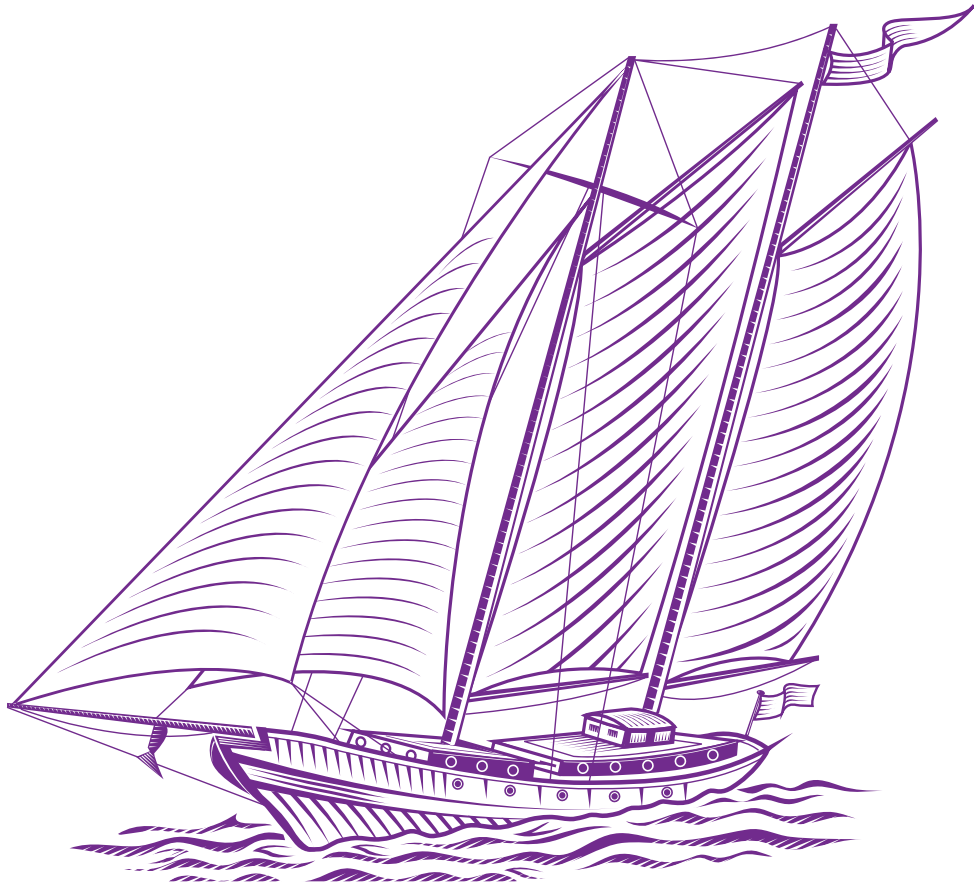




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SMEs GROWTH AND HUMAN CAPITAL INVESTMENTS (THE CASE OF POLAND)

URBAN PAULI¹

ABSTRACT. Small and medium enterprises (SMEs) face more threats and challenges than their larger counterparts. [It] This situation is caused mostly by the limited access to resources or their unavailability. That is why SMEs have to manage carefully their resources, plan growth and calculate investments in order to achieve the highest possible return. Many authors claim that one of the most valuable resource for any firm is the human capital (HC); it may be the source of competitive advantage. This article touches upon the relationship between SMEs growth and human capital investments. The main question is whether there is any relationship between the stage of SMEs growth and investments in HC. Do investments in HC support SMEs performance on every stage of their growth? The results of the research conducted on 219 Polish SMEs. On the basis of conducted analysis it can be stated that the share of investments in HC vary in subsequent stages. Moreover HC seems to impose SMEs' performance only in the mature stages, when organisations are well developed and have achieved an appropriate market position.

Key words: Human resources, Human Capital, Competitive advantage, Firm Goal, Entrepreneurship

JEL Classification: M500, O150, L250, L210, L260

Introduction

Given their importance for the economy as well as due to their diversity, small and medium enterprises (SMEs) became a field of intensified research. The complexity of problems faced by SMEs and the variety of solutions they introduce, create a great opportunity to investigate effective as well as ineffective decisions and actions. Human capital (HC) management is one of the fields that researchers dealing with SMEs focus on. The reason of such a situation can originate both

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from the resource-based view (RBV) theory (Barney, 1991) and increasing dynamics in SMEs growth. According to RBV theory, the companies can build their competitive advantages based on the resources considered as capital, out of which the human capital is the most valuable (Pocztowski, 2007). The dynamics of SMEs growth seem to be a phenomenon of the last decades. Previous research concerning increment and structured models of SMEs growth (Churchill and Lewis, 1983; Quinn and Cameron, 1983; Mintzberg, 1984; Greiner, 1998; Adizes, 2004) fail to explain the path to success of the 'born global' firms, defined as companies that from their initial phase seek to derive competitive advantage by operating on global markets (Gabrielsson et.al 2008).

However, according to recent research (Vlachos, 2009; Patel and Cardon; Pauli 2014; Razouk, 2011; Sheehan 2013) SMEs suffer from the lack of proficiency in HC management which lowers their competing position (especially in relation to larger companies). Moreover, human capital management practices were among the ones seen as less developed, and having a minor position in SMEs management (Razouk 2011). Although there are numerous HC management practices that can affect organisational performance, it is difficult to indicate how particular practices influence it. What is more, it is difficult to define causal relationship between investments in human capital or introducing human resource management practices and SMEs growth or their profitability. That is why researchers focus on investigating the relation between human capital and growth (Vlachos 2009).

The aim of this article is to show the correlation between the level and share of investments in human capital in total investments, and their economic results. As owners and managers of SMEs are highly oriented on goal achievement and profitability, pointing out such a relationship may help them in advancing their organisations.

The structure of the article is the following: the review of organisational growth theories is presented and key development areas in each stage are discussed. It is followed by analyses of the sources of competitive advantage of SMEs and the importance of human capital. The last part of literature review touches upon the investments in human capital and discusses possible forms of enhancing the value and quality of it. In the next part the research model is presented and hypotheses are discussed. It is followed by sample characteristics and results of the research conducted on 382 SMEs. The last part contains discussion and hypotheses verification.

Literature Review

a) Organization growth theories

Since the early 80's many scholars and scientists developed growth theories that correspond to organizations' life cycle. Most of them provide

researchers and policy-makers with information making it possible to choose between imperfect means for describing or characterising SMEs growth (McMahon, 1998). According to Floren (2011), the developed models can be divided into four groups that take into consideration: (1) environment and strategy – for example Quinn and Cameron (1983), (2) role of the entrepreneur/manager – Adizes (2004), (3) resources and capabilities – Flamholtz (1995) and (4) consequences of growth – Greiner (1998). Regardless of the approach, most of the models state that there are stages in firms' existence which cause changes in their market position and in internal processes development. Depending on the authors, the number of stages vary from four to ten, and each stage can be characterised by specific features.

Table 1. Organisations growth models and HC requirements

THE MODEL BASIS	STAGES	REQUIREMENTS FOR HC
Churchil and Lewis (1983)		
Subsequent stages are connected with growth which is related to market share, incomes and internal development. There are eight factors that are important for SMEs success or failure. Four of them relate to the enterprise and four to the owner.	<ol style="list-style-type: none"> 1. Existence 2. Survival 3. Success 4. Take-off 5. Resource maturity 	HC is very important at initial levels because it helps with designing products or services. On subsequent stages it imposes performance and enable to provide SME with appropriate level of process maturity. In the group of factors which relate to the enterprise and are important for success, <i>personnel resources</i> are mentioned. In the group of these related to the owner managerial as well as operational abilities are pointed out.
Quinn and Cameron (1983)		
At each of the growth stages organisational effectiveness stem from different configurations of four models of organisational	<ol style="list-style-type: none"> 1. Entrepreneurship 2. Collectivity 3. Formalization and control 4. Elaboration of structures 	HC refers mostly to the <i>human relations</i> model. That causes that it is the most important for effectiveness at the stage of <i>collectivity</i> and <i>elaboration of structure</i> . Human relations model is connected with employees

performance: <i>human relation, open systems, internal process and rational growth.</i>		satisfaction, competences as well as with internal communication systems.
Scott and Bruce (1987)		
There are possible crises that may appear between particular stages and are connected with some changes that have to be made.	<ol style="list-style-type: none"> 1. Inception 2. Survival 3. Growth 4. Expansion 5. Maturity 	At each stage there are activities requiring appropriate level of HC. For example: the scope and number of activities that have to be perform, building external relationships aimed at creating distribution channels, improvement of products and services, managing multiple processes. Insufficient level of HC may cause crises at each level.
Hanks et al. (1993)		
The model was based on the analyses of organisations' complexity including the number of structure levels, functions and employment.	<ol style="list-style-type: none"> 1. Start up 2. Expansion 3. Maturity 4. Diversification <p>1a) Life-style 2a) Capped Growth</p>	The HC is correlated with the possibility to run managerial tasks, to create and fulfil specific functions and to cooperate. Moreover, in the expansion stage competences related to consumer orientation are required. Moreover in the diversification stage HC is required for developing new products and services.
Greiner (1998)		
Organisation growth can be divided into phases of evolutionary and revolutionary changes. Revolutionary changes are connected with managerial crises.	<ol style="list-style-type: none"> 1. Creativity 2. Direction 3. Delegation 4. Coordination 5. ?-cooperation or network 	HC is correlated with all the phases of growth. It refers to the level of managerial competences as well as to the competences of employees who have to fulfil their tasks, cooperate and perform in accordance with rules and procedures.

Flamholtz (1995), Flamholtz and Randle (2007)		
Developed six key dimensions of organisational performance that refer to: (1) <i>market segment or niche</i> , (2) <i>products and services</i> , (3) <i>resources</i> , (4) <i>operational systems</i> , (5) <i>management systems</i> , and (6) <i>corporate culture</i>	<ol style="list-style-type: none"> 1. New venture 2. Expansion 3. Professionalization 4. Consolidation 5. Diversification 6. Integration 7. Decline 	HC in this model refers to three dimensions of organisational performance that are: <i>acquiring resources</i> , <i>managerial systems</i> and <i>corporate culture</i> . According to the model developed by Flamholtz and Randle these three dimensions are crucial for performance in the expansion, professionalization, consolidation, integration and decline stage.
Miller and Friessen (2014)		
Organisations differ in accordance with four main features: <i>strategy</i> , <i>situation</i> , <i>structure</i> and <i>decision making style</i>	<ol style="list-style-type: none"> 1. Birth 2. Growth 3. Maturity 4. Revival 5. Decline 	HC refers mostly to the possibility to introduce appropriate managerial style. Thus both the manager and the employee should have appropriate competences enabling fulfilling strategic aims and cooperate within the structure.

Source: Churchil and Lewis (1983), Quinn and Cameron (1983), Scott and Bruce (1987), Hans et al (1993), Flamholtz (1995), Greiner (1998), Flamholtz and Aksehirli (2000), Flamholtz and Randle (2007), Miller and Friessen (2014)

All of these models assume that the changes in companies' existence require changes both in internal systems and in the way they act on the market. While introducing such changes companies must use their resources in order to take advantage of emerging opportunities and prevent potential threats. One of these resources, which was discussed in the table 1 is human capital. In the following section the importance of human capital for achieving success and competitive advantage will be discussed.

b) Human capital as a source of SMEs success

While operating and implementing their strategies, the resources the firms use can be treated as strengths to reach desired goals or build their market position. According to Barney (1991) firms' resources can be divided into three

groups: (1) physical capital: consisting of technology, plant, equipment, location and access to raw materials, (2) human capital: including knowledge, intelligence, relationships, attitudes and abilities, and (3) organisational capital: represented by structure, internal systems and relations between groups within a firm and in its external environment (for example with business partners, suppliers, subcontractors). These resources can be the foundation of sustained competitive advantage if they are valuable, rare, inimitable and non-substitutable (VRIN).

According to Galbreath (2005) a firm's resources can be divided into two main categories: (1) tangible resources and (2) intangible resources. Tangible resources include financial assets and physical assets, while intangible resources consist in: *intellectual property assets, organizational assets, reputational assets and skills that include organizational capabilities*. On the basis of such categorisation Galbreath (2005) hypothesised that *intellectual property assets, organizational assets* as well as *reputational assets* contribute more significantly to the firm's success than *tangible assets*. Moreover, *organisational capabilities* have the greatest impact on the firm's success than any other resources. A capability is defined as a capacity to make use of a company's assets in order to reach a higher level of performance (Maritan, 2001). Capabilities are considered to be skills and accumulated knowledge that are the foundation of organizational routines (Galbreath, 2005). These routines, having a strategic aspect, allow organisations to achieve new resource configuration when changes on the markets occur. They can integrate, restructure and release resources providing high level of adaptability (Eisenhrdt, Martin 2000). Capabilities stem from organizational practices and are crucial for achieving strategic goals, and they result from actions taken by people, organisation history and stakeholders' activity (Kostova & Roth 1999).

Pike, Roos and Marr (2005) indicate that factors building organisations' potential originate from: *human capital, organisational capital, relational capital* and *financial assets*. Human capital includes knowledge, skills, motivation, abilities and attitudes of employees. They are crucial for fulfilling tasks on job positions, and because of their unique configuration cannot be imitated. Organisational capital consists of organizational culture, implemented strategies, structures, internal systems and procedures that regulate the way organisations operate. Organisational capital originate from firms' history and refers to the market situation. Relational capital includes relations with customers, suppliers, subcontractors, business partners and other stakeholders.

Because of their size and characteristics SMEs cannot compete with large companies that, in general, possess important physical and financial assets. Moreover, SMEs do not have well designed structures or procedures. They can rely mostly on the intangible resources, of which human capital seems to be most

important. It consists of knowledge, skills, motives, abilities, attitudes and health (Schultz, 1961). These components have a significant value for both employees and employers and are the source of incomes (Pocztowski, 2007). According to Sheehan (2013) human capital may have a higher impact on SMEs' rather than large companies' performance, because such organisations have to do more than large companies with fewer resources. Human capital is also critically important for the survival of SMEs because they are very often more labour-intensive than larger companies (Patel & Conklin, 2012). Moreover, human capital is perceived as a key success factor in knowledge based economy, it can be a foundation of relational as well as organizational capital and is a source of innovativeness (Pauli, 2014).

Despite the fact that human capital has such a significant meaning for SMEs they have limited options in acquiring it. With regard to human resource architecture there are four ways SMEs may accumulate it: (1) internal development, (2) acquisition, (3) contracting, and (4) alliance (Lepak & Snell, 1999). However, because of the lack of other resources and legitimacy on marketplace, SMEs may face many challenges connected with HRM (Patel and Cardon 2010). It may result in problems with recruiting employees that have the required competences or setting short or mid-term alliances. It seems that internal development consisting of a range of human capital investments may be the most appropriate for SMEs.

c) Human capital investments

Investments in human capital are those type of investments aimed at sustaining or developing the quality and value of human capital components (Lipka, 2010). Investing in HC by an organisation refers to expenditures on actions increasing or sustaining the value and quality of knowledge, skills, abilities, attitudes and health of employees. According to Schultz (1961) three types of expenditures may appear: (1) those referring to preferences and needs that impact only satisfaction and do not increase knowledge or skills, (2) those referring strictly to knowledge and skills improvement having no impact on satisfaction, (3) those that improve knowledge and skills and are the source of satisfaction. Some of the organisational expenditures are difficult to categorize as investments due to the lack of direct impact on organisation performance. For example *wellness* programs that, on the one hand, do not increase the level of knowledge or skills, while on the other can improve health, an important component of HC that can increase motivation.

Becker (1962) described four main forms of investing in HC that are: (1) on the job training, (2) schooling, (3) other activities aimed at acquiring information and (4) wage increase. On the job trainings support the development

of knowledge and skills, enhancing the attitudes that the employee already has and that are required while fulfilling tasks. This kind of investments highly corresponds to organisations' expectations. Schooling enables the development of both specialist as well as general knowledge and skills. This knowledge and skill can suit particular organisation's expectations as well as posts in other firms. Other activities may result in developing general knowledge about the branch, products or other specific issues. The most common forms of such investments are, for example seminars, conferences, meetings. Wage increase is aimed at raising the level of employees' involvement, and when connected with achieving goals is a way of rewarding. Increasing wages is also a way to keep valuable employees in the organisation.

Lipka (2010, based on in-depth analyses of expenditures aimed to increase the value of human capital, proposed a list of more than twenty categories of investments in human capital. They refer to (1) increase of knowledge and skills (for example on-the-job and off-the job trainings), (2) changing attitudes (coaching, cooperation development, teams-creation), (3) improving working conditions, (4) building commitment and involvement (benefits, retention programmes, employer branding) and (5) supporting health (additional insurance, healthcare, work-life balance programmes).

Taking into consideration possible initiatives, investments in human capital can be divided into two broad categories. The first one comprises the actions that support direct development or sustain the value of HC. Such investments are aimed at: knowledge, skills, attitudes, health, values and beliefs. The second group includes actions that support indirectly the development of HC. They are focused on teamwork, organizational culture, job satisfaction, involvement, internal communication and relations.

The model and hypotheses

On the basis of organisational growth models (Churchil and Lewis 1983, Quinn, Cameron 1983, Scott and Bruce 1987, Flamholtz 1995, Hanks et. al. 1993, Greiner 1998, Adizes 2004, Miller and Fressen 2014) a five stage growth model was developed. Each of the stages was characterised by a set of features that refer to:

1. Products/services - range, complexity, uniqueness, number of modification made,
2. Distribution – selling techniques, facilities for customers, type of purchase (single or multiple),
3. Technology – innovativeness, changes in technology made,

4. Management – decision-making process, level of tasks specification, structural solutions, communication systems, relationships among employees
5. Finance – way of financing liabilities, usage of external financing, cooperation with investors, margin calculation schemes, cost management systems, extent to which finances are planned,
6. Customers – structure, segmentation, CRM systems, customer satisfaction
7. Brand – recognition, image of a company
8. Stakeholders – profile of suppliers, profile of subcontractors, type of relationship with suppliers and subcontractors, changes in cooperation, membership in societies.

The general characteristics of the stages are the following: (1) **Survival** – low market share, no regular customers, financing provided by the owner's capital, narrow offer, no structural solutions and lack of internal systems; (2) **Take off** – products meet expectations, increasing income, widening internal processes, brand recognition in some groups, basic relationships with stakeholders, simple structural solutions, less centralised decision making process; (3) **Prime** – increasing market share and income, developing and widening products, good brand recognition, new technological solutions, management systems, stable relationships with crucial suppliers and subcontractors, functionally based structure, further decentralisation in decision making and management; (4) **Maturity** – high income, higher costs, well designed management systems, well recognized brand, well designed cooperation with stakeholders, complex structural solutions, decentralised management, creation of specialized departments; (5) **Decline** – decreasing income, market share and number of customers, highly developed internal systems, decentralised management, complex structure with departments, divisions and project teams. Each of these stages can be also characterised by specific terms of cooperation and relationships with customers, suppliers and business partners.

In each of the stages, SMEs build their competitive position based on the resources that can be treated/considered as organisation's strengths. These resources are divided into five groups: (1) human capital, (2) organisational capital, (3) relational capital, (4) tangible assets and (5) financial assets (Barney 1991, Galbreath 2005, Pike, Roos and Marr 2005). Growth oriented companies should invest in each of these resources in order to build their competitive advantage. Because SMEs have, in general, limited resources in comparison with large companies the most valuable for them may be the intangible assets out of which human capital seems to be crucial (Pocztowski, 2007; Patel & Conklin, 2012; Sheehan, 2013; Pauli, 2014).

H1: The share of investments in HC in total investments impact the level of return on investments (ROI)

Because of the perceived importance of human capital for SMEs success, investments in this resource should have a positive impact on performance indicators of SMEs that are: (1) sales value, (2) sales amount, (3) profits, (4) number of customers, (5) number of employees, (6) general economic condition, and (7) brand recognition.

H2: the value of HC investments has a positive impact on performance indicators of SMEs

H3: the share of HC investments in total investments has a positive impact on performance indicators of SMEs

Because each growth stage can be characterised by a set of different features, and companies face different challenges in subsequent stages they should diversify the structure of investments in every stage to achieve the highest ROI.

H4: The share of investments in HC in total investments vary in every growth stage between companies with highest and lowest ROI.

There are many forms of investing in HC that range from simple ones, like on-the-job-training, to complex ones like additional benefits, investments in working conditions (Schultz, 1961; Becker, 1962; Lipka, 2010). As SMEs grow, their internal systems become more complex which may make the number of investments in HC increase as well.

H5: The more developed SMEs are the more different forms of investing in HC they apply.

Data and results

The sample

The research was conducted between April and May 2015 on a group of 382 (Polish) SMEs. They were selected randomly from the database that consists of 1950 units. The study was conducted with the use of PAPI technique and owners or managers were interviewed. General characteristics of the sample are presented in Table 2.

Table 2. Sample characteristics

SMEs' characteristic	%
Profile	
Production	28
Services	62
Selling	31

Operating market	
Local	37
Regional	34
Country	26
International	13

The first step in the analysis was to verify the data and to calculate the ROI value. Unfortunately not all respondents provided the data concerning investments expenditures or profit. After screening the database, 219 SMEs were selected for further study. In order to identify the growth stage of each SME, eight main categories were evaluated and *k-means* method was applied to divide the investigated companies into particular stages of growth. As a result 55 companies could be considered as being in their survival stage, 43 in take-off, 50 in prime, 41 in maturity and 30 in decline stage. Based on the financial data, the value of ROI and the share of each category of investments in total investments were calculated. Then statistical analysis using structure and incidence (e.g. calculating the percentage of a given category of investment in overall investments), selected descriptive statistics, as well as k-means clustering method and correlation coefficient were used.

Results

The first stage of statistical analysis was to estimate the structure of investments in SMEs. The share of investments in particular capitals and assets with regard to the ROI level is presented in table 3.

There is a difference between the shares of particular categories of investments in subsequent stages of SMEs growth. Most funds in each stage are spent on tangible assets. The share varies from 41 to 56 percent for the companies with high ROI and from 47 to 63 percent for the companies with low ROI. Definitely financial assets have the lowest share in general.

Table 3. Structure of investments

Stage	ROI level	Human Capital	Organisational Capital	Relational Capital	Tangible Assets	Financial Assets
survival	Low ROI	11,1%	25,9%	6,4%	48,0%	8,6%
	High ROI	12,3%	21,4%	5,8%	54,6%	6,0%
take-off	Low ROI	6,4%	11,5%	5,2%	63,3%	13,6%
	High ROI	14,6%	20,0%	5,1%	55,9%	4,4%

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prime	Low ROI	10,7%	18,3%	2,1%	63,4%	5,6%
	High ROI	13,6%	26,4%	7,7%	51,7%	0,6%
maturity	Low ROI	21,1%	24,9%	6,8%	47,2%	0,0%
	High ROI	14,0%	24,6%	4,5%	43,7%	13,2%
decline	Low ROI	6,6%	23,1%	1,8%	54,0%	14,6%
	High ROI	20,4%	29,0%	9,3%	41,4%	0,0%

Taking human capital into account there is also a difference between the shares of these investments at particular stages (as Figure 1 shows). In the survival stage the share of HC investments is similar in SMEs with high and low ROI but in the next stage the difference is about 9%. Firms with high ROI level spend more on HC investments while those with low ROI prefer investments in other resources (mainly tangible assets; see Table 3). In two subsequent stages (prime and maturity) the companies with high ROI levels spend almost the same amount of funds on HC investments. In prime stage the share is about 11 percent and in maturity stage it is much higher accounting for 21 percent. In decline stage companies with high ROI spend much more on HC investments than those with low ROI, the difference is almost 14 percent.

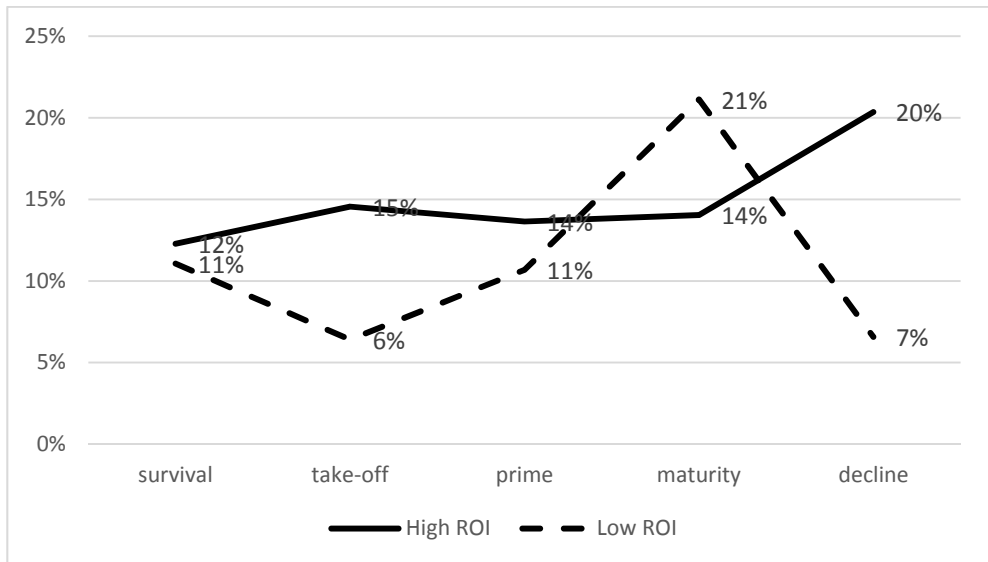


Figure 1: The share of HC investments in total investments in particular growth stage

For testing hypotheses 1-3 the correlation between (A) *value of HC investments*, (B) *share of HC investments*, (C) *ROI level* and performance indicators such as: (1) *amount of product sale*, (2) *amount of service sale*, (3) *value of products sale*, (4) *value of service sale*, (5) *profits value*, (6) *number of customers*, (7) *number of employees*, (8) *financial condition* and (9) *brand recognition* were verified.

In reference to performance indicators owners or managers were asked if they could observe *a definite decrease, decrease, no changes, increase, a definite increase*, in the last three years. All these correlations were verified both for all of the companies regardless of their growth stage and for each stage separately. Because of a large amount of data table 4 presents only the variables that correlate with the $p < 0,05$.

Table 4. Correlation between HC investments and economic variables

VARIABLES	Mean	SD	Value of HC inv	Share of HC inv
<i>All companies</i>				
Amount of products sale	3,22	0,79	0,159224	
Number of customers	3,26	0,78	0,140317	
Value of HC investments	15842,26	35915,56	1,000000	
Share of HC investments	0,12	0,18	0,189267	1,000000
ROI level	4,95	13,51		0,269124
<i>Survival stage</i>	Mean	SD	Value of HC inv	Share of HC inv
Number of customers	3,145	0,78	0,288204	0,291948
Value of HC investments	9800,000	19240,35	1,000000	
Share of HC investments	0,105	0,18	0,399167	1,000000
ROI level	4,301	15,27		0,399887
<i>Take-off stage</i>	Mean	SD	Value of HC inv	Share of HC inv
Financial condition	2,930	0,67	-0,373224	
Value of HC investments	7840,000	12866,09	1,000000	
Share of HC investments	0,110	0,20		1,000000
<i>Prime stage</i>	Mean	SD	Value of HC inv	Share of HC inv
Value of HC investments	8030,000	13701,86	1,000000	
Share of HC investments	0,103	0,17	0,288784	1,000000
ROI level	6,764	17,61		0,529915

<i>Maturity stage</i>	Mean	SD	Value of HC inv	Share of HC inv
Amount of product sale	3,41	0,74	0,367730	
Amount of service sale	3,46	0,64	0,500188	
Value of service sale	3,59	0,67	0,324188	
Brand recognition	3,22	0,47	0,365349	
Value of HC investments	14412,85	15959,96	1,000000	
Share of HC investments	0,13	0,21		1,000000
<i>Decline stage</i>	Mean	SD	Value of HC inv	Share of HC inv
Value of HC investments	53363,59	79814,62	1,000000	
Share of HC investments	0,16	0,14		1,000000
ROI level	6,73	12,27		0,374456

The share of HC investments in total investments is positively related with the changes in the number of customers thus only in the firms that are in *survival stage*. The shares of HC investments are also positively correlated with the level of ROI for companies in their *survival, prime* and *decline* stage.

The *value of HC investments* is correlated with the *amount of product sale* and the *number of customers* when taking into consideration all of the companies regardless of their growth stage. In the *survival* stage it is correlated only with the *number of customers*, and in the *take-off* stage it is negatively correlated with the *financial condition*. In the *prime* and *decline* stage there is no correlation between the *value of HC investments* and performance indicators. The *value of HC investments* seems to be the most important for the companies in *maturity* stage because it correlates with four out of nine characteristics that are: *amount of product sale, amount of service sale, value of service sale* and *brand recognition*.

These results partly support H1, that *the share of investments in HC in total investments impacts the level of return on investments (ROI)*. There is a positive correlation only for companies that are in *survival, prime* and *decline* stage.

The results of statistical analyses do not support H2 that: *the value of HC investments has a positive impact on performance indicators of SMEs*. Only for companies in maturity stage was found a correlation between the value of HC investments and the four variables.

There is no correlation between *the share of HC investments in total investments and performance indicators of SMEs*, which does not support H3.

In the study, fifteen different types of investments in HC were analysed. Studying the complexity of such investments in reference to the stage of growth it was found a positive correlation between the number of types of investments used and the stage of growth (0,271371, $p=0,005$). The mean value of the number of investments types vary from 1,6 in survival stage to 3,5 in decline. This supports H5: *The more developed SMEs are the more different forms of investing in HC they apply.*

Discussion

According to many authors human capital due to its value, rareness, inimitability and non-substitutability can be a source of competitive advantage. Moreover, due to SMEs characteristics and their limited access to other resources it can be a crucial factor for success or even survival (Sheehan, 2013; Patel & Conklin, 2012).

The present research does not support this point of view. Despite the fact that there are some correlations with the *amount of product sale*, *amount of service sale*, *value of service sale* and *brand recognition* in the *maturity* stage there are no direct relationships between the *value of HC investments* or the *share of HC investments* and performance indicators. Furthermore, in the *take-off* stage a high value of HC investments may be a constraint in companies' growth.

Comparing the results of the research with organisational growth theory it can be stated that in the early stages of growth (that are *survival*, *take-off* and *prime*) some other resources play a more important role in SMEs success. For example in the survival stage the tangible assets might be the important resource that allow to produce or sell services to customers. In the *take-off* stage, the tangible assets as well as the relational capital could play a crucial role. In the *prime* stage organizational capital that refers to internal systems and procedures could play the most important role.

Gathered data makes it possible to conduct in-depth analysis of the investments in HC. Their value, type as well as number of incentives were taken into account. On the basis of this additional analysis it can be stated that the mean value of investments in HC capital as well as the number of types of such investments increase subsequently in each stage. At the same time the share of such investments remains more or less the same (see table 3). It proves that HC investments do not have an important impact on SMEs performance in every stage and real profits from HC investments can be gained only when the organisation is well developed and has achieved an appropriate market position.

The main limitations of this research may stem from the number of organisations, their diversity, and technique used. Despite the fact that 219 companies were analysed and 382 were investigated, taking into account the total number of existing Polish SMEs the sample is relatively small. Moreover, these companies represent different sectors and size (although all belong to the group of small or medium enterprises). This may cause some biases because in some productive sectors the impact of particular resources on performance and growth can be totally different than in service oriented companies. It should also be mentioned that all the information were gathered during interviews with managers/owners of SMEs and referred only to the data included in financial statements for 2014. In order to analyse the impact of investments on performance and growth makes it is necessary to compare the collected data with those referring to a longer period of time.

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BUCHAREST STOCK EXCHANGE DEVELOPMENT BETWEEN 1995 AND 2015

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ABSTRACT. At the end of November 2015, Bucharest Stock Exchange reached the 20th anniversary since re-opening. The present paper is a survey of Bucharest Stock Exchange evolution along the past two decades. It highlights the main milestones that marked the evolution of the main Romanian capital market. The paper also offers a detailed presentation of the main market and of the alternative trading system evolution within Bucharest Stock Exchange. It briefly discusses BVB's strengths, weaknesses, opportunities and threats and concludes that through its capacity and willingness to change, adapt, and face new challenges, one can look with confidence at the Bucharest Stock Exchange's future development.

Key words: Bucharest Stock Exchange, 20 years, survey

JEL Classification: G19

Introduction

A discrete announcement marked the 20 year anniversary of Bucharest Stock Exchange re-opening on November 23rd 2015. The present survey paper was written in order to mark this milestone in Bucharest Stock Exchange (BVB² henceforth) development and to present the main steps that marked this process. BVB evolved from a non-profit public institution to a for profit public company that manage two trading platforms, the main/regulated market and the alternative trading system (ATS). Moreover, BVB lists its own shares within the main market Premium category. Through this institutional transformations, BVB

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² In order to preserve its unique identity it was chosen to use the Romanian abbreviation for Bucharest Stock Exchange instead of that resulting from the translation of the name in English.

followed the trend of other securities exchanges around the world and proved a good capacity to accommodate the necessary changes related to the rapid evolving financial market within the European Union and at the world level.

The paper is structured as follow: the first section presents the BVB general evolution, the second part describes BVB regulated/main market development with subsections dedicated to equity, bond, and other securities sectors, the third section briefly presents the ATS segment at BVB, the fourth part briefly discusses BVB's strengths, weaknesses, opportunities and threats, and the fifth part concludes.

While RASDAQ market was part of BVB between December 2005 and October 2015, this segment was not discussed here due to its special evolution and problems.

BVB general evolution

The re-opening of the exchange was considered two decades ago an important event that showed the country willingness to break the ties with the communist past and look toward a different future.

The main milestones that influenced the development of BVB as an institution are presented in Table 1. They mark the transformation of BVB from a non for profit institution (as it was the common legal status for most exchanges around the world 20 years ago) into a for profit public institution that administrates two trading platforms for several security markets and lists it own shares. The diversification of these platforms is highlighted by the absorption of RASDAQ Electronic Exchange in 2006 and by the introduction of the Alternative Trading System (ATS) in 2010. The 20th year of activity at BVB was marked by the closure of the controversial RASDAQ market³ and the further development of the ATS system by the launch AeRO segment dedicated to domestic small companies. AeRO facilitated the transfer of over 250 companies from RASDAQ market to ATS.

Table 1: The main events for BVB development as institution:

1995	<p>April 21st: BVB was re-established as a public non-profit institution based on the National Securities Commission Decision no.20/1995; in this capacity, BVB was under the administration of the trading member association; the 24 to 28* trading members created the Bucharest Stock Exchange Association; the number of member was not limited, providing the new members fulfilled a minimum set of requirements.</p> <p>June 23rd: the official inauguration</p>
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³ For more details regarding the RASDAQ market please see Pop et al.(2014) and Pop et al.(2015).

BUCHAREST STOCK EXCHANGE DEVELOPMENT BETWEEN 1995 AND 2015

	November 20th: the first trading session
2000	The introduction of an improved and transparent website, easy to read and to be used mainly by the domestic investors.
2003	BVB becomes an affiliated member of the Federation of European Securities Exchanges (FESE).
2005	BVB changes the legal status and becomes a for profit public company (joint stock company) based on the decision taken by the Stock Exchange Association. The members of the respective association became the BVB shareholders. The absorption of the RASDAQ Electronic Exchange was approved and the process was completed in December 2005. RASDAQ became the unregulated/OTC market of BVB.
2006	The failed merger negotiations with the Sibiu Monetary Financial and Commodities Exchange.
2007	BVB becomes a full member of FESE since Romania's accession to European Union.
2010	June 8th: BVB start listing its own shares within the regulated market second category/tier under the symbol BVB. The Alternative Trading System (ATS) is launched and Daimler AG is the first international company to be listed within this market segment.
2013	August: Ludwik Soboleski was appointed as BVB's CEO (Chief Executive Officer)
2014	The introduction of a new website in December
2015	February: AeRO is launched as a new ATS segment dedicated to small domestic companies. October 27th: RASDAQ, the unregulated segment, is closed and over 250 companies were transferred on AeRO.

Note: The number of trading members varies depending on the sources (Anghelache 2006, Skully & Brown 2006, and BVB 2001 Annual Report) due to the fact that it probably increased from 24 to 28 between April and November.

Sources: Pop (2011); <http://www.bvb.ro/aboutus/mediacenter/pressitem/20-de-ani-de-la-prima-tranzactie-pe-Bursa-de-Valori-Bucuresti/4164>;

http://www.bvb.ro/press/2015/2015.05.05_BVB%20Rez%20fin%201Q15_EN.pdf;

2001 and 2003 Annual Reports available at: <http://www.bvb.ro/AboutUs/Publications>

Currently, BVB is part of BVB Group which includes, beside BVB, the following institutions: the Central Depository (which offer clearing, settlement and registration for the cash/spot market), the Bucharest Clearing House (offering clearing for the derivatives market), the Investor Compensation Fund, and the Institute for Corporate Governance⁴. There was almost impossible to find out the moment when this group was established, but an educated guess points toward the year 2006 when BVB became a public company.

⁴ As of June 2013, BVB owned the following block of shares within the companies of the group: 69% of the Central Depository, 52.5% of the Bucharest Clearing House, 62.3% of the Investor Compensation Fund, and 100% of the Institute for Corporate Governance. The information was extracted from: http://www.bvb.ro/info/2013_07_24_bvb_ir_presentation_en.pdf

Table 2 briefly presents the main milestones related to the BVB trading system. It shows the continuous efforts of BVB managers to keep up the pace with the changes in information technologies and to implement them with the available resources. One should not forget that all BVB trading systems were developed in-house in order to address the peculiar demands of the domestic investors.

Table 2: Main evolutions regarding the BVB trading systems

1995	November 20th: The trading system STEA was implemented. The clearing and settlement system was integrated within STEA. The settlement period was T+5 days.
1996	October: The clearing and trading system Equator was launched, integrated with the trading system STEA.
1997	The cross transactions are introduced in order to speed up the trading for the listed companies from the Mass Privatization Program.
1998	Direct custody services are introduced.
1999	The implementation of the trading system HORIZON™ The settlement period was reduced at T+3 days. Trading blocks are introduced: 100 or any multiples of 100 for regular lots and the odd lots for less than 100. Several exceptions existed of 10 or 1 for regular lots based on the individual price of the shares.
2001	ARENA trading system is used for bond transactions
2003	ARENA trading system replaces completely the HORIZON system.
2006	The possibility to use margin accounts was introduced for investors
2009	The trading blocks within the regulated markets were increased at 500 or any multiple of 500 for the majority of the listed shares for regular lots. Exceptions were allowed and lots of 100, 10 and 1 were accepted as regular lots for the shares with high individual prices.
2011	January 25th: short selling operations became available for Fondul Proprietatea. (As of December 2015, 20 securities can be sold short at BVB: 16 shares and 4 municipal bonds: http://www.bvb.ro/FinancialInstruments/SelectedData/AllowedShortSellSecurities)
2014	The separation between the trading platform and post trading platform is implemented. December: the odd lot orders are eliminated. Any volume is accepted for all the traded securities on the regulated market. The settlement period decreases at T+2 days.

Source: Author's compilation based on the information available at:
<http://www.bvb.ro/AboutUs/Publications>,
<http://www.bvb.ro/AboutUs/MediaCenter/PressReleases>

Table 3 presents the equity market structure at BVB. This structure could not be reported for all the securities traded due to the fact that in the case of capitalization, BVB does not report the capitalization for bonds; while in the case of turnover, the rights traded on RASDAQ registered a negligible value, and the introduction of corporate bonds and UCITS within ATS also resulted in very small annual values.

Table 3: BVB equity market structure by capitalization and turnover (EUR mn.)

Year	Capitalization				Turnover		
	BVB main market	RASDAQ	ATS	total markets % of GDP	BVB main market	RASDAQ	ATS
2006	21,414.91	3,126.44	-	25.10	2,801.71	241.11	-
2007	24,600.75	6,985.67	-	25.34	4,152.44	1,287.71	-
2008	11,629.77	3,079.08	-	10.33	1,895.44	426.49	-
2009	19,052.65	2,937.67	-	18.25	1,203.80	136.32	-
2010	23,892.21	2,526.45	n/a	20.83	1,338.29	144.56	0.14
2011	16,385.91	2,366.93	n/a	14.06	2,349.04	136.21	2.62
2012	22,063.37	2,008.28	n/a	17.98	1,674.20	48.92	3.76
2013	29,980.44	1,774.47	n/a	22.01	2,543.57	68.34	4.72
2014	28,986.52	1,668.52	n/a	20.44	2,930.76	47.73	4.56
2015	32,240.80	502.25	851.07	*21.64	1,981.07	14.21	20.23

Note: The market capitalization for RASDAQ is reported for October 22nd 2015, the last day of trading on the respective market segment.

*Estimate

Source: Based on the data available at www.bvb.ro

Thus Table 3 offers an incomplete picture, due to the absence of bond capitalization. It clearly shows the dominance of BVB regulated market. The percentage in GDP of the combined equity market capitalization between 2006 and 2015 reach an average of about 20%.

In Table 4, the evolution of the intermediaries (as of the end of every year) is presented for all equity markets. Since 2006, the number of intermediaries for BVB main market and RASDAQ are similar, given the absorption of RASDAQ.

Table 4: The number of intermediaries at BVB (reported only for the equity sectors on the main market, RASDAQ and ATS)

Year	BVB main market	RASDAQ	ATS
1995	28	-	-
1996	62	85	-
1997	133	168	-
1998	173	202	-
1999	150	167	-
2000	120	101	-
2001	110	86	-
2002	75	69	-
2003	73	63	-
2004	67	65	-
2005	70	68	-
2006	73	73	-
2007	73	73	-
2008	76	76	-
2009	71	71	-
2010	65	65	45
2011	61	61	48

Year	BVB main market	RASDAQ	ATS
2012	54	54	45
2013	43	43	36
2014	40	40	34
2015	38	38	33

Source: <http://www.bvb.ro/TradingAndStatistics/Statistics/GeneralStatistics>

The steep increase of intermediaries between 1996 and 1998 is related to the trading of companies that emerged from the Mass Privatization Program. The listing of these companies generated a lot of activity. Thus, it had a short life and a steep decline was registered mainly on RASDAQ (1999-2001), followed by the decline on the BVB main market. More details regarding the problems related to the RASDAQ intermediaries can be found in Pop et al. (2014). In the case of BVB intermediaries, the decline was induced by the 2002 changes in regulations, demanding higher cash capital limits for the brokerage companies. The second decrease of intermediaries is related to the recent financial crisis and to the consolidation process within this intermediation sector, with several takeover publicly announced between 2012 and 2013.

BVB regulated/main market development

The milestones that marked the development of the regulated/main market at BVB are presented in Table 5. The diversification of the securities on offer started in November 2001 and currently was ended in 2012 by the introduction of the first (and as of December 2015, the only) Exchange Traded Fund (ETF).

Table 5: The main steps in developing the regulated/main market at BVB

Nov.1995 - Oct.2001	Only domestic equities were traded.
2001	November: the launch of the municipal bond market sector.
2003	May: the launch of the domestic corporate bond market sector
2005	The first rights are traded
2006	September: the introduction of international (corporate) bonds
2008	February: the first dual listing of Erste Group Bank AG (also listed at Vienna and Prague) within the section International equities/shares April: the launch of the derivative markets; only futures contracts on offer August: the launch of the Government bond market sector September: start trading of the first UCITS
2010	The introduction of the first certificates within the structured products' segment
2011	The listing of the first REIT at BVB within the regulated equity market under the section Other international securities
2012	The introduction of the first ETF

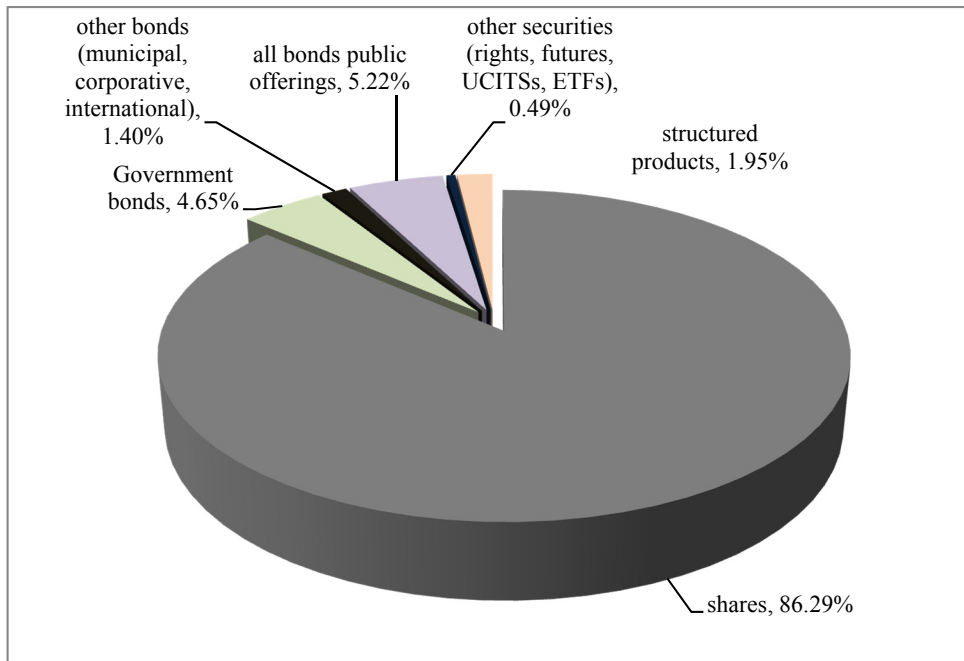
Source: Author's compilation based on the Annual Reports available at:

<http://www.bvb.ro/AboutUs/Publications> and on

<http://www.bvb.ro/aboutus/mediacenter/presstitem/20-de-ani-de-la-prima-tranzactie-pe-Bursa-de-Valori-Bucuresti/4164>

The average structure of BVB regulated market by turnover is presented in Graph 1. A detailed structure by years and securities is presented in Table 6. The equity trading is dominant within the main market. At an important distance the combined bond public offerings and Government bond trading rank second and third. The structured products (certificates) concentrate almost 2% of the trading activity, while the combined trading of municipal, corporate and international bonds is barely visible with less than 1.50%. The trading of other securities (rights, futures, UCITS, and ETFs) is almost negligible. As Table 6 show, since 2013 the trading of the futures contracts ceased completely. While the BVB officials mentioned the lack of liquidity for the underlying instruments to be the main reason for this stop, to this reason one must add the lack of investors' sophistication, a low intensity of individual portfolios' management and therefore the absence of a demand for hedging products. As of January 8th 2016, BVB announced the withdrawal of the authorization for regulated derivative market and its subsequent closure. BVB also announced the intention to reopen this market as soon as the liquidity on the underlying instruments will improve.

Graph 1: BVB main/regulated market structure by turnover
(average figures for the period 2002-2015)



Source: Based on the data available at www.bvb.ro

Table 6: BVB main/regulated market structure (%) by turnover of the listed securities

Year	Shares	Municipal bonds	Corporate bonds	International bonds	Government bonds	All bonds' public offerings	Rights	Futures	UCITSS	Funds' public offerings	Structured products	ETFs
1995	100.00	-	-	-	-	-	-	-	-	-	-	-
1996	100.00	-	-	-	-	-	-	-	-	-	-	-
1997	100.00	-	-	-	-	-	-	-	-	-	-	-
1998	100.00	-	-	-	-	-	-	-	-	-	-	-
1999	100.00	-	-	-	-	-	-	-	-	-	-	-
2000	100.00	-	-	-	-	-	-	-	-	-	-	-
2001	100.00	-	-	-	-	-	-	-	-	-	-	-
2002	99.89	0.11	-	-	-	-	-	-	-	-	-	-
2003	98.23	0.13	0.01	-	-	1.63	-	-	-	-	-	-
2004	89.22	0.20	1.79	-	-	8.79	-	-	-	-	-	-
2005	98.34	0.03	1.33	0.00	-	0.26	0.04	-	-	-	-	-
2006	90.81	0.07	0.86	0.82	-	7.43	0.01	-	-	-	-	-
2007	94.00	0.07	0.34	2.97	-	2.06	0.56	0.00	-	-	-	-
2008	96.29	0.44	0.59	1.42	0.27	0.00	0.66	0.26	0.07	-	-	-
2009	78.74	0.30	0.94	2.88	14.12	1.66	0.00	1.04	0.04	0.28	-	-
2010	67.04	0.27	0.00	0.17	27.46	2.90	0.05	1.28	0.13	0.15	0.55	-
2011	90.03	0.08	0.00	0.67	3.30	0.91	0.00	0.93	0.08	0.00	4.00	-
2012	77.42	0.00	0.00	0.11	12.19	2.61	0.00	0.42	0.05	0.00	7.20	0.00
2013	84.83	0.02	0.30	0.00	3.19	7.36	0.22	0.02	0.04	0.00	4.01	0.01
2014	91.58	0.02	0.28	0.00	0.80	5.64	0.00	0.00	0.06	0.00	1.60	0.02
2015	73.01	0.62	0.79	0.03	2.27	19.87	0.00	0.00	0.04	0.00	3.34	0.03

Source: Based on the data available at www.bvb.ro

The data in Table 6 show that the diversification of offered securities determined the trading to spread thin among financial instruments of marginal interest like the UCITSS and ETFs. This indicates that either these security offers should be discontinued or more interesting issuers should be listed. The lack of individual investors' sophistication and knowledge represent other reasons for the low trading of these securities.

BVB equity main market evolution

The regulated equity market is the oldest and the most important market segment at BVB. It started trading in November 1995 with only 8 companies included in the base category. This base category will become the second category/tier in 1997.

The milestones of the equity main market evolution are presented in Table 7.

Table 7: Main steps in the development of the regulated/main equity market at BVB

Nov.1995 – March 1996	Only one trading session per week.
April 1996 – Feb.1997	Two trading sessions per week.
January 28 th , 1997	The launch of the first tier/category. The first company listed within this tier was Azomures (AZO). The base tier became known also as the second tier/category.
March-April 1997	Three trading sessions per week
May 5 th , 1997	Five trading sessions per week were introduced.
November 1 st , 1999	The listing of the five Financial Investment Companies (SIFs) within the BVB first tier/category.
June 2000	For the first time, three companies (symbols DAC, PLC, SNC) are demoted from the first to second category.
August 2001	The virtual Plus (+) Category is created. Symbol plus is added for the companies included in this category; these companies are supposed to exhibit an enhanced transparency.
October 2002	Electroaparataj Bucuresti (ELJ) is enlisted within the Plus Category. It will remain the only one until this category was eliminated at the end of May 2007.
January 2008	The introduction of the third tier. This category was created in order to encourage the transfer of RASDAQ listed companies on the regulated/main market.
January 2011	The listing of Fondul Proprietatea
January 2014	The first and second tier/category are replaced by the Premium and Standard categories. The third tier/category was eliminated and the listed companies were either delisted or transferred on the standard category.

Source: Author's compilation based on the information available at:

<http://www.bvb.ro/AboutUs/Publications>, <http://www.bvb.ro/AboutUs/MediaCenter/PressReleases>

Table 8 presents the equity main market evolution as of the end of every year. The number of listed companies grew abruptly in 1998 under the listing pressure generated by the Mass Privatization Program. Thus the market capitalization decreased, indicating a poor quality associated with the respective companies. During 2000 and 2001 a 'cleaning campaign' was in place and new listing criteria were imposed. This is reflected in the important drop of the listed companies, while the market capitalization increased. The BVB market capitalization followed, in general, an upward trend since 2000; nevertheless two abrupt drops were registered in relation with the evolutions within the recent financial crisis of 2007-2011; the first drop occurred in 2008, under the climax of the financial crisis, while the second was registered in 2011 under the influence of sovereign crises within European Union countries.

Romania's accession to European Union (EU) in January 2007 was expected to trigger an important growth in capitalization. Thus, this phenomenon occurred much earlier, during 2004, under the influence of the first wave of accession of 10 countries, including the Central European countries: Czech Republic, Hungary, Poland, Slovenia, and Slovakia. The investors' enthusiasm combined with the knowledge that Romania and Bulgaria will become EU member countries either in 2007 or 2008, pushed up BVB market capitalization and the price-earnings ratio (PER) which reached 35.18 at the end of 2004, while the overvaluation of Romanian companies reached the highest level at the end of 2005 and again overpass 3.00 in 2007. During the respective period, dividend yield (DIVY) was poor not only due to the lack of consistent dividend policies at listed companies' level, but also due to high prices. Nevertheless, with the exception of 2004 and 2005, PER oscillated within normal limits of 10 to 20. The price to book ratio (P/B) shows the deep undervaluation of Romanian companies between 1997 and 2001, the overvaluation of the period preceding the recent financial crisis and the normal behavior after the crisis, with a ratio close to 1. The DIVY reached high values between 1998 and 2001 due to the deep undervaluation of the listed companies; registered low values when the overvaluation was a common phenomenon and started to exhibit reasonable values after the crisis due to the price corrections. More investigations are needed in order to see if this improvement is also related to a change in the dividend policy of BVB listed companies.

Table 8: BVB equity main market annual evolution

Year	Number of listed companies	Market capitalization (ECU/EUR mn.)	% of GDP	PER	P/B ratio	DIVY
1995	9	77.61	0.28	n/a	n/a	n/a
1996	17	48.53	0.16	n/a	n/a	n/a
1997	75	560.28	1.79	10.70	n/a	n/a
1998	126	317.82	0.85	8.22	0.38	10.66
1999	127	298.09	0.89	8.82	0.62	7.84
2000	114	450.51	1.11	3.98	0.41	7.48
2001	65	1,361.08	3.00	4.92	0.45	6.70
2002	65	2,646.45	5.44	9.12	0.84	4.97
2003	62	2,991.02	5.69	13.10	1.01	2.00
2004	60	8,818.82	14.45	35.18	2.29	1.45
2005	64	15,311.35	19.20	24.05	3.28	0.94
2006	68	21,414.91	21.90	18.03	2.72	1.72
2007	59	24,600.75	19.74	19.21	3.03	2.18
2008	68	11,629.77	8.17	4.11	0.76	8.57
2009	69	19,052.65	15.81	14.42	1.04	2.81
2010	74	23,892.21	18.84	10.74	1.08	1.87
2011	79	16,385.91	12.29	8.39	0.80	5.46

BUCHAREST STOCK EXCHANGE DEVELOPMENT BETWEEN 1995 AND 2015

Year	Number of listed companies	Market capitalization (ECU/EUR mn.)	% of GDP	PER	P/B ratio	DIVY
2012	81	22,063.37	16.48	7.64	0.94	6.94
2013	83	29,980.44	20.78	9.54	0.98	4.79
2014	83	28,986.52	19.33	7.16	0.93	6.11
2015	84	32,240.80	*20.77	11.61	0.88	5.35

*Estimate

Source: Based on the data available at www.bvb.ro

Table 9 presents the daily averages for the equity main market for the period 1995-2015. It also presents how much of the total daily transactions, volume and value was concentrated by the five Financial Investment Companies or SIFs (from the Romanian Societati de Investitii Financiare) and by Fondul Proprietatea (FP).

The highest number of trades per day was reached in 2007, along with the highest daily value. Thus, the highest daily volume was reached in 2005 under the influence of intense trading that started in 2004. Another exceptional year from volume point of view was 2011; thus this high volume was generated by the selling activity under the European sovereign crisis influence. It must be pointed out that 2015 shows an important slowdown of trading activity and the reasons are to be investigated.

The importance of the five SIFs and FP within the daily trading at BVB cannot be contested. The listing of SIFs in November 1999 and of FP in January 2011 boosted the trading activity. SIFs importance decreased after FP was listed. Nevertheless these six investment funds dominate the transactions at BVB, have high liquidity and overshadow most of the other listed companies. These funds attract the investors due to their diversified portfolios and reasonable results. Thus, their dominance over the trading activity might be a weak point if one or several of these funds will fail to deliver good performance or their reputation will be tainted by scandals and/or negative rumors.

Table 9: BVB equity main market: daily averages and the position of SIFs and FP

Year	Trades	Volume	Value (ECU/EUR mn.)	SIFs			FP		
				% of trades	% of volume	% of value	% of trades	% of volume	% of value
1995	88	8,552	0.19	-	-	-	-	-	-
1996	213	13,767	0.05	-	-	-	-	-	-
1997	2,949	2,871,383	1.16	-	-	-	-	-	-
1998	2,283	4,299,840	0.85	-	-	-	-	-	-
1999	1,611	4,075,483	0.34	79.63	67.82	43.07	-	-	-
2000	1,986	7,097,489	0.37	68.36	63.98	36.78	-	-	-
2001	1,416	8,947,193	0.59	44.43	45.15	28.10	-	-	-
2002	2,680	16,141,465	0.91	50.87	30.08	34.19	-	-	-
2003	1,776	15,386,348	1.05	49.69	30.08	34.99	-	-	-

Year	Trades	Volume	Value (ECU/EUR mn.)	SIFs			FP		
				% of trades	% of volume	% of value	% of trades	% of volume	% of value
2004	2,494	51,204,647	2.34	43.15	17.71	31.92	-	-	-
2005	4,664	68,179,041	8.62	46.70	16.92	43.43	-	-	-
2006	5,789	54,925,378	11.27	57.81	17.83	50.84	-	-	-
2007	6,112	55,332,825	16.47	52.40	20.27	52.13	-	-	-
2008	5,317	50,030,924	7.54	40.51	20.43	44.91	-	-	-
2009	5,248	57,593,849	4.80	37.99	23.26	43.39	-	-	-
2010	3,467	52,259,027	5.21	42.87	35.48	48.24	-	-	-
2011	3,506	64,843,988	9.17	36.95	16.03	22.05	15.85	56.70	50.15
2012	2,576	50,103,388	6.67	34.52	21.69	28.05	12.31	43.16	36.92
2013	2,519	52,236,011	10.14	31.46	14.11	17.56	11.74	43.97	39.32
2014	3,139	46,442,021	11.69	26.98	16.18	14.89	7.91	35.38	28.64
2015	2,720	26,681,645	7.90	22.68	11.89	7.36	8.47	34.76	23.33

Source: Based on the data available at www.bvb.org

BVB equity main market indices

As of December 2015, nine indices are reported for the main equity market. Eight of these indices are calculated and reported by BVB, and one index (ROTX) was developed in collaboration with Vienna Stock Exchange and is only reported by BVB.

The oldest equity index is BET, launched in September 1997, while the most recent index is BET-XT-TR, a total return index launched in March 2015.

Seven of the nine indices are price indices, while the two most recent ones are total return indices, adjusted for dividends.

A general description of these nine indices characteristics is presented in Annex 1. The high number of indices is due to the evolution and changes that occurred within the BVB listed companies. The first two indices, BET and BET-Composite did not include the five SIFs. These investment funds' prices were captured by BET-FI, the first sector index. The need to include the SIFs within an index portfolio generated in the end two new indices (BET-XT and BET-BK). The energy sector became important at BVB since 2007 and a dedicate index was created (BET-NG). These family of indices was completed in 2014 and 2015 by two total return indices (BET-TR and BET-XT-TR) that are considered to complete the price evolution with the inclusion of dividends for the 10 and respective 25 of the most traded companies.

The performance of these nine indices is presented in Table 10 and Table 11. The oldest indices performance can be split into three sub-periods: a) before 2002 when their annual returns were lower or similar to the bank deposits and lower than the inflation rate; between 2002 and 2013, when, in general, the annual returns over passed the bank deposits and the inflation rate; the only important exceptions being 2008 and 2011; c) the period 2014-2015 exhibiting poor performances, with the exception of ROTX annual returns.

In the case of the indices launched since 2007 (Table 11), the data are available only for maximum 8 years. BET-XT and BET-NG were both affected by the recent financial crisis with two steep decreased in 2008 and 2011. BET-NG exhibits a poorer performance than the more diversified BET-XT. BET-BK shows a reasonable level of return since 2012. The inclusion of dividends in the calculation of BET-TR and BET-XT-TR generated good annual returns and indicates that, when dividends are considers, BVB companies become an attractive investment option.

Table 10: BVB equity market oldest indices (launched between 1997 and 2005) annual performance compared to inflation rate, bank deposit interest rate and DIVY (%)

Year	BET return	BET-C/ Plus return	BET-FI return	ROTX return	Inflation rate	Bank deposits' rate	DIVY
1998	-49.40	-	-	-	59.10	38.30	10.66
1999	15.21	-4.99	-	-	45.80	45.40	7.84
2000	18.25	7.39	-	-	45.70	32.44	7.48
2001	35.71	-6.47	109.92	-	34.50	26.16	6.70
2002	117.52	124.02	113.14	-	22.50	18.39	4.97
2003	27.13	22.62	24.72	-	15.30	10.78	2.00
2004	93.15	98.29	106.94	-	11.90	11.34	1.45
2005	42.47	31.63	151.32	-	9.00	8.34	0.94
2006	18.09	25.07	24.66	20.16	6.56	6.51	1.72
2007	16.29	26.27	14.95	15.73	4.84	6.70	2.18
2008	-69.68	-69.68	-83.62	-68.70	7.85	9.55	8.57
2009	57.21	34.62	83.33	42.22	5.59	11.89	2.81
2010	10.89	13.49	-10.09	10.85	6.09	7.29	1.87
2011	-19.18	-16.73	-13.52	-27.09	5.79	6.29	5.46
2012	18.57	6.29	29.63	28.46	3.33	5.50	6.94
2013	21.87	16.25	19.88	20.49	3.98	4.54	4.79
2014	9.21	-6.11	-3.83	10.43	1.07	3.02	6.11
2015	0.48	0.24	0.52	8.64	-0.56	1.93	5.35

Source: Based on the data available at www.bvb.ro and at www.bnro.ro

Table 11: BVB equity new indices (launched since 2007) annual performance compared to inflation rate, bank deposit interest rate and DIVY (%)

Year	BET-XT return	BET-NG return	BET-BK return	BET-TR return	BET-XT-TR return	Inflation rate	Bank deposits rate	DIVY
2007	9.63	18.99	-	-	-	4.84	6.70	2.18
2008	-74.67	-71.71	-	-	-	7.85	9.55	8.57
2009	61.54	63.99	-	-	-	5.59	11.89	2.81
2010	0.30	27.96	7.60	-	-	6.09	7.29	1.87
2011	-15.25	-21.51	-18.21	-	-	5.79	6.29	5.46
2012	13.45	2.51	13.03	-	-	3.33	5.50	6.94
2013	19.64	2.65	15.55	26.79	28.24	3.98	4.54	4.79
2014	6.44	5.84	3.70	14.64	11.23	1.07	3.02	6.11
2015	1.16	-12.60	3.13	4.80	6.38	-0.56	1.93	5.35

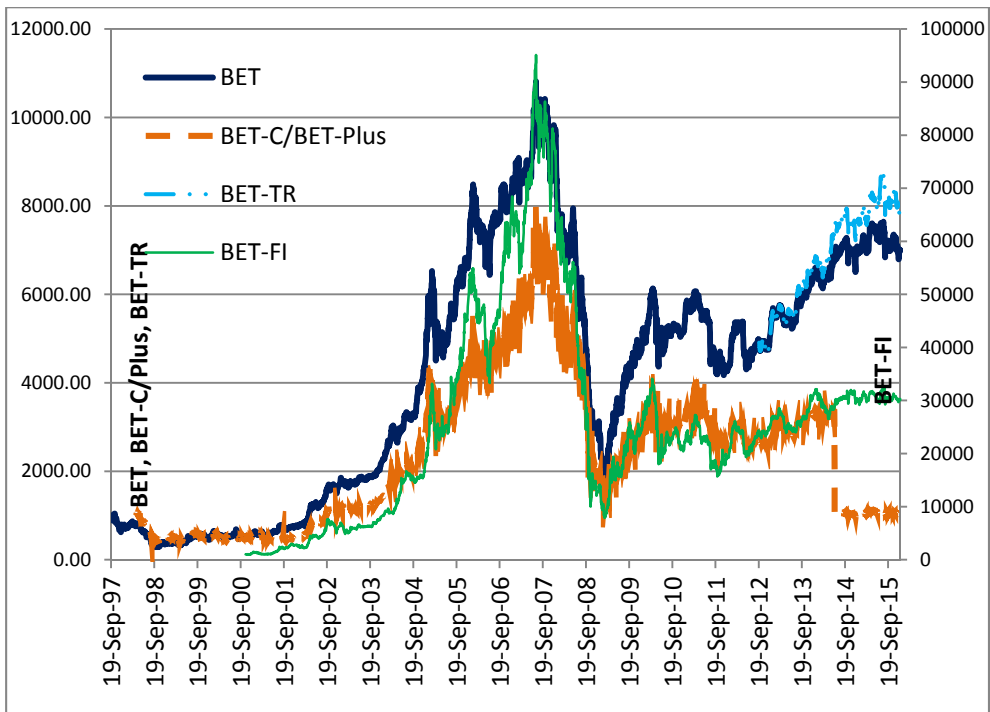
Source: Based on the data available at www.bvb.ro and at www.bnro.ro

The evolution BET, BET-C/Plus, BET-FI, and BET-TR is presented in Graph 2. The inclusion of all indices within one graph was impossible due to different scales and value intervals. However, other two graphs are available for the other indices in Annex 2.

In Annex 3 the descriptive statistics for the absolute values and the daily returns of all indices can be found, including the dates when the maximum and minimum values were recorded.

The results for daily returns indicate a relative symmetrical distributions for all the indices, slightly skewed to the left, with the exception of BET and BET-FI which are slightly skewed to the right. The high level of kurtosis indicates peaked distributions compared to a normal distribution.

Graph 2: The daily evolution of BET, BET-C/Plus, BET-FI, and BET-TR between April 1997 and December 2015.



Source: Based on the data available at www.bvb.ro

BVB bond main market

This market segment was launched in November 2001 with the introduction of municipal bonds. It was further diversified in 2003 through the introduction of the domestic corporate bonds, in 2006 with the international bonds, and in 2008 with the listing of domestic Government bonds. The year 2015 marked a premier: the first initial public offering for Government bonds (dedicated to individual investors only) was registered through the BVB trading platform.

Table 12 presents the general information for this bond market and the trading structure based on turnover. Table 13 presents the bond public offerings and their structure by final value.

The interest toward the listed bonds was transferred successively from municipal to domestic corporate bonds, then to international bonds, and finally remained concentrated around the domestic Government bonds. However, this concentration in value is misleading since the face values of the majority of these bonds are either 5,000 RON or 10,000 RON and the trading is concentrated by institutional investors. While the corporate bond sector seemed interesting for investors, its evolution was interrupted by no listed bonds for two years and the lack of transactions for three years. In general, the annual trading value for the bond main market is low, despite the listing of a high number of bonds. This is mainly due to the investors' buy and hold behavior given the relative high coupons mainly for the corporate and Government bonds.

As Table 13 reveals, the public offerings usually were concentrated on only one type of bond, with the exception of the years 2006 (domestic corporate and international bonds) and 2015 (municipal, domestic corporate and Government bonds).

Table 12: BVB bond main market segment general information (public offerings excluded)

Year	Trades	Volume	Value (EUR mn.)	No. of listed bond issues (as of the end of every year)	New listings	Turnover structure by bond segments (%)			
						% of muni. bonds	% of corporate bonds	% of international bonds	% of government bonds
2001	5	45	0.00	2	2	100.00	-	-	-
2002	10	59,050	0.25	4	2	100.00	-	-	-
2003	37	28,870	0.36	10	9	95.66	4.34	-	-
2004	274	118,136	13.15	25	17	10.02	89.98	-	-
2005	334	197,107	29.67	19	6	2.38	97.62	-	-
2006	319	603,208	53.88	18	5	3.80	49.38	46.82	-
2007	233	3,652,467	147.99	22	11	2.00	10.03	87.97	-

Year	Trades	Volume	Value (EUR mn.)	No. of listed bond issues (as of the end of every year)	New listings	Turnover structure by bond segments (%)			
						% of muni. bonds	% of corporate bonds	% of international bonds	% of government bonds
2008	547	862,927	53.47	50	34	15.92	22.30	52.09	9.69
2009	958	1,822,908	277.75	60	16	1.65	5.15	15.80	77.40
2010	540	591,511	552.87	55	7	0.99	0.00	0.59	98.42
2011	245	857,248	105.21	59	6	1.91	0.00	16.55	81.54
2012	368	220,238	264.87	63	8	0.04	0.00	0.91	99.05
2013	475	106,048	95.21	57	7	0.65	9.44	0.05	89.86
2014	325	90,029	35.04	65	5	1.65	25.39	0.00	72.96
2015	431	136,105	100.64	69	11	16.82	21.19	0.89	61.10

Note: A difference between the figures reported in this paper and the figures reported by BVB appears for the number of listed bonds at the end of the year. This difference occurs mainly due to the fact BVB still registers as suspended 12 Government bonds that matured in 2013, 2014, and 2015.

Source: Based on the data available at www.bvb.ro

Table 13: BVB bond main market segment public offerings

Year	Trades	Volume	Value (EUR mn.)	No. of offered issues	Turnover structure by bond offerings (%)			
					% of muni. Bonds offerings	% of corporate bonds offerings	% of international bonds offerings	% of government bonds offerings
2001	0	0	0.00	0	0.00	-	-	-
2002	0	0	0.00	0	0.00	-	-	-
2003	2	158,000	4.21	2	100.00	0.00	-	-
2004	705	371,000	48.26	3	0	100.00	-	-
2005	61	200,000	5.52	1	100.00	0.00	-	-
2006	252	3,321,264	228.66	3	0.00	34.68	65.32	-
2007	34	3,000,000	90.17	1	0.00	0.00	100.00	-
2008	0	0	0.00	0	0.00	0.00	0.00	0.00
2009	4	1,070,000	25.24	3	100.00	0.00	0.00	0.00
2010	3	2,422,864	57.52	3	100.00	0.00	0.00	0.00
2011	3	1,000,000	23.59	1	100.00	0.00	0.00	0.00
2012	41	25,000	56.06	1	0.00	100.00	0.00	0.00
2013	92	97,500	220.64	3	0.00	100.00	0.00	0.00
2014	68	80,000	180.03	2	0.00	100.00	0.00	0.00
2015	1,586	298,109	539.01	6	92.65	0.00	4.63	2.72

Source: Based on the data available at www.bvb.ro

Table 14 presents the average bond coupons in comparison with the inflation rate, bank deposits, and BET index. The results are mixed. The Government bonds should have the lowest coupons given their risk free standing. Thus, municipal bonds present the lowest coupons due to their variable interest rate that follows the current decrease of Romanian interbank interest rates and have low risk premia. Another oddity comes from the corporate bonds which seems to have a very low risk premium or no risk premium compared to Government bonds. As expected, the bonds prove to be better investment choices in times of equity market distress. This is reflected by the data in Annex 4 which shows the ‘flight to safety’ of investors in 2008 and 2009.

Table 14: BVB bond coupons compared to inflation rate, bank deposit rate and BET return (%)

Year	Municipal bonds	Corporate bonds	International bonds	Government bonds	Inflation rate	Bank deposit rate	BET return
2001	36.50	-	-	-	34.50	26.16	35.71
2002	31.71	-	-	-	22.50	18.39	117.52
2003	19.39	5.34	-	-	15.30	10.78	27.13
2004	20.16	12.76	-	-	11.90	11.34	93.15
2005	12.38	8.66	-	-	9.00	8.34	42.47
2006	9.20	8.29	6.75	-	6.56	6.51	18.09
2007	8.77	8.50	6.75	-	4.84	6.70	16.29
2008	11.22	10.39	6.75	7.31	7.85	9.55	-69.68
2009	13.25	12.42	8.25	7.58	5.59	11.89	57.21
2010	8.31	n/a	9.13	7.55	6.09	7.29	10.89
2011	6.85	n/a	9.13	7.41	5.79	6.29	-19.18
2012	6.18	7.40	9.13	7.01	3.33	5.50	18.57
2013	5.57	6.88	9.13	6.59	3.98	4.54	21.87
2014	3.64	6.03	9.13	6.32	1.07	3.02	9.21
2015	2.56	5.83	11.25	5.91	-0.56	1.93	0.48

Note: The bond coupons are calculated as the annual average of the listed bonds within the respective year

Source: Based on the data available at www.bvb.ro and at www.bnro.ro

Annex 4 presents the trading details for all the four types of bonds listed within the bond main market. The trading frequency is low for all four types of bonds and this is reflected also by the small number of trades per day. The trading volume must be considered in relation with the nominal value of the bonds which is relative low (100 RON) in the case of municipal bonds and in one case of a corporate bond issue (8 RON for IMO22) and high (5,000 and 10,000 RON) for the majority of the Government bonds. Also the corporate and international bonds have, in general, nominal values of 10,000 RON. This situation is not attractive for the majority of domestic individual investors due to the high value that is required for just one security.

Nonetheless, 2015 registered a premiere for the municipal bonds with the public offering and the subsequent listing of four bond issues launched by the Romanian capital, Bucharest. The introduction of these bonds increased the trading

activity within municipal bond sector at an annual level never reached previously. The second premiere is related to the Government bond sector which witnessed the first public issue dedicated to the population launched through BVB system and the subsequent listing of the respective bonds. This event also had a contribution to the increase in Government bonds trading activity.

While no data are available regarding the ownership structure of the BVB listed bonds, the trading profile indicates that the majority of trading is done by institutional investors, sporadically, when they need to convert the bonds into cash. Otherwise, the coupon levels induce the treasuring of these bonds.

It must be mentioned that the evolution of the bond main market becomes increasingly difficult to follow in the absence of an appropriate bond index or a family of indices dedicated to the listed types of bonds.

BVB other securities' main market

The trading activity for the other securities listed within the main market is presented in Tables 15 to 19. While almost negligible within the total BVB main market turnover, dominated by the equity trading, the evolution of each of these securities reveals interesting facts and, in some cases, weaknesses.

The trading intensity within the rights sector is mainly related to the privatization of Transgaz (TNG) in 2007-2008 and Nuclearelectrica (SNN) in 2013. The other two years when the rights' trading was moderate were 2005, when the rights of OMV Petrom (SNP) were introduced, and 2010 when Banca Transilvania (TLV) rights were traded. Both SNP and TLV are blue chip companies and all the related securities are intensely traded. Otherwise, the interest for trading rights is marginal as the data from 2011 and 2012 show.

Table 15: BVB main market: rights

Year	End of the year				Daily averages (for the days when trading took place)		
	Listed	Trades	Volume	Value (ECU/EUR mn.)	Trades	Volume	Value (ECU/EUR mn.)
2005	2	2,588	231,482,060	0.78	199	17,806,312	0.06
2006	2	606	393,246,100	0.16	40	26,216,407	0.01
2007	2	4,618	12,974,087	24.71	462	1,297,409	2.47
2008	3	3,827	2,924,796	12.98	75	57,703	0.26
2009	0	0	0	0.00	0	0	0.00
2010	1	2,769	161,790,000	1.11	185	10,786,000	0.07
2011	1	3	102	0.00	2	51	0.00
2012	1	2	5	0.00	1	3	0.00
2013	2	4,615	2,491,249	6.48	243	131,118	0.34
2014	0	0	0	0.00	0	0	0.00
2015	0	0	0	0.00	0	0	0.00

Source: Based on the data available at www.bvb.ro

The derivative market segment launched during 2007 offered only futures contracts. While the offer was diversified during 2008 by the introduction of contracts on listed equities, the trading activity remained modest. The contracts of BVB indices were almost never traded, indicating a low activity in portfolio management and subsequent need of hedging. It also might indicated that the for the existing portfolio managers, the hedging alternative offered by Vienna Stock Exchange with the contracts on ROTX is a better choice due to a higher liquidity of those contacts.

The trading activity on this market segment took place mostly during the period that followed the climax of the recent financial crisis. During 2011 the contracts on commodities (gold, silver, brent) were introduced. Thus the economic recovery that started in 2012 determined the loss of interest toward futures contracts and the trading died out in 2013. BVB executives decided to suspend the introduction of new contracts and the renewal of the existing ones and since January 2014 until December 2015 no futures contract was listed on the derivative market. As mentioned above, BVB announced the withdrawal of this market's authorization on January 8th 2016, mentioning a potential reopening when the liquidity for the underlying domestic assets will improve.

Table 16: BVB main market: futures contracts

Year	End of the year					Daily averages			
	Types of contracts	Open interest	Trades	Volume	Value (ECU/EUR mn.)	Open interest	Trades	Volume	Value (ECU/EUR mn.)
2007	2	33	40	62	0.16	26	3	4	0.01
2008	14	146	18,144	19,066,702	0.05	330	116	121,444	0.00
2009	14	958	507	15,613	15.81	1,206	4	115	0.12
2010	14	291	1,754	25,119	25.43	2,782	9	129	0.13
2011	20	1,084	3,003	54,137	24.30	1,127	13	227	0.10
2012	20	247	1,963	20,423	9.02	773	8	85	0.04
2013	1	0	415	2,795	0.68	469	4	29	0.01
2014	0	0	0	0	0	0	0	0	0.00
2015	0	0	0	0	0	0	0	0	0.00

Source: Based on the data available at www.bvb.ro

The introduction of UCITSs was motivated by diversification. Moreover, the relative low prices of these UCITSs should have increased their attractiveness among the individual investors. As in the case of futures contracts, this main market segment registered some trading activity mainly during 2010 and 2011, when the effects of the financial crisis determined investors to look for investment

alternatives. The low attractiveness of the sector might have two reasons: the issuers that do not trigger the investors' interest and the lack of knowledge among the the potential investors. With no new listings since 2010, even the existing investors will loose the interest toward UCITs.

Table 17: BVB main market: UCITs

Year	End of the year				Daily averages		
	Listed	Trades	Volume	Value (ECU/EUR mn.)	Trades	Volume	Value (ECU/EUR mn.)
2008	1	1,191	65,357	1.27	18	990	0.02
2009	2	2,038	71,662	0.65	8	287	0.00
2010	5	4,437	163,056	2.50	17	639	0.01
2011	5	12,474	88,644	2.05	49	348	0.01
2012	4	2,191	88,325	1.02	9	353	0.00
2013	3	4,285	80,840	1.33	17	322	0.01
2014	3	1,948	120,107	1.88	8	480	0.01
2015	3	885	61,352	1.07	4	244	0.00
Fund units public offerings							
Year	Listed	Trades	Volume	Value (ECU/EUR mn.)			
2009	2	1,496	88,322	4.19			
2010	2	590	60,056	2.87			

Source: Based on the data available at www.bvb.ro

The introduction of the certificates in 2010, the only financial instruments currently traded under the segment structured products, was also motivated by diversification. These certificates⁵ are hybrid financial instruments, based on an underlying asset and include a derivative component (long or short position) that influences the certificate's risk and return profile. The certificates can be issued by banks, financial intermediaries and other financial institutions and therefore these instruments bear the risk of the issuer in the case of default. Since they do not require a margin and closing a position through an opposite position, these certificates seemed to attract more the attention of BVB investors. The data indicate a higher trading activity than in the case of futures contracts. Thus, the trading dropped abruptly in 2014 and recovered in 2015. The parallel existence of the futures contracts and certificates might contributed to the lack of interest toward the futures contracts by speculators since the simpler features of the certificates and the lower associated costs make them more attractive.

⁵ BVB offer a presentation of these certificates within a guide book available at:
<http://www.bvb.ro/info/Rapoarte/Ghiduri/ghid%20certificate%20eng%20web.pdf>

Table 18: BVB main market: structured products

Year	End of the year				Daily averages		
	Listed	Trades	Volume	Value (ECU/EUR mn.)	Trades	Volume	Value (ECU/EUR mn.)
2010	24	12,706	1,213,307	10.86	102	9,785	0.09
2011	57	99,531	12,137,927	103.75	390	47,600	0.41
2012	65	217,520	42,634,704	154.90	870	170,539	0.62
2013	78	181,614	57,443,179	120.34	724	228,857	0.48
2014	93	197,174	51,957,069	51.26	789	207,828	0.21
2015	130	299,749	89,376,509	90.72	1,194	356,082	0.36

Source: Based on the data available at www.bvb.ro

The last type of securities introduced on BVB main markets were the ETFs, since 2012. In fact, only one ETF is listed and traded. The trading activity for this instrument, though frequent, is thin. It confirms the hypothesis of domestic investors' lack of sophistication and in depth knowledge regarding other financial instruments than shares. Also the only listed ETF might not be attractive for most investors and new listings might be welcome.

Table 19: BVB main market: ETFs

Year	End of the year				Daily averages		
	Listed	Trades	Volume	Value (ECU/EUR mn.)	Trades	Volume	Value (ECU/EUR mn.)
2012	1	456	76,449	0.09	5	910	0.00
2013	1	746	269,158	0.38	3	1,072	0.00
2014	1	1,624	386,260	0.40	6	1,545	0.00
2015	1	1,284	395,962	0.67	5	1,578	0.00

Source: Based on the data available at www.bvb.ro

Of all these other instruments, only the certificates (structured) products manage to concentrate about 2% of BVB main market turnover, as Graph 1 shows.

The ATS segment at BVB

The main milestones in the ATS recent development are presented in Table 20. Between 2008 and 2014 the ATS segment hosted only the dual listing of blue chip foreign shares.

While this market segment was created in order to encourage the transfer of RASDAQ listed companies on a new a better regulated market, the expected transfers never occurred. Only one was registered in 2013-2014. The problems with RASDAQ segment, considered an unregulated market, and the decision to close it during 2015 determined the transformation of ATS. AeRO sector was

introduced for (small) domestic companies and over 250 of about 900 companies listed on RASDAQ as of January 2015 were transferred on AeRO.

Table 20: The main steps in developing the ATS at BVB

2008	The introduction of ATS
2015	<p>February: The launch of the AeRO segment and the start of domestic equity trading</p> <p>July: The introduction of the first corporate bond; the second corporate bond start trading in December 2015.</p> <p>August: The introduction of the first UCITS, transferred from RASDAQ (XFOA symbol)</p>

Source: Author's compilation based on the information available at:

<http://www.bvb.ro/AboutUs/Publications>, <http://www.bvb.ro/AboutUs/MediaCenter/PressReleases>

The trading activity on ATS is presented in Table 21. While offering the possibility to trade on international blue chip stocks using the domestic currency and save the cost of trading on a foreign stock exchange, the offer seemed not very attractive mainly due to the high prices associated with these foreign shares. Trading at several hundreds or thousands of Romanian new lei, the foreign shares are out of the investment range of many individual investors. Therefore the trading on ATS remained also thin until the introduction of AeRO and the listing of domestic companies.

As Table 21 further shows, this segment also started to diversify in 2014 with the introduction of rights and in 2015 with the introduction of 2 corporate bonds and one UCIT. These new listings are too recent in order to be analyzed.

Table 21: BVB - ATS market

Equities				
Year	Listed securities	Trades	Volume	Value (ECU/EUR mil.)
2010	1	152	2,731	0.14
2011	10	3,285	89,211	2.62
2012	27	5,947	122,248	3.76
2013	29	7,656	1,951,214	4.72
2014	36	8,718	999,905	4.56
2015	306	31,657	165,338,187	20.23
Rights				
2014	1	33	638	0.00
Bonds				
2015	2	52	4,281	0.97
UCITs				
2015	1	135	19,121	0.01

Source: <http://www.bvb.ro/TradingAndStatistics/Statistics/GeneralStatistics> and based on the data available at www.bvb.ro

Discussions

A brief SWOT (strengths, weaknesses, opportunities and threats) analysis summarizes best the two decades of evolution at BVB

The SWOT analysis of BVB

Strengths	Weaknesses
<ul style="list-style-type: none"> ✓ BVB offers an interesting mix of listed securities. ✓ The listed companies on the main market still have a growth potential. ✓ The ATS – AeRO segment is still an unexplored ‘mine’. ✓ The Government bonds, corporate bonds and international bonds offer good coupons. ✓ An up to date trading platform and applications that allow the use of this platform on various mobile devices. ✓ A relative easy to use website, offering a high transparency mainly for domestic investors. ✓ The recent (2014) launch of two public relation campaigns addressing foreign institutional investors and domestic individual investors in order to attract and increase the number of BVB investors. ✓ BVB as a company shows a high level of transparency and a good corporate governance. All these show BVB to be a good manager of the main Romanian trading platform for securities. 	<ul style="list-style-type: none"> - The trading is spread thin among too many securities mainly within the regulated market segment. - The liquidity is low or very low outside the equity Premium category. - The equity trading is dominated by a small number of companies; - The nine indices reported for the equity market can create confusion among potential investors. - There is no index available for the bond main market. Therefore this market is difficult to follow and almost impossible to be compared with the similar markets within the trading platforms of the neighboring countries. - The absence of a liquid derivative market offering hedging alternatives. - A relative lower transparency for foreign investors; not all the information is available in English.

Opportunities	Threats
<ul style="list-style-type: none"> ➤ A good set of regulations, adjusted to the requirements of MiFID (Markets in Financial Instrument Directive). ➤ The position as frontier markets that, along with the associated risks, promises potential high returns. ➤ The improving of sovereign rating and the decrease of CDSs spreads for Romania. ➤ A simplified taxation procedure and a decreased in taxation level for dividends starting with 2016. ➤ Potential new issuers as the privatization process of some large Romanian companies (like the national carrier Tarom or CEC Bank) is likely to continue. ➤ A potential merger with SIBEX (Sibiu Stock Exchange) which has an older and better established derivative market. 	<ul style="list-style-type: none"> ○ The relative high risk associated with the status of frontier market. ○ The closure of the derivative market that might influence the efforts to upgrade the status to ‘emerging’. ○ A thin and unsophisticated base of domestic investors⁶. ○ The Romanian opaque business environment that influences the corporate governance of the listed companies and the transparency of other issuers like the municipalities and the central government. ○ A corporate culture that does not favor the public offerings of either shares or bonds. ○ The absence of a significant alliance with one or several of the neighboring exchanges in an effort to attract international investors. ○ The current MiFID1 and MiFID2 regulations and the competitive environment created by them.

To the points mentioned within the SWOT matrix two other details, difficult to include in the matrix, must be added.

The first one refers to the listed companies. Those on the main market are more transparent and might be interesting from their activity point of view. Thus, many of them have poor or mediocre websites, with absent or hidden and/or unorganized information for investors; most of the time, the information for

⁶ The Investor Compensation Fund is the only source regarding the number of investors at BVB. The data available within this fund annual reports show the following evolution of investor number.

2006	2007	2008	2009	2010	2011	2012	2013	2014	09/2015
65,304	87,664	92,865	94,545	86,453	88,143	81,218	85,381	74,571	71,376

Sources: <http://www.fond-fci.ro/pages/rapoarteanuale.php> and

<http://www.fond-fci.ro/docs/Comunicate/Comunicat%20de%20presa%2011%20nov.%202015.pdf>

investors are not available in English, even if an English version of the website is offered. Moreover, in most cases, the corporate governance is lax and this is best seen in the absence of a clearly formulated dividend/investment policy. Furthermore, the new companies transferred to AeRO from RASDAQ have an even lower level of transparency; in some cases they do not have even an active website.

The second one is related to the listed municipal bonds. The important change in regulations during 2000-2001 allowed the municipalities to borrow money through the issuance of bonds. Some provisions are made by regulations for the protection of the investors in the respective bonds; thus these provisions do not work properly as the default of a small municipality in 2014 has shown. This situation raised the problem of the absence of credit enhancement mechanisms, combined with absence of the credit rating for the domestic municipal and corporate bonds. The international investors will avoid investing in financial instruments that lack such characteristic. Moreover, the Romanian municipalities are the least transparent of the issuers due to the poor organization of information on their websites and the often absence of the information regarding the issued bonds.

While BVB managers and public relation officers often meet with the issuers' representatives, it is difficult to enforce a change in mentalities and to convince these issuers that their presence in the virtual world through their websites is an investment and not money thrown away.

In both these situations, the power to solve the problem is often outside BVB's influence. Suggestion can be made; thus to keep the balance between the number of issuers and the quality of their transparency needs a lot of diplomacy given the Romanian issuers' still emergent market culture.

Conclusions

When BVB was re-opened for transactions on November 20th 1995, the enthusiastic group of people that make it possible had high hopes for the future. BVB witnessed two crisis (the 1997-1998 Asian crisis and the recent 2007-2011 financial crisis), dealt with an opaque Mass Privatization Program, struggled to keep the listing standard, and to distance itself from the fraud scandals that tainted the image of (then) the competitor RASDAQ between 1999 and 2001.

BVB also had to navigate through and adapt to numerous changes in the set of regulations concerning the capital markets. Furthermore, BVB had to address not always supporting Government institutions; the most notorious (unfortunately) was the Ministry of Finance refusal to list the Government bonds at BVB between 1998 and 2007 and the same institution taxation policy and needless bureaucracy that constantly impaired the increase of investor number at BVB. At the same level of notoriety were the successive decisions of various

agencies/ministries that dealt with the privation process to avoid the use of BVB trading platform for this process. A breakthrough came in 2007, after Romania's accession to the European Union.

From a minuscule capitalization to over 32 EUR billion at the end of 2015, from a single type of security traded to the current diversification in trading platforms and listed securities, BVB's road to the current development was long and difficult. Thus, BVB members/shareholders and the executive team never lost their enthusiasm and their ambitious goals for development. The willingness to change and adapt to the highly competitive European financial environment was shown two years ago when the decision to bring a foreign and highly experience CEO was taken.

The current choice of BVB in facing the competition of the other European trading platforms is to remain independent. The present shareholder structure and BVB's rules regarding share concentration make any takeover almost impossible. Furthermore, BVB did not announce any clear intention to make an alliance or to become part of an alliance of security exchanges. However, this strategy might change according to the fast and ever changing European Union financial environment.

Manifestly, BVB is relevant for the domestic issuers. BVB's potential to grow is interlinked with the issuers' potential and willingness to grow. It is also linked to the quality of the listed issuers; if these issuers are interesting for diversifying international portfolios, the flow of foreign investors will follow. Currently, this situation is impaired by the low liquidity in most instruments, excepting about 10-12 shares listed within the main market Premium category.

Nevertheless, BVB officials, through their public campaign targeting the (young) individual investors, try to unearth this hidden domestic growth potential which has the power to increase BVB's trading activities in the years to come.

Through its capacity and willingness to change, adapt, and face new challenges, one can look with confidence at the BVB's future development.

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Annex 1

BVB main equity market indices

Symbol	Complete name	Launch date	Base/ Start value (points)	Number of constituents	Maximum weight/ constituent	Weightening	Type of index	Other information
BET ¹⁾	Bucharest Exchange Trading	September 19, 1997	1,000	10	20%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	Tracks the performance of the 10 most traded companies
BET-C	Bucharest Exchange Trading Composite	April 16, 1998 <i>Discontinued June 20, 2014</i>	1,000	all BVB traded companies except SIFs and foreign companies	20%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	Replaced by BET Plus
BET Plus	Bucharest Exchange Trading Plus	June 23, 2014	1,000	variable (as of Dec.2015, 34 constituents) does not include the SIFs and foreign companies	20%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	Conditions for the constituents: - minimum liquidity factor of 0.0002 - minimum/ free float: EUR 1 mn
BET-FI	Bucharest Exchange Trading – Investment Funds	October 31, 2000	1,000	variable (as of Dec.2015, 6 constituents)	30%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	The first sector index. Tracks the performance of the (closed-end) investment funds
BET-XT	Bucharest Exchange Trading Extended	July 1, 2008	1,000 as of January 2, 2007	25 (includes the SIFs)	15%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	Tracks the performance of the most traded 25 domestic listed companies, including SIFs
BET-NG	Bucharest Exchange Trading Energy & Related Utilities	July 1, 2008	1,000 as of January 2, 2007	variable (as of Dec.2015, 11 constituents)	30%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	The second sector index
BET-BK	Bucharest Exchange Trading Benchmark	July 3, 2012	1,000 as of September 18, 2009	25	²⁾ 10%	Float-adjusted capitalization weightening	Price index (not adjusted for dividends)	Minimum liquidity factor: 0.25. Designed to be used as benchmark by domestic asset managers and other institutional investors. ³⁾

BUCHAREST STOCK EXCHANGE DEVELOPMENT BETWEEN 1995 AND 2015

Symbol	Complete name	Launch date	Base/ Start value (points)	Number of constituents	Maximum weight/ constituent	Weightening	Type of index	Other information
BET-TR	Bucharest Exchange Trading Total Return	September 22, 2014	4,910.39 as of September 21, 2012	10 (the same constituents as for BET)	20%	Float-adjusted capitalization weightening	Total return (adjusted for dividends and similar cash distributions before tax)	The first total return index
BET-XT-TR	Bucharest Exchange Trading Extended Total Return	March 23, 2015	486.44 as of December 28, 2012	25 (the same constituents as for BET-XT)	15%	Float-adjusted capitalization weightening	Total return (adjusted for dividends and similar cash distributions before tax)	The second total return index
ROTX	Romanian Traded Index	March 15, 2005	1,000 as of January 1, 2002	15 (as of Dec.2015, 10 constituents)	20%	Capitalization weightening	Price index (not adjusted for dividends)	The constituents are Romanian blue chip stocks. Calculated and disseminated by Vienna Stock Exchange.

Note 1): Considered to be the reference index for the Romanian capital market

<http://www.bvb.ro/FinancialInstruments/Indices/Overview>

Note 2): The weight of a group of companies cannot exceed 20% The sum of weights of companies/ groups of companies accounting for more than 5% of the index cannot exceed 40% of the index capitalization;

<http://www.bvb.ro/info/indices/2015/2015.06.30%20-%20BET-BK%20Factsheet.pdf>

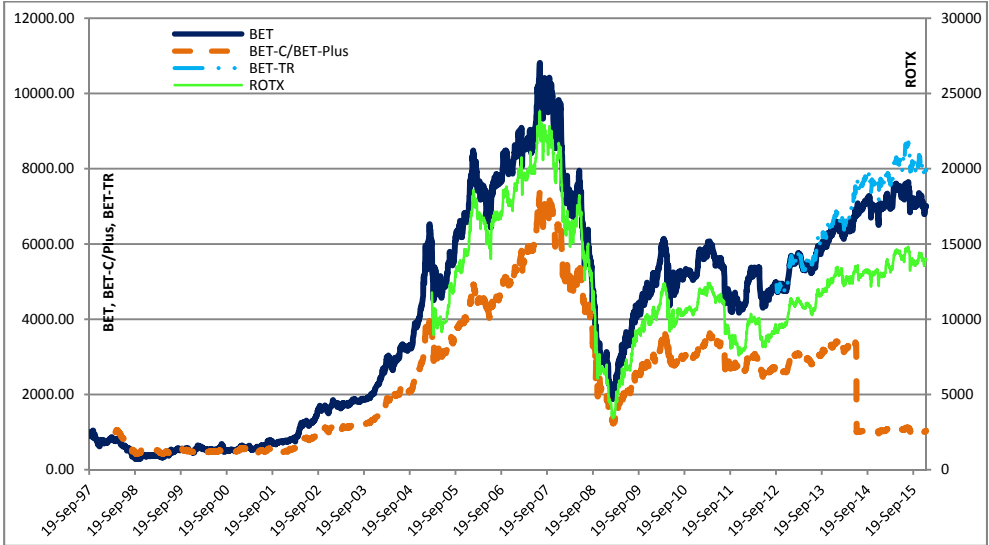
Note 3): The calculation of BET-BK reflects the legal requirements and the investment limits applying to domestic investment funds; fully UCITS compliant index;

<http://www.bvb.ro/info/indices/2015/2015.06.30%20-%20BET-BK%20Factsheet.pdf>

Source: <http://www.bvb.ro/FinancialInstruments/Indices/Overview> and the respective indices factsheets available within the aforementioned link.

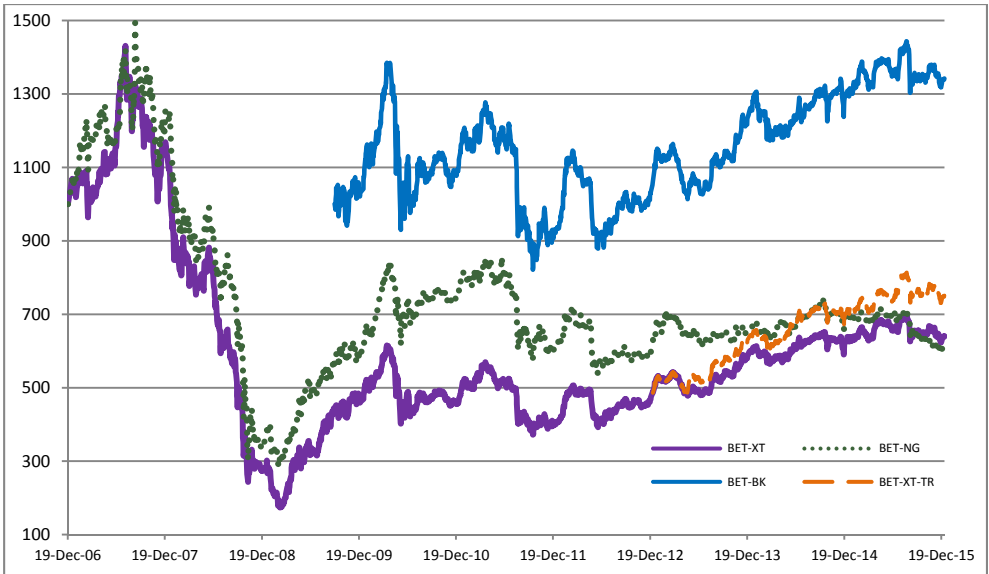
Annex 2

Annex 2a: The daily evolution of BET, BET-C/Plus, ROTX, and BET-TR



Source: Based on the data available at www.bvb.ro

Annex 2b: The daily evolution of BET-XT, BET-NG, BET-BK, and BET-XT-TR



Source: Based on the data available at www.bvb.ro

Annex 3

Annex 3a: BVB indices descriptive statistics for absolute values

	Mean	Median	Min.	Date when recorded (dd/mm/yy)	Max.	Date when recorded (dd/mm/yy)	Observations
BET	4,143.31	4,718.89	281.24	24/09/98	10,813.59	24/07/07	4,568
BET-C/ Plus	2,370.65	2,447.72	421.98	24/09/98	7,432.63	24/07/07	4,430
BET-FI	25,944.46	24,123.09	944.72	04/12/00	95,111.01	24/07/07	3,783
ROTX	12,611.83	12,013.94	3,440.98	25/02/09	23,811.65	23/07/07	2,706
BET-XT	595.12	528.64	173.57	24/02/09	1,430.91	24/07/07	2,263
BET-NG	729.86	682.96	290.91	17/02/09	1,494.01	29/08/07	2,263
BET-BK	1,151.45	1,139.87	821.63	04/11/11	1,443.66	10/08/15	1,581
BET-TR	6,871.24	6,960.39	4,723.07	03/10/12	8,699.58	10/08/15	819
BET-XT-TR	657.57	683.36	486.44	28/12/12	813.79	10/08/15	753

Source: Based on the data available at www.bvb.ro and at www.bnro.ro

Annex 3b: BVB indices descriptive statistics for daily returns (%)

Index	Mean	Median	Standard deviation	Min.	Date when recorded (dd/mm/yy)	Max.	Date when recorded (dd/mm/yy)	Kurtosis	Skewness	Observations
BET	0.0573	0.0447	1.7146	-12.2929	07/01/09	15.6924	21/03/02	8.1010	0.0349	4,567
BET-C/Plus	0.0364	0.0440	1.4705	-11.4129	07/01/09	11.5058	14/10/08	8.4933	-0.4098	4,429
BET-FI	0.1177	0.0202	2.3481	-14.8500	10/10/08	14.8269	16/04/09	6.7332	0.2301	3,782
ROTX	0.0215	0.0508	1.7254	-17.8425	07/01/09	10.9925	10/05/10	10.5928	-0.7211	2,705
BET-XT	-0.0041	0.0322	1.7640	-11.9155	25/05/10	11.6545	10/05/10	8.1985	-0.3111	2,262
BET-NG	-0.0071	-0.0018	1.7292	-14.1501	10/10/08	14.4024	14/10/08	11.7624	-0.0753	2,262
BET-BK	0.0264	0.0326	1.2475	-10.3164	25/05/10	11.9709	10/05/10	14.0984	-0.3033	1,580
BET-TR	0.0624	0.0518	0.7763	-6.3045	24/08/15	3.4716	03/01/13	7.0106	-0.5136	818
BET-XT-TR	0.0607	0.0487	0.7610	-6.2151	24/08/15	3.8922	13/05/13	8.4640	-0.5078	752

Source: Based on the data available at www.bvb.ro

Annex 4**BVB municipal bond main market sector general information (public offerings excluded)**

Year	Trades	Volume	Value (EUR mn.)	No.of listed issues (as of the end of every year)	New listings	Trading frequency (%)	Daily averages (for the days when trading took place)		
							Trades	Volume	Value (EUR mn.)
BVB municipal bond main market sector general information (public offerings excluded)									
2001	5	45	0.00	2	2	23.53	1	11	0.00
2002	10	59,050	0.25	4	2	2.43	2	9,842	0.04
2003	12	29,310	0.34	9	8	4.56	1	2,665	0.03
2004	85	51,945	1.32	19	12	14.23	2	1,443	0.04
2005	60	25,632	0.71	13	5	16.19	2	641	0.02
2006	60	80,658	2.04	11	3	8.47	3	3,841	0.10
2007	58	119,695	2.96	16	7	10.00	2	4,788	0.12
2008	175	323,793	8.51	20	9	22.80	3	5,681	0.15
2009	157	221,349	4.57	31	13	26.80	2	3,304	0.07
2010	88	254,207	5.46	35	5	15.69	2	6,355	0.14
2011	47	107,839	2.01	36	2	8.63	2	4,902	0.09
2012	8	5,992	0.10	36	0	2.40	1	999	0.02
2013	111	64,548	0.62	37	1	18.73	2	1,373	0.01
2014	150	74,382	0.58	35	0	30.80	2	966	0.01
2015	275	55,294	16.92	38	4	42.23	3	522	0.16
BVB corporate bond main market sector general information (public offerings excluded)									
2003	25	560	0.02	1	1	9.15	2	40	0.00
2004	189	66,191	11.83	6	5	32.41	2	807	0.14
2005	274	171,475	28.96	6	1	50.61	2	1,372	0.23
2006	250	432,638	26.61	6	1	48.39	2	3,605	0.22
2007	132	424,967	14.85	4	3	28.80	2	5,902	0.21
2008	184	422,933	11.92	4	0	33.20	2	5,096	0.14
2009	128	621,976	14.31	1	0	26.00	2	9,596	0.22
2010	0	0	0.00	0	0	0	0	0	0.00
2011	0	0	0.00	0	0	0	0	0	0.00
2012	0	0	0.00	1	1	0	0	0	0.00
2013	20	3,811	8.98	3	2	5.18	2	293	0.69
2014	27	3,621	8.90	6	3	7.20	2	201	0.49
2015	51	23,655	21.32	7	1	14.34	1	657	0.59
BVB international bond main market sector general information (public offerings excluded)									
2006	9	89,912	25.23	1	1	16.28	1	12,845	3.60
2007	43	3,107,805	130.17	2	1	12.40	1	100,252	4.20
2008	171	114,098	27.85	2	0	18.40	4	2,480	0.61
2009	330	893,894	43.89	2	1	29.60	4	12,080	0.59
2010	17	133,580	3.28	2	0	4.31	2	12,144	0.30
2011	17	713,520	17.41	2	0	3.53	2	79,280	1.93
2012	2	100,001	2.40	2	0	0.80	1	50,001	1.20
2013	7	2,114	0.05	2	0	1.99	1	423	0.01
2014	0	0	0.00	1	0	0.00	0	0	0.00
2015	10	396	0.90	2	1	3.98	1	40	0.09

BUCHAREST STOCK EXCHANGE DEVELOPMENT BETWEEN 1995 AND 2015

Year	Trades	Volume	Value (EUR mn.)	No.of listed issues (as of the end of every year)	New listings	Trading frequency (%)	Daily averages (for the days when trading took place)		
							Trades	Volume	Value (EUR mn.)
BVB Government bond main market sector general information (public offerings excluded)									
2008	17	2,069	5.18	24	25	18.40	2	188	0.47
2009	346	85,689	214.98	26	2	29.60	3	625	1.57
2010	435	203,724	544.13	18	2	4.31	3	1,520	4.06
2011	181	35,889	85.78	21	4	3.53	2	449	1.07
2012	358	114,245	262.37	24	7	0.80	3	865	1.99
2013	337	35,575	85.56	25	4	1.99	2	239	0.57
2014	148	12,026	25.57	23	2	0.00	2	165	0.35
2015	95	56,760	61.50	22	5	3.98	2	979	1.06

Note: The trading frequency is calculated as the ratio between the number of days when trading occurred and the total number of trading days within the respective year.

Source: Based on the data available at www.bvb.ro

CORPORATE GOVERNANCE CHOICE REGARDING SMEs FINANCING STRATEGIES IN ROMANIA

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ABSTRACT. The impact of financing strategies upon the financial information (released to users through financial statements) is different in the case of the financial position in comparison with the financial performance. The present study aims to establish, for the Romanian SMEs, which is the main choice of corporate governance as financing strategy. Further, the influence of a series of factors upon the financing strategy is investigated using a multilinear regression model. The study is based on a sample of 1,455 Romanian SMEs for the period 2005-2014. The main finding of the present study indicates that the main choice of corporate governance as financing strategy is the self-financing for 76.50% of the Romanian SMEs. The present study reveals that the variables influencing the corporate governance decisions are: the (business) expertise, the business size, the financial performance according to financial statement, and the main business area of activity. It seems that the legal structure has no influence on the financing decisions. The results of the present paper confirm and extend the findings of other studies in this area with data concerning SMEs in an European developing country.

Key words: financing strategy, financial statements, corporate governance, regression model

JEL classification: M40, M21, M16

1. Introduction and Review of Literature

The small and medium sized enterprises (SMEs) and the corporate governance represent two major components of today's economy. SMEs account for more than 90% of private sector companies. According to Eurostat, for the

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period 2010-2013, SMEs account for over 99% of the private sector within each member country. Their success or failure has an important influence on the economic growth and on the standard of living. SMEs generate the major part of a country's gross domestic product and provide an important number of jobs. They also have an important contribution to the innovation process.

The access to financial resources for SMEs is quite diverse. These financial resources include: own funding/self-financing (the reinvestment of the net accounting profit), bank loans, and non-banking financial institutions loans, commercial loans, increasing the equity capital through issuing new shares or social parts, different types of leasing, and (recently) crowd funding.

The impact of financing strategies upon the financial information (released to users through financial statements) is different in the case of the financial position in comparison with the financial performance. When the financial position is considered, a financial strategy influences the assets, the equity capital and the liabilities. The assets' entry value might be different depending on the financing strategy; the difference might be important mainly when the cost of debt should be included in the cost of long term assets. The value of equity capital is different when the equity capital is increased through issuing shares or social parts, in comparison with the situation in which the reported net accounting profit is not diminished (by dividend distribution and reinvestment). Furthermore, the liabilities' amount and structure have a different dynamic depending on the chosen financing strategy. In the case of financial performance, the influence of the financing strategy derive from the various costs associated with the respective strategy (mainly the borrowing related costs).

The present study aims to establish which is the main financing strategy chosen by corporate governance for Romanian SMEs between 2005 and 2014. Once the dominant financing strategy is established, a series of factors that might influence the corporate governance choice are determined. The results have supports the initiatives of corporate governance to assess the most adequate financing strategy in correlation with the respective business particularities and, therefore, to be able to take the best financing decision from the cost-profit ration point of view.

To the best of our knowledge, no recent academic study is available on this field for the Romanian SMEs. Thus, we were able to identify only four Romanian academic studies, Dragota et al.(2008, Corduneanu & Milos (2009), Brendea (2014), and Vatavu (2014), related to the financing strategy of Romanian companies listed at Bucharest Stock Exchange.

The present study is unique by taking into consideration a sample of 1,455 at the level of every year for a 10 year period (2005-2014) in order to establish a trend in corporate governance decisions regarding the choice of a financing strategy based on a series of factors.

At international level, the academic literature presents and investigates a series of theories which attempt to determine the factors that might influence the corporate governance choice of financing strategies.

According to Modigliani & Miller (1958), the company value has no influence upon the respective company financing strategy. Later on, the trade-off theory of Myers (2001) suggest that an economic entity will choose the bank loans as long as the savings on profit taxation is equal to the present value of bankruptcy costs.

The (financing sources) pecking order theory of Myers & Majluf (1984) considered that the entities with undervalued equity capital/net assets, due to investors' lack of information, will choose less risky financing alternatives like self-financing and the increase of loans. Therefore, the corporate governance will establish a pecking order of financing sources based on the investors' information level taking into consideration the available financial statements. Other studies for Asian countries (Chen, 2004; Delcoure, 2007) and Great Britain (Watson & Wilson, 2002) establish another priority for the factors influencing the decisions of corporate finance regarding the financing strategy. According to these studies, the first choice is self-financing, followed by the increase of equity capital and only as last resort comes the increase of loans.

Thus, according to Liao (2013), a corporate governance oriented toward performance will use a financing strategy that favors borrowing and will adjust the debt ratio according to shareholders' requirements.

The point of view differ within the market timing theory. According to Baker & Wurgler (2002) and Heyman et al. (2008) the main factors that will influence the choice of increasing the equity capital as financing alternative are: the convergence of shareholders' and managers' interests, a sound/healthy financial position, and an appropriate level of transparency for potential investors. Pnadey (2001) considers that the same factors might, at least, reduce the company's borrowing levels.

The overall economic conditions have also an influence over the choice of a financing strategy (Deesomsak et al., 2004). This general statement is already confirmed by the findings of Fosberg (2012) stating that during economic growth the economic entities will choose mainly to borrow on medium and long term, while during economic contraction will rather choose the short-term loans due to uncertainty (Michaelas et al., 1999).

The company age and the activity sector have a significant impact upon the financing strategy (Xiao, 2011;Johnsenand McMahon, 2005). Even if an economic entity is young and has a low credit rating, according to Levenson & Willard (2000), during the early development stages the companies seems to favor the borrowing. Other studies present conflicting results. Paul et al.(2007)

and Watson & Wilson (2002) show that small new created companies use mainly their equity capital as financing alternative, either through issuing new shares or reinvesting their profit. La Rocca and Cariola (2011), Gregory et al.(2005), Chittenden et al.(1996) consider that mainly the mature business chose to use own funding as financing strategy.

The debt ratio is different depending on the activity sector (Degryse et al., 2012). The transport and utilities companies based their financing strategy mainly on short-term commercial loans and bank overdrafts (Scherr et al., 1993). The entities that function in sectors where the introduction of new technologies has a high frequency, are more inclined to choose as financing strategy the increase of their equity capital (Hogan & Hutson, 2005; Hyytinen & Pajarinen, 2005). The situation is even more sensitive for the high-tech companies. Their development has a higher pace than the irreversible and reversible depreciation (Giudici & Paleari, 2000). Therefore, the classic financing sources are seldom accessed and the debt ratio is very low (Colombo & Grilli, 2007; Freel, 1999). In most cases, the high-tech companies will choose the own financing alternatives and the financing sources available to their owners (Manigart & Struyf, 1997).

The company size is another factor that influences the financing strategy. Thus, according to Lopez-Gracia & Aybar-Arias (2000) it seems that the activity sector is prevalent. Thus, the studies of Lim (2012) and Ahmed (2012) show that the large size entities have the tendency to choose borrowing over own funding.

Asset tangibility influences also the choice of a financing strategy. Daskalakis & Psillaki (2008) found a positive correlation between the debt ratio and asset tangibility. Thus, Nivorozhkin (2005) found a negative correlation between the same two variables especially within the developing countries.

According to Mac et al.(2010) the shareholder structure plays also an important role in ascertaining a financing strategy. The entities controlled by a majority shareholder or a small group of shareholders, mainly if they are family business, have the inclination to favor own financing and a higher degree of independence from financial institutions.

According to Mac et al.(2010) and Sogorb-Mira (2005) a company development prospects are taken into consideration by the corporate governance; if these prospects are numerous, the long and short term borrowing will be favored.

The studies of Berggren et al.(2000), Cressy & Olofsson (1997), and Cressy (1995) suggest that the corporate governance will rather chose external financing alternative if the averssion toward giving up the company control is low.

A series of studies suggest that the financing strategy is influenced by the (majority or controlling) owner's gender. Coleman (2000) shows that in US during 1993 female owners favor the borrowing and will finance their business with a higher interest rate than male owners. Riding & Swift (1990)

showed the women own, in general, smaller and newly launched companies and will use mainly short term loans with low frequency. The study of Haynes & Haynes (1999) indicate the same behavior toward borrowing regardless of the owner's gender.

The research of Brendea (2011), based on Hermanns (2006), breaks the factors influencing the corporate governance decision regarding the financing strategy as follow: institutional factors (the regulations, the bankruptcy procedure, minority investors' protection, and the capital market sophistication), macroeconomic factors (market conditions, inflation rate evolution, loans' interest rates), exogen factors related to the entity (entity's credit rating and market value), entity-specific factors (the level of profit, entity's size, tangible assets, growth opportunities/prospects).

Holmes & Kent (1991) and Lucey et al. (2006) mention another series of factors that have a significant influence on the financing strategy decision; thus, these factors' impact is difficult to assess. Among these factors, Holmes & Kent (1991) mention the trade credit level, the employees' financial expertize and recommendations, while Lucey et al. (2006) mention the past relationships with the financing institutions, the owners' financial standing (if they lent money to the company and their personal collateral which can enhance the company's credit rating).

It is difficult to support any of the above mentioned theories and results; this is mainly due to the fact that the different levels of economic development generate divergent results (Brendea, 2011; Daskalakis and Psillaki, 2008; Hall et al., 2004; Booth et al., 2001).

There are very few (recent) studies on developing countries covering an important number of factors influencing the corporate governance decisions regarding the financing strategies; among these we mention for central and eastern side of Europe Haas & Peeters (2006), Nivorozhkin, (2005) and (2002), Klapper et al. (2002), Cornelli et al. (1996).

2. Material and Method

The source of data for this study covers the past ten years and is provided by the National Council of Private Small and Medium Enterprises in Romania (NCPSMER)³, the National Trade Register Office, the Ministry of Public Finance,

³ The National Council of Private Small and Medium Enterprises in Romania (NCPSMER) was established in 1992 and is a Romanian confederation, legal person, independent, non-profit, non-governmental and non-political institution. NCPSMER ensures unified representation of the interests of SMEs and SME employers' movement nationally and internationally.

and the Romanian SMEs. An average number of 1,455 SMEs were taken into consideration for the period 2005-2014. The time span of the sample taken into consideration is presented in Table 1.

Table 1: The size and time span of SMEs sample used for collecting data

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
SMEs number	1,306	1,178	1,240	1,099	1,485	1,723	1,716	1,858	1,569	1,375

Source: *The National Council of Private Small and Medium Enterprises in Romania (NCPSMER)*

The representativeness of the SMEs' sample was ensured through the following choices:

- the investigated SMEs cover all the sectors, age categories, and the all eight development regions;
- the survey was an optimally-stratified one; the ratio of homogeneous layers (namely the SMEs within the service sector which show similar management and investment features) has been diminished; the ratio of heterogeneous layers has been augmented, by increasing the layer represented by the SMEs in the industrial sector;
- in order to highlight the results by sectors, for each SMEs the main area of activity (which accounts for the major part of revenues) was taken into consideration according to the NACE 2 code⁴; the secondary activities were ignored;
- the microenterprise ratio within our sample is lower than their ratio at country level; this reduction was accepted in order to allow the inclusion of a larger number of small and medium sized enterprises;
- at the level of every year, the SMEs included in the sample varied therefore ensuring a wider diversity of entities included into this study.

Within the first stage of the study, a descriptive analysis was carried on in order to establish which is the main financing strategy for Romanian SMEs. The following alternatives were considered: self-financing, bank loans, leasing, factoring, loans from non-banking financial institutions, and equity capital increase through the issuance of new shares or social parts. The results are presented in Table 2.

⁴ The Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE (for the French term "nomenclature statistique des activités économiques dans la Communauté européenne"), is the industry standard classification system used in the European Union. The current version is revision 2 and was established by Regulation (EC) No 1893/2006. It represents the European implementation of the UN classification ISIC, revision 4.

Table 2: The descriptive analysis of financing strategies evolution for Romanian SMEs between 2005 and 2014

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Strategy	%	%	%	%	%	%	%	%	%	%
Self-financing	77.72	68.93	71.26	64.42	73.06	69.87	74.90	91.27	91.52	82.04
Bank loans	47.32	56.62	49.52	51.05	35.02	41.39	30.40	25.75	22.43	24.58
Leasing	29.71	38.96	25.88	29.57	19.06	14.61	7.80	2.93	2.36	3.85
Factoring	3.29	0.93	1.93	3.91	0.74	0.80	0.29	0.22	0.06	0.07
Loans from other financial institutions	2.76	0.76	3.82	3.09	1.75	2.50	0.82	1.46	0.51	1.53
Issue of shares/social parts	0.54	0.34	0.40	1.46	1.55	0.11	0.99	0.49	0.06	0.22

Source: The National Council of Private Small and Medium Enterprises in Romania, 2006-2015

The majority of Romanian SMEs choose the financing strategies based on the reinvestment of their net profit, followed by bank loans and leasing.

In order to have a clear confirmation regarding the main financing strategy, Table 3 presents the summary statistics for all the 5 financing alternative considered.

Table 3: The summary statistics regarding the corporate governance choice on financing decision for Romanian SMEs between 2005 and 2014

Strategy	Self-financing	Bank loans	Leasing	Factoring	Loans from other fin.instit.	Shares issued
One-Variable Analysis	%	%	%	%	%	%
Average	76.50	38.41	17.47	1.22	1.9	0.62
Standard deviation	9.22	12.41	13.16	1.38	1.10	0.54
Coeff.of variation	12.05	32.31	75.31	112.45	58.06	87.10
Minimum	64.42	22.43	2.36	0.06	0.51	0.06
Maximum	91.52	56.62	38.96	3.91	3.82	1.55
Range	27.10	34.19	36.60	3.85	3.31	1.49
Standard skewness	0.9399	0.0811	0.3256	1.6088	0.5407	1.2435
Standard kurtosis	-0.3272	-1.0843	-0.9109	0.1827	-0.6028	-0.2820
Normal prob. plot (points outside of the straight line)	No	No	No	No	No	No
Trend	Constant	Decreasing	Decreasing	Decreasing	Decreasing	Decreasing

Source: Author's calculations

The average indicated that self-financing is chosen by 76.50% of Romanian SMEs and only 38.41% of the SMEs consider bank loans as a financing alternative. The standard deviation for self-financing seems high in comparison with the standard deviation for leasing, factoring, and equity capital increase. Thus, the coefficient of variation for self-financing is the lowest, indicating a constant choice toward this financing alternative over the past decade. The financing strategy based on factoring had the most unpredictable evolution, exhibiting a coefficient of variation of 112.45%.

For all the cases the skewness and kurtosis indicate that the data are within the range of a normal distribution.

The trend for five of the financing strategies is a descending one. Only self-financing has a constant trend, already confirmed by the lowest coefficient of variation.

Further, the analysis of the factors influencing the corporate governance decision on financing strategy for Romanian SMEs will concentrate on self-financing.

The variables initially selected for the analysis were the following: the age of the entity (less than 5 years, 5 to 10 years, 10 to 15 years, over 15 years); the entity size (micro-enterprises with less than 9 employees, small enterprises with 10 to 49 employees, medium enterprises with 50 to 249 employees); the performance level (as being a general perception of improvement of financial data) reported through the annual financial statements (higher, similar, lower), the legal structure (limited liability or joint stock company), business sector (trade, industry, services, tourism), shareholders/associates level of education (shareholders with higher education studies, shareholders with business studies, shareholders with training abroad), business experience of managers (years), associates/managers age, number of associates, family business or not, the number of hours per day worked for the business by the business owners (more than 8 hours).

Thus, when we collected the data, it became obvious that variables related to the shareholders/associated level of education, business experience of managers, associates/managers age, associates number, family business, the number of hours per day worked in business by the owners were available only for 4 to 7 years. Therefore these variables were excluded. Their exclusion might cast some limitation for the present study.

3. Results and Discussions

Of the initially selected variables, we chose only those that could be followed over the desired time span: the period 2005 to 2014. These variables are: the age of the entity; the entity size; the performance level; the legal form, and the business sector (trade, industry, services, tourism).

Table 4 presents the evolution of Romanian SMEs' age between 2005 and 2014.

Table 4: Romanian SMEs' age between 2005 and 2014

SMEs age (expertise)	Mean %	Median %	Standard deviation	Coefficient of variation %	Trend
< 5 years	34.18	35.88	6.42	18.78	↓
5 to 10 years	27.70	26.37	4.49	16.22	↑
10 to 15 years	18.86	16.18	7.30	38.72	↓
> 15 years	19.26	22.17	8.94	46.89	↑

Source: Author's calculations

The new entities are the most numerous, 34.18% and the coefficient of variation is relatively low for this group. Thus, they follow a descending trend indicating a decrease of new entity creation; nevertheless this also indicates an increased survival rate. The least numerous are the entities with an age of over 15 years. This group also registers the highest coefficient of variation indicating a volatile evolution. Thus, the trend of this group is ascending, suggesting that the economic environment support a good survival rate and a business consolidation.

A simple regression was constructed having the SMEs' preferring self-financing strategy as the dependent variable and the age of SMEs as the independent variable. The results are presented in Table 5.

Table 5: Self-financing strategy versus SMEs age

SMEs age (years)	p-value	Correlation coefficient (r)	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic (P)
< 5 years	0.0027	-0.83	69.61	65.81	5.39	1.9182 (P=0.3077)
5 to 10 years	0.0580	0.62	37.93	30.17	7.70	2.0959 (P=0.4891)
10 to 15 years	0.6940	-0.14	2.04	-10.20	9.68	0.8777 (P=0.0088)
>15 years	0.2484	0.40	16.23	5.75	8.95	0.9900 (P=0.0123)

Source: Author's calculations

The lowest p-value occurs for the newly created SMEs. There is a statistically significant relationship between self-financing SMEs and the SMEs age for the group with less than 5 years (independent variable) at the 95%

confidence level. The correlation coefficient equals -0.83432 , indicating a moderately strong negative relationship between self-financing strategy and the newly created Romanian SMEs. This is representative for 65.81% of Romanian SMEs with less than 5 years age. The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level.

The results show that the younger SMEs have a clear preference for self-financing. This finding confirms the study of Paul et al.(2007) for Scotland based on 20 start-up companies and the study of Watson & Wilson (2002) based on 626 British SMEs. Keeping debt related costs at a low level through self-financing seems to be a common feature for the young SMEs regardless if their home country is a developed or a developing economy.

The oldest Romanian SMEs (with an age over 15 years) does not present any significant relationship with the self-financing strategy. This result indicates the Romanian SMEs which manage to consolidate their business do not have a preference toward choosing self-financing as a financing strategy. They might use other strategies, regardless of their costs. This result contradicts the findings of La Rocca & Cariola (2011) considering the Italian SMEs between 1996 and 2005; the study suggest that the mature entities prefer self-financing. The Italian economic environment and the time frame might be the causes of this divergence.

The second variable is the size of Romanian SMEs. Three categories were considered taking into account the number of employees, based on the EU recommendation 2003/361. The evolution of this variable is presented in Table 6.

Table 6: Romanian SMEs size between 2005 and 2014

SMEs' size	Mean %	Median %	Standard deviation	Coefficient of variation %	Trend
Micro-enterprises (maximum 9 employees)	69.48	69.02	11.61	16.71	↑
Small businesses (between 10 and 49 employees)	23.11	23.08	7.68	33.23	↓
Medium sized enterprises (between 50 and 249 employees)	7.41	7.95	3.99	53.91	↓

Source: Author's calculations

The micro-enterprises are the most numerous and followed an upward trend between 2005-2014. The low coefficient of variation suggests a highly predictable evolution. The least numerous are the medium sized enterprises. They registered a downward trend and exhibit unexpected evolutions from one year to another (coefficient of variation is 53.91%).

A simple regression was constructed having the SMEs' preferring self-financing strategy as the dependent variable and the size of SMEs as the independent variable. The results are presented in Table 7.

Table 7: Self-financing strategy versus SMEs size

SMEs' size (employees)	p-value	Correlation coefficient (r)	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic
Micro enterprises	0.0081	0.78	60.46	55.52	6.15	1.4706 (P=0.0950)
Small businesses	0.0055	-0.80	63.86	59.35	5.88	1.4277 (P=0.0824)
Medium sized enterprises	0.0175	-0.73	52.68	46.77	6.73	1.5749 (P=0.1331)

Source: Author's calculations

In two cases, of micro-enterprises and small business, statistically significant relationship between self-financing for SMEs and SMEs' size at the 95% confidence level were found. In the case of small enterprises the significance is higher than for micro-enterprises. In both cases over 55% of the choice of self-financing strategy is explained by the size of the SMEs. The correlation coefficients also indicate a strong relationship between variables, thus in the case of small enterprises the correlation is negative. The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level.

The findings show that the smaller the entity, the more likely the corporate governance will choose the self-financing strategy. Once the company is growing in size, the corporate governance will start to consider other alternatives for financing the entity's development. This result is in line with the findings of Lim (2012) for the listed Chinese companies.

The SME performance is the third variable considers within this study. The annual performance was considered and compared with the previous year. Three alternatives were considered: companies that registered higher performances versus the previous year, companies with similar performances and companies with lower performances. The data are presented in Table 8.

Table 8: The evolution of Romanian SMEs' performance according to the financial statements during 2005-2014

SMEs' performance according to financial statements	Mean %	Median %	Standard deviation	Coefficient of variation %	Trend
Higher performance	34.21	25.17	17.83	52.13	↓
Similar performance	37.99	34.82	11.84	31.20	↑
Lower performance	27.80	21.97	18.15	62.27	↓

Source: Author's calculations

The results indicate that almost 38% of the SMEs have the capacity to generate similar performances year after year. This group has the lowest coefficient of variation and is the only one exhibiting an upward trend. The group of SMEs with lower performance is the least numerous and registered a descending trend.

A simple regression was constructed having the SMEs' preferring self-financing strategy as the dependent variable and the SMEs' performances as the independent variable. The results are presented in Table 9.

Table 9: Self-financing strategy versus SMEs' performance according to the financial statements

SMEs' performance	p-value	Correlation coefficient (r)	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic
Higher performance	0.2009	-0.44	19.53	9.47	8.77	0.9792 (P=0.0133)
Similar performance	0.0182	0.72	52.24	46.27	6.76	2.3190 (P=0.5812)
Lower performance	0.9177	-0.04	0.14	-12.34	9.77	0.7922 (P=0.0072)

Source: Author's calculations

Only the group of SMEs that generated similar performances over the years shows a significant relationship between the self-financing strategy and performance. The (similar) performance explains 46.27% of the choice of self-financing strategy. Moreover, the correlation coefficient is strong. The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level.

This result adds a new dimension to the findings of Heyman et al. (2008) regarding 1,132 of Belgian companies between 1996 and 2000; the study shows that the companies with higher financial performance have the tendency to borrow less.

The fourth variable considered was the legal structure of SMEs. Two main alternatives were considered: limited liability companies and joint stock companies.

Table 10: The evolution of Romanian SMEs' legal structure between 2005 and 2014

SMEs' legal structure	Mean %	Median %	Standard deviation	Coefficient of variation %	Trend
Joint stock company	3.16	2.72	1.29	40.95	↑
Limited liability company	9.20	90.38	3.10	3.40	→

Source: Author's calculations

The SMEs functioning as joint stock companies are few. The result an oscillating evolution of this form of company and also an upward trend. The dominant legal structure for Romanian SMEs is the limited liability company (LLC). This seems to indicate that LLC is the most appropriate for Romanian SMEs.

A simple regression was constructed having the SMEs' preferring self-financing strategy as the dependent variable and the SMEs' legal structure as the independent variable. The results are presented in Table 11.

Table 11: Self-financing strategy versus SMEs legal structure

SMEs' legal structure	p-value	Correlation coefficient (r)	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic
Stock company	0.2365	-0.41	16.99	6.61	8.90	1.5042 (P=0.1357)
Limited liability company	0.2981	-0.37	13.40	2.57	9.10	0.9215 (P=0.0225)

Source: Author's calculations

The results show that there is no statistically significant relationship between SMEs preferring self-financing and the legal structure of the company at the 95.0% confidence level. The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level.

Our findings indicate that the legal structure of SMEs does not influence the choice of self-financing as financing strategy.

Companies' sector impact on financing strategy is often analysed and an important number of studies are published on this topic. However, very few studies took into consideration the SMEs in the developing countries. Our fifth variable is this sector of activity. The evolution of these sectors for the Romanian SMEs is presented in Table 12.

Table 12: The evolution of Romanian SMEs' sectors between 2005 and 2014

SMEs' sector	Mean %	Median %	Standard deviation	Coefficient of variation %	Trend
Trade	38.40	38.17	3.83	9.98	↓
Industry	19.59	19.78	2.88	14.70	↓
Services	23.25	21.79	6.75	29.02	↑
Tourism	4.7	3.33	2.62	57.45	↑

Source: Author's calculations

The dominant sector for Romanian SMEs during the past decade is trade. The low coefficient of variation indicates a relative stability of these SMEs at annual level. Thus, the number of SMEs in the trade sector seems to be on decrease, similar with the SMEs on the industry sector. The tourism sector concentrate the least number of companies and the data indicate high oscillation in number over the years. The SMEs involved in tourism and services seems to be growing.

A simple regression was constructed having the SMEs' preferring self-financing strategy as the dependent variable and the SMEs' sector as the independent variable. The results are presented in Table 13.

Table 13: Self-financing strategy versus SMEs sector

SMEs sector	p-value	Correlation coefficient (r)	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic
Trade	0.5385	-0.22	4.91	-6.98	9.53	0.6123 (P=0.0050)
Industry	0.6155	0.18	3.30	-8.79	9.62	0.6803 (P=0.0072)
Services	0.0040	0.82	66.63	62.46	5.65	2.0804 (P=0.4470)
Tourism	0.5239	-0.23	5.26	-6.58	9.52	0.8805 (P=0.0109)

Source: Author's calculations

As the results show, only in the case of SMEs from the service sector a statistically significant relationship could be found (p -value of 0.0004). The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level. The correlation coefficient is strong for services SMEs sector and services sector explains 62.46% of the choice of self-financing strategy.

This indicate that these SMEs are more inclined to favor self-financing while compared to the other sectors considered. We consider this situation to be relevant given the fact that the percentage of this sector was diminishes when the SMEs sample was constructed. The results for Romanian SMEs in this respect are different from other academic studies. In the cases of Ireland (Hogan & Hutson, 2005), Finland (Hyytinen & Pajarinen, 2005), Italy (Giudici & Paleari, 2000), Belgium (Manigart & Struyf, 1997) and United States (Scherr et al., 1993) for the economic entities within the service sectors (mainly for those involved in transport, utility and hi-tech) the main choice as financing strategy is the increase of equity capital and/or borrowing. The main reason for this difference might be represented by the country's economic development level and the sophistication of its banking system.

As the analyses performed above indicate, of the five variables considered, four showed significant relationships with the self-financing strategy; these four independent variables are: the SMEs' age (less than 5 years), the SMEs size (micro and small entities), the performance (similar performances over the years), and the SMEs' sector (service sector.). The legal structure of SMEs seems to play no role in corporate governance decisions regarding the choice of self-financing as financing strategy.

A multiple regression analysis was performed in order to verify the combined relationship between these four independent variables and self-financing strategy as dependent variable. The results are presented in Table 14.

Table 14: Multiple regression results: self-financing strategy versus SMEs' age, size, performance and business sector

p-value	R-squared	R-squared adjusted	Standard error of estimation	Durbin-Watson statistic
0.0231	86.00	74.80	4.63	2.07781(P=0.4163)

Source: Author's calculations

The p -value of 0.0231 confirms the significant relationship that exists between the variables. The combination of the four independent variables explains 74.80% of the self-financing variability. The Durbin-Watson statistic tests indicates no serial autocorrelation of the residuals at the 95% confidence level.

These results can be used to construct prediction limits for new data. Table 15 presents the multiple regression models that can be used for further investigations.

Table 15: The equation of the fitted model of a multiple linear regression describing the relationship between self-financing strategy and the independent variables

SMEs financing strategies	=	-53.82
(self-financing)		+ 2.59*SMEs expertise (<5 years)
		- 1.05*SMEs size (small)
		+ 0.35*SMEs performance (similar)
		+ 2.25*SMEs business area (services)

Source: Author's calculations

4. Conclusions

The results of the present study indicate that the main choice of corporate governance of Romanian SMEs regarding the financing strategy is oriented toward self-financing. Over 75% of the Romanian SMEs chose this financing strategy over the past decade (2005-2014). The evolution suggest a constant trend following a normal distribution over this period. The second choice for Romanian SMEs is represented by bank loans. Over 47% of the investigated SMEs borrow from banks. Within the current study, an entity could access multiple financing sources.

The variables identified to influence the corporate governance decision regarding the financing strategy are: the SMEs' age (less than 5 years), the SMEs size (micro and small entities), the performance (similar performances over the years), and the SMEs' sector (service sector.). The legal structure does not have an influence over the choice of financing strategy.

The Romanian SMEs with and age lower than 5 years are the most numerous within our sample (34.18%). They have a strong negative correlation with the self-financing strategy. These findings are in line with the studies of Paul et al. (2007) and Watson & Wilson (2002) for small entities and start-ups in developed countries.

Romanian SMEs are dominated by micro-enterprises (almost 70%) and small businesses (over 23%). These two groups choose mainly the self-financing strategies. These results are similar with those of Lim (2012) for large entities in emerging economies.

Almost 38% of the Romanian SMEs managed to have similar performances over the past decade, and they exhibit an upward trend. This group of SMEs also show a strong tendency to choose self-financing as main funding strategy. This finding complements the findings of Heyman et al. (2008) pointing to the fact that the entities with good financial performances choose to borrow less.

The service sector, the second most representative within the Romanians SMEs sample, had an upward trend over the past 10 years. This is the only sector of the four considered where the SMEs prefer the self-financing strategy. These findings indicate a different point of view of the service sector SMEs within a developing country in comparison with developed countries where the preference goes toward the increase of the equity capital and/or bank loans, as the studies of Hogan & Hutson (2005), Hyytinen & Pajarinen (2005), Giudici & Paleari (2000), Manigart & Struyf (1997), Scherr et al., (1993) have shown.

The combined influence of the four variables (age, size, performance, and sector) explains almost 75% of the corporate governance decision concerning self-financing strategy variability over the past decade in Romania.

The present study highlighted the fact that within the particular case of Romania, SMEs corporate governance prefers self-financing. Further investigations might relate this preference with SMEs shareholder structure, their understanding of the financing alternatives and with the level of sophistication associated with the capital market and banking sector.

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IT SECTOR DEVELOPMENT IN CLUJ-NAPOCA. THE CASE OF SMEs

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ABSTRACT. The purpose of this paper is to explore the evolution of SMEs from Cluj-Napoca in the IT sector by looking into the following problems: the relationship between number of employees, type of ownership and type of activity, as well as relationship between profit, liabilities, turnover, type of ownership and type of activity. The results indicate that the sector is attractive for the investors no matter what type of activity they want to develop (production or outsourcing). The main reason that makes them invest is the well prepared and relatively low cost workforce. Moreover, under favorable conditions (increase in turnover, decrease in liabilities or liabilities/capital ratio), the trend of the profit is ascending, making from this sector an interesting one for the investors (Romanian or international). Thus, our models show that this possible increase of the profit is a moderate one. Further investigations show that the development of the sector is rather a moderate one not a “booming” one. The results are normal if we take into consideration the fact that the process of developing Cluj-Napoca as an IT pole is at the beginning.

Key words: IT sector, SMEs, profit, linear model, log-linear model

JEL classification: L86

1. Introduction

Romania has been acknowledged as one of the preferred destinations of IT companies. This is due to a large and talented pool of resources of IT graduates and professionals, lower labor costs compared to Western Europe and US, and a

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business culture similar to these countries than the more distant countries from Asia. Geographic and time zone proximity to Western Europe are supplementary featured that enhance Romania attractiveness as for IT companies (*Software & IT Services in Romania Study*, by ANIS, (<http://www.anis.ro>).

Romania's IT sector has reached an average annual turnover of EUR 2.8 billion. In 2014, Romania registered over 64,000 employees in the IT sector, being ranked first among the EU countries based on the number of employees in the IT sector per capita. Moreover, the sector was the third gross contributor to Romania's GDP (<http://www.romania-insider.com/romanias-itc-sector-reaches-eur-2-8-billion/148554/>).

Favorable economic conditions ensured a positive evolution for the Romanian IT sector. According to a study made by the Romanian National Institute for Computers the IT sector (software, hardware services and electronics) showed a strong upward trend during 2010 and 2011.

In an attempt to support the IT sector, the Romanian Government has been playing an active role in attracting foreign investment to this sector. A 100% income tax exemption for IT employees has been introduced and maintained even after joining the European Union. State aid schemes are also likely to be granted in the years to come (<http://www.clujbusiness.ro/why-cluj/main-industries/>).

Moreover, Romania's major cities were classified as strategic development poles in order to provide a fruitful environment to the areas in which they excel. A new strategic plan, endorsed by the Romanian Ministries of Economy and Regional Development, ranked Cluj-Napoca as the center of information services in Romania. On November 14th, 2012 Cluj-Napoca IT Innovation Cluster was officially launched at national level. The Cluj-Napoca IT Innovation Cluster has its role model in the Silicon Valley concept and aims to transform Cluj-Napoca into the most important center for IT research & development of Romania. The Cluster aims to provide an officially supported growth platform for local IT sector representatives.

With more than 300 IT companies established in the city and about 10,000 active software engineers, Cluj-Napoca has become in 2015 the first IT export hub of Romania, delivering 78% of the Romanian IT exports. This hidden treasure of South-Eastern Europe investment map stands out through its multicultural and multilingual community (<http://www.codespring.ro/news/cluj-napoca-growth-pole-of-romanias-ict-industry>).

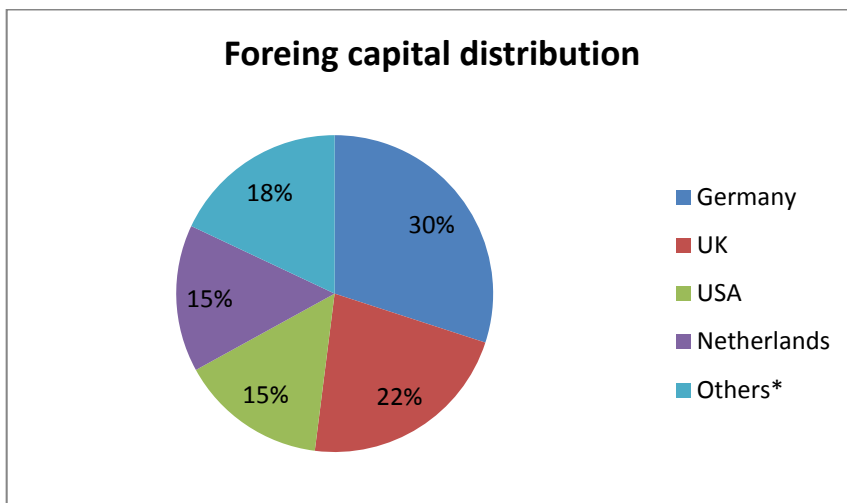
Cluj-Napoca has a significant potential for development in the IT sector, mainly due to the 1,500 specialists who graduate each year from the two top universities: Technical University of Cluj-Napoca and Babes-Bolyai University. More than 5,000 software engineers work in the companies that deliver customized software development, outsourcing and IT Services in Cluj-Napoca.

Cluj-Napoca has found a winning strategy in developing its IT production and outsourcing capacities. The software businesses in the city have registered constant growth even during the recent global recession. Local software engineers are valued not only for their technical skills but also for their wide knowledge of various foreign languages: English, German and French (<http://www.clujbusiness.ro/why-cluj/main-industries/>).

Both domestic and foreign investors are financing the IT sector in Cluj-Napoca. The foreign capital comes from the following countries: Germany (30%), UK (22%), USA (15%) and The Netherlands (15%) as major investors; they are followed by Austria (5%), Finland (4%), France and Sweden (3% each), Denmark and Switzerland (2% each), and Italy (0.5%) (<http://www.clujbusiness.ro/why-cluj/main-industries/>).

The chart below presents the foreign capital invested in IT sector in Cluj-Napoca distributed by countries of origin:

Figure 1. Foreign Capital Distribution by country of origin



Source: Data used from <http://www.clujbusiness.ro/why-cluj/main-industries/>

Cluj-Napoca IT Association has been legally established in October 2012 as a non-profit association and is set to coordinate the activities and projects undertaken by the Cluj-Napoca IT Innovation Cluster. It comprises 23 technology companies, with a total turnover of EUR 100 million. Cluj-Napoca IT Association aims to increase the capacity of research and development, by fostering

cooperation between public institutions undertaking research, development and innovation (RDI), and private companies, maximizing the underlying potential of IT and its application in both the public (public administration, education, health) and the private sector (enterprises, citizens). Furthermore, increasing the competitiveness of local IT industry representatives, supporting economic trade and commercial activities between members of the cluster, supporting entrepreneurship and SMEs among local IT members, identifying and attracting resources (investments, hedge funds) to attain long-term development in the sector are also among the objectives of the Association.

The activity of the IT companies located in Cluj-Napoca made the region one of the most attractive destinations for IT investments in Romania. Its high focus on export, especially towards EU and US markets, helped Cluj-Napoca rank among the first Romanian cities from an IT export revenue perspective.

These are some reasons for which we decided to study the evolution of this sector in terms of profit, turnover, number of employees, liabilities and the capital invested. We will also try to find out if there is a boom in the IT sector in Cluj-Napoca.

Regarding the literature review, to the best of our knowledge, this is the first study using econometric models in order to analyze the IT sector from the perspectives announced above. The sector is analyzed every year by *ANIS – Employers association of the software and services industry* but without using econometrical tools.

2. Methodology

Within our study, due to the difficult access to information, we used data collected from 82 SMEs from the IT sector in 2014. These companies were studied by analyzing the following variables:

- **Profit (y)**, which is the dependent (quantitative) variable, measured in lei;
- **Turnover**, which is an independent (quantitative) variable, measured in lei;
- **Number of Employees**, which is an independent (quantitative) variable;
- **Liabilities**, which is an independent (quantitative) variable, measured in lei;
- **Capital**, which is an independent (quantitative) variable, measured in lei;
- **Type of Activity** – an indicator which is treated as a **dummy independent variable** expressed by 0, 1 (code). If the company is of **outsourcing** type, the code is **0**, if it deals with **production**, the code is **1**;
- **Type of Ownership** – an indicator which is treated as a **dummy independent variable** expressed by 0, 1 (code); if the company is **Romanian** the code is **1**, if it's **international**, the code is **0**.

In order to study these companies and make forecasts regarding the evolution of the entire sector we used descriptive statistics and econometric models (linear and log-linear).

First, we will study the sample in order to obtain information regarding the structure, type of activity and type of ownership and also the average values of the indicators that we are using.

Next, we will study the evolution of the number of employees related to the type of activity and type of ownership in order to see if these variables are related. For this we are using a multiple linear model.

The evolution of the profit is studied in relation with turnover, liabilities, capital, type of activity and type of ownership. We are using a multiple linear model and also a multiple log-linear model showing in the end which one is better from the econometric point of view.

Finally, we will try to give an answer to the following question: "Is this a real boom?"

For this we are using a Cobb-Douglas function (log-linear form) in order to see the relation between turnover, capital and number of employees.

3. Finding and results

3.1. *The structure of the sample. Descriptive statistics.*

Table 1 presents the structure of the sample based on type of company, type of activity and type of ownership. The sample is dominated by small companies (56.1%), oriented toward outsourcing (64.6%) and financed by domestic capital (71.1%).

Table 1. The structure of the sample related to type of company, type of activity and type of ownership

Type of company	Frequency	Type of activity	Frequency	Type of ownership	Frequency
Medium	17	Outsourcing	53	International	23
Small	46	Production	29	Romanian	59
Micro	19				

Source: Authors' calculation

Table 2 presents the average values for the investigate variables.

Table 2. Average values for profit, turnover, number of employees, liabilities and capital (in lei)

Type of company	Average profit	Average turnover	Average no. of employees	Average liabilities	Average capital
Medium	1,940,287	25,266,798	145	6,257,913	4,359,267
Small	494,505	3,436,515	21	760,662	1,065,322
Micro	457,443	3,874,531	5	655,696	885,663
Overall	785,653	8,063,797	43	1,876,015	1,706,585

Source: Authors' calculation

At the level of 2014, the average turnover of the investigated 82 companies was of 8 million lei; they have an average profit of about 0.8 million lei, and an average number of 43 employees. The average level of liabilities and capital is almost similar. The medium-sized enterprises are the most profitable, while the small and micro entities seems to have similar performances, thus with a largely different number of employees.

Starting from the above-mentioned descriptive statistics we can estimate, with 95% confidence, that the average profit of all companies from the domain was, in 2014, between 536,372 and 4,034,930 lei, and the average number of employees was between 29 and 57. Table 3 presents the estimates for all the variables included in the study.

Table 3. Confidence limits for each average value (95% confidence)

95% confidence	Lower limit	Upper limit
Turnover	5,091,640	11,035,900
Profit	536,372	1,034,930
Employees	29	57
Liabilities	1,012,860	2,739,170
Capital	1,133,090	2,280,080

Source: Authors' calculation

In order to study the relationships between the variables, it is very important to see how correlated they are. In the next table we present the correlation matrix.

Table 4. The correlation matrix

	Turnover	Profit	Employees	Liabilities	Capital	Liabilities/ Capital	Activity	Ownership
Turnover p-value		0.806 8 0.000 0	0.6698 0.0000	0.6801 0.0000	0.7995 0.0000	0.2434 0.0275	0.0850 0.4479	-0.4054 0.0002
Profit p-value			0.6445 0.0000	0.4430 0.0000	0.8684 0.0000	-0.0244 0.8277	0.1129 0.3125	-0.2961 0.0069
Employees p-value				0.3941 0.0002	0.6758 0.0000	0.0685 0.5407	0.1480 0.1845	-0.5812 0.0000
Liabilities p-value					0.4203 0.0001	0.5186 0.0000	0.0187 0.8676	-0.3529 0.0011
Capital p-value						-0.0601 0.5916	0.1103 0.3241	-0.3068 0.0051
Liab./Capital ratio p-value							0.0396 0.7236	-0.2462 0.0258
Activity p-value								-0.2763 0.0120

Source: Authors' calculation

As expected, the most intense correlation appears between turnover and profit. Since the profit is the dependent variable, this relationship is expected to continue to be highlighted by the other models.

A high correlation exist between turnover and capital, which can lead finally to multicollinearity.

Even if the correlation matrix shows some moderate to strong relationships between our explanatory variables, overall the models that we will discuss are not significantly influenced by this phenomenon.

On the other hand, working with cross-sectional data, the heteroskedasticity of the error term could appear. In all cases, White's test shows that the error terms are homoskedastic.

3.2. The relationships between variables

3.2.1. The relationship between the number of employees, type of activity and type of ownership

In this part we study the influence the type of activity and the type of ownership have on the number of employees. Using a linear model we obtain the following results.

Table 5. The relationship between the number of employees, type of activity and type of ownership (linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	103.107	0.0000			
Type of activity	-1.803	0.8871			
Type of ownership	-82.736	0.0000			
Model		0.0000	20.16	0.3379	0.3211

Source: Authors' calculation

As we can observe the model is significantly related to the type of ownership and it is not significantly related to the type of activity at 5% level of significance. Overall, the model is significant (see p-value corresponding to the entire model).

As we can see 32.11% from the variability of the labor force in the domain is explained by the type of activity and the type of ownership.

However, the type of activity seems to play a next to none role in employees choice of a workplace.

The next table, Table 6, shows the evolution of the number of employees corresponding to each type of activity and ownership, with 95% confidence.

Table 6. The relationship between the number of employees, type of activity and type of ownership

Type of activity	Type of ownership	Average no. of employees	Confidence 95%	
Outsourcing	International	103	77	129
Outsourcing	Romanian	20	5	35
Production	International	101	77	125
Production	Romanian	18	1	35

Source: Authors' calculation

The results in Table 6 above indicate that Romanian companies are smaller than those financed by foreign capital, which are of medium size. Moreover, it seems that the IT companies financed by foreign capital seems to have a similar number of employees regardless of the type of activity, as indicated by the results in Table 5.

3.2.2. The relationship between profit, turnover, liabilities, type of activity and type of ownership

Further, we will study the relationship between profit, turnover, liabilities, type of activity and type of ownership. We will use the two models: the multiple linear model and the multiple log-linear model.

- **The linear model**

The results for this model are presented in Table 7.

Table 7. The relationship between the profit, turnover, liabilities, type of activity and type of ownership (linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	152118.	0.4438			
Turnover	0.0792125	0.0000			
Liabilities	-0.0544555	0.0389			
Type of activity	106755	0.5077			
Type of ownership	82258.4	0.6614			
Model		0.0000	39.77	0.6738	0.6568

Source: Authors' calculation

At 95% confidence, we can observe that the model is significantly related to each of the quantitative variable (turnover and liabilities) and overall.

The model shows that 65.68% from the variability of the profit is explained by the variability of the turnover and liabilities and also by the type of activity and type of ownership.

What is interesting in this model is the fact that the sign of the estimator corresponding to the liabilities is negative, which indicated that the most profitable companies are those that borrow less.

The following table, Table 8, shows the estimated profit corresponding to each type of activity and ownership.

Table 8. The average profit related to turnover and liabilities for each type of company and each type of ownership

Type of activity	Type of ownership	Average profit
Outsourcing	International	Profit=152,118+0.0792*Turnover-0.0544*Liabilities
Outsourcing	Romanian	Profit=237,376.4+0.0792*Turnover-0.0544*Liabilities
Production	International	Profit=258,873+0.0792*Turnover-0.0544*Liabilities
Production	Romanian	Profit=341,131.4+0.0792*Turnover-0.0544*Liabilities

Source: Authors' calculation

For example, for a Romanian production company, having the same level of liabilities, if the turnover increases by 1,000 lei, the average profit will increase by 79.2 lei. On the other hand, at the same level of turnover, if the liabilities increase by 100 lei, the average profit will decrease by 54.4 lei. An interesting fact is that if we maintain the turnover and the liabilities constant, the highest average profit is obtained by the Romanian production companies.

- **Partial elasticity. The log-linear model**

It would be interesting to see if the profit is elastic related to the turnover or to the liabilities. For this we shall use a multiple log-linear model. The results are presented in Table 9:

Table 9. The relationship between the profit, turnover, liabilities, type of activity and type of ownership (log-linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	1.80793	0.3285			
log(Turnover)	0.782697	0.0000			
log(Liabilities)	-0.100732	0.3090			
Type of activity	0.504081	0.0173			
Type of ownership	0.63018	0.0247			
Model		0.0000	11.94	0.3828	0.3508

Source: Authors' calculation

As we can observe the log-linear model is no longer significant related to the liabilities, but is significant related to the turnover, type of activity and type of ownership. Moreover, the model is overall significant. Therefore, it would be a wise decision to keep liabilities in the model. In this way we will see that the profit is rigidly related to the turnover and the liabilities. In fact, the model reveals that the profit is rigidly related to each quantitative explanatory variable, meaning that if any of those is modified by 1%, the corresponding change in the average profit will be less than 1%.

One fair question is which one to choose: the linear model or the log-linear one.

From the econometric point of view the answer is simple. We have to compare these two models. One problem that arises when we want to compare models is whether to use the R-squared in order to determine which model is better. This is due to the fact that in those two models (linear and log-linear) the R-squared expresses two different things. That is why, in order to compare models, we have to use the RSS (residual sum of squares). For this we have to consider a new dependent variable in which all values are divided by the geometric mean of the values. The reason for this is to make the values of the RSS comparable. In this way we obtain:

Table 10. Value of Residual Sum of Squares

RSS - linear model	174.807
RSS - log-linear model	56.936

Source: Authors' calculation

In conclusion, the best model from the econometric point of view is the log-linear model. The results are presented in Table 11:

Table 11. The average profit using the log-linear model

Type of activity	Type of ownership	Average profit
Outsourcing	International	$\text{Log}(\text{Profit})=1.80793+0.782697*\text{Log}(\text{turnover})-0.100732*\text{log}(\text{Liabilities})$
Outsourcing	Romanian	$\text{Log}(\text{Profit})=2.43811+0.782697*\text{Log}(\text{turnover})-0.100732*\text{log}(\text{Liabilities})$
Production	International	$\text{Log}(\text{Profit})=2.312011 +0.782697*\text{Log}(\text{turnover})-0.100732*\text{log}(\text{Liabilities})$
Production	Romanian	$\text{Log}(\text{Profit})=2.942191+0.782697*\text{Log}(\text{turnover})-0.100732*\text{log}(\text{Liabilities})$

Source: Authors' calculation

For example, in all cases, at the same level of liabilities, if the turnover increases by 1%, the average profit will increase by 0.782697%.

3.2.3. The relationship between profit, turnover, liabilities/capital ratio, type of activity and type of ownership

Due to the fact that the absolute value of liabilities might be misleading, we replaced this variable with the liabilities/capital ratio.

Using a multiple linear model we obtain the following results presented in Table 12.

Table 12. The relationship between the profit, turnover, ratio liabilities/capital, type of activity and type of ownership (linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	290579	0.1382			
Turnover	0.0724412	0.0000			
Liabilities/Capital	-116088	0.0005			
Type of activity	122167	0.4239			
Type of ownership	27029.5	0.8802			
Model		0.0000	46.05	0.7051	0.6898

Source: Authors' calculation

As we can see, the model is significant in relation with the turnover and to the new ratio, as well as overall, and it shows that 68.98% from the variability of the profit is explained by the variability of turnover, liabilities/capital ratio, type of activity and type of ownership. The model also show that the most profitable companies are those with a low liabilities/capital ratio.

The evolution of the average profit in relation with the turnover and the new ratio is presented in Table 13.

Table 13. The average profit related to turnover and liabilities/capital ratio for each type of company and each type of ownership (linear model)

Type of activity	Type of ownership	Average profit
Outsourcing	International	Profit=290,579+0.0724412*Turnover-116,088*(Liabilities/Capital)
Outsourcing	Romanian	Profit=317,608.5+0.0724412*Turnover-116,088*(Liabilities/Capital)
Production	International	Profit=412,746+0.0724412*Turnover-116,088*(Liabilities/Capital)
Production	Romanian	Profit=439,775.5+0.0724412*Turnover-116,088*(Liabilities/Capital)

Source: Authors' calculation

Table 13 shows that at same value of the liabilities/capital ratio, if the turnover increases by 1,000 lei, the average profit for each type of company and each type of ownership will increase by 72.44 lei. If the turnover and the liabilities/capital ratio are maintained at the same level, then the highest average profit is obtained by the Romanian production companies.

Using a log-linear model we will obtain the results presented in Table 14.

Table 14. The relationship between the profit, turnover, ratio liabilities/capital, type of activity and type of ownership (log-linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	-0.150108	0.9304			
Log(Turnover)	0.818668	0.0000			
Log(Liabilities/Capital)	-0.318746	0.0000			
Type of activity	0.447628	0.0194			
Type of ownership	0.493964	0.0519			
Model		0.0000	19.10	0.4980	0.4719

Source: Authors' calculation

Table 14 reveals the best model that we have determined so far. This model is significant related to each explanatory variable (even to the type of ownership, corresponding p-value is almost 0.05) and overall.

Using this model we obtain the results in Table 15.

Table 15. The average profit related to turnover and liabilities/capital ratio for each type of company and each type of ownership (log-linear model)

Type of activity	Type of ownership	Average profit
Outsourcing	International	$\text{Log}(\text{Profit}) = -0.150108 + 0.818668 * \text{log}(\text{Turnover}) - 318,746 * \text{log}(\text{Liabilities/Capital})$
Outsourcing	Romanian	$\text{Log}(\text{Profit}) = 0.343856 + 0.818668 * \text{log}(\text{Turnover}) - 318,746 * \text{log}(\text{Liabilities/Capital})$
Production	International	$\text{Log}(\text{Profit}) = 0.29752 + 0.818668 * \text{log}(\text{Turnover}) - 318,746 * \text{log}(\text{Liabilities/Capital})$
Production	Romanian	$\text{Log}(\text{Profit}) = 0.791484 + 0.818668 * \text{log}(\text{Turnover}) - 318,746 * \text{log}(\text{Liabilities/Capital})$

Source: Authors' calculation

Table 15 shows that at same value of the liabilities/capital ratio, if the turnover increases by 1%, the average profit for each type of company and each type of ownership will increase by 0.818668% no matter what type of activity or ownership company has. That means that the profit is rigid with respect to the turnover.

Comparing these two models we obtain:

Table 16. Value of Residual Sum of Squares

RSS - linear model	157.981
RSS - log-linear model	46.155

Source: Authors' calculation

In conclusion the best model is the log-linear one.

3.2.4. Is the IT sector development slow, constant or fast?

To see if this IT sector development is really a boom we will study the relationship between turnover, number of employees and capital, using a Cobb-Douglas function in the logarithmic form

$$\log(\text{Turnover}) = B_0 + B_1 \log(\text{employees}) + B_2 * \log(\text{capital})$$

and we will call this the unrestricted model.

We obtain the results presented in Table 16.

Table 16. The relationship between turnover, number of employees and capital (log-linear model)

Parameter	Estimate	P-Value	F-Ratio	R-squared	Adjusted R-squared
CONSTANT	7.9176	0.0000			
log(Employees)	0.338427	0.0000			
log(capital)	0.454117	0.0000			
Model		0.0000	40.58	0.5067	0.4942

Source: Authors' calculation

Table 16 shows that the model is significant in relation with each explanatory variable and overall. Moreover, we can see that the turnover is rigidly related to the number of employees and capital.

The purpose is to determine the development rate of the sector.

From the econometric point of view, the sum of the parameters B_1+B_2 represents the return to scale. If $B_1+B_2>1$, then there are increasing returns, and if $B_1+B_2<1$, there are decreasing returns.

In our case if we obtain that $B_1+B_2>1$, the answer to the question is positive: there is a boom.

We will assume that $B_1+B_2=1$ and in this way we obtain the following restricted model:

$$\log(\text{Turnover}/\text{employees})=B_0+B_2*\log(\text{capital}/\text{employees}) - \text{restricted model}$$

The hypotheses that we have to test are the following:

H_0 : the restriction is valid ($B_1+B_2=1$)

H_1 : the restriction is not valid

In order to test these hypotheses we have to determine the value of F-statistic using the formula:

$$F = \frac{(RSS_R - RSS_{UR}) / m}{RSS_{UR} / (n - k - 1)}$$

where:

- m is the number of restrictions;
- n is the number of observed values;
- k is the number of independent variables in the unrestricted model.

This value has to be compared with the critical one $F_{(m, n-k-1)}$. If $F > F_{(m, n-k-1)}$, then we can reject H_0 .

In our case, we have the following results in Table 17:

Table 17. Value of the F-statistic

RSS - unrestricted model	47.808
RSS - restricted model	51.0139
F - statistic	5.29756
Critical F	3.96

Source: Authors' calculation

Because $F\text{-statistic} > \text{Critical-F}$, we can conclude, with 95% confidence, that H_0 is rejected; therefore, the restriction is not valid.

An interesting fact must be highlighted. Because the sum of the estimators is less than 1, from the econometric point of view, we can see that the development is not (quite) a boom. In fact, the evolution is a moderate one.

4. Conclusions

As we have seen, the model that we have determined is significant related to the type of the ownership and overall, and it is not significant in relation with the type of activity. From the economic point of view, that means the sector is attractive for the investors no matter what type of activity they want to develop (production or outsourcing). The main reason that makes them invest is the well prepared and relatively low cost workforce.

All four models that we have determined (see 3.2.2 and 3.2.3) show that, under favorable conditions (increase in turnover, decrease in liabilities and/or liabilities/capital ratio), the trend of the profit is ascending, making from this sector an interesting one for the investors (Romanian or international). On the other hand, our models show that this possible increase of the profit is a moderate one (for example, both log-linear models show that the profit is rigid in relation with the turnover and liabilities or liabilities/capital ratio).

The hypotheses tested in section 3.2.4 show (similar to point 2 of this section) that the development of the sector is rather a moderate one not a "booming" one. Even if most people are expecting to find that this development is a rapid one, the results obtained are normal if we take into consideration the fact that the process of developing Cluj-Napoca as an IT pole is at the beginning. Nevertheless, the signs are favorable to an acceleration of this development.

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DID EUROPEAN COUNTRIES SUFFER FROM DIFFERENT CALCULATION OF HDI?

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ABSTRACT. The Human development index (HDI) was introduced for the first time in the summer of 1990. The objective was to provide a more complex indicator that captures a country's development level better than the gross national product. UNDP (United Nations Development Programme) justified this approach by the need to attempt to provide an informative value that exceeds the strict quantitative aspects. This article analyzes the impact of different calculation of HDI, by comparing the values of the index calculated relying on the Human Development Report from 2005 with the values of the index calculated based on the Human Development Report from 2010 for 10 European countries (five emerging countries and five developed countries). When using the new methodology in calculating the Human Development Index, there is a small and insignificant difference. The HDI values obtained based on the new methodology from the Human Development Report from 2010 are smaller, but these values do not change their rank.

Keywords: human development index (HDI), education, gross domestic product, life expectancy

JEL classification: O10, I21, E23

1. Introduction and Review of Literature

Development is a preamble of improving quality of life, and comprises both material elements such as infrastructure, housing quality and living standards, in general, and spiritual elements such as education, freedom of expression and cultural manifestation. These elements were summarized in the concept of human development that was introduced by the economist Amartya Sen, Nobel laureate for economics, in close relation with a concept of capability. Mahbub ul Haq, a Pakistani economist, further developed this concept by embedding it in the construction of the Human Development Index (HDI).

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Since 1990, the United Nations Development Programme (UNDP) promotes human development as an alternative paradigm to the classical economic approach to measure. UNDP uses Global Human Development Reports (24 in number) and National Reports on Human Development (so far - more than 400 national and sub national reports from more than 170 countries), respectively considers people as the center and goal of development. Human development, according to UNDP, means those capacities and justification of the people to choose and pursue their own choices in all areas of life. In overall size, this concept integrates health care, education, religion, a decent standard of living and political freedom. Also, human development does not reduce only to these aspects of life. The cultural identities of individuals must be recognized, being the state's obligation to give them a major focus. Individuals should be free to express their own identity without being subject of discrimination in various areas of their existence. In conclusion, cultural liberty is a human right and an important integrated part of human development.

Each year, Human Development Reports make efficient recommendations at both national and international levels. At national level, Human Development Reports focus on the priority of human development politics, the need to establish a new partnership between state and market, promotion of new forms of alliance between governments, civil society institutions, communities and individuals. National, regional, and global reports regarding human development played over the past two decades a key role in promoting human development.

Since 1990, when the Human Development Index (HDI) was included in the first Human Development Report, the index successfully served as an alternative assessment for the level of development and as a complement to economic indicators. HDI assesses a country's achievements in three aspects of human development: longevity, educational level and living standard (Secăreanu, 2000). Longevity is measured by life expectancy at birth; knowledge which is a combination of the level of mean years of schooling and expected years of schooling; standard of living that is based on Gross National income per capita measured in US dollars at purchasing power parity (PPP). For all these aspects an index is calculated; value 0 indicates a low level of human development, while value 1 indicates a high level of human development. The combination of these three indices underpins the annual country rank.

Human Development Index provides a complete radiography of human development level of countries worldwide, an overall assessment of progress and different strategies that have been followed by countries to achieve human welfare.

This index transposes into a synthetic substitute of the three indicators presented before. HDI measures the relative distance that separates each country

of the world by the targets considered to be priority, either: a long and healthy life, a free access to the acquisition of knowledge and, last but not least, a level of income to ensure a decent standard of living, which would be preferable to be on the world's average level of gross national income per capita.

Yang and Hu (2008) analyze China's HDI data for the years 1982, 1995, 1999, and 2003, respectively classify China's provinces into four tiers. The authors adopt both one-dimensional and multi-dimensional cluster analysis. The empirical results find that the overall regional disparities in China have been increasingly attributable to the regional economic disparities.

Abayomi and Pizarro (2013) used the variables of gross domestic product, literacy rate and life expectancy for a sample of 135 countries for the period 1970 through 2010. Also, they used the scores generated by the Principal Component Analysis results as initial the values in a Bayesian estimation process. The replicates for the weights of Human Development Index seem to be all statistically different, but high weights are assigned to education variable in Human Development Index.

Pinar et al. (2013) used in their research the Human Development indicators (education, life expectancy and gross domestic product) during the period 1975–2000 in 5-year increments. The authors compare the official equally-weighted HDI with all possible indices constructed from a different set of individual components in order to obtain the most optimistic scenario for human development. The study suggests that any indicator declined, on prior grounds, in order to weight education more strongly than does the official Human Development Index, would try to take a more optimistic view to the extent of general improvements in welfare.

Tofallis (2013) tries to find new weights for components HDI but he is careful not to disadvantage certain nations. Therefore, in order to avoid the use of arbitrary weights, he proposes to find the most advantageous set of weights that will be specific for each country, respectively to regress the associated optimal scores and identify a single weight set. The analysis is made on 169 countries for the year of 2010. His research indicates that the highest weight is placed on the variable of life expectancy at birth.

Terzi et al. (2014) studied the impact of causal effects of the different types of institutions on different components of human development. Their analysis includes the sample of countries that are in the report of HDI from 2006. The methodology used is partial least squares path modeling (PLS-PM) algorithm and it comprises 34 indicators. The results show that political and social institutions are positively affected by economic institutions. In fact, economic development produces a parallel process of the social conditions' improvement, which determines knowledge and health. The variable of aggregate demand (used in the model as an economic growth tool) leads to economic development.

Wu et al. (2014) built an efficiency model in order to evaluate the rationality of Human Development Index ranking. The study covers 19 evaluated OECD countries during 2009. The obtained results show that a weight of 75% from the evaluated countries has different results in the efficiency rankings and HDI rankings. Also, the input slack shows that almost 70% of analyzed countries over-used their capital to labor relative to the existing outputs.

This article is the first to investigate if the new methodology in calculating Human Development Index changes the countries' ranking for a sample of ten countries. The HDI values obtained by using the new methodology from Human Development Report of 2010 are smaller, but these values do not change their rank.

2. Material and Method

Human Development Index comprises three basic elements: longevity (measured by life expectancy at birth), education level (calculated as a weighted arithmetic average between the mean years of schooling and expected years of schooling); standard conditions of living (expressed in GNI per capita calculated at purchasing power parity).

The HDI measures the relative distance that separates every country of the world from the prioritized goals for social development, namely providing an overall assessment of progress and different strategies followed by states to achieve human welfare. The index is calculated as a geometric average of the three dimensions: health, education and living standard.

HDI level varies in the interval 0 and 1; an HDI closer to 1 indicates a higher level of human development. The maximum and the minimum values of variables are set in order to turn indicators into indices expressed in different units between 0 and 1. These values are presented in Table 1.

Table 1: The Minimum and the Maximum Values of HDI's Variables

Dimension	Indicator	Minimum	Maximum
Health	Life expectancy at birth	20	85
Education	Average years of schooling	0	18
	Expected years of schooling	0	15
Standard of living	Gross National Income (GNI) per capita (PPP 2011)	100	75,000

Source: UNDP (2011)

These values act as "natural zeros" respectively as "aspirational goals", values from which are standardized components of indicators. The variables are set at the following values: life expectancy at birth (20 to 85), average years of schooling (0 to 18), expected years of schooling (0 to 15), and Gross National Income per capita (PPP 2011) ($\ln(100) - \ln(75,000)$).

Having defined the minimum and the maximum values, the indicators' of dimensions are calculated as follows:

$$\text{Indicator dimension} = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}} \quad (1)$$

In the Human Development Report from 2005, the Human Development Index had the following formula:

$$HDI = \frac{I_{health} + I_{Education} + I_{GNI}}{3} \quad (2)$$

where:

I_{Health} – index of health

$I_{Education}$ – index of education

I_{GNI} – index of gross national income

In the Human Development Report from 2010, the Human Development Index formula has changed; it is a geometric average such as:

$$HDI = \sqrt[3]{(I_{Health} * I_{Education} * I_{Standard\ of\ life})} \quad (3)$$

where:

$I_{Standard\ of\ life}$ – index of standard conditions of life

To analyze the impact of the different formulas of HDI, for the current the values of the index calculated according to the Human Development Report from 2005 were compared to the values of the index calculated relying on the Human Development Report from 2010. The paper analyzes the evolution of ten countries: five emerging countries and five developed economies in order to observe the differences between them.

The analyzed period covers the years 1980, 1985, 1990, 2000 and the period 2005-2013. The frequency data is annual. Data were collected from the database of the United Nations Development Program: life expectancy at birth, average years of schooling, expected years of schooling and gross national income per capita.

The sample comprises 10 countries from Europe, of these: 5 countries have a very high Human Development rank (they are developed countries: Norway, Switzerland, Netherlands, Germany and France), and 5 countries have a high human development (they are emerging countries: Czech Republic, Poland, Hungary, Romania and Bulgaria).

3. Results and Discussions

Over the past 60 years, the average life expectancy at birth has increased globally by almost 21 years, from 46.5 years in 1950 to 71 years in 2013. This represents a global average increase in life expectancy of 3 months per year during that period. On average, the gain in life expectancy was 9 years in developed countries. Life expectancy at birth in the analyzed developed countries is between 73 years (in Germany in 1980) and 82.6 years (in Switzerland in 2013). It can be observed that this variable has an ascending trend (Figure 1). Life expectancy at birth is increasing in Norway. This indicator was around 50 years at the end of 1800s. Starting with 1900, it increased to around 70 years in 1950, respectively to 81 years in 2000. In 2012, life expectancy at birth for women was of 83.4 years, respectively of 79.4 years for men. Since 1900, it has increased by 30 years. Norway is among the 8 or 10 countries that have the highest life expectancy at birth. Life expectancy in Switzerland is one of the highest in the world, which has had a significant rise during the 20th Century. Since 1900, it had grown from 46.2 to 83 years. The indicator is with three years higher than the OECD average. People from most of the Western European countries, including Netherlands, are living longer, they have healthier lives. By 2050, it is expected that Dutch citizens will spend in retirement approximately twenty years of their lives. In the mid eighteenth century, life expectancy at birth in France was of just 25 years. During the nineteenth century, it reached 45 years. Life expectancy is still increasing, due to progress in cardiovascular diseases and cancer. French life expectancy is of 82 years now.

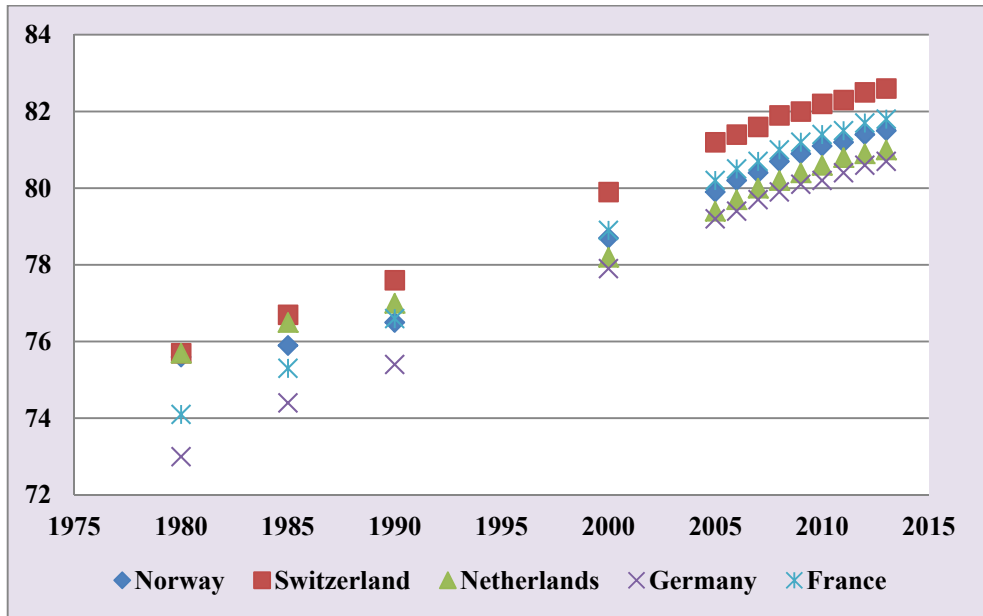


Figure 1: Life Expectancy at Birth in Developed Countries

Source: www.undp.org

The trend is similar within the developing countries, too. It can be observed that the scale is different: 69.2 years (in Hungary in 1985) and 77.7 years (in Czech Republic in 2013), the average values are down by 5 years compared to those of the developed countries (Figure 2). In 2013, the life expectancy at birth in Romania increased to 75.20 years. In this year, the life expectancy at birth for men was of 71.60 years and for women of 78.70 years. Romania's position has improved, dropping in one year from the 71st level in 2012 to the 65th position in 2013. The increase in life expectancy at birth that occurred during the first half of the 20th Century in many developed countries was the result of a rapid decline in mortality (especially infant and maternal mortality). Access to better sanitation and education, housing, an increased trend to smaller families, the increasing of incomes, and public health measures contributed greatly to this epidemiological transition. In most of the developed countries, this started approximately 100 to 150 years ago, and the process was much faster. In developing countries, this transition started even later, but it has not yet been completed. Also, in developed countries, the improvements in life expectancy at birth come mainly from reductions in death rates of adults now.

Life expectancy at birth in the Czech Republic increased to 77.7 years. Czech Republic's position took the 39th position in the ranking of 191 countries. In Poland, this indicator increased to 76.40 years. Poland's position was the 48th in the ranking of 191 countries. Hungary's position improved in this rank of life expectancy, dropping from the 61st in 2012 to the 59th in 2014. Hungarian life expectancy at birth reached 74.6 years. Bulgaria is one of the EU countries that have the lowest life expectancies at birth, it is around 73.5. The only countries where life expectancy is lower than in Bulgaria are Lithuania and Latvia. Bulgaria's position improved, dropping from the 76th in 2012 to 70th place in 2013.

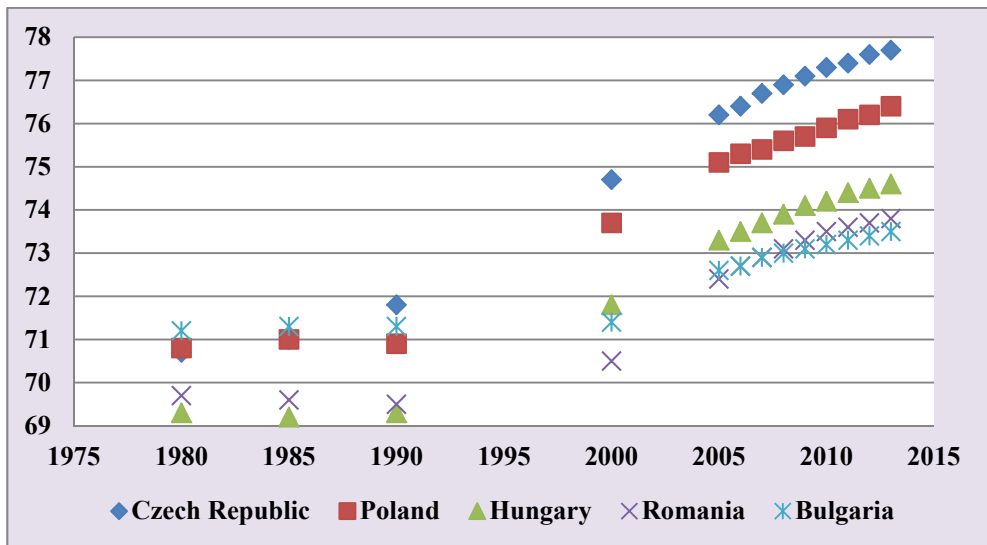


Figure 2: Life Expectancy at Birth in Developing Countries

Source: www.undp.org

There has been a strong upward trend in the variable average years of schooling for all countries worldwide, however, with only some exceptions; the gap between developing and developed countries has changed very little. Education represents the most powerful tool for reducing poverty and inequality; et the same time, it lays a foundation for a sustained economic growth.

In a fast-changing knowledge economy, education is understood as being about learning skills for life. The question is how many years of school, college or training will expect to attend future generations? The answer is that, on average,

people may expect to go through 17.7 years of education, if we judge by the number of people that have ages between 5 and 39 and they are currently in schools or colleges. The trend in education has been an ascending one until the year of 2008, except for the Czech Republic. From 2009, the analyzed countries have constant values for the average years of schooling. This variable is for the analyzed developed countries is between 5.7 years (in Germany in 1980) and 12.9 years (also, in Germany in 2013). It can be observed that this variable is on an ascending trend until 2008 (Figure 3), followed by a constant trend during 2009-2013. The Norwegian educational system is considered to be among the best in the world (close to the Finnish one), the average years of schooling already achieved 12.6 years.

Switzerland has registered a higher level of education over the past years, with the proportion of those that have graduated at tertiary level having grown by about 13.5 % during the 1995-2010 timespan. The average schooling years increases from 10 years (in 1980) to 12.2 years in 2013 in Netherlands, due to the increase of compulsory schooling. Only 72.5% of the French adults (25 to 64 years) have completed high school, compared to an average of 74.2% across the European Union. The indicator has increased from 6 years (in 1980) to 11.1 years (in 2013).

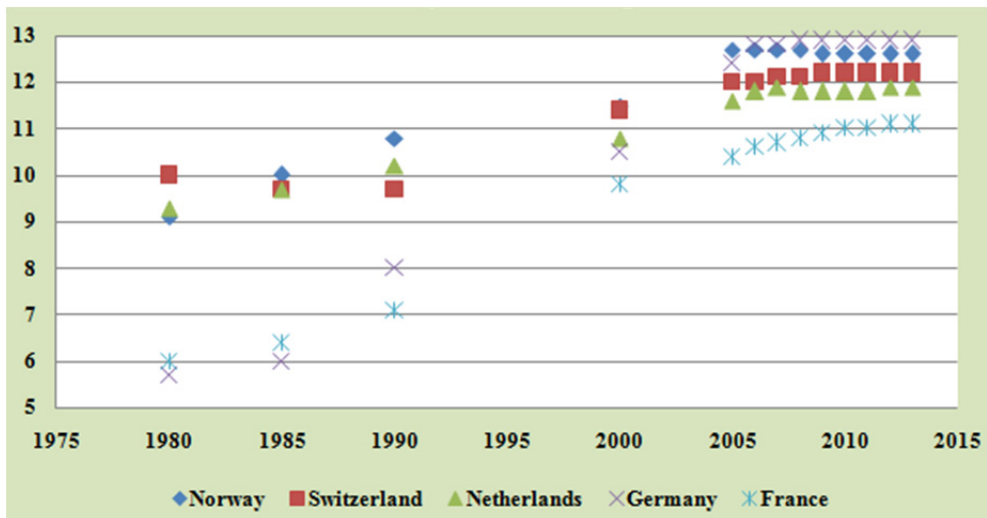


Figure 3: Average Years of Schooling in Developed Countries

Source: www.undp.org

The average schooling years in the analyzed developing countries are between 7.7 years (for Poland in 1980) and 13.1 years (Czech Republic in 2005). The Czech Republic is the only country that presents a decrease of this variable (by 0.8 years) for the period 2006-2010 (Figure 4). In Czech Republic, 92% of the adults with ages between 25-64 years have completed an upper secondary education cycle. The average schooling years have increased by 4.1 years in 2013 in Poland.

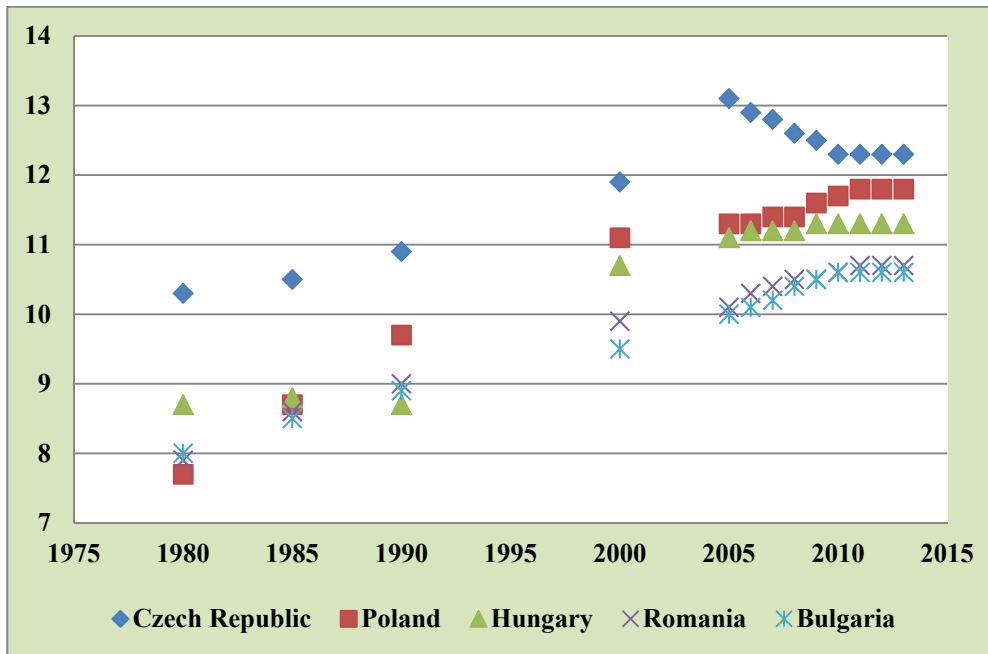


Figure 4: Average Schooling years in Developing Countries

Source: www.undp.org

Poland is followed by Romania, with an increase by 4.0 years during 1980-2013. The indicator rose only by 3.6 years to 11.3 years in 2013 in Hungary. The lowest increase and value of the indicator from analyzed countries is registered by Bulgaria with an increase of 2.6 years to 10.6 years in 2013.

A well-educated population is essential for each country's social and economic well-being. A good education contributes to improve the likelihood of finding a job and of earning enough money. Germans may expect to go through 18.2 years of education, 5.3 years above the average level (Figure 5). It can be

observed a little decrease for Norway during 2006-2009. The French education expects to go through 16.4 years between the ages of 5 and 39. People in the Netherlands expect to go through 18.7 years of education for people ageing between 5 and 39 years. In Switzerland, the indicator is expected to be of 17.3 years, due to the rise in tertiary-level education and changes in migration regarding the level of education.

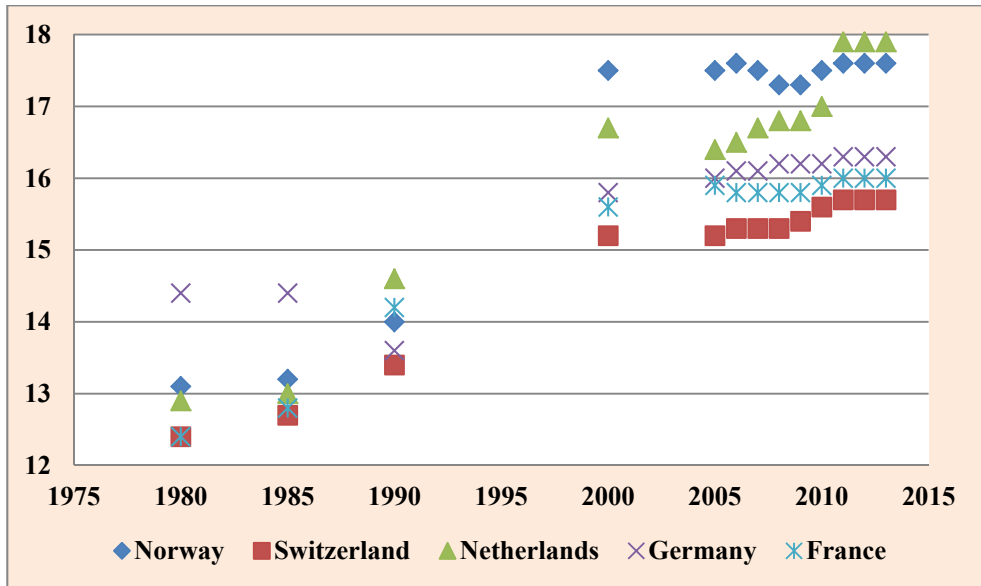


Figure 5: Expected Years of Schooling in Developed Countries

Source: www.undp.org

Czech Republic is expecting to go through 18.1 years of education between 5 and 39 years, by 2013 this value was 16.4 years up with 4.1 years above the mean (figure 6). The average values among developed and developing countries regarding the differences between the average years of schooling and expected years of schooling is around 1.1 years. Romania expects to obtain a value with 3.3 years above the average years of schooling. Hungarian people may expect to go through 17.6 years of education, while in Bulgaria is expected to register a value of only 14.3 years. Poland is supposed to register a higher value for the expected years of schooling (18.4 years), slightly more than the OECD average of 17.7 years.

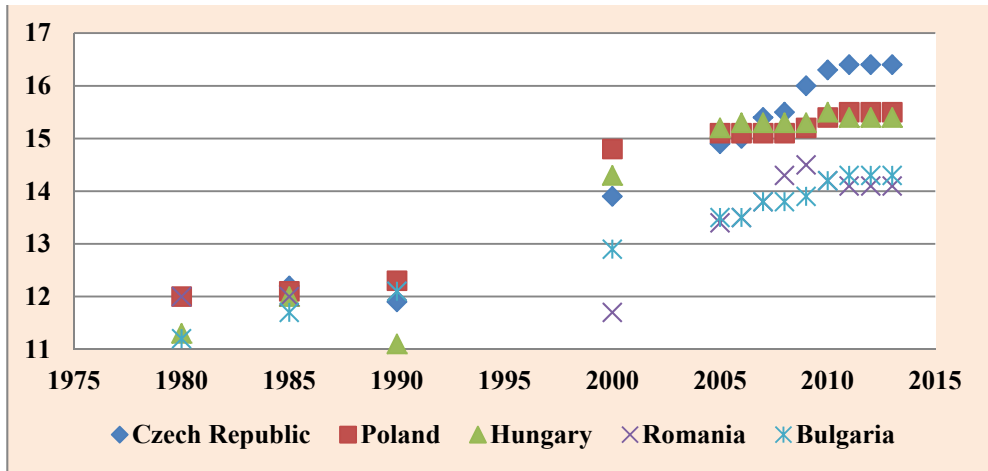


Figure 6: Expected years of schooling in developing countries

Source: www.undp.org

While money cannot buy happiness, it is an important tool to achieve higher living standards, respectively greater well-being. A higher economic wealth can also improve the access to quality health care, education and housing. The total value of the global income almost reached \$70 trillion per year in 2013, and there were seven billion people worldwide. This means that the average income should have been of \$10,000 per person per year in 2013. The reality is very different.

Gross national income (GNI) per capita has decreased in all analyzed countries during the global financial crisis. In 2013, the gross national income per capita was between 36.6 thousands PPP\$ (France) and 64 thousands PPP\$ (Norway) in developed countries (Figure 7), while in developing countries (Figure 8) the values were between 15,400 PPP\$ (Bulgaria) and 24,500 PPP\$ (Czech Republic).

The value of GNI per capita in Germany was of 43,991 for 2013. Over the past 43 years this indicator reached the maximum value of 44,085 in 2012 and a minimum value of 5,199 in 1970. In Norway, the indicator was of 65, for 2013. Over the past 33 years, the value for this indicator has fluctuated between 66,490 in 2012 and 32,658 in 1980. GNI per capita, PPP\$ in Switzerland was of 53,762 in 2013. Over the past 33 years, the value has fluctuated between 54,323 in 2010 and 38,928 in 1980. In Netherlands, the indicator has the value of 42,397 in 2013. During the 1980-2013 timespan, this indicator has fluctuated between 44,471 in 2007 and 26,145 in 1980. The value for GNI per capita, PPP is lower in France, than in other analyzed developed countries. It has registered the value of 36,629 in 2013.

DID EUROPEAN COUNTRIES SUFFER FROM DIFFERENT CALCULATION OF HDI?

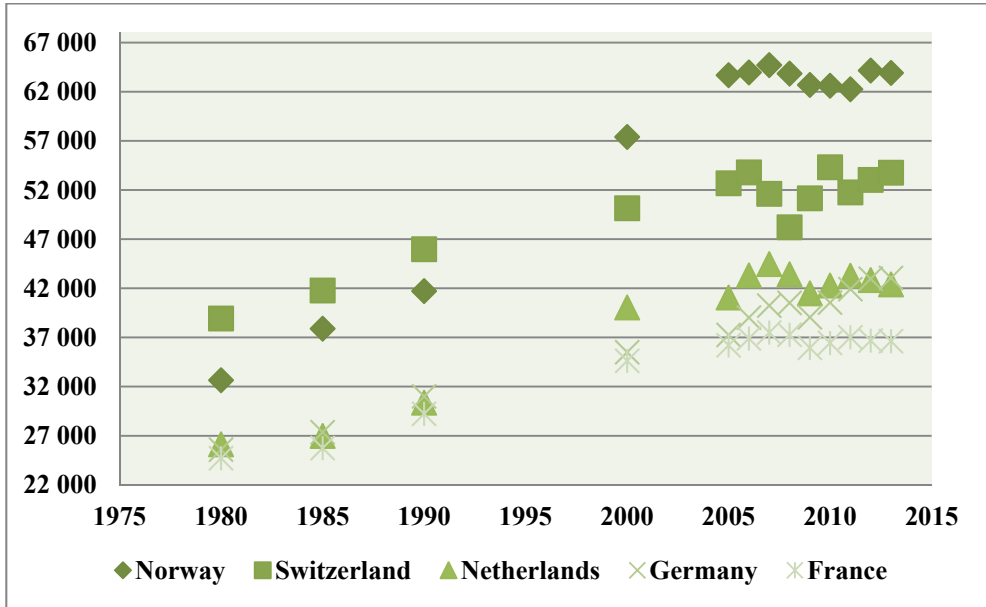


Figure 7: Gross National Income per Capita in Developed Countries

Source: www.undp.org

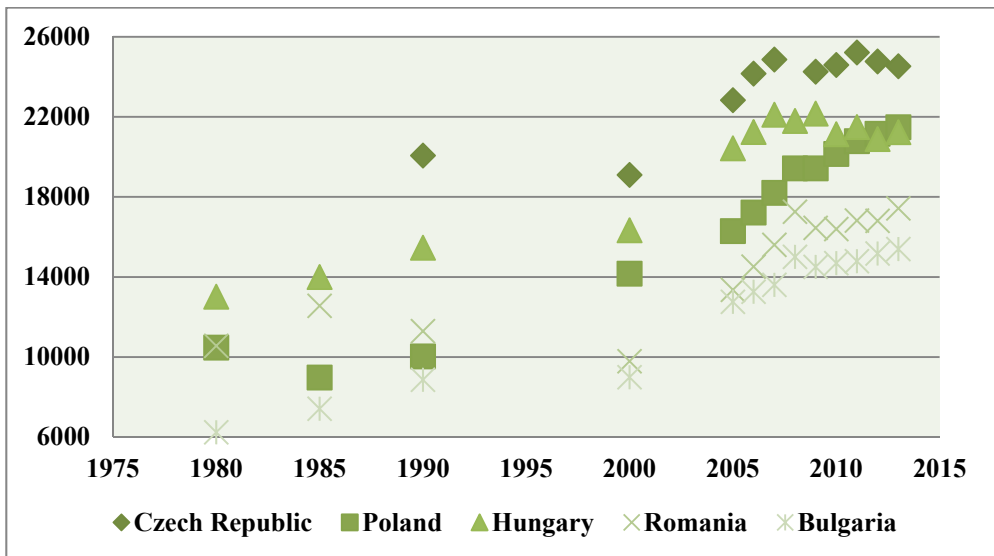


Figure 8: Gross national income per capita in developing countries

Source: www.undp.org

The higher values of GNI per capita, PPP\$ was of 24,535 in 2013 in the Czech Republic from all analyzed developing countries. On the second place in our analysis, Czech Republic is followed by Hungary, where the value of the indicator is 21,239 PPP\$ in 2013. Poland registered a decrease by almost 1500 PPP\$, between 1980 and 1985, but now it is on an upward trend, being the only country in Europe that wasn't affected by the global financial crisis. The GNI per capita is situated on an oscillating trend during the analyzed period in Romania. The values are between 9,796 PPP\$ (in 2000) and 17,433 PPP\$ (in 2013). In Bulgaria, the income level is still the lowest among the new EU member states, its value is of only 15,402 PPP\$ in 2013.

By using the new methodology in calculating the Human Development Index, there is a very small and insignificant difference in the new values of the index. The HDI values obtained after the new methodology from the Human Development Report of 2010 are smaller, but these values do not change the countries ranking (Table 2). Researchers agree to use geometric mean in calculating the index in order to use the average mean of the three dimensions.

Table 2: Values of HDI in 2005 and 2010

Years	Developed Countries									
	Norway		Switzerland		Netherlands		Germany		France	
	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)
1980	0.798374	0.792520	0.811646	0.805619	0.788408	0.783459	0.747778	0.738754	0.735701	0.721733
1985	0.818822	0.814115	0.819724	0.812784	0.800363	0.796019	0.761178	0.751863	0.753173	0.740994
1990	0.843096	0.840276	0.835663	0.829228	0.828121	0.825908	0.788626	0.781699	0.787175	0.778982
2000	0.911070	0.910321	0.887877	0.885783	0.874745	0.873992	0.855100	0.853717	0.849976	0.847509
2005	0.935593	0.935169	0.903405	0.901519	0.888882	0.888294	0.887670	0.887393	0.868551	0.866588
2006	0.938010	0.937612	0.907197	0.905347	0.895422	0.894843	0.895717	0.895545	0.871855	0.869820
2007	0.938908	0.938465	0.906729	0.904974	0.901222	0.900735	0.899647	0.899462	0.875085	0.873121
2008	0.937214	0.936733	0.904928	0.903291	0.901256	0.900762	0.901826	0.901642	0.877294	0.875364
2009	0.937372	0.936925	0.910053	0.908412	0.900164	0.899666	0.901188	0.900997	0.877563	0.875682
2010	0.939715	0.939330	0.916437	0.914850	0.904153	0.903719	0.904282	0.904065	0.880728	0.878902
2011	0.941307	0.940966	0.915696	0.914239	0.914535	0.914361	0.908457	0.908270	0.883855	0.882132
2012	0.943307	0.942921	0.917696	0.916164	0.915177	0.915005	0.910791	0.910574	0.885516	0.883813
2013	0.943974	0.943587	0.919030	0.917444	0.915511	0.915322	0.911791	0.911550	0.886183	0.884434

DID EUROPEAN COUNTRIES SUFFER FROM DIFFERENT CALCULATION OF HDI?

Years	Developing Countries									
	Czech Republic		Poland		Hungary		Romania		Bulgaria	
	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)	HDI (2005)	HDI (2010)
1980	0.7790	n.a.	0.692078	0.687554	0.698974	0.695525	0.688767	0.685187	0.663531	0.657701
1985	0.736494	n.a.	0.696852	0.693873	0.709467	0.706856	0.703811	0.700993	0.683291	0.679089
1990	0.763574	0.761874	0.715220	0.713551	0.705556	0.701110	0.704437	0.702535	0.699503	0.696458
2000	0.805893	0.805482	0.784536	0.783886	0.773634	0.773449	0.707633	0.705833	0.715741	0.713825
2005	0.844696	0.844495	0.803703	0.803055	0.805561	0.805483	0.750878	0.749815	0.750199	0.749015
2006	0.848253	0.848104	0.808359	0.807792	0.809597	0.809527	0.759790	0.758838	0.754039	0.752915
2007	0.852921	0.852772	0.812682	0.812171	0.813708	0.813620	0.769555	0.768812	0.759989	0.759051
2008	0.856145	0.85602	0.817338	0.816908	0.814151	0.814056	0.781355	0.780832	0.767161	0.766306
2009	0.856073	0.855842	0.820627	0.820193	0.816262	0.816162	0.781726	0.781233	0.767926	0.767124
2010	0.858815	0.858574	0.826007	0.825635	0.816891	0.816801	0.779976	0.779333	0.773210	0.772538
2011	0.861407	0.861176	0.830518	0.830176	0.817298	0.817188	0.782298	0.781649	0.775136	0.774467
2012	0.861407	0.861138	0.832900	0.832569	0.816631	0.816492	0.782631	0.781965	0.776802	0.776147
2013	0.861741	0.861419	0.834567	0.834217	0.817965	0.817816	0.785298	0.784612	0.778136	0.777457

Source: *www.undp.org and own calculations*

Last but not least, human development is about the development of the people, for the people and by the people. The essential difference between the concepts of economic growth and human development is that the first is focused exclusively on expanding an opportunity – one for income, while the second involves strengthening all possibilities – either economic, social, cultural or political. In terms of the human development concept, the income is a means for human development but not the only one. Using various methods, the benefits of income need to be used for encompassing many aspects of development. Therefore, economic growth is a necessary condition but not sufficient for human development.

Even if the values of the indicators (life expectancy at birth, average years of schooling, expected years of schooling, Gross National Income per capita expressed in PPP) varied over time, they did not affect the values of Human Development Index.

4. Conclusions

Human Development Index is not the ultimate index to calculate and assess the level of human development. Still, this index is better than other indices that are used to study the development level of various countries. Now, there are

assessments that the new HDI can better assess this development than the old HDI, even if the new methodology of HDI did not affect the evolution of countries in Human Development ranking.

According to the Human Development Report, human development matters, firstly, not in the quantity, but in the quality of economic growth. An important lesson for future synthetic indicators is the need of transparency regarding the tradeoffs implicit especially in complicated indices. These compromises are keys to understanding the properties and implications of the index.

The use of a geometric average in the new methodology of calculating the HDI is considered to be the most accurate result of calculating the averages even if there do not occur changes in the countries' rankings. Also, the geometric average has a positive impact on the new methodology, because it allows finding a value that is qualitatively equidistant from both the minimum and the maximum values of the indicator.

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