Two words

"The theoretical approach stems from studying the map and not the texture of the natural lay of economicity."

Just like in psychology, in Economics cognition has drastic limitations, with most of them bordering on the ridiculous. For instance, in the economic environment, as opposed to other domains, it is impossible to accurately pinpoint the cause of a phenomenon. Being a complex system, it is impossible to determine the conditionalities between the elements. It is impossible to describe the real links between the various impulses and the quality of the consequences, and the links between the motivations of the action and the contents of the concrete answers.

The chain of impossibilities is truly infinite. It is, in practice, a pronounced fragility of economic theories on matters of consistency. The exit from this epistemic dead-end hasn't been bestowed yet with a recipe in concordance with the status of a science that has been exposed to the judgements of historical contexts.

Economic theory has constructed an intellectual model of knowledge with elements of cognitive uncertainty. This epistemic handicap comes largely from the excessive simplification which Economics resorts to in its theoretical constructs. The simplification deals with and produces epi-phenomena, while the useful gain of knowledge ought to come from an approach focused on real phenomena. The argumentation supports – often credibly so – the theoretical ideas, but it does not reflect the true behaviour of concrete things.

This has led to the creation of an even worse sort of impossibility: the explicative models bear too little resemblance to reality. The theoretical approach thus stems from studying the map and not the texture of the natural lay of economicity.

This shortcoming is tentatively being substituted through the invention of regularity. In Economics however, the explanations revolve within the spectrum of linear dependencies. The reversed negative links and the essentiality of the influences from within a dynamic and volatile context are both but a marginal object for economic analyses. Learning as an ineffable function, which determines the configuration of the economic system, is being disregarded by Economics. The complexity of the influences between the components of the system and the

dynamics of the consequences are mentioned only as a footnote by the methods dealing with epi-phenomena.

The most frequent error is that a simple correlation among quantifiable factors is being considered as the cause of a trend. In Economics, the temporal dimension is perceived as a reasonable way for identifying the prior event with the cause, and the ulterior event with the consequence.

This pattern of understanding comes from the dichotomously structured thought, where the dialectical method provides Economics with the accessible arsenal for the false identification of the cause. The factorial perspective on the nature of economicity is formulated in terms of adversity. The temptation of alterity is negatively marked by simulating the contradiction. Almost without exception, the theoretical experience of economists has been structured on explaining the link between the two elements, which are more often than not in contradiction with each other. The economists' conceptual dyad represents the reflex of the insistence in accumulating the Aristotelian perspective on cognition. The described states have either a "yes" or "no" relevance. Economics has been used to an organon apt to provide understanding for categorically opposable states.

The bivalent and sequential binary arrangements of the episodes when exercising the roles imposed by the transactional subjectivity, show up as apparent types of conditionings which help with the operation, but place the trend into the noise. The linear determinism is accepted as the structuring pattern of the cognitive approach, while the choice of significations is radically simplified between two nominations, almost always ideologically decanted.

As an offshoot, the solutions to the problems are being judged in the alternative manner of "on the one hand, on the other hand".

The materialistic fixation of economic thought has developed the conceptual-lization of correlations which point to extreme consequences. The antinomy is seen by Economics as the source of functionality. When something happens to rise, something else needs to come down. The mechanics of transactions and the entire logic of the market demand the natural repetition of gain and loss. The cyclicity expresses a pattern of economic growth and recession. The profound rationality of economicity comes from the principle of the complementarity of the acts of will. If all men do the same thing at the same time, the economic action will be blocked.

From this conceptual perspective emerged the propensity towards equilibrium. The radiant paths of this vision have led to the disciplines which develop techniques and instruments in which a part of the economic activity must

correspond, either in value or in quantity and always nominally, to the antinomic part. Economics has failed in accounting for the inflows and outflows of money. Wealth is replaced by money. The Great Economics has been demoted to the double-entry bookkeeping of the motivations and answers of the human nature.

The obsession to simplify the object of study to two terms which are condemned to exist in opposition has fertilized the land of austerity. Economics' function as a social science has been minimalized, breaking the balance of progress. The fundamental relationship of economicity is formulated in terms of compensating resources. Labour cheapens, the result of capital exploitation rises. Thus, speculation has liquefied the foundation of wealth in the search for abundant work.

By its nature, the dialectic is fulfilled alternatively: Yes/No.

Marin Dinu

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Through creativity and innovation to economic development: is it possible in Romania?

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Abstract. *Creativity is a source of innovation. This paper investigates methods of stimulating creativity in firms. Using CIS7 data at the sectoral level, the exploratory analysis carried out first is followed by testing of factors which we identify in order to asses their incidence on R&D activity. The results show intense interactions between R&D investments and methods of stimulating creativity based on extrinsic motivations, as well as between R&D investments and turnover used as an indicator of financial results in firms. Trough such connections observed, this paper invites agents in business and government environments to recognize the importance of stimulating creativity and innovation in Romania, able to allow economic development.*

Keywords: firm, creativity, innovation, research and development.

JEL Classification: L2, O15.
REL Classification: 10B, 17B, 14C.

1. Introduction

Innovation is the result of the application of innate human inventiveness and ingenuity. Creativity is something that everyone is capable of, and the application of the innovativeness is a source of excitement, challenge and satisfaction. As organizations are struggling under new market conditions, innovation has become more of the concern. This then leads to the point that organizations must tap into their creative potential in order to develop themselves. Thus creativity may hold more importance to organizations now than in the past, and more in the future than in current times. Change reflected on the market is unfolding on a larger scale and it may be important to consider creativity and innovation on this larger scale, with organizations providing a viable starting point (Robedo et al., 2012).

The explosion of modern technology and the concomitant on the economic development has been the subject of a huge multidisciplinary literature. The industrial revolution and the subsequent developments did not just raise the level of technological capabilities; they changed the entire dynamics of how innovation comes about and the speeds of both invention and diffusion. For much of human history, innovation had been primarily a byproduct of normal economic activity, punctuated by a periodical flashing insight that produced inventions. But sustained and continuous innovation resulting from systematic R&D carried out in firms (Mokyr, 2010).

However, although the importance of the organizational dimension of innovation is recognized, many innovation studies continue to be dominated by an economic approach that allows little room for the analysis of creativity change and innovation within the organizations. By contract, researchers in the field of organizational studies who have developed a rich literature on organizational cognition, learning and creativity rarely relate their work explicitly to innovation. As a result, this stream of work which offers great potential for understanding the microdynamics of organizational change and innovation remains outside the main arena of innovation studies (Lam, 2006).

Using the new data provided by Eurostat (CIS7), this paper outlines an analysis on methods of stimulating creativity practiced by firms. Section 2 looks briefly on the notions of creativity and innovation at the microeconomic level from the perspective of organizational knowledge creation. Section 3 makes an incursion on creativity facilitators and section 4 examines the methods of stimulating creativity in Romanian firms and analyzes the relationships established between the latter and R&D carried out in firms. The last section concludes.

Although our attempt does not eliminate the issues mentioned above, it can be considered the beginning of a way, and its crossing relies undoubtedly on the available data. In fact, generating, adopting and putting into practice of new ideas

relate to the literature of "organizational innovation", which is very diverse, but not integrated into a coherent theoretical framework. Organizational innovation is subject of various interpretations regarding the propensity of an organization to innovate, often focusing on cognition and organizational learning at the level of micro-economic process. In this groundwork, cognitive foundations of organizational innovation are reflected, that relates to learning and knowledge creation process in organizations (companies). Firms vary in their characteristics of knowledge creation and innovative capabilities depending inclusively on their structural forms and activity.

2. Creativity and innovation

Creativity is incorporated within several fields of research, including psychology, education, political science and administration etc. In the field of management studies there has long been an interest in creativity because of its links to innovation. Creativity is defined by some authors as the generation of a product that is not only novel and imaginative but also useful and of good quality (Stoycheva and Lubart, 2001). Creativity may also be defined as a mind skill that generates new ideas. In this case, creativity is essentially not a knowledge or science, but appears as a skill that may be promoted and improved through various methods. Creative problem-solving is typically viewed as a form of "high-level" cognition. This, in contrast to the simpler, automatic, cognitive activities are commonly considered to be demanding. As a result of high-level cognition, one makes (conscious) decision, as to whether is willing to invest scarce resources in various problem solving activities occurring at the individual, group or organization levels.

The term cognition refers to the fact that individuals develop mental models, belief systems and knowledge structures that they use to perceive, construct and make sense of their worlds and to make decisions about what actions to take. The psychological literature has focused predominately on the information processing consequences of mental models. The researchers in management have extended the analysis to the group and organizational levels. Their analysis suggests that organizations develop collective mental models and interpretive schemes which affect managerial decision making and organizational action. Organizational cognition differs from individual cognition because it encompasses a social dimension. Much of the research focused on the sociocognitive connectedness seeks to account for the social processes in the formation of collective cognition and knowledge structures.

Creative behavior is a vital ingredient in generating and diffusion of innovations and can be boosted by the acquiring of new knowledge. The need for a better understanding of the factors that exert positive influence on the members engaged in creative activities at the individual or group level is expressed in a creative environment, in order to acquire new knowledge and innovation. In this context, innovation is seen as an activity for implementing ideas and creativity (Amabile, 1996). Individual and group creativity is the starting point in innovation activity. Production of new goods (products and services) or processes as a result of organizational creativity is a social phenomenon involving various actors in turning ideas into new goods or services. Innovation will generally involve more people in the organization who need to understand, to work or contribute to the implementation of the identified solutions.

The idea that organizations can act collectively, and function as a center of organized knowledge has stimulated much research on organizational learning and knowledge creation. This work has sought to understand how social interaction and group dynamics within organizations shape collective intelligence, learning and knowledge generation, and yields important insights into the innovative capability of firms. It has also examined how shared mental models or interpretive schemes affect organizational adaptiveness, emphasizing the “two sides of the same coin” (Lam, 2006, p. 124). On the one hand, some argue that shared interpretive schemes facilitate the organization's capacity to process information in a purposeful manner, promote organizational learning and collective problem solving and thus enhance adaptive potential (Brown and Duguid, 1991). On the other hand, others suggest that organizational interpretive schemes can create blind spots in decision-making and block organizational change (Shrivastava et al., 1987).

Innovation is viewed by some authors as a process of learning and knowledge creation through which new problems are defined and new knowledge is developed to solve them (Lam, 2006). Most theories of organizational learning stress the importance of collective knowledge as a source of innovation capability of firms. Collective knowledge is accumulated knowledge by firms and reflected in rules, procedures, and shared norms which guide the problem-solving activities and patterns of interaction among its members. Collective knowledge resembles the “memory” or “collective mind” of the organization and it can either be a “stock” of knowledge, or represent knowledge in a state of “flow” emerging from various interactions. Collective knowledge may exceed or be below individual knowledge, depending on the mechanisms by which individual knowledge can be anchored in the collective one.

The complex nature of the phenomena underlying creativity and innovations can be examined in the context of firm planning. At the individual level, creativity and innovation are influenced by expertise and motivation. At the group level, creativity and innovation are influenced by phenomena such as group process, climate perceptions, and leadership. At the firm level, firm structure, organizational learning, and strategy are of importance. These many and varied influences broach a critical question for those interested in enhancing creativity and innovation in firms: at what level and with respect to what set of variables should interventions be made in attempts to enhance creativity and innovation? The difficulty arises as these variables are interrelated. For example, climate perceptions and work context are strongly influenced by what the team is working on and how the team is lead.

Innovation is also induced by other factors, implying alongside recognition of new ideas (generated within the organization, transferred etc.), a significant amount of resources. Intangible inputs (knowledge acquired through learning and research activities, organizational skills, patented inventions etc.) or tangible assets (machinery and equipment, information and communication technologies, materials) affect the outcomes (outputs). From the non-linear perspective, the process of innovation becomes more complex, involving many interactions and feedbacks in a system that brings creativity, knowledge creation, research and innovation results all together.

3. Facilitators of creativity in firms

Economic growth is associated with efforts of producing of new or substantially improved goods (products or services) and processes as a result of creativity and innovation in firms. Success, in turn, enhances the firm's ability to recruit the best people, improve their integration, and accelerate the pace of change. Furthermore, development projects themselves often are the vehicle by which new approaches and new thinking are adopted. These benefits may be supplemented by obtaining of significant returns from expanding of sales, higher margins, increased value-added, lower costs, and improved productivity as a result of investments. While the potential benefits of innovation are enormous, unfortunately, in most firms they are rarely achievable. Most of the challenges and difficulties faced by firms consist of directing all processes effectively.

A number of empirical studies have been carried out to identify the main influencing factors on the performance of research groups in public institutions and firms. The major findings suggest that a successful creative research environment should have the following (Hemplin et al., 2004):

- clear objectives functioning in a coordinated way for researchers;
- a primary focus on research and a genuine research culture built up over a long time period;
- a positive group climate;
- group members who participate actively in the leadership of the group's research;
- a flat and decentralized organizational structure;
- internal and external communications which are lively and supporting;
- basic resources for staff: adequate time, research funding, research equipment, appropriate premises and library materials;
- diversity in size, age and experience of groups and individuals;
- high level of motivation (and even enjoyment of the job), career structure, promotion and rewards;
- well managed staff selection;
- tools of promoting individual competencies;
- quality control (although not in too excessive or intrusive a form); and
- an institutional base with an established reputation and visibility.

Elements listed above operate at different levels and can be grouped in various categories. Some of those refer to employees, others to firms. Influences on them may be exercised on a larger scale, from the entire society in which individuals and firms operate.

Personal characteristics include *personality attributes*. Individuals that present initiative, independence of judgment, flexibility, openness to new ideas, persistence, self-confidence, tolerance to ambiguity, disposition to take risks and learn from mistakes have greater chances of taking advantage of opportunities to express and develop creative ideas (Alencar, 2012). Besides variables from outside the individual, such as incentive, freedom to express ideas, opportunity and time, some personality traits, such as courage, perseverance and curiosity, can be considered as facilitators of creativity (Alencar & Fleith, 2004).

Creativity is also a result of *motivational factors.* They outline essential components of the tools system developed by firms engaged in encouraging creativity through pecuniary and non-pecuniary incentives. Reward or external recognition can also manifest a positive effect on creative performance. Sauermann and Cohen (2008) analyze the impact of preferences for benefits and job characteristics on innovative effort and performance at the individual level, but many questions remain. In fact, both motivational types—intrinsic and extrinsic—frequently interact, mutually combining to strengthen creativity. Intrinsic motivators (related to intellectual challenge) are sometimes found to be

more important than direct inducements such as compensation for worker performance.

A supportive but intellectually demanding environment or a climate in which individuals, including management team, express appreciation for the efforts of members of the organization can boost creativity. Also, freedom of choice stimulates creativity, suggesting that success can be hindered if researchers are looked excessively. An incentive system that provides more time and opportunity for search and feedback stimulates greater creativity because it encourages researchers to become less instrumental and more exploratory in their thinking, and thus more willing to adopt higher risk, higher payoff approaches to technological challenges (Azoulay et al., 2009). Although the problems associated with the recognition and rewarding are complex (especially those relating to experts in different areas or individuals proving talent), they need to be solved in the management of creativity and innovation.

The level of *expertise* refers to the superior performance gained in a domain or to the capacity acquired through practice or deliberate individual study in order to be valued in an activity involving creativity. Knowledge gained facilitates the acquisition of new knowledge and connections making between ideas, resulting other valuable ideas tailored to the needs of a particular context.

Organizational environment variables that may affect creativity have been the target of numerous studies (see Alencar, 2012 for a survey). The characteristics of a leader who motivates and fosters creativity, elements of groups or teams that may stimulate or inhibit creativity, the organizational climate and its impact on creativity, strategies adopted for stimulating creativity among firms with innovative capacity are some of the topics that have been investigated.

Rewarding creative work, defining the career paths that employers might follow, training employees on how to develop new ideas or creativity, using many of the most common methods of encouraging communications and collaboration, such as round-tables on particular areas of interest, talks by eminent visitors, weekly "workhere-in-progress" seminars by employees, lunch meetings and internship programs are practiced in innovative firms. International collaboration accentuates the need for a greater respect for partner competencies. Furthermore, awareness of the commensurate abilities of partners may provide a stimulus to creativity. It may provide, for example, an element of competitiveness between research teams that assists innovation. Of course, all these actions represent aspects of broader organizational development interventions.

Judge et al. (1997) determine that innovative firms have the following characteristics:

- give operational autonomy to researchers, inasmuch as they act entrepreneurially and have a sense of individual accomplishment;
- have managers that possess strategic autonomy, which align individual researcher interests with organizational aims;
- too little control by top management is found to cause a disconnection between business goals and research enterprise. A balance between operational and strategic autonomy promotes innovation by encouraging researchers to be creative in organizationally beneficial ways;
- individual and group success is rewarded extensively through intrinsic methods of personal acknowledgement and recognition by managers and peers, rather than by extrinsic impersonal rewards in the form of salary increases, bonuses etc.;
- "group cohesiveness" developed through particular attention to recruiting people whose "faces fit" and slot into the social environment;
- established goals are reasonable and deadlines are flexible;
- the firm possessed "organizational slack", which allow adaptation to the strategies pursued in the past and the present, and to be projected into the future.

Innovative firms confront with identification of cooperation modes and avoidance of hierarchical frictions. When are faced with a lack of clear performance metrics, traditional organizations increase rules, directives, and monitoring, that only hampers innovative activity. If firms can indeed provide satisfactory ways of measuring relevant aspects of employee performance, they then can provide greater autonomy by using incentives to begin a virtuous circle of work freedom and high reward. In this regard, "sensing" (an entrepreneurial activity) is particularly difficult to calibrate. Because of this, it is difficult to start up a new business inside an existing enterprise (Teece, 2010).

An effective group (team) management is essential for creativity and the success of R&D projects, but it is also important to manage key individuals. Key employees are essential for R&D productivity. The research managers must identify these people, nurture their creativity, and ensure that they remain with the company. On the contrary, a poor management of creativity and of stimulating of new ideas will have weak project management (control and evaluation is undertaken by non-specialists); high levels of bureaucracy and rigid procedures (e.g., in requiring excessive documentation); slow information processing systems; lack of involvement of personnel from the manufacturing function; too high workload (working on too many projects); and lack of funding for longer-term research.

R&D management requires both team management and individual creativity, and the issues of recruiting, rewarding, and organizing teams and individuals are central. R&D workers tend to be highly educated and skilled, and the most effective rewards tend to be more complicated than simple remuneration. High levels of task discretion and autonomy are common, but there is a need for formal organizational decision-making processes. These project management systems take a variety of forms, including those related to specific individuals at particular stages of the project's development. Integrated teams with a common system or product focus have been shown to be effective in the industries.

4. Methods of stimulating creativity in Romanian firms

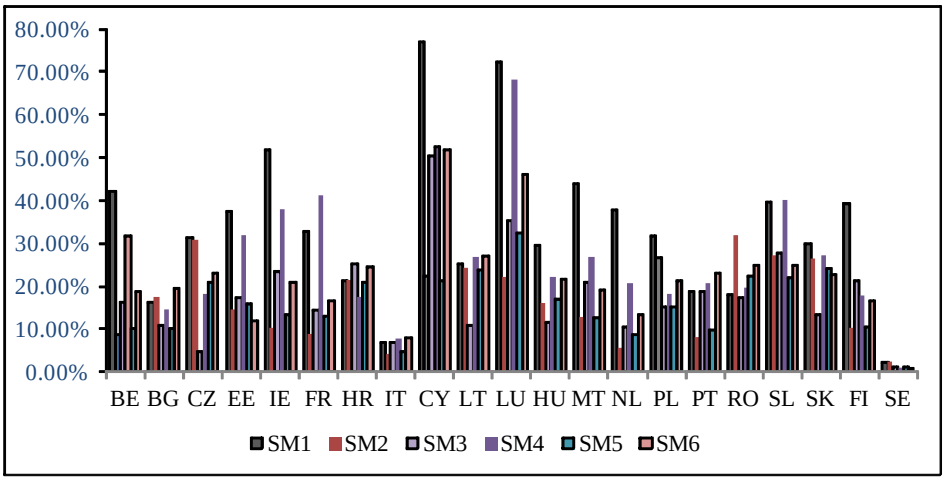
The investigation of methods used by firms in stimulating creativity leads to a better understanding on how the new ideas are managed for their application and obtaining of results. In this respect, Commission Innovation Survey (CIS7) provides, for the first time, information on methods of stimulating new ideas and creativity (SM) as grouped in the following table for the period 2008-2010:

Table 1. *Successful methods of stimulating new ideas and creativity*

SM1	Brainstorming sessions, successful method stimulating creativity
SM2	Financial incentives for employees to develop new ideas
SM3	Job rotation of staff
SM4	Multidisciplinary or cross-functional work teams
SM5	Non-financial incentives for employees
SM6	Training employees on how to develop new ideas or creativity

Innovative and non-innovative firms provide answers to questions that are not mutually exclusive. We can appreciate that the Eurostat initiative is favorable to a better understanding of factors that affect innovation performance. Looking on the methods of stimulating new ideas and creativity in EU countries (Figure 1), we see both similarities and differences. Data express the proportion of innovative firms that have positive answers to the questions of the total on innovators. In general, the most practiced methods appear to be the brainstorming sessions (SM1), job rotation of staff (SM3) and creating of multidisciplinary or cross-functional work teams (SM4). Unfortunately, the Eurostat data are not available for every EU country. It would have been of interest looking on how innovation leaders (Sweden, Denmark, Germany and Finland) manage creativity at the microeconomic level. The data we hold on Finland and especially Sweden appear to be surprising, given the low proportion of firms which responded affirmatively to questions.

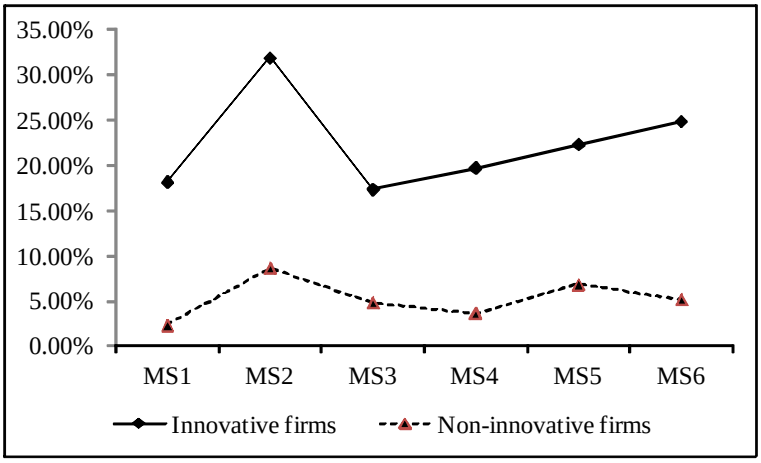
Figure 1. *Methods of stimulating creativity in innovative firms by country*



Source: Eurostat (CIS7) – all core NACE activities.

The most practiced methods in Romanian innovative firms are granting of financial incentives for employees in order to develop new ideas (SM2), training employees on how to develop new ideas (SM6) and granting of non-financial incentives for employees (SM5). Comparing the answers to the questions of innovative firms with those supplied by non-innovators, the difference appears to be obvious (Figure 2); in general, non-innovative firms are less engaged in stimulating new ideas and creativity and they are less involved in organizing of brainstorming sessions (SM1), forming of multidisciplinary or cross-functional work teams (SM4) and in training employees on how to develop new ideas (SM6).

Figure 2. *Methods of stimulating creativity in Romanian firms*



Source: Eurostat (CIS7) – all core NACE activities.

Therefore, these methods of stimulating creativity can be considered to be valorized by Romanian firms in order to create new products, processes or services in the innovation process. The questionnaire was designed to illustrate methods of stimulating creativity practiced by firms in various sectors. Two question arise: what kind of links are established between the various methods of stimulating creativity and how are they combined so that the R&D investment increases when they are translated into practice?

A principal component analysis can be used in order to answer to the first question. This enables us to identify the relationships established between the various methods of stimulating creativity and to obtain fewer variables. The latent variables that result can be subsequently used to assess their contribution to the research and development activity of firms.

The principal component analysis is useful in order to reduce a relatively large number of variables into a smaller set of variables that still captures the same information. The initial variables are expressed in relative values as proportions of innovative firms that use such methods of the total innovators in all core NACE activities. We divide the data so that we can get a larger number of cases. The descriptive statistics are shown in the table below:

Table 2. *Descriptive statistics: central tendency and variability*

	Minimum	Maximum	Mean	Std. deviation	Skeweness	Kurtoisis
SM1	0.0354	0.6786	0.208085	0.1309366	1.411	0.733
SM2	0.0797	0.4654	0.313403	0.1015638	-0.558	0.733
SM3	0.0357	0.5000	0.193220	0.0858168	0.805	0.733
SM4	0.0000	0.5714	0.218798	0.1293857	0.744	0.733
SM5	0.0663	0.5714	0.219658	0.0887622	1.506	0.733
SM6	0.0519	0.5714	0.273515	0.1333282	0.561	0.733
Valid N	40	40	40	4040	40	40

The higher the standard deviation, the more different are firms in terms of methods they use to stimulate creativity. In our case, the standard deviations register low values for all variables considered, which means that firms are not strongly differentiated, forming a space with a low variability. Table 3 shows the partial correlation matrix for the six original variables.

Table 3. *Correlation matrix*

	SM1	SM2	SM3	SM4	SM5	SM6
SM1	1					
SM2	0.484**	1				
	(0.002)					
SM3	0.692**	0.682**	1			
	(0.000)	(0.000)				
SM4	0.934**	0.541**	0.615**	1		
	(0.000)	(0.000)	(0.000)			

	SM1	SM2	SM3	SM4	SM5	SM6
SM5	0.834**	0.669**	0.712**	0.786**	1	
	(0.000)	(0.000)	(0.000)	(0.000)		
	0.857**	0.692**	0.703**	0.898**	0.765**	1
SM6	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Determinant = 0.001.

As we expected, there are strong correlations between all variables, and they are direct. The Bartlett's test is another indication of the strength of the relationship among variables. Table 4 shows the results for the KMO and Barlett tests. The value for KMO is good meaning that pattern of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. The Bartlett's test of sphericity is significant as well ($p < 0.001$), and therefore factor analysis is appropriate.

Table 4. *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin measure of sampling adequacy		0.780
Bartlett's test of sphericity	Approx. Chi-Square	261.474
	df	15
	Sig.	0.000

Principal component analysis with varimax rotation was conducted to assess the underlying structure for the six variables. Two factors were requested, based on the fact that the variables were designed to index two constructs: methods of stimulating creativity based on intrinsic motivations and methods of enhancing creativity based on extrinsic motivations. After rotation, the first component accounted for 77.36% of the variance, the second factor accounted for 11.146%, and all the remaining factors are not significant.

Table 5 displays the component matrix after rotation. The methods of stimulating creativity that load highly with component 1 are SM1, SM4, SM5 and SM6 (practicing of brainstorming sessions, constructing of multidisciplinary or cross-functional work teams, granting of non-financial incentives for employees and organizing of training sessions for employers), and all these are related to intrinsic motivations. Therefore, we label this component *as intrinsic motivations*. The methods that load highly with component 2 are SM2 and SM3 (financial incentives for employers and practicing job rotation of staff). Assuming that the rotation at work is a form of skills recognition within the organization, the last two variables correspond to the motivations related to rewards (extrinsic motivations), therefore we might label this factor *extrinsic motivations.*

Table 5. *Rotated component matrix*[a]

	Component	
	Component 1 *Intrinsic motivations*	Component 2 *Extrinsic motivations*
SM1	0.938	
SM4	0.927	
SM6	0.792	0.506
SM5	0.719	0.551
SM2		0.924
SM3		0.749

[a] Principal Component Analysis. Varimax rotation with Kaiser normalization.Rotation converged in 3 iterations.

The results of this analysis show that the initial questions of the questionnaire refer broadly to two types of methods practiced by companies to stimulate employers creativity, based on intrinsic or extrinsic motivations. We formulate the following hypothesis in order to assess the incidence of those methods on the research activity: increasing the proportions of firms engaged in creativity will have impact on the research and development activities by increasing of expenditures for this purpose. Under these conditions, we proceed to identify the best combination (from the econometric point of view) of methods used by firms in order to be implemented in research and development activities. In this respect we use a multiple linear regression model specified by the following general equation:

$$Y_i = \beta_{0i} + \sum_j \beta_j X_{ij} + \varepsilon_i , \quad (1)$$

in which, Y_i - dependent variable *i*; X_{ij} - exogenous variable; β_j - parameters that summarize the *j* factor contribution to the dependent variable; ε_i - an independent and identical distributed error term for *i* with zero mean and σ^2 variance.

The dependent variable includes total expenditure on (internal and contracted) R&D in absolute value (million of euro) in core NACE sectors with innovation activity (manufacturing and services). The independent variables that we introduce incorporates the factors obtained in the above analysis and they are associated with motivations of intrinsic (Si - factor 1) and extrinsic type (Se - factor 2). The control variable we use is the turnover of period in absolute size (million of euro).

Since we aim at identifying the best model which can explain the relationships between variables, we began the analysis with all variables considered, giving up the weakest predictors at every step. The coefficients of the best model which result, alongside the standard errors and the corresponding econometric tests are shown in Table 6:

Table 6. *OLS regression coefficients*

	Dependent variable: (Y = RD)	
	Coefficient	Std. deviation
Se - factor 2	10112.786	4245.322
Turnover	0.004	0.000
(constant)	-1047.831	5154.515
R-squared	0.871	
F-statistic	121.646	
Durbin-Watson	2.116	

The results indicate that stimulating creativity through extrinsic motivations as employees financial incentives and recognition (rotation) of employees in workplaces influence the R&D activities. The influence of the group of methods based on intrinsic motivations appears to be very low, so they were removed from the model above. A significant incidence also shows the size of turnover of the period.

The results show statistically significance, explain a large percentage of R&D variation ($R^2 = 0.871$) and the tests also demonstrate these observations.

We get the same results by introducing the total innovation expenditure (R&D, for acquisition of external knowledge, and of machinery, equipment and software) as a dependent variable. Although we expected that the two sets of results are not converging given the extremely low amount of R&D expenditures, but also the characteristic heterogeneity of sectors, obtaining the same effect profile of influencing with similar effects ($R^2 = 0,888$) strengthens the validity of the identified connections.

Conclusions

The favorable incidence of the methods of stimulating creativity of extrinsic type on R&D performed by firms can be justified: it is necessary to boost creativity and proper recognizing of employees that work in the research fields based on proven achievements. In fact, the strongest links identified from partial correlations are established between SM2 from the factor 2 and R&D. No doubt that the research itself, as a source of knowledge, is a source of creativity. However, the absence of any statistical connections, resulted both from partial correlations and by introducing the factor 1, between methods of intrinsic type and the size of research, or by introducing innovation expenditure as dependent variable, reveal all a low concern of Romanian firms for training employees, in general, for the dissemination of ideas and knowledge, for collaboration and ensuring a positive group environment based on harmony and support to those are u not favorable for research and innovation.

The most practiced collaborative relationships in Romanian innovative firms are those established with customers and suppliers (of non-interactive type), and the proportion of those employed in collaboration with institutions of higher education and research that are of importance for the innovation process from early stages through interactive transfer of knowledge to the private sector (improving, in the same time, the yields of public research), is one among the lowest in the EU.

A sporadic allocation of financial resources for research and innovation is evidenced by the strong dependence of both the total innovation expenditure and R&D expenditure and the financial results of the period (expressed as turnover). This feature induces discontinuities in innovation activity, and the consequences in terms of financial results are not surprising; the proportion of the turnover of new products to market that incorporates creativity of the total turnover achieved by innovative firms remains one of the lowest in Europe, 4.85%, which is well below the EU average of 8.60% (according to our calculations using Eurostat data). These results are consistent with how innovation is practiced by firms, most of them being adopters of technologies with lower requirements of inventiveness and use of skills that are needed for the design and development of new technologies.

A deeper understanding of the nature of research under the motivational factors is essential in shaping appropriate policies for research and innovation. Learning from the experience of the top innovators regarding the development modes of the creative capital can be useful in order to exploit innovation capacity, and that would be reflected both in government policies or promoted at the enterprise level. Creativity is the key source of economic growth. The best way to prosperity is by investing in creativity in all forms. Promoting a culture of creativity goes beyond the allocation of financial resources in research, involving multidimensionality.

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The analysis of the influence factors affecting the performance of pharmaceutical companies

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Abstract. *The paper provides an overview of current situation of the global pharmaceutical industry, with focus placed on the EU pharmaceutical market, including also the Romanian pharmaceutical market evolution synthetized into a SWOT analysis. As main goal the paper identifies several financial performance influence factors at the level of a number of companies from pharmaceutical sector, in order to generate a particular econometric model. The findings of the paper focus on the prediction of Return on Equity (ROE) ratio as the main performance measurement considered significant for the industry our and a large number of factors which contribute to its changes. Thereof, the paper investigates the relationship between various influence indicators or factors resulting from the financial situation of a company and the performance thereof and generates conclusions for the decisions makers at the level of the companies.*

Keywords: economic and financial performance, financial ratios, pharmaceutical industry, quantitative analysis.

JEL Classification: L25, C01, C10, C51, C87, L19.
REL Classification: 17G.

Introduction

The analysis of the economic and financial performances is a frequently debated matter in the economic media from the last decades, covering a very large spectrum, comprising various meanings and tendencies which will continuously capture the interest of the economists, the accountants and the IT specialists. A firm's performance measurement has been the subject matter of discussion for decision makers as managers, planners, economists and academic staff since long many years.

The present study attempts to examine financial performance at the level of EU pharmaceutical industry, to identify its strengths and weaknesses. Also one of the papers' objectives is to analyze how financial performance is achieved by the companies from this industry and to identify the main influence factors. To achieve this purpose we intend to develop an econometric model to empirically investigate the relationship between various influence indicators or factors resulting from the financial situation of a company and the performance thereof.

The study is based on both primary and secondary data. The collected data have been tabulated, analyzed and interpreted on the basis of different financial ratios using statistical tools. Pharmaceutical sector proves in the last years an extremely large openness on the single European market. To provide international visibility of the research results we intend to shape the level of openness of the single European market providing an overview of the financial performance at microeconomic level applied to the Pharmaceutical sector.

In this global market competition we will focus on the basis of the supply chain in this area, i.e. the performance of the producers of the pharmaceutical substances.

The structure of the paper is as follows. *The first chapter* deals with an overview of current situation of the global pharmaceutical industry, with focus placed on the EU pharmaceutical market evolution. The *second chapter* includes a literature review on economic performance of the pharmaceutical level applied at EU level. In the *third chapter* we have detailed the econometric modeling of the economic and financial performances presenting the relationship between performance's influence factors seen as independent variables. In *Chapter 4*, we have presented the research methodology with hypothesis, data sources and the usage of variables. At the end of the chapter, we provide the empirical results with their interpretation. In the last section, *Discussions and conclusions*, we intend to provide some final remarks, limitations of the thesis and future research actions.

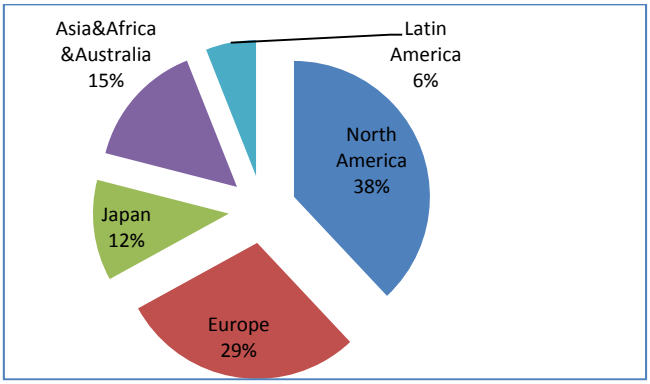
1. Overview on global pharmaceutical industry

According to SESRIC (2011) the global pharmaceutical industry has proved a rapid growth over the years and emerged as one of the fastest growing industries in the world. However, world pharmaceutical production and consumption is still unevenly dispersed around the world with the developed countries as the leading producers and consumers of pharmaceuticals.

IMS Health (2010) stated that world pharmaceutical market was valued at US$ 875 billion with a growth rate of 4.1% over the previous year at the constant exchange rate. The volume of pharmaceutical industry has surged from USD 647 billion in 2005 to USD 875 billion in 2010, corresponding to an increase of 35.2%. During this period, the industry's growth rate has witnessed a declining trend from 7.2% in 2005 to 4.1% in 2010. This decline is mainly associated with the slowdown in economic activity, especially in the developed countries which consume a large quantity of global pharmaceutical products. In 2008, economic slowdown in developed countries culminated into one of the worst global financial and economic crisis since the Great Depression. The negative effects were felt across the globe and the pharmaceutical sector experienced the same situation. However, in 2009, the negative effects of the crisis subsided and global economy has started to recover.

Both in terms of production and consumption, global pharmaceutical market is highly concentrated in the developed regions like North America (38%), Europe (29%) and Japan (12%) which in 2010 accounted for nearly 80% of global market. Developing regions like Asia, Africa, Australia and Latin America with a share of nearly 85% of world population are accounted for only 21% of global pharmaceutical consumption in 2010 (Figure 1). A breakdown of pharmaceutical market in developing world reveals that Asia, Australia and Africa represent nearly 15% whereas Latin America accounts for 6% of the global pharmaceutical market.

Figure 1. *Regional Distribution of Global Pharmaceutical Market*



Source: IMS Health Market Prognosis, March 2011.

IMS Health Midas provides an update of Top 10 Global Corporations in pharmaceutical industry also for the Romanian market as important players in the import of pharmaceutical products. Moreover, some of them have also production facilities (i.e. Sanofi-Aventis). The tendency expressed by several experts in the area was that pharmaceutical companies will face significant operating challenges during 2011, as the expiration of significant drug patents is set to erase record levels of revenues and earnings, coupled with pressure from government cost containment in the US and Europe. Also the governments were cutting healthcare costs across the board, ensuring that pharmaceutical companies face the prospect of much lower prices and higher reimbursement restrictions. The predictions for 2013 are similar with the one for 2012 and 2011 having in mind that fact that pharmaceutical companies are struggling to develop promising new therapies against a backdrop of global austerity and healthcare reform.

Pharmaceutical industry, like IT industry, relies heavily on research and development (R&D) activities. Hence proper R&D facilities should be built and researchers and technicians should be provided with necessary financial resources to develop an innovative pharmaceutical industry in the competitive economies.

Besides economies of scale in manufacturing, clinical trials and marketing, bigger companies can allow investments in more research and development (R&D) projects that diversify their future drugs portfolio and make them much more stable in the long term. As the result, top-companies in the industry were active participants of mergers and acquisitions (M&A), new joint ventures and spin-offs of non-core businesses. This M&A activity can be seen also in the Romanian market, as we will present later on.

As clarification, generics drugs are usually produced by a manufacturer who is not the inventor of the original product, and are marketed when intellectual property protection rights are exhausted. Original drugs, the branded ones, are those which revolutionize a certain market segment when they are launched, opening a new therapeutic area or providing a new treatment for a disease. The EU Pharmaceutical Legislation adopted in 2004 has created a harmonized EU eight-year data exclusivity provision with an additional two-year market exclusivity provision to which the drugs are protected by patents and licenses.

Global pharmaceutical companies are trying hard to stave off the R&D crisis through mergers and acquisitions, geographic expansion and diversification into new areas such as consumer health. As a consequence, according to an article in Seeking Alpha (2011), Fitch Ratings anticipated that pharmaceutical companies will face significant operating challenges during 2011, as the expiration of significant drug patents is set to erase record levels of revenues and earnings,

coupled with pressure from government cost containment in the US and Europe. In this regard, the agency outlook for the sector in 2011 was negative.

R&D is costly but if successful, it pays off. The market for pharmaceutical products is global and most (western) countries spend a large share of their income on health (around 6 to 10%). The national budgets that are spent on pharmaceuticals range from around 1% to 2% of GDP. On average, European countries spend around 1.5% of their income on pharmaceuticals according to ECORYS (2009).

According to EUROSTAT data, the pharmaceutical industry is the high technology sector with the highest value-added per person employed, well ahead of the average value for high-tech and manufacturing industries. The pharmaceutical industry is also the sector with the highest ratio of R&D investment to net sales. It amounts to approximately 3.5% of total EU manufacturing value added and 18.9% of the total worldwide business R&D expenditure. In 2007 the Romanian pharmaceutical production reached 280 million USD (EFPIA, 2009).

In 2010 the research based pharmaceutical industry invested an estimated 27.000 million USD in R&D in Europe. Romania carried out R&D in amount of approximately 150 million USD in 2009 according to EFPIA member associations (2009).

After a decade of strong US market dominance, which led to a significant shift of economic and pharmaceutical research activity towards the US during the period 1995-2005, Europe is now also facing increasing competition from emerging economies. For 2011-2012 China, India and Brazil are predicted to be the fastest growing regions among developing countries for the pharmaceutical industry according to *Global Pharmaceutical Industry Outlook Survey.*

According to Kiran and Mishran (2009) India now ranks 3rd worldwide in volume and 13th in value and exporting to more than 200 countries around the globe including the highly regulated markets of US, Europe, Japan and Australia.

In the same time, several studies show that China is predicted to be the second largest pharmaceutical market after the United States by 2015. Due to the evolution of the markets, within the next decade, Asia is expected to overtake Europe in pharmaceutical sales, driven by growth in key emerging markets.

Owing to their rapid growth, most of the important pharmaceutical companies are focusing on the emerging markets of Brazil, Russia, India, China, Mexico, and Turkey (BRIC-MT) to increase global and regional drug sales.

In 2007, according to CBI market survey (2010) Romania was the 16th largest pharmaceutical producer in the EU, accounting for over 0.2% of total EU production. The largest producer in the EU in 2007 was France, which accounted for 21% of the total production. Between 2005 and 2007, Romanian production increased by an annual average rate of 24%, amounting to 280 million euro in the latter year. The increase in Romanian production was well above the EU average of 3.5% during that same period and represents one of the highest growth rates in the EU.

There are approximately 300 manufacturers, importers and distributors of drugs on the Romanian market. In recent years, a number of overseas generic companies have entered the Romanian market, increasing the range of products available in the country, providing access to new export markets and improving sales performances. A number of acquisitions have taken place, including that of Sicomed in September 2005, by the leading Czech company Zentiva, now a member of Sanofi-Avensis group one of the most important companies from Central and Eastern Europe (CEE). In March 2006, India's largest generics manufacturer, Ranbaxy, acquired Terapia Cluj. In the same month, the Icelandic generics manufacturer, Actavis, acquired the generics company specialized in oncology products, Sindan.

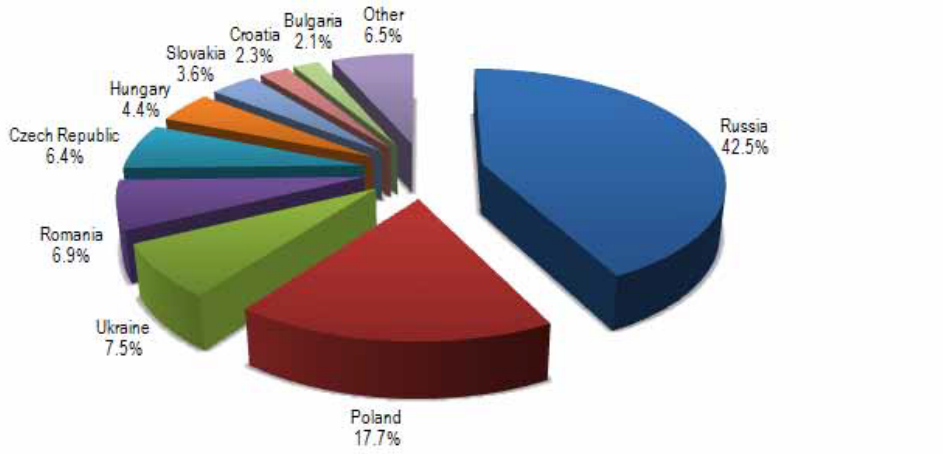
The Romanian Association of International Drug Producers has 26 members including Amgen, AstraZeneca, Bayer, Bristol-Myers Squibb, GlaxoSmithKline, Johnson & Johnson, Merck, Sharp & Dohme, Novartis, Pfizer, Sanofi-Aventis and Servier. First place as market share we can place Sanofi (including Zentiva) with 8.3%.

It is important to note that in Romania generic drugs represent around 70% of the market in volume terms and 30% in value terms. Romania's pharmaceutical production is strongly focused on generic medicines. Romania produces also original drugs (for cancer treatment i.e. Antibiotice Iaşi).

Ministry of Health research institutes or medical universities, located in large cities such as Bucharest, Iasi, Cluj, Târgu-Mureş and Timişoara are carrying out the majority of R&D activities. Local companies also invest in R&D, such as Antibiotice Iaşi, which is continuously developing new central nervous system, cardiovascular, musculoskeletal and dermatology drugs. Even if development of the Romanian biotechnology industry has been slow with little funding available for research, but under the 2007-2013 National Plan for R&D and Innovation, more emphasis has been placed on the promotion of high quality research considering the fact that Romania has an educated workforce with experience in biology, pharmacy and biochemistry.

Espicom (2012) issued a report on the Romania World Pharmaceutical Market in which is pointed the Romanian market for pharmaceuticals was estimated at US$4,467 million, or US$208 per capita. This market size is comparable to Hungary; in per capita terms, the market is similar to Bulgaria. The market was expected to expand at a CAGR (compound annual growth rate) of 10.0% in Romania over the next few years, reaching US$7,188 million by 2016, equal to US$337 per capita. The growth rate may be affected by slow economic recovery, however. Whilst the large population creates demand for pharmaceuticals, the low GDP per capita means that patients are unlikely to be able to afford the most expensive drugs and will settle for the cheaper alternatives.

Figure 2. *Regional Comparison of Projected Pharmaceutical Market Share at Retail Prices, 2016*



Source: Romania World Pharmaceutical Market 2012 after Espicom.

Pharmaceutical companies listed at Bucharest Stock Exchange are Antibiotice Iasi (ATB), Zentiva (SCD) si Biofarm (BIO) and Farmaceutica Remedia (RMAH). The primary growth drivers of the three companies listed at the stock market are their generic drugs division, which gives them an upper hand from international groups. Farmaceutica Remedia S.A. operates a chain of pharmacies in several cities from Romania. The company offers marketing and distribution services for the public and private pharmaceutical health system and the pharmaceutical market.

As a consequence of all financial information known regarding the evolution of the Romanian pharmaceutical market we can create a SWOT analysis table with the most important aspects taken into consideration.

Table 1. *SWOT analysis on Romanian pharmaceutical market*

Strengths ▪ Romania produces original drugs ▪ Relatively cheap labor force makes Romania a potential threat to suppliers in developing countries.	Weaknesses ▪ Romania is focused on the production of generic medicine. ▪ Romania is one of the smallest exporters of pharmaceutical products in the EU. ▪ Whilst the large population creates demand for pharmaceuticals, the low GDP per capita means that patients are unlikely to be able to afford the most expensive drugs and will settle for the cheaper alternatives.
Opportunities ▪ Generic medicines dominate the Romanian market, which points toward positive prospects for exporters in developing countries. ▪ Romania will be the fourth largest pharmaceutical market in Central & Eastern Europe in 2016	Threats ▪ Romania imports from developing countries, main imports being heavily dominated by two main countries, India and Egypt. ▪ The economic crisis is affecting the consumption of pharmaceutical products in the country, especially regarding non-prescription products.

2. Literature review on economic performance

The problematic of "performance" is a constant of the present economic turmoil, but also an insufficiently explored one. The "performance" of an organization has a complex character and reflects a concrete image over the financial and economic situation of an analyzed company. Recent studies on this issue brought to the specialists' attention the necessity of identifying an intelligent and performing information system in order to support the decision makers in the strategic management process.

While "performance" has been present in the economic and financial literature since 1960 being formulated through different criteria, both quantitative and qualitative, there is no concrete definition of the concept. Performance has evolved from 1990, in terms of necessities and requests, several definitions being established on the reason of the level of achievement of organizational objectives (Bourguignon, 1995), to a positive result of an action or success in a specific area as Niculescu (2005) pointed out, to the multidimensional goal or purpose of the activity as a reflection of an enterprise's multiple goals (Jianu, 2007)

The performance of an organization remains a central challenge for management research. In many diagnosis analyses, built around the main object of activity, there are direct links to items of financial performance. However, comparative economic data are not always available and they are subjective during a performance assessment. Due to these considerations, a greater attention has been given in the last years to the financial performance which generated a big impact over the performance management system.

Majumder and Rahman (2011) advanced the idea that financial statements contain a wealth of information which, if properly analyzed and interpreted, can provide valuable insights into a firm's performance and position on the market. Several studies that approach the performance issue at the microeconomic level prove the special importance of financial management aspects, on the improvement of which depend the outcomes and the companies' competiveness (Burja, 2011).

What interests us in a particular way, taking into account the specific of economic activity is the financial performance, through which we understand the capacity of a firm to generate new resources from day to day operations in a certain period of time.
Information regarding performance represents evidence about financial performance that are collected and systematically used. Evidence may relate to efficacy or effectiveness of activities in this case talking about outcomes, factors that may affect the results and measures that can be taken to improve financial performance. As I mentioned in a previous study the performance aimed real information translated into terms of performance indicators (Boldeanu, 2008).

Performance can be measured through several indicators or financial ratios. So far the literature has analyzed the performance of companies from various countries and economy sectors through different accounting – based measures with great impact including return on assets (ROA), return on equity (ROE) and gross profit margin (GPM) (Abu-Rub, 2011), net operating profitability (NOP) (Raheman et al., 2010), return on total assets (ROTA) (Deloof, 2003), return on invested capital (ROIC), return on assets (ROA) (Narware, 2010). Performance at microeconomic level has been studied depending also on liquidity such as current ratio and liquid ratio (Singh et al., 2008), risks factors identified through leverage (Weill, 2011) and cash flow per liabilities. Other researches highlight performance assessment expressed by earnings before interests and taxes (EBIT) or expressing it though economic value added (EVA), return on equity (ROE), operating profit margin (OPM) (Ryan, 2008).

Rees (1995) pointed out that in the financial analysis, the wide use of financial ratios is an answer to the high amount of data contained in a set of financial statements and to the issue of comparing companies of different sizes. Financial ratios may be used individually or in groups, in order to compare companies among themselves or against industry benchmarks. In most cases, the result of such analyses depends to a high extent on the financial analyst's skills and expertise.

A performance measure to determine the financial state of a company should not be sensitive to the choices of accounting methods and procedures, but it must assess the current management decisions, the risks of investment decisions and

not punish managers for circumstances that are beyond their control (Damodaran, 2002). Under these circumstances a better choice could be EVA or any other performance measure that would consider "adding" value through previous investments. Nevertheless, Han et al. (1999) concluded that ROE is often used in econometric analyses with financial data.

3. Econometric modeling of financial performance

Modeling economic performance aims to increase efficiency by improving interventions in an adaptive learning cycle (Campbell et al., 2001). The information rising from sources both internal and external to the company, the processing of this information, the obtaining of financial statements and determination of the representative indicators apt to illustrate the real status of the factors which influence the performance of the company and the wide range of potential users (investors, managers, employees, clients, banking institutions, state authorities etc.), all of these bring into light various systems for assisting the decision in an informational environment, with favorable results for all the actors involved in this process.

Within the economic-financial analysis, there is a series of models, methods and procedures which are either specific or borrowed from other sciences. At present there are several basic methods and procedures designed for the diagnosis analysis of a company and for setting its financial-economic performances. Such methods help to set up a direct link between the identified economic performances and the overall strategy of the company (Boldeanu, 2008).

The mathematical-economic methods which use the various financial ratios proved their usefulness in the decision-making process of capital investors. Most of the time, these models involve linear relations between a set of financial ratios and the company return ratio.

As a dependent variable used, we employed ROE, as we believed that it synthesizes best the concept of company performance if it is to synthesize it by means of one indicator only. Return on Equity is perhaps the most commonly used profitability measure (Bertoneche et al., 2001). Due to the data accessibility and the ease in being understood, as well as to the interest granted to this ratio by capital investors, we decided to apply ROE instead of EVA (Economic Value Added) in generating an econometric model to empirically investigate the relation between various ratios from the financial situation of a company and the performance thereof.

As to the company's specific factors, in our case ratios, included as independent variables, we decided to group them into four major categories:

Growth dynamics factors:

- **EBITDA or EBIT Margin** – EBITDA margin is calculated as EBIDTA (Earnings Before Interest, Taxes, Depreciation and Amortization) divided by Total Sales and EBIT Margin as EBIT (Earnings Before Interest and Taxes) divided by total revenue.
- **Net Profit Margin –** the ratio reveals the overall profitability of the concern, that's why it is very useful to the owners and prospective investors. It also indicates management efficiency in manufacturing, managing and selling of the products.
- **Earnings per Share (EPS) –** it is an important financial performance measure. Together with other ratios, EPS can provide insightful information on a firm's growth and financial condition.

Liquidity factors:

- **Current Ratio –** Going further than the usually employed models which are supposing liniar relations in only one sense, between ROE and various factors of financial ratios type, we will propose testing the hypotesis regarding the existence of non-linear relations between the financial ratios and ROE specific to various industries. According to Mramor and Marmor-Kosta ROE should rise fairly quickly, with the positive evolution of liquidity from zero until at some level of liquidity reaches a maximum level of ROE. ROE beyond that level starts to decrease slightly as the current liquidity continues to grow. Companies with low liquidity problems are estimated to meet its short term obligations, problems which have a negative impact on the rate of return. Once reached the optimum level of liquidity ratio, additional liquidity costs outweigh the benefits and the rate of return fades. In this case the function is estimated to have a quadratic form of logarithmic type as described before. (Mramor et al., 1997).
- **Quick Ratio** (immediate liquidity) - Evolution of ROE based on immediate liquidity and current liquidity is similar, with the observation of faster growth and achieving the maximum faster in case of the immediate liquidity.

Risk factor:

- **Leverage under the expression of Debt to Total Assets (DTTA) -** Financial structure leverage or simply leverage, calculated as ratio between debt and total assets (the version used in our model) or the ratio between liabilities and total assets. Financial structure leverage measures how the company's total assets are financed by debt or equity.

***Company Size Factors*:**

- **Book value (BV) –** A company's common stock equity as it appears on a balance sheet, equal to total assets minus liabilities, preferred stock, and intangible assets such as goodwill.

Furthermore, besides the specific company factors, in a future more detailed analysis we might also consider some effects related to the company country of origin (Inflation GDP deflator, GNI/capita, health expenses/GDP), as assessment through experimental analysis of their impact.

We do not claim that the list of the variables above is exhaustive. ROE may also be influenced by other factors besides the ones already specified, which we will gather in a stochastic variable called error by obtaining a classic regression equation.

We can also employ dummies variables as independent variables. A dummy variable is a number variable used for econometric regressions to represent subsets of the data set. The simplest case, dummy is a variable with two values, 0 and 1, where to a record in the data set we are assigning the value 1 it means it belongs to the group taken into consideration. Dummy variables are useful because they allow the use of a single equation to represent multiple different groups, and can focus the characteristic effect of each group factors, which are not specified individually in the model.

In this case, considering the fact that we have mentioned in the first chapter the difference between generic and original drugs and the evolution of the pharmaceutical industry in the CEE countries we will use two dummy variables:

- **Country origin** (**CO**) (we are interested only in Romanian companies from our panel set of data). Romanian companies will be assigned with value 1, all the others with value 0.
- **Types of drugs** (**TD**) produced by the companies (the original drugs protected by patents and licenses will be assigned with 1 and the generic producers with 0).

The initial function of the model will have the following structure:

Figure 3. *Initial structure of regression function*

$$\begin{aligned} \text{ROE} = \beta_1 + \beta_2 * \text{EBIT Margin} + \beta_3 * \text{Earning per Share (EPS)} + \beta_4 * \text{Net Profit Margin} + \beta_5 \\ * \text{Current Ratio} + \beta_6 * \text{Quick Ratio} + \beta_7 * \text{Debt to Total Assets (DTTA)} + \beta_8 \\ * \text{BookValue(BV)} + \beta_8 * \text{CompanyOrigin (CO)} + \beta_9 * \text{Drug Type (DT)} \end{aligned}$$

4. The research methodology

Data source, methodology and usage of variables

The model aimed to be provided can help the decision maker to obtain a qualified answer to at least the following issues:

- Which are the factors that positively or negatively influence ROE and which is their degree of influence?

- Which are the other factors that influence the company performance and that may be considered in order to improve the model?

Having as starting point the research questions considered in our case as hypotheses, we shall continue with the research methodology based on a quantitative analysis focused on the explanation or prediction of the Return on Equity (ROE), using all available data within the company and the relation between various financial indicators/ratios resulting from the financial situation of a company.

In this case we have used a total number of 23 companies on a period of three years from 2010 to 2012 from the pharmaceutical sector from CEE, based on an ordinary regression of the type of the least squares method (OLS). The most frequently used method for this type of analysis is multiple regression, a method we will also use but with a few elements, let's call them experimental, as a variation from the traditional regressions.

The data set refers to the financial statements obtained through access to the online database ISI Emerging Markets (www.securities.com). We took into consideration only listed companies from 7 CEE countries (Bulgaria, Poland, Romania, Russia, Slovakia, Turkey and Ukraine) having as main activity object "*Pharmaceutical and Medicine Manufacturing*".

In this research paper we have used SPSS program in order to get the regression results. Data cleaning was a process which helped us to keep only accurate data for the panel analysis.

According to Mramor and Marmor-Kosta (1997), ROE should grow fairly quickly, with the positive evolution of liquidity from zero, up until a certain level of liquidity to achieve a maximum ROE, while ROE beyond that point starts to decrease slightly as the current liquidity continues to grow. Companies with low levels of liquidity are expected to have problems to fulfill their obligations in the short term, problems that have a negative impact on the rate of return. Once reached the optimal level of liquidity ratio, additional liquidity costs are greater than benefits and the rate of return begins to decrease. And in this case the function is estimated to have a quadratic logarithmic type:

$$y = a + b_1 * \ln x + b_2 * \ln^2 x$$

Such a function has the following features (assuming appropriate values assigned coefficients) when the variable x increases, the values of y function first increase rapidly, then reach a maximum after which they begin to decline slowly. The disadvantage of such function is that their parameters cannot get a simple economic and easy to understand explanation.

According to Mramor and Marmor-Kosta (1977), the relationship between ROE and ROA (Return of Assets) should be increasing, either as linear or quadratic form (grade 2) due to financial leverage. We will consider increasing linear relationship as leverage in the model is analyzed separately by specific factors. ROA is a factor often used in econometric models, mentioning here the works of Chen (2004) and Cronqvist et al. (2003).

Similar with the case of ROA in accordance with the same authors mentioned above, the effect is linear and increasing or, due to the leverage total effect, increasing quadratic - we will consider EBIT Margin by the same argument as linear.

Following the previous reasoning we are going to use the independent variables as follows: ln(CurrentRatio), $\ln^2$(CurrentRatio), ln(Quick Ratio), $\ln^2$(Quick Ratio), ln(DTTA), $\ln^2$(DTTA). Considering these aspects, the regression formula will have the following structure:

Figure 4. *Logarithmic and quadric logarithmic structure of the model*

$$\begin{aligned} \text{ROE} = \beta_1 + \beta_2 * \text{EBIT Margin} + \beta_3 * \text{EPS} + \beta_4 * \text{Net Profit Margin} + \beta_5 * \ln(\text{Current Ratio}) \\ + \beta_6 * \ln^2(\text{Current Ratio}) + \beta_7 * \ln(\text{Quick Ratio}) \\ + \beta_8 * \ln^2(\text{Quick Ratio}) + \beta_9 * \ln(\text{DTTA}) + \beta_{10} \\ * \ln^2(\text{DTTA}) + \beta_{11} * \ln(\text{BV}) + \beta_{12} * \text{CO} + \beta_{13} * \text{DT} \end{aligned}$$

We considered in our regression model the natural logarithm of book value. Natural logarithm is used to reduce the proportion of scale and high values of indicators used in the literature by many researchers, as Himmelberg et al. were pointing out in their paper (1999). Bigger the company, greater the synergies and scale economies and ROE is expected to grow.

The econometric model is interesting through the large number of factors which contribute to the changes of the ROE indicators and helps us to identify and validate the main, essential factors, in our opinion and the one of other specialists mentioned all along the paperwork, factors which determine the financial and economic performances of the company.

Using these variables in the regression model we will obtain an R^2 of 0,795 and adjusted R^2 of 0,750 meaning that the model is significant with an F-statistic of 18,042. Still there are several variables which are not significant at all, like i.e. the 2 dummies used to express the specificities of the industry and the importance of a country in the whole panel data (i.e. Romanian companies). As a result for this implementation, the dependent variable, in our case ROE is explained 79% through the 12 variables from the model. The number of used variables is interesting, nevertheless considering the reduce data set and the fact that some variables are not significant and that Durbin Watson is only 1,209 we will reconsider the model.

Table 2 *Regression between ROE & Independent Variables*

No.	Predictors	Coefficients	Std. Error	t- student	Sig	VIF
1.	Constant	17,159	69,164	0,248	0,805	
2.	ln (BV)	-0,398	0,583	-0,683	0,495	1,728
3.	Net Profit Margin	0,313	0,036	8,790	0,000	1,541
4.	DC	1,440	2,801	0,514	0,609	1,623
5.	DT	0,902	2,008	0,449	0,655	1,668
6.	EBIT Margin	0,033	0,017	1,907	0,062	2,064
7.	ln(DTTA)	1,907	2,027	0,941	0,351	6,177
8.	ln^2(DTTA)	-0,966	0,565	-1,710	0,093	7,943
9.	ln(CR)	61,647	53,534	1,152	0,254	2,173
10.	ln^2(CR)	-5,566	5,027	-1,107	0,271	2,571
11.	ln(QR)	-60,638	36,268	-1,672	0,100	1,338
12.	ln^2(QR)	5,339	3,702	1,442	0,155	1,671
13.	EPS	0,530	0,105	5,027	0,000	1,434
Number of Observations			69			
R^2			0,795			
R^2 adjusted			0,750			
Durbin Watson			1,209			
F			18,042			
Sig			0,000			

Having in mind the fact that correlation between variables (Annex 1) Net Profit Margin and ROE is 0,783 we can reconsider the model through eliminating this variable and also the dummy variables (Country origin and Drug Type). In this case we will obtain the following model:

Figure 5. *Simplified structure of the regression model*

$$\mathrm{ROE} = \beta_1 + \beta_2 * \text{EBIT Margin} + \beta_3 * \text{EPS} + \beta_4 * \ln(\text{Current Ratio}) + \beta_5 * \ln^2(\text{Current Ratio}) + \beta_6 * \ln(\text{Quick Ratio}) + \beta_7 * \ln^2(\text{Quick Ratio}) + \beta_8 * \ln(\text{DTTA}) + \beta_9 * \ln^2(\text{DTTA}) + \beta_{10} * \ln(\text{BV})$$

In this situation the results of the regression model indicates that the dependent variable, in our case ROE is explained 50% through the 9 variables from the model. We can notice that the model is statistically significant by F-statistic value (6,566) and the associated probability Adjusted value of R^2 and R^2 are at an satisfying level for the given set of data (Adjusted R Square 42,42%).

Table 3 *Regression between ROE & Independent Variables in the second proposed model*

No.	Predictors	Coefficients	Std. Error	t- student	Sig	VIF
1.	Constant	-81,289	90,779	-0,895	0,374	
2.	ln(BV)	-0,843	0,840	-1,003	0,320	1.256
3.	EBIT Margin (%)	0,093	0,023	4,100	0,000	1.533
4.	ln(DTTA)	3,505	3,051	1,149	0,255	7.678
5.	ln^2(DTTA)	-1,817	0,844	-2,154	0,035	1.621E3
6.	ln(CR)	163,109	70,229	2,323	0,024	1.899E3
7.	ln^2(CR)	-14,892	6,563	-2,269	0,027	1.092E3

No.	Predictors	Coefficients	Std. Error	t- student	Sig	VIF
8.	Ln(QR)	-126,403	49,773	-2,540	0,014	1.318E3
9.	ln^2(QR)	11,930	4,993	2,389	0,020	6.061
10.	EPS	0,561	0,150	3,740	0,000	1.555
Number of Observations				69		
R^2				0,5004		
R^2 adjusted				0,4242		
Durbin Watson				1.382		
F				6,566		
Sig				0,000		

Figure 6. *The regression equation*

$$\text{ROE} = -81{,}289 + 0{,}093 * \text{EBIT Margin} + 0{,}561 * \text{EPS} + 163{,}109 * \ln(\text{Current Ratio}) - 14{,}892 * \ln^2(\text{Current Ratio}) - 126{,}403 * \ln(\text{Quick Ratio}) + 11{,}930 * \ln^2(\text{Quick Ratio}) - 3{,}505 * \ln(\text{DTTA}) - 1{,}817 * \ln^2(\text{DTTA}) - 0{,}843 * \ln(\text{BV})$$

Durbin Watson statistics is 1.382 not so close to the value of 2, which is the level that normally indicates no autocorrelation. There is an issue with the correlation of errors.

As a result of applying Stepwise method regression we have derived another model, a simplified formula of the regression function. We will employ in this model all the variables presented before. As a consequence of the method, from the initial model we can state that the main influence factors over firm's financial performance expressed through ROE are the following:

- **EarningPerShare (EPS)**
- **Net Profit Margin**

Table 4 *Regression between ROE & Independent Variables in the simplified model*

No.	Predictors	Coefficients	Std. Error	t- student	Sig	VIF
1.	Constant	5,908	0,860	6,873	.000	
2.	EPS	0,488	0,032	10,683	.000	1.048
3.	Net Profit Margin	0,337	0,097	5,042	.000	1.048
Number of Observations			69			
R^2			0,849			
R^2 adjusted			0,721			
Durbin Watson			1,113			
F			85,109			
Sig			0,000			

The regression equation obtained in the end reflects the relationship between the return rate ROE and factors belonging to the efficiency and the growth dynamic.

Figure 7. *Simplified formula for the regression equation*

$$\text{ROE} = 5{,}908 + 0{,}488 * \text{EPS} + 0{,}337 * \text{EBIT Margin}$$

There is no multicolliniarity between independent variables. No VIF is greater than 10 and the average of VIF isn't much greater than 1.

Durbin Watson statistics is 1.113 not very close to value 2 (which it is the right indication for no autocorrelation). There is an issue with the correlation of errors. For d statistics calculated for 69 observations and 2 variables, this means that we have evidence for $\alpha = 0.05$ indicating the rejection of the hypothesis regarding the absence of autocorrelation.

Empirical results of the regression analysis

The dependent variable, in our case for the second model taken into consideration (Figure 6) is explained in a proportion of 50% through the 9 variables from the model. We can notice that the model is statistically significant by F-statistic value and the associated probability Adjusted value of R^2 and R^2 are at a satisfying level of approximately 42.42%.

The probabilities attached to the coefficients for each variable assumptions allow the null hypothesis for $\alpha = 0.05$ level for six out of nine predictors). There is no predefined solution to develop a good model. A satisfactory result comes more from the application of econometric rules and from the high number of trials and the analyst's intuition regarding the factors to be added, the relationship type (linear, quadratic), the effects of the combined factors type (cross-factors, such as a regression of the βi*EBIT Margin*Indebtedness degree type).

In order to receive an answer to the question "What will be the ROE evolution in the next period and which are the factors that positively influence ROE and which is their degree of influence?", it is enough to set the trend of influence factors (EBIT Margin, Quick Ratio, Current Ratio, etc.), and then, based on the model, to obtain a future ROE evolution, taking into account, though, the error margin within the limit set for the model.

The explanation of factors can be provided by the complexity of economic phenomena associated with the company and the pharmaceutical industry, as follows:

- A company that has higher EBIT Margin is undoubtedly a company operating on the original pharmaceutical products segment, protected by patents and patents, and not the generics segment.

To support a leadership position in original medicines, such a company must invest significant sums in the costs of research and development (R & D) in the long run, to discover and develop new original recipes (after a period original medicines no longer are protected by patents and generic drugs), such payments in certain circumstances can lead to a decrease in ROE. Hence the idea that further analysis should include the costs R & D, either in absolute terms or as a ratio

of R & D/SG & A (general administrative expenses and selling) as suggested by Shin (2006) and should be considered as a factor in a future more elaborated model.

- Dummy variables for the company market (original or generic drugs) did not have any significance for the data set. On a larger data set this dummy, along with dummy linked to the country origin (markets on which are operating a large number of companies) might be relevant and significant.

Based on the comments above, we can add to these factors the R&D Expenses/ Total SG&A Expenses, as well as a dummy variable for the manufacturing of original and not generic medicines.

For a data set with an increased number of observations and a frequency of several years and considering the dynamics of growth, we can use in a future model as independent variables the following:

- Assets growth ratio (assets one year growth calculated as a percentage of the assets given for a year divided by the value of the previous year and subtracting the value 1), due to the fact that it usually has a higher influence, proven that the pharmaceutical industry is a place where large players enjoy success, since they have the resources to support significant expenses for research and development
- Sales growth ratio (sales one year growth) calculated on the same manner, variable used in other similar model by Himmelberg et al. (1999).

The described model may be the object of decision making support application, may be used in analyses of the data mining type in order to identify significant clusters, decision making trees, pertinent associations among variables etc. These elements allow for a complex analysis of the economic-financial indicators that might lead to making strategic decisions for the improvement of economic-financial performances.

Discussions and conclusions

The importance of analyzing performance ratios, to make comparisons with the companies from the same field of activity, to detect new tendencies and to make profitable changes require the use of advanced specific tools for multidimensional analysis, equipment's performance, qualified personal for interpreting the analysis and the strengths to take important decisions for the prosperity of the company.

The classifications made in this study and the econometrical model can identify certain performance indicators useful for any financial and economic performance analysis of the companies. The regression model obtained in the paper reflects the relationship between the return rate ROE and principal influence factors belonging to the growth dynamic, as well as factors related to liquidity and risk. Other important factors such as R&D Expenses/Total SG&A Expenses or

Price/Book ratio might be involved in a future econometric model to observe more complex relationships.

Initially, we intended to develop the present regression analysis only on the Romanian pharmaceutical industry. Due to the limited number of Romanian companies in this area and the reduced time series, especially the listed ones, data collecting was proven to be a challenge for this research paper. Lack of information regarding pharmaceutical industry date was one of the big challenges of the paper. Collecting data for CEE companies on pharmaceutical sector for the years involved in research necessitates a lot of work concentrated on data finding and processing. As a limitation to this paper might be the limited size of the current sample, following the variables that might be taken into consideration, like country effects, but more important the R&D expenses.

A new tendency for a future research paper, using the current findings can be considered building a deterministic econometric model for determining the performance of Romanian pharmaceutical companies concentrated on the area of supply-chains, meaning here the whole set of producer –importer – distributor - retail (chain of pharmacies/independent pharmacies).

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Sensory marketing strategies. Case study: Oltenia

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Abstract. *From the perspective of the tourist, sensory marketing strategies may result in an experience improvement which leads, in time, to acquiring a positive destination image, and, from the perspective of the destination, to furthering its harmonious development. Even though it appears that sensory marketing strategies can be considered as alternatives for marketing strategies, they actually are complementary, and their objective (increasing product quality by "turning to the beginning", where perception and consumer knowledge start), aims to handle the senses of the consumer by starting from the identification of his/her needs.*

Keywords: sensory marketing strategies, sensory signatures, sensory dimensions, sensory brand of the destination.

JEL Classification: M31.
REL Classification: 14G.

1. Introduction

For marketing to offer a single solution to the consumer – a premise for any destination's brand experience, sensory marketing must take into account deep segmentation, to the level of approaching the senses of any individual. Segmentation is important and is followed by choosing the segment, positioning and then by establishing marketing objectives, and the marketing strategy respectively, in the context of marketing strategic planning (Morrison, 2013, p. 87).

Out of the desire of providing consumers with products that would represent memorable experiences for themselves, organisations have also started to implement sensory marketing strategies. Practically, these strategies are strategic approaches that aim to achieve competitive advantages, which can mean sensory, emotional and rational benefits for the consumers, so that the implementing organisation can establish, maintain and improve relations with the other organizations with which it interacts or with its own consumers, by stimulating their senses by obtaining a congruence between the brand's value and its image (Rodrigues et al., 2011). For this reason, sensory marketing strategies are considered complementary to those within the framework of the marketing plan and are concerned with leading the consumer to achieve a "supreme sensory experience" in relation to the brand (Hultén et al., 2009, p. 14).

Sensory marketing strategies are founded on differentiations by which they can, according to Giboreau and Body (2007, pp. 25-27), be classified into:

- sensory-hedonistic differentiation, where the strategy is focused on the consumer's sensations, so that the symbolic and/or functional attributes can be developed starting from the desired sensations for the purpose of achieving a connection between the consumer and the product, and arriving at customer attachment to the brand;
- sensory-functional differentiation, where the strategy follows the perception of better functionality, by identifying some new uses, additional services and innovative functions, so that the sensory attributes developed afterwards will sustain functional benefits before, during and after product use, assuring product-brand coherence;
- sensory-symbolic differentiation, where the strategy has as its objective brand positioning, and the sensory attributes are chosen so that they are coherent and support that positioning, by creating associations in the consumers' minds, starting from a central element, which then has been "declined in all relevant symbolic directions" (Giboreau, Body, 2007, p. 26).

This study establishes a series of sensory identity elements for the destination brand Oltenia which can become, on the long-term, sensory signatures if the marketer, maintaining the guiding line provided by these elements and improving

tourist experience in the identified contact points, creates unique associations, strong in the mind of the consumer, to position the brand. In this context, sensory signatures can be considered sensory marketing strategies. Taking into account the experience nature of the destination, whose use should transform into a memorable experience for the tourist, sensory marketing strategies are an optimal way of positioning the destination brand in the heart and mind of the tourist.

Micro-destination Oltenia(1) is bounded by the Southern Carpathians in the North and North-West, by the Olt River in the East, by the Danube in the South and South-West and includes the counties of Dolj, Gorj, Mehedinți, Olt and Vâlcea. Together with the other micro-destinations (Dobrogea, Muntenia, Banat-Crișana, Transilvania, Maramureș, Moldova and Bucovina), Oltenia forms macro-destination Romania, the discovery of the sensory signatures that define it was done after analysing the sensory identity elements, and research.

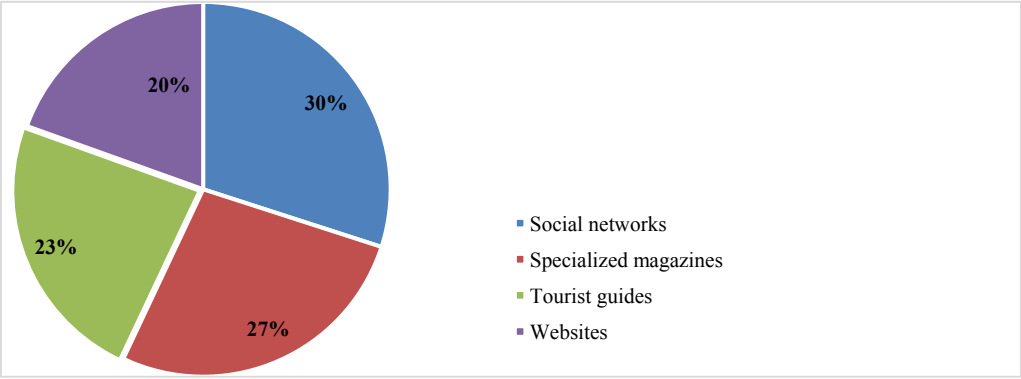
2. Methodological framework

The research, conducted between March 2012 and July 2012 on a sample of 416 respondents coming from all of Romania's regions, aged 20-24 years, with higher education or ongoing higher educations, with 27.2% men and 72.8% women, had as its objective identifying sensory signatures for micro-destination Oltenia. This research is building on an earlier one regarding representative attraction elements for micro-destination Oltenia, conducted between October 2010 – December 2010 – January 2011 on a sample of 1887 respondents (Stăncioiu et al., 2011), with a similar profile with the current research.

Among the respondents, 83.9% have visited Oltenia, 77.4% wishing to return to this destination, which shows they were satisfied with the experience. The respondents that didn't visit Oltenia (16.1%) explained their choice by: insufficient time (29.8%), lack of material resources (23.7%), lack of interest (18.6%), lack of information concerning accommodation facilities (9.3%), unfavourable information on the region (3.3%), other reason (4.7%) and do not know (10.6%).

The information sources that the tourists have used to document themselves concerning micro-destination Oltenia are presented in Figure 1. What is surprising is the strong showing that social networks have on informing tourists about micro-destination Oltenia. One explanation could be that most of the potential tourist's acquaintances are on these social networks, the tourist trusting their recommendations, and also in the ease of sharing information among social networks, especially of photographs, important elements in presenting a destination and creating a first impression.

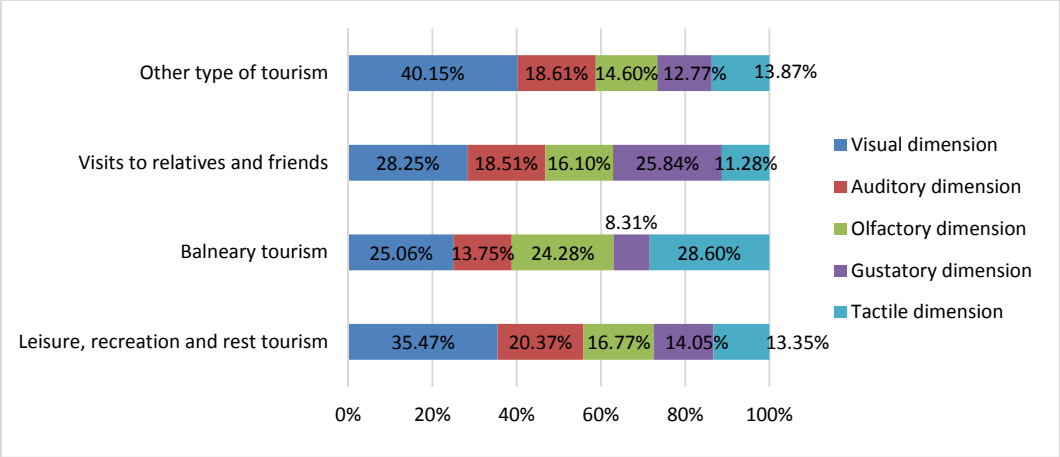
Figure 1. *Information sources used by tourists in order to document themselves regarding micro-destination Oltenia*



From here we can infer that the marketer should be assured that the tourist's experience is a memorable one, at least in the identified tourist – destination interaction points, so that the photographs he made (which will later be published on social networks) will lead in forming a correct destination image.

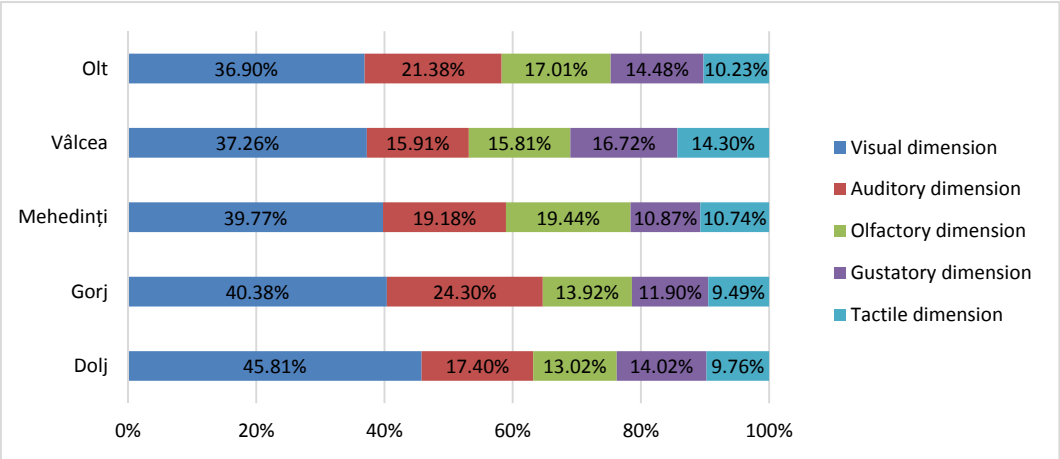
Another aspect the marketer should take into account is that of the optimal use of destination resources, so that they represent a real competitive advantage, "imposing", at the same time, the characteristic type of tourism. Therefore, the tourism type – the main motivation for which the tourist travels to a destination – needs a sensory analysis (Figure 2), with the purpose of improving tourist experience by dealing with his senses and improving destination quality. At the same time, by prioritising the specific type of tourism of Oltenia, followed by selecting contact points that support that type of tourism (considered a priority) and transforming those points into coherent "scenes" on which the tourist lives unique experiences, but also by improving services (transport, accommodation, food, leisure and other complementary ones), the whole micro-destination can develop harmoniously. As an example, if balneary tourism becomes a priority for the Oltenia micro-destination (as Figure 2 shows, food services are poorly developed), in this case, in order to offer to the tourist a positive holistic experience the rapid improvement of service quality is imposed.

Figure 2. *The sensory dimensions perceived by tourists for the main types of tourism in micro-destination Oltenia*



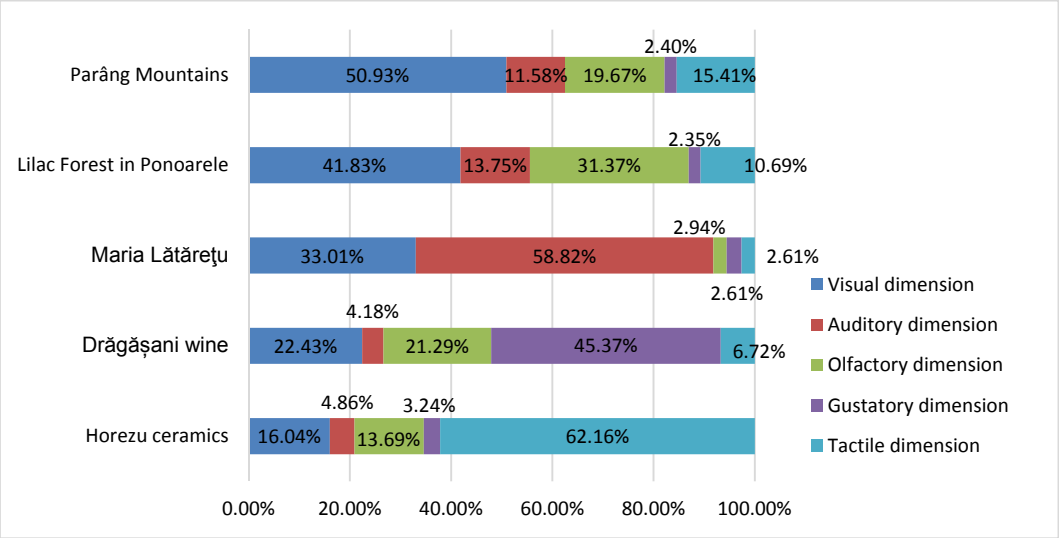
Once the type of tourism becomes a priority at the level of the "region" as micro-destination, the marketer will realize a sensory analysis of the composing counties (Figure 3), taking into account that each one can constitute a destination on its own, but that they should deliver an integrated experience. One can observe (Figure 3) that among all the counties composing the Oltenia micro-destination, Vâlcea County has the most developed tactile dimension, being known that tactile stimuli are mostly used in balneary tourism, and Vâlcea houses most of the balneary resorts and locations in Oltenia. On the other side, Mehedinți and Gorj Counties also house a balneary resort or location, for which the tactile dimension is poorly developed, so that in order to improve tourist balneary experience in micro-destination Oltenia, adequate marketer measures are necessary.

Figure 3. *Sensory dimensions perceived by tourists in the counties composing micro-destination Oltenia*



The sensory analysis can be further made at the level of specific attractions elements for micro-destination Oltenia and/or for each county (Figure 4).

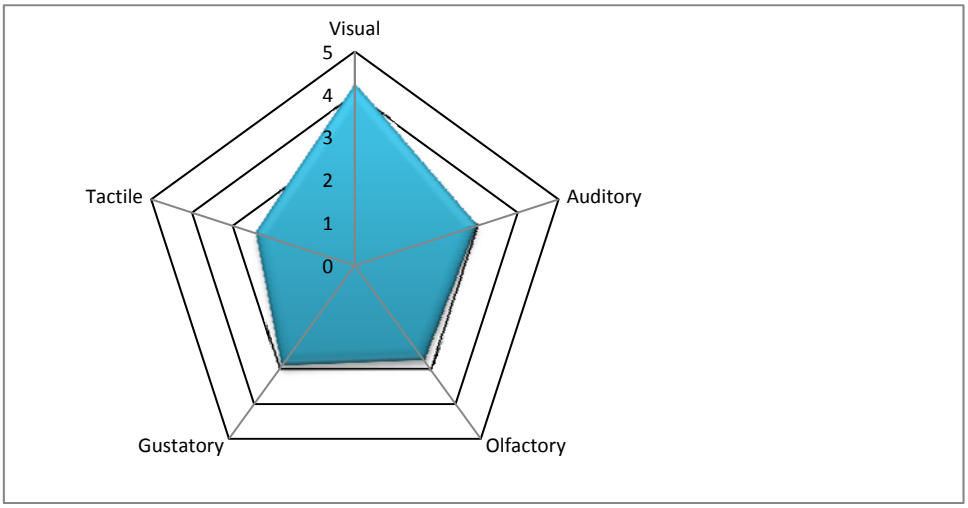
Figure 4. *Sensory dimensions perceived by tourists for attraction elements of micro-destination Oltenia*



The researched attraction elements constitute contact points between the tourist and destination, and unique experiences can be developed around them in order to lead to the wanted positioning for Oltenia. Figure 4 contains an attraction element that peaks on a certain sensory dimension (visual dimension – Parâng Mountains, auditory dimension – Maria Lătăreţu, olfactory dimension – the Lilac Forest in Ponoarele, gustatory dimension – Drăgăşani wine, tactile dimension – Horezu ceramics).

Carrying out the sensory profile of micro-destination Oltenia (Figure 5), by following Lindstrom in creating sensory models (sensograms) for a brand (Lindstrom, 2009), becomes a measure of developing and monitoring the sensory brand of the destination. The figure makes it clear that the sensory profile of micro-destination Oltenia is poorly developed and only by identifying sensory identity elements, which can lead in time (by implementing sensory marketing strategies) to attaining the peak on each sensory dimensions (becoming destination brand signatures), we can come to a clear positioning in the heart and mind of the tourist.

Figure 5. *Sensory profile of the micro-destination Oltenia*



After creating the sensory profile, once the interaction points between the tourist and the destination are identified, by analysing the experience the tourist feels in Oltenia, the marketer will select the sensory identity elements that he/she wishes to transform into sensory signatures. In Table 1 the contact points (attraction elements) that characterize the tourist's visual experience in micro-destination Oltenia are presented.

Table 1. *Visual elements "composing" the experience for the micro-destination Oltenia*

-% of total column-

			of which	
	Visual elements	**Total**	**Male**	**Female**
	Base	416	113	303
1	Endless Column – Coloana Infinitului	12.0	9.7	12.9
2	landscape	7.7	7.1	7.9
3	Olt	5.3	8.0	4.3
4	fields	4.6	5.3	4.3
5	The Gate of the Kiss – Poarta Sărutului	4.3	5.3	4.0
6	beautiful	3.1	1.8	3.6
7	mountain	2.9	2.7	3.0
8	River Olt	2.6	4.4	2.0
9	monasteries	2.4	2.7	2.3
10	Olt River Valley	2.4	1.8	2.6
11	Cozia Monastery	2.2	0.9	2.6
12	Craiova	1.9	3.5	1.3
13	Muierii Cave	1.9	3.5	1.3
14	Târgu Jiu	1.9	2.7	1.7
15	green	1.9	1.8	2.0
16	Brâncuşi masterpieces	0.0	1.8	1.7
17	Others	39.4	32.7	41.9
18	Does not exist/I don't know	1.7	4.4	0.7

The Endless Column is the visual identity element that can, in time, become the visual signature of the brand Oltenia. Also from Table 1 we can observe that the visual experience concerning the micro-destination Oltenia is dominated by Brâncuşi's masterpieces, so that, together with the Endless Column, the other art pieces from the great artist complete the visual identity of the micro-destination Oltenia brand.

Concerning the auditory experience that the tourist can have when he visits Oltenia, it can be observed that there is no single element that can be associated with the destination, with the exception of the local accent (Table 2). Because of this, for the marketer to succeed in creating a auditory signature for the micro-destination Oltenia (Table 2), he/she must identify a specific traditional song (for example *sârba oltenească, rustemul, căluşarii* etc.) which would become the auditory signature, or he/she can create an event during which traditional-folk music from Oltenia would play, or even represent the central element, in this hypothesys, the event becoming the auditory signature for the Oltenia brand.

Table 2. *Auditory elements "composing" the experience for the micro-destination Oltenia*

-% of total column-

			of which	
	Auditory elements	**Total**	**Male**	**female**
	Base	416	113	303
1	quietness	13.0	12.4	13.2
2	traditional music	7.7	9.7	6.9
3	music	4.1	1.8	5.0
4	accent	3.6	4.4	3.3
5	noise	3.4	6.2	2.3
6	local accent (Oltenia)	2.9	5.3	2.0
7	commotion	2.9	3.5	2.6
8	birds	2.9	3.5	2.6
9	folklore	2.4	1.8	2.6
10	stream	2.2	2.7	2.0
11	manele	1.9	3.5	1.3
12	local music	1.9	2.7	1.7
13	Sârbă (dance)	1.9	1.8	2.0
14	streams	1.7	1.8	1.7
15	Others	44.7	31.9	49.5
16	Does not exist/I don't know	2.9	7.1	1.3

The tourist olfactory experience in micro-destination Oltenia is dominated by the clean air (Table 3), which can't represent an element of olfactory identity.

Table 3. *Olfactory elements "composing" the experience for the micro-destination Oltenia*

-% of total column-

			Of which	
	Olfactory elements	**Total**	**Male**	**female**
	Base	416	113	303
1	fresh	12.5	13.3	12.2
2	clean air	6.5	6.2	6.6
3	fresh air	3.4	1.8	4.0
4	flower	3.1	2.7	3.3
5	scallion	2.6	2.7	2.6
6	clean	2.4	4.4	1.7
7	grass	1.9	1.8	2.0
8	food	1.9	2.7	1.7
9	smell	1.9	3.5	1.3
10	nature	1.9	3.5	1.3
11	flowers	1.7	1.8	1.7
12	enjoyable	1.7	0.9	2.0
13	blossomed linden tree	1.7	1.8	1.7
14	Olt River	1.2	1.8	1.0
15	Other	41.1	29.2	45.5
16	Does not exist/I don't know	14.4	22.1	11.6

The gustatory experience for the tourist in micro-destination Oltenia, according to respondent opinion (Table 4), is represented by scallion (praz), which can be found in a lot of local recipes (scallion ciorba (soup), filled scallion, scallion with cheddar, scallion with cheese, scallion bread, etc.). Scallion can become the gustatory signature for the Oltenia brand as, among traditional Romanian recipes with a local trait, scallion ciorba (soup) is mentioned. Other gustatory identity elements that were mentioned by the respondents are: local sausages (including "trandafir" (rose) sausages), and zaibăr (Table 4).

Table 4. *Gustatory elements "composing" the experience for micro-destination Oltenia*

-% of total column-

			of which	
	Gustatory elements	**Total**	**Male**	**female**
	Base	416	113	303
1	Scallion (praz)	17.8	21.2	16.5
2	food	7.5	7.1	7.6
3	traditional food	5.8	7.1	5.3
4	good	3.8	4.4	3.6
5	sarmale	3.8	2.7	4.3
6	Local (Oltenia) sausages	2.9	5.3	2.0
7	Zaibăr	2.4	4.4	1.7
8	sweet	2.2	1.8	2.3
9	good food	2.2	2.7	2.0
10	wine	1.4	1.8	1.3
11	salted	1.2	0.9	1.3
12	flavoured	1.0	0.9	1.0
13	sausages	1.0	1.8	0.7
14	ciorba	1.0	1.8	0.7
15	Others	38.9	26.5	43.6
16	Does not exist/I don't know	7.2	9.7	6.3

From the point of view of the tactile dimension, Oltenia offers the tourist the experience of sculpture and the art of clay modelling (Table 5). Component of the UNESCO Immaterial World Heritage, Horezu ceramics can become the tactile signature of the Oltenia brand.

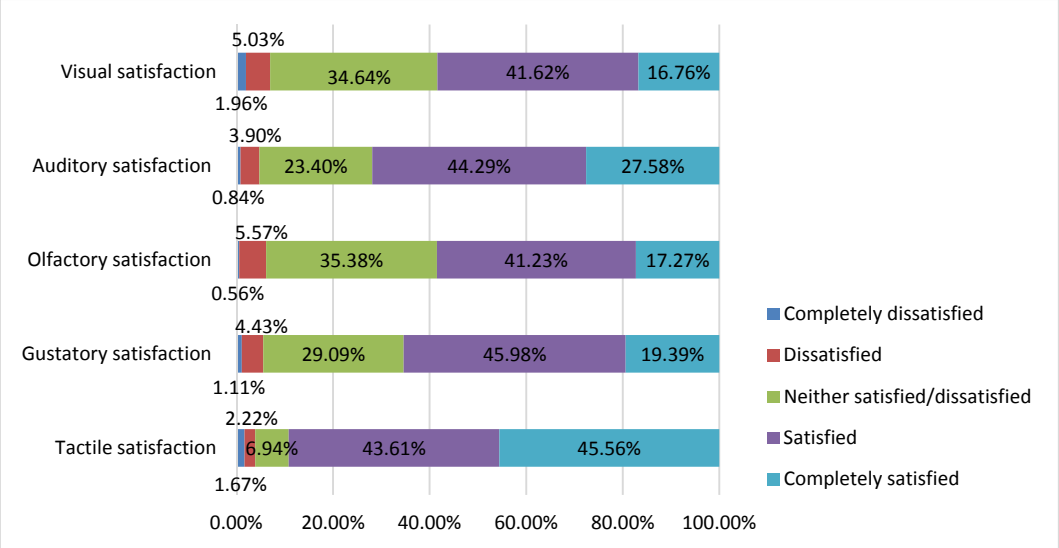
Table 5. *Tactile elements "composing" the experience for the micro-destination Oltenia*

-% of total column-

			Of which	
	Tactile elements	**Total**	**Male**	**female**
	Base	416	113	303
1	hot	15.1	20.4	13.2
2	high temperature	5.0	5.3	5.0
3	temperature	3.1	2.7	3.3
4	ceramics	2.4	2.7	2.3
5	grass	2.2	1.8	2.3
6	chill	1.7	0.0	2.3
7	pleasant temperature	1.7	1.8	1.7
8	Horezu ceramics	1.4	3.5	0.7
9	enjoyable	1.2	0.9	1.3
10	water	1.0	1.8	0.7
11	good	1.0	0.9	1.0
12	Endless Column	1.0	0.0	1.3
13	Others	43.5	26.5	49.8
14	Does not exist/I don't know	19.7	31.9	15.2

At the same time, the tactile experience offers tourists the biggest satisfaction, as we can see from Figure 6. It seems that the potters' craft and Horezu ceramics, together with sculpture (represented by the pieces of Constantin Brâncuși) create a memorable tactile experience for the tourist.

Figure 6. *The satisfaction degree felt by tourists on each sensory dimension in micro-destination Oltenia*



Even if the tourist is satisfied by the experience, and by the sensory experience lived in micro-destination Oltenia (Figure 6) respectively, the low number of unique attraction elements associated with this place, put against a vast existing and recognized material and immaterial heritage, is a measure of the lack of continuous marketing activity, and of sensory marketing respectively, which could build, step by step, the sensory brand of micro-destination Oltenia.

Taking into account all the sensory attraction elements referenced earlier, sensory marketing should assert itself all the more, as even in 1919, professor George Vâlsan was saying that "each person associates, more so than one could suspect, the semblance of nature to his frames of mind, especially of the happy ones, of the most intimate [...] Our conscience sometimes identifies itself with nature. [...] nature begets a soul [...] – she has a social soul. Meaning it gives common reason to each individual manifestation" (Vâlsan, 2006, pp. 27-28).

3. Conclusions

Sensory marketing strategies ensure sustainable competitive advantages to a destination in an economy of knowledge, thus leading to sensory brand creation. Taking into account the fact that tourist experience represents an indicator of destination quality, the marketer has started to attach a greater importance to this indicator, an example being the in-line ministry which, in its strategy formulation for the tourism brand Romania, has proposed "designing some unique Romanian experiences, as well as some routes and special developed areas, where they can be lived" (Ministerul Dezvoltării Regionale și Turismului, 2011, p. 20). This way, the success of sensory marketing strategies depends on providing the right sensory mix (Derval, 2010).

Even if that for a destination sensory marketing strategies start from symbolic differentiation, in the sense of brand positioning, beyond the associations created in the mind of the tourist, they will also lead, in time, to the improvement of destination quality, by developing some contact points where the tourist experience is memorable.

Research limits are represented by the errors that appear in the sensory evaluation of a complex product, like a destination, and also by the fact that, during the course of the study, only tourist opinion was analysed, presenting a consumer perspective and not taking into account the opinion of all its stakeholders, including the opinion of the marketer.

In the future, completing the study with the perspective of the organisation which handles the marketing and the destination management will be pursued, along with the study of the opinions of respondents from different age groups.

Note

(1) This article follows up on the series concerning the sensory audit of macro-destination Romania, the first two "episodes" being "Dimensions of the destination's sensory profile. Case study: Muntenia" (Stăncioiu et al., 2014) and "The sensory brand of the destination. Case study: Transylvania" (Dițoiu et al., 2014). In those articles, using historical and geographic segmentation criteria, the perspective is that of the national level destination, macro-destination Romania, composed by region-level destinations, called micro- destinations.

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Financial development and domestic savings in emerging Asian countries

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Abstract. *Saving is one of the important determinants of economic growth. Therefore determinants of saving are indirectly important for a sustainable economic growth. Financial sector has come into prominence as a possible determinant of saving in the globalized financial markets. This study examines the relationship between gross domestic savings and financial development in the emerging Asian countries during the period 1992-2011 by using panel regression. We found that financial development, economic growth and real interest rate had positive impact on gross domestic saving, while aged dependency ratio had negative impact on gross domestic saving.*

Keywords: financial development, gross domestic savings, panel regression.

JEL Classification: C23, E21, 016.
REL Classification: 11B.

1. Introduction

Saving rate is one of the important components of economic growth with regard to both exogenous and endogenous growth theories (see Solow (1956), Romer (1986), Lucas (1988)). Therefore it is crucial to understand the determinants of domestic saving rate for policy makers to keep a sustainable economic growth. The studies empirical studies have found a large number of determinants of savings such as economic growth, real GDP per capita, macroeconomic stability, budget deficit, real interest rate, financial development, foreign saving, demographic variables including fertility rate, life expectancy, aged/youth dependency.

We will examine the relationship between domestic saving rate and financial development in this study. The theoretical relationship between savings and financial development traced to the McKinnon (1973) and Shaw (1973). McKinnon (1973) and Shaw (1973) stated that a developed financial sector is expected to increase the savings by raising the efficiency of financial intermediation. On the other hand a more developed financial system has potential to provide alternative saving instruments which are more suited for individual preferences (Schmidt-Hebbel and Serven, 2002).

Saving rate has been relatively higher in highly growing emerging Asian countries. Their financial sector also has developed since 1990s in parallel with increasing saving rates. This study investigates the role of development of financial sector on domestic savings in emerging Asian economies (China, India, Indonesia, Korea, Malaysia, Philippines, Thailand) during the period 1992-2007 by panel regression. The rest of the paper is organized as follows. Section 2 reviews the previous literature, Section 3 deals with data and present econometric application and main findings and Section 4 concludes the study.

2. Literature review

Financial sectors of many countries have developed significantly together with the globalization of financial markets especially as of 1990s. So many studies have conducted to determine the possible effects of financial sector development on major macroeconomic indicators. The studies generally have focused the relationship between financial development and economic growth, and relatively few studies have examined the effects of financial development on domestic savings rate in the literature. The studies investigating relationship between saving rate and financial development have generally used the variables of M2, M1, domestic credit to private sector representing financial development and also employed economic growth, real interest rate, aged/youth dependency ratio as

control variables. Most of the studies in the literature such as Edwards (1996), Dayal-Gulati and Thimann (1997), Kelly and Mavrotas (2001), Kelly and Mavrotas (2003), Kelly and Mavrotas (2008), Touny (2008), Park and Shin (2009), Horioka and Yin (2010) and Sahoo and Dash (2013) found that financial development had positive effect on domestic savings.

Edwards (1996) examined the possible determinants of saving rates in 36 countries but focused Latin America during the period 1970-1992 by using panel regression. He found that growth rate of GPD per capita and financial development (proxied by M1 and M2) had positive effect on private savings rate, while real interest rate had no statistically significant effect on private savings rate. Dayal-Gulati and Thimann (1997) examined the determinants of private saving in 14 Southeast Asia (Indonesia, Malaysia, Philippines, Singapore and Thailand) and Latin America countries (Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru, Uruguay and Venezuela) during the period 1975-1995 by using panel regression. They found that financial development (proxied by M2 as a percent of GDP) had a positive effect on private saving in Southeast Asia and Latin America.

Loayza et al. (2000) examined the determinants of private saving in 150 countries during the period 1965-1994 by panel regression and they found that economic growth had a positive impact on private saving rate, while real interest rate and age dependency ratio had a negative impact on private saving rate. On the other hand they reached the finding that M2/GNP had a insignificant relationship with private saving rate, while private domestic credit had a negative impact on private saving rate. Kelly and Mavrotas (2001) invetigated the relationship between private savings and financial development during the period 1972-1997 and found that financial development haf a positive impact on private savings. In another study Kelly and Mavrotas (2003) examined the effects of financial sector development (proxied by financial sector development index) on private saving in Sri Lanka during the period 1970-1997 by using co-integration test. They found that financial sector development had a positive effect of on private savings.

Kelly and Mavrotas (2008) examined the effects of financial sector development (proxied by private credit) on private saving in 17 African countries during the period 1972-1994 by using Pedroni co-integration test and they found that there was a positive relationship between financial sector development and private savings. Yong et al. (2008) examined the determinants of saving rate in Malaysia during the period 1974-2004 by using ARDL model. They found that GDP and GDP growth had a positive impact on saving rate, while foreign saving and dependency ratio had a negative impact on saving rate. On the other hand interest rate had no significant impact on saving rate.

Touny (2008) examined the determinants of domestic saving rates in Egypt during the period 1975 – 2006 by using and he found that economic growth, financial development (proxied by M2/GNP ratio) and real interest rate had a positive impact on domestic savings. Park and Shin (2009) examined the possible determiants of savings and investment rate in 137 countries during the period 1965-2004 by using panel regression. Their empirical findings demonstrated that financial development (proxied by M2 as a percent of GDP) and economic growth had positive impact on saving rate. Horioka and Yin (2010) examined the determinants of the household savings rates in OECD countries by using panel regression and they found that financial development (proxied by ratio of private credit by deposit money banks and other financial institutions to GDP) and age dependency ratio had negative impact on household saving rate.

Wang et al. (2012) examined the relationship between domestic saving rate and financial development (proxied by domestic credit to private sector and M2), economic growth, real interest rate, aged dependency ratio in 31 OECD countries and 12 East Asian countries during the period 1960-2008 by panel regression and found that there was a hump-shaped relationship between financial development and domestic savings, in other words total saving rate rose initially with financial development, but then decreased with further financial development. On the other hand economic growth had a positive impact on domestic savigs, while aged dependency ratio and real interest rate had a negative impact on domestic savings.

Sahoo and Dash (2013) examined the effects of financial sector development (proxied by financial development index M2Y, bank credit to domestic sector and access to banking), real interest rate, economic growth and age dependency ratio on the savings in South Asian countries (Bangladesh, India, Pakistan, Sri Lanka and Nepal) during the period 1975-2010 by panel co-integration and causality tests. They found that development of financial sector, real interest rate (post-liberalization period) and GDP growth had positive effect on the savings rate and there was unidirectional causality from financial sector development to savings. On the other hand Sharma and Kumar (2013) examined the effects of financial development on savings and capital formation in India during the period 1950-2011 and found that financial development had a positive effect on savings. Shahbaz et al. (2013) investigated the relationship among financial development, domestic savings and poverty in Pakistan during the period by using ARDL bound test and Granger causality test and they found that there was causal relationship between financial development and domestic savings.

3. Data, empirical application and findings

3.1. Data

We examined the possible effects of financial development, economic growth, real interest rate and age dependency ratio on gross domestic savings in emerging Asian countries by using panel regression. Our data cover 7 emerging Asian countries during the period 1992-2011 and was obtained from the Financial Development and Structure Database and the World Development Indicators (World Bank 2013a, 2013b). The variables, their symbols and their sources were presented in Table 1. Eviews 7.1 and Stata 10.0 statistical packages were used in the econometric analysis.

Table 1. *Variables used in the econometric analysis and their symbols*

Variable	Symbol	Data Source
Gross Domestic Savings	GDS	World Development Indicators
Deposit money bank assets to (Deposit money + central) bank assets (%)	BAC	Financial Development and Structure Dataset
Liquid liabilities to GDP (%)	LLG	Financial Development and Structure Dataset
Private credit by deposit money banks and other financial institutions to GDP (%)	PCR	Financial Development and Structure Dataset
Stock market capitalization to GDP (%)	STM	Financial Development and Structure Dataset
Real GDP Growth Rate	GDP	World Development Indicators
Real Interest Rate	RIR	World Development Indicators
Age Dependency Ratio	ADR	World Development Indicators

3.2. Empirical application and findings

3.2.1. Panel Unit Root Tests

The variables used in the panel data analysis should be stationary to avoid causing possible spurious relationships among the variables. Therefore we tested common unit root process by Levin, Lin and Chu (2002) test and tested unit root process for every unit (country) by Im, Pesaran ve Shin (2003). We tested stationarity of the time series by Augmented Dickey Fuller (ADF) (1979) test. The results of panel unit root tests were presented in Table 2. We found that all the variables were not stationary at the level, but became stationary after first differencing.

Table 2. *Results of panel unit root test*

Variables	Levin, Lin & Chu Test Results		Im, Pesaran & Shin Test Results		ADF-Fisher Chi-square	
	Level	First Difference	Level	First Difference	Level	First Difference
	Trend and Constant	Constant	Trend and Constant	Constant	Trend and Constant	Constant
GDS	0.1182	0.0001*	0.1166	0.0197*	0.1268	0.0009*
BAC	0.1488	0.0000*	0.1924	0.0102*	0.1253	0.0014*
LLG	0.0830	0.0000*	0.1062	0.0003*	0.1077	0.0000*
PCR	0.1376	0.0027*	0.1264	0.0000*	0.0932	0.0000*
STM	0.0722	0.0144*	0.0921	0.0026*	0.0834	0.0026*
GDP	0.1035	0.0000*	0.1172	0.0000*	0.1124	0.0000*
RIR	0.0881	0.0268*	0.0935	0.0163*	0.0933	0.0032*
ADR	0.1374	0.0000*	0.1562	0.0000*	0.1371	0.0026*

The series were deseasonalized by Hodrick-Prescott filter during the stationarity analyses and periods of crisis and policy change were considered with regard to the statistical significance. In the model selection, trend and constant components were included in the model as long as they were they were significant.

* Significant at the 0.05 and 0.01 level, lags for ADF test were selected automatically by based on Schwarz information criterion, Bandwiths for Phillips-Perron test were selected automatically by based on Newey-West Bandwith.

Cusum path lies within the confidence interval bounds at %5, structural breakpoint was not observed.

The panel unit root tests in Table 2 are called as first generation panel unit root tests. First generation panel unit root tests is based on the assumption which cross-sectional units of the panel are independent and all the cross-sectional units are affected equally from the any shock which one of the panel units is exposed to. Whereas it is more realistic that the other units are affected from the shock which any one of the panel units is exposed to in different levels. The second generation panel unit root tests were developed to eliminate this shortcoming and they test the stationarity by considering the dependency among the cross-sectional units (Göçer, 2013, p. 5094).

It is required to test the cross-sectional dependency in panel data set for determining the existence of unit root. If the cross-sectional dependency in panel data set is rejected, first generation panel unit root test can be used. However if there is cross-sectional dependency in the panel data, use of second generation panel unit root tests yield a more consistent, efficient and powerful estimation (Güloğlu and İspir, 2011, pp. 209-210).

We can determine the existence of cross-sectional dependency by Breusch-Pagan (1980) CD_{LM1} test in case of time dimension (T) > cross-sectional dimension (N), Pesaran (2004) CD_{LM2} test in case of T=N, by Pesaran (2004) CD_{LM} test in case of T<N. We used Breusch Pagan (1980) CD_{LM1} to test the cross-sectional dependency because there are 7 countries (N=7) and 20 years (T=20). The hypotheses of the test are as follows:

H_0: There is no cross-sectional dependency

H_1: There is cross-sectional dependency

If the p value is smaller than 0.05, H_0 is rejected at 5% significance level and it is decided there is cross-sectional dependency among the panel units (Pesaran, 2004). The results of CD_{LM1} test were presented in Table 3. The results demonstrated that there was cross-sectional dependency in the series and equation because p value is smaller than 0.05. In this case there is cross-sectional dependency among the countries which formed the panel and all the other countries affected from the shock which any country was exposed to.

Table 3. *Results of CD_{LM1} Test*

GDS	BAC	LLG	PCR	STM	GDP	RIR	ADR
4.911*	4.765*	5.315*	5.763*	5.172*	7.620*	6.438*	7.552*

* Significant at the 0.05 level.

Since we found that there was cross-sectional dependency among the countries which formed the panel, we tested the stationarity of the series by cross-sectionally augmented Im-Pesaran-Shin (2003) (CIPS) based CADF (Cross-Sectionally Augmented Dickey-Fuller) which is one of the second generation unit root tests. The hypotheses of the test are as follows:

H_0: There is unit root and

H_1: There is no unit root.

CIPS statistics is calculated by taking arithmetic averages of the all CADF statistics to determine whether there is unit root in the overall panel. The calculated CIPS statistics is compared with the table value in Pesaran (2006) and if the calculated CIPS value is smaller than the table critical value, H_0 is rejected. In this case there is no unit root in relevant data of the countries and the shocks are temporary (Göçer, 2013:5094-5095).

CIPS statistics were calculated and the results were presented in Table 5. Since calculated CIPS statistics is higher than the critical value in the table, H_0 is accepted and it was decided there was unit roots in the series which formed the panel. In this case the series were not stationary at the levels. So we made the regression analysis with first differences of the variables, because the series were not stationary at the level.

Table 4. *Results of CIPS test*

GDS	BAC	LLG	PCR	STM	GDP	RIR	ADR
4.335*	5.887*	7.303*	8.320*	6.409*	10.821*	7.463*	9.003*

* Significant at the 0.05 level.

3.2.2. Panel Regression

Panel data analysis is implemented by fixed and random effects as specified in Baltagi (2004). We applied some statistical tests to determine which estimation method we use in the analysis. The main issue is whether the data will be pooled among the countries and the periods because all the variables in the model may be varied among the countries and the periods. We used Chow test to determine common significance of country specific effects and time specific effects. Here effective estimator under null hypothesis is pooled ordinary least squares, while effective estimator under alternative hypothesis is fixed effect model (Berke, 2009, p. 41). We used Chow and Breush-Pagan tests to determine which panel regression model would be used and the results of the tests were presented in Table 5. Null and alternative hypotheses for BP tests respectively pooled regression and random effects model, while null and alternative hypotheses for Chow test respectively are pooled regression and fixed effects model.

Table 5. *Results of panel regression estimation method*

Test	p value	Decision
Chow(F test)	0.025	Accept H_1
BP(χ^2 test)	0.001	Accept H_1

We then used Hausman test to decide whether we use random effects model and fixed effects model. In this test null hypothesis is that there are random effects, while alternative hypothesis is that there are not random effects. The results of Hausman test were presented in Table 6. Hausman test results demonstrated that alternative hypothesis was accepted. So we used random effects model in the analysis.

Table 6. *Hausman test results*

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	113.678	3	0.131
Period random	211.772	3	0.250
Cross-section and period random	419.553	3	0.217

We used different algorithms for the analysis and the estimation results of the model obtained by panel-corrected standard errors (PCSE) algorithm which had minimum value of total squared error and the results of panel regression were presented in Table 7. We found that all the variables except ADR had statistically significant positive effect on domestic saving, while ADR had statistically significant negative effect on domestic saving. Moreover our explanatory variables explained 87% of variation in dependent variable (gross domestic saving). Our findings are consistent with the general trend in the literature.

Increases in financial sector development, economic growth and real interest rate raised the domestic savings, while increases in aged dependency ratio decreased the domestic savings in emerging Asian countries. 1% increase in the variables of STR, LLG, PCR, BAC, RIR and GDP respectively caused 23.21%, 7.96%, 8.71%, 9.35%, 9.09% and 69.06% increase in the domestic savings, while 1% increase in the variable of ADR led a 10.48% decrease in the domestic savings.

Table 7. *Results of panel regression estimation*

Dependent Variable: DGDS
Method: Panel EGLS (Two-way random effects)
Periods included: 20
Cross-sections included: 7
Total panel (balanced) observations: 133
Swamy and Arora estimator of component variances
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSTR	0.232111	0.079005	2.937944	0.0039
DLLG	0.079680	0.020203	3.943923	0.0001
DPCR	0.087128	0.022345	3.899249	0.0002
DADR	-0.104880	0.030716	-3.414548	0.0008
DBAC	0.093594	0.044418	2.107120	0.0370
DRIR	0.090901	0.028998	3.134738	0.0021
DGDP	0.690670	0.213719	3.231673	0.0015
C	40.42585	5.281320	7.654498	0.0000
	Effects Specification			
			S.D.	Rho
Cross-section random			6.408972	0.8683
Period random			0.000000	0.0000
Idiosyncratic random			2.496169	0.1317
	Weighted Statistics			
R-squared	0.872999	Mean dependent var		2.811506
Adjusted R-squared	0.845873	S.D. dependent var		3.352307
S.E. of regression	2.911161	Sum squared resid		1135.631
F-statistic	40.06379	Durbin-Watson stat		2.733130
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.858114	Mean dependent var		32.40479
Sum squared resid	6877.303	Durbin-Watson stat		2.121060

Autocorrelation is an important problem in the panel data analyses as in all the time series. One of the main assumptions of the regression analysis is that there should be not the relationship (correlation) among the same error terms for the different observations. If the error terms are interrelated, this is called as

autocorrelation or serial correlation (Greene, 2011). We tested the autocorrelation in the data set by Woolridge (2002) autocorrelation test. The test result was presented in Table 8 and the null hypothesis, which states that there is no autocorrelation, was rejected according to the test results. In other words there was no autocorrelation among the error terms.

Table 8. *Results of Woolridge autocorrelation test*

F value	Probability
431.047	0.165

On the other hand heteroscedasticity was tested by Greene heteroscedastic test and the test result was presented in Table 9. H_0 hypothesis, which states that there is no heteroscedasticity, was accepted according to the test results.

Table 9. *Results of Greene heteroscedastic test*

chi2 (2) = 412.980
Prob>chi2 = 0.242

4. Conclusions

Saving rate is one of the important macroeconomic variables underlying the economic growth for an economy. Therefore it is crucial to understand the determinants of the domestic savings for the policy makers to sustain economic growth. This study examined the effects of financial development including major financial sector indicators, economic growth, real interest rate and age dependency ratio on gross domestic savings in emerging Asian countries by panel regression.

The empirical findings demonstrated that financial development, economic growth and real interest rate had positive effect on domestic saving, while age dependency ration had negative effect on domestic saving. This finding is consistent with the studies such as Edwards (1996), Dayal-Gulati and Thimann (1997), Kelly and Mavrotas (2001), Kelly and Mavrotas (2003), Kelly and Mavrotas (2008), Touny (2008), Park and Shin (2009), Horioka and Yin (2010) and Sahoo and Dash (2013) which found that financial development had positive effect on domestic savings. Therefore policy makers should consider the financial sector which is one of the key determinants of domestic savings and they are required to develop financial sector to increase the saving rate in their countries as emerging Asian economies did.

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Between objective and subjective in the sustainable development and the identification of crisis mitigation solutions

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Abstract. *The paper presents an objective perspective on the sustainable development in Romania, as it is illustrated by the statistical data. The analysis of the main indicators related to the human development, the environment and the socio-economic issues reveals the position of our country within the European space. Besides the objective perspective, the citizens' perspective has been also considered. The survey organised has identified the general citizens' views related to the barriers and opportunities concerning the sustainable development and possible crisis mitigation solutions. The results of the pilot survey demonstrate the citizens' commitment in finding solutions for the issues that affect their lives. The article emphasizes the citizens' potential role in finding solutions in complex and difficult situations.*

Keywords: sustainable development, sustainable development indexes, crisis mitigation solutions.

JEL Classification: O210, O410.
REL Classification: 8B, 8I, 16E, 16G.

1. Perspectives on the sustainable development

The actual challenges concerning the sustainable development lead to the design of a wide range of models and set of indicators characterizing the sustainable development and facilitating the evaluation of the sustainable development, according to specific objectives (standards, targets).

1.1. Main sustainable development models

There are two main trends in the actual approaches: the development of a set of indicators grouped on main themes (socio-economic development, environment protection and human development) and the development of composite indexes which integrates more indicators. A short list of the most used indicators for the sustainability measurement is provided by the Table 1.

Table 1. *Relevant sustainable indicators*

Type of index	Name of indicators	Components	Implementation
Indicators for monitoring the European sustainable development	Sustainable Development Indicators (10 Themes, 3 levels)	Theme 1: Socio-Economic Development Theme 2: Sustainable Consumption and Production Theme 3: Social Inclusion Theme 4: Demographic Changes Theme 5: Public Health Theme 6: Climate Change and Energy Theme 7: Sustainable Transport Theme 8: Natural Resources Theme 9: Global Partnership Theme 10: Good Governance	EUROSTAT National Institute for Statistics (Theme 1–8) (Eurostat, 2012; ***, 2011a, ***, 2010c)
Composite index for monitoring Lisbon strategy	Economic Lisbon Indicator	1. Gross Domestic Product (GDP) per capita 2. Employment rate age15-64 years 3. Employment rate age 55-64 years 4. Research and development expenditure as percentage from GDP 5. Long term unemployment (% of total unemployment) 6. Rate of young people (age 20-24 years) who have attended at least the upper secondary level of education	European Commission (***, 2011)
Composite index for the innovation	Regional Innovation Performance Index (RIPI)	1. Innovation engines 2. Knowledge creation 3. Innovation and entrepreneurship 4. Applications 5. Intellectual Property	European Commission (Eurostat, 2012)
Sustainable development indicators	Sustainable Society Index	1. Personal development 2. Clean environment 3. Well-balanced society 4. Sustainable use of resources 5. Sustainable world	Geurt van de Kerk (Van de Kerk, 2010, pp. 228-242)
Composite index for the human development	Human Development Index (HDI) Poverty Index (PI)	Life expectancy Education (literacy index and educational attainment) PIB per capita	United Nations Development Programme (UNDP, 2011)
Composite index for the environment	Environmental Performance Index (EPI) - 6 categories, 16 indicators	Environmental Health Biodiversity and Habitat Water quality Air quality Climate changes Productive Resource Management	Columbia University and Yale University, USA (***, 2010a)

Source: Synthesis of (***, 2011; ***, 2011a; Eurostat, 2012; UNDP, 2011; ***, 2010a; ***, 2010d; Van de Kerk, 2010).

The list of indicators is not an exhaustive presentation; it intends only to emphasize the most recent indicators developed for the assessment of the sustainable development. The European Union has developed a set of indicators for monitoring the sustainable development. The themes follow a general gradient from the economic, to the social, and then to the environmental and institutional dimensions. They are further divided into sub-themes to organize the set in a way that reflects the operational objectives and actions of the sustainable development strategy (***, 2011). The set of indicators for the sustainable development assessment is integrated also in our statistical system of indicators and are accessible on the portal of the National Institute for Statistics (theme 1 to 8).

1.2 Heuristic model for the assessment of the sustainable development

The analysis of the various sustainable development indexes and models has been carried out within the framework of a wide research project financed through the national research fund. Thus, the research revealed the utility of a comparative model in order to assess the various sustainable development indexes in relation with certain standards and values used as comparison terms. The proposed heuristic model enables the positioning of a region and/or country related to international standards, level of indicators within the European space or various targets to be achieved (Table 2).

Table 2. *Algorithm for the specific indicators of the model*

No.	Formula	Significance	Explanation
1	$IS_i = \frac{V_i}{P_i}$	i = year, varying from 1 to n k = domain, varying from 1 to m IS_{ki}= specific indicator k in the year i V_i= specific value of the factor k in the year i P_i = population in the year i	Value of the specific indicator per capita
2	- maximization: $I_{ki} = \frac{IS_{k_i} - I_{k\,min}}{I_{k\,max} - I_{k\,min}}$ - minimization: $I_{k_i} = \frac{I_{k\,max} - IS_{ki}}{I_{k\,max} - I_{k\,min}}$	IS_{ki}= specific indicator k in the year i I_{ki} = index for the specific indicator k in the year i I_k _min = minimum value (related to the global/EU development) of the specific indicator k I_k _max = maximum value (related to the global/EU development) of the specific indicator k	Comparative index to indicate the position of the indicator at a global/ European scale
3	$I_{Di} = \frac{(\sum_{k=1}^{n} I_{ki} * \alpha_k)}{\sum_{k=1}^{n} \alpha_k}$	I_{Di} = value of the composite index specific to the domain D in the year i I_{ki} = index for the specific indicator k in the year i α_k= the weight for each specific indicator in the composite index for the domain D	Composite indicator for a specific domain

Source: Own research/processing.

For the calculation of the specific index, for the maximization is used the following formula:

$$I_{ki} = \frac{IS_{Ki} - I_{K\,min}}{I_{K\,max} - I_{K\,min}}$$

and for the minimization is used the formula:

$$I_{ki} = \frac{I_{K\,max} - IS_{ki}}{I_{K\,max} - I_{K\,min}}$$

where:
IS_{ki}= specific indicator k in the year i;
I_{ki} = specific index k in the year i;
I_k _min = min value (related to the global/European values) for the specific indicator k;
I_k _max = max/average value (related to the global/European values) for the specific indicator k.

The average is used for aggregating the specific indicators. According to the statistical theoretical and practical approach, the geometrical average ($\sqrt[n]{I_{I1} \cdot I_{I2} \cdots I_{In}}$) is indicated, but due to the risk of null values, the geometrical average is not relevant for the calculation of the composite indexes. In this case, considering the mentioned aspects, the composite indexes will be calculated using the simple or weighted arithmetic average, enabling us to assign a certain importance through the specific weights provided (third line of the Table 2). Thus, the composite index represents the adjusted average of the transformed indicators (scale 0 to 1 – Comparing index for a positioning on a global/European scale).

The project has proposed the use of a set of specific indicators for the fundamentation of the sustainable strategy, at the regional or country level, for a better positioning of the region towards standards or targets. In this sense, various analyses have been performed based on these indicators for Bucharest-Ilfov region or, in the case data have not been available, the indicators have been illustrated at the national level. The statistical data correspond to the year 2009 and have been collected from the specific statistical data portals of the European Union (Eurostat, 2012; 2010b) and of the National Institute for Statistics (National Institute for Statistics, 2010; 2010c).

2. Objective assessment of the sustainable development

The model is structured according to the main sustainable development axes: personal development, social development, economic development and protection of the natural environment. (1).

$$IDRS = \frac{IDP + IMN + IMS + IDE}{4} \quad (1)$$

where:
IDRS = sustainable development index;
IDP = personal development index;
IMN = natural environment index;
IMS = social environment index;
IDE = economic development index.

Each domain index is calculated by integrating the specific domain indicators, according to the scheme and algorithm presented in the Table 2. A synthesis of the structure for each index on the four domains is presented in the following sections.

2.1. Personal development index - IDP

The personal development index (2) stands for a composite index enabling a synthetic view on the personal development for a region or a country. The index measures and compares opportunities related to a long and healthy life, education, free time and income:

$$IDP = (ISV + IDG + IRLL + IVR + \ldots)/(\text{no. of calculated indexes}) \quad (2)$$

where:
ISV = life expectancy index;
IDG = gender development index;
IRLL = index of the free and working time;
IVR = index of the real income.

The calculation according to the algorithm takes into consideration as basis for comparison the European Union countries. The data show a major discrepancy between the real average income in our country and the same data in the European space, our country being at the minimum European level. In this case, the composite index of the personal development could be calculated (2), according to the results obtained by each index, as it is revealed in the Table 3. The results show an ascending trend of this index during the first decade of the third millennium, but remains at a low level compared to the European level (less than 0.3 in 2009), as it is illustrated in the Table 3.

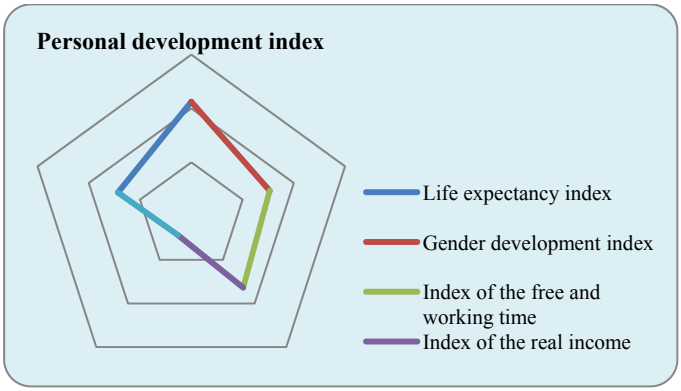
Table 3. *Main indexes of the personal development in Romania compared to the European Union*

Indicators	Romania	Min. UE	Max. UE	IDP
Life expectancy index	73.40	64.90	84.80	**0.425**
Gender development index	0.57	0.47	0.84	**0.306**
ndex of the free and working time	38.61	30.75	42.43	**0.327**
Index of the real income	5.65	3.79	253.11	**0.086**
Index of the personal development				**0.286**

Source: Own calculation.

A clear presentation of the positioning of the personal development index compared with the minimum and maximum values of the European space is illustrated in the Figure 1.

Figure 1. *Personal development index*



Source: Own calculation.

2.2. Natural environment index – IMN

The natural environment index shows the status of the natural environment, evaluating the quality of the air, water and soil (formula 3), vital elements contributing to ensure a healthy life environment for the inhabitants of the region, maintaining in the same time the appropriate life conditions for the next generations.

$$IMN = \frac{ICA + ICAP + ICT}{3} \tag{3}$$

where:
ICA = air quality index;
ICAP = water quality index;
ICT = soil quality index.

This generic approach could be customized taking into consideration additional elements, such as noise, waste management etc. It is important also to mention, that, due to the fact that the research took place in Bucharest-Ilfov region, the soil quality is not a major issue, meanwhile the green spaces is a critical factor for the natural environment. From this point of view, the natural environment index is calculated using two different (formulas: 3.1 and 3.2), emphasizing the main characteristics of the urban and non-urban space.

$$IMN_i = \frac{ICA + ICAP + ISPV + IZ}{4} \text{ urban (Bucharest)} \quad (3.1)$$

where:
ICA = air quality index;
ICAP = water quality index;
ISPV = green space index;
IZ = noise index.

$$IMN_i = \frac{ICA + ICAP + ICT + ISPV + IZ}{5} \text{ non-urban} \quad (3.2)$$

where:
ICA = air quality index;
ICAP = water quality index;
ICT = soil quality index;
ISPV = green space index;
IZ = noise index.

According to the composite index of the natural environment, the worse situation has been noticed related to the green space and the waste storage. Regarding the water and air quality, Romania has a relative good situation compared with the European Union. While indicators related to dust in the air and the amount of nitrogen were much higher than the permissible average, the overall air quality is good, as shown in Table 4.

Table 4. *Air quality indexes*

Indicators	Romania	Min. UE	Max. UE	ICA
Nitrogen Dioxid	49.83	0	30	**-0.661**
Dust in suspension	49.67	0	20	**-1.4835**
Greenhouse gas CO2	6060	4308	24994	**0.94**
Ozone emissions	0.271	0.002	2217	**0.878**
Quality air emissions				**0.797**

Source: Own calculation based on Eurostat data.

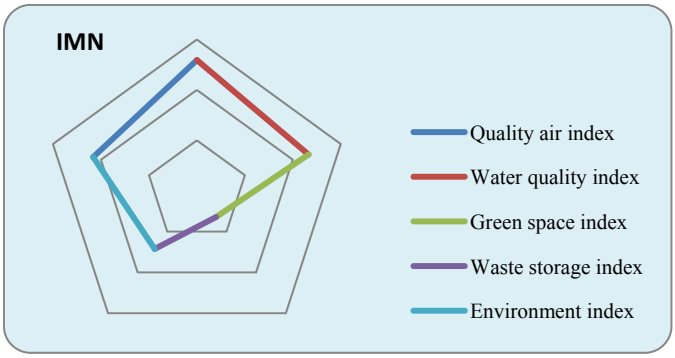
The values of the environment index have been presented in the Table 5 and the Figure 2.

Table 5. *Environment index*

Indexes	IMN
Quality air index	0,797
Water quality index	0,664
Green space index	-0,177
Waste storage index	0,212
Environment index	0,581

Source: Own calculation.

Figure 2. *Natural Environment Index*



Source: Own calculation.

2.3. Social environment index - IMS

The social environment index is a composite index characterising the social environment for a region/local area, related to the general life conditions, health, education, employment conditions, unemployment and poverty risks specific to the region analysed:

IMS = (ICL+ISVS+ICS+IE+ISS+IROP+ISL+IS+...)/(no. of calculated indexes) (4)

where:
IMS = social environment index;
ICL = general habitation conditions index;
ISVS = healthy life expectancy index;
ICS = social expenditure index;
IE = education index;
ISS = health system index;
IROP = employment rate index;
ISL = long unemployment index;
IS = poverty exposure risk index.

In a simplified version, introduced because there were not sufficient data for testing the model, the social environment index is calculated according the formula (4.1):

$$IMS = \frac{I_{CS} + I_{ROP} + I_{SOML} + I_{RS}}{4} \quad (4.1)$$

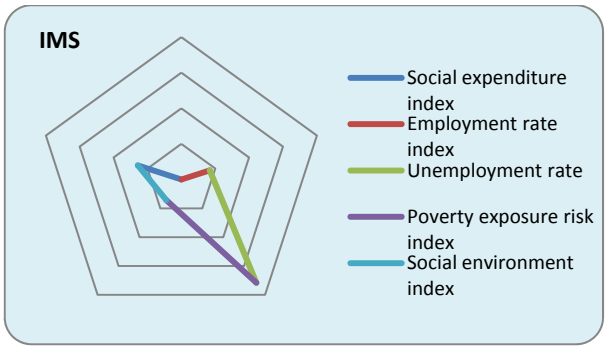
As it is obvious, according to the construction of the social environment index, the calculation of the index is based on indexes with positive and negative indexes, as the Table 6 and the Figure 3 illustrate the composite index values as it is presented in the formula (4.1).

Table 6. *Social Environment Index*

Indexes	Romania	Min. UE	Max. UE	IMS
Social expenditure index	1363.000	1363.000	13638.000	**0.000**
Employment rate index	58.600	54.900	77.000	**0.167**
Unemployment rate	2.200	0.500	6.500	**0.717**
Poverty exposure risk index	23.600	11.000	25.700	**0.143**
Social environment index				**0.257**

Source: Own calculation based on Eurostat data.

Figure 3. *Social environment index positioning*



Source: Own calculation.

2.4. Economic development index - IDE

The economic development index integrates the main economic aspects of the region, aiming at a balanced development and at maintaining the premises of the future balanced development:

IDE = (IPIB + IRDE +IW+IEXP+ICE+IDI+IDF+…)/(no. of indexes) (5)

where:
IPIB = economic results index;
IRDE = economic dependency rate;

IW = productivity rate;
IEXP = export index;
ICE = energy consumption index;
IDI = innovation and development index;
IDF = financial index.

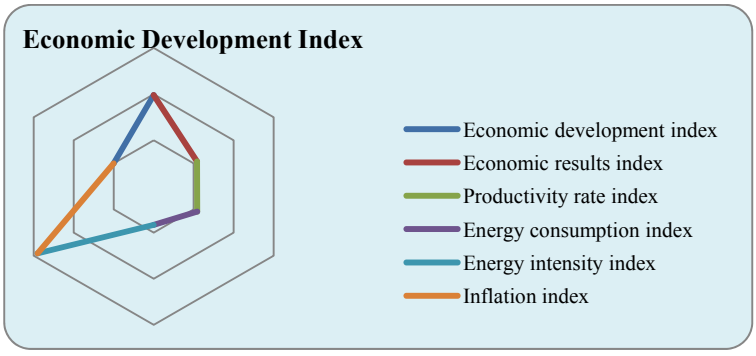
Due to the lack of statistical data for the Bucharest-Ilfov region, the tests for the economic index have been carried out with data at the country level, taking into consideration the indexes related to the GDP per capita (IPIB), the productivity, energy consumption and the inflation. The data related to the economic results are presented in the Table 7, illustrating a disadvantaged situation of our country within the European Union, the indexes indicating values near the European minimum values. In addition, the value of the index is decreasing beginning with 2008. The values for the indexes integrated in the economic environment index are presented in the Table 7 and in the Figure 4.

Table 7. *Economic development index*

Indexes	IDE
Economic results index	**0.017**
Productivity rate index	**0.018**
Energy consumption index	**-0.034**
Energy intensity index	**0.381**
Inflation index	**0.000**
Economic development index	**0.196**

Source: Own calculation.

Figure 4. *Economic Development Index positioning*



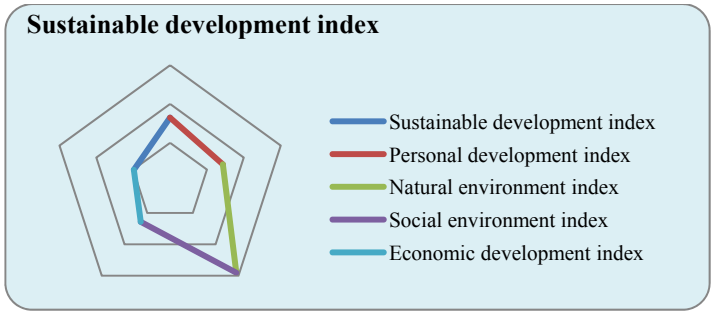
Source: Own calculation.

2.5. Sustainable development index

Using the data calculated for the personal development, the natural, social and economic environments, and the index for measuring the sustainable development position has been calculated. For calculating the sustainable development index, the values obtained at the national level have been considered as values for the

Bucharest-Ilfov region. Thus, the value for the composite index is 0.33, which does not demonstrate a favorable position of our country within the European space (Figure 5).

Figure 5. *Sustainable development index*



Source: Own calculation.

The analysis has demonstrated the weak and strong points, where a significant discrepancy related to the European Union member states has been noticed, i.e. the economic development. The population's real income, the social protection expenditures represent other elements where we have significant gaps compared with the European space. For a complete and realistic image on the regional development, besides the data from the statistics analysis, revealing the most sensible points, the research team has initiated pilot surveys for the identification of the regional actors' perception on the personal development, on the quality of the natural and of the socio-economic environment.

3. Subjective perspective on the sustainable development

Besides the quantitative and qualitative analysis based on the proposed model, it is necessary to have a complementary qualitative view, based on the regional actors' opinions. For this purpose, a questionnaire applied in a pilot survey has been developed in order to identify the Bucharest-Ilfov citizens' opinion. Raw data obtained from the questionnaire, representing information that can be integrated in regional strategy development phase, with secondary data resulting from the application of the sustainable development models. The specific approach of the project enables the regional stakeholders' access to various data; so that the regional actors are informed and they could carry out individual or group analysis for a better understanding of the development trends, and their opinions rely on this information.

The pilot survey used a similar methodological approach as the first survey, based on online questionnaires. Finally, there were 154 respondents, with a wide

distribution related to the age and social categories. The pilot survey focused on identifying the regional actors' opinion on:
- the general situation of the region;
- the perception of the personal life;
- the perception of the quality of the natural environment;
- the perception of the social environment;
- the perception of the economic environment.

The sample's area involved in the survey referred to the Bucharest area, including the metropolitan area of the capital, the participants being randomly selected, with only the requirement that the participants should be residents in the Bucharest-Ilfov region and having over 18 years. The survey has been carried out in the first quarter 2010. The questionnaires have been structured on five sections: the first section included the respondent's identification data and questions regarding the perception of the general situation in the Bucharest and the metropolitan area. The other sections have been structured according to the four axes of the sustainable development: natural environment, social and economic environment and the personal development. The majority of the questions are clearly formulated and closed, without ambiguities or possible interpretations.

A synthesis of the main elements concerning the sample structure illustrates that:
- according to sex variable, the sample distribution included 66% women and 34% men;
- according to education level, the sample included 38% persons with upper secondary level, 47% graduated persons and 15% persons with post-graduated studies;
- regarding the activity domain, the sample structure is illustrated in the Table 8.

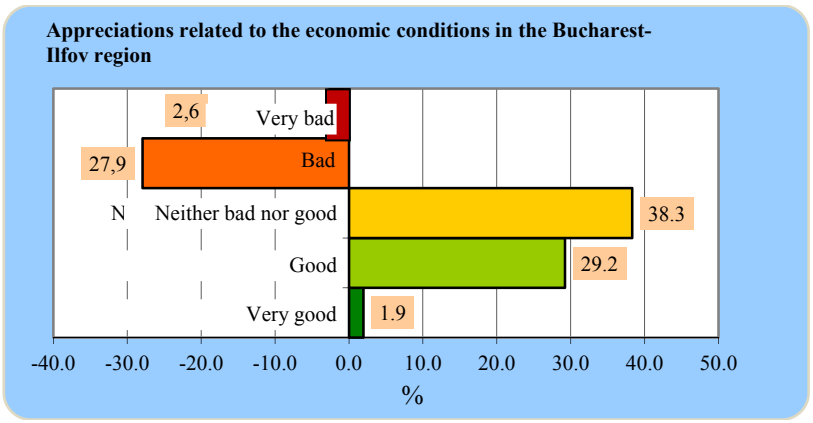
Table 8. *Sample structure related to the activity domain*

	Category	Persons	Rate %
a.	Public administration	**33**	21.4
b.	Social domain	**5**	3.2
c.	Political domain	**4**	2.6
d.	Educational domain	**13**	8.4
e.	Research	**4**	2.6
f.	Judicial domain	**3**	1.9
g.	Cultural domain	**5**	3.2
h.	Health domain	**7**	4.5
i.	Transports	**5**	3.2
j.	Constructions	**5**	3.2
k.	Trade	**16**	10.4
l.	Services	**19**	12.3
m.	Industry	**13**	8.4
n.	Other domains	**32**	14.7
	TOTAL	154	100,0

Source: Own calculation.

The general opinion related to the economic situation of the region reveals that the majority appreciates that the situation is good (29.22%) or neither bad nor good (38.31%), and more than 30% consider that the conditions in the region are not good, as it is presented in the Figure 6.

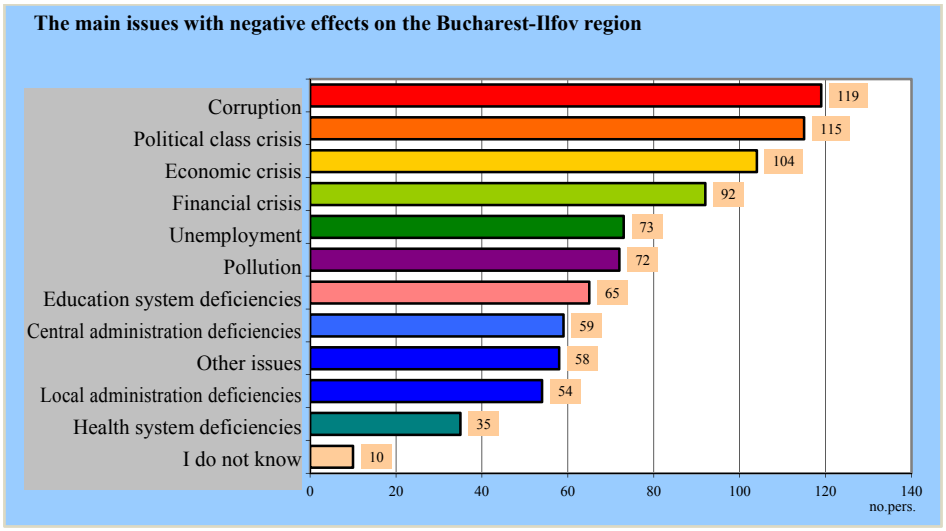
Figure 6. *Satisfaction level related to the economic situation*



Source: Own calculation.

Regarding the causes generating the actual situation in the region, the participants indicated as main negative factor the corruption (77.27% of the respondents), as it is illustrated in the Figure 7.

Figure 7. *Main causes of the actual situation in the Bucharest-Ilfov region*



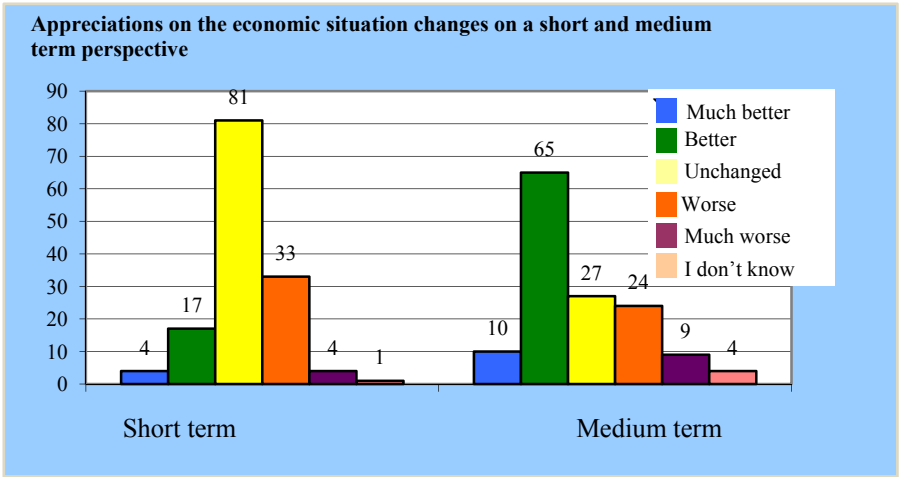
Source: Own calculation.

Although the economic situation in the region Bucharest-Ilfov is not considered a good one, respondents mention the corruption and the poilitical crisis as main causes for the actual situation, with greater negative effects than the economic crisis.

Another relevant question referred to the chance of changing the actual short and long term situation.

The respondents' perception revealed that on short term there are not important chances to change in a better way the existent situation. On a long term horizon, the perspectives are more optimist, as presented in the Figure 8.

Figure 8. *Appreciations on the economic evolution on the short and medium term*

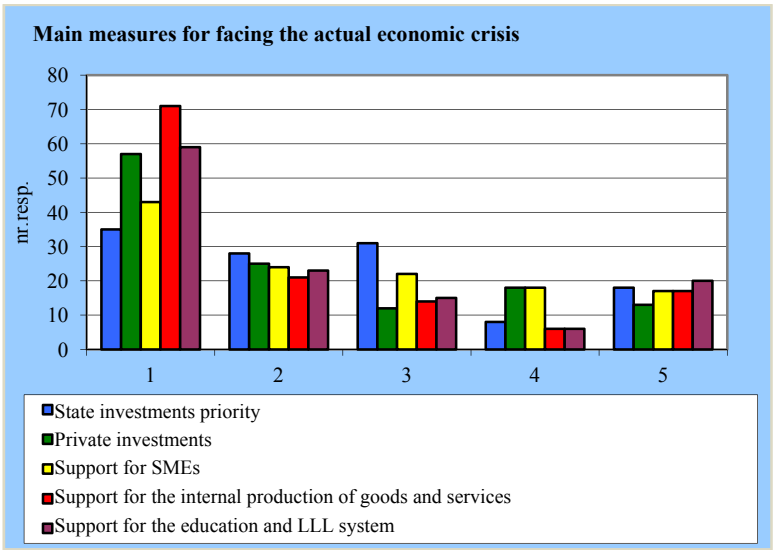


Source: Own calculation.

An interesting result has been obtained related to the solutions, which the participants to the survey consider useful.

The majority of the respondents considers that the improvement of the actual situation could be obtained through a mix of measures, which could stimulate the economic activity, among them the development of the internal production of goods and services, the investments in the development of the education system and long life learning represent priorities for the amelioration of the actual economic situation (Figure 9). Both categories of Investments, i.e. private and state are considered the main development factors, along with sustainable state support through appropriate policy measures.

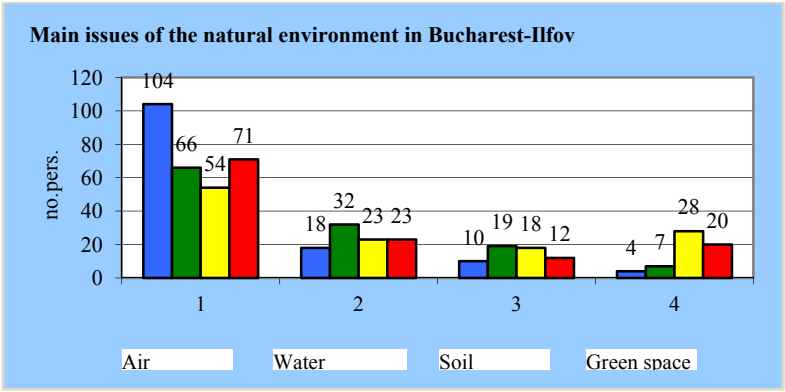
Figure 9. *Measures for facing the economic crisis*



Source: Own calculation.

The section related to the natural environment revealed that the participants' most important issue stands for the air quality, and then the water quality and the green space surfaces (Figure 10).

Figure 10. *Main issues related to the natural environment*



Source: Own calculation.

Simultaneously the respondents highlight a depreciation of the natural environment in the Bucharest-Ilfov region, as the answers presented in the Table 9 have demonstrated.

Table 9. *Natural environment pollution in the Bucharest-Ilfov region*

Code	Options related to the environment pollution	Bucharest	Ilfov	Rate %	
				Bucharest	Ilfov
a.	More pollution than 5-10 years ago	**125**	**56**	81.17	36.36
b.	As polluted as 5 - 10 years ago	**9**	**8**	5.84	5.19
c.	Less polluted than 5 -10 years ago	**1**	**2**	0.65	1.31
	Non answer	**19**	**88**	12.34	57.14
	Total	154	154	100,0	100,0

Source: Own calculation.

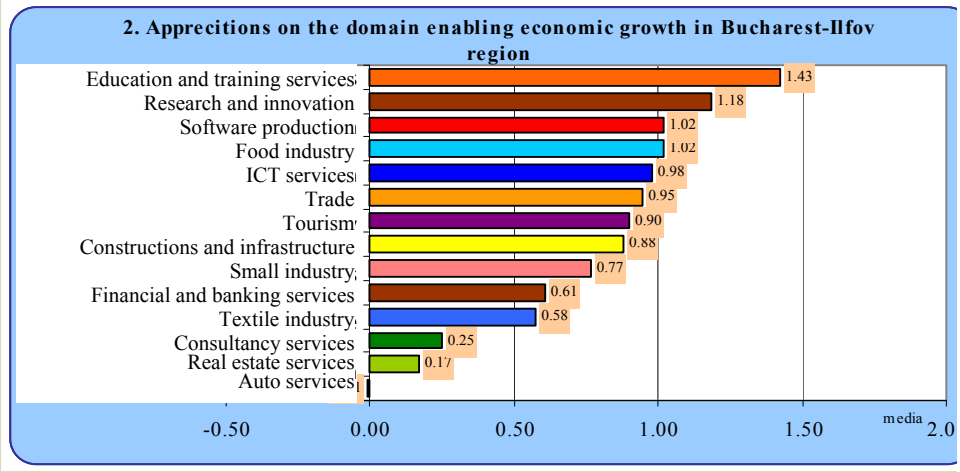
The respondents have appreciated the quality of the water, air and soil with medium values, i.e. on a scale from 1 to 10, the average for water represented 5.02, for air 5.07, and for the soil 5.12. Regarding the quality of the air and especially the dust, the people have noticed the existing issues, the mark being only 3.98.

These answers could be correlated with the results of the statistics analysis for the water, air soil and green space quality, the concordance between citizens' opinions and the statistic data, i.e. the respondents highlighted the decline of the environment quality and the identification of the air quality as the major environmental issue.

These issues have been emphasized also by the data analysed. The citizens' opinions are in line with the results of the analysis based on the proposed model.

Taking into consideration the economic situation of the Bucharest-Ilfov region, the majority of the sample appreciated that its status is stationary (55%). 20% considered that it is an economic growth and 25% appreciated that it is an economic decline. Using a scale from -2 to +2, a hierarchy of the domains which could generate economic growth is illustrated in the Figure 11.

Figure 11. *Main economic growth factors*



Source: Own calculation.

Besides this evaluation of the economic situation and of the main aspects contributing to the economic growth, the respondents have identified also the obstacles in the normal development of the economic processes. The main difficulties in the business area have been identified and a hierarchy of the negative factors have been drawn up using a scale form 1 (very important obstacles) to 10 (very small obstacles). The synthesis of the results is presented in the Table 10. As it is obvious from the table, the main obstacle for the business processes is the corruption, and after that the bureaucracy and the excessive taxation. The participants in the survey demonstrate a coherent approach, because both evaluation of the general situation of the region, and of the causes blocking the business area identified the corruption as main obstacle for the development at the micro- and macro-economic level.

In addition, at the micro level, there are also other obstacles blocking the business area (funding difficulties, market instability, lack of qualified work force etc.).

Table 10. *Obstacles for the business processes*

No.	Obstacles	Average
1	Corruption	2.23
2	Excessive bureaucracy	2.44
3	Excessive taxation	2.73
4	Lack of funding access	2.95
5	Lack of stable markets	3.44
6	Lack of local tax facilities	3.49
7	The limited purchase power of the market	3.78
8	Lack of the qualified workforce	4.31
9	Lack of production spaces	5.21
10	Lack of local work force	5.60
11	Lack of commercial spaces	5.66

Source: Own calculation.

A very consistent part of the questionnaire (16 questions) focused on the evaluation of the respondents' satisfaction level towards their personal life. According to the previously highlighted economic situation, the respondents mentioned that also the personal income is reduced, the majority having an income per person under 1000 Lei/person (27.27%) or equal to 1000 Lei/person (40.91%). Only 9.74% of the participants have the income above 3000 lei/person. In this particular context, the respondents declare that their income is under their current needs or just as the limit to cover these needs, as it is illustrated in the Table 11.

Table 11. *The level of the income related to a decent life*

Code	Level of the income	Rate %
a.	Not sufficient for the basic needs	22.73
b.	Sufficient only for the basic needs	38.31
c.	Sufficient for e decent life	35.06
d.	Satisfactory for our wishes (I can afford to have what I will)	3.90

Source: Own calculation.

The economic crisis effects are reflected in the personal life, having a negative influence on the income and the life security, as it is illustrated in the Table 12. The table presents the participants' opinion regarding the way the crisis affected their lives, using a scale from 1 (the strongest effect) to 5 (the weakest effect).

Table 12. *Economic crisis effects on the personal life*

Code	Issues	1	2	3	4	5	Average
a.	Reducing the income	77	21	15	10	6	1.81
b.	Increasing the unsecurity	56	21	29	8	11	2.18
c.	Decreasing the life standard	45	33	31	11	5	2.18
d.	Increasing the risk of illness	23	25	22	26	26	3.06
e.	Destroying the family	16	4	9	11	80	4.13

Source: Own calculation.

Though the incomes are directly affected by the crisis and do not support a wealthy life, the number of working hours is greater than the official one, which demonstrates the fact that the employees are overloaded or that they need to work supplementary for an additional income. The Table 13 illustrates the fact that the majority of the participants are working more than 8 hours daily, and in the same time the relaxing time is reduced. This conclusion is not in line with the statistic data. This discrepancy has as main cause the fact that there are no specific records concerning the additional working time in the same working place or in a different one.

Table 13. *The working and relaxing hours*

Code	Number of hours at the working place (daily)	Rate %	Number of hours – relaxing time	Rate %
a.	under 6 hours	11.69	under 1 hour	18.83
b.	6-8 hours	27.92	1-3 hours	48.7
c.	8-10 hours	41.56	over 3 hors	32.47
d.	over 10 hours	18.83		

Source: Own calculation.

While, from the point of view of their income and the relaxing time, the respondents have not a particular satisfaction reason, from the perspective of their personal life, they declare that they are in general content (27%) and very content (49%) regarding their families, their homes (47% - are content and 19% - very content) and even their professions (50% - content and 14.4% - very content). Thus, the general level of satisfaction on the personal life, the participants declared their general satisfaction on their life (59.09%), and 10.39% mentioned that they are even very content (Table 14).

Table 14. *Satisfaction level concerning the personal life*

Code	Level of satisfaction	Rate %
a.	Very satisfied	10.39
b.	Satisfied	59.09
c.	Indifferent	4.55
d.	Unsatisfied	22.08
e.	Very unsatisfied	3.90

Source: Own calculation.

It is interesting to analyze the way of constructing the personal satisfaction, without a direct determination between the material conditions and the persons' satisfaction. The satisfaction depends, as the survey demonstrates, mostly on the familial and professional environment.

The results of the survey have been further interpreted and compared with the results obtained by using various models and indexes for the sustainable development. In the majority of the cases the citizens' views are in line with the quantitative results. In some cases the particular regional actors' perception was more refined identifying even the causes of the phenomena or providing ideas for finding appropriate solutions to cope with the actual challenges.

4. Conclusions

The study revealed the strong correlation between the objective and subjective perspectives, i.e. between the statistical data and the citizens opinion. It should also be mentioned that the research had a wider approach, in this paper being presented only the main aspects and indicators. The research has been conducted within a research project framework, financed by the national budget for research and innovation (UEFISCDI).

The contribution of the study consists in the innovative elements and approach which could be valorised for enhancing the scientific base used in the regional development strategy design process and for increasing its participatory character in order to identify the sustainable development main paths. In this perspective, this approach support the e-Democracy concept, referring to "the possibility to develop the influence and participation of the public in the political sphere" (Nordfors et al., 2009, p. 15), using advanced and efficient online interaction channels. Thus, the citizens' involvement will take place in the virtual place (Panopoulou et al., 2009).

The proposed model could be implemented for various benchmarking analysis regarding the status and the positioning of the sustainable development indicators towards specific targets.

The results could generate different scenarious facilitating the interpretation and analysis for improving the decision making process. Simultaneously, the results based on the statistical analysis could be integrated with the citizens' views generating a holistic approach related to the regional sustainable development.

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Appreciate the impact of relevant costing for decision making in Ready-Made Garments (RMG) industry of Bangladesh

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Abstract. *Relevant costing is a management accounting term that relates to focusing on only the costs relevant to a specific decision being made. It simplifies the decision-making process as it ignores cost data that is irrelevant, or will not have an impact on the specific decision being made. This study adopts an observation of quantitative methodology with primary and secondary data in view of the nature of the analysis. Relevant costing is often used in short-terFm decision making and a number of specific practical examples are illustrated in this study. This study has been designed to achieve the objective of assessing the level of perceptions of four areas such as (i)making & buying, (ii) dropping or retaining a segment, (iii) constrained resources and (iv) special orders in using relevant costing in Ready-made Garments Industry (RMG) of Bangladesh. To attain this objective total 100 sample respondent company from Ready-made Garments Industry (RMG) have been randomly selected. By using variance analysis, authors have found that all four factors have significant influence in using relevant costing. Last, the result of this study suggests that the strengthening the decision-making mechanism required a strong relevant costing benefits and its proper application.*

Keywords: Relevant costing, Decision Making (DM), Make or Buy, Special Order, Constrained Resources, Dropping or Retaining Segment and Ready-made Garments Industry (RMG) etc.

JEL Classification: L23.
REL Classification: 17G.

1. Introduction

The RMG industry has been Bangladesh's key export industry and a main source of foreign exchange for the last 25 years. As a result of an insulated market guaranteed by Multi-Fibre Agreement (MFA) of General Agreement Tariff and Trade (GATT) and supportive policies of the Government of Bangladesh (GoB), it attained a high profile in terms of foreign exchange earnings, exports, industrialization and contribution to the GDP within a short period. In less than a decade it increased its exports, foreign exchange earnings, and contribution to the GDP by 4.39%. RMG exports reached a steadfast figure of USD 17.91 billion in fiscal year 2010-2011; accounting more than 78% of national export earnings, which was about 4-5% of the global total of such exports. It further contributes 10% to the country's GDP (Mahmud R.B., 2012). The foreign exchange earnings and employment generation of the RMG sector have been increasing at double-digit rates from year to year (Quddus et al., 2000). Currently, there are more than 4,000 RMG firms in Bangladesh. More than 95 per cent of those firms are locally owned with the exception of a few foreign firms located in export processing zones (Gonzales, 2002).

Management oriented accounting should be able to oversee the successful mimplementation of decisions, from which are shown the true values which are compared with standard values (Tulvinschi, 2010). Relevant costs and revenues as those future costs and revenues that will be changed by a decision, whereas irrelevant costs and revenues are those that will be not affected by a decision (Drury, 2004). Any cost would be an asset if it has a favorable economic effect on expected future costs or future revenues. In other words, if a given cost represents a future economic benefit in the Iota of a reduction of total expected future costs teat addition to total expected future revenue in the ordinary course of business it is a relevant cost and should be considered as unexpired (Fess, 1963). If a cost increase, decrease, appear, disappear as different alternatives are concerned, it is a relevant cost (Lal, 2005). In case of relevant cost concepts, one is to compare relevant revenues with relevant cost and ignore historic sunk and past cost, from the decision making process so that decision can be protected from being mislead.

1.1. Literature review

Relevant costs are future cash flows arising as a direct consequence of the decision under consideration. In many short term situations, the fixed costs remain constant for each of the alternatives being considered and thus the marginal costing approach showing sales, marginal cost and contribution is particularly appropriate. In the long run (and sometimes in the short run) fixed costs do change and accordingly the differential costs must include any changes in the amount of fixed costs (Schweikart, 1986).

Making the decision is often a difficult task that is complicated by numerous alternatives and massive amounts of data, only some of which may be relevant (Victoravich, 2010). A relevant cost is a cost whose magnitude will be affected by a decision being made. Management should consider only future costs and revenues that will differ under each alternative (Arora, 2008). Relevant information is the predicted future costs and revenues that will differ among the alternatives relevant information (Horngren et al., 2006).

Every decision involves choosing from among two alternatives. In making a decision, the cost and benefits of one alternative must be compared to the costs and benefits of other alternatives. Costs that differ between alternatives are relevant costs. Distinguishing between relevant and irrelevant cost and benefits is critical for two reasons: First, irrelevant data can be ignored – saving decision makers tremendous amount of time and effort. Second, bad decisions can easily result from erroneously including irrelevant cost and benefits when analyzing alternatives (Garrison, Noreen, 2012).

When choosing among different alternatives, the manager should concentrate only on the costs and revenues that differ across the decision alternatives; these are relevant cost/revenues. Whether particular costs and revenues are relevant for decision making depends on decision context and the alternatives available (Atkinson et al., 2008). Relevant cost should be used for assessing the economic and financial consequences of any decision by management. Only relevant cost and benefits should be taken into consideration when evaluating the financial consequences of a decision (Woolf, 2011).

Therefore, the study shows that how relevant costing and benefit play a significant role in decision making for a Ready-made Garments Industry in Bangladesh.

1.2. Objectives of the study

The objectives of this study are as follows:

- To show the application of relevant costing terms in decision making.
- To measure the impact of relevant costing for decision making in Ready-made Garments Industry (RMG) of Bangladesh.

2. Methodology of the study

Data collection and sample: The study is mainly based on both the primary and secondary data. A structured survey questionnaire has been used for primary data collection. Sample size Total 100 respondents have been surveyed of different types of Garments company in Bangladesh on a random sampling basis. Interviewed to get the answers of the questionnaires to one employee from each

company such as- General Manager, Assistant Manager, Cost Management Accountant (CMA) or others industry employees & specialist. In the questionnaire the perception has been calculated by 5- point Likert type measurement scale where 5 = Strongly Agree and 1= Strongly Disagree. Secondary sources are from different local and international published articles, books, websites, and seminar papers etc.

Data analysis: Data have been analyzed by using Mean value and Two-way ANOVA test. Significance level is 5%.

Study period: Time period of the study was November 2013 to January, 2014.

3. Applicability of relevant cost concepts

3.1. Making or buying decision

For many years **PINAKI GARMENTS LTD.** Company has purchased the starters that it is installed in its standard line of sweing machine. Due to a reduction in output, the company has idle capacity that could be used to produce the starters. The chief engineer has recommended against this move, however, pointing out that the cost to produce the starters would be greater than the current $10.00 per unit purchase price. The company's unit product cost, based on a production level of 60,000 starters per year, is as follows:

Particular	Make	
Direct materials	$4.00	
Direct labor	2.75	
Variable manufacturing overhead	.50	
Fixed manufacturing overhead, traceable	3.00	$180,000
Fixed manufacturing overhead, common (allocated based on direct labor hours)	2.25	$135,000
Total production cost	$12.50	

An outside supplier has offered to supply the starter to **PINAKI** or only $10.00 per starter. One-third of the traceable fixed manufacturing costs represent supervisory salaries and other costs that can be eliminated of the starters are purchased. The other two-thirds of the traceable fixed manufacturing costs are a depreciation of special manufacturing equipment that has no resale value. The decision would have no effect on the common fixed costs of the company and the space being used to produce the parts would otherwise be idle.

Decision:

Particulars	Relevant Costs	
	Make	Buy
Direct materials	$4.00	
Direct labor	2.75	
Variable manufacturing overhead	.50	
Fixed manufacturing overhead, traceable	1.00	
Purchase price		$10.00
Total relevant cost	$8.25	$10.00
Units produced	60,000	60,000
Total Cost	$495,000	$600,000

The two-thirds of the traceable fixed manufacturing overhead costs that cannot be eliminated, and all of the common fixed manufacturing overhead costs, are irrelevant. The company would save $105,000 per year by continuing to make the parts itself. In other words, profits would decline by $105,000 per year if the parts were purchased from the outside supplier.

3.2. Dropping or retaining a segment

Another area in which Relevant Costing is used is whether to drop a division or product. Companies often prepare income statements for their divisions or products. **H.R. FASHION**, A fabrics company has two departments, X and Y. A recent monthly contribution format income state of the company follows.

Particulars	X	Y	Total
Sales	$3,000,000	$1,000,000	$4,000,000
Variable expenses	900,000	400,000	1,300,000
Contribution margin	2,100,000	600,000	2,700,000
Fixed expenses	1,400,000	800,000	2,200,000
Operating income (loss)	$700,000	($200,000)	$500,000

The study indicates that $340,000 of the fixed expenses being charged to Y are sunk costs or allocated costs that will continue even if Y is dropped. In addition the elimination of Y will result in a 10% decrease in the sales of X.

Decision:

Particulars	Total
Department Y contribution margin lost	($600,000)
Department X contribution margin lost	(210,000)
Total contribution margin lost	(810,000)
Avoidable fixed costs	460,000
Decrease in operating income	($350,000)

Contribution margin lost if Y is dropped. Therefore, based on the data given, the Y segment should not be discontinued unless a more profitable use can be found.

3.3. Special orders

Special Orders are a classic area in which Relevant Costing is used. The customer is in an area that your business does not normally serve. The potential customer offers to buy your product or service at a price below the cost to provide the product or service (the special order).

A-Z KNITWEARS LTD. produces a single product. The cost of producing and selling a single unit of this product at the company's normal activity level of 8,000 units per year is:

Particulars	Total
Direct materials	$2.50
Direct labor	3.00
Variable manufacturing overhead	.50
Fixed manufacturing overhead	4.25
Variable selling and administrative expense	1.50
Fixed selling and administrative expense	2.00

The normal selling price is $15.00 per unit. The company's capacity is 10,000 units per month. An order has been received from an overseas source for 2,000 units at the special price of $12.00 per unit. This order would not affect regular sales. If the order is accepted, how much will monthly profits increase or decrease? (The order will not change the company's total fixed costs.)

Decision:

Particulars	Amount	Total
Selling price		$12.00
Direct materials	$2.50	
Direct labor	3.00	
Variable manufacturing overhead	.50	
Variable selling and administrative expense	1.50	
Total variable expenses		7.50
Contribution margin	4.50	
Units sold		2,000
Total contribution margin		$9,000

The relevant cost is $1.50 (the variable selling and administrative costs). All other variable costs are sunk, since the units have already been produced. The fixed costs would not be relevant, since they will not be affected by the sale of leftover units.

3.4. Constrained Resources

Relevant Costing is also very useful when deciding whether you should outsource a product. In these problems, you can either make an item that you use in your business or you can purchase it from an outside supplier. **Peoples Fashion LTD.** produces three products, X, Y, and Z. Data concerning the three products is as follows:

Particulars	X	Y	Z
Selling price	$80.00	$56.00	$70.00
Variable expenses:			
Direct materials	24.00	15.00	9.00
Direct labor	14.00	13.00	15.00
Other variable expenses	10.00	14.00	25.00
Contribution margin	$32.00	$14.00	$21.00

Demand for the company's products is very stronger, with far more order each month than the company can produce with the available raw materials. The same material is used in each product. The material cost $3 per pound, with a maximum of 5,000 pounds available each month. In which order should the company produce X, Y and Z?

Decision:

Particulars	X	Y	Z
Direct materials cost	$24.00	$15.00	$9.00
Cost per pound	$3.00	$3.00	$3.00
Direct material pounds per unit	8.00	5.00	3.00
Contribution margin	$32.00	$14.00	$21.00
Contribution margin per pound	$4.00	$2.80	$7.00

The company should accept orders first for Z, second for X and third for Y.

4. Analysis and discussion

To measure whether perception levels of four factors are same or not in Ready-made Garments Industry, the authors have applied two-way ANOVA analysis using two hypotheses.

Hypothesis-1:

H0=There are no significant relationship between the relevant costing and decision making of Ready-made Garments Industry in Bangladesh.

HA = There exist a significant relationship between them.

Hypothesis 2:

H0 = The four levels of relevant costing factor are not equal for decision making in Ready-made Garments Industry in Bangladesh.

HA= All the four level are equal.

Table 1. *Mean value*

Relevant Costing Factor	Total Respondent's points for Decision making					
	Strongly Agree	Agree	Undecided	Disagree	Disagree Strongly	Total
Making & buying	350	100	12	2	0	=464
Dropping or retaining a segment	105	48	120	24	15	= 312
Constrained resources	225	124	12	10	25	= 396
Special orders	40	116	99	36	12	=303
Total	720	388	243	72	52	=1475

Correction Factor = $\frac{T^2}{N} = \frac{(1475)^2}{20}$ = 108781.25

Sum of Square between decision making:

$= \frac{(52)^2}{4} + \frac{(72)^2}{4} + \frac{(243)^2}{4} + \frac{(388)^2}{4} + \frac{(720)^2}{4} - C.F$= (676+1296+14762.25+37636+ 129600) – 108781.25 = 75189

V= (c-1) = (5-1) =4

Sum of Square between Relevant Costing:

$= \frac{(464)^2}{5} + \frac{(312)^2}{5} + \frac{(396)^2}{5} + \frac{(303)^2}{5} - C.F.$ = (43059.2+ 19468.8+31363.2+18361.8) – 108781.25 = 3471.75

V= (r-1) = (4-1) =3

Total Sum= $(0)^2 + (15)^2 + (25)^2 + (12)^2 + (2)^2 + (24)^2 + (10)^2 + (36)^2 + (12)^2 + (120)^2 + (12)^2 + (99)^2 + (100)^2 + (48)^2 + (124)^2 + (116)^2 + (350)^2 + (105)^2 + (225)^2 + (40)^2$ - C.F = (254,345-108,781.25) = 145,563.75

Residual value = (145,563.75- 75,189- 3,471.75) = 66,903

V= (c-1) (r-1) = 4*3 = 12

Table 2. *ANOVA Analysis*

Source of Variation	S.S.	d.f.	Mean Square	F	Level of Sig. 5%
Between decision making	75,189	4	18,797.25	3.38	3.26
Between Relevant costing	3,471.75	3	1,157.25	0.22	3.49
Residual	66,903	12	5,575.25		
Total	145563.75	19			

The above table shows that the relationship between the relevant costing and decision making of Ready-made Garments Industry in Bangladesh vary due to the calculated value 3.38 and the table value for F (4,12) is 3.26. On the other hand, the using relevant costing in respect of four factors in decision making are not the same. The calculated value between relevant costing is 0.22 but the table value for F (3,12) at the 5% level of significance= 3.49.

Conclusions

Relevant costing provide a very useful way of assessing whether company that show a loss at the net marginal level are nevertheless viable in the short term. Consumers are more and more demanding, looking for everything at a very attractive price. The company has to master revenues and costs very carefully to make a profit (Kaplan, 1990). The relevant costing will vary with each company according to circumstances. In our analysis for hypothesis 1, we reject the null hypothesis and accept the alternative which shows that there is a significant relationship between the relevant costing and decision making of RMG in Bangladesh. But in test 2 we reject alternative and accept null hypothesis because of the result means the decision regarding the four levels of relevant costing varies. Everything in this study consists of application of one simple but powerful idea. This simple idea was applied in a variety of situations including decisions that involve adding or dropping a product line, making or buying a component, accepting or rejecting a special order, using a constrained resource in RMG in Bangladesh. Indeed, any decision involving costs hinges on the proper identification and analysis of the costs that are relevant. Consequently, relevant costing is an important concept in Managerial accounting which clearly depicts in this study about successful decision making in RMG in Bangladesh.

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APPENDIX

A. Survey items used in this study

TRADE NAME	
PERSON INTERVIEWED	
POST	
FIRM'S LEGAL STATUS	
WEB PAGE	
E-MAIL	
AUTHOSISED CAPITAL	
COMPANY REGISTRATION NUMBER	

Question:

1. Does Relevant costing play an important role in planning the firm's strategies?
2. What types of Relevant costing activity is undertaken by your organization to make effective decision?
3. Would you mention some weakness in using Relevant costing technique in your organization?
4. Does profits would decline by per year if the parts were purchased from the outside supplier for making and buying decision?

1	2	3	4	5

5. If a product line is generating a loss, then it be discontinued for Dropping or retaining a segment decision?

1	2	3	4	5

6. Does the amount of constrained resource consume help the company to maximize its profits?

1	2	3	4	5

7. Should the special order is accepted if the company's regular sale's and the order could be fulfilled using existing capacity?

1	2	3	4	5

8. Please briefly put forward your personal comment(s) on using Relevant costing in Ready-made Garments Industry (RMG) of Bangladesh.

B. TOTAL RESPONDANT =100.

Relevant Costing Factor	Number of Respondent's answer for Decision making				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Making & buying	70	25	4	1	0
Dropping or retaining a segment	21	12	40	12	15
Constrained resources	45	31	4	5	25
Special orders	8	29	33	18	12

C. LIKERT TYPE MEASUREMENT SCALE:

Strongly Agree = 5 points
Strongly= 4 points
Undecided = 3 points
Disagree = 2 points
Disagree Strongly = 1 points

Relevant Costing Factor	Total Respondent's points for Decision making				
	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree(1)
Making & buying	350	100	12	2	0
Dropping or retaining a segment	105	48	120	24	15
Constrained resources	225	124	12	10	25
Special orders	40	116	99	36	12

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The economic crisis and the great problems of mankind

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Abstract. *The economic crisis that humanity is currently facing proves to be the most severe one since the Great Depression of the 1930s. Poor financial system, unsustainable public debt and competitiveness inequalities in the world have greatly contributed to the crisis. Naturally, economic policy makers are concerned about problems related to the restoration of fiscal, trade and monetary balances and are trying to boost investment, employment and consumption. Solving these problems is difficult, but insufficient for the future of global economy.*
This paper attempts to draw attention to problems with long-term impact which, if they are neglected, could cause future crises of even greater intensity than the present one. Among these issues are increased poverty, lack of environmental protection and demographic imbalances.

Keywords: macroeconomics, financial markets, global warming, poverty, population ageing.

JEL Classification: E44, Q54, E43.
REL Classification: 8B.

Introduction

Above all, the crisis brought the financial system to a deadlock, but this also happened to other sectors. These deadlocks are nothing more than the effect of the fundamental errors inside these systems. Many economists and international institutions in the years preceding the crisis had drawn attention to problems such as huge U.S. government deficits, slow growth in emerging economies and the euro area, high dependence on inflows of foreign capital investment in many countries, growing current account deficits, problems requiring a coordinated global approach to initiate reforms and correct imbalances. Years that followed confirmed the lack of response in dealing with these problems, which made the crisis possible. The current crisis recorded failure of governments, regulators, legislators and, last but not least, failure of markets.

The failure of solving fiscal, commercial or monetary imbalances is closely related to the much smaller attention on some of the problems related to the long-term macroeconomic developments and the global economy. Unfortunately, from their recognition to concrete, coherent and consistent actions, there is a great distance.

Each of these problems is associated with a crisis of its own. The general trend is to focus on short and medium term issues that may lead to stabilizing the economy and to start an uptrend. From this point of view, the crisis has diminished the attention to long-term problems in favor of those problems and solutions that create the feeling of recovery: restoring the financial system, the recovery in consumption, production and employment. Under these terms, a legitimate question can be made: in the case it even happens, how sustainable the rehabilitation of these economic system segments may prove? In other words, to what extent an improvement of these processes could reduce the pressure from the problems that existed in all economies long before the current crisis and keep existing today?

The article is structured in four parts. The first part aims to present a summary of the financial crisis, how parties involved reacted, and the possible long-term effects of this crisis. The other three parts of the article are dedicated to the global problems of mankind, which should be a constant concern of public authorities responsible for economic policy. These are global warming, increased poverty and demographic imbalances.

1. The financial crisis

Due to its devastating effects and prolong, the current economic and financial crisis is proving to be one of the worst crises the world has faced throughout its modern history. This crisis started in the United States and, above all, was caused

by the errors produced in the financial system. Sub-prime lending that took place in the late 1990s and early 2000s reached truly explosive dimensions, which had a negative impact not only on the too enthusiastic borrowers and lenders, but to all citizens and institutions not directly involved in such a process. The situation has spread with great speed around the world due to the high degree of globalization of the world economy and naivety of some who left themselves blinded by the illusion of rapid prosperity without risks. In most countries the crisis overlapped older problems. For example, in Europe the most important of them wore related to the unification of monetary policy and the differing from state to state fiscal policies.

Governments and central banks intervened primarily in support of the financial sector. But one can easily see that this sector has not reached by far its purpose of providing resources for the functioning of the economy, reducing transaction costs and creating financial instruments that ensure better risk management. The financial system has proven highly innovative in creating new ways that lead to the increasing of risks for the markets participants without them being aware of it. Affluence actors in these markets were growing, most finding that their wealth was increasing every day. Nobody wanted to stay behind, without delving into the benefits of playing the stock market. When a too large part of the wealth of individuals and the companies' profits had this source, a much more attention of governments and banks to manage financial resources would have been required. Markets followed their own way but in a context of "general exuberance". Economic policy makers were either not aware of where we are heading or were too afraid to intervene. It is a false idea, otherwise highly promoted, that even if they knew they could not intervene effectively. Speculative bubbles need time to build and provide enough accurate information only if markets are closely monitored and the decision makers have a broad perspective on the macroeconomic framework.

Important crisis have called into question the economic role of the state. This role has changed overtime. The 1930s crisis has increased its importance and, in the 1980s, with the Reagan-Thatcher revolution allowing the market to operate more freely, giving up a series of regulations, its role decreased. Many of these regulations that had proved useful in the aftermath of World War II ensured the stability of the financial system and the economy in general. Belief that markets are able to return to equilibrium with only minimum government intervention and monitoring, had returned in force. The last decade of the last century has confirmed some of the assumptions of the prevailing theory. Failure of the financial system has relaunched the theory of State's active role in markets, at least as regulator. And even more than that, the State's role of savior of last resort, meaning firefighter and banker at the same time. Starting from a misdiagnosis, the

emergency of state intervention and pressure from certain groups made the State to inject liquidity into the economy. This is because the real problem was the lack of trust that propagated in the economy with an extraordinary speed. In an attempt to save the economy, the State has left itself guided by unclear criteria, under which it granted undeserved support to some of the major banking institutions. The real culprits of the crisis have not paid the price of their guilt, which encourages moral hazard, the premise of future costs that can be neglected.

In these circumstances the role of the state should be redesigned. The crisis sluggish and solutions identified by governments and central banks are proving to have only slow effects. Speculative bubbles, wherever they appeared (in real estate or securities area) have masked the unsustainable character of the development economic model. The only thing that seemed to matter was the evolution of GDP and the level or GDP per capita. As a natural consequence, the concern for the really important problems went into the background, despite clear demonstrations of their impact on future welfare.

At the public level, the first signs of the crisis have gone unnoticed. The dominant belief, fueled by a relatively long period of prosperity, was that the crisis is only temporally and its passing will not leave permanent marks. Even when the crisis has showed its teeth and bite from their income, people were not convinced that the easy prosperity era was gone. Consumption continued, at least for a while, mainly due to the fact that people are inertial in adjusting consumption decisions.

The period since 2008 has convinced even the most skeptical of us that we are dealing with a crisis of rare virulence, whose long-term impact is a certain thing. Instead, at the same time, intense debates over previous solutions have exacerbated conflict between the philosophies related to the relationship between the state and the free market.

2. Global warming

Global warming is just one of the great problems facing humanity, which has aggravated in recent years despite continuous warnings of various organizations and academic institutions. It is a phenomenon in which global temperatures in the oceans and atmosphere are in a slight increase. If certain temperature variations have always existed, the dynamics of this process increased in recent years and the obvious consequences, sometimes catastrophic, are causing maximum concern and requires quick and consistent actions.

The average temperature of the planet has increased in the last 100 years by about 0.8°C, two thirds of this increase occurring in the last 30 years (National Research Council, 2011, pp. 15). Visible effects are related to the rarefaction of the

atmosphere, reducing the Arctic ice, rising sea levels, affecting plant and animal species. According to most estimates, anthropogenic emissions of greenhouse gases will grow at a sustained pace in the coming decades. OECD statistics even speak about a tripling of such emissions by 2050, reaching a level of 50-70 billion tons of CO2 equivalent or 15 to 20 billion tons of coal equivalent per year (emissions are often expressed in equivalent tons of coal, 1 ton of coal is equivalent to 3.66 tons of carbon dioxide). International Energy Agency (IEA) says that, in the year 2010, 44% of carbon dioxide emissions came from coal, 36% from oil and 20% from gas. OECD countries have the largest contribution to global pollution (about 10 tons of CO2), followed by China (5.8 tons) and India (1.5 tons). Contribution of these latter two countries, with very large populations, is likely to increase in the near future due to accelerating growth.

Climate change will become extremely dangerous if the average temperature at the Earth's surface increases by more than 2°C. IEA warns that annual emissions must not exceed 32 gigatons in 2020, but according to the latest estimates, emissions have already reached 30.6 gigatons in 2010. Nicholas Stern of the London School of Economics, author of several works on climate change, expects that in the absence of effective measures to counter pollution, the concentration of greenhouse gases in the atmosphere may double by the year 2035. In the long term there is a 20% probability that the average temperature increase by 5°C, which would lead to changes in world geography enough to affect people's livelihoods (Stern, 2007, pp. 3). The most obvious cause of global warming are the result of emissions of carbon dioxide and other greenhouse gases produced undoubtedly by human activity. Widespread recognition of this relationship by policymakers required concerted action of most countries to counter the phenomenon. Global conferences on this topic have multiplied without often reach their objectives. Late ‘70 have meant adopting a new philosophy of environmental policies which have integrated the concept of sustainable development. Promoting these environmental policies has involved not only government institutions but also the civil society, seen as a key factor limiting the environmental damage. In this context, in 1979 was held in Geneva the first World Climate Conference at the end of which was passed the Protection of the World Climate Programme (WCP). Perhaps the most important result of this event was the recognition of all relevant stakeholders of the impact of human activities on the environment and the urgency of adopting solutions, which laid the foundation for an international policy consensus on climate. Another important point in the same direction was the adoption in 1997 of the Kyoto Protocol that proposed reduction of greenhouse gas emissions in the period 2008 to 2012 with at least 5% compared to the level of 1990. Even more ambitious targets have been set at EU level through the project called Europe 2020. This

means that by 2020 the aim is to achieve a 20% reduction in carbon dioxide emissions and energy consumption compared to 1990 and less than 20% of energy must be produced from renewable sources (source: The EU climate and energy package).

In 2009 was held the Copenhagen UN climate conference. This conference was attended by representatives from 193 countries and was intended to establish new regulations for pollution reduction, applicable from 2012. At this conference it was signed an agreement that recognizes the need to maintain the world temperature increase to below 2°C, but does not contain specific obligations for signatory states. Another proposal of the Conference was related to increasing funds for poor countries to develop renewable resources.

Recently, in 2011, in Durban, South African Republic, was organized by the UN another conference, the result of which was a new agreement whereby Member States would limit emissions of greenhouse gases. This agreement will enter into force in 2020.

In general, pollution mitigation measures are aimed at internalizing external environmental costs, which, through the effect on prices could change human behavior towards a more responsible and efficient use of natural resources.

Limiting pollution can be achieved by resorting to more legal-economic and institutional instruments. The intensity with which these instruments are used is closely related to decision-makers philosophy. Thus, some economic policy makers have firm belief that the free market and private property protects the environment. There are two assumptions which support such a view: property rights, whether clear or not, but in any case uncontested, and rationality of users to use resources. Establishment of private rights over resources for which property rights are not highlighted or legally protected, ensures the owners support the consequences in case of damage to the environment. Such a view is attributed to the Austrian school of economics.

Neoclassical school supporters believe that the safest way for nature protection is provided by state regulations introduced in the legal system. In the context of unspecified property rights over vital resources such as air and water, it becomes obvious that people use these resources without incurring unreasonable consequences of their actions and pollution becomes an expression of market failure. From this perspective, government intervention through the establishment of tradable pollution rights, taxes, subsidies or consignment system is a necessity.

Some tools are quantitative, being based on pollution rights. Tradable pollution rights were originally used in the U.S. to reduce costs and facilitate growth of certain heavily polluted industries. These were later extended to other countries

with regard to air and water pollution. Such a system implies to determine the global maximum pollution limits, according to the capacity of the environment to absorb a level of pollution (Beder, 2001, p.2).

Applying this method means companies have the right to pollute the atmosphere only as much as allowed by the pollution certificates they own. However, this system allows each company to sell the surplus allowances, while firms that need can buy additional certificates. Such transactions are carried out on a specific market, where there is usually a good control. These exchanges of marketable pollution permits give the process a deep commercial character, turning into an important source of revenue for companies that have consistently promoted clean technologies. In contrast, other companies avoid extremely severe consequences from failure to obey the pollution rules imposed.

Belief causing the establishing of these limits was that once the countries and companies will have to pay for additional pollutants will react accordingly and promote clean technologies. The price of these licenses is determined by the supply-demand report, constantly changing when introducing new regulations. In fact, the opportunity to buy pollution permits may even reduce the pressure for the introduction of clean technologies. The ratio between the price of pollution permits and the cost of replacing polluting technologies is not unique. At least for some firms, according to analysis in terms of costs and benefits, the decision to maintain the old technologies may prove effective. For the effects in terms of reducing pollution to be significant the price of pollution permits should record such a development to situate it over the cost of replacement with clean technologies. Otherwise, the results can only be modest.

Perhaps the most important problem associated pollution rights is the establishment of the maximum pollution level. The higher the limit the weaker is the stimulus of introducing clean technologies. On the other hand, setting a limit too low results in economies facing major constraints. The role of pollution permits is similar to a tax which, once established, affects all the involved economic operators and the economy in general. Acquisition by the companies of the right to pollute further, translates into increased costs and possible raising prices and reducing employment. Competitiveness of firms, as well as the buyers opportunities for acquisition tend to decrease. These consequences are caused by the reluctance of the authorities to ratify various international agreements that would establish lower limits of pollution. Beyond such consequences, anti-pollution efforts are influenced by the interests of politicians related to the electoral cycle. Often they are willing to sacrifice a future sustainable wealth for the sake of immediate apparent wealth.

The second set of measures is aimed directly against pollution by using taxes and subsidies price likely to compel polluters to react individually through tighter control on emissions of greenhouse gases. Fees are applied to products that cause environmental damage, increasing the cost of their production. These products are not necessarily eliminated, their use being only limited. In contrast, for products that protect nature subsidies apply and taxes are eliminated.

Generally there are serious criticisms related to the inconsistency and deficient nature of approaches and interventions to limit the polluting effects of human actions. Failure of policy makers responsible in this area is due not only to their lack of vision but also to market prices that do not contain relevant information, as stated by the efficient market theory. Prices are among others an indicator of scarcity. However, the prices of natural resources do not always suggest such an aspect, which has encouraged their use as if they were *ad libitum.* As the prices of other assets were subject to severe correction after crisis, probably just as necessary should be the correction of prices of the natural resources. Signals in the economy would be much more accurate and the risk of excess pollution would diminish. In these circumstances, the market can guide choices on resource consumption, including the greenhouse pollutant, and action on environmental protection.

Negotiating and signing any international agreement often generates hard and prolonged debates. There is, unfortunately, a long experience of powerlessness global harmonization decisions. A good example in this regard is the debate within the WTO. The situation is similar for fixation and assuming national obligations to limit and reduce emissions. That some countries agree and sign a protocol, such as Kyoto, while others do not, creates global inequity. There is rather a global disponibility to "therapy" than to prevention, despite lower costs in the second case than in the first. The main problem in combating global warming has always been represented by the costs involved and by who is willing to bear these costs. Pollution from one country can be "exported" to other countries without obstruction. Protecting the pollution rights proves extremely costly, which cast doubt on the effectiveness of all conceivable solutions to pollution. Promote actions to reduce emissions of greenhouse gases could increase as a result of pressure from civil society to politicians. This in turn depends on the extent to which people notice that pollution destroys their resources and jobs. Instead of being created sustainable jobs, substantial resources will be targeted to treat damage to the environment. Although it is possible that such efforts to create employment opportunities in the long term these are lacking the necessary sustainability.

As long as a country's economic performance are given by the annual growth of GDP per capita, global warming will never be assessed as a priority for economic policymakers. Pressure to initiate fierce actions against pollution does not seem to have yet reached the critical point despite more conclusive evidence that appear day after day. Such actions can explained the delayed and modest results ending all kinds of world conferences focusing on climate change.

A growth model which doesn't take into account global warming is not sustainable in the long term. Economic growth is likely to be impossible in the short run. In addition, natural resources are limited, and many of them are finite. Global consumption of natural resources and depreciation of the resource base appear to exceed the pace of introduction of clean technologies. The financial crisis led to a decline in financial resources, especially in developed countries, leading to the postponement of the proposed solutions to mitigate global warming. It is possible that this delay may prove to be too expensive. A healthy environment has a positive impact not only on health but also on future environmental costs. Reconciliation of man with nature requires a behavior change in individual and collective consciousness in promoting common prudence in administering the same resources, regardless of their geographical distribution.

3. The increase of poverty

In general, all human societies have as a fundamental objective to create the conditions for fulfillment of aspirations of present and future. This should be achieved despite the fact that overall economic activity is evolving wavy and continuous economic growth is a myth. Attempts to cause such an increase ignores the necessity of sustainable economic activities, translated by altering the resources to increase welfare with its corollary, reducing poverty and increasing living standards. When these attempts become too extensive and viable solutions do not appear, history has shown that ideologies emerge that open up the way for major conflicts and even totalitarian regimes.

Globally there are huge disparities in terms of consumption and income. If such differences within a national economy are causing concern, the huge gap between much of the rich world and other poverty parts represents a threat to global stability. The share of population living in developed countries is about 18% today and for the years 2030 is expected to drop to 15%.

Measuring the gap between the living standards of people at a global level is not a very easy task. An attempt in this direction was accomplished by the economist Branko Milanovic who, in his work entitled "Global inequality and global inequality extraction ratio: The story of the last two Centuries", proposed an

estimate of the Gini coefficient - a measure of statistical dispersion used to represent disparities in income and wealth distribution - globally for the period 1880 to 2002 (Milanovic, 2009, p. 13). The results of estimating this coefficient are presented in the table below.

Table 1. *Gini Index*

	1820	1850	1870	1913*	1929	1950	1960	1980	2002
Gini	15.2	25.9	31.9	44.3	48.0	55.0	54.0	56.8	52.6

Source: http://mpra.ub.uni-muenchen.de/16535/

The higher the index the higher are the income differences between individuals. One can clearly see a worsening in the period analyzed. Thus, this problem has existed for long time, but in conjunction with today's crisis reached a critical point. Few countries have managed to escape from the group of poor and improvement were due to a successful macroeconomic policy and a consistent restructuring that followed after, years in a row. China and India are examples. In particular, China's development has had a powerful drive over some large region of Africa or Latin America. Among the same countries that have made a leap lately are those with an important natural resource, as is the case of Brazil.

Consumption differences between countries are not always evolving consistent with differences in productivity and competitiveness. For example, despite a relatively recent rebound in productivity, the U.S. continued to consume excessively. Much of this consumption was supported by huge loans to countries whose essential feature model lead to savings. Such a process of global dimension involves the risk of a "disorderly settlement of these imbalances with potentially disruptive changes of great magnitude in the exchange rates" (Stiglitz, 2010, p. 310). In this context, quite easily can be imagined the economic consequences of these imbalances. One possible orderly settlement of imbalances could be provided by promoting a consumption in line with countries' own possibilities. For example, the US should reduce their consumption and even save and countries with high savings rate should increase it. Such a trend has little chance of realization in the near future.

Consequences of massive loans should be made in relation to the implications on interest rates. This high risk in the current trend can only mean more an expensive credit, despite the actions of central banks to supply cash savings. Unfortunately, for those countries that don’t have fiscal space, public debt increased substantially, which will affect some programs and social development. Unemployed and poverty support require increasingly higher resources. Unemployment has reached unprecedented dimensions in many countries. For example, Spain is facing a quarter of the working population in search of a job, while Greece has a similar unemployment rate. Globally, 40% of the population

earns less than $2 per day and is devoid of opportunities to improve the living standards. Growth rate in many countries is almost zero, making the standard of living unchangeable for generations. Poverty is not so much a result of the crisis, but rather a major cause of it.

Countries which can raise funds and direct them in useful directions can get good results. However, given the limited financial resources, many countries will not access these funds. Their level of poverty and inequalities can be deep. Problems become more difficult for some countries, including the rich ones, facing aging and a generation reaching retirement age numerically superior than the new generation who reach the age of employment. From this perspective, the primary resource orientation for supporting investment in new technologies, education, research, health is a viable option for exiting the crisis and ensuring the well-being for present and future.

Investing in education is the most profitable of investments whose effects are in long term. Education is the key to discovery, application and dissemination of valuable ideas and technologies that support economic growth, it improves cognitive skills and create those "human capabilities" so necessary to increase productivity. Countries that have allocated over time significant proportions of GDP and were able to identify the best opportunities for using these resources have obtained a spending multiplier of the highest. The relationship education-economic growth-income-standard of living is extremely strong.

4. Demographic imbalances

Another important problem the world faces for decades is the demographic imbalances. Aging population in developed countries is one of the main root causes of imbalances, and this, according to most estimates, will increase in the future. In a report published by the United Nations show that the share of people over 60 years in developed countries is expected to increase by 2050 to 33% from 20% as in the present (United Nations, 2009, p.11).

The aging process is something unique in human history. Mostly it is powered by the progress of medicine and the low birth rate. The largest birth rates are registered in the poorest areas of the planet. Revenue growth is accompanied by reduced family size. High-income families, located mainly in developed countries opt for a small number of children, even below replacement rate. UN statistics estimate that 2050 the African continent will be the only one in the world with a less aging population.

Problems usually associated with aging derives from the fact that people of different ages have different needs and different economic behaviors. From an

economic perspective, the aging population will significantly influence the economic growth rate. Reducing workforce and different behaviors of individuals will affect consumption, investment, saving, revenue and expenditures and, therefore, the design of macroeconomic policies. Also, older people will need health services to an extent far greater than the young. As a result, most likely health costs will register a strong increase, while their support is becoming increasingly difficult in the absence of action involving at least fiscal policy changes. A second problem that arises as a consequence of increased life expectancy is the existence of a gender imbalance of older persons. Because women tend to live longer than men the percentage of elderly who are alone is higher and is obvious represented by women. Single and elderly people face a greater risk of social isolation and tough economic constraints. For this reason, these individuals require additional support (United Nations, 2009, p.12).

One of the measures taken by the governments of developed countries is increasing the retirement age. This is a natural measure with a double determination. On the one hand, the average life expectancy for some time registered an upward trend. On the other hand, the resources needed to support those who have left the labor force is constantly decreasing, which is why they set up private pension funds. Declining birth rate and changing the ratio of people leaving the labor force and those in work contributes greatly to lack of resources for social insurance. According to UN estimates, worldwide, the number of people over 60 is expected to exceed those of children under 15 years in 2045 (United Nations, 2009, p.10).

The recent financial crisis has hit hard in the pension funds sector. Stock market crash brought lowering the portfolios of many people. The most affected are those recently retired or near retirement age.

Developing states face the same aging process and reducing the workforce. In particular, the speed of propagation of this phenomenon in developing countries is much higher than in developed ones. This implies a lower response time for these countries to adapt to the new conditions. Their social security systems are suffocated by the large number of pensioners and pension funds are almost nonexistent. Romania is one case where the ratio between the number of pensioners and employees is higher than 1 for several years. The situation is expected to worsen in the near future due to labor migration and "Explosive Generation" of the late 1960s. Migration of part of the working population from less developed countries to the economically advanced phenomenon is of a global dimension. Despite real competition for its own citizens and xenophobic reactions, developed countries benefit fully from this process because immigrants are active and often have a good qualification. In countries of origin, high

unemployment rates are associated with deficiency of skilled workers, which creates a major risk for future development.

Perhaps the most serious problem associated with demographic imbalances is that low developed states belonging to the third world faces a high birth rate increase, while extending life expectancy. In the current economic development, younger generations tend to have uncertain prospects, which involve behavioral changes and movement of important segments of the population.

Unlike developed countries, less developed countries have an immediate problem with aging. Demographic pole shift not only in economy, but also on a global scale, will affect the future balance of power. The evolution of this report will be determined by the manner in which each country will be able to manage the collection and allocation of resources from those active people to the older ones, more numerous. In addition, changing the proportion of people aged between active and inactive influence policy choices, because most of the electorate is made up of social security beneficiaries (Greenspan, 2008,p. 413).

Current context reveals major discrepancies in living standards between countries of the world, a phenomenon that has a long history. In the absence of adequate measures this can only lead to strong social conflicts, perhaps with an international character. Foreign aid is a solution, but with limited action. At least in the medium term, access to education, including measures to familiarize young people with "family planning", targeted national investment and growth prospects modification can improve the situation of these countries. Unfortunately, the financial crisis and scarcity of resources in all states make it more difficult to implement economic policies with such objectives.

Conclusions

Poor financial system, unsustainable public debt and global competitiveness inequalities were the main factors that contributed to the economic crisis and its so fast spreading. Solving problems related to restoring macroeconomic balances and their careful monitoring in the future may prove insufficient to "tame the business cycle", in other words, to ensure a future marked less by major fluctuations in economic activity.

The period since 2008 undoubtedly is an extremely tense one, in which governments and various organizations discuss and seek solutions. One of the great gains of this crisis is the public awareness of how business processes interact to produce wealth at a national and global scale. However, from this intense process of acquiring knowledge derives a new way of action, prudent and responsible at the same time. The next higher level of awareness and

accountability of individuals on immediate issues is the focus on global issues which is likely to exert the pressure on governments for adding them to the international meetings agendas. Neglecting these problems, among which the most important were mentioned in this paper, will cause political and economic instability. Political instability is envisioned by social movements to challenge the leaders and policies put into practice, which opens the way for political opportunism. Form this to even more serious economic error is only one step. This trend will maintain a consistent possible recession, which can appear at shorter intervals. Starting from these premises, it becomes quite likely that the next period will be characterized by modest increases of economic activity in alternation with similar contraction.

The future will validate or infirm the efficiency of redesigning the national strategies and the measure they harmonize at a regional and global level. Implemented strategies are required to be continuously evaluated and their effectiveness should be considered in a broader context of the mitigation or exacerbation of other fundamental problems of human existence. It is essential for the economic model that we're heading to prove sustainable, with resource-oriented in innovative directions, to include the man who should be in harmony with his fellow and his living environment.

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New theoretical foundations for economic policy

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Abstract. *For four decades, economics has been confronted with two major flaws: the large theoretical gap between macroeconomic and microeconomic analysis, and the growing rates of both inflation and unemployment. Research seemed divided between two opposite approaches, searching for a new theory to solve the macro imbalances in modern economies.*
In this context, we start with the analysis and evaluation of the main theoretical contributions during the past decades: rational expectations, market-clearing models and rigidities. Then we investigate how this considerable theoretical progress has managed to influence economic policies. The theoretical part of the paper uses formal analysis and synthesis, comparison and interpretation regarding recent progress in economics. In the second part, we bring empirical evidence from several countries to point out the impact of these developments at the policy level.
We conclude that today the ideological division seems to have vanished; new theories don't follow a strict ideology. Theoretical research has integrated microeconomic principles into macro analysis and has addressed the macroeconomic implications of imperfections.
By contrast, policy-makers still use the outdated IS-LM model together with the modern Phillips curve, they still use complex macroeconomic models for forecasts, which suggests that theoretical progress has had little impact on applied macroeconomics.

Keywords: market-clearing model, rational expectations, macroeconomics, New Classical Economics, New Keynesian Economics.

JEL Classification: B22.
REL Classification: 1A, 2B, 8A.

During the ‘60s, the large macroeconomic models used by economists would describe the economy through a system of equations – one for consumption, one for investment, one for the money demand etc. – each of these being derived from the decisions of firms or individuals. This approach was attractive because the models were explicit and clear from a mathematical point of view, and the equations parameters could be estimated using the solid econometric tools constructed and perfected during the post war period. They were considered unanimously as fitting the US economy model and were used to solve economic policy problems, primarily the influence of monetary policy on production, inflation and unemployment. At the same time though, economic research had created a gap between macroeconomic analysis and microeconomic principles and economists needed to investigate the relationship between the micro and macro levels, in other words, to provide solid microeconomic foundations for macroeconomics.

This apparent consensus that dominated economic thinking until the 8th decade was much along the lines of the Keynesian doctrine. However, since the early ‘70s, a state of turmoil has characterized economics – and particularly macroeconomics – causing the consensus to break down. Essentially, this breakdown was due to two major flaws, one empirical and one theoretical. The empirical flaw was that the mainstream view could not adequately cope with the rising rates of inflation and unemployment experienced during the ‘70s. The theoretical flaw was that the mainstream view continued to preserve a chasm between macroeconomic practice and microeconomic principles. These theoretical and empirical failures led to a period of confusion and division in economics, which, in part, still continues today (Rogojanu, Badea, 2011). Consequently, much of the economic research of the past 20 years has attempted to build macroeconomics on a firm microeconomic foundation; economists have focused on formulating macroeconomic theories founded on sound microeconomic principles; the most important outcome of these attempts was, by far, the so-called "rational expectations revolution", one of the few hypotheses in recent economic research, almost unanimously accepted by economists. Unfortunately, the relevance of theoretical research to current economic issues is often neglected, if not completely ignored. (Enăchescu et al., 2012). Too many practitioners, the research endeavours appear esoteric, or even useless, and in many respects, research seems indeed futile for practical purposes.

A relevant synthesis of the directions of macroeconomic research divides these directions into 3 main categories (Mankiw, 1988); the classification is very useful, in that it provides a better understanding of the motivations and goals of the research programmes undertaken by macroeconomists during the past four

decades. We discuss these directions of research, bringing forth their advantages and disadvantages, as well as the pros and cons for each category.

- **Microeconomic foundations and rational expectations**

Following Lucas' (1976) attack on standard macroeconomic practice – which focused on the improper manner of dealing with expectations – economists' first task was to find ways to approach the predictions of rational economic agents. At the beginning of the New Classical revolution, many economists believed the existing models could be "repaired" quite easily, by replacing the current approximations and estimations of expectations with the RATEX hypothesis. But this vision proved too optimistic, so that the main goal of the New Classical revolution was to rebuild macroeconomics starting from microeconomic principles regarding agents' preferences and technology. To attain this goal, the New Classical School maintained the assumption that economic agents have optimizing behaviours, and that markets tend towards equilibrium.

A major part of recent research has been trying to model expectations in a more "satisfactory" manner than 30 years ago. Once the attention of macroeconomists turned to the central role of expectations, economists focused on rebuilding macroeconomic theory, to take into account the way private decision-makers form expectations appropriate to their environment. The incorporation of expectations into existing econometric models can lead to new and surprising implications at the macroeconomic level. The wide acknowledgement of this axiom has probably been the most important achievement in macroeconomics during the past three decades. In essence, just as we agree that firms maximize profits and consumers maximize utility, it would be absurd to reject the assumption that individuals behave rationally when making predictions about the future.

By itself, the rational expectations hypothesis has no direct empirical implication, just as the assumption of utility maximization has no direct empirical implication. Yet, together with other auxiliary hypotheses – like the example presented above regarding monetary policy – it can have profound and startling implications. But the most important consequence of the rational expectations "revolution" is that it replaced the work on the large-scale macroeconometric models of Keynesian inspiration, which prevailed at that time.

Expectations are not new in economic analysis, but the most important feature of the RATEX revolution is the introduction of the term "rational" (Barro, 1984). This places its opponents in a rather awkward position: to reject the rational expectations hypothesis is to claim that economic agents are irrational. However, the evidence points out that the RATEX hypothesis has been accepted by and large, by most economists. Its decisive victory is attested by the fact that many of

the new Keynesian models have incorporated it, while maintaining wage or price rigidities.

In the same paper, Barro asserts that the use of rational expectations in macroeconomics is closely connected to one of the most controversial issues debated by economists – monetary neutrality. A relevant example is the New Classical business cycle theory, which postulates that the incomplete information available to economic agents on the money supply and the general price level can lead to monetary non-neutrality. In other words, a shift in the money supply will result in temporary confusions between the general price level and the relative prices of goods, which, in turn, will lead to shifts in output and employment. Some versions of this business cycle model lead to the conclusion that the real effects of monetary disturbances persist long enough to correspond to the cycles observed in national economies. Moreover, the rational expectations assumption has surprising implications for monetary policy: systematic policy measures are irrelevant to rational economic agents, while unpredictable, inconsistent measures even tend to have harmful effects.

Another important issue regarding the micro foundations of macroeconomics refers to the role of rational expectations in the – often political – Keynesian debates. At least implicitly, many economists consider that the valid hypotheses of rational expectations theory are incompatible with the Keynesian framework; however, many New Keynesian economists have incorporated rational expectations into their macroeconomic analyses. According to Barro, this theoretical endeavour is still not enough to support monetary non-neutrality, to improve the Keynesian theory, or to eliminate its theoretical and empirical flaws. The Keynesian model is nothing short of an incomplete theory that provides numerous policy prescriptions, but preserves considerable inconsistencies with individuals' rational behaviour. In particular, so far, no economist has been able to use such elements as the cost of information or that of labour mobility – which provide feasible explanations for market coordination failures – in Keynesian analyses. At the same time, Keynesian models still preserve important deficiencies regarding inflation and supply shocks – which are, in part, responsible for the dissatisfaction generated ever since the `70s.

To conclude, we can rightfully ascertain that today, the rational expectations axiom represents the standard approach in empirical research and is used in the analysis of numerous and various issues – such as labour demand and supply, consumption, investment, stock accumulation, to name just a few. And even though these new techniques are unlikely to replace the outdated econometric models completely, they have become quite an important empirical tool.

Very few economists on the other hand, stand against rational expectations; these economists claim that while the RATEX assumption is indeed valid, economists should also consider and explore other premises. They acknowledge the importance and the essential role of expectations in current economic analysis, especially those expectations which are not mere generalizations of past experience. In the particular case of political science, expectations are not a new issue, but they have been introduced recently in economic science and their use still has unexplored consequences. Despite being a New Classical economist, Herbert Stein (1988) considers that by incorporating rational expectations into economic analysis, we venture upon slippery ground, because we don't know either what determines individuals' expectations, or how they can be influenced. The main objection raised by the RATEX opponents is that it often leads to different – even conflicting – opinions by different economists, meaning that its premises are not rigorously defined and we lack precise quantitative information on the pattern of rational expectations. This high degree of uncertainty can be reduced by adopting strict rules of monetary policy. But this is not a feasible solution; economists need further investigations in order to provide a "more scientific" foundation for expectations.

- **The *market-clearing* model**

An important theoretical approach attempts to explain macroeconomic phenomena using New Classical models – or *market-clearing* models – which start from the premise that prices adjust continuously to equilibrate supply and demand. The view that markets always clear is closely related to the idea that private markets function efficiently. Specifically, on cleared markets, it is impossible to improve on any outcomes by matching potential buyers and sellers of goods or potential borrowers and lenders: cleared markets already accomplish all of these mutually advantageous trades. Market clearing reflects the optimizing behaviour of individuals, which is related to the microfoundations of the macroeconomic model. On the one hand, people determine their individual choices of work, consumption and so on, to make themselves as well off as possible. On the other hand, market clearing means that people who participate on the market – and are guided by the pursuit of their own interest – do not waste resources, and therefore achieve efficient outcomes. Recent research has pointed out more profound implications than 40 years ago, when disequilibrium models were prevalent in macroeconomic analysis.

As to the concept of equilibrium, in accordance with microeconomic principles, New Classical economists start from the assumption that certain conditions must be fulfilled when we add up the actions of all individuals. These conditions are usually referred to as "aggregate consistency" conditions and they refer to: (i) the

equality between the quantities demanded and supplied on the goods market; (ii) the equality between the amounts borrowed and lent and (iii) the equality between money demand and money supply. These three conditions provide information on how aggregate variables must behave, so that the analysis may have internal consistency. Any viable macroeconomic model must comply with these conditions, and one way to ensure this is to assume that markets tend towards equilibrium, in other words the price level and the interest rate adjust simultaneously, so that aggregate demand and aggregate supply become equal (Dobrescu et al., 2012). This approach, known as the *market-clearing* model, is founded on Walras' Law and refers to the equality between demand and supply on the goods market and on the monetary market.

In Robert Barro's vision, the market-clearing model can be depicted as follows:

- for the goods market, the equilibrium condition is:

$Y(R,\dots) = C(R,\dots)$,

where Y and C are the aggregate supply and the aggregate demand, and R is the interest rate.

On the goods market, only the effects of the interest rate on aggregate demand and aggregate supply are taken into consideration; thus*, a higher rate of interest implies intertemporal substitution effects, which reduce current demand C and increase current supply Y*, through the increase in the amount of labour supplied. However, there are other variables that influence demand and supply, such as the substitution and income effects induced by the shift in the production function. These variables are omitted from the analysis – they are marked accordingly by dots in the demand and supply functions.

The central idea behind the goods market equilibrium is that, starting from this equality, we can determine the equilibrium levels of the interest rate and of output.

- for the monetary market, the equilibrium condition is:

$M = P \times L(R, Y, \dots)$

where M is the money supply, P is the price level and L is the demand for money

In real terms, money demand – M/P – is in a direct relation to current demand C and in an inverse relation to the interest rate; in the money demand equation, it is therefore convenient to replace current demand by current supply, since they are equal when the goods market is in equilibrium.

In this manner, starting from the two equations, we can determine the levels of the equilibrium interest rate and price. First of all, the equality between supply and

demand on the goods market allows for the determination of the interest rate R* and then for the determination of output and aggregate consumption Y* = C*. Then, by substituting the values of the interest rate R* and output (aggregate supply) Y* in the money demand equation, when the money supply M is given, we can determine the general price level corresponding to equilibrium on both markets. In this manner, we do not need to know the price level in order to determine the interest rate. The simplicity and originality of the procedure derives from the fact that the price level is not part of the first equation, which focuses on the goods market; in other words, the *price variations do not modify the demand and supply curves*. This is the simplified market-clearing model in Robert Barro's vision.

On the basis of this model, we can subsequently analyze the shifts – either temporary or permanent – in the production function. The author also demonstrates how a temporary reduction in the production function leads to a decrease in output and a simultaneous increase in the interest rate and the price level; at the same time, the effect on labour supply is undetermined. If the shift in the production function is permanent, on the other hand, the interest rate does not rise, but remains constant; the explanation is that the interest rate is a signal showing the cost of using resources at present rather than the future. When the decrease in the production function is temporary, we deal with the relative scarcity of present goods compared to the future, and a superior interest rate is justified, since it determines people to consider the present relative scarcity in choosing their levels of consumption and work effort. On the other hand, a permanent decrease does not alter the present situation compared to the future and the interest rate remains constant, because the cost of using resources at present compared to the future is constant. Another important implication of this model is monetary neutrality: a once-and-for-all change in the aggregate money supply will affect the nominal variables, but will leave the real variables – such as output and employment – unchanged.

Economists often use the word *equilibrium* when they refer to the market-clearing model; this is not however, the best choice: the term equilibrium has had so many connotations throughout time, that its significance has become at least ambiguous, if not confusing. To name just one example, some economists regard the Keynesian model as a disequilibrium model, whereas others approach it as a different concept of equilibrium. Apart from such controversies, economists generally agree on the basic features of the market-clearing model. First of all, the model postulates that private markets function efficiently. On these markets, each participant may buy or sell as much as they wish at the equilibrium price level; on the other hand, a possible improvement of their functioning by matching additional sellers and buyers is practically impossible, because markets already

incorporate all the mutually profitable trades. Furthermore, the model is closely connected to the optimizing behaviour of individuals, which lies at the microeconomic foundations of macroeconomics. Thus, on the one hand, economic agents adopt decisions regarding their choices of consumption and work effort, decisions that will best satisfy their needs and interests; on the other hand, the market-clearing model postulates that agents that operate on the market and are guided by their own interests, do not waste resources and therefore, achieve efficient outcomes. In this manner, the market-clearing model becomes the natural macro-complement of the microeconomic principles underpinning it.

This brief presentation of the model cannot leave out its practical utility, namely the importance of its approach at the macroeconomic level. In this context, it is worth noting that once the theoretical apparatus has been constructed, the basic model can be developed and extended so as to be applied to numerous macroeconomic issues. The most important of these issues regard the study of supply shocks and business fluctuations, of the labour market, of long-term economic growth, of the role of public acquisitions and public services, of monetary and fiscal policies, and last, but not least, of globalization.

- **Nominal and real rigidities**

The third category – specific to New Keynesian models – tries to rebuild macroeconomic theory, using a non-Walrasian approach which combines the IS-LM diagram with the modern version of the Phillips curve, adapted to rational expectations. This direction of research can be considered as an attempt to provide Keynesian analyses the microeconomic foundation they lacked. The term "Keynesian" however, is so vast, that we can rightfully assert the only feature uniting Keynesian theories is the hypothesis that economic fluctuations do not reflect the Paretian response of the economy to shifts in preferences and technologies, but rather a market failure on a grand scale. The most frequent explanation is the failure of prices and wages to adjust instantly to equilibrate supply and demand. This was the key assumption of Keynesian theories during the '60s, but the lack of a proper theoretical justification was one of the fatal flaws that undermined the consensus in economics.

Another important criticism – coming from the New Classical School this time – points out that the nominal rigidities assumption is incoherent from a theoretical point of view: not only does this assumption lack micro foundations; it is also inconsistent with all pertinent microeconomic hypotheses. The New Keynesians however, believe they have neutralized this argument, since research has progressed beyond the microeconomic foundations: today we do not question whether these models can be constructed, but rather, whether they describe

economic reality correctly (Frâncu, Hociung, 2012). In this context, the New Keynesians' research endeavours are focused on three main directions:

- The first direction focuses **on small nominal barriers to price adjustment**. So far, economists have undertaken relatively few studies of price adjustment at the firm level, and the results are somewhat ambiguous, and some of them quite contrasting. Moreover, they stand out through the idiosyncratic character of both firms, and the goods under analysis, and therefore, we cannot be sure that studies of different firms or of different goods will generate similar conclusions. In short, economists have not yet managed to figure out either the strategies and price policies of firms, or their adjustment mechanisms.

Knowing the precise nature of the microeconomic barriers to price adjustment is all the more important, as they seem to have considerable implications at the macroeconomic level. On the other hand, Caplin and Spulber (1987) provided an example in which the microeconomic costs of the adjustment process failed to produce aggregate nominal rigidities. The authors' vision was founded on two key assumptions: (i) all adjustments are made in the same direction, that is all prices increase, and (ii) all firms increase their prices only when aggregate demand increases by a certain fixed amount, compared to the previous price adjustment. Based on these two assumptions, the authors demonstrate that the share of firms that actually make the adjustments may vary – relatively to the size of nominal shocks – in such a manner, that the real gross product in the whole economy will remain unchanged.

Other assumptions regarding the microeconomic characteristics of nominal obstacles have, however, very different implications on aggregate macroeconomic behaviour. For instance, the time factor is very likely to play an important role within firms' adjustment policies; this means that, to a certain extent, firms are more likely to adjust their prices with a time lag, rather than right after an increase in demand. If these price policies are associated with considerable real rigidities, then the effects of nominal disturbances will not only be large, they will also be long-lasting. In this case the share of firms that do modify prices at one point reacts only slightly to nominal shocks, and the existence of real rigidities determines firms to undertake only small price changes (Blanchard, 1982). Taking into account that the characteristics of firms' price adjustment policies decisively influence the macroeconomic effects of nominal shocks, we can conclude that analyzing adjustment barriers is undoubtedly a pressing topic on economists' research agenda.

- The second direction of research is focused on the study of **real rigidities**. If we accept the hypothesis that demand shocks can have substantial real effects – and not just on nominal prices – then it means that there exist a series of factors

which determine firms to seek only small adjustments of relative prices, in response to the demand-induced shifts in aggregate output. The analysis of these real rigidities must clarify the reasons why large shifts in output and employment are accompanied by merely small shifts in real wages. In this context, the active topics in current research include: *efficiency wage* models, market externalities, capital market imperfections, the cyclical evolution of demand elasticity, and a variety of other potential sources of real rigidities.

- Last, but not least, the third direction of research starts from the observation that studying microeconomic phenomena – such as adjustment difficulties or real rigidities – turned out to be insufficient to explain large shocks in the economy; therefore, it is necessary to correlate these rigidities with the **macroeconomic phenomena** which they underpin and which we want to understand. Understanding the way microeconomic characteristics and principles generate macroeconomic phenomena is in itself a realistic purpose for economists. But this undertaking cannot itself become synonymous to unifying the micro and macro levels of the economy: more often than not, simplifications that prove extremely useful in understanding microeconomic phenomena can lead to fatal mistakes in analyzing macroeconomic fluctuations.

Therefore, the third direction in recent theoretical research focuses on the examination of macroeconomic evidence regarding the effects of monetary disturbances and other aggregate demand shocks. Analyses that place aggregate demand shifts at the heart of business fluctuations have been an issue of major interest in economic research for a long time; and taking into account the difficulty and importance of the problem they try to deal with, they will certainly remain so for a long time to come.

If we admit that individual price adjustments are not synchronized, then the general price level will only increase if some firms want to increase their relative prices. Once the general price level has completely adjusted to the increase in the money supply, and supply and demand have returned to their initial levels, the relative prices targeted by producers will also reach their previous levels; but this only happens at the end of the adjustment process, resulting in a very important implication: the adjustment speed of the general price level depends on the elasticity of relative prices desired by producers to the shifts in demand. The larger this elasticity, the stronger producers' desire to raise prices, hence the faster the increase in the general price level, and consequently, the shorter the effects of money supply on prices. This observation usually takes the following form: in order to explain the substantial nominal rigidity of prices, additional real rigidities are required – such as this low elasticity of the prices desired by producers to the shifts in demand.

The above implication is extremely important, since it points out to the existence of an interaction between nominal rigidities and other types of imperfections in the economy. If such imperfections are in a position to generate real rigidities – which is still questionable – then they can contribute to the explanation of the substantial nominal rigidities manifested in modern economies.

Implications of recent theoretical progress on economic policy

As we can see, the theoretical progress ever since the '70s has indeed been considerable. But what happened in practice, did the evolutions in the field of policy actually keep up with the theoretical achievements? Economists generally agree that, in opposition to the radical changes of vision in academic thinking, practitioners have not radically changed the way they analyse the economy and continue to use the outdated IS-LM model together with the modern version of the Phillips curve in the formulation of economic policy (Mankiw, 1990). Governments continue to use extremely complex macroeconomic models for forecasts and interpretations, which suggests that the theoretical evolutions of the past four decades have had little impact on applied macroeconomics.

The 7th and 8th decades represented a prolific period for economic research, marked by the endorsement of important theoretical insights, particularly in macroeconomics: the approaches of rational individual behaviour, the simple relationship between monetary creation and price increases, the natural rate of unemployment and the strategic role of aggregate supply were all generalized during this period. All these analyses converged towards the denigration of interventionism and the reduction of states' role in the economy. While the Keynesian revolution founded economic policies on the strategic role of aggregate demand – which implied the analysis of uncertainty and anticipations – the new theoretical trends and streams actually represented a liberal retaliation. Most importantly, this counter-offensive was not merely theoretical, it was also put into practice through the political orientation of decision-makers and through the liberal economic policies of developed countries adopted in the '70s. Two renowned political figures are most commonly associated with the institution of liberal regimes in the developed world: former UK Prime Minister Margaret Thatcher, and former US president Ronald Reagan. Moreover, following the conferences held in the UK, Nobel-prize economist Milton Friedman proposed a shock therapy for the British economy, inspired, in part, by that applied in Chile (Friedman, 1977). Among other things, this shock therapy implied the acceleration of privatization and de-regulation, which were implemented starting from 1979. In the USA, President Reagan criticized the increased role of interventionism and the neglect of monetary policy, claiming that governments'

task should be limited to building a solid and stable framework for the long run, in which the private sector must constitute the main engine of growth, employment and improved life standards. To this aim, the main objective was to improve economic performance by reducing the role of the federal government, particularly by avoiding past economic *"stop and go"* policies, since – by adopting a short-term approach – they aggravated the existing imbalances. These political evolutions triggered heavy criticism from post-Keynesians, institutionalists, radicals, Marxists and other heterodox economists, but they were also condemned by the neoclassical synthesis economists, who constantly denigrated monetarism, particularly in its political upsurge.

The distinctive feature of the monetarist school and the real source of conflicts however, is not the monetarist theory itself, but the role it should play in the formulation of stabilization policies. The opponents of monetarism subscribe to the general practical message of Keynes' General Theory: that free market economies need to be stabilized, can be stabilized and have to be stabilized by means of monetary and fiscal policies. By contrast, monetarist economists believe that economic stabilization by state intervention is not necessary. And even if it were necessary, it could not be done, since stabilization policies are more likely to enhance than reduce stability and governments should not trust they have the ability to implement such policies.

Another attack on monetarism came from the monetarists' very own disciples and took a quite different shape: these economists, who share the monetarists' political vision, were even more radical about state intervention. But they criticize both Monetarist and Keynesian economists for the lack of theoretical rigour, particularly in what regards the microeconomic foundations of their macroeconomic models. The analyses undertaken by the New Classical economists started from Friedman and Phelps' reflections on the long-run Phillips curve and unemployment and led to the rejection of traditional econometric models and of the traditional theory of economic policy (Lucas, 1980b). Both traditional Monetarist and Keynesian models rely on the premise that economic agents adopt behaviour patterns that are invariable to economic policies and, more importantly, to shifts in economic policy. Using this line of reasoning, the models are not able either to foresee or to explain the effects of the huge budget deficits and money supply increases on output, employment and prices experienced during the '70s. Taking into account that the structure of an econometric model consists of optimal decision rules and that these rules vary systematically together with the shifts in the structure of the decision-making apparatus, it means that every policy change will systematically modify the structure of econometric models. Under these circumstances, any economic policy to stimulate aggregate demand that is anticipated and systematic cannot have any effect whatsoever on

production and unemployment. This theoretical formulation belongs to New Classical economists Th. Sargent, R. Wallace and R. Barro and is usually referred to as the theorem of neutrality or of policy inefficiency. Policy decision makers react depending on economic circumstances, whereas economic agents end up adapting their behaviour accordingly. The deviation of the real unemployment rate from its natural rate derives from random shocks, not from authorities' systematic policies.

One of the first – and most controversial – consequences of rational expectations was that systematic monetary policy is irrelevant to the evolution of consumption levels and of the unemployment rate (Sargent, Wallace, 1975). In formulating this conclusion, they applied rational expectations theory to the new version of the Phillips curve, as depicted by Friedman and Phelps in 1968. Yhe latter questioned the validity of the long-run Phillips curve, while admitting that the inflation-unemployment trade-off might work over the short-term (Friedman, 1968 and Phelps, 1968). The explanation was that in the short run, agents could be fooled to make more investments by the increased money supply, but in the long run, they would realize their purchasing power diminishes and decrease production, thus reducing output and employment to their previous levels. Further on, using this model of the Phillips curve, Sargent and Wallace claimed that while anticipated inflation did not influence output and employment, unanticipated inflation might reduce the unemployment rate below its natural level. The role of the rational expectations axiom is essential: in essence, this axiom states that economic agents cannot be surprised by events that occur in a uniform and consistent fashion. Starting from this observation, Sargent and Wallace argue that systematic monetary policy can only generate anticipated inflation and therefore, is not in a position to influence the level of unemployment, in other words, it is inefficient. The bold conclusions of Sargent and Wallace generated confusion and ambiguities, in that economists interpreted the inefficiency of monetary policy as the direct and exclusive consequence of rational expectations theory. Today we are aware however, that things are not as simple as that: in the late '70s, Fischer (1977) demonstrated the possibility to construct rational expectations models, where systematic monetary policy can result in economic stabilization; thus, Fischer's model, in which wage rigidity plays the central role, provides Keynesian policy prescriptions, while integrating the rational expectations assumption at the same time.

The analyses of the New Classical economists are very diverse from a theoretical point of view, and they formulate numerous implications for economic policy. Sargent actually denied that we could speak of a proper rational expectations school as designating a group of economists with a unique economic model and a common vision on optimal monetary and fiscal policies. But we can however,

identify a common attitude towards economic policy. In this respect, the New Classicals' positions are radical and marked by absolute scepticism towards the efficiency of interventionist policies. The New Classical economists consider that it suffices to formulate stable, clear, well known rules of policy. Lucas (1980a) formulates these rules, stating that they are just an amendment of Friedman's previous work on the monetary and fiscal context of stabilization policy. Thus, the first rule refers to the institution of a stable growth rate of money supply for each year. The second rule refers to a rate of public expenses and transfers that does not vary – in real terms – throughout the cycle. Finally, the third rule refers to fixed tax rates, whose objective is to equilibrate the budget over the long term. To these three rules, Lucas adds a fourth: a clearly formulated policy, where the prices and wages set by means of private agreements between economic agents will not generate governmental action in any way. These rules are thus, minimal rules. In a way, the best economic policy, in the New Classical approach, is the absence of economic policy.

Departing from the traditional Keynesian theory, a New Keynesian on the other hand, can also share the Monetarists' or the New Classicals' reluctance to state intervention. However, most of the research of New Keynesian economists shows that the normal functioning of monetary economies – which implies perfect rationality of economic agents – does not lead to the stability and equilibrium postulated by the Monetarist and the New Classical models. As a consequence, most New Keynesian economists do believe that state intervention can indeed improve the functioning of the economy. The problem is to find the suitable policy, by choosing between alternative economic measures.

In conclusion, a major part of macroeconomic research during the past 4 decades has been trying to deal with the problems that triggered the "crisis" in economics. Economists have focused upon founding their macro theories on sound microeconomic principles. In the search for a new paradigm, interdisciplinary research and new methods of economic analysis play an important role. Unfortunately, the relevance of research to the current economic problems is often neglected and there seems to be a large gap between theoretical progress and economic practice, as economists have failed to incorporate the new contributions into their policies. Economists still use the large econometric models based on the IS-LM diagram and the modern version of the Phillips curve. Macroeconomists should try to abandon the old ways and incorporate the new theoretical developments into their policies. Instead of holding on to outdated policy prescriptions, they should be more innovative in their thinking, address the causes of the business cycle and correlate them with the proposed remedies.

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Mutual influence of economic growth and economic development and its impact on social transformations

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Abstract. *The purpose of the article is to study the mutual influence of economic growth and economic development as well as its importance for transformational changes in both economic and social systems. Author identifies the essential common and distinctive features of economic growth and economic development and describes the dialectical mechanism of mutual influence of these processes, which is represented as the key to transition of economic and social system towards condition of a new quality that allows to satisfy increased society's needs.*

Keywords: economic growth, economic development, social development, production principle, post-industrial society.

JEL Classification: A13, O11, O33, O40.
REL Classification: 8E, 18B, 18D.

1. Introduction

Society's development is a general scientific category that reflects complex of absolute, complementary, progressive quantitative and qualitative changes in the functioning of the social system. While determining incentives of social development, modern institutional researches usually pay much attention to non-economic factors such as social, cultural and political. Just considering synergistic relations of different social subsystems, they rarely explore internal relationships within specific subsystems, which indeed cause significant impact on general social transformations. Most important relationships undoubtedly include mutual influence of economic growth and economic development - fundamental macroeconomic processes that determine society's development at all chronological stages. R. Lucas, P. Romer, A. Sen, J. Stiglitz are well-known modern researchers who had provided a significant contribution to the study of the processes of economic growth and economic development. However, the problem of their mutual influence remains still unexplored, which doesn't make it possible to determine the balance of quantitative and qualitative changes that are necessary for economic and social systems and their advancing to new conditions.

2. Economic growth and economic development as various aspects of economic dynamics

Common scientific understanding defines any system as a set of functional elements and dynamic relations between them, which are isolated from the external environment within a particular time interval (Sagatovsky, 1973: p. 322). Growth can be determined as process that characterizes overall performance of defined system, which emphasizes its relevance for the identification of dynamic transformations in quantitative terms. However, the concept of development serves as a measure of dynamic transformations defined in movements of existing structures, technological and social changes etc.

Economic system, being one of the most important social subsystems can be also characterized by both quantitative and qualitative dynamics that represent most common tendencies of its development at certain time period. Economic growth in clarified understanding represents quantitative changes of economic system and determines the increasing of country's economic power, production level and possibility of the national economy to meet the growing needs for goods and services. However, economic development can be defined as qualitative transformation of the economic system and its transition to a new condition & more perfect form that is irreversible (Prodanova, 2011: pp. 301-302).

In this perspective, economic growth and economic development can be defined as complementary processes that provide escalation of macroeconomic dynamics from different perspectives - quantitative and qualitative accordingly. The proof of this fact is based on related philosophical foundations, which are reflected in economic system - in particular, law of the passage of quantitative changes into qualitative changes in dialectics philosophy, formulated by Engels according to Hegel's Science of Logic interpretation.

The subject of this law is a passage from small, hidden and gradual quantitative changes to fundamental transformations where qualitative changes occur not by chance, but naturally, as a result of quantitative changes gradual accumulation. Movement of quantitative changes beyond critical interval (where system still remains current characteristics) leads to a change in the quality of the object, i.e. its development. Hence, law of the passage of quantitative changes into qualitative explains development as a qualitative progress through the accumulation of quantitative changes, resulting in going beyond an existing interval and abrupt transition to a new quality. Generally, dialectical philosophy defines development as a set of high-quality changes that became possible because of quantitative conversion.

Obviously, in this aspect we can also determine the reverse mechanism of impact not only of the quantity on quality, but also vice versa. As explained below, growth leads to development that results in qualitative changes. Accordingly, the new growth (quantitative change) occurs on new fundamental basis, which became possible because of the development at previous phase (qualitative changes). Therefore, we can admit continuous circulation of quantitative and qualitative transformations, which encourages each system to qualitative advancing.

Seeking the ways to continuous society’s development as a strategic purpose of economic system functioning, we can arrive to conclusion that it may be possible only under the condition of effective both economic growth and economic development. Consequently, in long-term perspective in can be reached only by efficient mutual influence of these processes, which continuously supply each other.

Describing of economic growth and economic development as complementary processes, we can arrive to conclusion about their unity towards overall transformation of the economic system. However, understanding of these categories as indicators of different transformation levels determines their fundamental differences. These tendencies cause dialectical form of relationship between economic growth and economic development, which is based on two main aspects:

1. Their fundamental distinction based on the fact that these categories reveal different levels of transformation of the economic system.

2. Their mutual influence – as on the one hand, growth is the foundation of development, because of giving start to a dynamic changes and creating more complex dynamic forms towards development, etc. On the other hand, long-term qualitative changes affects both further quantitative (growth) and qualitative changes (such as progress, transformation, evolution), which may subsequently lead to a new wave of social evolution and modify existing structure.

The last statement can be considered as particularly important, because it gives possibility of identifying the effect of mutual influence for both economic and social progress, which is provided through structural transformation of the system. Economic growth and economic development can be identified as over-system categories, which reflect the movement of the economic system from one equilibrium to another one, just able to satisfy increased needs. New social and economic state creates higher-level entities such as advanced households, enterprises and state authorities, as well as modernized markets. This represents resolution of the dialectical contradiction of economic growth and economic development.

3. Transformational changes of economic system as a result of mutual influence of economic growth and economic development - theoretical aspect

While exploring the implementation of any structural changes in economic system, we can admit their realization through some specific mechanism. Scientific sources propose certain types of mechanisms such as market mechanism, pricing mechanism etc. In turn, generalized mechanism of structural changes can be defined as interaction of certain elements of economic system towards essential changes of them and their mutual arrangement. Concerning economic system structure, the mechanism of structural transformations is the coordination of changes in the structure of social needs and allocation of required resources.

Any structural change starts with changing technical and technological characteristics of the economic system and organizational relationships – technology, capital assets, labor, etc. The most important structural changes form and support a new quality of productive forces and techno-industrial and economic relations (Geets et al., 2011: p. 49). However, we should understand that not every change leads to profound qualitative changes in the structure of economic relationships or irreversible changes in the structure of social needs. Finally, it can result in acceleration or, otherwise, stagnation of economic

processes (structural crisis), or small deviation from the common tendencies, that usually did not represent evolution as usual for relatively closed systems.

Mutual influence of economic growth and economic development, what leads to quantitative and qualitative transformation, is a specific form of the internal contradictions of these processes. This process begins when new needs cause corresponding changes in the structure of production and allocation of resources, but at the same time, these changes cannot happen without the initial capital values involved. Hence, the internal contradiction of structural changes mechanism is the contradiction between the changes in the society needs and the capital availability to provide necessary changes in the structure of distribution of the resources. Further, due to the inflow of capital to certain elements, we can admit allocation of more resources for the development or a structural shift. Here we have increase of its capacity, speed and intensity (Krasilnikov, 1999: p. 26). The reverse process is an outflow of capital from structural elements, what causes falling down of relevant quantitative characteristics.

Saturation with the resources is necessary for the implementation of quantitative and qualitative changes. This problem is also raised in the theory of long waves by N. Kondratiev, who noted importance of mentioned saturation for the upward phase of the economic cycle - as the revival in the field of technical inventions and discoveries can be observed 10-20 years before the upward wave cycle (Kondratiev, 1993: p. 47). We can also admit that the question of prior investments that should initiate structural changes is particularly important for the current stage of economic development of Eastern European countries, many of which are still in process of deep restructuring of economic system.

However, it may be another reverse process where, first of all, system requires transformations what subsequently may result further quantitative economic growth. Such a situation is possible for societies solved the problem of basic material needs satisfaction as well as saturation of economy with capital, which currently require structural changes for better economic efficiency. One of the most effective ways to solve this problem is innovation activity. The process starts with providing of financing of various researches, which may require certain level of capital. It is also necessary at all other stages of the innovation process, up to the commercialization of innovations and obtaining beneficial effects in the form of profit, rent, etc. After innovative products and whole innovative sectors are implemented into economic activity, this ultimately leads to a qualitative transformation in the form of economic development that has impact on further growth.

4. Mutual influence of economic growth and economic development as factor of practical social transformations

Having explored the current stage of economic and social development, many researchers note that since the 60's of the XX century and up to the present economic and social system can be characterized by a number of distinguishing features and trends, which include increased globalization processes at different levels, the rapid development of science (including advances in engineering and technology) and, as a result - by scientific and technological revolution with the development of a new type of economic system and multidimensional social changes. Modern society that emerged as a result, according to one of the most popular definitions (Bell, 1999) is often identified as a post-industrial, describing its "immaterial" direction and commitment to meet relevant requirements.

The most common understanding of post-industrial society notes that due to scientific and technological revolution and substantial growth of average income, new priorities were shifted from production of goods to production of services. Accordingly, this economic system became able to solve the problem of products supply to meet basic society needs. The background of a new society is generated by implementation of technological progress to increase the volume and variety of goods, as well by change of the people's attitude to themselves and surroundings.

Material progress is a necessary condition for the formation of post-economic order; however, a sufficient condition is also the transformation of human internal values, which leads to the fact that improving of human potential became main incentive of people's activity (Inozemtsev, 2000: p. 23). Here we can observe how economic growth (quantitative changes) leads to the empowerment of social system, its transformation not only in economic but also in social terms (Prodanova, 2011: p. 28). On the other hand, economic development helps to provide social changes on the new material and technical background, what is just the result of structural transformations. Generally, having focused on modern social transformation we want to note that practical transition to a postindustrial society is impossible without both quantitative and qualitative economic transformation at earlier stages of social development. Accordingly, it is required to study the evolution of social evolution in its retrospect, with the projection on mutual influence of economic growth and economic development.

To our opinion, evolutionary changes in social systems can be described in accordance with the popular civilizational approach, which proposes the concept of the social history periodization by providing a historical cycle of different society types with the constant improvement of civilization, preserving previous experience for each of them. Related scientific concept by A. Toffler, where evolutionary process is represented through various waves of society's

development and particular historical periods, can be considered as most appropriate for this study. The first wave, according to Toffler, is the transition of humanity from a society of hunters and fishermen to agrarian civilization, the second – from agricultural to industrial, and the third that radically change the existing social structure – to over-industrial civilization (Toffler, 2004: p. 25) with forming a new historical community of people whose lives are inextricably linked with information technologies, and the new structure of needs that can be satisfied with application of advanced achievements of science and technologies. This periodization is appropriate for our study because it provides an opportunity to realize the basic scientific approaches for systematic research of practical social transformations:

- stadial principle for exploring various stages of social development, which allows to apply the principles of formation approach to our research;
- evolution of historical stages, what implies preservation and enrichment of historical experience and reflects the civilizational approach;
- necessity of systematic study of economic and social processes, implemented by systematic and synergetic approaches.

Economic and social changes and their intensity at each historical stage are essential for related society condition of today. In accordance with civilization and system-synergetic approach to research, as well as historical and comparative methods, the method of analysis and synthesis, principles of monism, pluralism and objectivity, previous historical experience is much important for studying mutual influence of economic growth and economic development in modern post-industrial society. For more profound exploration, it is much helpful to use the approach of Ukrainian researcher O. Melnyk, who proposes to study related processes according to basic production principle, where hunt-gathering and agrarian-handicraft principles correspond with pre-industrial society, machine-industrial principle – with industrial society, service-informational principle – with post-industrial society (Melnyk, 2004: pp. 19, 22-23).

Hunt-gathering production principle, just having opened world economic history and pre-industrial era in particular (which was realized around 40 thousand years ago), represents a stage of development of society productive forces, where the provision of human life is ensured directly by immediate appropriation of nature's gifts. Thus, the satisfaction of society needs at this stage took place without an established production process and the basic forms of human activities were hunting and gathering (Melnyk, 2004: p. 24).Under the conditions of this production principle, there has been a slow extensive growth with even slower economic development. Above we noted the important role of growth for resource accumulation and further development. In this case, the weak growth cannot allow resource allocation to ensure certain quality changes (economic development),

that's why qualitative changes occur rather spontaneously. This should make it impossible to provide adequate satisfaction of society needs, but this undeveloped society doesn't require as have primitive needs. Mutual influence of economic growth and economic development have poor both economic and social effect.

The dynamism of economic and social changes at various stages of development honestly proves that statics and stagnation can be justified only in the short term, while in general case system must evolve under the influence of the variable surroundings. Population increase, climate changes and other factors were those external catalysts that prompted pre-industrial system to develop. The main objectives towards improving the quality of life in the new environment was to ensure its economic preconditions – achieving higher economic growth, which would allow to obtain more product and economic development that would allow to do it with less labor input.

While exploring relevant factors in new, agrarian-handicraft production method, which also refers to pre-industrial development, we can admit either progressive quantitative or qualitative changes that would give the possibility of complex changes in the economic system. Agriculture and handicrafts became leading areas of activity, so general progress is emphasized by numerous inventions to facilitate and streamline updated production process. At this period (approximately 10 thousand years ago) we can observe not only the full establishment of economic growth and economic development, but also their mutual influence that moves forward both economic and social system due to synergy effect. On the one hand, material resources were allocated for various technological innovations, which, in turn, allowed achieving of better production results. The process begins with the cultivation of agriculture that provides some economic growth in form of achieving product from related activities. The invention of the plow and other means of cultivation (in Mesopotamia, Central Asia areas) caused the transition to a more productive agriculture, in other words - intensification of economic growth through economic development. Upgrading work equipment, extension of animal husbandry and so on caused even greater intensity of development, reflected in strong economic growth, which in turn, provides resources for new technological achievements – the promotion of irrigation systems, collective methods of cultivation etc. In some time interval, described above is typical for the period about 2 thousand years BC, and was realized in Ancient Egypt and Mesopotamia.

According to various estimates, the duration of this part of pre-industrial era is much shorter than the previous one because economic & social changes became much dynamic. In our opinion, it is quite possible to link their growing intensity with mutual influence of economic growth and economic development when

quantitative conversion determine qualitative changes, and vice versa, implementation of economic development provides growth being realized in another environment. As proved above, it causes different intensity of social progress.

Having explored new phase of economic and society's development - industrial society and related machine-industrial principle, we could admit that the most significant GDP growth (what means economic growth) and early start of the industrial revolution (economic development) occurs precisely in those regions that accumulated required resources at the final stages of previous production principles. The essence of the industrial revolution – a catalyst of rapid economic development – is the large-scale replacement of manual labor by machines, so that the dominant principle of production, which is key to the study of the cross impact of economic growth and economic development can be defined as machine-industrial. Massive use of various machines and mechanisms is what distinguishes economic development at this stage – while technique is not used at all under the conditions of hunt-gathering principle and acted only as a supplement to some operations in agrarian-handicraft principle, starting from the beginning of the industrial age, it becomes main attribute of economic activity.

As we know, the main purpose of various techniques is to improve general efficiency and productivity, as well as more efficient use of natural resources. Accordingly, its task in economic sense is accelerating of economic development. Such technological advances as the invention of mining hoist, drilling machine, various tools in the XV century (Melnyk, 2004: p. 62) have replaced the labor of tens of thousands of people and made it more efficient, which exactly defines economic development.

It is clear that early stages of machine-industrial production principle are associated with rapid economic development. In particular, the first phase of qualitative changes was the transition to the primitive industry in the form of various types of factories, various mechanisms, improvement of maritime transport, and the second one - industrial revolution associated with the use of machines based on steam engines (Melnyk, 2004: pp.17-18). Obviously, result of the mutual influence causes more productive growth, which is resulted finally in the industrial revolution. Formation and development of machine-industrial production principle is carried out in conjunction with the development of commodity-money relations. These economic forms contributed to unprecedented high rates of productive forces growth and deep changes in the structure of the economic system.

The most significant increase of GDP level, what defines economic growth, can be noted in countries like Netherlands and England, being considered as the

pioneers of the industrial revolution. Among the advanced technical and economic changes that characterize the economic development in these countries we can additionally admit rapid development of transportation (including shipbuilding) and trade, as well as implementation of a number of technical and technological innovations that have contributed to rapid growth of labor productivity and GDP. However, a new phenomenon has not become systematic at the vast part of European continent. This causes different levels of economic and society's development between different countries, sometimes even close neighbors. Differences in economic growth determine the orientation of the workforce to markets with better wages; however differences in economic development force governments of less developed countries to seek more effective ways to achieve a high level of production and general optimization of production process.

The distinctive feature of machine-industrial production principle at later stages is the spreading of new types of economic activities and intensive replacement of handicraft by industry on the greater part of Western Europe. The most important achievements that characterize economic development at this stage are associated with borrowed British innovations being expanded on the rest of the continent which contributed to strong economic growth at the first half of XVII - XVIII centuries. Strong economic growth, in turn, had formed required resources and investments for future development. The beginning of XIX century, therefore, is the height of industrial era development. However, growth at this time had slowed down for a little. This can be explained by the transition of economic growth rates to a more stable phase, in contrast to abrupt transformation at earlier stages.

In general, economic development, having converted industrial era to its maturity, provides a qualitatively new growth - not based on manual labor and use of primitive mechanisms, but on complex machines, some of which are used nowadays. Even at the stage of industrial development, economic progress can no longer be imagined without mutual influence of economic growth and economic development, while members of pre-industrial societies got along without it. Perhaps, it had sense for undeveloped society, where living standard are very low, and progressive changes had occurred over tens and hundreds of thousands years. It goes without saying that such a development is unsuitable for a society with newer, modern post-industrial mindset, where personal and social development, in contrast to simple survival, is the main purpose of existence.

As mentioned above, post-industrial society can defined as a modern social system where the priority in economic system have primarily switched from producing goods to services, researches, education and life quality improvement, where a class of technicians has become the leading professional group and development and growth are implemented on the basis of innovations and

theoretical knowledge. It can be noted that despite the prevalence of social factors, economic growth and economic development still keep close mutual influence and influence on general economic & social situation.

The historical dialectic of these processes in the new environment is directed towards their effective combination to provide a new level of society well-being. In our opinion, one of the main characteristic features of this development stage is increased complexity of economic growth and economic development, which are adapted to the changing environment of human activity. In particular, in terms of post-industrial society, economic growth, describing quantitative results of economic system, is expected not only to satisfy basic needs, but also wide range of needs related to self-realization and internal development of individuals. In turn, economic development, identifying qualitative changes, also acquire new content under the conditions of radical social changes, becoming more complex. Transformations of fundamental macroeconomic processes become especially visible during modern update of post-industrial society, when the main sphere of human activity is not just immaterial sphere, but its informational and innovative environment. Additionally, human needs are not determined simply by getting services but specific informational products.

However, it should be noted also with reference to mutual influence of both processes that in this new environment it becomes a set of not only economic, but also social components. Emphasizing the development on the last stages of pre-industrial era, we admitted its low social effect, because the significant economic achievements are linked with underdeveloped public institutions, low average life expectancy, forced labor, and social inequality. This phenomenon, of course, is unacceptable for a new philosophy of post-industrial development, respectively, growth and development should have much expressed social complexion.

This approach to economic growth and economic development and their mutual influence, being based on the comparative method of the research, defines its essential difference under the conditions of post-industrial society. At the same time, this is important not only within a single pre-industrial, industrial or post-industrial era. We believe that mutual influence of economic growth and economic development obtains fundamental meaning while transition from one system to another and escalating of dialectical contradictions between growth and development, social and economic situation in general. The development of any system up to now would be not realized without mutual influence of economic growth and economic development, because of the controversy driven system development. The general recommendation is that this dialectic is a natural and unconditional phenomenon, and must always be resolved in order to meet the growing needs of that system that actually led to this contradiction. Naturally,

dialectical nature of economic growth and economic development mutual influence in post-industrial society acquire more complex form. Accordingly, it is important to define its further prospects within modernized socio-economic structure.

5. Prospects of mutual influence of economic growth and economic development in post-industrial society

Discussion about economic growth and economic development as balance of quantitative and qualitative parameters of society's development in the new socio-economic conditions of post-industrial society is a subject of particular importance. Under the conditions of the post-industrial research paradigm object of related analysis is a new socio-economic society structure, which is based on the intellectualization, humanization and informatization. Hence, the study of economic growth and economic development should be based on the transition mostly from quantitative to qualitative indicators. Most effective growth and development combination may imply zero growth and advanced development. One of the significant achievements of the post-industrial countries is solving of general dialectics of growth and development, for example, in cases where there is a lack of resources (material implementation of growth), financial support is carried out by the state. On the other hand, the level of development has reached a stage where private businesses also actively participate in entire innovation process (therefore, generate economic growth).

Important role of both economic growth and economic development in society's development generally makes it possible to integrate described concepts in the post-industrial research paradigm. This combination of techniques allows us to consider the economic and general social transformation processes in their interaction and impact on quantitative and qualitative changes that occur in certain countries. Taking into account the importance of the economic component, the comprehensive study complements the general knowledge of post-industrial development, which general trend of historical and logical methodology can be supplemented by neoclassical and neo-Keynesian pragmatic concepts of economic growth, abstract study of economic development and so on. For example, the official international statistics refers post-industrial countries including those that have a predominance of the services over industrial production and agriculture in GDP. Extended research methodology should include to distinctive features of post-industrial economies not only dominance of services but other characteristics such as the proportion of high-tech industries in general production structure, indicators of science and higher education development, the spread of information technologies and technical equipment into economy, trade, tourism and recreation

activities and so on. Given that general pattern of structural change is a decrease of raw material industries share as well as material production and agriculture, mentioned industries should maintain good performance and ensure physical increment (economic growth), which is the basis of progressive structural changes (economic development). In developed post-industrial countries production remains an important sector of economy and provides a high level of technological development of related systems. It is where latest achievements of scientific-technological progress are primarily accumulated which allow to build a highly diversified economy that focuses on latest scientific and technical elaborations.

Finally, despite critical importance of the economic system for social evolution in XXI century, we should appreciate social transformations also playing very important role in practice. The fundamental basis of differentiation for society types (even highly developed in general case) are mental and cultural factors. The formation of various post-industrial societies is based on their features expressed in the historic mission of religion, which formed unique social values and regulated its compliance. Thus, the economic and social structure of developed western countries such as USA, Canada, UK, Germany, Sweden etc. is based on Protestantism that preaches such human values as freedom of action and personal responsibility for actions, respecting the law and favouring of scientific knowledge. However, the formation of Japanese society is based on Shintoism, which preaches the harmony between man and nature (which facilitated the solution of environmental problems), proclaims respect to the man (which contributed to the formation of tolerant forms of interaction in the community).

At the same time, the limitations of personal desires, obedience to management and general discipline as important Buddhist religious values can be detected in use by Japanese government while post-war reconstruction and implementation of the post-war economic miracle (Grytsenko et al., 2008: p. 174). This clearly needs to be taken into account, as for example, projects for economic development, requiring resources that can reduce social welfare, in some societies (accustomed to high levels of the welfare) will inevitably cause a negative reaction. We can conclude that the coordination of particular differences and general civilization trends is an important task of strategic management, either in this concrete case, or in general, what concerns challenges for mutual influence of economic growth and economic development in post-industrial society. Economic transformation, that at macro level are detected in the balance of quantitative and qualitative transformations, should be carried out in accordance with national particular features.

6. Conclusions

Investigation of economic growth and economic development as a justification of quantitative and qualitative changes at the macroeconomic level determines their mutual influence as an important factor of economic and social transformations. Economic growth being defined as a process that reflects quantitative changes in the economic system is a basis for qualitative structural transformation, the implementation of which is actually economic development. However, our study also drew attention to the reverse impact of qualitative and quantitative changes, as economic development, expanding productive capacity of society, improve efficiency of resource use, as well as new methods of organization and implementation of the production process that ultimately leads to economic growth on a new material and technological base. It is reflected in dialectical form of relationship between mentioned processes, as one the one hand, they have fundamental distinction as different levels of economic transformations, and on the other hand, keep unity and close mutual influence. Resolving of constant contradictions (common for economic growth and development) is a fundamental condition of continuous changes towards new stages of society's development.

The study of society's development in pre-industrial, industrial and post-industrial societies show its progress being closely connected with the mutual influence of economic growth and economic development. Pre-industrial era is characterized by slow economic growth and development, which causes poor mutual influence of these processes (as well as poor social contribution of economic system). At the same time, its growing intensity in industrial era causes visible intensification of economic and social activity. Moreover, most significant growth at the beginning of industrial revolution occurs precisely in countries that accumulated enough resources at the final stages of previous era and related production principles. It proves the fact that economic development requires preliminary saturation with capital, accumulated by prior economic growth. However, mutual influence of these processes becomes extremely important while transition from one era to another while escalating of dialectical contradiction between growth and development, social and economic state and so on.

The formation of post-industrial system that developed either on the basis of quantitative economic performance, or on qualitative structural changes, is the result of evolution over the entire economic history. Establishment of effective mutual influence of economic growth and economic development at the current stage is also particularly important and requires consideration of a number of non-economic factors. Balancing between quantitative and qualitative transformations can be defined as essential element of practical social and economic strategies at the different types of economic systems and should be also coordinated with national particular characteristics.

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