researcher's choice that is subjective by definition. The argument is sustained by the capabilities approach in the following rationale: If the interest to select a particular problem or approach may be the result of value judgments, the objective nature of science can be maintained by a research method based on logical arguments and/or factual evidence.

Ultimately, one last argument in favor of capabilities approach would be that if the researcher overtly assumes judgment values, then his scientific endeavor is as honest as possible and more so, internalizing and discussing these judgment values is the one fact which makes economics more interesting. This is in fact what Sen also points. “There is no escape from the problem of evaluation in selecting a class of functionings in the description and appraisal of capabilities, and this selection problem is, in fact, one part of the general task of the choice of weights in making normative evaluation... The need for selection and discrimination is neither an embarrassment, nor a unique difficulty, for conceptualizing functionings and capabilities” (Sen, 2008, p. 11).

Clearly, the objectivity-value judgments controversy continues in many other areas related with quality of life concept and will continue for a long time. What is noteworthy is that the capabilities approach seems to resist the siege of the traditional epistemological trends, and, moreover, to impose a new vision on methodological approach in quality of life issues.

4. Conclusions

Consistent with the purpose aimed at in the introduction, the present paper concentrated on the analysis from the perspective of epistemological foundations, of two common approaches in the study of quality of life. The analysis of the two approaches, the utilitarian one and the one on functions and capabilities, proves to be interesting from at least three points of view, that can be summarized as follows: (1) they are probably the most known methods to analyze the quality of life; (2) seem to have common source in the area of economic science and (3) the methods promoted by these are the result of opposed epistemological views. On the one hand the utilitarian approach, although generated by the need to overcome an epistemological barrier imposed by the holistic method, in the end gave up to analyze subjective context in favor of an objectivism imposed by the traditional epistemological perspective. On the other hand, the approach based on functions and capabilities seems to have chosen precisely the rationale of context, despite all the risks related to an objective character which can be challenged from the point of view of theories more or less in fashion regarding scientific knowledge. Therefore, both approaches specific to quality of life seem to be the result of crucial choices or sacrifices from the perspective of methodology, fact which may render them vulnerable to criticism directed towards this angle. But, while the utilitarian approach shows that it has exhausted its resources and that it has at least temporarily abandoned the methodological battle, the approach based on functions and capabilities demonstrates that it can successfully face any epistemological controversy, thus proving a viable path in deciphering phenomena and meanings specific to quality of life.

Acknowledgements

This work was cofinanced from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/1.5/S/59184 „Performance and excellence in postdoctoral research in Romanian economics science domain.

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The Natural Rate of Unemployment and its Implications for Economic Policy*

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Abstract. *The analysis of the inflation-unemployment tradeoff has undergone several stages during the post-war era. The first was marked by the acceptance of A.W. Phillips' 1957 hypothesis and the subsequent Phillips curve. The next stage – marked by Friedman's contributions – revealed a vertical long-run Phillips curve and introduced the natural rate of unemployment, designating that level of unemployment consistent with stable inflation. This paper explores the theoretical and empirical implications that have emerged since the introduction of the natural rate concept. At the theoretical level, we find that, far from questioning its existence, the theoretical debates revolve around two main questions: Can we actually determine the precise level of the natural rate and what are the appropriate techniques? and How does the natural rate change over time and what are the factors that influence it? Empirical knowledge, on the other hand, lags behind. Despite numerous empirical studies, economists are a long way from an appropriate quantitative understanding of the determinants and variability of the natural rate, either across time or across countries.*

Keywords: natural rate of unemployment; vertical long-run Phillips curve; expectations-adjusted Phillips curve.

JEL Codes: E24, E31.

REL Codes: 8G, 8I.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?“, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

Up to the beginning of the seventies, the vast majority of research in mainstream economics was focused upon the essential role of the Phillips curve in explaining business fluctuations. Following an extensive empirical study of the growth rate of nominal wages and the growth of the unemployment rate, in 1958, A.W. Phillips had concluded that there existed a negative relation between the two variables (Phillips, 1958). Based on this study, subsequent research extended the analysis: economists examined the existence of a correlation between changes in the inflation rate and changes in the gross national product and discovered a similar negative relationship between the two variables. The most important consequence of these findings was their immediate implication for economic policy: the stable relationship between inflation and output suggested that monetary authorities would be able to reduce the unemployment rate by accepting a higher inflation rate; similarly, the authorities can reduce the inflation rate at the cost of higher unemployment.

The existence of a stable relationship between inflation and unemployment was easily accepted by economists, for it filled a gap in Keynes' theoretical construct and seemed to be the equation that Keynes himself said was missing. In addition, it offered a very useful policy tool, which was accepted as long as it was in line with empirical evidence. Later on, economists noticed that it was hard to maintain this hypothesis in its simple initial form and that higher rates of inflation were required in order to maintain acceptable levels of unemployment.

In reaction to the emergence of stagflation, numerous attempts to fix or correct the hypothesis were made, particularly by taking into account "special" factors, but none of these versions were confirmed by empirical evidence. A more radical revision was needed and this resulted in the incorporation of economic agents' anticipations, which focused on the importance of surprises, namely the differences between the expected and the real levels of various variables. It put forward once again the importance of the distinction between real and nominal variables, by demonstrating the existence of a natural rate of unemployment, always determined by real factors. This rate tends to occur when anticipations coincide with real evolutions in the economy. On the other hand, unanticipated changes in the nominal aggregate demand and in the inflation rate trigger systematic misperceptions among both employers and employees, which initially will determine the deviation of the unemployment rate from its natural level. Still, these deviations are transitory, even though a long period may at times be required to eliminate them, as the adjustment of agents' anticipations occurs.

This apparent consensus was, however, very short-lived: in 1968, Milton Friedman and Edmund Phelps formulated solid theoretical arguments against

such policy recommendations (Friedman, 1968, Phelps, 1968). Starting from microeconomic foundations, the two economists argued that this empirical relationship between inflation and unemployment would collapse if the authorities attempted to exploit it. First of all, they argued that, according to theoretical principles, an artificially-sustained inflation could not have any effect on output and unemployment, because people cared about the real – and not the nominal – variables in the economy. Thus, according to Friedman, excess demand or excess supply on the labour market does not depend on the nominal wage, but on the real wage, because economic agents are rational and they tend to adjust the wages in line with the anticipated price increase. As a consequence, the real issue underlying the Phillips curve concerns the identification of a correlation between the nominal wages growth rate – adjusted with the anticipated inflation rate – on the one hand, and the unemployment rate, on the other. Founded on a quite different approach, Phelps' analysis reaches a similar conclusion: the author constructs models of the labour market, where people strive to find the most advantageous terms of employment. Depending on the information costs and other restrictions on these markets, a certain time passes between leaving a job and finding a new one, which engenders an inherent frictional unemployment. Job seekers will accept that nominal wage which encompasses the anticipations of the price level – in real terms. If the workers' anticipations underestimate the inflation rate, then they will be inclined either to supply more labour – in Friedman's approach – or to reduce the search time – according to Phelps. In essence, the explanation is the same: by anticipating an inflation rate beneath the real rate, economic agents actually overestimate the real wage. At the policy level, this reduction in unemployment is made possible by means of adopting an expansionist monetary policy; in the short run, such policy measures can indeed be effective: by determining an unexpected rise in inflation above the level anticipated by agents, they will lead to a temporary decrease in unemployment. In this manner, over the short term, agents can be "fooled" by the monetary illusion, but only temporarily; economic agents are not blind however, and therefore they will eventually revise their expectations to accommodate the unexpected inflation. As information is disseminated and agents' perceptions are corrected, the gap between the real inflation rate and the anticipated rate will gradually diminish, and unemployment will return to its previous, higher level. Hence follows that monetary authorities will only manage to reduce unemployment temporarily; moreover, they will be confronted with ever higher inflation rates, which will be more difficult and costly to control. In other words, the negative relationship postulated by the Phillips curve is only valid in the short run; over the medium and long term, this relationship does not hold, meaning that the long-run

Phillips curve is vertical. The subsequent economic events came to confirm the theories of Friedman and Phelps: during the seventies, inflation rose constantly, without a permanent reduction in unemployment. The central message of this line of reasoning is pragmatic in nature and has an immediate practical corollary: monetary authorities will never be able to influence unemployment over the medium and long term, because the unemployment rate tends towards a so-called *natural level*, a term introduced by Milton Friedman in 1968 in his Presidential Address to the American Economic Association.

The natural rate assumption incorporates the initial Phillips curve as a particular case, offering interpretations for a much larger scale of economic phenomena, and in particular, stagflation. Still, there exists one phenomenon that this assumption cannot account for, namely the association of higher inflation and higher unemployment. This association may reflect the joint impact of certain events – such as the oil crises – or of certain independent forces that determined a rising trend for both inflation and unemployment.

A feasible explanation refers to a transition period that implies the adaptation of attitudes and institutions to the new monetary framework. Not only is inflation higher, but it is also highly volatile and is accompanied by enhanced state intervention in the price setting process. The increased volatility together with the deviation of relative prices from market prices render the economic system less efficient, introduce perturbations on all markets and are probably the cause of rising unemployment.

Friedman's model assumes that, in the long-run, labour markets clear (i.e. supply of and demand for labour are equal at a single wage rate and level of employment). The actual level of the natural rate itself is determined by the inherent characteristics of the labour market, such as any market imperfections or informational problems. In Friedman's own words, the natural rate of unemployment designates "*the level which would be ground out by the Walrasian system of general equilibrium equations, provided that there are imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility and so on.*" Very importantly, in Friedman's approach, labour market equilibrium and the natural rate do not depend on the growth rate of the money supply, but on the labour supply and labour demand, the optimal search times, as well as other microeconomic considerations.

Over the last four decades a lot of research has attempted to formalize Friedman's definition and to identify the determinants of the natural rate of unemployment, and it is only fair to say that progress in this field has been

considerable. Starting from the natural rate hypothesis – as initially defined by Friedman – macroeconomic research has further extended the analyses, so that today economists speak of the existence and estimation of NAIRU; the acronym NAIRU stands for Non-Accelerating Inflation Rate of Unemployment and reflects that level of unemployment consistent with stable inflation. Note, however, that there are certain differences between the original concept of Friedman and the NAIRU.

The NAIRU hypothesis is based on the New Keynesian imperfect competition model of labour markets. This model assumes that both labour and product markets are imperfectly competitive, due to certain market imperfections – such as trade unions and oligopolistic firms. Labour (through the process of collective bargaining) can therefore demand a *bargained real wage*, whilst firms can set a *price-determined real wage* at which they can earn supernormal profits. The firms' *price-determined real wage* consists of the actual value of output (as determined by the marginal product of labour) minus a profit per worker for the firm.

In the NAIRU model, labour's *bargained real wage* increases with the level of employment. This is because increased employment means that there are fewer unemployed workers looking for jobs, so labour markets become tighter and the bargaining power of labour increases. Unemployment disciplines the workforce. The *price-determined real wage* remains fixed at a set wage rate, on the other hand. This is because it represents the claims of firms on output per worker. The wage rate and level of employment at which the *bargained real wage* and the *price-determined real wage* are equal is known as the NAIRU. This is the wage rate and level of employment at which the competing claims of labour (the workers) and capital (the firms) are satisfied.

A solid theoretical framework has emerged since the natural rate was first introduced and this framework is focused upon two central ideas; first, the labour market is a market with a high level of traffic, with large flows of workers who have either lost their jobs or are looking for better ones. This assumption naturally implies the existence of some frictional unemployment; second, the nature of the relations between workers and firms leads to a wage setting process which often departs from competitive wage setting. And this, in turn, results in a level of unemployment which differs from the efficient frictional level.

As to the theoretical issues surrounding the natural rate hypothesis, nowadays economists do not even question the existence of such a rate; instead the theoretical debates revolve around two main questions: Can we actually determine the precise level of the natural rate and what are the appropriate techniques for an accurate estimation? and How does the natural rate change

over time and what are the factors that influence it? These are crucial issues related to the practical importance of the natural rate: if there exists such a natural rate, but we cannot measure it precisely, then the concept is of no use for policy purposes, but remains a mere theoretical notion; furthermore, if the natural rate is not constant, but changes over time under the influence of certain factors, then we must be able to estimate it effectively at all times, in order to use it in the formulation of economic policy.

Empirical knowledge, on the other hand, sadly lags behind. Despite numerous empirical studies, economists are a long way from an appropriate quantitative understanding of the determinants and variability of the natural rate, either across time or across countries. Several potential factors have been put forward, but economists are still groping for precise answers. However, a major barrier in this direction is the poor integration of the empirical works of labour economists and the theoretical research of macroeconomists, and it is our opinion that such joint work should be encouraged.

Moreover, this slow empirical progress and the lack of coordination with the theoretical research have important consequences for the construction of economic policy; indeed, current analyses are deficient in assessing the policy implications of the NAIRU hypothesis, thus hindering its incorporation into economic policy. Therefore, despite the considerable theoretical progress, public authorities have not significantly changed the way they analyze the economy. The IS-LM model, accompanied by the so-called modern version of the Phillips curve – adjusted to incorporate the rational expectations hypothesis – is still the best framework for the formulation and implementation of economic policy. Governments are reluctant to incorporate the theoretical evolutions of the past thirty years and continue to use very complex macroeconomic models for analysis and forecasting.

Even today, many new Keynesians continue to regard the Phillips curve as an intact structural relationship, once the econometric models of the '60s were adjusted to incorporate supply-shocks together with a vertical Phillips curve. At that point, the theoretical framework seemed complete, and this self-sufficient approach deterred further research, with one exception: regularly testing the stability of the Phillips curve relationship. This, in turn, was determined by the widely-held view that the essential feature of the Phillips curve after World War Two was its stability.

The new classical economists, on the other hand, reject the possibility of postulating a theoretical relationship between inflation and unemployment, thus questioning the Phillips curve and the natural rate hypothesis. In 1978, Robert E. Lucas, Jr. and Thomas Sargent stated that the Phillips curve was but “an econometric failure on a grand scale”, because, over the long term, the negative

correlation between inflation and unemployment used in the macroeconomic models was strongly contradicted by the positive correlation supported by the data (Lucas, Sargent, 1978). Some of these economists turned their attention towards other more pressing issues, because they believed that the inflationary process in the US was stable and the models constructed in the early '80s functioned so well, that there were no more "mysteries" to solve. Other macroeconomists reject the natural rate hypothesis because they see it as an unproductive, failed line of research. According to Robert J. Gordon, numerous neoclassical economists stopped paying attention to the empirical research on the inflation – unemployment tradeoff, thus ignoring the new generation of Phillips curves – as of the late '80s, the new estimates incorporated both a vertical long-run Phillips curve, and supply shocks (Gordon, 1997). These economists turned their attention to constructing theories on fluctuations of the real aggregate output; disappointingly, not only did these models fail to explain the inflation mechanism, they were not even focused on this mechanism.

In his Nobel Prize lecture, Friedman stated that the analysis of the inflation-unemployment tradeoff had undergone two stages in the post-war period and was then preparing to enter a third stage. The first stage was marked by the acceptance of A.W. Phillips' hypothesis, according to which there existed a stable negative relationship between the unemployment level and the rate of wage changes.

By using a simplified model to illustrate the failure of the Phillips curve, Friedman concludes that what really matters is not inflation itself, but rather *unanticipated inflation*. There exists, though, a natural rate of unemployment (corresponding to the second stage of research) which is consistent with the real variables in the economy and with the correct perceptions of economic agents. The unemployment rate can be maintained below this level only by means of accelerating inflation; and, above this level, by means of accelerating deflation. This natural rate of unemployment is not a numerical constant, but depends on real – rather than monetary factors – such as labour market efficiency, competition and monopolies, barriers or incentives to engage in certain occupations" (Friedman, 1997).

The natural rate hypothesis – or the anticipation adjusted Phillips curve, as it is sometimes called in the economic literature – is now widely accepted among economists, although not unanimously: some economists still cling to the initial model of the Phillips curve; other macroeconomists acknowledge the difference between the short-run and the long-run Phillips curve, but continue to consider the latter negative; finally, some researchers substitute the stable relationship between the acceleration of inflation and the unemployment rate by a relationship between the inflation rate and the unemployment rate. A major

part of research is focused upon the exploration of various aspects of this second stage – such as the dynamics of the process, expectations formation or the proper type of economic policy.

And even though the second stage is far from being fully explored, the functioning of the economy has triggered the shift to a new stage. During recent years, the rising rates of inflation have been accompanied by higher – and not lower – unemployment, particularly regarding long periods of time. A simple econometric regression is sufficient to demonstrate the fact that, for these periods, the Phillips curve is positive, and not vertical. The third stage is centered upon the theoretical integration and explanation of this phenomenon. In Friedman's opinion, such an undertaking requires the integration of political variables into economic research as endogenous variables, determined by economic events. And whereas the second stage bears the mark of two major theoretical achievements – those of George Stigler and Gary Becker – the third is likely to be influenced by the application of economic analysis to political behaviour, pioneered by James Buchanan, Gordon Tullock as well as Stigler and Becker.

Friedman also suggested a possible explanation for the phenomenon of stagflation: just as the natural rate hypothesis explains the existence of a negative short-run Phillips curve as a temporary phenomenon which tends to vanish as agents adjust their anticipations to the new economic realities, a positive long-run Phillips curve may also occur as a transition phenomenon which will vanish as agents adjust both their anticipations and their institutional and political arrangements to the new reality. In other words, there is no question about the existence and validity of the NAIRU: the positive Phillips curve observed is determined by a series of economic distortions that can be eliminated through appropriate economic policies.

Moreover, we are now aware that the natural rate has increased in the US due to two major reasons: firstly, women, teenagers and part-time workers represent a growing fraction of the total labour force – due to their higher mobility regarding both market entrance/exit conditions and changing their workplace, these groups have higher unemployment rates; secondly, unemployment benefits and other forms of assistance are larger in volume, are granted for longer periods and are available to more categories of workers. Recently unemployed workers are thus confronted with less pressure to find a new job; in addition, they have the tendency to wait longer and to be more selective in choosing a new job.

The *natural rate* supporters argue in favour of its theoretical and practical utility, based on strong arguments. First of all, these economists claim that NAIRU is a very useful analytical device for understanding the mechanism and

causes of inflation; moreover, at the empirical level, NAIRU represents the basis for inflation forecasting. In the event that the unemployment rate is below its natural level, then the inflation rate rises, and vice versa. From a theoretical point of view, NAIRU captures the way the economy behaves outside equilibrium. Thus, when the unemployment rate is below the NAIRU, the real wages expected by the employees are above those that firms are willing to pay at the current or anticipated price level. This inconsistency is resolved through an inflationary wage-price spiral, in which workers do not get the real wages they expect and firms do not get the prices they desire. As a result, inflation will be above the anticipated level and this will translate into an inflation rate increase, in the attempt to correct the imbalance. Equilibrium – defined as a stable inflation rate which is equal to its anticipated level – will only be restored when the unemployment rate rises to its natural level. In other words, the natural rate hypothesis imagines the inflation rate changes as a labour market phenomenon; moreover, the magnitude of this phenomenon can be estimated by means of an indicator which reveals the amplitude of labour market imbalances: the unemployment rate.

According to *Joseph Stiglitz*, in assessing the theoretical and practical utility of the natural rate, economic analysis resorts to three major criteria: first of all, economists need to determine whether the deviation of the unemployment rate from its natural level provides a realistic and coherent method for forecasting inflation rate variations (Stiglitz, 1997). But since this empirical question is not sufficient to sustain the NAIRU hypothesis, there emerges a second criterion: the prospect of finding a theoretical explanation for the variation of the NAIRU over time. This criterion is of primary practical importance, because in correcting and anticipating economic dysfunctions, public authorities need to fully understand the variables involved in forecasting. And since economists are yet a long way from such an understanding, a third criterion comes forward: the possibility of using the NAIRU as a framework for formulating and evaluating economic policy. In analyzing this criterion, we must not overlook the fact that both the exact level and the variation of the NAIRU are still surrounded by uncertainty. Consequently, first of all we need to assess whether the natural rate hypothesis is pertinent and consistent enough to provide an answer to the issue of ensuring economic growth in an uncertain environment, while maintaining stable prices.

The empirical success of the Phillips curve

In what regards the first criterion, the empirical data seems to support the assumption that unemployment is an accurate indicator of the variations in the

inflation rate. Starting from the '60s, for the American economy, the empirical data point out that inflation rose whenever unemployment fell below 5%, and decreased whenever unemployment exceeded 7%. Apart from identifying a feasible empirical regularity, the data suggest a possible estimation of the NAIRU, between 5-7%, after 1960. To the extent that we accept empirical evidence as a satisfactory argument, these results confirm the fact that unemployment has predictive powers in what regards the inflation rate variations. However, this negative relationship cannot by itself prove the utility of the NAIRU and requires further quantitative estimations of the variations in the two variables. In this respect, the empirical tests undertaken by the Council of Economic Advisors in the US revealed that maintaining the unemployment rate one percentage point below the NAIRU leads to a 0.3-0.6% rise in the inflation rate, which is significant enough for the formulation of economic policy. Moreover, the tests showed that at least 20% of the inflation rate variations are attributable to the level and variations of the unemployment rate. These relationships are extremely relevant for practical purposes: they point out that the inflation mechanism and economic policy measures are much more complex than a mere direct relationship between the NAIRU and the inflation rate.

Changes in the natural rate of unemployment

The second criterion for evaluating the utility of the NAIRU aims to account for its variation across time, to possibly forecast this variation, and even to formulate policies that can influence the NAIRU. When Friedman first introduced the natural rate concept, he presented it as an invariable constant; however, three decades later there seems to be an apparent consensus among macroeconomists: to the extent that there exists such a natural rate, then this rate definitely changes over time.

This assumption is firmly supported by the data available for the US economy in the '90s: in the beginning of this interval, the estimates of the NAIRU most commonly varied between 6.0-6.2%. Had this level remained constant, then the average unemployment rate for 1994-1996 – of 5.6%, below the NAIRU –, should have determined a rise in inflation. This implication was contradicted by the available data, which revealed an inflation decrease from 2.9% to 2.6% during the above mentioned period. For the NAIRU supporters, the explanation lies in the econometric research findings: the natural rate must have fallen. Thus the CEA research points out that the natural rate has decreased by 1.5% as compared to its peak in the early '80s. Still, the uncertainty of these estimations – in what regards both the accuracy of the model and the standard errors – is rather high.

The subsequent economic literature has identified three major causes for this decline in the NAIRU: the demographic changes in the labour force structure, better synchronization between productivity growth and employees' wage expectations and, finally, a general rise in competitiveness both on the goods and the labour market.

Demographic changes in the labour force structure

The first underlying factor – demographic changes – is the easiest to account for and, at the same time, is strongly rooted in empirical evidence. The basic assumption is that each demographic group has its own natural rate of unemployment – which does not change over time, but remains constant. Moreover, this rate is higher for the young than for the middle-aged, and is also higher for women than for men. From such a perspective, the NAIRU variations are due to alterations in the share of each labour group within the labour force; however, we must take into account that the natural rate is influenced by all the factors that affect the structure and the volume of the labour force. If we accept the assumption that demographic changes affect the natural rate in a similar fashion as they affect the real unemployment rate, then approximately one third of the 1.5% decrease in the natural rate can be accounted for by these changes. The most important demographic development in recent years is the aging of the “baby boomers” generation – so that the US is enjoying a more mature labour force, in which the groups with lower unemployment rates are prevalent.

Increased productivity and higher wage expectations

In what concerns the second underlying factor, neither the productivity level, nor its growth rate has an impact on the unemployment rate over the long term; this is obvious during the 20th century, when unemployment remained relatively constant, despite massive productivity growth and large fluctuations in the productivity growth rate. In the short run though, changes in the productivity growth rate can have a temporary effect in the natural rate of unemployment. The basic assumption behind this assertion is of a psychological nature: the workers' demand for higher real wages depends on their previous experience and is probably due to the fact that people get used to a certain improvement in the living standards. Thus, even when the productivity growth rate declines, workers will still demand higher real wages – based on their previous experience – which will result in higher inflation and a corresponding higher unemployment rate to preserve equilibrium. However, this increase in the natural rate is temporary, either because the productivity shock itself is temporary, or because workers will revise their wage aspirations in the event of a permanent decrease of the productivity growth rate. Anyway,

in both cases, NAIRU will return to its previous level over the longer term; this is best illustrated by the NAIRU increase during the '70s and '80s, in line with the fall in the productivity growth rate, followed by its decrease in the '90s.

Increased competitiveness of the product and labour markets

The third factor – increased product and labour market productivity – is due to the continuous opening of both national and international markets, as a result of regulatory reforms and trade liberalization agreements. Even in the event that trade accounts for a relatively low share within the national product – like in the US – the existence of potential competitors in the productive sectors is enough to induce wage limitations. The institutional changes experienced on the labour market – such as reduced trade union arrangements – also have a beneficial effect on inflation. And even though quantifying the enhanced competitiveness or the institutional structure of the labour market is extremely difficult, it is reasonable to assume that they can account for the remaining 0.5% of the 1.5% decrease in the NAIRU.

Apart from these three factors, another possible underlying cause is hysteresis. The assumption that sustained high unemployment can lead to a gradual increase in the NAIRU is probably more popular in the European context. The explanation behind this reasoning is that high persistent unemployment diminishes both the working skills and the searching abilities of the unemployed. At the same time, the working labour force desires to maintain the current wages, which deters the increase in the employment rate. For the US economy, the available data does not seem to support this theory. However, if the hysteresis assumption is true, then high persistent unemployment might have surprisingly deep consequences, because it leads to an increase in the NAIRU, whereas low unemployment has a beneficial effect, in that it leads to a reduction in the NAIRU.

NAIRU – A framework for formulating and evaluating economic policy

The final criterion in evaluating the opportunity of the NAIRU refers to its utility in the formulation of economic policy, even though the precise determination of its current and future levels is surrounded by uncertainty. From a certain perspective it is difficult to imagine economic policy without the natural rate concept. Suppose there were no clear, systematic relationship between inflation and unemployment: then why don't public authorities concentrate exclusively on reducing unemployment, while ignoring inflation? The most feasible answer lies in the authorities' belief – or rather conviction – that modifying the level of economic activity does indeed have an impact on the inflation rate.

In deciding whether economic policies should be focused on targeting the natural rate, we must first determine the possible consequences of founding such policies on incorrect estimations of the NAIRU. In this respect, numerous researchers claim that if the unemployment rate decreases slightly, then, in turn, inflation is expected to rise only slightly. This opinion contrasts another frequent assertion – rather popular within the non-academic environments – that the NAIRU is like a chasm: only a slight decrease of the unemployment rate below its natural level is enough to generate a rapid inflationary spiral. The empirical evidence, however, seems to contradict the latter assumption: the available data show that by maintaining the unemployment rate 1 percentage point below the NAIRU for one year, inflation will only increase by 0.3-0.6%. This observation contradicts the bleak accelerationist thesis and demonstrates that the magnitude of the inflation rise does not increase even if the unemployment rate remains below the NAIRU for longer periods.

Another interesting aspect related to practical issues is whether economic policy can influence the natural rate: the empirical evidence shows that the type of monetary policy has an impact on the natural rate. Thus, countries which haven't followed an expansionist monetary policy during the recessions in the early '80s experienced higher NAIRU increases than countries that followed such a policy. This empirical observation can be regarded as a challenge to the standard theory (Ball, 1997). Other authors (Mankiw, 1999) accept this causal relationship, but believe that it works the other way round. In other words, it is the estimates and the forecasts of the natural rate that influence the monetary policy of the central bank. Thus, when the NAIRU decreases, the central bank enjoys more freedom to follow an expansionary monetary policy through measures destined to increase the money supply and decrease the interest rate. Similarly, when the NAIRU increases, the central bank is forced to stick to tighter rules to control inflation. According to this line of reasoning, countries that experienced larger NAIRU increases in the early '80s were forced to follow non-expansionary policies. This appears to be the standard approach to monetary policy in the US during recent years. To the extent that we accept the NAIRU hypothesis, Mankiw's opinion seems more pertinent, because it accounts for the utility of the concept – that of orienting authorities' monetary policy.

Despite the controversies and the uncertainty surrounding the NAIRU, there is no denying that it occupies an important place in business cycle research. At least, from an empirical point of view, the aggregate demand changes – such as those induced by economic policies – seem to affect inflation and unemployment in opposite directions, at least over the short term. This is the very assumption that lies behind the natural rate concept. On the other hand, the practical use of the concept is a much more sensitive issue: first of all, the

NAIRU is very difficult to measure, because it changes over time, and secondly, the economy experiences various types of shocks which influence inflation and unemployment in different ways.

As to the variation of the natural rate over time, there have emerged numerous explanations, among which the demographic factor seems to play a central role. However, the available data are not able to help us establish which of these explanations is correct. And even though recent research has advanced considerably, a lot of issues are extremely controversial and uncertain and need further analysis.

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Estimation of Inflationary Expectations and the Effectiveness of Inflation Targeting Strategy*

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Abstract. *The credibility and accountability of a central bank, acting in an inflation targeting regime, are essential because they allow a sustainable anchoring of the inflationary anticipation of economic agents. Their decisions and behavior will increasingly be grounded on information provided by the central bank, especially if it shows transparency in the process of communicating with the public. Thus, inflationary anticipations are one of the most important channels through which the monetary policy affects the economic activity. They are crucial in the formation of the consumer prices among producers and traders, especially since it is relatively expensive for the economic agents to adjust their prices at short intervals. That is why many central banks use response functions containing inflationary anticipations, in their inflation targeting models. The most frequently problem in relation to these anticipations is that they are based on the assumption of optimal forecasts of future inflation, which are, implicitly, rational anticipations. In fact, the economic agents' inflationary anticipations are most often adaptive or even irrational. Thus, rational anticipations cannot be used to estimate equations for the Romanian economy because the agents who form their expectations do not have sufficient information and an*

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

inflationary environment stable enough to fully anticipate the inflation evolution. The inflation evolution in the Romanian economy helps to calculate adaptive forecasts for which the weight of the "forward looking" component has to be rather important. The economic agents form their inflation expectations for periods of time that, usually, coincide with a production cycle (one year) and consider the official and unofficial inflation forecasts present on the market in order to make strategic decisions. Thus, in recent research on inflation modeling, actual inflationary anticipations of economic agents which are revealed based on national opinion surveys are being used.

As a result of a previous study testing the equations of an inflation targeting model for Romania, the authors of this article attempt to correct the estimators of inflationary anticipations depending on the central bank reaction, based on the results of a national survey among the population. However, in order to have a more accurate picture of inflationary anticipations and the propagation mechanism of shocks affecting price stability, an analysis of the pricing behavior of the consumer goods bidders in the national economy is also needed.

Keywords: inflation targeting; transparency; accountability; reaction function.

JEL Code: E58.

REL Code: 8J.

The strategy of inflation targeting include the recognition of importance of the inflationary phenomenon in modern economies, meaning therefore that ensuring price stability is the most effective way to support through monetary policy the general objective of long term economic growth. Widely used in industrialized countries in the 90s, the strategy of inflation targeting became an attractive alternative for emerging economies as a result of the crises in Latin America and Asia.

In order to achieve the target-level of inflation, the central bank uses the rules as “guiding elements for building the monetary policy” (Svensson, 1997), not being obliged to apply them in a mechanical manner. The central bank retains the ability to respond to unanticipated shocks by adjusting the level of the monetary policy instruments, provided that the central bank does not sacrifice the final objective.

Inflation expectations play a central role for conducting monetary policy. Since many central banks have explicitly or implicitly adopted an inflation targeting regime, stabilizing inflation expectations has become the primary policy objective. Because there is a lag between policy actions and its impacts on the central banks target, monetary authorities are guided by forecasts. This makes inflation forecasting essential for effective monetary policy. Although monetary authorities seek to stabilize long-term inflation expectations, monitoring short and medium-term inflation is important as well. Whenever inflation exhibits some inertia, good short term inflation forecasts translate into more-accurate longer-term projections.

An influence of communication on inflation expectations is possible in two ways. First, the gap between realized and expected inflation can be influenced by the rhetoric of the central bank. Second, the communication could directly influence the expectations formation process. Thus, the way an indicator is formulated can have a great influence on inflation expectations, whereas the impact on the gap between inflation expectations and realized inflation does not seem to be robust. A possible interpretation is that the rhetoric of the Central Bank communicates risks to price stability in a credible way and that financial market experts react to the announcements by adjusting their inflation expectations in the short run. The influence arises because the indicator seems to summarize information that would otherwise be provided by different macroeconomic variables that are publicly available.

The arguments in favor of greater transparency rest on two pillars – accountability and efficiency. The first stresses the importance of transparency for ensuring the public can hold policymakers accountable. This rationale for transparency resonates strongly among supporters of central bank independence. With independence comes accountability, and accountability

requires transparency. The second argument for transparency is that it improves economic efficiency, in terms of either the operation of financial markets or the implementation of policy.

Transparency may also improve the ability of monetary policy to achieve its goals by ensuring that private market expectations are consistent with the aims of central bank policy. In the forward-looking new Keynesian model that is widely used for monetary policy analysis, for example, the effectiveness of monetary policy depends on the policy's ability to affect expectations about the future path of interest rates (Woodford, 2003). A transparent policy – one that reduces uncertainty about future policy actions – can improve the trade-off between output and inflation objectives.

Both arguments in favor of transparency have been challenged. Critics of formal inflation targeting argue that any regime that holds a central bank accountable for a single objective – such as achieving an inflation target – may lead the central bank to ignore the effects of its actions on broader measures of economic welfare. This is a general problem in designing incentive mechanisms; a high powered incentive scheme works best when actions can be monitored closely⁽¹⁾.

Furthermore, some analysts argue that transparency may actually reduce the central bank's ability to engage in stabilization policies. This last argument is, perhaps, not surprising. Much of the academic literature examining transparency uses models in which monetary policy has real effects only to the extent that it can surprise the public. By creating an inflation surprise, the central bank is able to stimulate real output. Since the public cannot be systematically surprised under rational expectations, the attempt to engineer an economic expansion only leads to an average inflation bias. If transparency reduces the central bank's ability to generate surprises, it weakens the central bank's incentive to engage in expansionary policy and, as a result, lowers the equilibrium rate of inflation. Transparency would seem to be unambiguously advantageous (Faust, Svensson, 2002). However, if the central bank's scope for engaging in stabilization policies is also a function of its ability to generate surprise inflation, transparency reduces that ability.

This limits the potential for policy to reduce economic fluctuations. Transparency may leave the central bank unable to cushion the real economy from macroeconomic shocks, a cost emphasized by Cukierman (2001). Economists now have a great appreciation for the role that systematic, predictable policy can have on the real economy. There are not just surprises that matter. The effects of transparency may differ considerably when the predictability of the monetary policy plays an important role in the economy⁽²⁾.

It is well understood that monetary policy in general and inflation targeting in particular is what is called “management of expectations” (Woodford, 2004, 2005). Monetary policy affects inflation and the real economy mainly through its effects on private-sector expectations about future interest rates, inflation and the real economy. Expectations of future instrument rates (the expected instrument-rate path) matter and affect the yield curve and longer nominal interest rates.

Expectations of future inflation affect actual inflation and longer real interest rates. Expectations of future developments of the real economy and longer real interest rates affect current decisions and plans for the real economy. Thus, transparency makes monetary policy more effective in a direct way, by making possible more effective management of private-sector expectations.

Publishing inflation and real-economy forecasts is already common among inflation-targeting central banks. An interest-rate forecast or some assumption about the interest-rate path is necessary for an inflation and real-economy forecast. Central banks have used different assumptions about the interest-rate path, such as a constant interest rate or a path given by market expectations as revealed by the forward rates implied by the yield curve. A constant interest rate is often a conspicuously unrealistic and time-inconsistent interest-rate forecast. Implied forward rates may result in inflation and real-economy forecasts that do not “look good,” and central banks using this interest-rate assumption have sometimes felt compelled to comment that an interest-rate path higher or lower than the implied forward rates would be more appropriate

Furthermore, a published forecast of the interest rate is useful to the private sector and a better forecast is more useful to the private sector. The central bank should have an obvious information advantage about its own intentions for its instrument rate and be able to produce the best forecast, and, as argued in the previous section, publishing its own interest-rate forecast should be the most effective way for the central bank to manage private-sector interest-rate expectations. Given this logic, and given the increased acceptance of the idea that monetary policy is about managing expectations, it is rather strange that still so few central banks publish their own interest-rate forecast.

Some arguments in the literature against publishing instrument-rate paths seem somewhat contrived. Morris and Shin (2002) shows that public information may reduce social welfare. Because public information is known by all private agents and will affect the behavior of all private agents, it is rational for each private agent to attach more weight to public information than to private information. If the public information is of poor quality, private agents

end up attaching more weight on poor-quality information, which may deteriorate social welfare.

We think that the optimal targeting weight balances the need for accountability with the imperfect ability to monitor the central bank. Monitoring is imperfect if the information on which the central bank bases policy is private and publicly unverifiable. The ability to monitor can also be described in terms of the policy “transparency”; a transparent policy improves the ability to monitor. If monitoring is perfect, the central bank is instructed to care only about achieving a state contingent target for inflation; this solves the accountability problem without distorting stabilization policy. When monitoring is incomplete due to imperfect information, it is optimal to place less weight on achieving the inflation target to avoid distorting stabilization policy.

Political pressures are assumed to operate on the incentive to engage in expansionary policies. These pressures lead to socially undesired fluctuations in inflation. Inflation shocks provide a role for stabilization policies.

Empirical analysis

In these circumstances the central bank tries to achieve inflation target by interest rate channel of monetary policy. The central bank reaction function correlate inflation rate with interest gap, interest rate’s long-term trend, output gap, inflation deviation from target and real exchange rate variation:

$$i_{(t)} = \beta_1 \times i_{gap(t-1)} + i_{trend(t)} + \beta_2 \times y_{gap(t)} + \beta_3 \times (\pi_{(t)}^e - \pi_{(t)}^{target}) + \beta_4 \times mod_curs_real_{(t)} + \varepsilon_{3(t)} \quad (1)$$

The variables included in the reaction function are:

- *the interest rate gap’s previous level.* When including this variable, the central bank is acting cautiously as it considers the adverse consequences that frequent interest rate changes can have on economic agents. Harjes and Ricci (2008) show that the corresponding coefficient for this variable is generally quite high in order to ensure that the monetary authorities are restraining themselves from aggressively countering economy shocks. Thus, monetary authorities avoid sudden changes in rates, a phenomenon known in practice as “smoothing and stabilizing the interest rate”.
- *the interest rate’s long-term trend.* The reason for including this variable is logical: on the long-term, the interest rate tends toward its equilibrium value, thus determining the convergence to the model’s equilibrium point.
- *the inflation’s deviation from the target.* The central bank will adjust the nominal interest rate depending on the inflation’s deviations from

the target. The coefficient for this variable must be higher than 1 in order for the monetary policy's mechanism to function.

- *the output gap*. When including this variable, the practice of a flexible inflation targeting is considered, as well as the determining role the excess demand has in explaining inflationary pressures.
- *the real exchange rate variation*. The presence of this variable in reaction function equation is necessary to describe the correlation between domestic interest rate and real exchange rate fluctuation in order to improve monetary policy concerning Mundell-Fleming model requirement⁽³⁾. Furthermore a style concordance with aggregate demand and supply equation is also necessary.
- *other shocks* of the monetary policy that can influence the behavior of monetary authorities when dealing with inflation targeting (estimating residuals).

Since the data is expressed quarterly and the inflation target annually, we computed the quarterly inflation target. It is obvious that this feat can only be achieved for the 2005-2009 timeframe, as inflation targeting was implemented starting with 2005. For the 2000-2005 timeframe, the effective inflation's trend was used as the inflation's target.

The equation of the reaction function can be written as follows:

$$i_{(t)} = \underset{\substack{[9.407413] \\ (0.0000)}}{0.7906} \times i_{gap(t-1)} + \underset{\substack{[2.626591] \\ (0.0071)}}{0.4110} \times y_{gap(t)} + \underset{\substack{[2.941367] \\ (0.0148)}}{0.0704} \times (\pi_{(t)}^e - \pi_{(t)}^{target}) + \quad (2)$$

$$+ \underset{\substack{[4.131510] \\ (0.0004)}}{0.0421} \times mod_curs_real_{(t)} + \varepsilon_{3(t)}$$

The equation highlights the practice of a flexible inflation targeting strategy, by considering in the central bank's reaction function the inflation's deviation from the target and other macroeconomic variables, such as the output gap, or the appreciation/depreciation of the national currency. Including the inflation's variation from the trend indicates that the monetary policy transmits its effects with delays and therefore it has to react timely to the inflationary pressures that will manifest themselves in the future.

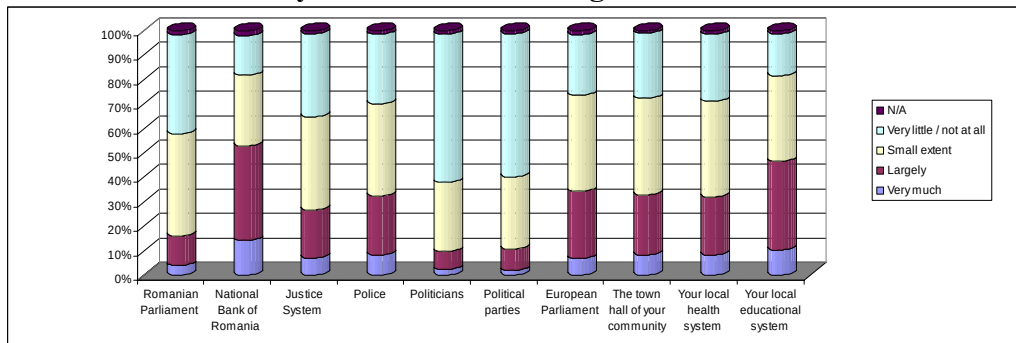
Adaptive expectations

Adaptive expectations state that if inflation increased in the past period, people will expect a higher rate of inflation in the next period, meaning that people base future predictions on what happened in the past. In the real world,

past data is one of many factors that influence future behavior. In particular adaptive expectations is limited if inflation is on an upward or downward trend. These limitations led to the development of rational expectations which incorporated many factors into the decision making process.

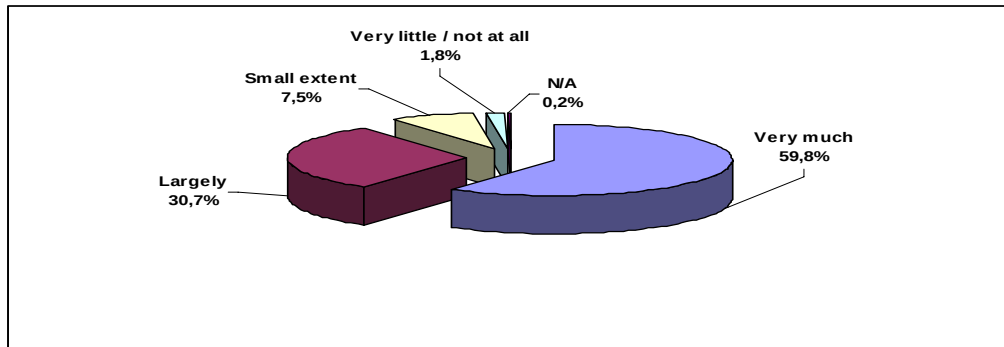
The adaptive expectations of inflation were estimated based on a survey conducted on a representative sample at a national level, mainly focusing upon the state of the economic and social cohesion in Romania⁽⁴⁾. Since the population's attitude towards the national institutions is important for this study, we decided upon including the National Bank among the other institutions considered representative of the market economy system. The main results of the survey indicate that the National Bank is the most credible institution in Romania (with a degree of confidence of about 53% – to large and very large extent) being considered far more reliable than other national institutions. The second best credible institution turned out to be the local educational system (a 46% confidence level – to large and very large extent). Another aspect that should also be noted consists in the fact that the reliability in the European Parliament exceeds the confidence level in the other national institutions. Given the high level of credibility of the National Bank, we can formulate the hypothesis that the signals of the National Bank do have a great influence in shaping the inflationary expectations of the population.

What extent do you trust the following institutions?



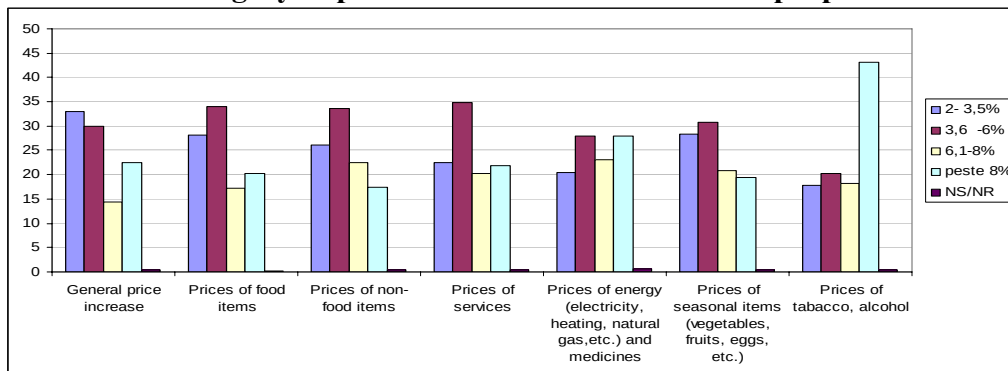
Another question included in the questionnaire took into account the population concern about the general price increase (the increase of the daily living cost). The results of the survey show that the population is very concerned about the inflation outlook (90% of responses indicate a large and very large extent). Such an attitude creates conditions for a positive framework to the “hot money” phenomenon, meaning that inflation expectations could be accelerated by population’s anticipations.

How much you are worried about increase in cost of living (price increase)?



The distribution of the responses concerning the inflation expectations upon different product categories is very interesting, indicating an asymmetry of the extreme preferences, meaning that the degree of supporting inflationary expectations for small and moderate levels (2.5 to 6%) is high, then drops abruptly to 6-8% and then rises again sharply to over 8%. This reveals a certain confusion regarding the inflation perspectives among the population. In terms of statistical significance of population indicators, the results are perfectly normal, since there is still no basic economic culture to allow the population a relatively accurate interpretation of macroeconomic indicators (being evident from the media errors on the correct interpretation of these indicators). In these circumstances it is normal that the answers to have like referential a simple comparison of figures with a normal correction in relation to the great concern about the inflationary expectations.

Which category of prices will increase and in what proportion?



In these circumstances, we reviewed econometrically the response function equation of the National Bank, by introducing the estimated inflation adaptive expectations of the population. Despite the correction time, we notice an improvement in the econometric response function equation of the National Bank, both in terms of coefficients and of significance tests.

$$\begin{aligned}
 i_{(t)} = & 0.7203 \times i_{gap(t-1)} + 0.4711 \times y_{gap(t)} + 0.0930 \times (\pi_{(t)}^e - \pi_{(t)}^{target}) + \\
 & \begin{matrix} [9.167921] \\ (0.0000) \end{matrix} \quad \begin{matrix} [2.702580] \\ (0.0104) \end{matrix} \quad \begin{matrix} [3.658791] \\ (0.0304) \end{matrix} \\
 & + 0.0641 \times mod_curs_real_{(t)} + \varepsilon_{3(t)} \\
 & \begin{matrix} [4.780254] \\ (0.0013) \end{matrix}
 \end{aligned} \tag{3}$$

The results encourage us to continue our research in estimating the inflation adaptive expectations of the entrepreneurs (the representatives of suppliers). In this manner, we can verify the National Bank estimations of the inflation targeting strategy equation, in a constructive framework for ideas exchange among the specialists in the field, in order to improve the effectiveness of the economic policies to control the inflation phenomenon.

Conclusions

The analysis emphasizes the essence of the inflation targeting strategy: the monetary policy has a key role in anchoring inflationary expectations. On the other hand, considering the period of transmission for the mechanism of the monetary policy and the unexpected shocks that can affect an economy, inflation targeting becomes inflation forecast targeting, thus stressing out the strategy's anticipative character and its capability to stabilize the inflation around the target for a medium-term time frame.

Many central banks use reaction functions containing inflationary anticipations, in their inflation targeting models, but there is a problem concerning the assumption of anticipations: rational vs. adaptive (even more irrational). Testing the reaction function of central bank, we tried to compare this alternative assumption based on national survey. The survey revealed that the central bank is the most credible institution for Romanian and the Romanians are very worried about inflationary context.

As a novelty, we valued the information obtained from the survey regarding the population's perceptions on the evolution of inflation, by introducing them as adaptive expectations in the reaction function of the National Bank. Thus, we noticed an improvement in the econometric estimations based on these adaptive expectations.

Notes

- ⁽¹⁾ See Walsh (2003) for an application of this principle to inflation targeting.
- ⁽²⁾ The reliance on models in which surprises are the key to the real effects of monetary policy may be one reason that Carpenter (2004) finds only a limited set of lessons for policymakers to learn from the academic literature on transparency.
- ⁽³⁾ It is a common fact that the central bank diminishes the interest rate when there is an unjustified appreciation of the national currency (the exchange rate drops) and it increases the interest rate when the national currency goes through a powerful depreciation (the exchange rate increases)
- ⁽⁴⁾ PN II Research Project no. 91-050/2007 - *Diminution of inequalities - pre-requisite for economic and social cohesion. Improving the quality of the European integration*. The survey was conducted on a nationally representative sample from March to September 2010.

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The Impact of Investments and Gross Value Added upon Earnings*

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Abstract. *In this paper we tried to capture the impact of investments and gross value added, but also the impact of the employment on the average wage. The analysis refers to the period 1998-2008 and we are using data on the activities of the Romanian economy. The results of this study confirm the negative influence of the employment, being consistent with the theory. Also, the impact of investments and that of gross value added came out to be positive and significant.*

Keywords: employment; wages; added value; investments.

JEL Codes: E24, J30, J64.

REL Codes: 8G, 12F, 12I.

* Ideas in this article were presented at the Symposium „The global crisis and reconstruction of economics?”, 5-6 November 2010, Faculty of Economics, Bucharest Academy of Economic Studies.

1. Introduction

The purpose of this paper is to estimate the impact of investments, gross value added and employed population upon the average earnings in Romania, during the period 1998-2008. We used in this analysis 11 activities of the Romanian economy.

This paper contributes to the vast literature on earnings determination. The approaches, however, are very different. For example, Riahi-Belkaoui (1999) empirically tested a net value added-earnings policy model. The model was estimated annually for nonfinancial firms over the period 1976 – 1995, the results being consistent with the role of net value added and the previous level of earnings in the determination of earnings.

Concerning Romania, there is a recent study on earnings determination that tries to capture the dependence of the average wage on the unemployment rate, the number of immigrants and emigrants, the proportion of employees working in industry from the total employees, the proportion of employees working in financial and insurance activities from the total employees and the proportion of part-time employed population from the total employed population. The analysis was conducted over a period of nine years (2000-2008), using a panel data for the 42 counties of Romania. The most important results of the panel data estimation indicated a negative impact of the unemployment rate on wage and a significant positive effect of the immigrants on the average wage.

The paper is organized as follows: Section 2 describes the data and presents a descriptive analysis, Section 3 presents the econometric framework used for this study, while Section 4 presents the econometric model. Section 5 concludes.

2. Data analysis

The variables used in this paper are: the average monthly wage (*lrwage*), the employed population (*lpopoc*), the gross value added (*vab*) and the investments (*invest*). In order to ensure the comparability of the data for the econometric analysis, we used the consumer price index to deflate the average monthly wage. All the variables were used in the log form.

The analysis refers to the period 1998-2008. We used a panel data for 11 activities of the Romanian economy, NACE Rev 1. The source of our data was the Romanian National Institute of Statistics (the online database TEMPO).

Analyzing the evolution of the monthly average wage in Romania, for the period 1998-2008, one can observe that the wages have had an upward trend for the entire period. The highest wages are earned in financial intermediation

activity, followed by public administration and defence, transport, storage and communication and education. All these activities have the average wage greater than the national average value. The smallest wages in Romania are earned by workers in hotels and restaurants activity.

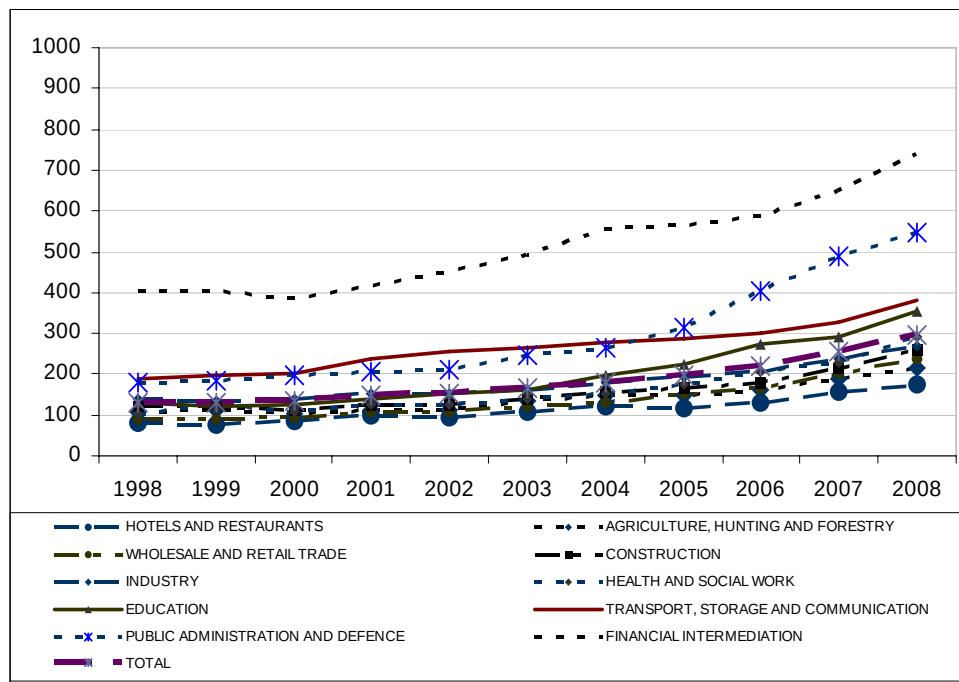


Figure 1. The evolution of the real average wage, 1998-2008

Regarding the investments it is very clear that the industry received the largest investments. In 2008, the value of these investments was around 31,632.5 millions RON (5,336.21 millions Ron in 1998 prices), more than two times higher than the next value, registered for wholesale and retail trade activity: 14,438.2 millions RON (2,435.63 millions RON in 1998 prices). Close to the investments in wholesale and retail trade for 2008 we find also the transport, storage and communication activity and the construction activity.

The activities for which the level of investments is low are: education, health and social work, hotels and restaurants and financial intermediation.

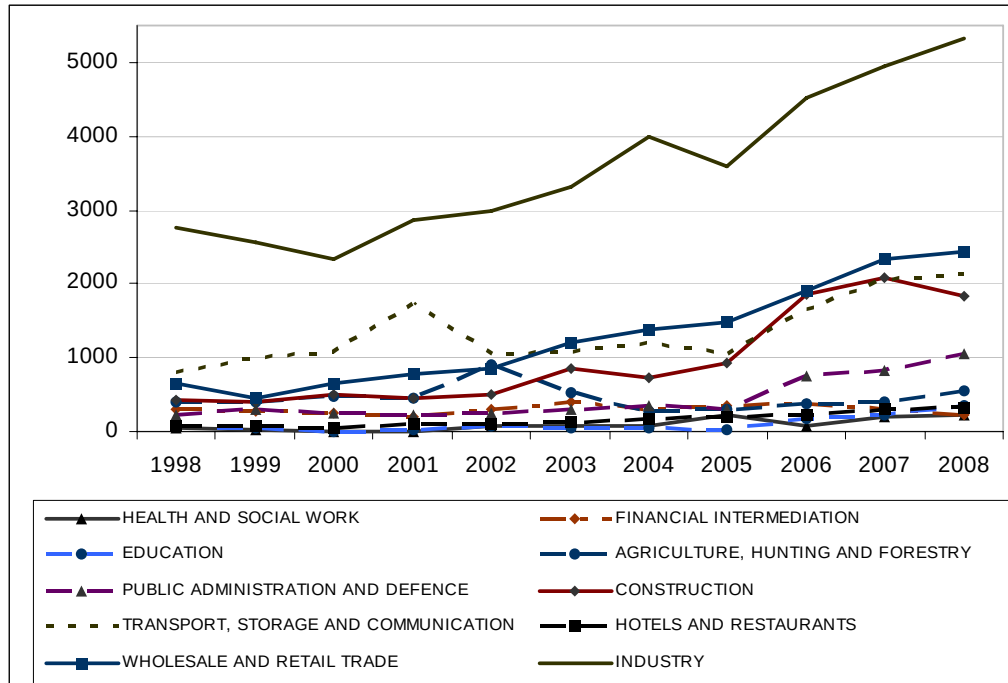


Figure 2. *The evolution of the net investments, 1998-2008*

The Gross Value Added (GVA) is a measure of the value of goods and services produced in an area, industry or sector of an economy. In the national accounts, GVA is output minus intermediate consumption; it is a balancing item of the national production account.

In Romania, the gross value added is calculated for each of the activities of the national economy. The highest GVA is registered for industry, which is a normal situation. Thus, in 2008, the GVA for industry was 114,873.29 million RON (19378.41 in 1998 prices). The next values are registered for transport, storage and communication activity, commerce activity and construction activity, which benefit also from considerable investments during this period of time.

The activities that generated the lowest GVA were hotels and restaurants and financial intermediation.

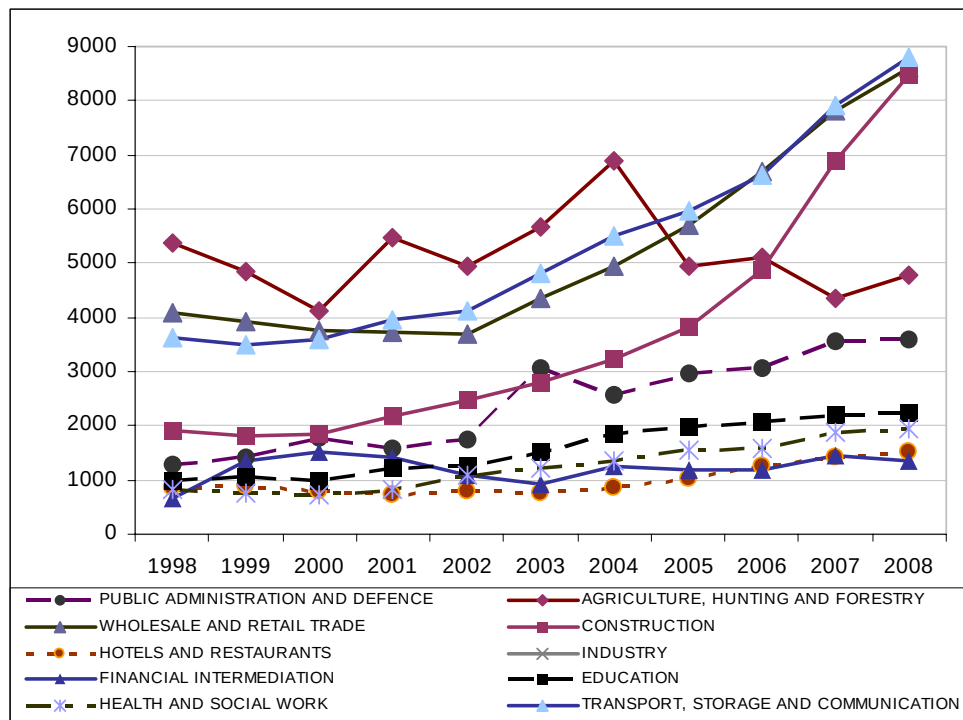


Figure 3. *The evolution of the gross value added, 1998-2008*

Employment includes, according to the methodology of “Household labour force survey“, all the persons aged 15 years and over who carried out an economic activity producing goods or services of at least one hour during the reference period (the week previous to the recording) in order to get income as salaries, payment in kind or other benefits.

From the statistical data we can observe that the employed population in agriculture, hunting and forestry is declining since 1998. The same situation was registered at a different scale for industry. In 1998 were employed 2.6 million persons in industry, compared to 4.3 million persons in agriculture. In 2008, the situation was a little bit changed: in industry were employed 2.2 million persons and in agriculture were 2.7 million persons. Both activities suffered a reduction of employed population, but the decline in agriculture is more obvious.

On the other hand, in wholesale and retail trade and construction we can observe a slight increase of employment.

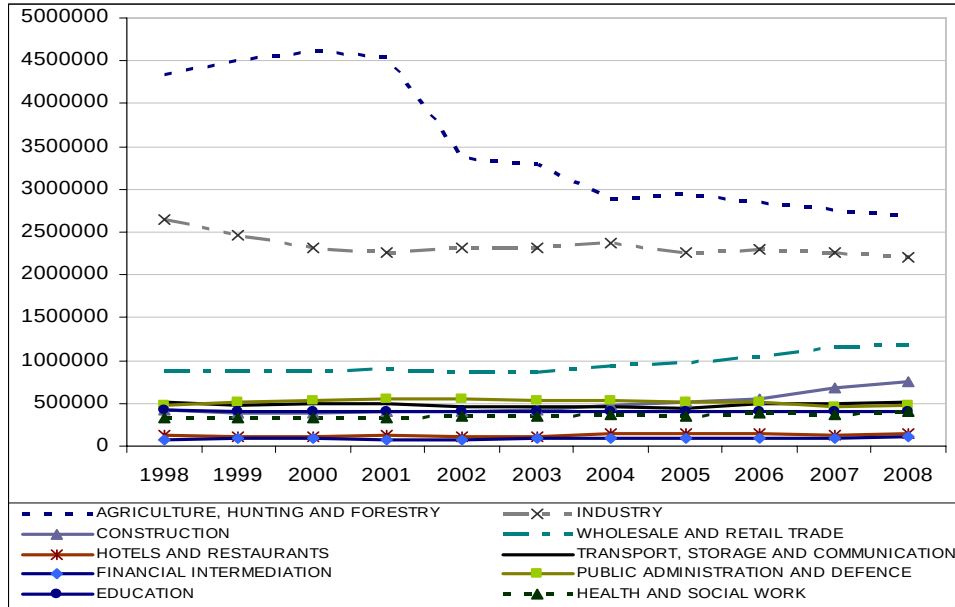


Figure 4. The evolution of the employed population, 1998-2008

3. Methodology

A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables. The i subscript denotes the cross-section dimension and t denotes the time-series dimension (Baltagi, 2008).

$$y_{it} = a + X_{it} \times b + u_{it}, \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (1)$$

One of the main motivations behind pooling a time series of cross-sections is to widen the database in order to get better and more reliable estimates of the parameters of the model. The simplest poolability test has its null hypothesis the OLS model: $y_{it} = b' \times X_{it} + \alpha_i + \varepsilon_{it}$ and as its alternative the fixed-effects (FE) model: $y_{it} = a + b' \times X_{it} + \alpha_i + \varepsilon_{it}$. In other words, we test for the presence of individual effects. In Stata, if we run the *xtreg* command with the *fe* option, we obtain at the bottom of the output the F-test that all $\alpha_i = 0$. If we reject the null hypothesis it also means that the OLS estimates are biased and inconsistent.

Most of the panel data applications use a one-way error component model for the disturbances, with: $u_{it} = \alpha_i + \varepsilon_{it}$. There are several different linear

models for panel data. The fundamental distinction between fixed-effects and random-effects models consists in the fact that, in the fixed-effects (FE) model, the α_i are permitted to be correlated with the regressors x_{it} , while continuing to assume that x_{it} is uncorrelated with the idiosyncratic error ε_{it} . On the other hand, in the random-effects (RE) model, it is assumed that α_i is purely random, which is a stronger assumption implying that α_i is uncorrelated with the regressors (Baum, 2001).

In order to decide whether a RE or a FE model is more appropriate, we can run a Hausman test. Its principle can be applied to all hypothesis testing problems, in which two different estimators are available. In the concrete case of panel models, we know that the FE estimator is consistent in the RE model as well as in the FE model. In the FE model it is even efficient, while in the RE model it has good asymptotic properties. By contrast, the RE–GLS estimator cannot be used in the FE model, while it is efficient by construction in the RE model (Kunst, 2009). In Stata, the Hausman test statistic can be properly computed based upon the contrast between the RE estimator and fixed effects (FE).

The most commonly used estimator for a FE model is the within estimator which eliminates the fixed-effect by mean-differencing. Because the within estimator provides a consistent estimate of the FE model, it is often called the FE estimator. It is also consistent under the RE model, but alternative estimators are more efficient. The fixed-effects α_i can be eliminated by subtraction of the corresponding model for individual means $\bar{y}_i = \bar{x}_i' b + \bar{\varepsilon}_i$ leading to the within model or mean-difference model:

$$(y_{it} - \bar{y}_i) = (x_{it} - \bar{x}_i)' b + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad (2)$$

The within estimator is the OLS estimator of this model. Because α_i has been eliminated, OLS leads to consistent estimates of b even if α_i is correlated with x_{it} as is the case in the FE model. This result is a great advantage of panel data.

In Stata, the within estimator is computed by using the `xtreg` command with the `fe` option. The default standard errors assume that after controlling for α_i , the error ε_{it} is independent and identically distributed (i.i.d) (Cameron, 2009).

Also, the command `xtreg, fe` estimates this model assuming that the regression disturbances are homoskedastic with the same variance across time and individuals. This may be a restrictive assumption for panels. When heteroskedasticity is present the standard errors of the estimates will be biased and we should compute robust standard errors correcting for the possible presence of heteroskedasticity. The most likely deviation from homoskedastic errors in the context of pooled cross-section time-series data (or panel data) is likely to be error

variances specific to the cross-sectional unit. When the error process is homoskedastic within cross-sectional units, but its variance differs across units we have the so called groupwise heteroskedasticity. The `xttest3` Stata command calculates a modified Wald statistic for groupwise heteroskedasticity in the residuals of a fixed-effect regression model (Baum, 2001).

The next step is the need to identify serial correlation in the idiosyncratic error term of the panel-data model. While a number of tests for serial correlation in panel-data models have been proposed, a test discussed by Wooldridge (2002) is very attractive because it requires relatively few assumptions and is easy to implement (Drukker, 2003). This test is implemented in Stata by David Drukker under the name `xtserial`. The command `xtserial` performs a Wald test, where the null hypothesis is no first order autocorrelation.

Stata has a long tradition of providing the option to estimate standard errors that are “robust” to certain violations of the underlying econometric model. The Stata program `xtscc`, implemented by Daniel Hoechle (2007), estimates pooled OLS and fixed effects (within) regression models with Driscoll and Kraay standard errors. The error structure is assumed to be heteroskedastic, autocorrelated up to some lag and possibly correlated between the groups (panels).

4. Econometric analysis

We considered the following general form of the linear regression model:

$$lrwage_{it} = a + b_1 \times lpopoc_{it} + b_2 \times lvab_{it} + b_3 \times linvest_{it} + u_{it} \quad (3)$$

We also included in the model the first lag of the variables and we tested them for significance.

From the variance decomposition table presented in Figure 5 we can see that all the variables have within variation, which means that the FE estimation of the panel data model is appropriate. Moreover, we observe that for wages (*lrwage*) and gross value added (*lvab*) the within variation is bigger than the between variation. For investments (*linvest*) we obtained a value of 1.21 for the within variation, slightly less than the value of the between variation (1.27).

Variable		Mean	Std. Dev.	Min	Max	Observations
lrwage	overall	6.194321	1.034195	3.906741	8.311286	N = 121
	between		.4342396	5.675914	7.205543	n = 11
	within		.9469467	4.316736	7.609135	T = 11
lpopoc	overall	13.08824	1.06279	11.1881	15.34306	N = 121
	between		1.103376	11.36246	15.05194	n = 11
	within		.1163521	12.84133	13.53121	T = 11
lvab	overall	8.832773	1.251682	6.031292	11.57601	N = 121
	between		.8334634	7.849986	10.44833	n = 11
	within		.964332	6.785973	10.53331	T = 11
linvest	overall	7.009771	1.720073	1.736255	10.28637	N = 121
	between		1.27865	5.025507	9.127047	n = 11
	within		1.208283	3.720519	9.552464	T = 11

Figure 5. Variance decomposition

A starting point for estimating the model is a pooled OLS regression. But we must know if pooling the data is the solution in our case. So, a poolability test is needed. The result obtained in Stata tells us to reject the null hypothesis that all α_i are zero (Figure 6). This also means that the OLS estimator is biased and inconsistent and we accept the presence of the individual effects.

Fixed-effects (within) regression		Number of obs	=	110	
Group variable: id		Number of groups	=	11	
R-sq:	within	=	0.9735	Obs per group: min =	10
	between	=	0.0831	avg =	10.0
	overall	=	0.6948	max =	10
corr(u_i, Xb) = -0.2919		F(4, 95)	=	872.43	
		Prob > F	=	0.0000	

lrwage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lpopoc	-.4825027	.124931	-3.86	0.000	-.7305222	-.2344833
lvab	.3287556	.1069955	3.07	0.003	.1163426	.5411685
l1_vab	.5036203	.0954148	5.28	0.000	.3141979	.6930427
l1_invest	.0675143	.0308443	2.19	0.031	.0062806	.128748
_cons	4.870886	1.593512	3.06	0.003	1.707366	8.034407
sigma_u	.52491895					
sigma_e	.1396495					
rho	.93390096	(fraction of variance due to u_i)				

F test that all u_i=0:	F(10, 95) =	79.78	Prob > F =	0.0000
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Figure 6. Fixed-effects (within) regression

The next step is to decide whether we have a fixed-effects model or a random-effects one, using the Hausman test. The probability is 0.0133, indicating that our model is more suitable for a fixed-effects estimation.

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) f	(B) r		
lpopoc	-.4825027	-.5881681	.1056654	.0836841
lvab	.3287556	.3363458	-.0075903	.
li_vab	.5036203	.501312	.0023083	.008759
li_invest	.0675143	.0650788	.0024355	.0053139

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic
 chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 12.63
 Prob>chi2 = 0.0133
 (V_b-V_B is not positive definite)

Figure 7. The Hausman test

Concluding that we have a fixed-effects model, we continue with the estimation of our model using the within estimator. The estimated standard deviation of α_i (sigma_u) is 0.52, much bigger than the standard deviation of ε_{it} (sigma_e) which is 0.14, suggesting that the individual-specific component of the error is more important than the idiosyncratic error (Figure 6).

When performing both the modified Wald test for groupwise heteroskedasticity in the FE model, implemented in Stata by Christopher Baum, and the serial correlation test proposed by David Drukker, it resulted that the errors are both autocorrelated and heteroskedastic.

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Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (11) =      595.89
Prob>chi2 =      0.0000

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F( 1,      10) =      81.592
Prob > F =      0.0000

```

Figure 8. Tests for heteroskedasticity and autocorrelation of the errors

To ensure the validity of the statistical results, we performed a fixed-effects (within) regression with Driscoll and Kraay standard errors. The error structure is assumed to be heteroskedastic, autocorrelated up to some lag and possibly correlated between the groups. The author of this Stata command is Daniel Hoechle.

Regression with Driscoll-Kraay standard errors				Number of obs	=	110
Method: Fixed-effects regression				Number of groups	=	11
Group variable (i): id				F(4, 10)	=	3772.79
maximum lag: 2				Prob > F	=	0.0000
				within R-squared	=	0.9735

	Coef.	Drisc/Kraay Std. Err.	t	P> t	[95% Conf. Interval]	
lrwage						
lpopoc	-.4825027	.0999547	-4.83	0.001	-.7052158	-.2597897
lvab	.3287556	.0904774	3.63	0.005	.1271593	.5303519
l1_vab	.5036203	.068718	7.33	0.000	.350507	.6567336
l1_invest	.0675143	.0308076	2.19	0.053	-.0011293	.1361579
_cons	4.870886	1.358993	3.58	0.005	1.842861	7.898911

Figure 9. The robust fixed-effects regression

The resulted econometric model is:

$$lrwage_{it} = -0.48 \times lpopoc_{it} + 0.33 \times lvab_{it} + 0.5 \times l1_vab_{it} + 0.07 \times l1_invest_{it} + 4.87 \quad (4)$$

(0.09)**
(0.09)**
(0.06)**
(0.03)**
(1.36)**

where between brackets are the Driscoll and Kraay standard errors, while the levels of statistical significance are: **) for the 0.05 level and (*) for the 0.1 level.

In the estimation process, we also tested the significance of lagged variables. Therefore, the final form of our model includes the first order lag of investments (*l1_invest*) and that of the gross value added (*l1_vab*).

As expected, the employed population has a significant negative coefficient, indicating that an increase with 10% leads to a decrease by 4.8% of the earnings.

Regarding the gross value added, we found a strong and positive contemporaneous influence on the earnings; also, the value of GVA from previous year has a positive impact even stronger than the present value. Thus, we obtained a cumulative effect of 0.83, meaning that a 10% increase of GVA induces a 8.3% increase of wages. The gross value added can be used in order to calculate the productivity. Therefore the GVA can be seen as an indicator of efficiency. It is very important for an economy to have a good, healthy relation between productivity and wages.

Analyzing the impact of investments on earnings, as expected, we found an one year delay between when the investments are made and the moment when their influence can be noticed. The coefficient is statistically significant and the impact is positive, but not very important as value. An increase by 10% of investments will lead to only 0.67% increase of earnings.

5. Conclusions

This paper tried to capture the impact of investments and gross value added, but also the impact of the employment on the average wage.

We made first a descriptive analysis of the average earnings, the investments, the gross value added and the employment. Therefore, we saw that the highest earnings are obtained in financial intermediation activity, which has only around 2% employees of the total employees. Also, this activity received only few investments during this period. On the other hand, the industry, which in Romania has a long tradition, is the activity that has benefited from most part of the investments over the analyzed period. Moreover, the industry is the activity that generates the most considerable gross value added in the Romanian economy.

From the econometric analysis we concluded that the investments and the GVA have a positive effect, while the employed persons have a negative impact. Another aspect of our results is that the investments have an one year delay impact upon average earnings, as expected. Regarding the influence of the gross value added, in our model we captured both the contemporary and the one year delayed component, resulting a cumulated effect of 0.83. As for the employment, after estimating the equation, we obtained a negative effect, but relatively strong (0.48). This is a normal condition, according to the economic theory.

We consider that the work presented here enriches the research on earnings from our Romania and we are confident that our future analysis will produce even more interesting and important results, given the economic crisis that already affects Romania for two years.

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