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Contents

Financing medical services in Romania's health system

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Abstract. *In Romania, the financing of health services is hierarchical: the state budget law establishes the maximum levels of payments that cannot be overcome and are distributed to the health insurance houses according to historical allocations and estimated spending needs. This paper examines the developments of the main healthcare services, funded by the Romanian health insurance system, in the last nine years, observing the volume and the cost of services and noting the impact of measures taken by the policy makers. Thus, in the analyzed period, the priorities pursued in the healthcare system were the costs' control and rationalization, the quality of the services and the access to these being secondary concerns. In conclusion, the Romanian health system requires a program to improve the quality of healthcare services in order to increase the patients' satisfaction and to streamline the spending in the health system.*

Keywords: health system, medical services, financing, analysis, cost control.

JEL Classification: I15; G28.

Introduction

The health care system in Romania is a social insurance system that aims to ensure citizens' access to universal and equitable health services, and also to protect them from financial difficulties that are associated with the health services payment (Vlădescu, 2004).

Social health insurance system is the main financing system of public health, which offers a basic service package that includes medical services, health care services, drugs, sanitary materials and medical devices (Law No. 95/2006).

Currently, persons insured in the Romanian health care system benefits the package of basic services in case of illness or accident, from the first day of illness or the accident and until cured, having paid both the health insurance contributions and the amount representing the co-payment. People who have not paid their social insurance contributions for health care but are leaving in Romania are entitled to a minimum package of health services, which include medical services only in case of surgical emergencies, endemo-epidemic diseases, including those stipulated in the National Immunization Program, monitoring of pregnancy, family planning services. There are also people (members of diplomatic missions accredited in Romania, foreign citizens who are temporarily in the country without requiring long-term visa and Romanian citizens leaving abroad who are temporarily in the country) voluntary ensured in the system of health insurance and benefits from a package of medical services defined distinctly and includes medical services, health care services, drugs, sanitary materials, medical devices and other services.

The health insurance houses ensure the quantity and quality of medical services provided to the insured persons checking the fulfillment of the contractual terms of the framework contract signed with healthcare providers. In this respect, the framework agreement regulates the conditions for granting medical assistance on the minimum package of health services; the basic package of health services; the list of medical services, drugs and medical devices; quality standards for health services; ways of establishment, use and management of the National Health Insurance Fund; negotiating and contracting conditions between CNAS, insurers, suppliers and insured persons; ways of prescribing drugs; adequate patient information.

Legal provisions oblige all actors in the health system (Ministry of Health, CNAS, County Houses, The Public Health District Authorities and health care providers) to meet quarterly to analyze the quality of services provided to the insured persons and to make improvements to the functioning of the system if they will be considered necessary.

The health care of the insured persons is done through medical services, drugs, sanitary materials, medical devices and other services. Medical services provided in the social health insurance system in Romania are:
- The primary care.
- The structures of medical ambulatory.
- The emergency medical assistance and qualified first aid.
- The medical transport services.
- The services provided by hospitals.
- Drugs.
- The medical home care services.
- The medical devices.
- Special medical services.

Primary care

Primary care is the first level of contact of the population with the health system, offering patients non-discriminatory access to preventive, curative, recovery services, regardless of the absence or presence of a disease. This is provided by family doctors through consulting rooms organized according to the laws in force.

The services provided in primary care are: prevention and preventive health care, curative health services, home health services, additional medical services, support activities.

In this context, the role of the family physician is defined as the "gate-keeper" of the health care systems, the first contact of the patient with the healthcare system, but at the same time, the person who directs the patient to solve the problem of health, protecting the health care system from inadequate services (Frâncu and Frâncu, 2012: p. 4).

Resources allocated to family medicine in the National Unique Fund of Health Insurance totalled most frequently about 6% of total expenditure (respective 8.76%, in 2008, and 7.23%, in 2009). In opposition to the objectives of stimulating primary care, in 2015 the amounts allocated to these health services were, in real terms, lower than in 2008. In the period studied, the value of "per capita" was maximum in 2008, then decreased gradually and strengthened since 2012. Evolution of the value of "per service" was extensive, with significant decrease in 2009 and 2010 and then stabilized from 2012.
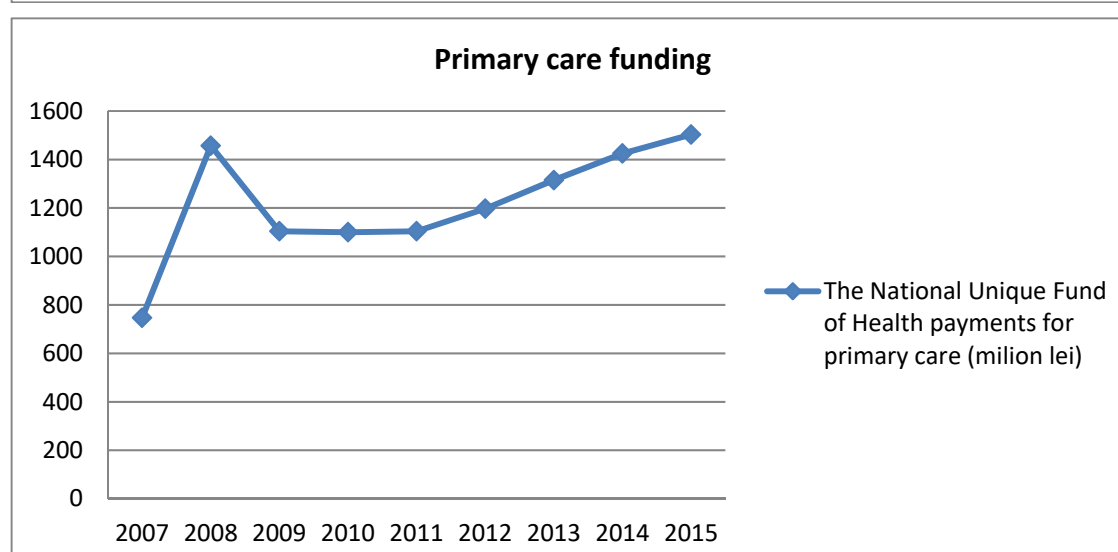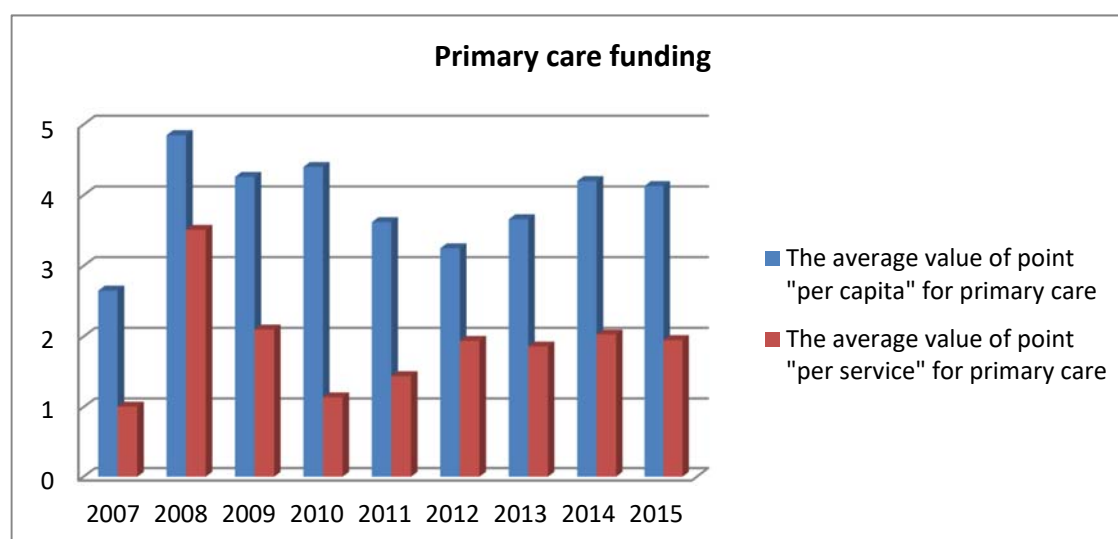
Source: Compiled by the author based on CNAS databases.

A key objective of the Romanian health system consists of a higher health coverage of the population needs through health services provided by the family doctor. In this regard, primary care should ensure equitable access to quality health services and cost effective, to coordinate with other levels of care and ensure continuity of the medical care.

Ambulatory healthcare structures

The healthcare of the outpatients is provided by specialist doctors and medical staff (nurses, etc.) and includes curative medical activities, surgical interventions, diagnostic and investigation activities, activities of speech therapy, psychology activities, physiotherapy and medical recovery activities, activities related to medical care, specialist care activities accredited and authorized by the Ministry of Health.

The ambulatory healthcare should ensure vertical integration between primary care services and the hospital. The ambulatory is a recognized potential to take over and solve more types of services, relieving hospital services and reducing costs, creating, also, secondary and tertiary prevention in the health insurance system.

Contrary to its importance, paying suppliers of medical services performed in ambulatory structure represents only 2% of annual resources of the National Fund for Health Insurance.
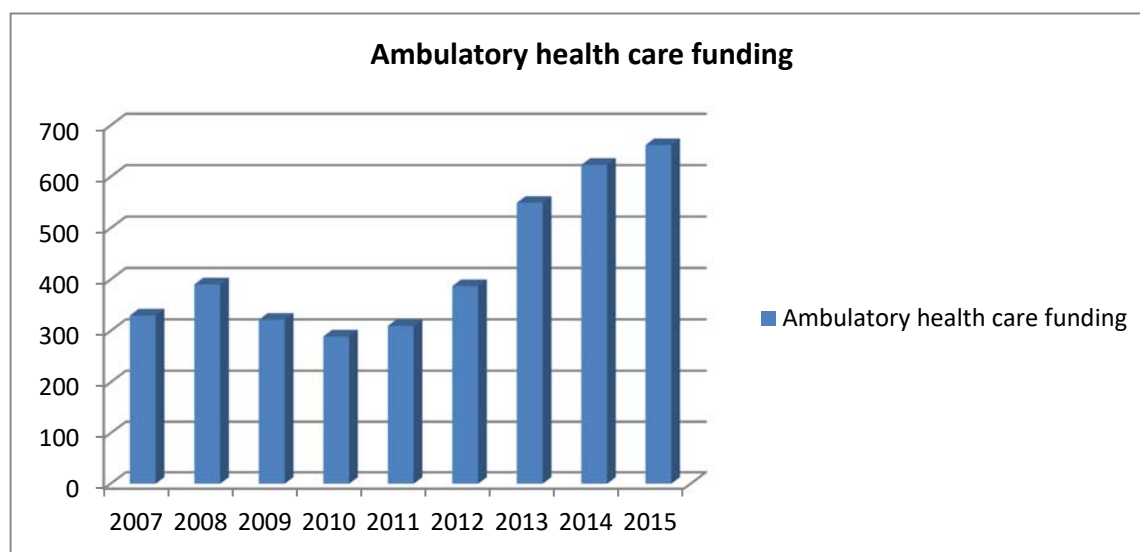
Source: Compiled by the author based on CNAS databases.

Due to budgetary constraints and a lack of appreciation given by the authorities to this segment, 2009 and 2010 brought declines in funding, it recorded an upward trend since 2012 due to the existence of a public policy that boosts services in primary care.

Evolution of the average points "per service" in ambulatory healthcare took into account the budgetary allocations. Thus, it has declined by 20% in 2009 and then stabilized since the years 2012 and 2013 (33% and 45% respectively).

The average value of point "per service" in ambulatory healthcare

A bar chart showing values for years 2007-2015, with y-axis from 0 to 2. Legend: The average value of point "per service" in ambulatory healthcare
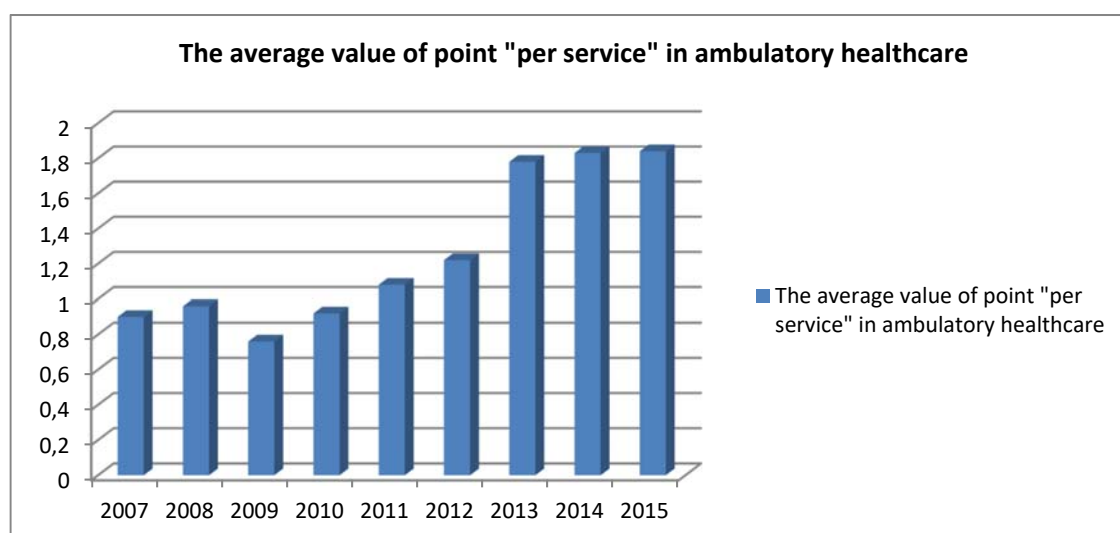
Source: Compiled by the author based on CNAS databases.

In conclusion, it is necessary that the structural reform in the organization, financing and delivery of health services to support the ambulatory healthcare to develop its capacity and to improve the services quality.

Healthcare and emergency medical transport

Emergency care is supplied in case of surgical emergencies, calamities, disasters and other conditions that endanger life by providing specialized medical assistance, transportation and supervision to ensure patients to the hospitals.

Emergency care is given free to all patients, insured and uninsured people in the social health insurance system in Romania.

Funding for emergency medical assistance is made through the state budget, local government budget and other sources.

In years 2007-2012 expenditure on emergency care had a variable share in the NUFH, between 3% and 4%, totalling less than 1% of the currently resources of HUFH.

Emergency medical assistance funding

A bar chart showing values for years 2007-2015, with y-axis from 0 to 700. Legend: Emergency medical assistance funding
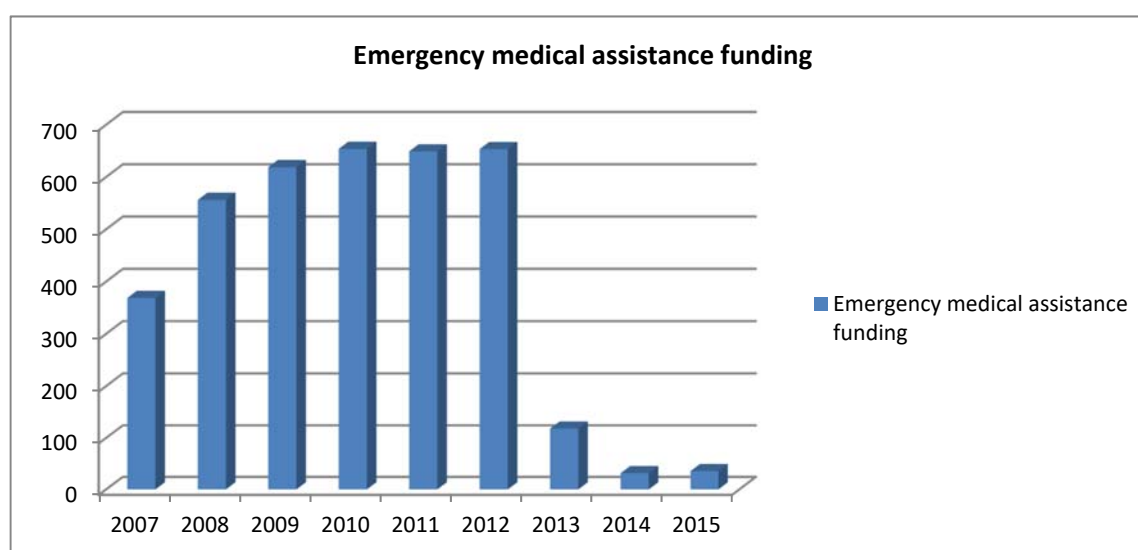
Source: Compiled by the author based on CNAS databases.

Hospital Care

From a legal point of view, the hospital is a health unit with beds, public utility, with legal personality, which provides preventive care, curative and palliative recovery. Hospital responds for the quality of care, for accommodation, hygiene, nutrition and prevention of nosocomial infections, under the rules approved by the minister of health. There are two types of hospital services:

▪ Services requiring hospital care which is ensured uninterrupted, which can be short-term or long-term.

▪ Services rendered in the form of daily inpatient or provided in cases where the patient's condition allows him to be out of the hospital, the patient returns to the hospital daily for treatment at the doctor' indications of treatment.

Hospital services include: consulting, investigation, diagnosis, medical treatment and/or surgical treatment, care, rehabilitation, drugs and sanitary materials, medical devices, accommodation and meals.

Hospitalization is based on a referral issued by the family doctor or a specialist doctor (the emergency cases do not require a referral) and the document that certifies the quality of the insured person.

Hospitals provide medical assistance in case of surgical emergencies and diseases with epidemic potential, regardless of their insurance status.

Romanian hospitals currently consume, 38% of CNAS budget. Public hospitals receive ¾ of its revenue from contracts with health insurance houses, 20% of revenue comes from the state budget or local budgets, and 5% of revenues represent amounts obtained from their own sources.
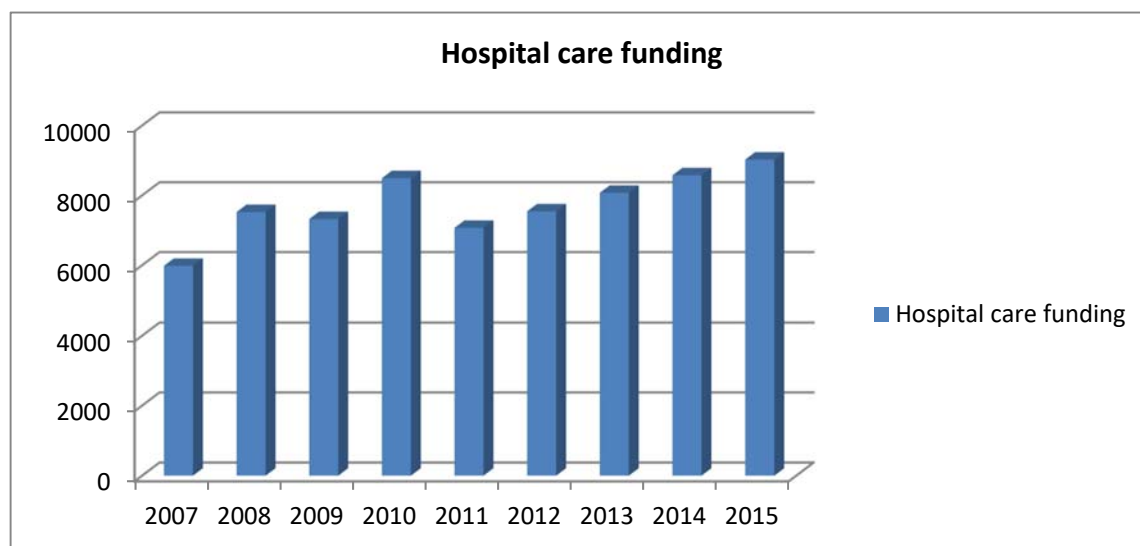
Source: Compiled by the author based on CNAS databases.

In conclusion, the reforms of recent years have produced changes in the functioning of hospitals reducing their activity and supporting simultaneously with a reorientation towards day hospitalization in the ambulatory structures, but issues of quality assurance in the hospital system stands in the background.

Medical laboratory services

The general physician or the specialist physician can indicate for insured patients laboratory medical tests (laboratory analises, radiology, imaging, nuclear medicine and functional

explorations), without personal contribution, included in the basic health care services package.

In the analyzed period, the laboratory healthcare specialties weighed between 1.6% and 3.6% in the National Unique Fund of Health. "The National Programme for Assessing the Health of the Population" led to significant increases in funding in 2008, following large declines in the budget in 2009-2012.
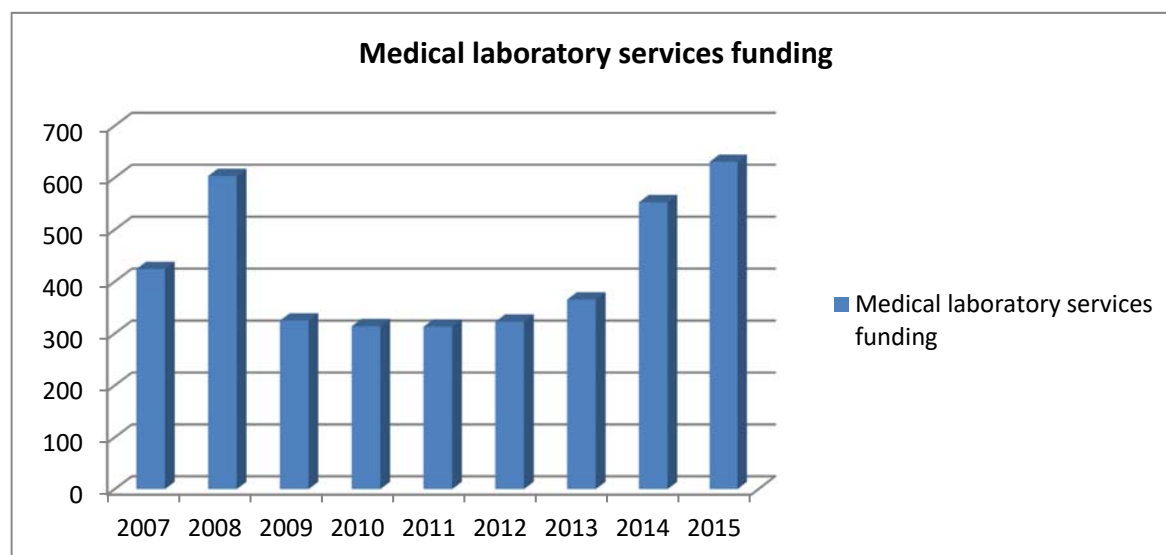
Source: Compiled by the author based on CNAS databases.

Palliative care at home

Services of home health care is granted based on recommendations made by specialized doctors, including family physicians and doctors from hospitals, taking into account the diagnosis, the patient's pathology and the performance status of their ECOG (their degree of dependence).

Medical and palliative care at home is a reduced component of the National Unique Fund of Health budget as is revealed in the following figure.
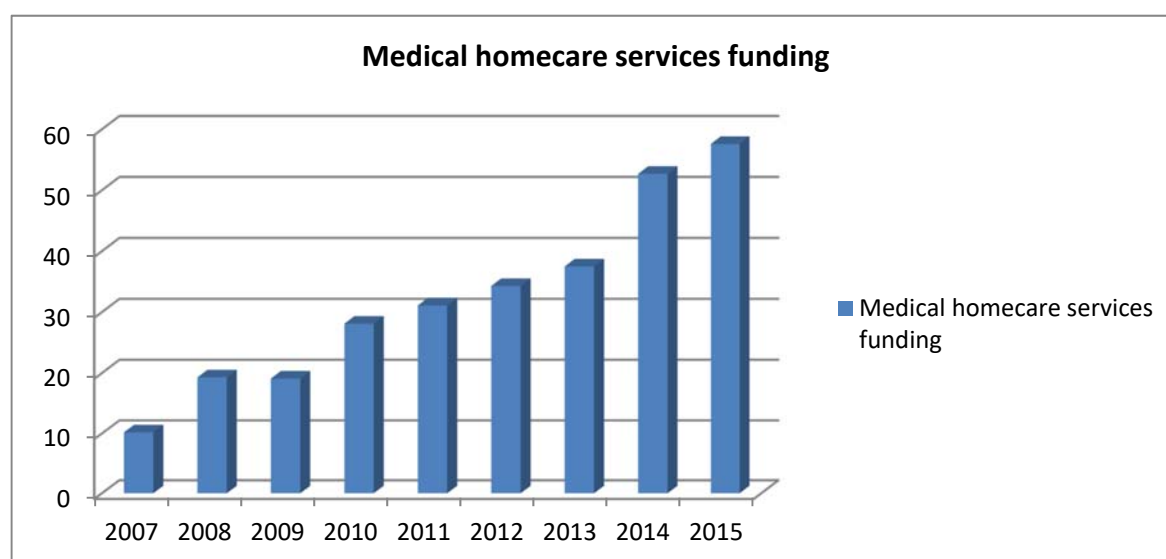
Source: Compiled by the author based on CNAS databases.

Medical devices

Medical devices is granted to insured patients by the specialist physician and with the approval of the territorial health insurance houses for correcting eyesight, hearing, for protecting limbs and other specialty materials, in order to protect some organic or physiological deficiencies, for a fixed or indefinite period, based on medical prescriptions, with or without personal contribution, as provided in the contract framework.

Spending on medical devices accounts for less than 1% of the National Unique Fund of Health resources. Consequently, access to insured medical devices is limited, there are long waiting lists or additional costs for patients, which many can not afford.
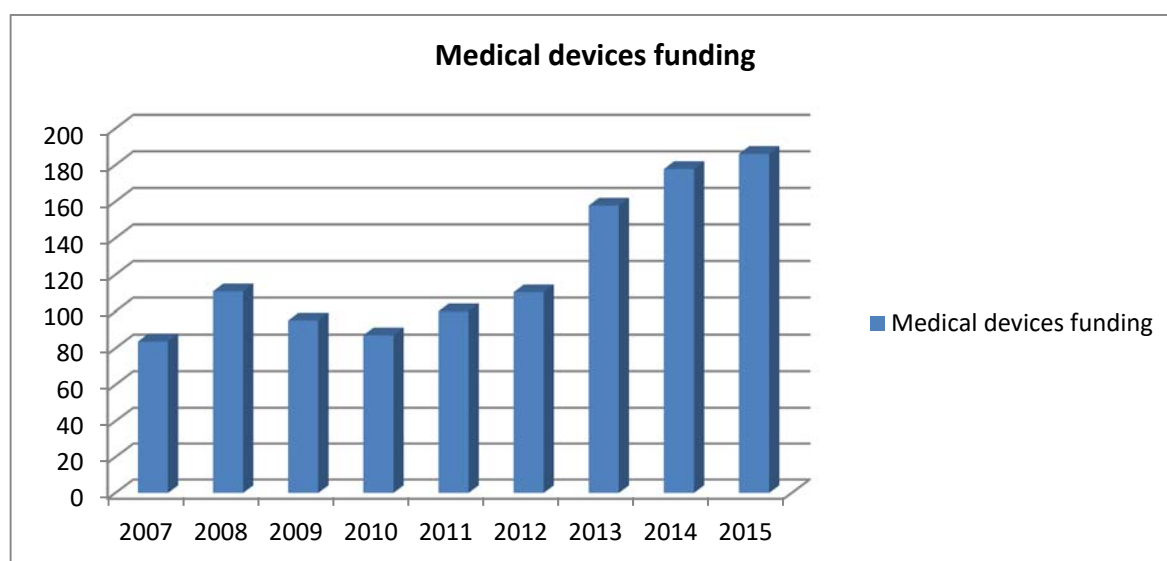
Source: Compiled by the author based on CNAS databases.

Drugs

Drugs are an important part of the costs of the health care insurance system in Romania. The share of drugs with or without personal contribution in the National Unique Fund of Health expenditure is currently about 23% of the total.
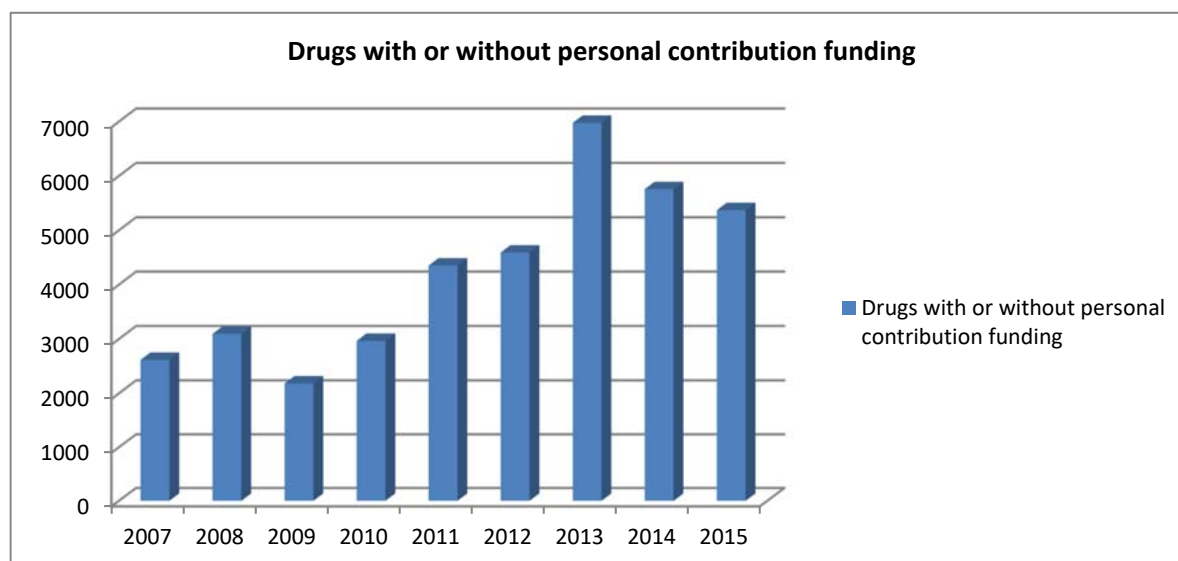
Source: Compiled by the author based on CNAS databases.

Ministry of Health and the National Health Insurance House, in consultation with the College of Pharmacists in Romania elaborates annual the list of international common names of drugs that benefits the insured persons based on medical prescription with or without personal contribution. The list is approved by government decision.

Drugs without personal contribution may be prescribed by family doctors and by medical specialists.

From the point of view of the beneficiaries it is known that seniors represent the largest category of consumers which is distributed as 40% of the drugs budget of the National Unique Fund of Health; for patients in the national health programs it is spent 20% of drug budget and the employees consume 12% of the value of subsidized drugs.

The consumption of drugs in Romania fits into an increase in both volume and value. In this context, it is necessary to develop a system for prescribing and delivering medicines that need to aim for patient's access to safe, effective and of good quality drugs.

Conclusions

The Romanian health system needs to improve the quality of care in order to increase the patients' satisfaction and to determine efficient expenditure of funds in the healthcare system.

Analyzing the structure of healthcare services in Romania requires the development of healthcare services accessible to all, qualitative and cost-effective services focusing on prevention and promoting a healthy lifestyle, the integration of the medical services, the reorganization of the hospital services, creating a fair healthcare system that meets the health needs of the population.

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<http://www.who.int/gho/en/>

Annexes

	2007	2008	2009	2010	2011	2012	2013	2014	2015
The average value of point "per capita" for primary care	2.65	4.85	4.26	4.4	3.62	3.25	3.66	4.2	4.13
The average value of point "per service" for primary care	1.008	3.51	2.1	1.14	1.44	1.94	1.86	2.03	1.95
The National Unique Fund of Health payments for primary care (million lei)	747	1457	1104	1100	1104	1197	1315	1425	1503

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ambulatory health care funding	330.2	390.7	321.9	289.4	310	387.4	549.6	623.3	661.9
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
The average value of point "per service" in ambulatory healthcare	0.9	0.96	0.76	0.92	1.08	1.22	1.78	1.83	1.84

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Emergency medical assistance funding	368.6	556.1	618.8	653.7	649	653.3	118.1	31.4	35.6
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hospital care funding	5982.9	7522	7321.8	8492	7068.8	7543.1	8072.9	8574.8	9024.1
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Medical homecare services funding	10.2	19.3	19.1	28.1	31.1	34.3	37.5	52.7	57.6
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Medical laboratory services funding	424.1	603.2	324.8	314.1	313.1	322.7	365.3	552.7	630.4
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Medical devices funding	83.7	110.9	95.2	87.1	100	110.4	157.8	177.8	186.1
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Drugs with or without personal contribution funding	2616.1	3094.9	2181.9	2965.4	4351.9	4591.4	6976.2	5758	5370.4
National Unique Fund of Health total	12859.1	16636.3	15274.8	17507.4	17820.9	19459.3	23089.8	22868.5	23489.9

The relationship between sales value, salary expenses and corporate social responsibility in the Romanian pharmaceutical sector

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Abstract. *Using bi-annual databases for the indicators between December 2008 and June 2016, this paper proposes to study the influence of the salary and environment to the sales value for four of the five listed pharmaceutical companies on the Bucharest Exchange Market. I discovered that it is a strong relationship between the turnover evolution, salary expenses and corporate social responsibility represented by environment expenses. The studied companies had well-educated employees, more than 50% of them had university degree.*

Keywords: company sales, corporate social responsibility, salary expenses, environment expenses, pharmaceutical sector.

JEL Classification: I19.

Introduction

Financial performances are very important and these are behind seemingly straightforward everyday business and individual decisions of every company. Many researchers demonstrated that a good project management improves the likelihood of an organization being successful. "The project management benefits were the subjects of many articles and there were classified as: improvements in organization productivity, in effectiveness, efficiency, financial performances, and any other performances". (Adler, 2016)

In this article it is investigated the influences to the turnover of the salary expenses, and corporate social responsibilities represented by environment expenses. During the history, the studies reported a positive, negative, and neutral impact of corporate social responsibility and financial performances. In recent years, customers, employees, suppliers, community groups, governments, and some shareholders have encouraged firms to undertake additional investments in corporate social responsibility (CSR). In 2012, Romania was on the third position in a top of 132 countries evaluated by trend of Environmental Performance Index. "Some firms have responded to these concerns by devoting more resources to CSR. Other companies' managers have resisted, arguing that additional investment in CSR is inconsistent with their efforts to maximize profits. The resulting controversy has induced researchers to examine the relationship between Corporate Social Responsibility and financial performance, in an effort to assess the validity of concerns regarding a tradeoff between investment in CSR and profitability." (Siegel, 2000)

The literature on relationship between financial performances and corporate social responsibility in Romanian market is pretty well developed. (Dumitrescu, 2015; Simionescu and Dumitrescu, 2014) These articles were very important for my following research. This research tries to add new insights to the research for the field of the Romanian Corporate Social Responsibility literature, by adding new statistic proves and by investigating the effect of the above elements to sales values. A big contribution of these turnovers appears as a result of how businesses face the risks, because they exist everywhere. They can be hedged, minimized, shared, or simply transferred away, but they cannot be destructed, just mitigated. The term "risk" implies any event or action that company's achieving its strategic goals on any of its organizational-levels. Therefore, risk management is a structured and identifying, analyzing and managing the risks that affect the people and technologies. (Rogachev, 2008) The strategic goals of a company, as well as its policy, are determined by the expectations one has about that company. The company shareholders expect the managers to ensure that the business brings the expected profits. The clients are looking for high quality products and services at the lowest prices. The company management relies on the efficiency and reliability of the organizational systems in accomplishing the set strategic goals. The company employees expect the guarantees of keeping their jobs and progress in the company development. (Berman, 1999) This idea was previous mentioned in the Corporate Stakeholders and Corporate Finance Theory by (Shapiro, 1987) which suggested that a firm must satisfy not only stockholders or bondholders, but also those with less explicit, or implicit, claims. Stakeholder theory further suggests that implicit claims like product quality are less costly to a firm than explicit claims like wage con-tracts or stockholder or bondholder demands. One of the conclusions was that a low level of social responsibility, however, may encourage some stakeholders to doubt the ability of a firm to honor implicit claims and may increase the number of a firm's more costly explicit claims. (Shapiro, 1987)

The most important categories of social responsibility that appear in many of today`s business are: environmental effort, businesses regardless of size have a large carbon footprint, so any environment expense or any penny spend to reduce this footprint is considered good for the company and society; philanthropy is another important social activity, firms donate a lot of money to national and local charities, even the Romanian National Regulations encourage

them to invest in social activities, the companies benefits by decreases of minimum between (3‰ of annual turnover and 20% of profit)[1] of profit taxes; the third one is ethical labor practice, treating employees fairly and ethical it is considered a corporate social responsibility; volunteering is the fourth one and it is associated with "doing good without any expectation", but it is very important for a company marketing to be involved in as many volunteering activities as it can.

The firm social responsibility is very often associated by the clients and other market pieces such as: employees, possible future employees – labor market, suppliers with the company credibility. Also, this credibility is offered by the company financial performances in the develop countries. (Rezaee, 2009)

Many recent researches demonstrated that the image, market reputation and market credibility are very important factors for the company sales and also for the company performances. These elements are more important in developing countries, where the population is oriented towards consumption, and the domestic companies does not have a long history. This situation is present also in the Central-East Europe, where the most of the countries were under the communism policy. "Corporate credibility is also becoming more critical in emerging markets with the development of their corporation systems and financial markets. Taking China as an example, over the last two decades, it has experienced astounding levels of growth and structural change. In this evolving competitive arena, corporate credibility and corporate reputation have become major concerns for most firms operating in the Chinese market. Major foreign multinationals have shown through their behavior that they believe corporate reputation to be a significant asset in China" (Reid, 2006). Also, some local companies understood that they need to build a strong reputation and to deliver high quality products and services at a lower price than the market price to have a chance in the "fight" with the foreign big corporations.

Literature review

According to (Barnett, 2006) "corporate reputation" is defined as observers' collective judgments of a corporation based on assessments of the financial, social, and environment impacts attributed to the corporation over time.

According to (Grant, 1991) firms with assets that are valuable and rare possess a competitive advantage and can expect to earn superior returns. I considered that in pharmaceutical sector, the research and development departments and the employees are the most important assets of the company, because they must find every day new aid against the diseases. I did not find the necessary information for all the studied companies, but I took into consideration the second one option, the employees. Those whose assets are also difficult to imitate may achieve sustained superior turnover.

The effects of industry pollution-related factors to financial indicators value were researched by the (Noordewier, 2016). The authors concluded that "the effect on financial performance of implementing EMPs (Environment Management Practices) is greater in relatively dirty and non-proactive industry contexts than in relatively clean and proactive contexts."

In November 2004, nongovernmental organizations (NGOs) and trade unions, primarily in Europe, joined together to call for the European Union to propose a new corporate social responsibility (CSR) agenda. At the top of that agenda was the demand that CSR "demonstrate its credibility globally, particularly in the developing country context". (Blowfield, 2005)

In the "Corporate Social Responsibility and Financial Performances" (Jean B. McGuire, 1988) the authors studied the relationship between corporate social responsibility in both directions,

and they observed that the influence exists and the evolution of the one determines the other one movements. It is one of the very fewest articles which analyses and discovered the fact that also revenue and turnovers, which usually is reflected in more money and bigger project budgets, determine the social responsibility. This study considered company goals not just in the accounting mode, but also in terms of risk.

The necessary skills of employees and the IT importance to develop the enterprise profitability were studied by (Adler, 2016). In this article, it was shown the importance of the project management and the IT skills, and how they affect positive the enterprise sales.

They started from the idea that any company strives to maximize its value on the financial market and tailor its inventory decisions to achieve this goal. Sometimes, can appear mismatches between supply and demand because of the supply uncertainties, and these will affect the evolution of the company. In this paper, the authors considered the company aiming to maximize its firm value in a vendor setting with a randomly capacitated supplier and a stochastic demand correlated with the market return. They demonstrated that while the optimal order quantity is independent of the supplier's random capacity, firm value is not. Building on this firm-value/random-capacity dependence, they next explore the impact of capacity process improvements on firm value and establish when and how such improvements will contribute to firm value the most. They also identified several factors that moderate the impact of capacity process improvements on firm value.

Methodology

I selected four of pharmaceutical companies, which are listed on Bucharest Stock Exchange Market for our study. I chose this industry because I wanted that workers have high level education, and more than 50% of the employees from the studied enterprise have university degree and 100% have high-school degree, as per companies 2015 audited reports.

I took into consideration the company sales because these are an upper-line element in determination of the company profit and it is very important in determination of company performances. The environment expenses are important because they are an indicator about the modernity and the enterprise board management orientation. In Romania, the stakeholders are interested in or took into consideration the environment expenses just in the last decade, so it is a new view for the company management. The salary expenses are the second largest expenses in every studied company, so they should be considered important in the company evolution.

An important area in financial statistics is the data frequency. Even if, over the last decades we have seen substantial growth in databases sources and information, and we beneficiate by the increase of information volume, the lack of transparency for Romanian companies still exist. The data frequency is important because it permits estimation of certain financial variables, such as volatility, with high precision. I could obtain the necessary information just biannual, even if I had need a higher database and a higher frequency of the reports as quarterly or monthly periods.

I measured the company goals in terms of accounting, and I used the total revenues, because I considered that it is upper-line element for many firm financial indicators, and also for the profit. I chose the turnover because I wanted to show the effect of the salary expenses and social responsibility to company sales value. In my opinion, these elements like: salary expenses and environment investment will reflect at a higher level in the sales value than any other indicator because all of these help the company image and the first effect is that the sales will increase. Shareholders requirements are different, so the most important indicators are not the same, they are in direct collaboration with the shareholders preferences. All investors are

oriented to profit, and the managers obtains this return using their money and invest them in company`s assets, in the projects or the new ideas. All managers are looking for higher sales revenue, because the other things are influenced by costs, and costs can be adjusted.

I used a panel date to check the relationship between sales values, salary expenses and corporate social responsibility, represented by environment expenses.

I used a balanced panel, because all companies have measurements in the studied period. The total number of equations is the product between number of semesters and the number of companies, 4x16=64. In these 64 rows, I used four values: sales values (dependent variable), salary expenses, environment expenses (independent variables) and the constants vectors.

I checked the two tests: Redundant Fix Effects-Likelihood Ratio and Correlated Random Effects-Hausmann Test. I obtained a lower p-value for Fix Effects, and this is the reason why I chose the Fixed Model, and not the Random one. A fixed group effect model examines individual differences in intercepts, assuming the same slopes and constant variance across individual (group and entity). Since an individual specific effect is time invariant and considered a part of the intercept, error$_i$ is allowed to be correlated with another regressor.

To stationary these values, I used the logarithmic values, for all of the above elements. Because of they have big values, and the value differences from one semester to another, I use the logarithm of company`s indicators. In this way, the evolution has a lower range.

For the first semester, I used the Sales Value as it is recorded in Profit and Loss Account. For the second one, I make the difference between the year turnover and the sales value of the first semester.

Salary expense is defined that the logarithmic value of bi-annual expense for one employee, I divided the total salary expense with the average number of employees in that period.

The environment expense is the value registered in the Profit and Loss Account at that moment. I did not use differentials between first semester and the second one because, usually, the entire expense is recorded in the first semester, and in the second one is recorded just a small regulation.

I tried to add the EURO/RON exchange rate or the index price consumers, but their evolutions are correlated with the salary evolution.

The result of Wald test gave me the opportunity to strongly reject the null hypothesis, that the errors are not correlated. Also, the Residual Graph and Actual, Fitted, Residual Table (please see Table A1 in Annex) indicated the same things (please see Table A2 in Annex).

Empirical Results

Table 1. *Descriptive stats*

	Sales	Salary	Environment
Mean	18.55669	8.391959	5.075660
Std. Dev.	0.567241	0.298570	7.174497
Skewness	-0.760777	0.839403	0.742759
Kurtosis	2.411990	2.758437	1.651425
Jarque-Bera	7.095691	7.671310	10.73444
Probability	0.028787	0.021587	0.004667
Sum	1187.628	537.0854	324.8422
Observations	64	64	64

As you can see in the above table, the mean the logarithm value of sales, salary expenses and environment expenses during one semester are: 18.56, 8.39 and 5.08. These values are for all 64 observations (4 companies and 16 bi-annual values). The Skewness values are not 0, or

near this value, but they are not higher than 1 and neither less than -1, which suggested me, than my data did not follow a Normal Distribution, but they are not far from symmetrical. This fact was sustained by the Kurtosis values, which showed us that the statistical data are "light tail" distribution, especially Environment expenses.

P value is lower than 0.05, this is the reason why I accepted these variables in my equation.

Table 2. *Correlation matrix*

	Sales	Salary	Environment
Sales	1.000000		
Salary	0.311225	1.000000	
Environment	0.321498	0.752256	1.000000

The Correlation Matrix appointed an important direct correlation between salary expenses and environment expenses.

The panel equation is shown below, also you can see the equation results:

$$Y_{it} = (\alpha + \mu_{it}) + X'_{1it} \times \beta_1 + X'_{2it} \times \beta_2 + C$$

$$Ln\_Sales_{it} = (\alpha + \mu_{it}) + Ln\_Salary'_{1it} \times \beta_1 + Ln\_Environment'_{2it} \times \beta_2 + C$$

Dependent Variable: SALES VALUE
Method: Panel Two-Stage Least Squares
Sample (adjusted): 12/01/2008 6/01/2016
Periods included: 16
Cross-sections included: 4
Total panel (balanced) observations: 64
Instrument specification: C SALARY ENVIRONMENT
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.88932	0.499564	25.80112	0.0000
SALARY	0.669662	0.060022	11.15693	0.0000
ENVIRONMENT	0.014123	0.005107	2.765263	0.0076

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.919113	Mean dependent var	18.55669
Adjusted R-squared	0.912140	S.D. dependent var	0.567241
S.E. of regression	0.168137	Sum squared resid	1.639658
F-statistic	131.8105	Durbin-Watson stat	1.322591
Prob(F-statistic)	0.000000	Second-Stage SSR	1.639658
Instrument rank	6		

The method used to study the impact of social responsibility indicators to turnover is the least squares (LS and AR). I considered this equation the best option because of the existence of the correlation between the first semester sales value and the second semester value. So, they are positive auto-correlated, but the level I considered that the correlation level it can be accepted, because the Durbin-Watson value is 1.32, a value not too far from the 1.8-2.2 accepted values.

The value R-squared and Adjusted R-squared show us if the variables of the model were properly selected. Because these two indicators have values higher than 91%, give us the reason to believe that I had selected the wright variables and that they are truly important in the sales evolution. As per output from Annex 1, the influences of the two independent variables to the sales evolution are very important, in fact their influence is 91.12%.

In the following paragraph, I will explain the significance of the variable values

"C" is a constant and it represent the value of the sales logarithm, the dependent variable, is 12.889 if all other dependent variables will be zero.

The coefficient for the logarithm of salary expenses is 0.6696, this means that an increase or a decrease of salary expenses will affect in the same direction the sales with 0.6696%. It is a direct influence between this dependent variable and the sales, independent variable. Probability is 0.0000, which gives me the opportunity to reject, with more than 99.99%, the Hypotheses 0, which was that the variables are not correlated, and to accept hypotheses 1, that salary expense influence the sales. Standard error is 0.06, which is an acceptable value.

The coefficient for the logarithm of environment expenses is 0.0141, this means that an increase or a decrease of salary expenses will affect in the same direction the sales with 0.0141%. It is a direct influence between this dependent variable and the sales, independent variable. Probability is 0.0076, which gives me the opportunity to reject, with more than 99.99%, the Hypotheses 0, which was that the variables are not correlated, and to accept hypotheses 1, that salary expense influence the sales. Standard error is 0.005, which is an acceptable value.

The model validity is sustained by the value of the Prob.(F-statistic) which is 0.00, and this offer me a very high confidence, 99.99% to reject hypotheses 0, which say that the model is not valid, and to accept the hypotheses 1, which sustain the opposite.

The Sum of residual square (SSR) is 1.639658.

Conclusion and discussion

This paper analyses the relation between company sales, salary expenses per capita and CSR, represented by the company environment expenses.

This article demonstrated that it is a direct relation between the two independent variables and the sales values. It sustained my expectation, that a higher salary, which can be seen, but not necessary, as better prepare employee or a better workplace it is important for the enterprise evolution. Also, as (Simionescu and Dumitrescu, 2014) empirically demonstrated that in Romania, which is a developing country, CSR are in a direct relation with the company sales values.

Research Limit: it would have been helpful if it had used another data frequency, at least quarterly and if I have had the access to very detailed information like a company account.

Further research

I am aware that this paper has some limitations. In the future researches I want to add new information on this subject by extending the number of companies in the sample, number of industries, the sample of date and periods. I want to study if the company specific economic area it is important to determine the grade of the influences of the CSR to the enterprise financial performances.

Note

(1) Law 32/1994 regarding the sponsorship, published in the Official Monitor no. 129/25.05.1994.

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Annex

Table A1. *Wald Test output*
Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	4.877000	59	0.0000
F-statistic	23.78513	(1, 59)	0.0000
Chi-square	23.78513	1	0.0000

Null Hypothesis: C(1)=-0.16
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
0.16 + C(1)	0.544000	0.111544

Restrictions are linear in coefficients.

Table A2. *Residual Graph*

LNCA Residuals
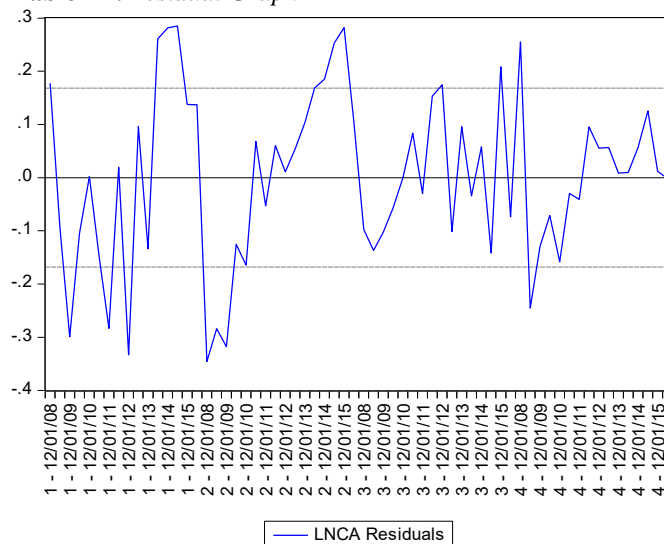
Comparative analysis of evaluation models in insurance solvency

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Abstract. *Adoption and implementation of a new model for calculating the solvency of insurance at European level since 2016 by legislating Directive 2009/138/EC, known as Solvency II Directive, was the end of a long process of testing and analysis of insurance market European bodies conducted by the European Commission level. But before the actual implementation from 1 January 2016 the new solvency regime Solvency II on the European level, the European Commission has issued during 2015 a number of decisions on equivalence of the prudential regime and solvency for insurance and reinsurance headquartered central in third countries, which apply to group solvency calculation models different, depending on the rules of non-EU jurisdiction concerned. Thus, agreements were signed patterns equivalent solvency regime Solvency II with number eight countries: Bermuda, Switzerland, Australia, Brazil, Canada, Mexico, the US and Japan, for a period of ten years. After analyzing those models resulted primarily important risks in the standard formula calculation of solvency. As a result, there were three countries that are aligned in terms of calculating the solvency margin model Solvency II, while in the remaining countries the differences are due to insufficient coverage of the variables taken into account related mainly technical risk and market. In conclusion, the adoption of Solvency II regime in Europe is a challenge in terms of quality compared to the rest of the countries that apply different models of solvency.*

Keywords: solvency models, Solvency II, insurance.

JEL Classification: G22, G31, H73.

1. Introduction

Adoption and implementation of a new model for calculating the solvency of insurance at European level since 2016 by legislating Directive 2009/138 / EC, known as Solvency II Directive, was the end of a long process of testing and analysis of insurance market European bodies conducted by the European Commission level.

The launch, since 2001, the process of Solvency II by the European Commission - following the recommendations on the introduction of additional parameters related to credit ratings, conducted by the Conference Supervisors Insurance (ISC – Insurance Supervisors Conference), the 1997 – was from the beginning a fundamental review of existing insurance regulations. As a result, in the new report issued in 2002, ISC concluded that, any failures recorded by insurers, not due to a single cause, while recommending integration into the regulatory framework for evaluation of capital, taking into account a vision wider risk management process over.

In the next period, between the years 2006-2011, the European authority responsible for managing the process Solvency II (originally CEIOPS – Committee of European Insurance and Occupational Pension Supervisors, transformed in 2011 in EIOPA – European Insurance and Occupational Pension Authority) conducted a series testing and analysis at European insurance companies in the form of quantitative impact studies (QIS), presented as follows:

- QIS1 – Summary report - a report issued on 17 March 2006, based on data from the end of financial year 2004 related to a total of 312 insurance and reinsurance companies. Although according to CEIOPS, the first study had its own limitations, making sure that the main purpose of identifying a prudent level of technical trends, consideration certain predefined levels of trust. The main conclusion of the study showed that the best estimate of liabilities plus risk margin tends to be lower than the current level of technical reserves.

- QIS 2 – Summary Report - report issued on 26 October 2006, attended by 514 companies from 19 European countries the Insurance reinsurance, which held at the time of exercise a market share of approximately 50%. The results showed that technical reserves fell overall, while increased capital requirement, given that the available capital also increased.

- QIS 3 – CEIOPS 'Report on Quantitative Impact Study for STIs third Solvency II - issued in November 2007, attended by 1027 companies from 28 European countries the Insurance reinsurance. The exercise included a comparison with the former regime Solvency I. The results demonstrated that there are no significant changes in the structure or size of balance sheet items, when the comparison of the two solvency regimes. Also, most companies (98%) required no additional capital after calculating minimum capital requirements. Solvency Capital Requirement recorded a lower rate than the result for the current Solvency Capital. However, implementation of the new regime does not cause companies to access additional capital but rather existing capital allocation, available depending on the risks assumed by each company.

- QIS 4 – CEIOPS 'fourth Quantitative Impact Report on STI Study (QIS4) for Solvency II - issued in November 2008, involving a total of 1,412 insurance and reinsurance companies. The results showed that most of the companies (98.8%) reach a sufficient level of minimum capital requirement, excluding captive companies that do not meet this level. Also, 11% of the participants meet capital requirements solvency.

- QIS 5 – EIOPA Report on the fifth Quantitative Impact Study (QIS5) for Solvency II - issued on 14 March 2011 and was last exercise before implementing new solvency regime. In all, a total of 2,520 insurers and reinsurers participated in this study, covering over 95% of technical reserves and about 85% of premiums written at European level. The results of the exercise showed that although financial surpluses in the European insurance sector calculated according to Solvency I, decreased in 2008 by EUR 200 billion euro - as a

result of the financial crisis - financial position calculated according to Solvency II - in the QIS 5 - remains at a comfortable level, registering eligible own funds in excess of 395 billion euro.

Testing the European market insurance in the mentioned period, aimed, on the one hand, calibrating more careful and more realistic models for calculating solvency in insurance, and on the other hand, framing all risks and possibly exceptions due mainly modernization of insurance products offered by the companies concerned. Not least, they have been taken into account new trends in risk management, already applied in the financial and banking – by adopting the solvency Basel II since 2004 and preparing a new model of computing, Basel III - changes intensified by the financial crisis of 2007-2008.

But before the actual implementation from 1 January 2016 the new solvency regime Solvency II on the European level, the European Commission has issued during 2015 a number of decisions on equivalence of the prudential regime and solvency for insurance and reinsurance headquartered central in third countries, which apply to group solvency calculation models different, depending on the rules of non-EU jurisdiction concerned and are presented below:

- Delegated Decision (EU) 2015/2290 of the Commission of June 12, 2015 the equivalent temporary solvency regimes in force in Australia, Bermuda, Brazil, Canada, Mexico and the United States applicable to insurance and reinsurance companies headquartered in these countries for a period of 10 years from 1 January 2016, details are given according to each country, as follows:
  - Australia: the Life and General Insurance Capital Standards (LAGIC) require insurers to calculate capital charges for:
    - insurance and concentration risk.
    - insurance risk, asset risk and asset concentration risk.
    - operational risk and aggregation benefit. There is a minimum capital requirement (the Prudential Capital Requirement (PCR)); insurers are also required to establish an ICAAP (Internal Capital Adequacy Assessment Process) setting out the actions that will occur to rectify a decline in capital through set points above its PCR. . Insurers must report to the APRA their solvency, financial position, financial performance, capital adequacy, investments, assets and asset concentrations, premiums and claims data, policy liabilities and off-balance sheet exposures.
  - United States: supervision of insurance and reinsurance companies is done decentralized in the member states, each company being overseen by the oversight body in each state in which they issue insurance policies. *National Association of Insurance Commissioners* – NAIC, the official authority, issued the Risk-Based Capital (RBC) Model Law, which has been adopted by all states. The RBC standard formula covers the most material risks for each of the primary insurance types (life, property and casualty, and health), allowing the use of internal models for specific products and risk modules. RBC is calculated by applying factors to various assets, premium, claim, expense and reserve items. There are four levels of quantitative capital requirements with different supervisory interventions in each case:
    - Company Action Level.
    - Regulatory Action Level.
    - Authorized Control Level.
    - Mandatory Control Level.

Determination of capital depending on the assumed risks is performed by applying coefficients of assets, premiums, claims, reserves and expenses recorded, while quantitative capital requirements are classified into four categories:

- The company's shares.
- The level of regulatory actions.
- Authorized control level.
- The level of control required.
– Switzerland: the supervisory system it is based on the Swiss relevant legislative framework, including the Swiss Financial Market Supervisory Act of 22 June 2007 (FINMASA), which entered into force on 1 January 2009, the Insurance Supervision Act (ISA) of 17 December 2004 and the Insurance Supervision Ordinance (ISO). Regarding solvency, the Swiss Solvency Test (SST) assessment of the financial position of (re)insurance undertakings or groups relies on sound economic principles, and solvency requirements are based on an economic valuation of all assets and liabilities. The SST requires (re)insurance undertakings to hold adequate financial resources and lays down criteria on technical provisions, investments, capital requirements (including minimum level of capital) and own funds, requiring timely intervention by FINMA if capital requirements are not complied with or if policyholders' interests are threatened.
– Japan: The Japanese solvency regime is laid down in the Insurance Business Act and Insurance Business Ordinance, as last amended in 2010. For both life and non-life undertakings, supervisory intervention can be triggered by three different thresholds, defined as different 'Solvency Margin Ratios' (SRM), expressed as a ratio of double the own funds divided by a capital requirement named the 'Total Risk'. The 'Total Risk' metric covers underwriting risks, interest rate and market risks, operational risk and the catastrophe risk. Valuation balance sheet is performed by Japanese insurance companies as follows:
  - Assets: most are measured at fair value in accordance with generally accepted accounting principles in Japan.
  - Long-term technical reserves are discounted at a rate determined periodically by JFSA, only upside.
– In Bermuda, the Insurance Act lays down two capital requirements for insurers other than captive insurance companies (4): the Minimum Solvency Margin (MSM) and the Enhanced Capital Requirement (ECR), applicable to both commercial life and non-life insurers. The ECR is determined from the relevant Basic Solvency Capital Requirement (BSCR) according to a standard formula or the insurer's approved internal capital model provided that the ECR is at least equal to the insurer's MSM. The BSCR covers the following risks: credit risk, spread risk, market risk, premium risk, reserve risk, interest risk, catastrophe risk and operational risk.
– In Brazil, the Insurance Decree-Law No. 73/1966 determines that insurers, to guarantee all their obligations, establish technical provisions, special funds and provisions in accordance with the criteria established by the National Council of Private Insurance (CNSP). The Minimum Capital Required (CMR) is the higher of the Base Capital and the Risk Capital. The Base Capital is a fixed amount linked to the type of entity and the regions in which it has been authorized to operate, as well as the Risk Capital, which is the sum of capital requirements for underwriting, credit, operational and market risks.
– In Canada, the Insurance Companies Act requires insurers to maintain adequate capital. The applicable capital requirements for insurers are the Minimum Continuing Capital and Surplus Requirement (MCCSR Guideline) for life insurers and the Minimum Capital Test (MCT Guideline) for non-life insurers. Both the MCCSR and the MCT address risks related to both assets and liabilities on and off the balance sheet. Non-life insurers are required to hold capital in excess of 100% of the MCT, while life insurers are required to hold capital in excess of 120% of the MCCSR.
– In Mexico, the act laying down a revised insurance prudential framework, the Ley de Instituciones de Seguros y de Fianzas (LISF), entered into force on 4 April 2015. Under

the LISF, the Solvency Capital Requirement (SCR) applies, covering underwriting risks and financial and counterparty risks.

Typology equivalents established by the European Commission, according to near solvency models applied by each country presented above to the new regime Solvency II, has been established as follows:
- Total equivalent in those countries Bermuda and Switzerland.
- Provisional equivalent in those countries: Australia, Brazil, Canada, Mexico, the United States, Japan.
- Additional suspension equivalent in Japan.

A possible explanation of the diversity patterns solvency applied in the above countries, a different level of insolvencies can be recorded at each national economy. According to a research conducted recently economic global insolvency index fell by 2% in 2016, while the forecast for 2017 shows an increase of 1% in insolvencies. Thus, the countries analyzed above fit in terms of insolvencies as follows:
- Increase in insolvencies over 3%: Brazil.
- Increase in insolvencies between 0 and 3%: Canada, United States, Australia, Japan, Switzerland, while the rest of the European area, the level of insolvencies registered an average decrease of 1%.

2. Models overall solvency assessment insurance

Solvency in the insurance field is a unique concept, because the risks inherent in carrying out insurance business. Starting from the definition of solvency in trade or commerce, applicable to all entities operating in business, namely the capacity of a legal entity to extinguish matured obligations towards its creditors, where in insurance is considered that an insurer is solvent when assets overshadow his responsibilities with the minimum margin required by regulations. Thus, while the actual margin of solvency represents the difference between assets and liabilities balance sheet, the minimum margin required is the minimum level required insurer supervisors in order to conduct insurance in normal solvency so as to comply with obligations in insurance policies.

Specifics if the solvency of the insurance sector is that, in addition to the risks incurred in the performance of any economic activities, where insurance this exposure is doubled by its own insurance business, which requires in turn a subrogation of customers in terms of risks, insurers covering these risks in return for an increase in balance sheet assets due to underwriting and collection of insurance premiums.

In conclusion, insurers are exposed to risks as follows:
- Underwriting risks represented by the risks covered by issuing policies to customers.
- Risk management insurance portfolio (internal risks).
- Counterparty risk, compared to assets and liabilities managed and traded with third parties (external risks).

Different solvency calculation models used internationally to various countries were classified according to the calculation method as follows:
- The European Solvency II (EIOPA).
- The American RBC (NAIC).
- The Canadian test (DCAT).
- The Australian Model.
- The Japanese Model.

2.1. The European Solvency II (EIOPA)

Implemented starting on 1 January in Europe, Solvency II regime is the continuation of Solvency I regime, originally introduced in Europe in 1973, but in optics and an improved risk extended in scope. While the former regime Solvency I is based on a unified approach, establishing a solvency margin according to the obligations arising from premiums or damage recorded, the new regime Solvency II requires a detailed approach both the risks assumed and available funds. Furthermore, Solvency II took over in the evaluations latest developments and trends that occurred in general insurance market, namely:

- An appropriate system of risk management.
- An adequate system of internal control.
- Differential treatment components for products mixed investment (unit-linked contracts).
- Supervision at group level.

Measuring assets and liabilities in the balance sheet Solvency II is performed to the values that could be traded/transferred/settled between stakeholders, voluntarily and knowingly, in objective conditions and normal competition.

The calculation of technical reserves in a prudent, reliable and objective are made according to the following formula:

$$VRT = BE + MR,$$
where:
VRT is the value of technical reserves.
BE is the average of future cash flows (best estimate).
MR is the risk margin.

Own funds are determined by the following formula:

$$FP = + FPA \ FPB,$$
where:
FP represents its own funds.
FPB represents common equity base.
FPA is ancillary own funds.

Own funds are classified by ranks, having stipulated certain eligibility limits.

Capital requirements under Solvency II are classified as follows:
- Solvency capital requirement (SCR), which is determined taking into account the risk value of FPB, with a confidence level of 99.5% over a period of 1 year;
- Minimum Capital Requirement (MCR), which is determined taking into account the FPB value at risk with a confidence level of 85%, for a period of 1 year.

SCR standard formula is determined as follows:

$$SCR = SCR\_B + SC\_RO + AJP,$$
where:
SCR_B solvency capital requirement is basic.
SC_RO represents capital requirement related to operational risks.
AJP is adjusting losses.

Such notice is the importance given to the risks assumed by each insurance company, depending on the required capital in order to cover obligations. Incidentally, in the solvency capital requirement base are considered risk modules, classified as follows:

- Underwriting risks: risks of catastrophe, mortality, longevity, disability, termination, management.
- Market risks: interest rates, equities, real immobile, dispersion rate, concentration.
- Counterparty risks: deterioration of the creditworthiness of borrowers, the devaluation of the shares.

2.2. Other international models for assessing the solvency Insurance

Especially due to different exposure to risk at the international level have been developed over time a number of theoretical models of insurance solvency, presented as follows:
- The coefficient fixed – used until 2015 in European countries, as the solvency regime Solvency I, the model assesses the obligations maximum depending on premiums or damage recorded, setting the solvency of insurance companies in relation to equity.
- The RBC – used by insurers Americans, adopted by the NAIC (National Association of Insurance Commissioners), RBC is a model which aims to determine the minimum capital requirements depending on the risk exposure of insurance company assets and liabilities from the balance sheet which are weighted according to risk.
- Model-based scenarios – used mainly in Canada, the United Kingdom and the United States, the model analyzes the impact of specific risk exposures according to insurers, subjecting balance sheet items to stress tests to simulate the possible financial consequences.
- Probabilistic model – used primarily in Australia and Canada, the model tries to cover the whole range of risks faced by insurance companies, being executed simulations and associated probabilities being calculated on the possible adverse developments.

By analyzing those models is remarkable importance given the risks and other variables such as the definition of capital, the approach, predictability and complexity of the model and the impact on risk management, a complete table is presented below:

Variable / models	fixed coefficient	RBC	Scenarios	probabilistic
Risks	limited to subscriptions	all	Financial (flexible)	combined
Capital	unclear definition	unclear definition	explicit definition	clear definition
Approach	static	static	dynamics	dynamics
Predictability	low	superior	untested	untested
Complexity	simple	moderate	increased	extreme
Impact (RM)	reduced	reduced	positive	positive

3. Comparative analysis of models used in insurance solvency

Risk modules considered in the model Solvency II standard formula for the calculation for calculating solvency capital requirement (SCR) were classified as follows:

Risks according to solvency II			
CCSB			CCRO
Technical	Market	Counterparty	Operational
catastrophe death rate longevity invalidity	interest actions active exchange	creditworthiness devaluation	insurance loss

where:
CCSB is the solvency capital requirement base.
CCRO represents capital requirement related to operational risks.

Such notice is a risk sharing in external risks (technical underwriting, market and counterparty respectively), respectively, in internal risks (operational risk).

On the other hand, we analyzed the risks taken into account by countries applying other models of solvency in insurance, according to all the risks assumed in the calculation formula related to Solvency II results are presented as follows:

Total Risks
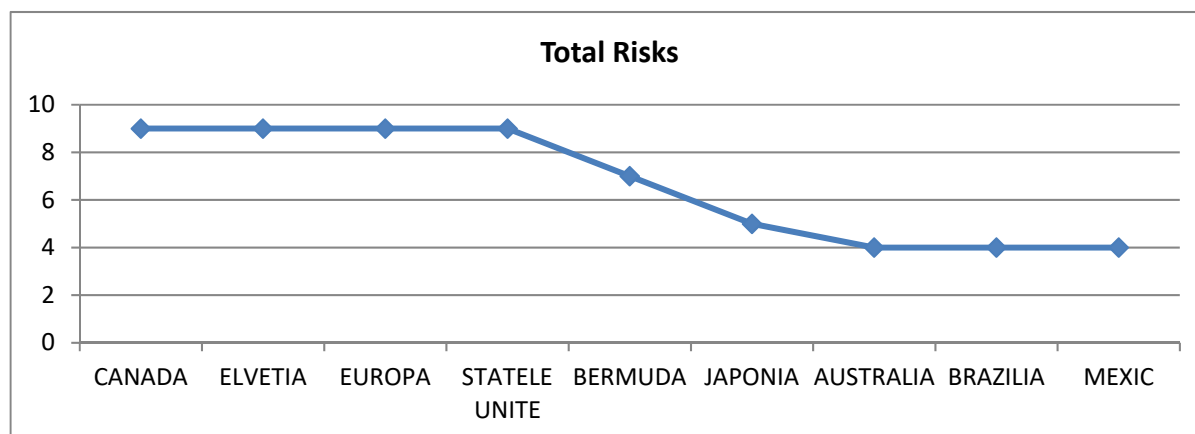
Thus, we observe an alignment in terms of all risks by models solvency applied in Switzerland, the US and Canada model Solvency II applied in Europe, and an approximation of the models applied in Bermuda and Japan.

There were also analyzed technical risks and market risks as well as risks components of the solvency capital requirement Basic Solvency II related results are presented graphic as follows:
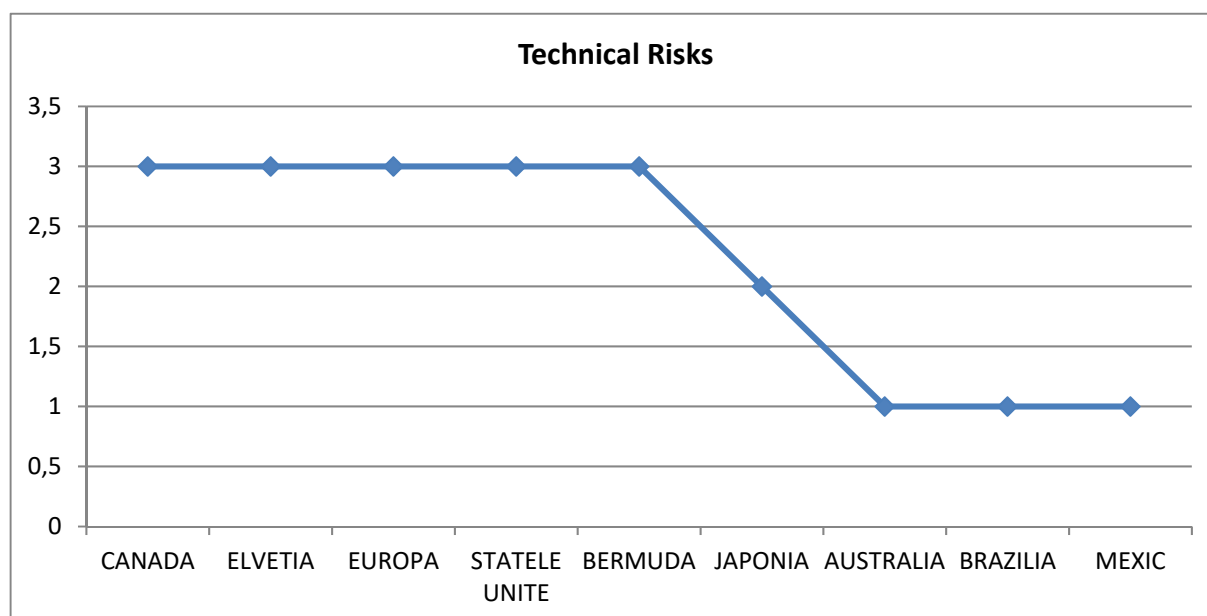
Technical Risks

From the analysis, it follows that Bermuda is aligned in terms of technical risks with the four countries that consider all the risks in the models Solvency possible explanation is related to the possible presence of market insurance and reinsurance in Bermuda to major companies in the field with capital coming from Canada, Switzerland, Europe and the United States.

An almost similar situation is seen in the case of market risks, except for Bermuda State, which does not take in all the model solvency risks, possible explanation is related to reduced exposure to market insurance related to the effects of the international financial markets.

Market Risks
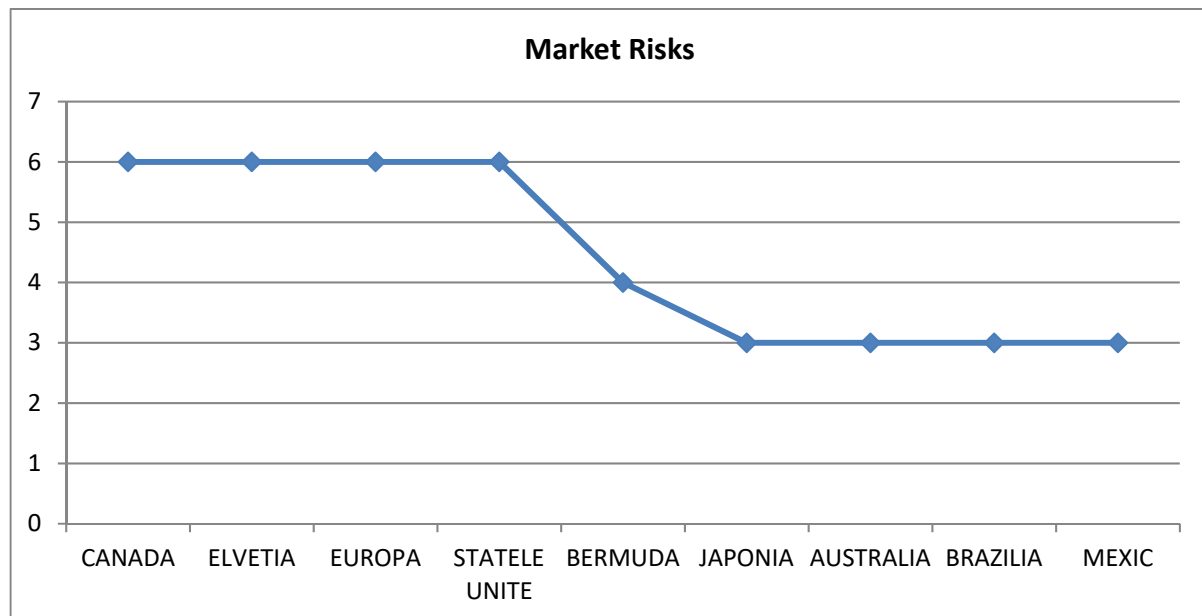
4. Conclusions

The adoption of the Solvency II regime in Europe is a challenge in terms of quality compared to the rest of the countries that apply different models of solvency. From the analysis above, it can be seen that the model covers a large area Solvency II risk equally in evaluating in detail capitals that make up the formula related.

Although there are still three countries which apply models almost similar to Solvency II (Canada United States and Switzerland), the rest of applying different designs (Brazil, Mexico, Japan, Australia, Bermuda), will have in the future to proceed with adjustments formulas related calculation of the solvency margin. The reason could be the growing trend of globalization of financial markets, and increasing emphasis on risk management in all organizations, regardless of their field of activity. A good example in this regard and somewhat recently is the last effects of the financial crisis, which broke even in the United States, took effect globally, resulting in the adoption of new procedures for risk assessment and thus financial products.

In conclusion, although the term equivalent of ten years, agreed between EIOPA and the supervisory bodies of Member States which apply models' solvency different Solvency II may seem sufficient time for harmonization latest trends outlined above, and efforts made to globally to reduce risks, will lead these states to gradually adjust the respective models.

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Determinants of effective corporate tax rate. Empirical evidence from listed companies in Eastern European Stock Exchanges

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Abstract. *The aim of the paper is to examine the determinants of effective corporate tax rate for three listed companies from Eastern European Stock Exchanges - Bulgaria, Hungary, and Romania, for the period 2006-2015. Using multivariate regressions and different estimation methods (data panels with OLS EGLS and quantile regressions) we studied the link between the effective corporate tax rate and profitability (ROA and ROE), indebtedness (long-term debt, debt-on-equity) and firm-level control variables (firm size and year-to-year asset variation). Empirical results supported the idea that for Romania, Bulgaria and Hungary managers are focused on the financial management, especially on profitability, and less focused on fiscal management, in part, due to the lower taxation. The negative link between profitability and the effective corporate tax rate implies the idea that a profitable company is implicitly able to lower its effective tax rate without using tax avoidance.*

Keywords: effective corporate tax rate, political power, multivariate regressions.

JEL Classification: G1, G3, H3.

1. Introduction

East European countries have encountered a dark period during the communist regime. Since the fall of the Berlin Wall there are more than 25 years, and the will of transition to global financial systems are obvious for the East European countries. The status of 'emerging country' is set, among others, by the quality of the companies (listed and unlisted) which are activating in that country, and the aim of the present paper is to study the drivers of the effective corporate tax rates for Romania, Bulgaria and Hungary. All three are ex-communist countries, and their evolution from the restrictive perspective of the communist regime to the capitalist one, is a major topic for the economic research. The novelty of this paper consists in the fact that we explore the fiscal management approach within listed companies from the East European region, using as proxy the effective tax rate. Corporate finance has a significant role for the wealth of a company and the fiscal regime attracts or, by the contrary, reflects the interest of investors to invest in a country. The path from emerging to developed country is leveled, in a way, by the relation between the appetite of investors to invest and the fiscal regime.

The effective corporate tax rate is a simple tool to assess the financial efficiency of a company and is able to reveal, depending of its level, different types of characteristics. A low level can suggest that the company uses tax avoidance, tax breaks, tax deferrals or other elements from tax planning and tax management in order to reduce its tax burden. A high effective tax rate, compared with the market, can suggest that there are non-deductible expenses, which can indicate a defectuous management conducted by the CEO or the fact that the majority shareholders are using the company resources in their own benefits. The effective tax rate (abbrev. ETR) shows the contribution of the companies to the public budget, in other words, shows the contribution of the companies to the status emerging/developed country/stock exchange. As members of the European Union, both Romania and Bulgaria are placed in the last positions among European countries and we examine, by empirical methods, if taxation and its influential factors can explain the characteristics of these emerging countries. Haughton (2007) considered that Romania and Bulgaria were accepted within European Union for geo-strategic reasons. Thus, it is on interest to observe if they aligned their tax system with the EU requirements and if tax deductions are used for the reduction of the effective tax rates. The period examined is extended over ten years and the results reveal the perspective of corporate finance in the middle of Eastern and Western Europe. For the economic interpretations of the results we tried to define them within and from the relation between managers, shareholders and investors in the context of tax morale. The remainder of the paper proceeds as follows. Section 2 provides literature review. Section 3 discusses our sample and data collection, as well as the econometric methodology applied. Section 4 presents the empirical results. The final section highlights conclusions drawn from the analysis of the results obtained and provides suggestions and future research direction.

2. Literature review

The well-desired rating of developed market is hard to acquire and it is driven by the quality of the companies listed on that market. The difference between Western and Eastern European markets is based on the historical events, but in the context of globalization the emerging countries from Eastern Europe are in a permanent endeavour to become developed. The effective tax rate is a good indicator for investors who want to know about the taxation from a country. The fiscal management conducted by the managers and the policies related to investment strategies are directly influenced by taxation and the effective tax rate plays an important role in financial decisions. Becker, Fuest and Riedel (2012) studied the European markets and they found a negative link between the quality investments made by investors and

the level of ETR. From the vast academic literature about taxation and the influential factors of effective corporate tax rates indebtedness, profitability and firm size are the most debated topics.

Stickney and McGee (1982) found negative link between effective corporate tax rate and firm size, whereas Zimmerman (1983) revealed positive relation. In the context of corporate finance political cost and political power are topics of interest for emerging companies because both of them act as a trigger in the development process of the companies. Political cost is related to mature companies, which are exploited by the fiscal authorities because they have the power to pay more for their growth. Belz, von Hagen and Steffens (2016) studied the political power theory, which is important for emerging companies. An emerging company, which wants to obtain more benefits and more power, can lobby the fiscal authorities and political persons in order to obtain a lower level of taxation. For emerging countries where the supervision is lower political power is more striking. For example (Buijink and Jensen, 2000; Phillips, 2003) obtained positive link between capital intensity and. From the perspective of financial performance Noor et al. (2010) found that firms with higher ROA recorded lower effective corporate tax rates, whereas Gupta and Newberry (1997) consider that ETRs are systematically related to ROA. Using European companies, Buijink et al. (2002) obtained a negative link between return on assets and the effective corporate tax rate. Lee and Swenson (2012) achieved a positive correlation between ROA and ETR. Huizinga and Laeven (2008) consider that in emerging European markets the lower tax burden conducts to a smaller difference between the accounting and tax books.

It is well known that interest rate expenses are deductible and thus they reduce the level of ETR. (Gupta and Newberry, 1997; Richardson and Lanis, 2007) reported a negative link between leverage and effective tax rates. Richardson, Lanis and Leung (2014) obtained empirical results that tax aggressiveness is negatively correlated with debt. Rego and Wilson (2012) empirically supported the idea that high debt and leverage are linked to lower effective corporate tax rates.

The discussion about the effective corporate tax rate becomes more relevant in the context of tax morale. Torgler (2012) studied the problem of tax morale for Eastern European countries, including the ones from our sample, in the context of adherence at European Union. Torgler (2007) obtained empirical results showing that Eastern European countries have lower tax morale comparing with the Western states as a result of the former communist influence. These countries were unable to adjust their tax systems in order to align with the EU requirements and the tax morale is less correlated with tax avoidance used for reducing the level of effective tax rate. But comparing the periods 1999 and 2008, Torgler (2007) revealed that the values of tax morale was lower and in 2008 the maximum value was recorded in Hungary and Bulgaria and the minimum value in Romania. Contrary to this study, Elschner and Vanborren (2009) observed that with the exception of Ireland, all European members have the effective tax rate lower than the statutory rate, a fact which captures the companies' propensity for tax deductions. Davies and Voget (2009) showed that once obtained the EU membership, due to the competition, the level of taxation for the new-entry members slightly rose and therefore, the level of effective tax rate was higher. Lai (2010) considers that the integration on the EU resulted with a lower taxation.

3. Data and methodology

3.1. Sample and variables

We used for the construction of the data panel variables related to effective tax rate, indebtedness, profitability and firm size, a sample of three East European emerging countries including Romania, Bulgaria and Hungary. The timeframe covers 2006-2015 and there are 35

public companies in the sample, listed on stock exchange. The relative low number from the sample is due to the fact that we applied filters for selection such as excluding financial institutions and companies with gaps in the data. Because all three are emerging countries with underdeveloped stock exchanges, the degree of disclosure is lower than Western European countries and the number of companies listed is smaller. Also, among the public companies there are many of them with consecutive years with losses and therefore the computation of ETR would have been unavailable. We excluded these companies. Hence, the sample has 35 companies, with a total of 315 observations. Data were collected from the Thomson Reuters Eikon platform. In Table 1 there are exhibited the firm-level data on corporate taxation as well as company-specific characteristics.

Table 1. *Definitions of variables used in empirical analysis*

Variables	Description
Variables towards taxation (Dependent variable)	
ETR	Effective corporate tax rate, calculated as Income Tax (Total)/Net income Before Taxes (EBIT).
Corporate profitability/(Independent variables)	
ROA	Return on assets ratio, formed by dividing the net income by total assets. This ratio is used for assessing the efficiency of the firm when using its assets.
ROE	Return on equity, formed by dividing the net income by total equity. This ratio is used for assessing the efficiency of the firm when using its equity.
Assets efficiency/(Independent variables)	
CINT	Capital intensity, formed by dividing the Property, plant, equipment (total net values) by total assets.
INVT	Inventory intensity, formed by dividing the total inventory by total assets.
Indebtedness/(Independent variables)	
D/E	Debt-to-equity ratio, known as financial leverage which reveals how much of a company is financed by its debt holders compared with its owners.
LTDEBT	Long term Debt-to-total assets ratio named the Long term Debt ratio shows the percentage of the long term debt used to finance assets.
Firm-level control/(Independent variables)	
SIZE	The size of a company computed as the natural logarithm applied to total assets.
GROWTH	Shows the evolution of a company in time (from year-to-year) computed as [(Total Assets$_x$ - Total Assets$_{x-1)}$/Total Assets$_{x-1}$]

Source: Authors own work.

Firm size, performance and indebtedness are the most studied topic about the effective corporate tax rates and we prefer to select them in this research about taxation of East European emerging companies. From size of the companies derived the idea of political cost which leads to a positive link between size and ETR. Political power theory supports the idea of a negative connection between the size of the company and the ETR. Many research obtained a negative link between profitability and ETR. For profitability, we used two proxies – ROA and ROE – because they represent the decisions of the managers and of the shareholders. Indebtedness was almost in every research negatively linked with ETR.

3.2. Quantitative framework

We used econometric models for the empiric research with multivariate analysis including data panels regression estimated with the least generalized squares method and the robust least square method. For robust results and soundness, we used quantile regressions, fixed effects generalized least squares (cross-section weights – EGLS) regressions. GLS estimation has functions to produce the Best Linear Unbiased Estimators (BLUE). Gujarati (2003) indicates that the GLS estimation to be used to eliminate heteroscedasticity from data. The different number of methods has a role for validation, stabilization and increase the implicit level of trust of associated coefficients. The aim of the number of estimation models is to reduce the negative inferences from the data, considering that the quality of the data from East European countries has a lower degree of confidence. Disclosure policies as in US markets were implemented in the last years, especially after the 2007' crisis and there are some discrepancies in the data available for the beginning of the 2000s. For the quantile regression,

we used as starting point the study of Delgado et al. (2014) about quantile regression by deciles. Armstrong et al. (2015) consider that quantile regression technique can better shape the distribution of interest. Buchinsky (1998) considers that the quantile regressions are better than the OLS when the distribution of errors is non-normal. For the other estimation models, we choose the study made by Richardson and Lanis (2007) which reflects the impact of the company size, assets and financial performance on ETR.

The general econometric models used to quantify the impact of influential factors of the effective corporate tax rates over 2006-2015 are:

1) $ETR_{it} = \alpha_0 + \beta_1 \times Firm\_characteristics + \beta_2 \times Firm\_Controls + \varepsilon_{it}$

2) $ETR_{it} = \alpha + \beta_1 \times CINT_{it} + \beta_2 \times INVT_{it} + \beta_3 \times D\_E_{it} + \beta_4 \times LTDEBT_{it} + \beta_5 \times SIZE_{it} +$

$+ \beta_6 \times GROWTH_{it} + \beta_7 \times ROA / ROE_{it} + e_{it}$

where
i – companies;
t – 2006-2015;
ROA and ROE are used in different regression since they are similar and highly correlated. Firm_characteristics – variables regarding indebtedness and profitability (explanatory variables); Firm_Controls – variables regarding firm size and annual growth, α_0 – intercept quantifies the influence on the financial performance of all variables non-included in the model;
$\beta_1, \beta_2, \beta_3$ – regression coefficients, ε_{it} is the error term.

4. Empirical results

4.1. Summary statistics and correlations

In Table 2 we attached the descriptive statistics. It can be seen that the mean of ETR is 10.64%, a relatively low level if it is compared with US companies, but expected since the companies analyzed are from emerging markets. A study of Nicodème (2007) revealed that European companies faced after the 2000's lower levels of effective corporate tax rates. Variables for profitability, ROA and ROE recorded low levels, 6% and 9%, a fact suggesting that emerging markets from Romania, Bulgaria and Hungary had financial difficulties for the selected period. A possible explanation can be put on the fact that the period analyzed contains the period of financial crisis which negatively affected the global financial sector. The level of ROA can indicate that the efficiency of managers from these countries was not very high and they were unable to use assets in the context of financial crisis. The level of indebtedness is normal, between 20% and 30% and it is known that because of the poor development of the stock exchanges, companies from East European markets finance their activities by loans. The deductibility of interest expenses can explain the low level of ETR recorded.

Table 2. *Descriptive statistics*

Variables	Valid N	Mean	Minimum	Maximum	Lower Quartile	Upper Quartile	Std. Dev.
ETR	350	0.106457	-34.757000	6.161000	0.106000	0.230000	1.928406
CINT	350	1.284631	0.127000	57.314000	0.355000	0.684000	5.920666
INVT	350	0.147851	0.001000	4.191000	0.040000	0.180000	0.265199
ROA	350	0.056489	-0.136000	0.294000	0.017000	0.093000	0.059721
ROE	350	0.089126	-0.359000	0.447000	0.030000	0.145000	0.096659
D/E	350	0.316000	0.000000	2.200000	0.020000	0.510000	0.358500
LTDEBT	350	0.205709	0.000000	19.553000	0.000000	0.114000	1.493001
SIZE	350	4.996429	1.841000	13.970000	3.758000	5.649000	1.941478
GROWTH	350	0.075471	-0.990000	4.241000	-0.036000	0.110000	0.319976

Source: Authors' computations.

In Table 3 we attached the correlation matrix between variables. There is a strong correlation between ROA and ROE (94%), but we deployed these variables in different models. Also, there is a strong correlation between LTDEBT and CINT (58%) but their economic meaning is different so we decided to keep these variables. The negative effect of multicollinearity increases the standard errors of the coefficients and the estimated results are inefficient.

Table 3. *Correlation matrix*

Variables	ETR	CINT	INVT	ROA	ROE	D_E	LTDEBT	SIZE	GROWTH
ETR	1.000000 -----								
CINT	0.016540 (0.308591)	1.000000 -----							
INVT	0.035984 (0.671702)	0.410603 (8.400504)	1.000000 -----						
ROA	-0.029328 (-0.547337)	-0.063768 (-1.192009)	-0.064035 (-1.197007)	1.000000 -----					
ROE	-0.017829 (-0.332642)	-0.053423 (-0.998011)	-0.020793 (-0.387968)	0.941787 (52.25552)	1.000000 -----				
D_E	0.089786 (1.681734)	0.178987 (3.393758)	0.223558 (4.278719)	-0.327111 (-6.457431)	-0.168523 (-3.189364)	1.000000 -----			
LTDEBT	0.013187 (0.246013)	0.582368 (13.36399)	0.286811 (5.585028)	-0.043341 (-0.809272)	-0.020757 (-0.387296)	0.180098 (3.415528)	1.000000 -----		
SIZE	0.031451 (0.586995)	0.295164 (5.762964)	-0.004563 (-0.085125)	0.022464 (0.419168)	0.047463 (0.886418)	0.131873 (2.481741)	0.246035 (4.735281)	1.000000 -----	
GROWTH	0.046447 (0.867390)	-0.084891 (-1.589361)	-0.075077 (-1.404506)	0.038035 (0.710053)	0.041733 (0.779193)	-0.039991 (-0.746612)	-0.059691 (-1.115509)	-0.070828 (-1.324602)	1.000000 -----

Source: Authors' computations. t-statistic is provided in brackets.

4.2. Econometric methods output

In Table 4 we attached the results obtained with OLS estimation and White's method Cross-section weight for heteroscedasticity and with the Robust least square method. The goodness of fit statistic R^2 is used to check if the estimated models are valid. The values of R^2 for our models were around 45% and thus, the models are valid. The low values for the Robust least squares did not support the validity of the estimated regressions. We applied the Student-t and the z-test for the econometric inference. The empirical results from data panel estimations about the impact of drivers of the effective corporate tax rate were not significant for the variable CINT. Inventory intensity (INVT) recorded a positive link with ETR on both models (ROA and ROE). Inventory from the fiscal point of view are not part of tax deductions and cannot be used to lower the level of taxation and a higher level of inventory will increase the overall taxation. The variables proxied for profitability, ROA and ROA, recorded a negative link with ETR which can be explained by the fact that the overall profitability of a company is reflected on the level of taxation. A profitable company from the financial point of view is able to lower its effective tax rate as a part of that profitability. In the Robust least square method, ROE recorded a positive link with ETR. It is important to take into consideration the high value of the coefficients obtained for the ROA (41%) and for the ROE (26%). The more permissive fiscal regimes from East European countries, compared with U.S, and the struggle to achieve the status of emerging markets, makes the companies to be less interest in tax deduction and tax planning. For them is more important to be profitable and are more focused on ROA and ROE. The strong link between ROA and ETR signifies that CEOs from East European countries achieve a lower taxation through financial management. They are more interest to maximize the wealth of shareholders and do not put accent on tax breaks as managers from U.S. This correlation can be a sign of political power presence. More profitable companies are more power and they can influence the authorities in order to obtain lower taxation. The lack of correlation between CINT and LTDEBT supports furthermore the

idea that companies from East European emerging markets are more focused on financial management than fiscal management, because the tax burden is less burdensome.

Table 4. *Panel data regressions towards the influence of firm characteristics on effective corporate tax rate*

Variables	Eq 1 Method: Panel EGLS (Cross-section weights)	Eq2 Method: Panel EGLS (Cross-section weights)	Eq3 Method: Robust Least Squares	Eq4 Method: Robust Least Squares
Constant	-0.045557 (-0.361914)	0.002692 (0.024386)	0.134112 (7.727535)***	0.129703 (7.717143)***
CINT	0.006833 (1.405464)	0.005846 (1.251835)	0.001528 (1.266883)	0.001624 (1.356008)
INVT	0.012058 (5.215647)***	0.012134 (5.31987)***	-0.004345 (-0.190081)	-0.004842 (-0.213467)
ROA	-0.415827 (-4.013726)***		0.093529 (0.981299)	
ROE		-0.268306 (-4.336727)***		0.105872 (1.887895)†
D/E	0.090964 (3.515599)***	0.095065 (3.810867)***	-0.021649 (-1.316168)	-0.023211 (-1.482132)
LTDEBT	-0.006491 (-0.811425)	-0.006851 (-0.854801)	0.005179 (1.160408)	0.005201 (1.175189)
SIZE	0.026993 (1.134689)	0.017322 (0.818342)	0.00509 (1.716683)†	0.005016 (1.704593)†
GROWTH	0.035228 (1.445939)	0.042365 (1.959059)†	-0.012032 (-0.713639)	-0.012425 (-0.742917)
R-squared	0.456052	0.469532	0.020501	0.024518

Source: Author's computations. Notes: ***, **, *, † refer to 0.1%, 1%, 5%, and 10% levels of significance. t-Statistic is provided in brackets (Eq1 and Eq2). z-Statistic is provided in brackets (Eq3 and Eq4). White cross-section standard errors & covariance (d.f. corrected) are considered in Eq1 and Eq2. Huber Type I Standard Errors & Covariance are considered in Eq3 and Eq4.

Debt-on-Equity, the financial leverage, recorded a positive link with ETR. This sign is unexpected since the deductibility of the interest rates but, the financing through loans from the banks is generalized for Eastern European emerging companies and the bankruptcy risk is costly and non-deductible. The "eyes" of the creditors prevent the managers to juggle with the resources of the company in order to reduce the ETR and the relative low taxation from East Europe countries disincentives them to do that. Regarding the indebtedness for LTDEBT there were no significant regressions. As previous stated in this paper, the political cost and the political power are two theories, which are important to characterize companies from emerging markets. In order to capture these theories, we used firm size and GROWTH. SIZE and GROWTH are the basic variables to observe the evolution of a market and the transition from emerging status to the developed one. Applied to public companies for Romania, Bulgaria and Hungary both variables recorded a positive link with ETR. Thus, is supported the political cost theory. The old communist mentality that companies work for the State is a part of the political cost theory in the context of corporate finance. It can be stated that the value of the coefficients are small and hence, the influence is reduce. The statutory rates in East European countries are smaller than Western markets (e.g. Romania has a statutory rate of 16%) and the idea of political cost is not supported in the fiscal perspective. The positive link between GROWTH and ETR can be explained by the fact that a bigger company has a higher income to be imposed upon taxation.

In Table 5 and Table 6 we attached the quantile regressions results for ROA and ROE. From Tables 5 and 6 the results estimated with quantile regressions are similar with those obtained with OLS regressions but the differences consist in the fact that CINT and LTDEBT were significant.

Table 5. *Quantile regressions towards the influence of firm characteristics on effective corporate tax rate (ROA included)*

Variables	Eq 1 tau = 0.1	Eq2 tau = 0.2	Eq3 tau = 0.3	Eq4 tau = 0.4	Eq5 tau = 0.5	Eq6 tau = 0.6	Eq7 tau = 0.7	Eq8 tau = 0.8	Eq9 tau = 0.9
Constant	-0.002521 (-0.070897)	0.025793 (0.363162)	**0.074517** (2.952237)**	**0.12073** (6.207181)***	0.147175 (7.156269)***	0.184095 (8.553497)***	0.222953 (8.102246)***	0.277074 (6.528733)***	0.367177 (2.112368)*
CINT	**0.00361** (2.085847)*	0.002066 (0.454621)	0.001309 (1.076272)	0.001026 (0.746703)	0.003564 (1.424675)	0.003227 (1.350125)	**0.011078** (9.524342)***	**0.009751** (7.724426)***	0.005762 (2.733524)**
INVT	**0.039257** (4.692129)***	-0.000936 (-0.003616)	**0.016817** (1.79081)†	0.009739 (0.938121)	0.002102 (0.182483)	-0.004269 (-0.38703)	-0.016664 (-1.415302)	-0.03732 (-3.284598)**	-0.083395 (-2.302895)*
ROA	**0.479527** (4.828887)***	**0.446407** (4.268586)***	0.122916 (1.007499)	0.017495 (0.159262)	-0.070308 (-0.528886)	-0.208527 (-1.371208)	**-0.431941** (-2.535694)*	**-0.665969** (-3.411668)***	-1.292321 (-2.964105)**
D/E	0.037349 (0.990455)	**0.044406** (1.663469)†	-0.01672 (-0.500073)	-0.02859 (-1.067706)	-0.004621 (-0.201433)	-0.008362 (-0.343388)	0.017806 (0.318623)	**0.112342** (3.801612)***	0.155233 (0.520028)
LTDEBT	-0.017215 (-0.946669)	0.007102 (1.179579)	0.006206 (1.570209)	0.005977 (1.349563)	-0.000469 (-0.084665)	-0.000703 (-0.132934)	**-0.015472** (-4.662331)***	**-0.017668** (-5.851828)***	-0.020805 (-4.012303)***
SIZE	-0.002985 (-0.40729)	0.003141 (0.386178)	**0.006744** (1.840751)†	**0.00569** (1.885428)†	0.004524 (1.642492)	0.003859 (1.466303)	0.00407 (1.092796)	0.001223 (0.196004)	0.017101 (0.50651)
GROWTH	-0.000718 (-0.073801)	-0.013832 (-1.200981)	0.017336 (0.635228)	-0.001854 (-0.066626)	-0.005491 (-0.203636)	-0.017735 (-0.693187)	-0.04036 (-1.600772)	**-0.053328** (-1.792195)†	-0.112715 (-2.931473)**
Pseudo R-squared	0.009014	0.007713	0.005606	0.005229	0.008864	0.012164	0.022078	0.047980	0.082514

Source: Author's computations. Notes: ***, **, *, † refer to 0.1%, 1%, 5%, and 10% levels of significance. t-Statistic is provided in brackets. Huber Sandwich Standard Errors & Covariance. Sparsity method: Kernel (Epanechnikov) using residuals.

Thus, capital intensity, CINT, recorded a positive link with ETR. This result is similar to other research from the literature about the European companies. Investments in fixed assets need resources which implies deductible interest expenses and the level of effective tax rates should be reduced. The link between ROA and ETR is significant and correlated with the sign obtained for CINT it enhances the idea that managers from East European companies are more focused on how to exploit the assets to maximize profitability not from the fiscal management perspective. Also, long term debt recorded a negative correlation with ETR. In the context of deductible interest expenses this sign was expected. Another difference registered with quantile regressions was for variable GROWTH, which was negatively correlated with ETR indicating the political power theory. As the company reaches its maturity has more experience with fiscal management and has more resources to invest in order to reduce the effective corporate tax rates.

Table 6. *Quantile regressions towards the influence of firm characteristics on effective corporate tax rate (ROE included)*

Variables	Eq 1 tau = 0.1	Eq2 tau = 0.2	Eq3 tau = 0.3	Eq4 tau = 0.4	Eq5 tau = 0.5	Eq6 tau = 0.6	Eq7 tau = 0.7	Eq8 tau = 0.8	Eq9 tau = 0.9
Constant	-0.00123 (-0.037513)	0.031972 (0.520022)	**0.077096** (3.415323)***	0.116326 (6.281088)***	0.144237 (7.372503)***	0.181755 (8.87398)***	0.209911 (8.23148)***	0.267581 (6.017996)***	0.346529 (3.975055)***
CINT	**0.003562** (2.023904)*	0.002605 (0.626543)	0.001475 (1.18268)	0.001051 (0.76053)	0.003573 (1.43033)	0.003131 (1.301643)	**0.011019** (9.187715)***	**0.009471** (7.229953)***	0.004598 (2.61848)**
INVT	**0.038539** (4.669769)***	-0.0366 (-0.156576)	0.007444 (0.496094)	0.010339 (0.995397)	0.002201 (0.192493)	-0.004501 (-0.407121)	-0.016603 (-1.398491)	-0.036801 (-3.316309)**	-0.092183 (-4.919254)***
ROE	**0.383864** (6.776602)***	**0.300692** (4.695917)***	**0.133366** (2.078372)*	0.056946 (0.902004)	-0.021719 (-0.267392)	-0.118974 (-1.321627)	**-0.201834** (-2.013832)*	-0.405434 (-3.804883)***	-0.780689 (-3.610983)***
D/E	0.021662 (0.652199)	0.018185 (0.673475)	-0.009816 (-0.344907)	-0.027615 (-1.098927)	-0.002648 (-0.115555)	0.000219 (0.008515)	0.043944 (0.792343)	**0.113784** (4.056504)***	0.243621 (3.181573)**
LTDEBT	-0.017802 (-0.942071)	0.007824 (1.363879)	0.006522 (1.624549)	0.006054 (1.359123)	-0.000486 (-0.08821)	-0.00063 (-0.119324)	**-0.015724** (-4.894983)***	-0.017214 (-5.691271)***	-0.021848 (-6.389166)***
SIZE	-0.002452 (-0.409142)	0.004664 (0.677059)	0.005449 (1.61268)	**0.005467** (1.852568)†	**0.004625** (1.686997)†	0.003696 (1.38704)	0.003473 (0.950111)	0.002968 (0.390111)	**0.019149** (1.362603)
GROWTH	0.00057 (0.057506)	-0.013265 (-1.186794)	-0.009125 (-0.171202)	-0.001563 (-0.055929)	-0.010134 (-0.364366)	-0.016326 (-0.627457)	-0.035275 (-1.393965)	**-0.054051** (-1.969566)*	-0.109643 (-4.039189)***
Pseudo R-squared	0.010945	0.010181	0.007336	0.005587	0.008229	0.010749	0.020434	0.047868	0.086888

Source: Author's computations. Notes: ***, **, *, † refer to 0.1%, 1%, 5%, and 10% levels of significance. t-Statistic is provided in brackets. Huber Sandwich Standard Errors & Covariance. Sparsity method: Kernel (Epanechnikov) using residuals.

5. Conclusions

Each company and each country are trying to become more profitable and more developed. After the communist era, Eastern European emerging countries aligned with the global financial system. It is a tendency that emerging markets to become more involved, in the context of corporate finance, with developed ones. Between these systems there are many differences and the fiscal regimes is one of them. Statutory rates are the first line to compare taxation between two countries, but the true picture about taxes is depicted by the effective corporate tax rates. We empirically study the drivers of the effective tax rate for Romania, Bulgaria and Hungary. The three countries are neighbours and all are ex-communist countries and thus, apart from the economic meaning of the results there is a symbolic value of this study. We include variables from profitability, ROA and ROE, from indebtedness and variables related to the size of the company in order to capture the presence of political power/political cost theories. Similar with other researches applied to European companies, we obtain empirical results which support the idea that in East European emerging companies the focus is set on the overall profitability, proxied as ROA and ROE, and less on taxation and tax deduction. The lower taxation, the emerging status correlated with the underdeveloped stock exchanges and the loan-based financing make the managers of European countries to be more interest on financial management and less on the fiscal management. Return on assets and return of equity had a negative link with ETR. On a broad perspective brought by the quantile regressions, indebtedness had a negative correlation with the effective tax rate due to the deductibility of interest expenses and the firm-level control variables supported the political cost theory (firm size was positive correlated with ETR) but, on the contrary, GROWTH variable supported the political power theory. If taking into consideration capital intensity and inventory intensity positive correlations with ETR the idea of a financial perspective is highlighted again.

For future directions, we are going to use bigger sample data, more emerging countries from the East Europe and more variables to capture the characteristics of taxation from this region and the drivers of the effective tax rates.

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Conservatism, corporate governance and audit quality: A study at Istanbul Stock Exchange

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Abstract. *The purpose of this study is to examine the relationship between conservatism and corporate governance and audit quality. For this purpose, a multiple regression analysis was performed using the data of the companies included in BIST-100. In this study, the definition of conservatism and corporate governance and audit quality and their relationships are mentioned. Consequently, this study has shown that the conservatism has a relationship with some of corporate governance applications and also conservatism has a relationship with audit quality.*

Introduction

The concept of conservatism dating back to the 15th century is defined as an approach based on approaching cautiously to information about profit and loss (Basu, 2005). Conservatism is one of the basic characteristics of financial reporting that combines practice and theory, which can also be described as low profit expectation (Wolk et al., 2013). Conservatism presents differences in four areas as contracts, shareholder rights, accounting regulations and taxation (Watts, 2003a). Conservatism, according to a traditional definition is to move by foreseeing the worst possible loss (Bliss, 2004). Therefore, conservatism is revealed in the policies of investors, governments and corporations (Feltham and Olson, 1995). Conservatism, also perceived as being cautious and underwriting is used as a measure of earnings management (Ball and Shivakumar, 2005) and is seen as one of the important features of financial statements as it increases transparency (Francis et al., 2004). Institutionalization increases the transparency and credibility of businesses and perpetuates the assets and reputations of the businesses in international markets (Bekçi and Gör, 2016: 3). The corporate governance that emerged with institutionalization aims to give the right information from companies by acting transparently (Koçel, 2003: 469). In order for corporate governance to function effectively, it is necessary to comply with international standards and to ensure the independence of the board of directors (Lazereva et al., 2007: 2). In addition, corporate governance ensures that businesses must perform their activities in accordance with legislative and regulatory requirements to meet shareholder and community expectations in line with their organizational goals in an international competitive environment (Küçüksözen et al., 2005: 102).

Audit is a systematic practice that investigates, finalizes and approves accounting information objectively in accordance with the relevant legislation and generally accepted accounting principles with evidence whether the actual nature of the economic events is included in the records (Certified Public Accountants Law No. 3568). Audit is also an effort to reduce the concession confronting investors with managers (Wallin, 1992: 121). The main purpose of the audit is to reveal what is to be done in the actual situation to reach desired situation by comparing the actual situation with the desired situation. For this reason, auditing also means seeking conformity to standards (Köse, 2000:63). In addition, it is a necessity to question the quality and reliability of the audit activity itself, since it is an accuracy inquiry. The quality and reliability of the audit depends on the suitability of the audit activity to predetermined criteria. Auditing standards are a set of criteria relating to the quality of work performed in a situation and include both the supervisor in terms of personal characteristics and the entire audit process from the beginning to the end (Kenger, 2001: 16).

Subsequent to Enron, Worldcom and similar scandals, regulations have been developed to increase the quality of the audit as well as the corporate governance practices. Within these developments, it is thought that the concept of conservatism contradicts with transparency which is one of the basic principles of corporate governance. For quality audit, transparency is also a very important requirement. Especially conservatism is thought to impair the transparency and impartiality of financial statements. It is expected that conservatism will affect both audit quality and corporate governance practices. The main focus of the study is to compare the policy of companies to maintain their existence by acting cautiously against risks with the policy of companies to struggle with their competitors by gaining trust and reputation in a transparency.

2. Literature review and hypotheses

There are some researches in the literature which investigate the relationship between corporate governance practices and conservatism (Rezazadeh and Azad, 2008; Khoshtinat and

Yousefi, 2006; Ebrahimi and Shariary, 2009; Banimahd and Baghbani, 2009; Chi et al., 2009; Ahmad and Duellman, 2007) and also the relationship between direct corporate governance and conservatism (Garcia et al., 2009; Kootanaee et al., 2013; Erdoğan and Çubukçu, 2010).

The researches examining the existence and nature of a relationship between corporate governance and conservatism and the hypotheses based on these researches are listed below as subheadings.

2.1. Corporate governance index and conservatism

Although it is not included as a variable in any study in the literature, it is seen that it is chosen as the population in some studies (Gör et al., 2016). It is known that the companies in the BİST Corporate Governance Index have at least 7 out of 10 compliance notes to the corporate governance principles. It seems that the companies that are most compatible with corporate governance principles include this index. In this study, BİST-100 Index is selected as the population. At the same time, companies in the Corporate Governance Index are also listed in this index. For this reason, it is desired to measure whether there will be an effect on the relationship between corporate governance practices and conservatism if the companies are included in the Corporate Governance Index or not.

H1: There is a significant and negative relationship between listing in Corporate Governance Index and conservatism.

2.2. Board of directors and conservatism

Board of directors is revealed as an affecting factor both in studies related with corporate governance and in studies, which examine the relationship between conservatism and corporate governance practices. The breadth of the board of directors is an important factor that is measured by the number of members and affects the independence of the board (Zahra and Pearce, 1989). Increasing the breadth of the board is seen as part of corporate governance practices by increasing the independence of the board. However, the widening of the board causes more time and cost loss in decision-making and thus has a negative effect on conservatism (Kootanaee et al., 2013). For this reason, it is expected that the widening of the board will have a negative impact on conservatism.

H2: There is a significant and negative relationship between the breadth of the board of directors and conservatism.

It is known that ensuring the independence of the board is one of the most basic applications of corporate governance practices. One of the actions taken to ensure independence of the board is to increase the proportion of independent board members. Abor and Biepke (2007) also point out that increasing the number of board members who are not in-line is another way of increasing the independence of the board. Since in the study, the relationship between the ratio of independent board members with conservatism is examined. The studies in the literature reveal that increasing the independence of board of directors affects the conservatism negatively (Kootanaee et al., 2013). For this reason, in this study it is expected that the ratio of independent board members will be in a negative relationship with conservatism.

H3: There is a significant and negative relationship between the ratio of independent board members and conservatism.

According to top executive dilemma, which is one of the practices of corporate governance related with board of directors, the general manager and the Chairman of the board should not be the same person (Kouki et al., 2011). In this way, it is expected that the independence of the board will be strengthened. Bartov et al. (2001) also point out that the top management dilemma weakens corporate governance. It is seen that being the chairman of the board of

directors and general manager as the same person contributes positively to the conservatism (Kootanaee et al., 2013; Chi et al., 2009). It is expected that the presence of top manager dilemma is desirable in terms of conservatism although it is not desirable in terms of corporate governance practices.

H4: There is a significant and positive relationship between top manager dilemma and conservatism.

Another factor that has emerged as one of the corporate governance practices in recent studies is the number of female members. If the number of female members increases, the independence of the executive board will be expected to increase (Gör et al., 2016). It is expected that the increase in the number of female members will have a negative effect on conservativeness because each application that increases the independence of the management board has a negative effect on conservatism according to related literature.

H5: There is a significant and negative relationship between the number of female members and conservatism.

2.3. Ownership structure and conservatism

The ownership structure emerges as another factor related with conservatism. The fact that company managers are different from the owners of the company creates different interest concerns (Jensen and Meckling, 1976). The presence of large shareholders affects ownership by causing manipulation from these shareholders (Bebchuk, 1994). Shleifer and Vishny (1997) also argue that corporate ownership is one of the important factors affecting corporate governance. Jensen (1993) and Solomon et al. (2012) states that the increase in the ratio of institutional investors encourages companies to implement corporate governance practices. It is seen that there is a negative relationship between the percentage of institutional investors and conservatism in the literature (Kootanaee et al., 2013; Chi et al., 2009). Increasing institutional ownership percentages are expected to have a positive impact on conservativeness, as it is thought that the increase in the percentage of institutional investors will help to avoid information asymmetry, thus reducing costs.

H6: There is a significant and positive relationship between the percentage of institutional investors and conservatism.

Another variable that may be included in the percentage of ownership is the share percentage of the board of directors. This variable, which also shows the independence of the board, is expected to be inversely related to conservatism, like other corporate governance practices affecting independence of the board.

H7: There is a significant and negative relationship between the share percentage of the board of directors and conservatism.

2.4. Audit committee and conservatism

In the literature, there is not any study that examines the relationship between the audit committee and conservatism. However, some research has been examined the relationship between the breadth of the board and conservatism. When the members of the audit committee are usually selected from independent board members, the breadth of the audit committee seems to be related with conservatism. Because conservatism is expected to have a negative relationship with independent board members, it is expected that the breadth of the audit committee will be in a negative relationship with conservatism.

H8: There is a significant and negative relationship between the breadth of the audit committee and conservatism.

2.5. Audit quality and conservatism

The quality of audit is included in the literature with the relationship with both accounting conservatism and auditor conservatism. In studies that examine the relationship between audit quality and conservatism, it is seen that working with large firms is used as the criterion of audit quality. There are studies in the literature that consider the conservativeness of the auditor to have a positive impact on audit quality (Lee et al., 2006), as well as studies that examine the effect of conservative attitudes in financial reporting on audit quality (Hamdan et al., 2012; Liao and Radhakrishnan, 2016). In addition, there are studies in the literature (Paulo et al., 2013) which consider conservatism as an element of accounting knowledge and so audit quality. A study which reveals a positive relationship between audit quality and conservatism (Soliman, 2014) is also in the literature. On the other hand, there are studies (Pae, 2004) that show that there is no relationship between conservatism and audit quality. Audit quality and corporate governance together with two complementary concepts play an important role in companies' trust and reputation in global competition conditions. For this reason, when examining the relationship between conservatism and corporate governance, it is thought that the audit quality should be included in this examination.

H9: There is a significant and positive relationship between audit quality and conservatism.

2.6. Internal control and conservatism

Internal control is also included in the literature as another factor that can be associated with conservatism. Conservatism is evaluated as a factor that can shape direct internal control directly and as an attitude that can influence internal control indirectly in practice. There are studies in the literature that find a positive relationship between internal control and conservatism (Goh and Li, 2011), as well as studies that identify negative relationships (Mitra et al., 2015). In this study, it is expected that internal control is positively related to conservatism.

H10: There is a significant and positive relationship between internal control and conservatism.

3. Research and methodology

The data used in the study were obtained from financial statements, annual reports and internet sites of companies listed in BİST-100 Index. The study covers seven years' data from 2009 to 2015. Data of 74 companies which consistently listed in BIS-100 Index for seven excluding sports, banking and finance sectors are used. Due to the non-compliance of sports companies' operating periods and differences in the financial statements of the companies in the banking and finance sectors, companies in these sectors are excluded from the scope of the study. The representation of population used in the study is 100%.

3.1. Determination of variables

Conservatism (CONS) is dependent variable of the study. Dependent variable is selected as the market value / book value ratio used for the measurement of conservatism. Beaver and Ryan have developed this ratio by developing Feltham and Ohlson model. Conservatism in the Feltham and Ohlson model is seen as a tendency to pull book value down against the market value. Beaver and Ryan also developed this model and argue the following model:

PDDD = Market Value / Book Value.

In the literature review, the reasons why the independent variables are chosen are explained. Definitions and abbreviations of the variables are included in the following table.

Table 1. *Variables and abbreviations*

VARIABLE	ABBREVIATIONS
Conservatism	CONS
Internal Control	INCO
Corporate Governance Index	CGEN
The Breadth of Board Of Directors	BOSI
The Ratio of Independent Board Members	BIND
Top Management Dilemma	CEOD
Audit Quality	AUQU
The Number of Female Members of The Board Of Directors	WOBM
The percentage of Institutional Investors	ININ
The Share Percentage of The Board of Directors	BINV
The Breadth of Audit Committee	SIAC
Company Size	FISI
Current Ratio	CURA
Sector	SECT
Financial Leverage (total debt / total assets)	LEVE

The CGEN, AUQU and CEOD are dummy variables. If the company is listed in the corporate governance index 1 is used and if it does not 0 is used. In audit quality, if one of the four major auditing firms conducts audit activities of the company, it assumes a value of 1 and if it does not, it assumes a value of 1. For the CEOD variable, if the general manager and the chairman of the board are the same person, a value of 1 is used and if it is not, a value of 0 is used.

3.2. Method and model

In the study, analysis was performed by using multiple regression analysis. The model used in the study is revealed below.

$$CONS = \beta_0 + \beta_1\ CGEN + \beta_2\ BOSI + \beta_3\ BIND + \beta_4\ CEOD + \beta_5\ AUQU + \beta_6\ WOBM + \beta_7\ ININ + \beta_8\ BINV + \beta_9\ SIAC + \beta_{10}\ FISI + \beta_{11}\ CURA + \beta_{12}\ SECT + \beta_{13}\ LEVE + \varepsilon$$

4. Results and discussion

In this section, the data obtained from 74 companies in BİST-100 Index excluding sports, banking and finance sectors are analyzed and the results of the analyzes are presented comparatively with the literature.

4.1. Characteristic information

The basic and descriptive statistical data related to the data of the companies included in the analysis are presented in Table 2.

Table 2. *Descriptive statistics*

	CONS	CGEN	INCO	BOSI	BIND	ININ	BINV	AUQU	CEOD	WOBM	SIAC	FISI	LEVE	CURA	SECT
Mean	2.43984	0.32432	6.22780	8.43050	0.19736	0.60499	0.19360	0.87838	0.07915	0.11607	1.85135	14.39585	1.53854	7.39642	14.22973
Standard deviation	4.59278	0.46857	1.78708	2.29329	0.14268	0.22267	0.28216	0.32716	0.27023	0.11841	0.77379	1.59100	2.97491	35.03966	7.05596
Minimum	-3.19372	0.00000	0.00000	2.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	10.47726	-26.94753	0.24109	1.00000
Maximum	54.33935	1.00000	8.00000	15.00000	0.50000	0.97920	0.87360	1.00000	1.00000	0.55550	5.00000	19.39720	49.97816	445.41304	28.00000
Observation	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518

The maximum, minimum, mean value and standard deviations of each variable are given in Table 2. When the table is examined, it is seen that the majority of companies in BİST-100 are not included in the corporate governance index. It is seen that the breadth of the board of directors is 8.43. It is also seen that the ratio of independent members of the board of directors of these companies is around 19.73%. On the other hand, 7.92% percentage of the top manager dilemma indicates that there is not much of a top manager dilemma in these companies. Finally, it is understood that the percentage of institutional investors in these companies is 60.49%.

4.2. Results of multiple regression analysis

Multiple linear regression analysis is performed to test hypotheses generated in the study. Multiple linear regression analysis is used to analyze the mathematical relationship between dependent variable and independent variable. To apply this analysis, the data should have a normal distribution and there should be no multicollinearity problem between the data (Çokluk, 2010: 1361). The normality tests indicate whether the data have normal distribution. If the number of data is small, Shapiro-Wilk is applied and if the number of data is small large, the Kolmogorov-Smirnov Test is applied. It is understood that data has a normal distribution when $p > 0.05$ (Kalaycı, 2010: 10). Collinearity statistic is used to show that there is no multicollinearity problem between variables. The fact that VIF values are less than 10 in this statistic shows that there is no multicollinearity problem. The Durbin-Watson statistics is used to explain the autocorrelation problem. This value is expected to be close to two.

Table 3. *Normal distribution, multicollinearity and Durbin-Watson Tests*

NORMAL DISTRIBUTION		Durbin-Watson Statistics	1,789
Variables	Kolmogorov-Smirnov Test		
	p value	Collinearity Statistics	
CONS	,435	Variables	VIF
INCO	,237	INCO	1,492
CGEN	,098	CGEN	1,143
BOSI	,385	BOSI	1,241
BIND	,095	BIND	1,062
CEOD	,110	CEOD	1,052
AUQU	,151	AUQU	1,075
WOBM	,223	WOBM	1,071
ININ	,281	ININ	1,469
BINV	,322	BINV	1,116
SIAC	,227	SIAC	1,235
FISI	,260	FISI	1,103
CURA	,243	CURA	1,235
SECT	,217	SECT	1,493
LEVE	,349	LEVE	1,172

From Table 3, it can be understood that the variables have normal distribution because their p values in the Kolmogorov-Smirnov test are larger than 0.05. It is determined that the value of Durbin-Watson is around 2 and there is not autocorrelation between variables, VIF values less than 10 reveals that there is no multicollinearity problem between the variables.

Table 4. *Results of multiple regression analysis*

CONS	Coefficient	Standard Deviation	Significance
INCO	0.2804	0.0999	**0.005***
CGEN	1.8165	1.3747	0.187
BOSI	-0.0638	0.0822	0.438
BIND	-0.4184	0.9547	0.261
CEOD	1.7908	0.6553	**0.007***
AUQU	1.0923	0.5361	**0.042***
WOBM	-4.3522	1.4409	**0.003***
ININ	1.8165	1.3747	0.187
BINV	0.6117	0.7038	0.385
SIAC	0.3110	0.2347	0.186
FISI	-0.9197	0.1226	**0.000***
CURA	0.0222	0.0048	**0.000***
SECT	0.0561	0.0246	**0.000***
LEVE	0.6580	0.0572	**0.023***
Constant	9.9062	2.3437	0.000
Prob > F		0	
Adjusted R square		0.3340	
Observation		518	
*		<0.05	

According to the results of multiple regression analysis, it is observed that the number of female members and the CEO dilemma performed by the companies in the BİST-100 index as corporate governance practices are statistically related to the conservatism at 5% significance level. Moreover, there is a statistically significant relationship between conservatism and audit quality and internal control at the level of 5% significance. In this context, H4, H5, H9, H10 are accepted, H1, H2, H3, H6, H7 and H8 are rejected. In addition, the company size, leverage ratio, current ratio and sector used as control variables are in statistically significant relationship with conservatism.

According to the H4 hypothesis, it was seen that the top manager dilemma has a significant and positive relationship with conservatism, so H4 was accepted. This result is consistent with the literature. Kootanaee et al. (2013) and Chi et al. (2009) found that the top executive dilemma had a statistically significant and positive relationship with conservatism.

According to H5 hypothesis, it can be seen that the number of female members in the board of directors is in a statistically significant and negative relationship with conservatism, so H5 has been accepted. There is no study in the literature regarding the number of female members.

When H9 hypothesis is evaluated, it is seen that audit quality is in a statistically significant and positive relationship with conservatism. Quality control is expected to affect conservatism positively. This result is compatible with the literature. Paulo et al. (2013) and Soliman (2014) found positive relationships between conservatism and audit quality.

According to the H10 hypothesis, internal control seems to be in a statistically significant and positive relationship with conservatism. This result seems to be consistent with the literature. Goh and Li (2011) found a positive relationship between internal control and conservatism.

Moreover, it is seen that company size which is a control variable has a significant and negative relationship with conservatism. Kootanaee et al. (2013) obtained a similar result. The leverage ratio, which is another control variable, is in a significant and positive relationship with conservatism. In the literature Kootanaee et al. (2013) obtained a similar result. Finally, the current ratio and sector, which are not used in the literature but used as control variables in the study, are in a statistically significant and positive relationship with conservatism.

5. Conclusion

The aim of this study is to examine the relationship between conservatism, corporate governance practices and audit quality for the companies in the BİST-100 index. In order to achieve this aim, a survey was conducted on the companies listed on the BIST-100 Index. Due to the difference in financial statements the banking and finance sectors, and due to the period difference the sports companies are not included in this study. The variables used in the analysis were selected from the studies in the literature.

As a result of the study, it is determined that top manager dilemma and the number of female members in the board of directors which are corporate governance practices are statistically significant relationship with conservatism. It is found that corporate governance practices that increase the independence of the board are in a negative relationship with conservatism. On the other hand, it is determined that audit quality affects conservatism positively. It is also found that internal control affects conservatism positively as expected. It is determined that control variables as the company size, leverage ratio, current ratio and industry also affect conservatism. The results are consistent with the literature. It is seen that the number of female members who are not associated with conservatism in the literature but increase the independence of the board is inversely related to conservatism. On the other hand, it is found that conservatism does not affect the relationship with corporate governance practices whether the companies included in the sample are included in the corporate governance index.

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Rentability and risk in trading financial titles on the Romanian capital market

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Abstract. *The paper presents the correlation between the shares rentability and the capital market rentability, for 33 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, during a period of six months, through the Capital Asset Pricing Model (CAPM), in order to establish how they are assessed on the capital market. The research demonstrated that during the period 01.01.2016-30.06.2016, excepting the shares of MECANICA CEAHLĂU (MECF) company, the titles of the rest of the studied companies are overvalued, being recommended to sell them, in order to decrease their market price and increase their efficiency.*

Keywords: rentability, risk, volatility, portfolio, security market line.

JEL Classification: G12, G15.

1. Literature review

Among the most popular models used for portfolio selection on the capital market, (the Markowitz model and the market model) there is also the Capital Asset Pricing Model (CAPM), which develops the Markowitz model, regarding the assessment of the financial titles (Akinwale and Abiola, 2007: 193) and highlights the correlation between a share's rentability and the rentability of the capital market.

Capital Asset Pricing Model (CAPM) was developed in the papers of William Sharpe (1964), John Lintner (1965) and Jan Mossin (1966), based on the research of Henry Markovitz. The first fundamental hypothesis of the CAPM model is that the investors are interested about the expected rentability closely related to it's risk (Perold, 2004: 16). When the capital market it's in equilibrium, the model shows a linear relationship between the portfolio's expected rentability and the amount of risk that the investors are willing to assume, relationship highlighted by the Security Market Line (SML) (Merton, 1973: 882).

The basic concept of the C.A.P.M model is that, under equilibrium conditions of the capital market, the rentability of a financial title is determined by a macroeconomic factor, ie the general rentability of the capital market (R_M), determined through the variation of the general index of the Bucharest Stock Exchange (systematic risk or market risk) and by the β coefficient (Stanciu, 2002: 143). Also, under equilibrium conditions of the capital market, the model highlights the linear correlation between the portfolio's expected rentability and the risk assumed by the investors (Balteș et al., 2014: 80).

The CAPM model introduces the concept of risk-free asset (Prisacariu, 2009: 69) and allows determining the risk and also establishing the correlation between the risk and the rentability of the titles (Stroe, 2000: 8). The importance of the CAPM model consists in determining the linear relationship between the rentability that the investors expect and the level of the systematic risk (Roman, 2003: 18). The relationship is represented by the Security Market Line (Badea, 2006: 4):

Figure 1. *Security Market Line*
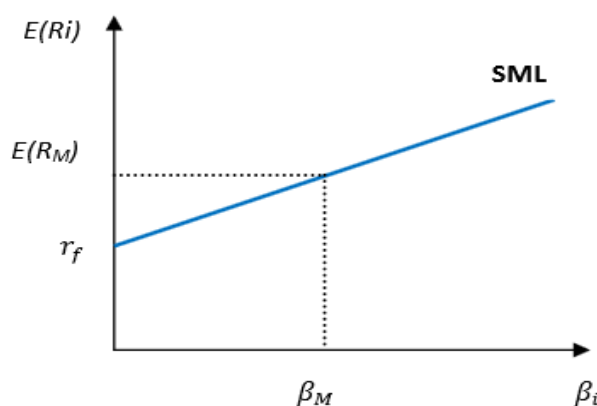
Source: Adapted by Finch, Fraser, Schef, 2011: 79.

The Security Market Line (SML), can be represented also in the form of the following equation (Fama and French, 2004: 28):

$$E_i = R_f + (E_M - R_f) x \beta_i \tag{1}$$

where,
E_i – the portfolio's expected rentability.
R_f – the rentability of the un-risky financial instruments.
β_i – the beta coefficient, the slope of the regression right.
E_M – the expected rentability of the capital market.
$E_M - R_f$ = the market risk premium

The rentability of the un-risky financial titles (Rf) is represented by the interest rate for the governmental bonds and the value of the risk premium of the capital market (EM-Rf) depends on the level of investors risk aversion. Since in the research are used weekly values, it was determined the weekly interest rate according to the following model (Anghelache et al., 2013: 21):

$$(1 + \text{annual rate}) = (1 + \text{weekly rate})^{52} \qquad (2)$$

The beta coefficient (ß) determines the title's rentability based on the variation of the general rentability from the capital market (the market rentability dispersion) (https://www.academia.edu). Beta is an elasticity coefficient of the variation of the title's individual rentability after the variation with one unit of the general rentability of the market (Balteș et al., 2014: 81).

Depending on beta's (β) coefficient values, the titles can be considered: volatiles ($\beta>1$), meaning that a variation of $\pm1\%$ of the general index of the capital market determines a variation higher than $\pm1\%$ of the title's rentability; less volatile ($\beta < 1$), meaning that a variation of $\pm1\%$ of the general index of the capital market determines a variation lower than $\pm1\%$ of the title's rentability, and titles with $\beta=1$, where the variation of the general rentability determines the same variation of the title's rentability (Anghelache et al., 1992 : 110.).

2. Research methodology

The research was based on the information provided by the portal (www.bvb.ro), for 33 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the first and second category, during the period 01.01.2016 – 30.06.2016.

The steps of the research are presented below:
1. Determining the weekly rentability of the capital market (Rp), based on the variation of the BET Plus index and of the market risk (σ_p), resulting a number of 26 values of the two indicators;
2. Determining the cross-correlation between the net profit and the market capitalization of the companies;
3. The cross-correlation with lags and leads, used in order to establish the determinant variable (the net profit) and the lag of time in which the determined variable (the market capitalization) is influenced. The cross-correlation with lags and leads, between the net profit and the market capitalization at the listed companies (NCSS Statistical Software NCSS.com 473, NCSS, LLC, Chapter473, Cross-Correlations-http://ncss.wpengine.netdna-cdn.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Cross-Correlations.pdf) can be determined through the formula below:

$$r_k = \frac{\sum_{i=1}^{n-k}(Xi-Xm)(Yi+k-Ym)}{\sqrt{\sum_{i=1}^{n}(Xi-Xm)2\sum_{i=1}^{n}(Yi-Ym)2}}, \qquad (3)$$

$$x_m = \frac{1}{n}\sum_{i=1}^{n} xi, \qquad (4)$$

$$y_m = \frac{1}{n}\sum_{i=1}^{n} yi \qquad (5)$$

where:
r_k – the correlation coefficient.
x_m – the net profit.
y_m – the market capitalization.

4. Determining the volatility of the shares based on the weekly closing prices, during the period 01.01.2016-30.06.2016, and the calculation of the following indicators:

The rentability dispersion: $\sigma^2_s = \sum(Rs-Rsm)^2/n$.

The standard deviation (total risk): $\sigma_s = \sqrt{\sigma^2_s}$.

The covariance between the rentability of the title and the rentability of the capital market: $\sigma_s*_p = \sum (R_s-R_{sm})(R_p-R_{pm})/n$.

The title's volatility/beta coefficient (β_S): $\beta_{S\ =}\ \sigma_s*_p\ /\ \sigma^{2p}$.

The intensity of the correlation between the title's rentability and the rentability of the capital market (http://www.bvb.ro/FinancialInstruments/Indices/IndicesProfiles.aspx?i=BET), highlighted through the correlation coefficient, determined as ratio between the covariance between the title and the capital market (σ_s*_p) and the standard deviations of the title's rentability and the rentability of BET Plus index ($\sigma_s*\sigma_p$) (Balteș et al., 2014: 84):

$\rho s*p = \sigma_{s*p}/(\sigma_s*\sigma_p)$.

The specific (diversifiable) risk of the title:

(The title's total risk)² = (The systematic risk)² + (The title's specific risk)²

$\sigma^2 (R_i) = \beta_i{}^2\ \sigma^2 (R_p) + \sigma^2 (\varepsilon_i),\ \sigma^2 (\varepsilon_s) = \sigma^2{}_s*(1-\rho^2 s*p),\ \sigma(\varepsilon_s) = \sqrt{\sigma^2 (\varepsilon_s)}$.

3. Data analysis and empirical results

3.1. Determining the rentability and the risk of the capital market

In the Table 1 it was determined the weekly market rentability (Rp), based on the variation of the BET Plus index and on the market risk (σ_p).

Table 1. *The average rentability and the risk of the capital market during the period 01.01.2016-30.06.2016*

Period	BetPlus	Rp (%)	Rp – Rpm (σ_p)	$\sigma^2{}_p$
1/4/2016	6906			
1/11/2016	6608	-4.31508833	-4.10412127	16.8438114
1/18/2016	6019	-8.91343826	-8.70247119	75.7330049
1/25/2016	6256	3.937531151	4.148498213	17.2100374
2/3/2016	6290	0.543478261	0.754445323	0.56918774
2/8/2016	6239	-0.81081081	-0.59984375	0.35981252
2/15/2016	6136	-1.65090559	-1.43993853	2.07342298
2/22/2016	6338	3.292046936	3.503013998	12.2711071
3/1/2016	6508	2.682234143	2.893201205	8.37061321
3/7/2016	6626	1.813153042	2.024120104	4.0970622
3/15/2016	6628	0.030184123	0.241151185	0.05815389
3/21/2016	6790	2.444176222	2.655143284	7.04978586
3/28/2016	6753	-0.544919	-0.33395194	0.1115239
4/4/2016	6732	-0.3109729	-0.10000584	0.01000117
4/11/2016	6712	-0.29708853	-0.08612147	0.00741691
4/18/2016	6623	-1.32598331	-1.11501625	1.24326124
4/25/2016	6566	-0.86063717	-0.64967011	0.42207125
5/3/2016	6406	-2.43679561	-2.22582855	4.95431274
5/10/2016	6475	1.077115204	1.288082266	1.65915592
5/17/2016	6408	-1.03474903	-0.82378197	0.67861674
5/24/2016	6406	-0.03121099	0.179756075	0.03231225
5/31/2016	6360	-0.7180768	-0.50710974	0.25716029
6/3/2016	6546	2.924528302	3.135495364	9.83133118
6/10/2016	6410	-2.07760464	-1.86663758	3.48433586
6/17/2016	6488	1.216848674	1.427815736	2.03865777
6/24/2016	6266	-3.4217016	-3.21073454	10.3088163
6/30/2016	6473	3.30354293	3.514509992	12.3517805
		Rpm = -0.2109		$\sigma^2{}_p$ = 7.3856

Source: Authors own processing based on the data provided by the portal www.bvb.ro.

After processing the dates, it resulted that during the period 01.01.2016-30.06.2016, the average rentability of the capital market (Rpm) recorded a value of -0.2109%; the dispersion of the market rentability (σ^2_p) determined according to the relationship $\sum(Rp-Rpm)^2/26$, recorded the value of 7.3856, and the standard deviation of the market (σ_P), determined as $\sqrt{\sigma_p^2}$ was 2.7176. As consequence, during the period 01.01.2016-30.06.2016, the rentability of the capital market recorded, weekly, values between -0.2109% ± 2.7176%.

3.2. The cross-correlation between the net profit and the market capitalization of the studied companies

The evolution of the net profit and of the market capitalization at the 33 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the first and second category, during the period 2007-2015, is presented in the Table 2.

Table 2. *The evolution of the net profit and market capitalization, during the period 2007-2015*

Year	Net profit (mil. RON)	Market capitalization (mil. RON)
2007	7.2	85.962.4
2008	-9.0	45.701.5
2009	-10.5	80.074.5
2010	-10.4	102.442.6
2011	-10.4	70.782.2
2012	-8.9	97.720.9
2013	-6.4	133.829.7
2014	-25.9	129.958.1
2015	9.2	146.002.5

Source: Authors own processing based on the data provided by the portal www.bvb.ro.

Data was processed in the econometric and statistical software EViews, the results being presented in the Table 3.

Table 3. *The correlation between the market capitalization and the net profit of the companies from the manufacturing industry, during the period 2007-2015*

Sample: 2007 2015
Included observations: 9
Correlations are asymptotically consistent approximations

CAP_BURS_A_SOC_LISTATE__,PF_NET_LEI(-i)	CAP_BURS_A_SOC_LISTATE__,PF_NET_LEI(+i)	i	lag	lead
		0	0.0992	0.0992
		1	-0.5742	0.0551
		2	-0.1119	0.3081
		3	-0.0660	0.2762
		4	-0.2812	-0.1524
		5	-0.1211	0.1427
		6	0.1073	0.2485
		7	0.1329	-0.2319

Source: Authors own processing based on the data provided by the portal www.bvb.ro.

The results show that the net profit influences in a negative way the market capitalization with a lag of one year, so the effect of a variation of the net profit, affects the market capitalization after one year, the value of the correlation being -0.5742. Therefore, it is rejected the theory that the profit positively influences the shares price, which means that the speculations have an important role in determining this behavior on the capital market. The continuous decrease of the monetary policy rate since the beginning of the crisis and until now, could represent the main reason of this behavior, i.e. of the fact that the companies net profit does not influence directly the investors decision.

3.2. The risk and the volatility of the titles of the companies from the manufacturing industry, listed on the Bucharest Stock Exchange

In order to determine the volatility of the companies shares, the weekly closing prices of the shares were used.

The Figure 2 highlights the volatility (β) of the shares of the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, during the period 01.01.2016 – 30.06.2016.

Figure 2. The titles volatility (β) during the period 01.01.2016 – 30.06.2016
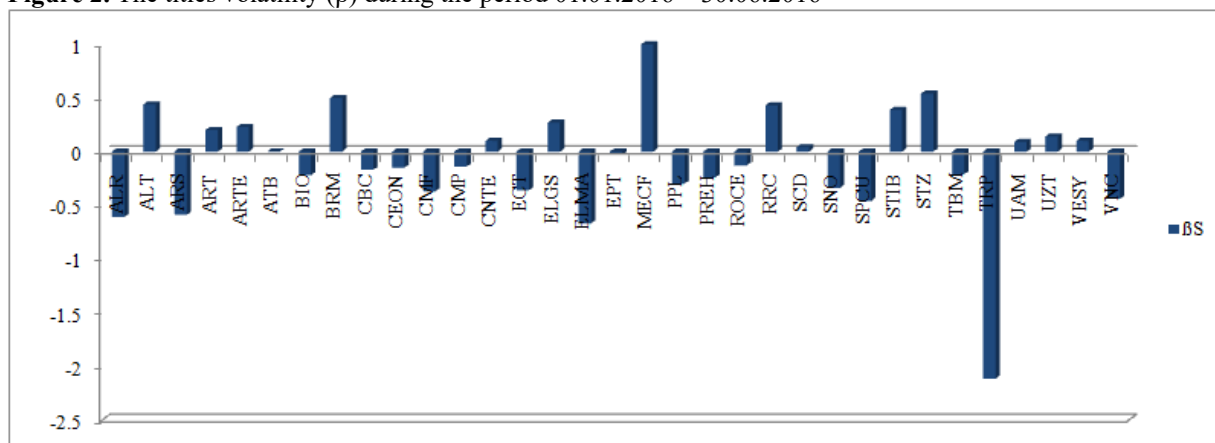
Source: Authors own processing based on the data provided by the portal www.bvb.ro

Excepting the shares of MECANICA CEAHLĂU (MECF) company, that record a volatility equal to 1, the shares of the rest of the studied companies, record volatilities lower than 1, being less volatile with the capital market, during the period 01.01.2016-30.06.2016. A variation of ±1% of the general index of the capital market, determines a variation lower than ±1% of the rentability of the companies titles.

The intensity of the correlation between the titles rentability and the rentability of the capital market, highlighted throught the correlation coefficient (ρs*p), during the period 01.01.2016-30.06.2016 is presented in the Figure 3.

Figure 3. The intensity of the correlation between the rentability of the companies titles and the rentability of the capital market, during the period 01.01.2016 – 30.06.2016
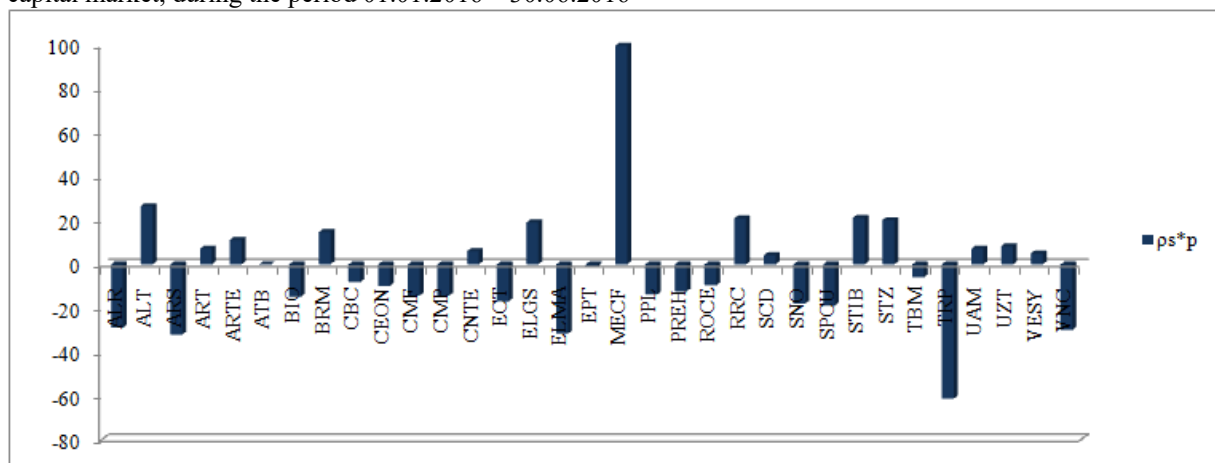
Source: Authors own processing based on the data provided by the portal www.bvb.ro

The rentability of MECANICA CEAHLĂU (MECF) company is perfect correlated with the market rentability, having a correlation coefficient of 100%. The titles who's market value is positively influenced by the evolution of the capital market are those of the companies: ALTUR SA (ALT), STIROM SA (STIB), ROMPETROL RAFINARE SA (RRC), SINTEZA SA (STZ) and ELECTROARGES SA (ELGS). The titles that are recording negative

correlations with the capital market, having a medium intensity, are those of the companies: TERAPLAST SA (TRP), AEROSTAR SA (ARS), ELECTROMAGNETICA SA (ELMA), VNC (VRANCART SA) and ALR (ALRO SA).

The specific risk ($\sigma\varepsilon_s$) determined for the titles of the 33 companies is presented in the Figure 4.

Figure 4. *The titles specific risk ($\sigma\varepsilon_s$), during the period 01.01.2016 – 30.06.2016*

Source: Authors own processing based on the data provided by the portal www.bvb.ro

ELECTROPUTERE SA (EPT) has the highest specific risk, followed by TURBOMECANICA SA (TBM), BERMAS SA (BRM) and TMK - ARTROM SA (ART). Between the companies with a low specific risk, there are especially, companies from the pharmaceutical industry, as ANTIBIOTICE SA (ATB), BIOFARM SA (BIO), ZENTIVA SA (SCD) but also a company from the automotive industry - COMPA SA (CMP). MECANICA CEAHLĂU (MECF) is the only company that does not have specific risk during the studied period.

The evolution of the rentability of the companies shares (Ei), compared with the average rentability of the capital market (EM = 1.75%), that corresponds to the issue of Romanian governmental bonds, during the period 01.01.2016 – 01.06.2016, is presented in the Figure 5.

Figure 5. *The evolution of the rentability of the companies shares (Ei), compared with the average rentability of the capital market (EM), during the period 01.01. 2016 – 30.06.2016*
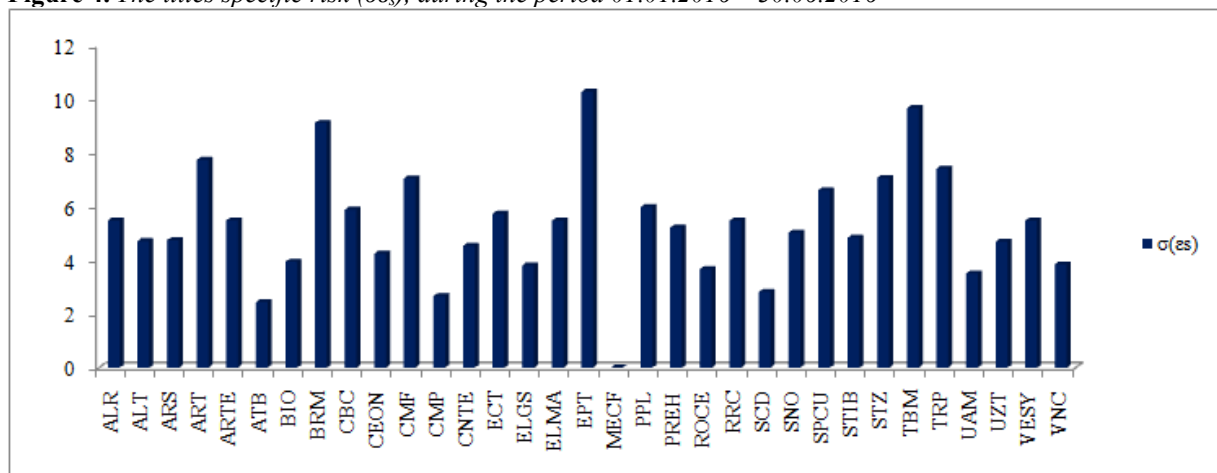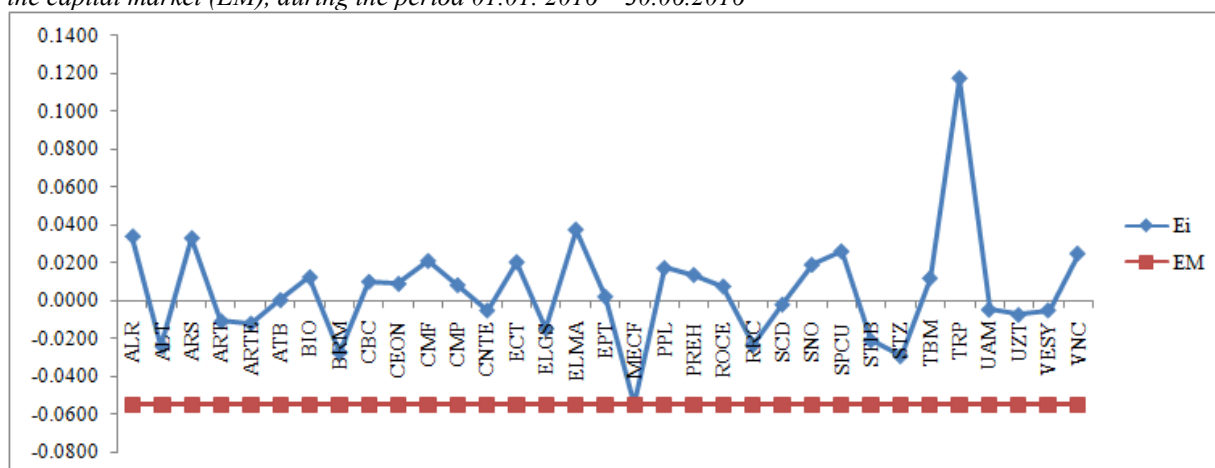

Source: Authors own processing based on the data provided by the portal www.bvb.ro

Excepting the shares of Mecanica Ceahlău (MECF) company, who's portfolio rentability (Ei) is equal to the average rentability of the capital market (EM), the shares of the rest of the companies from the manufacturing industry are overvalued, recording a rentability (Ei) superior to the average rentability of the capital market (EM). In this situation, it is

recommended to sell the shares. Therefore, the market price of the shares will decrease and the rentability of the shares will get closer to the average rentability of the capital market.

Conclusions

Assessing the shares of 33 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the first and second category, during the period 01.01.2016 – 30.06.2016, leads us to the conclusion that those titles (excepting MECANICA CEAHLĂU) are overvalued, being less volatile with the capital market. In these situations, it is recommended to sell them, in order to decrease the market price and increase their rentability.

Forecasting the growth of the value of the general index of the Bucharest Stock Exchange, determines the investors to purchase titles with a higher volatility, achieving in this way a rentability superior to the one of the capital market. In the case when it is predicted a decrease of the value of the general index of the capital market, the investors prefer to purchase titles with a low volatility, as their rentability will decrease less than the rentability of the capital market.

Even if the CAPM model has some weaknesses, especially regarding the beta's coefficient variability in time and the impossibility to determine with certainty it's value, it still remains the most used model in portfolio selection and management, and in assessing the companies shares.

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Social assistance efficiency
in Romanian labor market context

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Abstract. *The purpose of this study is to perform a comparative analysis of specific allocations of social work in Romania, compared to the local macroeconomic context. The study is estimating the influence of social benefits on the labor market. Based on the National Institute of Statistics and the National Agency for Payments and Social Inspection data, the authors used data envelopment analysis in order to determine the effectiveness of social assistance benefits management related to poverty. The research findings offer a performance measurement tool of social assistance, which can be used as a mechanism for risk analysis in social work, which reveals a heterogeneous management at county level with influence on the labor market. Furthermore, the study also provides a tool for evaluating the effectiveness of management and control processes regarding the redistribution of budgetary allocations for social assistance.*

Introduction

Choosing the time individuals are willing to allocate to labor related activities results from the confrontation of consumption or wage and non-wage incomes with leisure, comprising two opposite effects, respectively the effect of income and substitution effects.

Numerous studies have tried to determine the influence of variation in wages, taxes and social benefits, affecting the balance of the labor market. [1]

The influence of poverty social programs on the labor market is an important and current factor. [2]

The social programs represent the redistribution of revenues toward persons considered to be in need according to the public policies. [3]

Therefore, government financed welfare programs are often looked at as a type of safety net of the state itself by groups of persons having certain features, which are detected according to a selection process. [4]

The state should grant the ultimate successive safety net to individuals in whose cases the previous safety nets would have failed.

The beneficiaries are persons selected by different decision-makers (labellers) who are aware of the actual status.

It is important to define a relationship between a set of indicators that characterize social exclusion of groups, of individuals and other indicators (such as the demographic or the economic, sociologic) to quantify the effectiveness of public income redistribution in social assistance and also the influence on labor market force. [5]

Social assistance programs for poverty plays an important role and can influence the job offers in the labor market. For example, minimum wage and family support allowance for disadvantaged population.

Family support allowance [6] is a state support to all families who have low incomes and growing children aged up to 18. This assistance is provided to both two-parent families, and those single parents. Also, the adopted children, those who are in foster care or maternally assisted benefit from the family support allowance.

The guaranteed minimum income [7] is addressed to the poorest social segments and is meant to help them escape the poverty in which they live, without discouraging their attitude towards work.

Among the conditions for entitlement to the minimum income guarantee are: single person/family income must be set lower than the guaranteed minimum income; one person/family should not hold goods other than those considered strictly necessary; one person/family must reside within the jurisdiction of sector or location where the application for social assistance is submitted; people who are able to work and have no wage gains or other income generating activity must prove that: are registered at the territorial agency for employment and did not reject a job offer or participation at a training program.

Ensuring appropriate assistance for income represents an effective instrument to facilitate the transition to the labor market, to promote social inclusion and encourage global demand but influences the rising of voluntarily unemployment and discourages the work.

Providing benefits for social assistance and verification of eligibility conditions is carried out in the administrative units by social workers based on applications received.

These data are checked prior to be paid by social inspection agencies that also have a role in monitoring and control.

Income redistribution is achieved through budgetary allocations paid by County Agencies for Payments and Social Inspection that also have the responsibility to verify these allocations through social inspection function and through other specific assessments performed by the internal control function.

There can be such a heterogeneous approach to the various territorial divisions on whether or not to include certain persons in the social care system by decision makers hereinafter referred to as labellers. The authors have proposed to validate this statement.

The labelling process allowing a certain degree of protection is only known by some members of the society and, based on the increase of the labelling level, there is a possibility for informational asymmetry to appear.

In other words, the more limited the capacity of the labeler to know the actual status of the potential beneficiary, the larger the error margin of the labelling process. [8]

Error may be defined with two components: first degree error, supposing that the person is in need but it cannot be identified even if it complied with the eligibility criteria (sub-exclusion error) and second degree error which presupposes fraud (over-inclusion error).

Labeller's influence in the decision to grant social assistance is a factor to be taken into account to determine more accurately the process of providing social care services.

We shall then define the labeller as being the person performing the assessment based on an attribute/eligibility criterion. Based on such assessment, they perform the categorization in the respective class/category of social aid – such labeller may be the beneficiary of the aid, or the doctor, or the social worker.

Labeller's influence in the decision to grant social assistance is a factor to be taken into account to determine more accurately the process of providing social care services.

Depending on local macroeconomic context the labellers from a county incorporate in the social care system a certain number of people.

Data used and graphical analysis

The study took into consideration the number of social assisted persons who receive family support allowance (FSA), the guaranteed minimum income (GMI) and the value of these benefits for October 2016. Data were taken from the website of the National Agency for Payments and Social Inspection. [9]

Regarding the local economic context, the study considers the following indicators: [10]

Monthly average earning which is the ratio between the amounts paid to employees by operators during the reference month, regardless of period and the average number of employees.

The average number of employees represents a simple arithmetic mean calculated based on daily timesheets in each month.

The active population characterize potential labor supply and employment of the population including civilian employment and registered unemployed.

Gross domestic product (**GDP**) is the sum of end users of goods and services of resident institutional units (actual final consumption, gross fixed capital formation), plus exports minus imports of goods and services.

The unemployment rate is an indicator by which the intensity of unemployment is measured, calculated as a ratio between the number of unemployed and the reference population (usually active population).

Data on macroeconomic context were extracted from the National Statistics Institute portal and are presented in Annex 1 of this study.

Based on data collected, the authors calculated the derived indicators rate per capita and the share of total assisted (as the sum of the number of assisted FSA + GMI), monthly average wage, monthly gross domestic product (GDP) per capita, unemployment rate and the share of the working/active population. The indicators are presented in graphical analysis in the research.

From the first analysis presented below we can notice that in the western region counties of Romania but also in the counties: Ilfov, Constanta and Bucharest, the ratio GDP/capita and average earnings are higher, being a characteristic of capital redistribution to wages.

Figure 1. *The GDP per capita/Average earnings in Romanian counties*
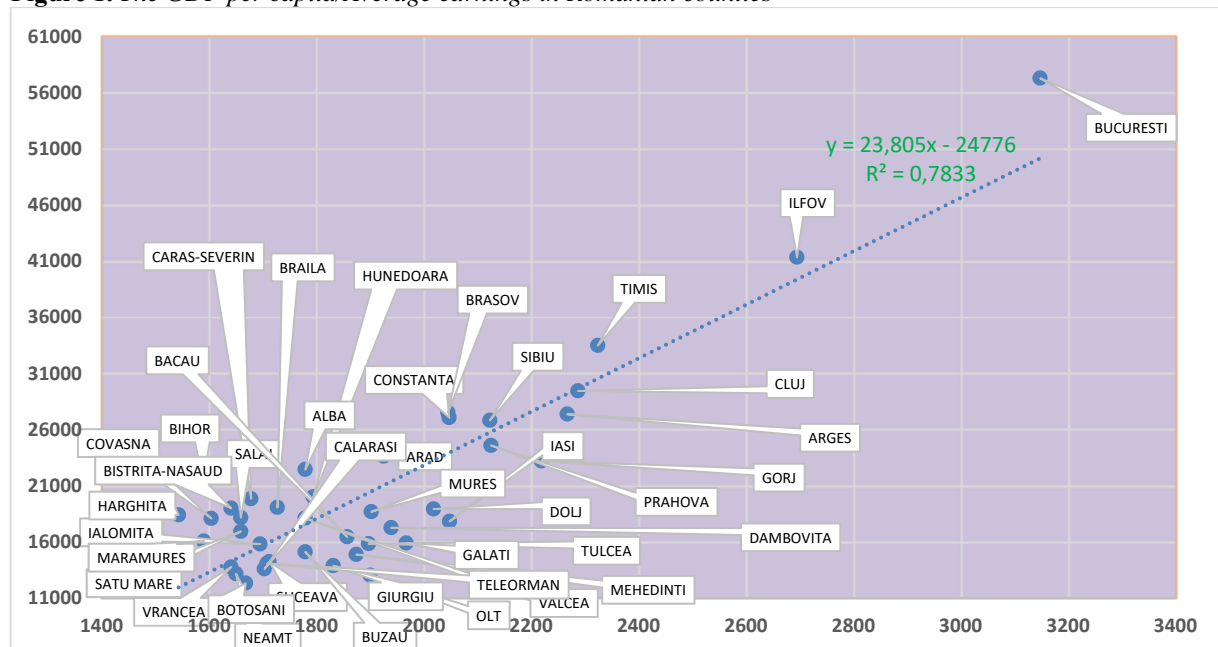
Source: authors' own research results..

By pegging the share number of FSA and GMI beneficiaries to the total population comparing to the unemployment rate it can be observed a heterogeneous linear dependence, and, also, that some counties (located above the regression line on the chart) have a small number of socially assisted persons in comparison with the unemployment rate in the county.

For example, in the following counties: Mehedinti, Ialomita, Dolj, Covasna, Gorj and Alba, the weight of the number of assisted persons is lower in relation to unemployment.

Figure 2. *Weight of the total assisted individuals/Unemployment rate in Romanian counties*
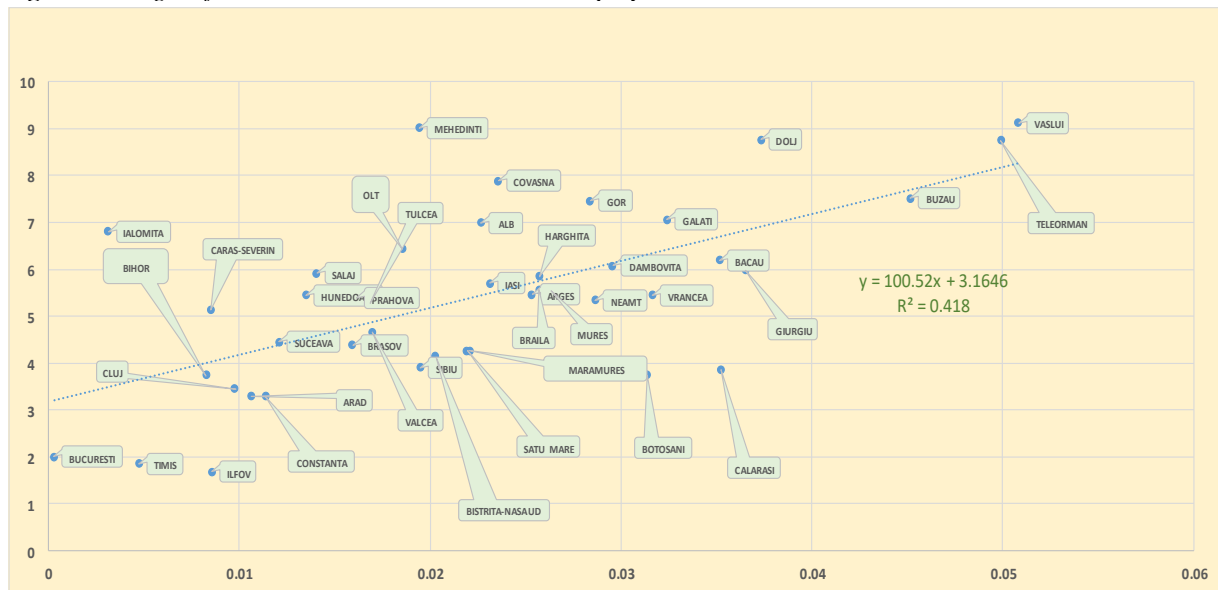
Source: authors' own research results.

Analyzing the percentage of assisted individuals (FSA + GMI) compared to the average monthly earnings we discover a heterogeneous distribution.

Thus, on an average salary of 2,500 lei, there are major differences between Arges and Timis counties.

Figure 3. *Weight of the total assisted individuals/Monthly average income in Romanian counties*
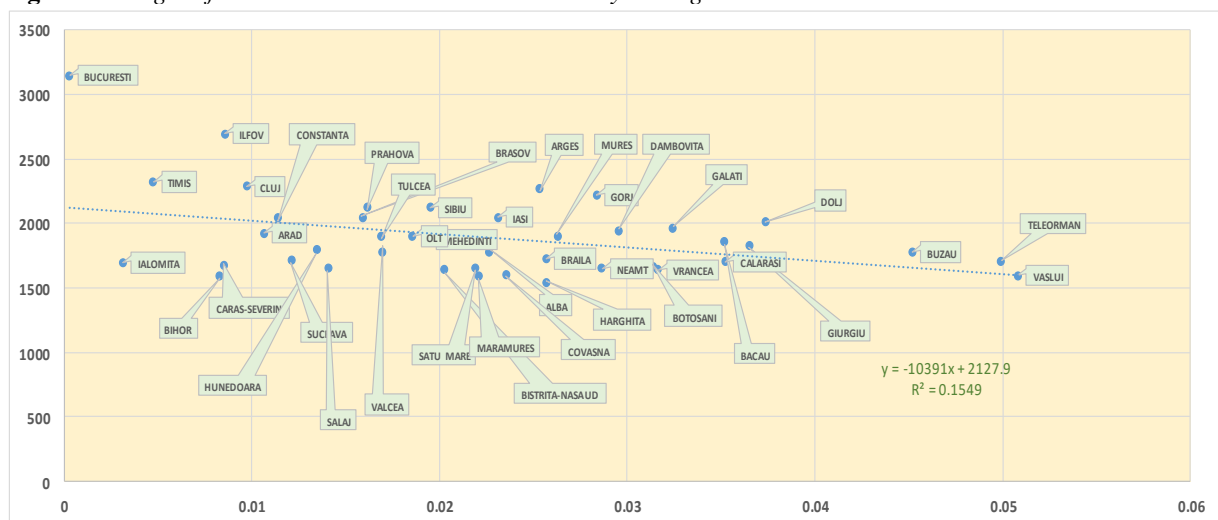
Source: authors' own research results.

The average monthly wage increase leads to a decrease in unemployment, generally confirming the income effect on the labor market, although here there is also a very high heterogeneity.

Hence, comparing Timis and Arges counties, we notice that at a close average income the unemployment rates are much different between the two counties.

Figure 4. *Indicator (1- unemployment rate)/Monthly average income in Romanian counties*
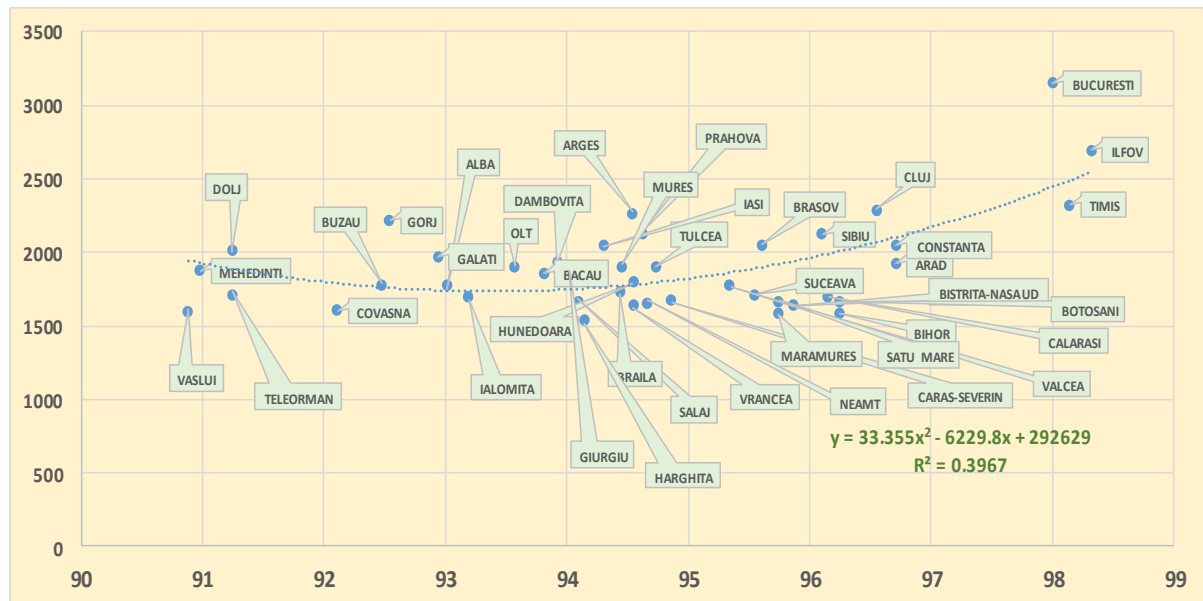
Source: authors' own research results.

Analyzing the percentage of assisted persons (FSA + GMI) based on GDP per capita we notice the huge heterogeneity of the data.

For example, between Buzau and Ialomita counties there are significant differences concerning the share number of assisted persons compared to the GDP per capita.

Figure 5. *Weight of the total assisted individuals/GDP per capita in Romanian counties*
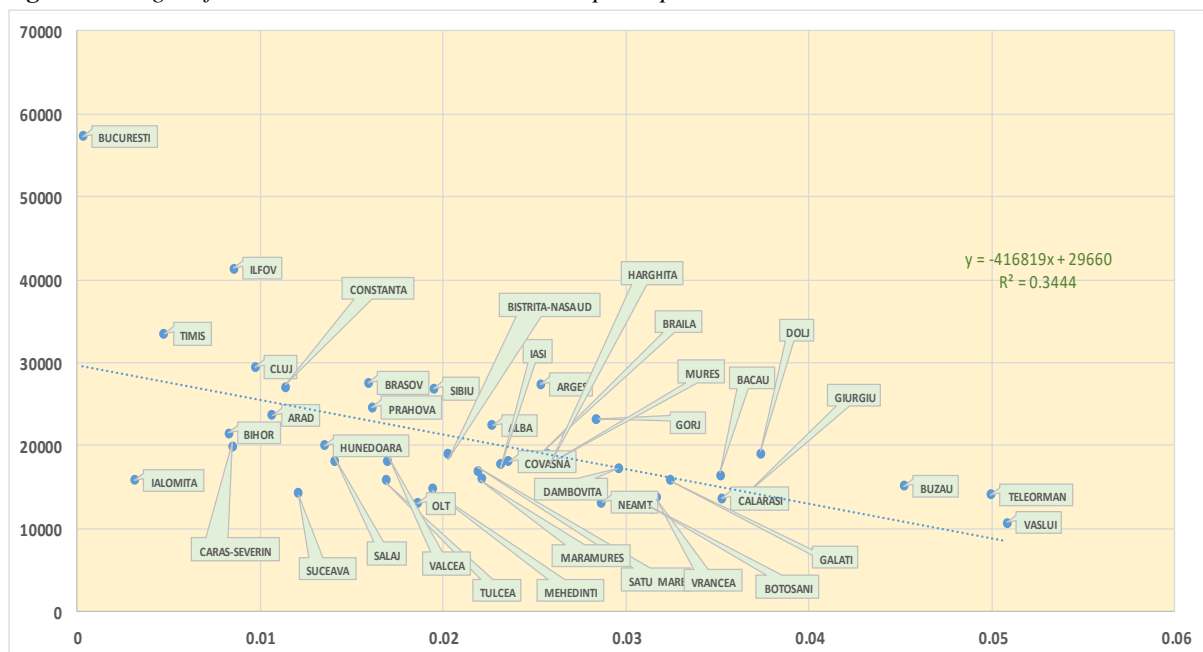
Source: authors' own research results.

The same heterogeneity stands if we analyze the share number of assisted persons compared to the employed population.

There are significant differences between Ialomita and Buzau counties.

Figure 6. *Weight of the total assisted individuals/Active population in Romanian counties*
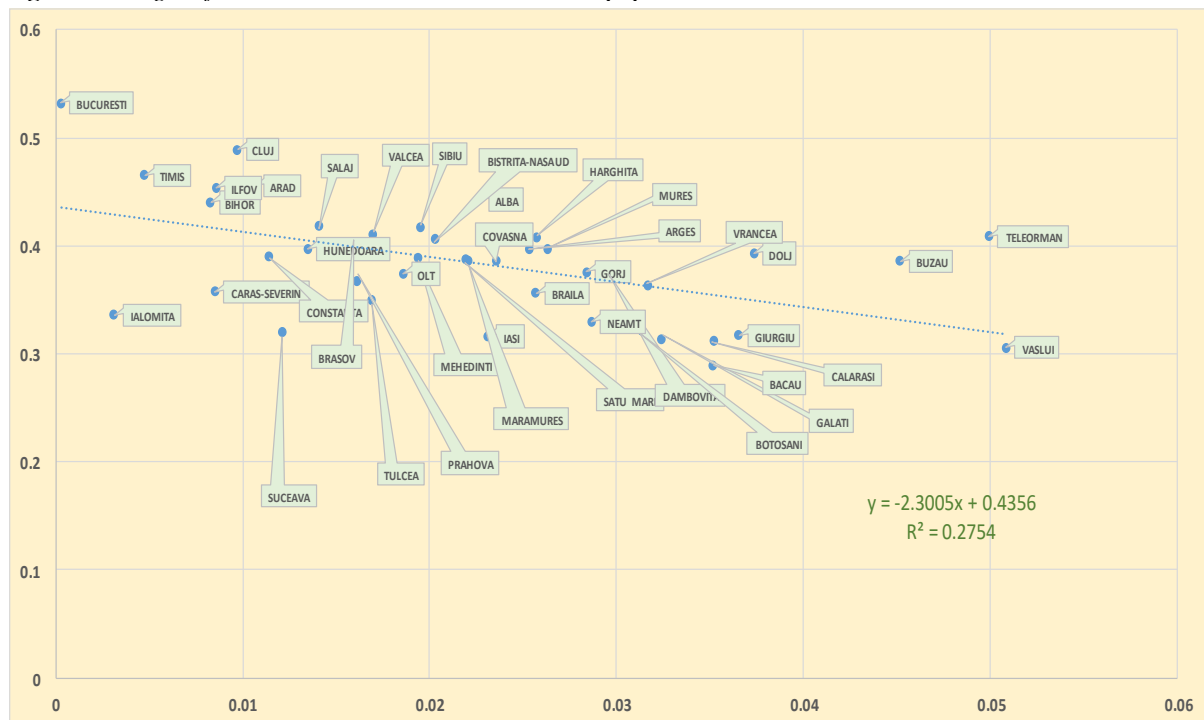
Source: authors' own research results.

Due to reduced regression parameters, it is difficult to analyze the performance based on a set of indicators. Thus, we applied a nonparametric analysis tool, for example Data Envelopment Analysis.

The premise of this research is that the result of the assisted share number (FSA + GMI) must be given by the unemployment context, wages, capital and active population in a county defined as DMU (Decision Making Unit).

Description of the methodologies applied

Data envelopment analysis (DEA) is a nonparametric method in operations research and economics for the estimation of production frontiers. [11]

It is used to empirically measure productive efficiency of decision making units, county in our case (or DMUs).

Although DEA has a strong link to production theory in economics, the tool is also used for benchmarking in operations management, where a set of measures is selected to benchmark the performance of manufacturing and service operations. [12]

Some of the advantages of DEA are: [13]
a. no need to explicitly specify a mathematical form;
b. proven to be useful in uncovering relationships that remain hidden for other methodologies;
c. capable of handling multiple inputs and outputs;
d. capable of being used with any input-output measurement;
e. the sources of inefficiency can be analysed and quantified for every unit evaluated.

Some of the disadvantages of DEA are:
a. results are sensitive to the selection of inputs and outputs;
b. you cannot test for the best specification;

c. the number of efficient firms on the frontier tends to increase with the number of input and output variables.

In the study we used DEA multistage CRS output oriented method.

We use this technique because we try to build a frontier by enveloping all the observed input-output vectors.

Output-orientated model looks at the amount by which outputs can be proportionally expanded, with inputs fixed. [14]

DEA can be conducted under the assumption of constant returns to scale (CRS) or variable returns to scale (VRS). In this study we use CRS.

Efficiency is measured by the distance of its input-output vectors to the frontier.

It fits a piece-wise linear frontier using a linear programming technique.

As input variables, we have chosen the monthly average earnings, gross domestic product (GDP) per capita, 1-unemployment ratio and the share of the active population and as the output variable the assisted share (FSA + GMI).

In the chart below are presented the results of the efficiency indicator in relation to the socially assisted population.

Thus, at a certain percentage of the assisted population (X axis) we can have different efficiencies (Y axis), being the higher the indicator is closer to the unit value.

Low efficiencies are encountered in Ilfov, Timis counties and Bucharest and high efficiencies in Ialomita, Mehedinti, Covasna, Harghita and Bacau counties.

Figure 7. *Evolution of DEA technical efficiency indicator in relation to the weight of the assisted population in Romanian counties*
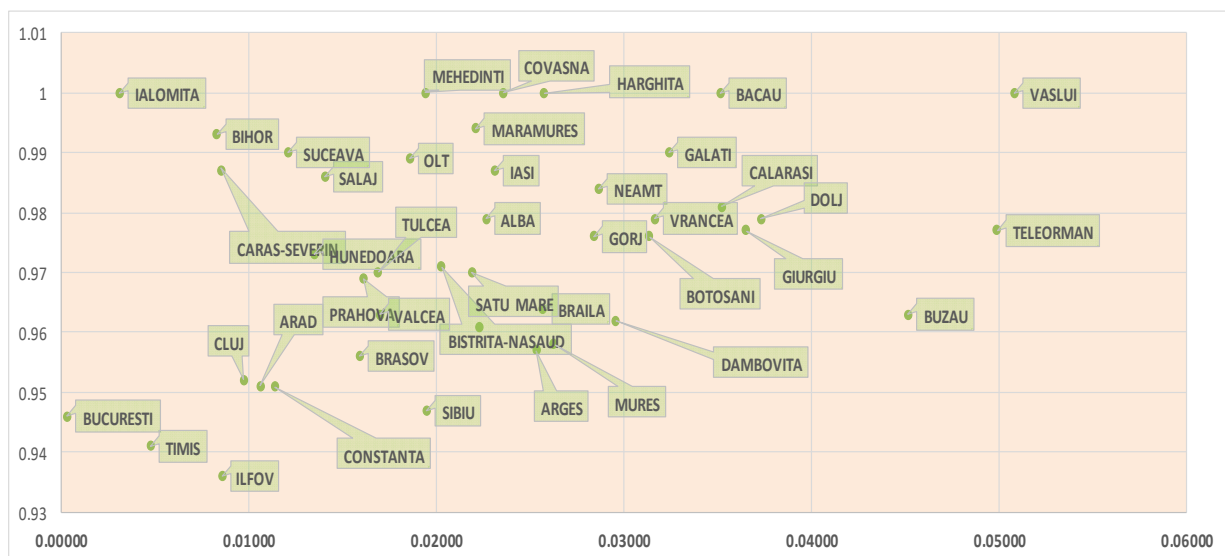
Source: authors' own research results.

Also in the Table 1 below it is calculated the technical efficiency for each county that is presented on a scale from green to red, from the most efficient to the inefficient counties.

Separately, there are calculated the ratios between the output indicator and input indicators.

Table 1. *DEA technical efficiency indicator calculation in relation to the percentage of assisted population in Romanian counties in comparison with other indicators*

Country	percentage of assisted persons	technical efficiency TE	output variable 1-percentage of assisted persons	input variable Monthly average earning	input variable GDP / capita	The unemployment rate	input variable 1-The unemployment rate	input variable Percentage of active population	te	Weight of percentage of assisted person/ unemployment rate	Weight of percentage of assisted person/ monthly average earning	Weight of percentage of assisted person/GDP/ capita	Weight of percentage of assisted person/percentage of active population
ALBA	0.02267	0.979	0.97733	1779.00000	22452.10000	6.99000	93.01000	0.44255	0.979	0.003243	0.000013	0.0000010097	0.0512277580
ARAD	0.01064	0.951	0.98936	1925.00000	23630.80000	3.29000	96.71000	0.45554	0.951	0.003235	0.000006	0.0000004505	0.0233672997
ARGES	0.02533	0.957	0.97467	2267.00000	27377.60000	5.46000	94.54000	0.39685	0.957	0.004639	0.000011	0.0000009251	0.0638206628
BACAU	0.03515	1	0.96485	1857.00000	16455.20000	6.19000	93.81000	0.28865	1	0.005679	0.000019	0.0000021363	0.1217819026
BIHOR	0.00829	0.993	0.99171	1589.00000	21501.00000	3.76000	96.24000	0.43999	0.993	0.002206	0.000005	0.0000003858	0.0188509545
BISTRITA-NASAUD	0.02028	0.971	0.97972	1641.00000	19003.80000	4.14000	95.86000	0.40645	0.971	0.004899	0.000012	0.0000010672	0.0498953662
BOTOSANI	0.03137	0.976	0.96863	1668.00000	12332.10000	3.75000	96.25000	0.32151	0.976	0.008367	0.000019	0.0000025441	0.0975852660
BRAILA	0.02569	0.964	0.97431	1727.00000	19073.80000	5.56000	94.44000	0.35598	0.964	0.004621	0.000015	0.0000013469	0.0721687697
BRASOV	0.01593	0.956	0.98407	2045.00000	27522.50000	4.39000	95.61000	0.40155	0.956	0.003628	0.000009	0.0000005787	0.0396644295
BUCURESTI	0.00029	0.946	0.99971	3148.00000	57285.00000	2.00000	98.00000	0.53201	0.946	0.000147	0.000000	0.0000000051	0.0005524320
BUZAU	0.04517	0.963	0.95483	1779.00000	15117.60000	7.52000	92.48000	0.38575	0.963	0.006006	0.000025	0.0000029878	0.1170925826
CALARASI	0.03523	0.981	0.96477	1703.00000	13601.10000	3.85000	96.15000	0.31201	0.981	0.009151	0.000021	0.0000025904	0.1129191919
CARAS-SEVERIN	0.00850	0.987	0.99150	1678.00000	19847.60000	5.14000	94.86000	0.35757	0.987	0.001654	0.000005	0.0000004284	0.0237766411
CLUJ	0.00973	0.952	0.99027	2287.00000	29445.40000	3.45000	96.55000	0.48923	0.952	0.002821	0.000004	0.0000003305	0.0198924122
CONSTANTA	0.01139	0.951	0.98861	2047.00000	27068.40000	3.29000	96.71000	0.38986	0.951	0.003463	0.000006	0.0000004209	0.0292269244
COVASNA	0.02356	1	0.97644	1604.00000	18096.60000	7.89000	92.11000	0.38604	1	0.002986	0.000015	0.0000013019	0.0610305776
DAMBOVITA	0.02956	0.962	0.97044	1939.00000	17261.10000	6.08000	93.92000	0.37640	0.962	0.004862	0.000015	0.0000017127	0.0785419809
DOLJ	0.03735	0.979	0.96265	2018.00000	18934.30000	8.76000	91.24000	0.39279	0.979	0.004263	0.000019	0.0000019724	0.0950763636
GALATI	0.03242	0.99	0.96758	1967.00000	15893.50000	7.06000	92.94000	0.31409	0.99	0.004592	0.000016	0.0000021775	0.1032207661
GIURGIU	0.03654	0.977	0.96346	1831.00000	13888.80000	5.98000	94.02000	0.31686	0.977	0.00611	0.000020	0.0000026307	0.1153135690
GORJ	0.02839	0.976	0.97161	2219.00000	23203.00000	7.46000	92.54000	0.37569	0.976	0.003806	0.000013	0.0000012235	0.0755668605
HARGHITA	0.02572	1	0.97428	1543.00000	18405.40000	5.85000	94.15000	0.40758	1	0.004396	0.000017	0.0000013972	0.0630955882
HUNEDOARA	0.01348	0.973	0.98652	1794.00000	20014.90000	5.45000	94.55000	0.39672	0.973	0.002474	0.000008	0.0000006736	0.0339860515
IALOMITA	0.00312	1	0.99688	1695.00000	15813.50000	6.81000	93.19000	0.33576	1	0.000458	0.000002	0.0000001973	0.0092900609
IASI	0.02312	0.987	0.97688	2048.00000	17839.50000	5.70000	94.30000	0.31598	0.987	0.004055	0.000011	0.0000012957	0.0731542700
ILFOV	0.00856	0.936	0.99144	2695.00000	41348.70000	1.68000	98.32000	0.45374	0.936	0.005097	0.000003	0.0000002071	0.0188719684
MARAMURES	0.02208	0.994	0.97792	1590.00000	16075.50000	4.26000	95.74000	0.38572	0.994	0.005182	0.000014	0.0000013733	0.0572337278
MEHEDINTI	0.01941	1	0.98059	1874.00000	14884.10000	9.02000	90.98000	0.38894	1	0.002152	0.000010	0.0000013042	0.0499103139
MURES	0.02628	0.958	0.97372	1902.00000	18687.50000	5.55000	94.45000	0.39752	0.958	0.004735	0.000014	0.0000014063	0.0661122837
NEAMT	0.02866	0.984	0.97134	1650.00000	13161.50000	5.34000	94.66000	0.32960	0.984	0.005367	0.000017	0.0000021775	0.0869521808
OLT	0.01857	0.989	0.98143	1900.00000	13040.80000	6.43000	93.57000	0.37392	0.989	0.002888	0.000010	0.0000014241	0.0496672608
PRAHOVA	0.01613	0.969	0.98387	2125.00000	24595.50000	5.38000	94.62000	0.36710	0.969	0.002999	0.000008	0.0000006560	0.0439528620
SALAJ	0.01405	0.986	0.98595	1659.00000	18165.70000	5.91000	94.09000	0.41812	0.986	0.002378	0.000008	0.0000007737	0.0336135266
SATU MARE	0.02192	0.97	0.97808	1659.00000	16939.60000	4.26000	95.74000	0.38731	0.97	0.005144	0.000013	0.0000012937	0.0565829478
SIBIU	0.01950	0.947	0.98050	2123.00000	26831.30000	3.90000	96.10000	0.41749	0.947	0.004999	0.000009	0.0000007267	0.0467027864
SUCEAVA	0.01210	0.99	0.98790	1712.00000	14244.10000	4.45000	95.55000	0.31964	0.99	0.002719	0.000007	0.0000008495	0.0378544384
TELEORMAN	0.04992	0.977	0.95008	1708.00000	14084.30000	8.75000	91.25000	0.40880	0.977	0.005705	0.000029	0.0000035443	0.1221105528
TIMIS	0.00475	0.941	0.99525	2324.00000	33498.70000	1.86000	98.14000	0.46508	0.941	0.002553	0.000002	0.0000001417	0.0102083936
TULCEA	0.01691	0.97	0.98309	1897.00000	15849.60000	5.27000	94.73000	0.35046	0.97	0.003209	0.000009	0.0000010668	0.0482476636
VALCEA	0.01698	0.963	0.98302	1779.00000	18115.60000	4.67000	95.33000	0.41074	0.963	0.003635	0.000010	0.0000009371	0.0413285024
VASLUI	0.05083	1	0.94917	1597.00000	10699.20000	9.12000	90.88000	0.30574	1	0.005573	0.000032	0.0000047504	0.1662372188
VRANCEA	0.03165	0.979	0.96835	1641.00000	13766.10000	5.45000	94.55000	0.36378	0.979	0.005807	0.000019	0.0000022988	0.0869922699
Average	0.02231	0.961	0.97769	1896.02381	20358.39048	5.40762	94.59238	0.38422	0.961	0.004127	0.000012	0.0000010961	0.0580787708

Source: authors' own research results.

The above table quantifies the efficiency of social assisted persons' management in each county.

A general conclusion is that the aggregate inefficiency stands at the confluence of several factors but also other possible factors such as local management's efficiency of social inspection.

Management effectiveness can be achieved on two levels on which is performed the assessment of beneficiaries' eligibility, namely at the territorial administrative units level by social workers, and at local agencies for payments and social inspections level by social inspection function.

As such, inefficient allocations for poverty programs can be significantly influenced by the existing control processes at the territorial administrative unit's level, and especially by the

efficiency and effectiveness of social inspections, as control and evaluation mechanisms in the poverty aid programs.

If we consider that the payment of poverty aid is made by the state to ensure minimum living conditions for all citizens (the state being in this case the principal), for the efficient allocations, the state must check the persons involved in determining the eligibility criteria, (social workers, mayors) for an efficient and effective implementation of the programs.

The design of the appropriate internal control system must take into account a number of factors, for instance the choice between ex ante and ex post (or internal and external) controls, the type of variables to be monitored (input versus result indicators), and the choice between systematic or random inspections.

Conclusion

This study examined the effectiveness of social assistance benefits related to poverty (FSA and GMI) using the Data Envelopment technique depending on different input indicators related to specific labor market and regional context.

The research reveals that management efficiency is given by both the macroeconomic environment, quality of management and social inspection.

The analysis provides a concrete possibility of determining the efficiency of the management of social assistance benefits and the effectiveness of the social inspection.

The study also may lead to effective management by establishing some transparent targets for each county or by limiting funding from the state budget to a number of assisted persons greater than a minimum value of efficiency and limit the additional funding from local budgets.

Moreover, should be implemented different rates of benefits, or establishing a certain maximum period of time a person can be assisted and incorporating certain criteria to be fulfilled by the beneficiaries.

The limitations of the study are given by the limitations of the tool used, DEA, and also by the fact that in the analysis were considered only the data of a single time period.

Therefore, the authors have proposed for the next research paper to conduct an analysis using Malmquist indicator to determine the efficiency of the panel data.

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Annex 1. Dataset used

County	Population	FSA Bene-ficiaries	GMI Bene-ficiaries	No. FSA + GMI	Monthly average wage	GDP / capita	Total no. of unemployed persons	Unempl oyment rate	Active civilian population
Alba	380976	3704	4933	8637	1779	22452.1	12.184	6.99	168600
Arad	473946	2228	2817	5045	1925	23630.8	6.954	3.29	215900
Arges	646333	8307	8063	16370	2267	27377.6	14.125	5.46	256500
Bacau	746566	14717	11527	26244	1857	16455.2	14.01	6.19	215500
Bihor	619102	5079	56	5135	1589	21501	10.517	3.76	272400
Bistrita-Nasaud	329188	4117	2559	6676	1641	19003.8	5.529	4.14	133800
Botosani	455973	9241	5065	14306	1668	12332.1	5.809	3.75	146600
Braila	356196	4529	4622	9151	1727	19073.8	7.489	5.56	126800
Brasov	630807	4555	5492	10047	2045	27522.5	10.785	4.39	253300
Bucuresti	2106144	364	255	619	3148	57285	21.616	2	1120500
Buzau	478811	9899	11728	21627	1779	15117.6	14.357	7.52	184700
Calarasi	317293	6226	4953	11179	1703	13601.1	5.732	3.85	99000
Caras-Severin	328047	2544	245	2789	1678	19847.6	6.442	5.14	117300
Cluj	721955	3609	3417	7026	2287	29445.4	11.794	3.45	353200
Constanta	769768	4318	4453	8771	2047	27068.4	10.176	3.29	300100
Covasna	228732	2956	2433	5389	1604	18096.6	7.073	7.89	88300
Dambovita	528426	7228	8394	15622	1939	17261.1	12.869	6.08	198900
Dolj	700117	11307	14839	26146	2018	18934.3	25.475	8.76	275000
Galati	631669	9234	11245	20479	1967	15893.5	14.466	7.06	198400
Giurgiu	276781	5959	4154	10113	1831	13888.8	5.564	5.98	87700
Gorj	366261	5724	4674	10398	2219	23203	10.993	7.46	137600
Harghita	333674	5093	3488	8581	1543	18405.4	8.365	5.85	136000
Hunedoara	469853	3056	3279	6335	1794	20014.9	10.626	5.45	186400
Ialomita	293658	518	398	916	1695	15813.5	7.215	6.81	98600
Iasi	919049	12812	8432	21244	2048	17839.5	17.272	5.7	290400
Ilfov	390751	1734	1612	3346	2695	41348.7	2.717	1.68	177300
Maramures	525765	6335	5272	11607	1590	16075.5	8.841	4.26	202800
Mehedinti	286678	4886	679	5565	1874	14884.1	10.535	9.02	111500
Mures	595948	8503	7159	15662	1902	18687.5	13.752	5.55	236900
Neamt	577359	9849	6698	16547	1650	13161.5	10.884	5.34	190300
Olt	450094	7564	795	8359	1900	13040.8	11.189	6.43	168300
Prahova	809052	7539	5515	13054	2125	24595.5	16.868	5.38	297000
Salaj	247537	3172	307	3479	1659	18165.7	6.278	5.91	103500
Satu Mare	390639	4098	4463	8561	1659	16939.6	6.579	4.26	151300
Sibiu	464202	4983	4068	9051	2123	26831.3	7.265	3.9	193800
Suceava	743645	1397	7601	8998	1712	14244.1	11.085	4.45	237700
Teleorman	389433	8659	10781	19440	1708	14084.3	14.811	8.75	159200
Timis	742886	1726	1801	3527	2324	33498.7	6.092	1.86	345500
Tulcea	244249	1832	2298	4130	1897	15849.6	4.595	5.27	85600
Valcea	403171	6409	435	6844	1779	18115.6	8.42	4.67	165600
Vaslui	479815	13396	10991	24387	1597	10699.2	14.311	9.12	146700
Vrancea	391169	5836	6543	12379	1641	13766.1	8.269	5.45	142300

Source: authors' own research results.

How much is the listed enterprise worth?
The price multipliers′ approach

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Abstract. *The analysis of the most commonly used stock indices help us in determining the market value of the company, so investors looking for valuable listed enterprises analyse the market indices in order to make investment decisions. This study builds upon previous research on the value of largest Romanian companies from the oil and energy sector listed at the Bucharest Stock Exchange, focusing on the market value of the largest integrated oil and gas group in South-Eastern Europe. In this article, the market capitalisation is considered as proxy for the enterprise value and is analysed further, too.*

Keywords: stocks, indices, multiplier, enterprise value, market value.

JEL Classification: G32.

Introduction

This study is a minor extension to a previous article (Ion, 2016) on the value of large Romanian companies from the oil and energy sector that are listed at the Bucharest Stock Exchange (BSE) using the comparable method, in the market-based valuation.

Literature citations

Knowing *what an asset is worth* and what determines that value (v) is a pre-requisite for intelligent *decision making*, in choosing investments for a portfolio, in deciding on the appropriate price to pay or receive in a takeover and in making investment, financing and dividend choices when running a business. The premise of valuation is that we can make reasonable estimates of value for most assets, and that the same fundamental principles determine the values of all types of assets, real as well as financial. The details of valuation vary from asset to asset, and the uncertainty associated with value estimates is different for different assets, but the core principles remain the same (Damodaran, n.d.).

In practice, it is sufficient to form a judgment as to whether a share is significantly *under or overvalued* (Keynes, 1936).

The value of an asset (v) is estimated quite subjectively by (1) variables considered to influence the fundamental value of the asset or (2) by comparing it to the observable *market value* (MV) of "similar" assets, i.e. the comparison of the intrinsic value of the stock (IV) with its market price and (2) of its price with that of comparable stocks. The most direct use of equity valuation is to guide the purchase, holding, or sale of stocks (Kaplan Schweser, 2012).

The market value of a company (or the company's *market capitalization*) equals its stock price (p) time's shares outstanding (n):

MV = Cap = p * n.

In a speculative bubble, the market value of stocks are driven more by emotion and fads. That is why Benjamin Graham and David Dodd provided a systematic and disciplined approach to equity analysis: financial statement analysis and equity valuation (Schweser, 2012).

Valuation is the process of determining *the present value* of assets, for example: investments in marketable securities such as stocks, options, business enterprises, or intangible assets such as patents and trademarks or on liabilities (e.g., bonds issued by a company) for investment analysis, capital budgeting, merger and acquisition transactions, financial reporting, taxable events to determine the proper tax liability, and in litigation (Simkovic, 2016).

As opposed to the present value, *price* (p) is determined by supply and demand in the market place, which may depend on *subjective factors* other than rational estimates of future cash flow (Damodaran, 2014).

Investors considering an investment decision (whether to buy, sell or hold stock) in a publicly traded firm try to determine *the fair price of the stock* based on the information that is made available by the firm (Chauhan, 2014).

Price (1998) specified that his first analysis of an intangible asset was way overstated, increased *book value (BV)*, and showed higher earnings than were warranted, in order to keep the stock price higher than it otherwise would have been warranted in 1975. Price also indicated that stock price must relate to its financials and that *book value (BV)*, *cash flow*, *interest* and *ratios* fundamentally value common stock. With this respect, Graham showed the difference between: "Book value including intangibles" and "tangible/net book value" (Graham, 1937).

The evolving of the financial world, the increasing number of formulas, ratios, financial acronyms, definitions and interpretations[1] offer theoretical and practical instruments;

nonetheless, they can generate confusion on what kind of parameters should be taken as a reference and can further complicate comparison among companies/groups, as in the adjustments analysis to "normalize" reporting items (such as EBIT, EBITDA or Net Profit) or for the key parameter for the financial markets (EPS) and on how the adjustments have been made (EFFAS, 2016).

Methodology

Enterprise Value Estimation

Enterprise value (EV) is total company value, calculated as:

EV = market value of common stock + market value of preferred equity+ market value of debt + minority interest – cash and investments.

The rationale for subtracting cash and investments is that an acquirer's net price paid for an acquisition target would be lowered by the amount of the target's liquid assets (Kaplan Schweser, 2012).

In this research, the enterprise value is approximated with the market value (MV) for the subject company which is the #1 energy supplier - accounting for approx. 40% of oil, gas and fuel supply, and up to 10% of power generation in Romania (OMV Petrom SA, 2017).

The oil sector suffered deeply from the oil price dropdown, and the share price of OMV Petrom SA suffered more abrupt than the BSE (Bucharest Stock Exchange) indices in the period 2014-2017. For this reason, the company management proposed not to distribute dividends in 2016, which may have also affected the investors' perception. In 2017, the company is again operating on profit. In 2017 the price is recovered, when probably considering the large investment announced in December 2016 (OMV Petrom SA, 2016). The analysis of the price evolution of the shares is shown in Figure 1.

Figure 1. *The daily price variation of the OMV Petrom SA shares (SNP)*
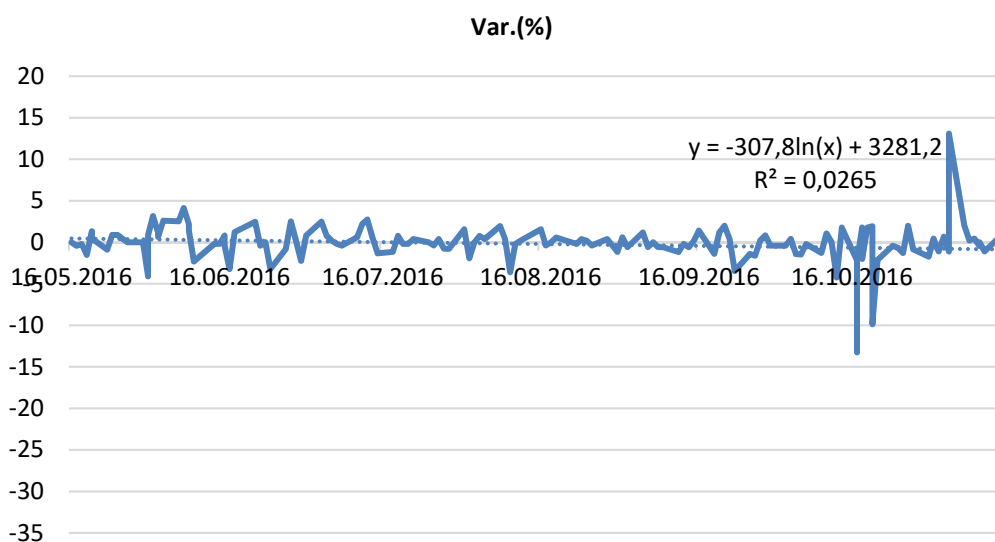

Source: author's calculations.

Based on the analysis of the price evolution, this research aims to build the mathematical model for the maximization of the market value of the company by using the Lagrange multipliers: for the case of only one constraint and only two choice variables the problem is to maximize f(x, y) subject to g(x, y) = c.

Stocks' Price Multipliers

Price multiples are among the most widely used tools for valuation of equities. Comparing stocks' price multiples can show whether a particular stock is overvalued, undervalued, or properly valued in terms of measures such as earnings, sales, cash flow, or book value per share (Kaplan Schweser, 2012).

For the traded companies operating in the same field (or similar fields), comparisons are usually made using specific market indicators (PER, PBV, DIVY, etc.) as in Figure 2 that shows the main multiples for the biggest Romanian oil company, way beyond the sector' median.

Figure 2. *Multipliers of companies from the oil sector*
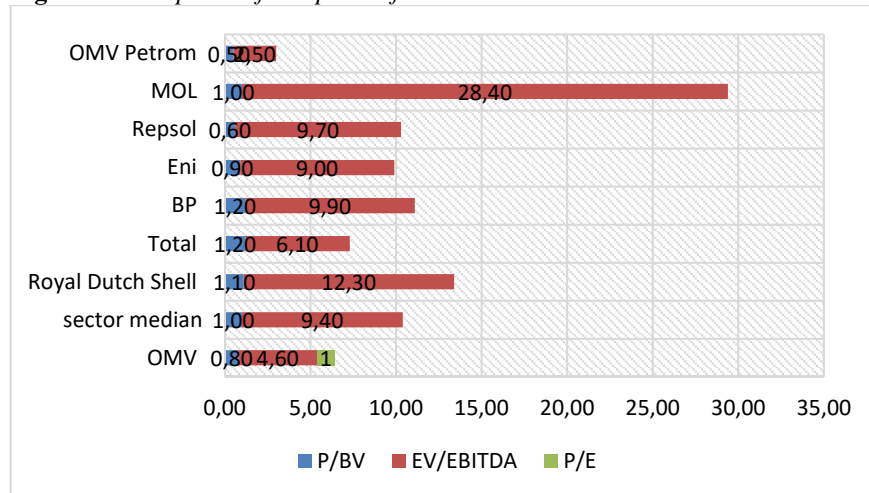
Source: authors' research.

The earnings multiplier refers to the price-to-earnings ratio (the P/E ratio): the company's stock price (P) to earnings (E) – the net income per share of common stock earned by the company. The earnings multiplier model can be used to calculate the fair value of the stock (Schweser, 2012).

PER (or P/E) is based on the market capitalization of companies on profit and expresses the number of years the investment in one share could be recovered from the issuing company; in the case that the company announces losses (as OMV Petrom SA did in 2016), P/E is not relevant for the respective company (in Figure 2), so its inverted should be considered.

P/E or PBV reflect the company's profitability and signals over/undervalued enterprise; at the same time, it represents an alternative to the traditional assessment methods (assets, financial performance) based on the financial statements (which show historical data), which should reflect the image of the company but does not register the brand's reputation, or goodwill (Ion, 2016).
▪ Small PER may indicate the stock is undervalued (Pasol, 2004), especially when compared with similar companies from the same sector of activity.

However, some firms have no interest to report a big profit, in order to optimize costs: there are Romanian companies relying on bank financing and banks look for companies with a solid financial situation – assets, equity, dues, etc. (Pasol, 2004).

A well-known business person and successful investor (W. Buffet)[2] started to buy shares at P/E < 8, for example, while also considering other aspects of valuation, such as the business, the performance forecast, and intrinsic value.
▪ Investors begin to sell, when the PER of a share/the price is too high for the company profit level, considering the action is overrated – over 20 or buy, when consider that the shares are undervalued - below 0 (Ionescu, 2012).

The P/E ratio can be calculated in two ways (Schweser, 2012):
1. Trailing P/E: current price divided by prior year (latest) earnings.
2. Leading P/E: current price divided by predicted next year earnings, which eliminate certain components such as cessions or cassations, provisions or adjustments.

Price/book value (P/BV) is the ratio of the market value of equity to the book value of equity, i.e., the measure of shareholders' equity in the balance sheet. P/BV represents the amount that the shareholders would receive after paying all debt. In the balance sheet, the book value is identified with the company equity. In sectors with significant fixed assets P/BV is usually smaller (Ion, 2016). In Figure 3, the comparison is extended to 25 different Romanian companies (middle caps[3] and smaller), regardless their operating sector.

Figure 3. *PER, and PBV of important Romanian listed companies*
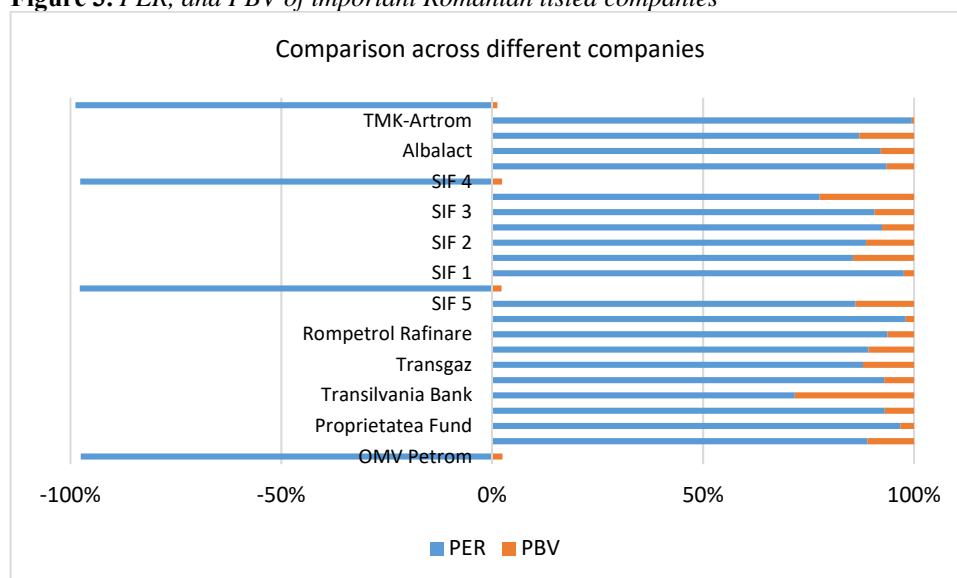
Source: authors' research.

Conclusion

The analysis is an extension of the author's previous research regarding the oil, gas and energy sector, in order to understand the role of stocks price multipliers in valuating traded companies with history and in identifying undervalued stocks for investment.

Based on the analysis of the price evolution, this research aims to build the mathematical model for the maximization of the market value of the company by using the Lagrange multipliers.

Traders should ground their investment decisions on solid data, after understanding the business, forecast its performance and convert the forecasts into a valuation.

For researchers, the market offers many directions for testing the valuation models which can be put into practice by the investors.

It is crucial that the enterprise performance attracts investors in its development and it comes with an interest. Romania, like other European countries, is not yet strongly and directly connected to the international financial markets.

Notes

[1] Which do not always reflect what is commonly recognized by the major accounting entities and by national and international standard setters (EFFAS, 2016).

[2] http://www.berkshirehathaway.com/SpecialLetters/WEB%20past%20present%20future%202014.pdf

[3] (market) capitalization is the value of all outstanding shares. Computed as shares times current market price. Capitalization is a measure of corporate size (Nasdaq, 2017).

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Digital innovation the new paradigm for financial services industry

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Abstract. *Financial services industry is facing a disruptive innovation phase, driven by automation and social media connectivity, changing the fundamentals of small business access to financial products and services. The rapid development of technological innovation applied to financial services, also known as financial technology or FinTech, created new products and delivery channels. The aim of the article is to analyze the financial industry competitive dynamics drift. Competitive factors are changed by the new players redefining the financial services products proposition for clients through data management and digital platforms. The digital tools have a broad impact over the traditional business models, creating a new type of access to financial services market –characterized by speed, efficiency and client oriented strategies and redefining client experience form face to face to on-line automated interactions. The trends suggest that full automation of client relationship, advanced predictive analytics and machine learning software, will create improved client experience and increasing efficiency of risk management process. Fintech key competitive advantage is built on operational excellence, integrating different business models, big data optimization analytics.*

Keywords: financial technology, banking, microfinance, financial inclusion, small business, operational management.

JEL Classification: G29.

1. Introduction

Financial industry is disrupted by a new computing paradigm generated by Internet of Things (IoT) applications. The rapid development of technological innovation applied to financial services, also known as financial technology or FinTech, created new products and delivery channels. As a generic term, financial technology applies to information and communications technology (Shima and Shinb, 2016), implemented by existing financial system and new startup financial organizations. Financial technology is challenging the fundamentals of the highly regulated financial sector (Leong et al., 2016). IoT technology created opportunity for an emerging financial services sector, offering an alternative to the traditional financial institutions. Development of information technologies (cloud computing, mobile communications, online social networks) reshaped the business models in financial industry. The new technology starting in the first stages with online services for small market niche, is extending rapidly to large market segments having the power to disrupt traditional industry, providing a different customer experience.

Process automations through the recent technology is transforming the customer experience definition in banking sector, from face to face to on-line automated interactions. Considering social media impact on customer behavior, organizations will need to redefine strategies. Financial services industry has to find ways to take advantage of the technological tools to create customer-centric business models. Analytics tools strengthen the ability to adapt marketing strategies and credit portfolio management processes to the client's behavior and needs will be a significant business asset. Digital technology has the power to increase customer experience and loyalty and adapt products delivered by internet connected devices as the drivers of the changes in financial services. While FinTech brought a new type of products for clients in mature economies, internet and mobile based financial services in developing countries is a positive factor in extending access to the commercial banking institutions.

Based on a trust decreasing trend of traditional banking system and convergence with advanced technology innovative financial services (P2P lending, digital wallet, online lending platforms) increase financial inclusion for previously excluded client segments at a lower cost and efficiency (Leong et al., 2016).

Internet of Things created new data analytics models, capable to optimize decision process, impacting technology based financial products and services: (i) operational processes creating a new type of customer experience through digital platforms – offering financial services from payments, lending to asset management; (ii) big data algorithms automating financial services decisional processes – increasing efficiency and building new risk management tools; (iii) cryptocurrency – through blockchain technology creating real time global payment systems; (iv) peer to peer lending model (crowdfunding) based on market place lending, creating new channels in existing lending services landscape.

2. Literature review

Relation finance – technology has a long history, financial services evolving supported by technological infrastructure. First, financial globalization era from 1866 to 1987 has been supported by technological infrastructure – telegraph and transatlantic transmission cables, followed by the start of digitized processes 1987-2008 (Arner et al., 2015). Latest evolution of Internet and mobile based financial services have the potential to increase the global financial inclusion levels. Studies on mobile telephony in India during 2001-2012 are proving positive effects on economic growth, reflecting a positive impact of the mobile services coverage on financial inclusion and loan behavior (Saibal, 2015). With 1.3 billion active credit and debit accounts and more than 5 billion active mobile phone accounts existing globally, credit

institutions are in front of a transformation by increasing internet connected smartphones users (Türkmen et al., 2015).

Financial technology has a progressive investment trend growing exponentially from $1.8 billion 2010 to $19 billion in 2015, estimation for 2020 are $45 billion (KPMG, 2016). Internet of Things (IoT) ecosystem continues to create new opportunities in the banking sectors, with 12% annual growth rates, respectively reflecting effects on biometrics market estimated at $30bn by 2021 (Elsevier, 2016). Recent technology impacts financial institutions, regulators, customers and business models across a wide range of industries, challenging the mechanisms of a highly-regulated sector (Zeng et al., 2016). Banks concern to provide their customers digital services is motivated by the potential of increasing their effectiveness and efficiency. The digital services implementation success is direct related with customer's behavior, influenced by performance expectancy, effort expectancy, hedonic motivation, price value and trust (Abdallah et al., 2017). In developed markets, the adoption of financial technology is linked with the Global Financial Crisis of 2008 driven by client's behavior and political demands for the diversification of banking system. In the same time, in developing countries financial technology adoption has been driven by the necessity of financial system access, mobile communication and technology evolution (Arner et al., 2015).

Key influence factors for mobile financial transactions adoption by small business segment is the mobile payment service and technology education level. A restriction in the adoption of had been identifies in "insufficient understanding of the several factors for the proliferation of payment transactions" (Mwafise and Stapleton, 2012). In the same time, on-line social media networks is changing human behavior increasing trust levels, have a significant effect on digital services adoption (Boateng, 2016).

Financial crisis generated a confidence deficit in the official monetary system, creating the context for alternative systems of payment. Based on blockchain technology, cryptocurrency (e.g. Bitcoin) is an example of disruptive payment system (Papadopoulos, 2015). Through Bitcoin payment protocol, users can transact directly without needing a bank, identified as a current bottleneck for the payments system (Huang et al., 2016). Another payment channel different from traditional systems is developing along with the rapid growth of on-line sales. This new generation of online payment providers acts as an online version of the in-store payment terminal (e.g. Braintree, Worldpay), have the potential to be disruptive

Built on internet connected devices and maturing technological applications, sharing economy is another business model, with Peer to Peer (P2P) lending platforms potential to increase financial inclusion. With a high integration with blockchain technology, sharing economy builds a new framework to interact with banking models, with the potential to change global and local economies toward sustainability (Daunorienė et al., 2015). This mechanism of funding works as such: Small business is accessing funds from a large audience (the "crowd"), in which each investor provides a small amount (Belleflammea et al., 2013). Crowdfunding lending models are a valuable alternative source of funding for entrepreneurs, enabling small business owners to access capital. This type of lending model creates the environment, offering the possibility to validate business model and in the same time acts as a marketing channel, building a community who will promote the business.

3. Technology impact on financial institutions business models

3.1. Operational perspective

For traditional banking system, lower margins and increasing regulatory demands creates an operational optimization urgency. From 2010 to 2015, the cost-income ratio calculated for 150 European banking institutions increased from 59% to 65% percent, while the income-asset ratio remained at the same level (Mills and McCarthy, 2016).

Operational efficiency of new emerging FinTech creates the opportunity to target strategic aspects of banks value chain: originations and sales – activities accounting for 60% of banks profit, with a return on equity of 22%, much higher than 6% from the provision of balance sheet[1]. Designing simple access applications, with real time services, FinTech are starting to attract traditional banking clients (Nisar et al., 2014). An example is US located on line platform, with credit approval process based on risk assessment using customer operations from real time access databases (PayPal, Amazon, eBay). This new type of business models are forcing banks to adapt customer interactions operations.

Financial technology driven by automation and connectivity, changing the fundamentals of small business access to financial products and services, generates a disruptive innovation phase. Considering the financial system complex operations and high cost characteristic, from a competitive point of view the operations efficiency are essential in long run. Using on-line based financial services platforms, customer's access to funds to acquire goods can be efficiently correlated with the time when they needed - on low cost and quality. Operational management concept Just in Time (JIT) defined as a "*philosophy of manufacturing excellence based on pursuit of the planned elimination of all waste and consistent improvement of productivity. It encompasses the successful execution of all manufacturing activities required to produce a final product from design engineering to delivery and including all stages from conversion of raw material onward*"[2], applied to banking industry, can change the customer experience standards and operational efficiency. Reengineering processes implementing new technology, can optimize files handling, client-bank interactions eliminating waste of time and reducing cost and other resources increasing quality standards. Fintech have the potential to create competitive advantage by upgrading system flexibility.

Just-in-Time which is now considered to be an effective tool in manufacturing as well as in services sector. As part of JIT implementation, organizations must instill the habit of expecting continuous small improvements in the process. The operators must never be satisfied with the current environment, but always be moving closer to the ideal situation. Service operations are significant for productivity gains that can be achieved through process improvements. JIT refers to long-term optimization of the whole production and distribution network rather than short run. However, recognizing processes that can be improved through the implementation of JIT has been difficult (Harle et al., 2016). Quasim (2014) research showed that by the effective application of JIT operational principles to financial services in loan approval process, banks can make better utilization of their resources and can improve operations efficiency on long term. Considering JIT principles applicability in financial services:

"1. Quality at Source - Many examples found like different techniques used which facilitate self-inspection, visual control and standardization.
2. Cellular Structure - Some examples found regarding engagement of employees into cells and processes. It also involves grouping of products into families due to specialized activities.
3. Reduced Setup Times - No applicability found since setups (i.e. quantity independent time spent) typically don't exist in financial services.
4. Kanban Technique - No application found in the literature however, this is a vital tool and enable to enough create significant improvements in certain types of financial services' operations.
5. Development of Supplier Networks - No application found in the literature.
6. Employees Involvement - Literature supports the application of Employees involvement in JIT implementation" (Harle et al., 2016).

3.2. Credit risk management

Innovative technology integration in the in financial services industry led by start-ups, as new emerging financial services organizations (3), created the necessity of new credit risk approach. Fintech credit risk models must adapt to fast changing market environment and e-commerce development. Fintech credit risk management systems are integrating the big data based analytics, using online client behavior and traditional credit scoring systems.

Difference from traditional off-line credit scoring and risk management are significant from two main points of view: (i) big data based credit scoring – massive data analytics for e-businesses, (ii) real-time credit risk management – processes monitoring in real-time credit customer status (Nisar et al., 2014), enabling JIT operations implementation to properly handle credit portfolio quality.

The risk management knowledge and strategies, are significant resources creating value in competitive dynamics, along with funding capabilities. Risk management for small businesses can be difficult to replicate due to information asymmetry - having low levels of public information about the lending performance. Client relationships in the underwriting processes and loyalty strategies programs, are traditional banking advantages, but these operations are expensive. On long term, financial institutions access to low-cost capital and capabilities to adapt to the real needs of the small business customer will have a greater customer satisfaction and lower defaults (Lin et al., 2015).

Recent studies (Mills and McCarthy, 2016) reveals that portfolio management has a growing complexity trend. The risk operating model for the traditional banks have a structure with an average of 50% for credit administration process and 15% allocated to analytics (20). McKinsey survey estimates for 2015 the structure will change to 25% for credit administration process and 40% allocated to advanced analytics. In the same time, the same study reveals faster computing power will enable risk functions to improve credit risk decisions, better predict portfolios future evolution, fraud detection, based on machine learning algorithms and new emerging risks related to cybersecurity.

3.3. Regulatory frame

Traditional banking system is built on extended regulatory foundation that enforces a strong entry barrier in the banking system for the new entrants. With a fast-growing path, globally and a significant impact over the financial services market, FinTech regulation framework become a responsibility for policy makers. For example, researches on US market, shows that significant actions are needed to insure transparency on small lending market, to catalyze the advantages of the digital lending platforms (Lin et al., 2015). Regulators initiative can have a significant role in supporting FinTech, as tool to accelerate financial inclusion and using competition towards optimization of the old system challenged by post-crisis restructuring decade.

Research on latest evolution of new financial organizations based on technology are showing that FinTech start-ups have the strategic capability to occupy a market niche in financial sector, enables risk management alternative as the credit scores built on non-traditional data analytics and in the same time improves the financial inclusion offering alternatives for excluded market segments (Leong et al., 2016). Considering the last point in the Leong et al. (2016) study, we have identified political initiative promoting financial inclusion a potential significant factor in Fintech development. Formal institutions and international organizations are developing policies to facilitate access to financial services. In 2014 G20 (international forum for the governments and central bank governors from 20 major economies) adopted a financial inclusion plan aiming small business, with the objective of building regulatory frame, developing financial education and optimize market infrastructure. According to the

World Bank 2016 Global Findex the number of people worldwide excluded from financial services access is two billion, with a 20% decrease in the last three years. With a 40% of population access to internet[3], the digital technology can play a pivotal role in increasing financial inclusion.
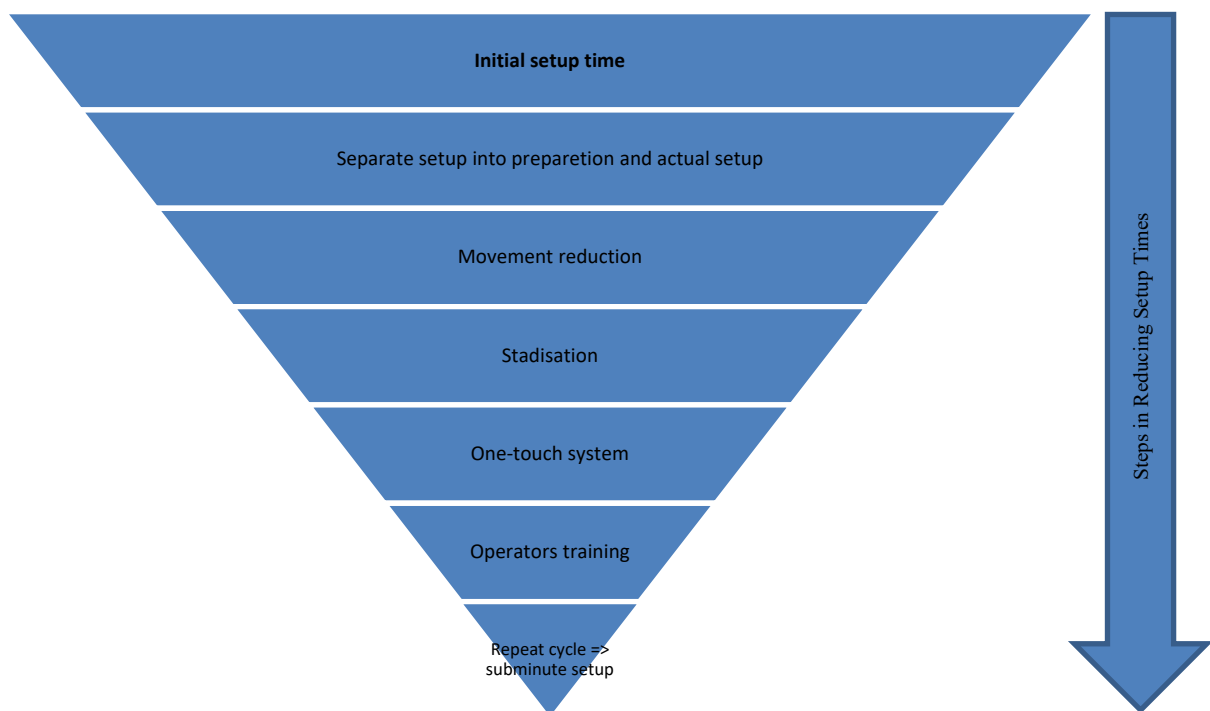
4. Methodology

4.1. Just in Time (JIT)

Specific for production operations JIT techniques, had been implemented also for services, as a strategic decision to create competitive advantage (Figure 1). Specific for JIT is forced problem solving, focusing on high-quality delivery and correlated with the exact time when services are needed. JIT strategy is built on continuous improvement, analyzing every process failure that generates waste (goods/services not delivered as needed), in order to minimize costs. In same time buyer-supplier partnership is a key component of effective JIT strategy, based on close partnership and trust (removal of unnecessary activities, removal of in-plant inventory, removal of in-transit inventory, obtain improved quality and reliability) (Nario, 2016).

Figure 1. *JIT Contribution to competitive advantage*
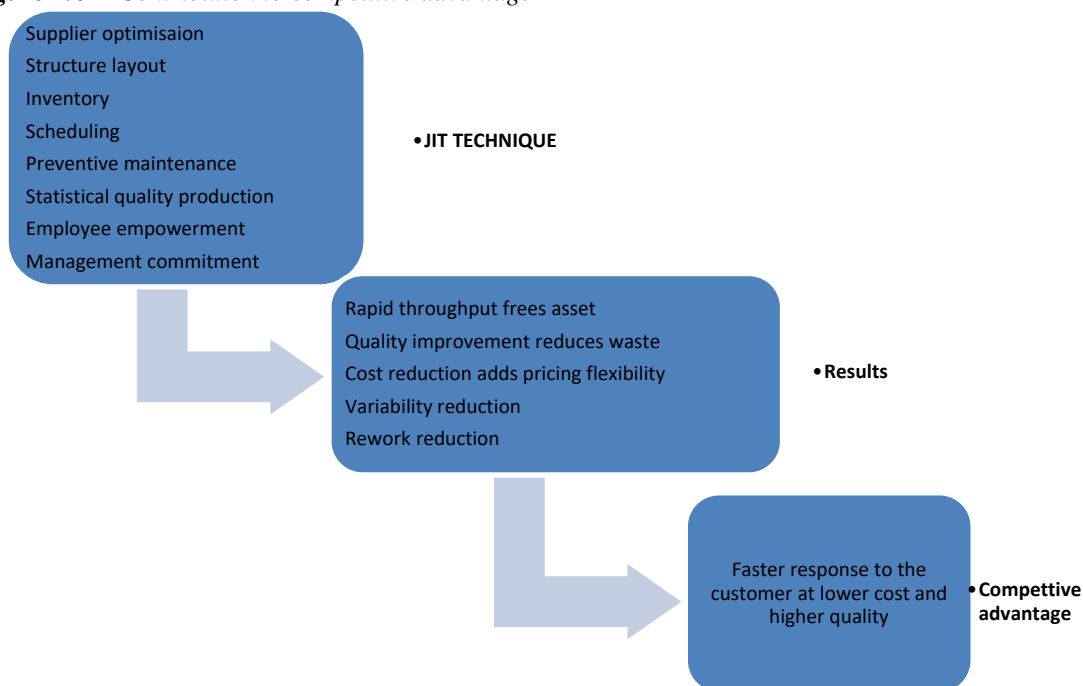
Source: Adapted from Jay Heizer, Barry Render. *Operations Management.* Eleventh Edition. s.l., Pearson, 2014.
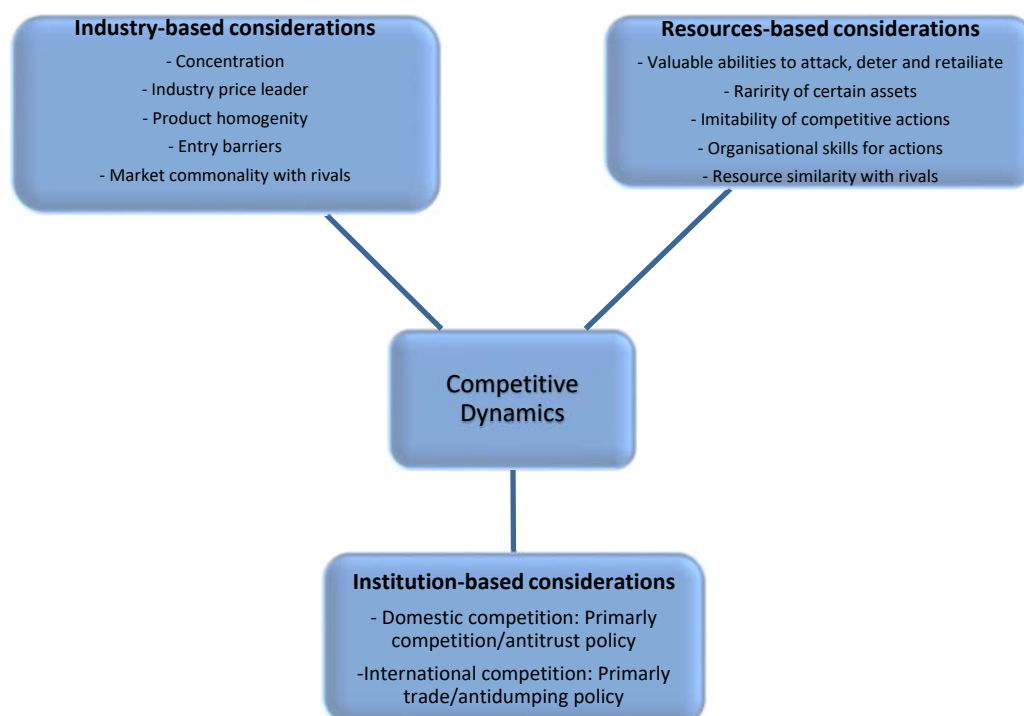
JIT layout is focused on minimizing movement, reducing waste of time (Figure 2). Setup time can be reduced in the operations order process, as a tool for productivity improvement.

Figure 2. *Steps in reducing setup times*

Initial setup time

Separate setup into preparetion and actual setup

Movement reduction

Stadisation

One-touch system

Operators training

Repeat cycle => subminute setup

Steps in Reducing Setup Times

Source: Adapted from Peng, Mike W. *Global Strategic Management - International edition.* Third Edition, 2014.

4.2. Competitive dynamics

To analyze the strategic perspective of FinTech development, we will use a comprehensive model of global competitive dynamics (Figure 3), considering: industry conditions for cooperation and collusion; resources and capabilities influence over the competitive dynamics; regulators and formal institutions response to national and international competition (Peng, 2014).

Figure 3. *A comprehensive model of global competitive dynamics*

Industry-based considerations
- Concentration
- Industry price leader
- Product homogenity
- Entry barriers
- Market commonality with rivals

Resources-based considerations
- Valuable abilities to attack, deter and retailiate
- Rarirty of certain assets
- Imitability of competitive actions
- Organisational skills for actions
- Resource similarity with rivals

Competitive Dynamics

Institution-based considerations
- Domestic competition: Primarily competition/antitrust policy
- International competition: Primarily trade/antidumping policy

Source: Adapted from Peng, Mike W. *Global Strategic Management - International edition.* Third Edition, 2014.

From a strategic point of view an in-depth understanding of industry nature, resources capabilities and the rules of regulations game can shape the decision to compete or cooperate. Competitive dynamics consider the actions and responses taken by the competing organizations, in the form of price cuts, advertising campaigns, market entries and new products.

5. Findings

The objective of this study is analyzing the financial services competitive dynamics changes driven by new financial technology business models, applying the JIT concepts in lending process.

5.1. JIT loan operational process

We have analyzed loan granting operational process, considering operational costs in this process for banks and the importance for microfinance access to lending products at the exact time when funds are needed. The reason for the selection of JIT concept is the operational cost for banks because of resources allocated and setup time – a source of waste leading to unnecessary rework, or wrong decisions regarding loan approval. We have simulated JIT model to examine the effective application of JIT in microenterprises loan granting process, using interviews collected data from credit department of different banks, for small ticket working capital loans, below 100.000 euro, for microenterprises (Figure 4).

Figure 4. *Current microenterprises loan granting process - working capital loans < 100.000 Euro*
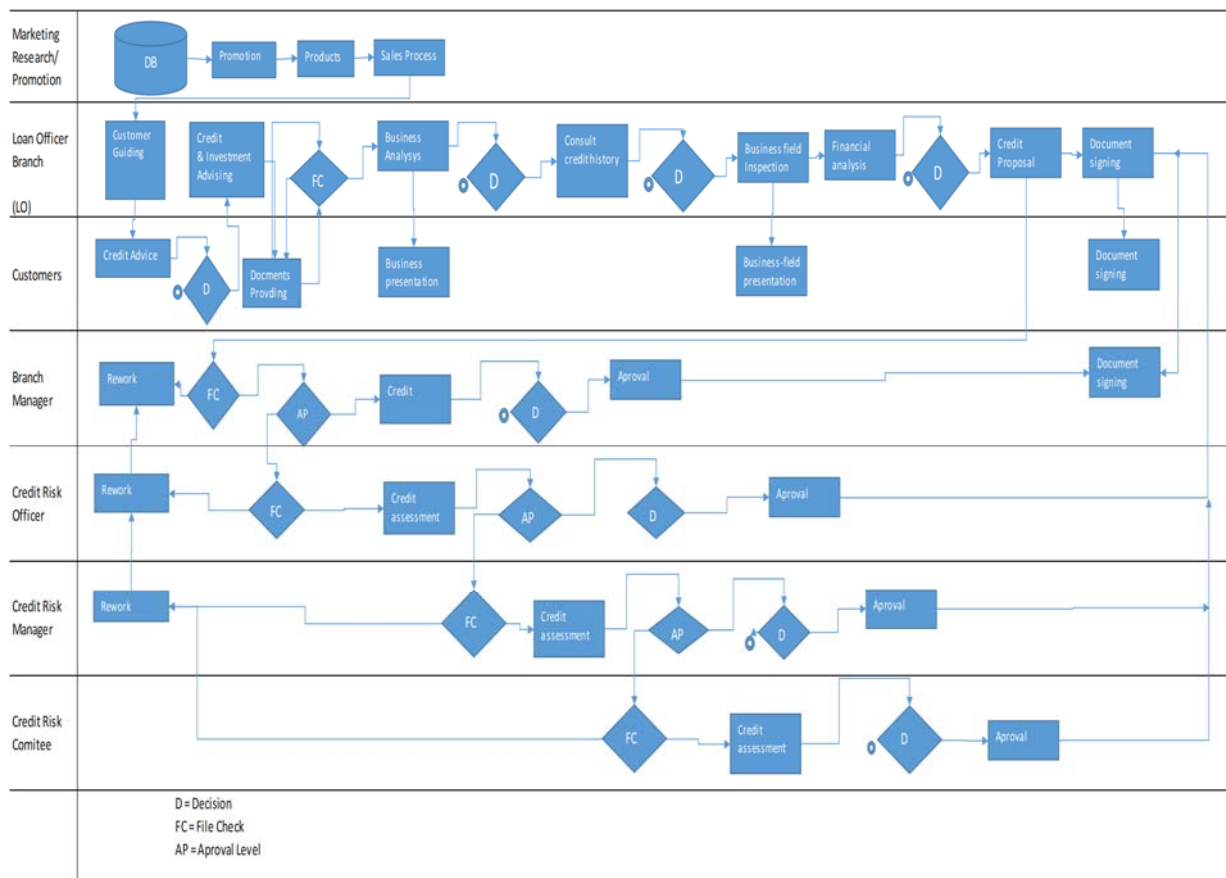
Considering microenterprises loan granting process - working capital loans below 100.000 Euro, based on interviews we have applied JIT structure concept and evaluated effective setup time reduction using financial technology (Figure 5).

Figure 5. *Fintech microenterprises loan granting process - working capital loans < 100.000 Euro*
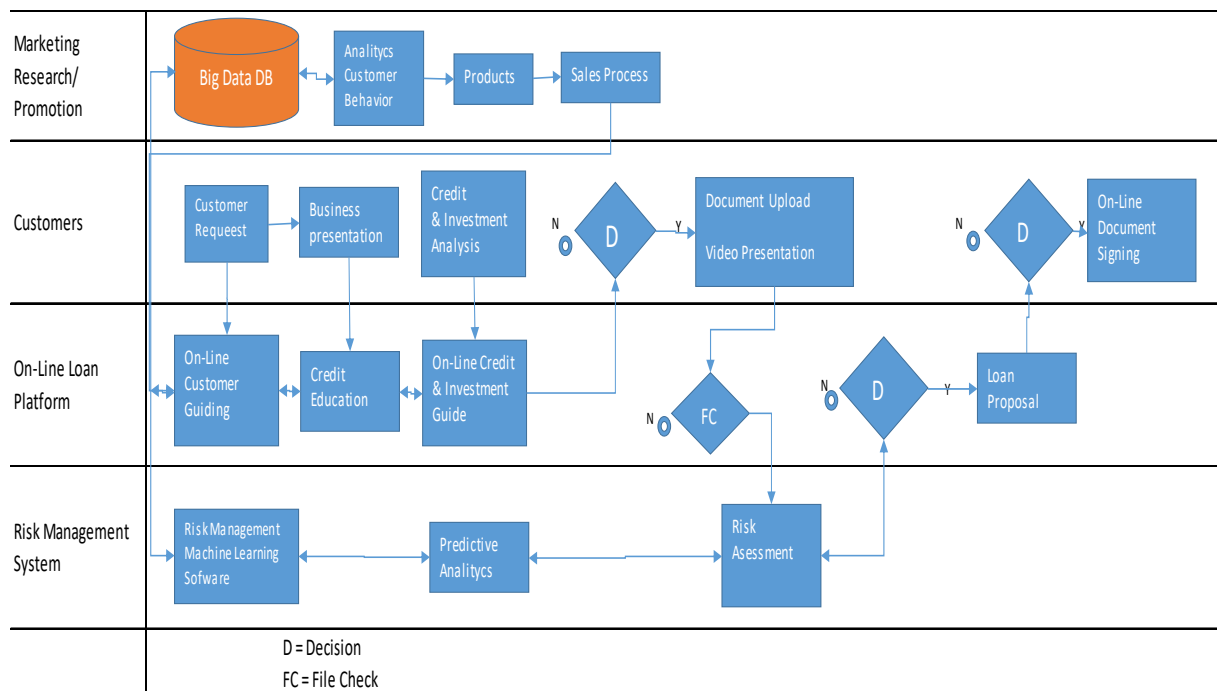
5.2. Competitive dynamics

Traditional banking system institutions are faced with the challenge of innovation at a large-scale organization and technology based startups have the challenge of regulatory policies, risk management knowhow, larger infrastructures correlated with rapid growth.

A key theme for the industry cooperation and collusion conditions is the rivalry among competitors. On financial operations targeting microenterprises loans, Fintech is changing the dynamism of the market, challenging traditional banks business models, with a faster in lower cost computational advantages. For traditional small business lending clients search and acquisition costs are high (Karen Gordon Mills, 2016).

Price leader strategy for traditional banking could not be considered – there are high cost of competitive action and reaction on interest levels. Based on a trust decreasing trend of traditional banking system (post crisis restructuring and low interest levels), estimated advancement of FinTech will have implications on revenues and market share. Evidence of FinTech development are showing an increasing potential toward developing financial inclusion, creating possibilities to access financial services for previously excluded microenterprises.

Resources and capabilities influence over the competitive dynamics - the risk management knowledge and strategies, are significant resources creating competitive advantage. Clients relationships and the underwriting processes knowhow and loyalty strategies programs, are traditional banking advantages, but these operations are expensive. Strong risk management culture will have a strategic role in FinTech development. Based on automations and advanced analytics integrated with behavioral economics, future risk function capabilities can enable significant shits in banking business model, toward optimizing margins.

Future market evolution creates the frame for both players to engage in partnerships and make capital out of innovations generated by the recent technology. Future estimations regarding FinTech for the collaboration or competition with existing financial service:

(i)   banks acquire innovative firms as corporate investors,
(ii)   banks launching their competitive digital products,
(iii) advanced integration banks risk management systems and Fintech operational capabilities,
(iv)   further integration telecom-financial system based on telecom driven by big data analytics capabilities, given the scalability and complex requirements of big data and also risk management know-how.

Regulatory initiative will have a significant role in defining supporting FinTech. In present are arising risks in continuously stricter regulations for financial services. Acting as a tool to accelerate financial inclusion FinTech emerging organizations can exert a pressure for future regulation governmental strategies. On long term, financial institutions capabilities to adapt to the real needs of the small business customer have the potential to create a greater customer satisfaction and lower defaults level are proved in recent research (Mills et al., 2016).

6. Conclusion

The review of the major academic research journals revealed that automation and social media connectivity had generated a disruptive innovation phase financial services industry. Research journals, are at an incipient phase to identify the major strategic implications for traditional banking system in the context of the new financial technology.

In this article, we have reviewed the literature reporting rapid development of technological innovation applied to financial services, from three perspectives: operational model, risk management models, regulatory frame. We have applied two different concepts: JIT operational management concept applied to loan approval process for microenterprises and a financial services competitive dynamics forces analysis looking at the strategic management perspective. We have used a simulation model to examine the impact of process automation for loan approval. The comparison results revealed that digital structure creates the potential to implement JIT operational management strategy implementation, significantly enhance the performance of loan approval system.

This article provides evidence that technological innovation is, in fact, redefining the financial services sector business model. Further, the articles explore clients and traditional banking system benefit from the introduction of automation and social media connectivity technologies. The trends suggest that automation of client relationship, advanced predictive analytics and machine learning software, will create improved client experience and increasing efficiency of risk management process.

Considering strategic dynamics options traditional banks could compete or collaborate with digital platforms, or simultaneously apply both strategies. There is a high potential of collaboration between traditional banking system and digital emerging organizations to accelerate soon.

Fintech key competitive advantage built on digital platforms operational excellence strategy and big data optimization analytics, will challenge financial institutions strategic decisions,

in order to cope with market dynamics. Study conclusion is that financial institutions being in front of a transformation, new technology will create strategic opportunities:

- faster potential of international deployment for on line business models through;
- reengineer client experience adapting to new generations preferences and education level, under the pressure of demographic changes in the next 20 years;
- strategic integration with complementary industries (e.g. telecom, retail chains, medical services), driven by increasing internet connected smartphones users based on integration. Initial stages integration banking and telecom services have the potential to accelerate, considering complementary know-how, client relationship models (globally are more than 5 billion active mobile phone accounts and 1.3 billion active credit and debit accounts).

From a financial inclusion perspective Fintech can play a potential pivotal role for the small business excluded clients and digital platforms. Financial inclusion political initiative and financial technology based startups capability to target financial excluded clients, can influence regulators to create the necessary policy frame.

Research of financial services technology needs to grow beyond the current case study. This study limitation on quantitative data available, can be explored in future research. Future work could explore risk management models for digital players and regulation context for international expansion, crowdfunding digital systems.

Notes

[1] McKinsey global banking annual review 2015 – September 2015.
[2] APICS (American Production and Inventory Control Society) 1992 dictionary definition.
[3] World Development Report 2016: Digital Dividends – World Bank.

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Determine the most important of the early guidance indicators about banks continuation or their financial failure from the point of view of the external auditor by using factor analysis. Case study in a sample of serviced offices of external audit in Iraq

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Abstract. *The current study aims at illustrating the role of external audit in the evaluation of the ability of banks continuation in their activity or financial failure over the next period, according to a set of factors and indicators, which the auditor uses in the operation of the evaluation. To achieve the aim of this study, we selected a set of external auditors working in Iraq in order to design a questionnaire. It would analyze the data under study, which the external audit considers responsible in case it does not take enough occupational care for the continuation of the evaluation of banks and financial failure over the next period, although from this ability to focus on those occupational cares in the evaluation operation according to the factors and indicators, which have varying importance according to the banking activity in the Iraqi environment.*

1. Introduction

The continuity in the activity of companies in general and banks in particular has big importance for internal and external parties, which represents the relationship of investors and management, government agencies and other parties. The oversight role appears to the job of external audit by determining the most important factors and indicators, which give an early warning on the continuity of banks activity or its failure over the next period In recent years, studies and researchers have focused on determining most factors and indicators, which can be used for knowing about banks continuity or their financial failure. This happened especially after the financial collapses of many international banks, without there being any early warning signs from the external Audit Offices responsible for auditing those banks about exciting factors and indicators of failure for those banks. Over the next period this caused a trust and credibility crisis in the profession of external auditing. The importance of the current study by highlighting on the financial failure of banking companies which leads to exit of these companies from its activities and close out these companies if they don't predict failure in early also the international standard of audit number (570) required from external audit doing many procedure to make sure the financial have been prepared in accordance with the hypothesis of continuity of companies and the responsibility of the external auditor to predict the financial failure of the companies or its ability to continue of its activity also the important to our study because it completes the studies and research, regarding this topic also taking into consideration the Iraqi environment. The study includes three sections and the first section talking about theoretical framework which includes five paragraphs as follows: 1. previous studies, 2. the importance of banks continuity, 3.responsibility of external auditor, 4.procedures must be imposed on the external auditor, 5.the duties of external auditor.

The second section talking about field study and the third section talking about the conclusion.

2. Literature review and theoretical framework

2.1. Previous studies

The responsibility of the external auditor in evaluating the ability of companies to continue to its work or financial failure is the subject of debate and controversy and many researches and continues to this day.

The most important previous studies are as follows:
- Matar study (2001): This study aimed at discovering the nature and importance of the indicators used by the external auditor and financial analyst to predict the failure financial of companies.
- Shoiat study (2004): This study aimed to look at the external auditor a responsibility for assessing the ability of the corporate customers to continue their work.
- Ammar study (2008): This study aimed to find the extent to which commercial banks on financial analysis to predict the financial failure of these banks through a questionnaire distributed to banks managers and using descriptive and analysis of the data by the statically program (spss).
- Shaheen and Matar study (2011): This study aimed to reach the best set of financial ratios that can be used to predict the financial failure of banking companies for the early detection of those banks to allowing the parties concerned and regulatory intervention to address those problems and obstacles through the use of multivariate statistical analysis discriminatory linear.
- Zahra study (2012): According to this study the use Sherrord model to predict the failure of banks by applying it to sample of Iraqi private banks.

The characteristic of the current study is to recruit new statistical tool based reduction numerous indicators to predict the continuity of banking companies in their work or financial failures in the coming periods to fewer indicators of the impact strength of higher and cleare explanation by focusing on indictors that give an early warning of the external auditor to predict continuously in their work or financial failures in the future.

2.2. The importance of banks continuity

The imposition of continuity is considered one of the important impositions of accounting, which is used in the setup of final financial statements. As it is assumed that the bank is based, for example, in order to work and that it continued and sustained for a reasonable period of time and an unspecified loss among some banks the imposition of accounting on continuity means that the company is continuing to work and will not stop its activity. Therefore, it can increase its resources sufficiently for an infinite time interval, enabling it to achieve its plans and to fulfill its obligations and the growth of its activity without losses (Alamode, 2001: 35). The standard of International audit under special number (570) about the imposing of instructions continuity concerning the responsibility of the external auditor at the Audit of Financial Statements regarding the appropriateness of continuity is basic for the setup of financial statements. This standard determined a set of financial indicators and other operational helping auditors in the discovery of suspicious cases in company continuity. Paragraph (2) refers to the same standard, namely that the external auditor takes into account the imposition on the basis of continuity for the preparation of financial statements as in paragraph (4) the same standard, which states that the company continuity is expected to be able to maintain continuity in the future. It does not exceed one financial year after the end of the year when it exposed the setup of the financial statements in the absence of information reflecting that. And thus recording of assets and liabilities based on the company's ability to collect the value of the assets and the payment of obligations from normal activity.

3. Responsibility of the external auditor regarding the evaluation of the ability of banks to continue their activity

The continuity of banks as active or the weakness in their ability of continuity or failure has various indicators for what external auditors can reach through their required regular checks in order to achieve the goals expected by the external audit. Someone needs to require special and complex procedures from auditors in an effort for big testing and expertise. Moreover, this carries high costs even if they perform everything with adequate professional care. Therefore, the external auditors consider it as their responsibility if they show lack in evaluating the ability of banks to continue with their activities using their ordinary examination to the bank. Then, the external auditor will carry professional liability responsibility liable to harm the customer (bank), thus violating the professional standards of the profession, where the international standard audit refers to the external auditor. The auditor is interested in arranging and re-registering the assets and obligations in case there is a possibility of the inability of companies to continue, and in case substantial doubts or conditions or indicators are uncertain about the ability of companies to continue on the external auditor's signal or reservation to this in his report, or to refrain from expressing an opinion (SAS, No 2, p. 17) – the international standard audit under number (570). It is special about the exact continuity in that the external auditor is responsible for evaluating the company's ability to continue its work. They also determine the duties performed by the auditor, which helps in the evaluating process, and they also determine some factors and indicators, which help in the evaluating process.

4. Procedures which must be imposed on the external auditor to secure their commitment to the work of ensuring the continuity of the banks

There are many factors and indicators, that the external auditor should take into consideration in order to be able to evaluate the ability of banks to carry on with their work without faltering or failure (Thenibat, 1991: 33). A lot of academic research and professional studies are interested in their studies and applications to determine the importance of the factors and the financial, operational and legal indicators, which can be used as knowledge about the possibility of banks to continue to work or are stumbled or financial failure. These studies determine the relative importance of those indicators and factors according to international and local environment in which they work. We will review below the most important of these factors and indicators.

4.1. Indicators and factors, we will check on through the analytical procedures which the external auditor performed

A procedure that uses a test check in the planning and follow-up phase of the audit process (ASB, 1981, p. 2) which may refer to negative trends, such as the slow movement in supplies, liquidity problems and the ability to pay major clients exposed to bankruptcy in addition to other possible factors and indicators to constitute an obstacle in the continuity of banking activity:
- The collapse of the market price of the banks supplies.
- The confiscation of the assets of the bank.
- Withdrawal of credit facility by the bank (Driku, 1998: 27).

Addition to review the condition that the terms of the debt agreements to research for violations of the debt agreements and the possibility of failure to meet those debt (Abdallah, 1998: 13) The measures also include a review and audit of the records of the board of directors and general assembly of shareholders in the banks to look for the following:
- Involvement in litigation expensive.
- Loss of a major supplier.
- Loss of credit facilities.
- Loss of lawsuits and the occurrence of large its losses resulting from claims and compensation paid for those issues (Hmad, 2007: 96).

4.2. Negative indicators denote that the banks have essential problems and drawbacks affecting their ordinary ability of continuity by being active through the next period

4.2.1. Negative Indicators and factors (Moter, 2001: 7)
- Decline in the revenues of banking services.
- Increase of expenses in the costs to banking services.
- Repetition of operating losses.
- Lack of work capital.
- Negative cash flows from operating.
- Financial ratios going the opposite direction than desired.

4.2.2. Financial indicators (Jrboe, 2001: 16)
- Net Liabilities and circulation Liabilities: when liabilities are more than assess circulation there will be problems in the ability of banks to meet their obligations.
- The loans and possibility of repayment: banks cannot repay their long loans so this will continue in the accumulation of debts. Therefore, the bank will no longer be able to continue its activity.

- Suffering from substantial and recurring losses: recurring of losses that have physical impact on banks leading to their physical disability and thus weakening the ability of the banks to continue, thus decreasing share prices in the financial markets.
- Not to distribute profit: where not to distribute profit to shareholders in the following period, although the exact profit is distributable in the financial statements. But the banks distribute stock instead of the profits and without that there will be no justification for the increase of capital by the amount of the distributed stock which will lead to a decline in the confidence of the shareholders of those banks, which also reduced their share prices in the financial markets.

4.2.3. Operational indicators

- Loss of a major market, concession or license.
- Important management positions are empty of leadership and not able to bring alternatives.
- The existence of problems and difficulties in dealing with the crises in employment or access to important operating requirements.

4.2.4. Legal indicators

- Non-compliance with legal requirements, such as lack of capital adequacy in banks.
- Changes in laws and government policies.

4.2.5. Other internal procedures

- Inefficiency of user accounting system.
- The work stopped between now and then because of operating difficulties.
- Non-economic linked to long-term (Kaplan and Krumvried, 2001: 13).

And will be the focus of the current our study applied to the most important indicators that can give early warning about vulnerability of the banking companies to the financial failure or the possibility of continuing to work in the coming periods.

5. The duties of the external auditor to assessment of the ability of the bank companies to continue to work or financial failure following procedures (Ahmed, 2002)

- Analysis and discussion of cash flow and profit and administration forecasts.
- Auditing events after the balance sheet date of banking company especially affecting the continuity of it work.
- Analysis and discussion of the quarterly financial statement in the recent period.
- Auditing conditions for issuing loan bonds and loan agreements to determine if there are any infringements.
- Auditing the minutes of meetings of the general assembly of shareholders and the board of director of the banking company.
- Auditing the lawsuits and claims against the banking company.
- Make sure there is an ongoing legal obligation regarding the readiness certain parties to provide financial support for the bank with the evaluation of the financial ability of those parties.
- Auditing and discussion bank company concerning the failure to meet its' customers requests.
- If their doubts at the external auditor regarding the continued work of the bank and must the external auditor collection evidence about these doubts.

Field study

6. Paper simple and phenomenon variables

We depend on a questionnaire according to the quintet Likert scale, in which comprehensive questions on the phenomenon under study were asked. The sample size under study was (70) under observation, it represented external auditors working in Iraq who took their opinions about the most important use of the elevation of continuously working banks or the financial failure in the next period and the kinds linked between these factors and the relative importance for these factors. The questionnaire under study contains (13) equations, it represents independent variables as indicators to the continuation of the activity or potential financial failure of the banks under study from the point of view of external auditors as follows:

Variable code	Variables
X1	The existence of consecutive financial losses considered by the indicators that assist the auditor in the evaluation the bank's ability to continue.
X2	In case of the existence of important consecutive financial ratios.
X3	The bank exposed to financial hardship repeatedly several times in a very short period of time.
X4	The bank unable to distribute the profit repeatedly through many financial periods, which provide these profits.
X5	Lack of advanced service of technological banking in the bank.
X6	The inability of the management of the bank to solve the urgent problems and follow up on the implementation of plans and programs that are linked to the basic operations continue.
X7	Does not provide sufficient liquidity, as well as lack of the bank's ability to meet the customer's requirements.
X8	In case the bank loses the main customers (companies and individuals) reflect on the size of its banking activity considered indicators that assist the auditor in evaluating the bank's ability to continue.
X9	In case there occur repeated essential changes in management and bank employees.
X10	The existence of legal proceedings related to the bank and lawsuits against its introduction.
X11	accreditation on doubt indicators in the financial indicators over an operating and other in evaluation.
X12	The bank empty its archive accounts through last year's indicators that assist the auditor in evaluating the bank's ability to continue.
X13	Delay repayment of private bank debt of the customers.

The result of this questionnaire transfers to numerical values after this stage analyzing by using statistical programs (spss), where this study focuses on determining the most important variables under study by using factor analysis.

Table 1. *The correlation matrix between variables of the phenomenon under study*

Variables	X1	X 2	X 3	X 4	X 5	X 6	X 7	X 8	X 9	X 10	X 11	X 12	X 13
X 1	1.00	0.06	-0.05	0.03	0.20	0.08	-0.04	-0.34	0.24	-0.04	0.12	-0.10	0.19
X 2	0.06	1.00	0.05	0.01	0.04	-0.21	-0.01	0.24	0.28	0.14	-0.01	0.12	0.03
X 3	0.05	0.05	1.00	0.14	0.12	0.18	-0.10	0.36	-0.12	0.16	-0.03	0.29	0.09
X 4	0.03	0.01	0.14	1.00	0.07	-0.03	0.19	0.24	0.44	0.04	0.08	-0.07	0.06
X 5	0.21	0.04	0.12	-0.07	1.00	0.23	0.03	0.35	-0.04	0.29	-0.14	-0.04	-0.18
X 6	0.01	-0.21	0.18	-0.03	0.23	1.00	0.09	-0.11	0.09	-0.31	0.02	-0.07	-0.06
X 7	-0.04	-0.01	-0.10	0.19	0.03	0.09	1.00	0.24	-0.26	0.27	0.40	-0.21	-0.12
X 8	0.07	0.09	-0.03	0.08	0.22	-0.02	-0.18	1.00	-0.37	-0.50	-0.22	-0.10	0.40
X 9	0.21	0.14	0.04	-0.01	-0.10	-0.06	-0.06	-0.33	1.00	-0.50	0.09	-0.02	0.21
X 9	0.14	0.03	-0.05	-0.02	0.01	-0.46	-0.12	0.68	0.24	1.00	0.03	0.01	0.03
X 10	0.12	-0.01	-0.03	0.08	-0.14	0.32	0.40	0.08	-0.27	0.09	0.06	-0.06	0.19
X 11	-0.10	0.12	0.29	0.02	-0.04	-0.37	0.21	0.21	-0.08	-0.03	1.00	0.16	0.08
X 12	-0. 07	0.36	-0.01	-0.05	0.04	-0.06	0.03	-0.05	0.45	0.01	-0.06	1.00	-0.01
X 13	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	1.00

Through the correlation matrix we see the variables under study correlated by positive or inverse relationship as following X1 (The existence of consecutive financial losses

considered indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.06) with X2 (In case there are important consecutive financial ratios considered as indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses considered as indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.05) with X3 (The bank exposed to financial hardship repeatedly several times in a very short period of time considered the indicators that assist the auditor in evaluating the bank's ability to continue) X1 (The existence of consecutive financial losses considered the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.03) with X4 (The bank not able to distribute the profit through repeated financial periods which provide these profits is considered for the indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.20) with X5 (lack of advanced service of technological banking in the bank considered the indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.08) with X6 (The inability of the management of the bank to solve the urgent problems and follow up the implementation of plans and programs that are linked to the basic operations is considered for the indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in inverse relationship by amount (-0.04) with X7 (not providing sufficient liquidity, as well as lack of the bank's ability to meet the customer's requirements are considered indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in inverse relationship by amount (-0.34) with X8 (In case the bank loses the main customers (companies and individual) reflect on the size of its banking activity is considered for the indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.24) with X9 (In case repeated essential changes in management and bank employees are considered for the indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in inverse relationship by amount (-0.04) with X10 (The existence of legal proceedings related to the bank and lawsuits is against the introduction considered indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount (0.12) with X11 (accreditation on doubt indicators in the financial indicators over operating and in other evaluation). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in inverse relationship by amount (-0.10) with X12 (The banks empty their archive accounts from the last year indicators that assist the auditor in evaluating the bank's ability to continue). X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) is in positive relationship by amount

(0.19) with X13 (Delay repayment of private bank debt of the customers indicators that assist the auditor in evaluating the bank's ability to continue)

And so, for the rest of the correlations for other variables as shown Figure 1.

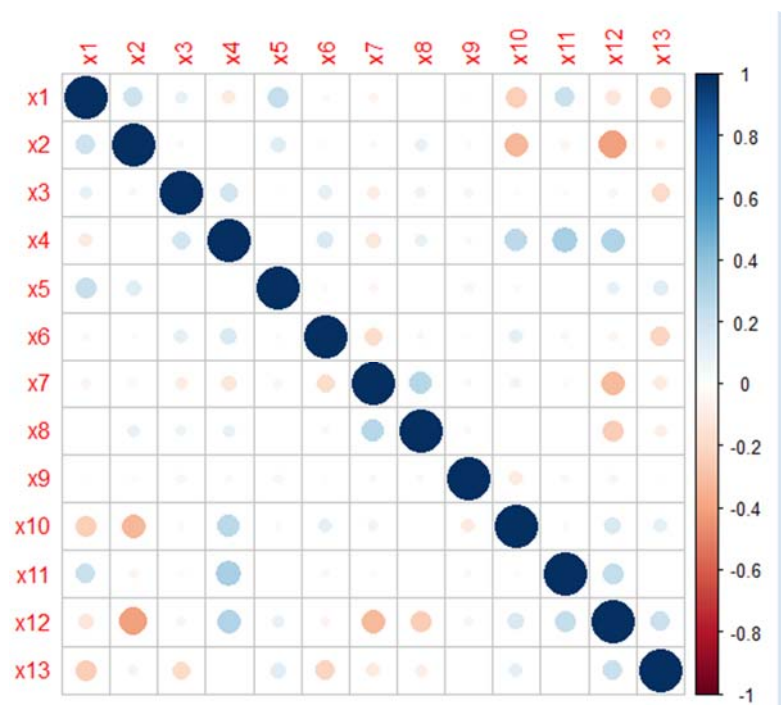**Figure 1.** *The correlation between the variables under study*

Table 2. *The Eigenvalues and variance ratio as well as total variance*

Eigenvalues	Variance ratio	Total variance
2.060	15.8	15.8
1.633	12.5	28.6
1.476	11.3	39.9
1.206	9.2	49.1
1.092	8.4	57.5
1.059	8.1	65.6
1.009	7.6	73.2
0.999	6.9	82.8
0.733	5.4	88.2
0.608	4.6	92.8
0.558	4.2	97
0.371	2.8	99.8
0.330	0.2	100

From Table 2 we see the number of factors that have a significant effect on the phenomenon under study 7 factors from (13) factors (this result according to Eigenvalues greater than 1), where these 7 factors together can explain (73%) from the total variance, where each factor from the significant factors containing all the variables of the phenomenon under study.

Table 3. *The factor loading especially by the variables of the phenomenon under study*

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
X1	0.960	-0.441	0.257	- 0.176	0.103	0.321	0.116
X2	0.406	-0.177	0.785	-0.139	0.318	-0.218	0.014
X3	-0.045	-0.783	-0.172	0.243	-0.148	-0.408	-0.261
X4	-0.353	-0.355	-0.257	-0.823	0.123	-0.471	-0.072
X5	0.011	-0.149	0.321	-0.323	0.477	0.086	-0.766
X6	-0.056	-0.357	-0.218	0.369	0.566	0.157	-0.014
X7	0.244	0.643	-0.408	-0.386	-0.241	-0.323	-0.121
X8	0.208	-0.049	-0.471	-0.318	0.157	0.651	-0.182
X9	-0.808	-0.031	0.086	0.062	-0.323	-0.320	-0.801
X10	-0.358	0.039	-0.660	-0.045	0.351	-0.163	0.012
X11	-0.197	-0.370	-0.014	-0.498	-0.320	-0.355	0.269
X12	-0.450	-0.075	0.215	-0.052	-0.163	-0.149	-0.033
X13	-0.253	0.353	0.281	-0.302	0.217	-0.357	-0.118

The first factor

This factor is more important in effect on the financial failure of banks, where this factor can explain (15.8%) from the total variance and contains two variables as follows:

1-X1 (The existence of consecutive financial losses is considered of for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.960)

X9 (In case there occurs repeated essential changes in management and bank employees they are considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.808)

The second factor

This factor comes after the first factor in effect on financial failure of banks, where this factor can explain (12.5%) from the total variance and contains two variables as follows:

X3 (The bank exposed to financial hardship repeatedly several times in a very short period of time is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.783).

X7 (not providing sufficient liquidity, as well as lack of the bank's ability to meet the customer's requirements is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0. 643).

The third factor

This factor comes in effect after the second factor on the financial failure of banks, where this factor can explain (11.3%) from the total variance and contains two variables as follows:

X2 (In case there are important consecutive financial ratios considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.785).

X10 (The existence of legal proceedings related to the bank and lawsuits is against the introduction of considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.660).

The fourth factor

This factor comes in effect after the third factor on the financial failure of banks, where this factor can explain (9.2%) from the total variance and contains one variable as follows:

X4 (The bank not able to distribute the profit through many repeated financial periods which provide these profits of considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.823).

The fifth factor

This factor comes in effect after the fourth factor on the financial failure of banks, where this factor can explain (8.4%) from the total variance and contains one variable as follows:

1-X6 (The inability of the management of the bank to solve the urgent problems and follow up on the implementation of plans and programs that are linked to the basic operations for the considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.566).

The sixth factor

This factor comes in effect after the fifth factor on the financial failure of banks, where this factor can explain (8.1%) from the total variance and contains one variable as follows:

1-X8 (In case the bank loses the main customers (companies and individuals) reflect on the size of its banking activity considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.651).

The seventh factor

1-X5 (lack of advanced service of technological banking in the bank is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.766).

7. Conclusions

Through theoretical study and analysis of the data under study, this paper reached the following results:

- External audit profession has an important supervisory role on the bank being active through determined factors and indicators which it gives as an early warning around banks continuous in its active or the potential financial failure in the next periods.
- There are financial, operational, legal and other factors and indicators, which can be used by external auditors to determine continuous activity or bank failure. Some of these results were reached by means of conventional ordinary tests by the profession of external audit.
- Some audit operate needed much effort and testing and cost in order to reached it.
- The external auditor considers responsible and remiss in evaluating the continued activity of banks or financial failure that did not make the necessary professional care.
- Correlation of the continuation of factors and indicators on financial failure with positive or inverse correlation together as shown in Table 1.
- The factors and indicators have various relative importance which is used in evaluating the continuation of the banking activity or financial failures according to the opinion of the external auditor. These factors are arranged according to priority and importance as follows:

First rank: X1 (The existence of consecutive financial losses is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.960).

Second rank: X4 (The bank not able to distribute the profit through many repeated financial periods which provide these profits is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.823).

Third rank: X9 (In case there occur repeated essential changes in management and bank employees are considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.808).

Fourth rank: X2 (In case there are important consecutive financial ratios considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (0.785).

Fifth rank: X3 (The bank exposed to financial hardship repeatedly several times in a very short period of time is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.783).

Sixth rank: X5 (lack of advanced service of technological banking in the bank is considered for the indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.766).

Seventh rank: X10 (The existence of legal proceedings relating to the bank and lawsuits is against the introduction of considered indicators that assist the auditor in evaluating the bank's ability to continue) by amount of factor loading (-0.660).

Eighth rank: X8 (In case the bank loses its main customers (companies and individual) reflects on the size of its banking activity considering indicators that assist the auditor in evaluating the bank's ability to continue) by the amount of factor loading (0.651).

Ninth rank: X6 (The inability of the management of the bank to solve the urgent problems and follow up on the implementation of plans and programs that are linked to the basic operations for considered indicators that assist the auditor in evaluating the bank's ability to) by amount of factor loading (0.566).

But the remaining four variables (X7 does not provide sufficient liquidity, as well as lack of the bank's ability to meet the customer's requirements is considered for the indicators that assist the auditor in evaluating the bank's ability to continue, X11 accreditation of doubt indicators in the financial indicators over operating and other in evaluating, the bank empty its accounts archive through last year's indicators that assist the auditor in evaluating the bank's ability to continue and X13 delay in repayment of the private bank debt of the customers are indicators that assist the auditor in evaluating the bank's ability to continue) have insignificant effect and are therefore removed from the explanation).

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The influence of VAT on prices and inflation rate. Romania case

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Abstract. *The paper presents the European tax system referring to the evolution of VAT and how it influenced the fluctuations of the inflation rate. In the first part, we present the position of the indirect taxes in European Union, referring to VAT rates. We analyzed the evolution of the VAT share in GDP as average and also the number of changes in VAT system at the EU level. In the second part, we focused on the Romania case and we built an econometric model based on a simple linear regression, having the dependent variable inflation rate and the independent variable the VAT revenues expressed as share of GDP. In the last part, we emphasized the conclusions obtain with this paper.*

Keywords: tax, inflation, VAT.

JEL Classification: E31, H20, C20.

1. Introduction

The price stability is the main objective for many central banks from developed or emerging countries. Modern economic theory says that monetary policy can most efficiently contribute to increasing welfare by ensuring the predictability of the economic environment, maintaining price stability and creating a trustful financial system. In order to accomplish these goals, central banks started to use the inflation targeting as a framework strategy, whereby the central bank strives to achieve its primary objective of price stability through a publicly announced inflation target. Under this regime, the central bank fights also to decrease economic volatility arising from different sources and reducing social welfare, exploiting the fact that inflation targeting provides it with a sufficiently flexible strategy (Felcser, 2013).

Taxation is one of the most important component, which has to be taken into consideration when we are talking about complementary factors involved in maintaining the price stability. Even if we are talking about direct taxation, which may influence directly the population welfare, about indirect taxation that affects indirectly the money spent on different kind of goods or about the efforts that central banks must do to cover the economic shocks, price stability is affected.

This paper it is concentrated on the effect of changes in indirect taxation, represented by VAT, on the inflation rate. With a VAT increase, prices go up in the economy as businesses pass through the effects of the tax rise. Technically, this means that the consumer price index increases for one year; this is called the first-round effect. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the VAT hike to be persistent and future inflation to remain higher than it was before the VAT rise in the long term. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. In case the consumption tax rates are changed frequently, this second-round effect is more likely to appear, which may require a monetary policy response.

2. VAT in EU

The Value Added Tax played an important role in the fiscal environment during and after the economic crisis. Total tax revenues (from direct and indirect taxes as well as social security contributions) expressed in terms of GDP reached their lowest point in 2010. Ever since then, the Member States tried to recover and in many cases we faced an increase in taxes instead of a reduction in expenditure.

Indirect taxes are imposed on consumption, sales, services, and are usually included in the price of goods and services, which makes them less visible for the payers in comparison with the direct taxes. The value added tax is the most important tax from the indirect ones because it has the biggest share. The revenues from VAT represent the main tax category for the Central and Eastern European countries. On the contrary, the old member states collect relatively equal from direct taxes, indirect taxes and social contributions.

However, in the last years, starting with the first quarter of 2009, the VAT revenues as percentage of GDP managed to grow at the level of European Union (Milos, 2014). In the graph below in can be seen that until 2008 there are no big changes, but in 2009 when the crisis effects started to be felt in most of the countries, the collected revenues decreased. What we had represented on the graph is an average, but the most affected were the Eastern and Central European countries, where the tax revenues are based on the indirect taxes and especially on VAT.

The influence of VAT on prices and inflation rate. Romania case

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Figure 1. *VAT revenues in EU (average as percent of GDP)*
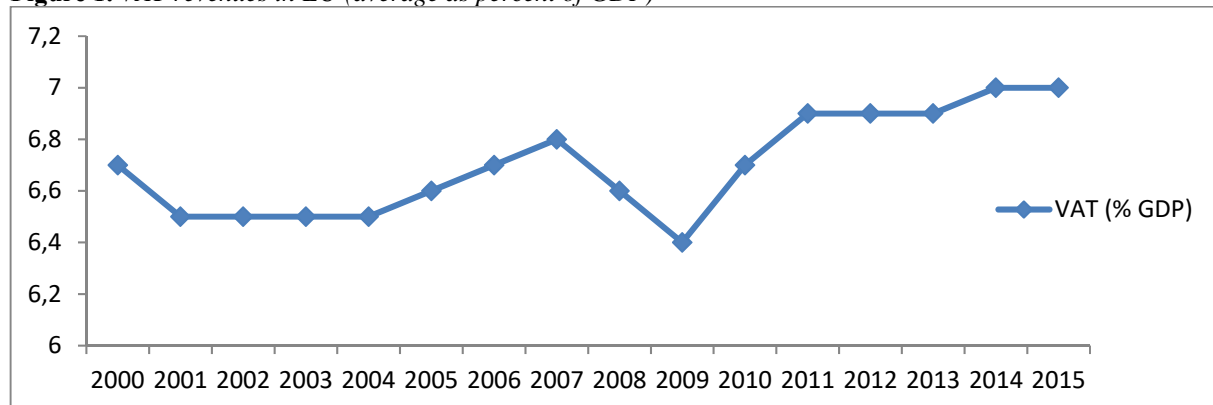
Source: Eurostat.

The increase of VAT revenues (in terms of GDP) has been driven in a big pat by the rise in standard Value Added Tax rates in many Member States. The EU-28 average standard rate increased by 2 percentage points between 2008 and 2015 (from 19.5% to 21.6%) (EU Commission paper, 2015). The EU has attempted over the years, in line with the objectives of the Single Market, to harmonize the tax system with a series of Directives. Currently, the VAT Directive, enacted on January 1 2007 and replacing the Sixth Directive, contains all legislations concerning the common VAT system in place. The Directive does not stipulate one uniform percentage rate for the whole Union, but sets boundaries for the Member States. For example, it restricts the minimum standard rate to 15 percent and allows for two reduced rates of at least 5 percent for some goods and services. Some derogations and exceptions for Member States are in place, entailing the existence of exemptions, zero rates and super reduced rates (EU Commission Report, 2013).

We can observe in Figure 2 that if during the period 2000-2008, the VAT rates were quite stable, but from 2009, Member States had started to increase VAT rates in order to stabilize their budgets.

Figure 2. *Evolution of the average of standard VAT rates in EU*
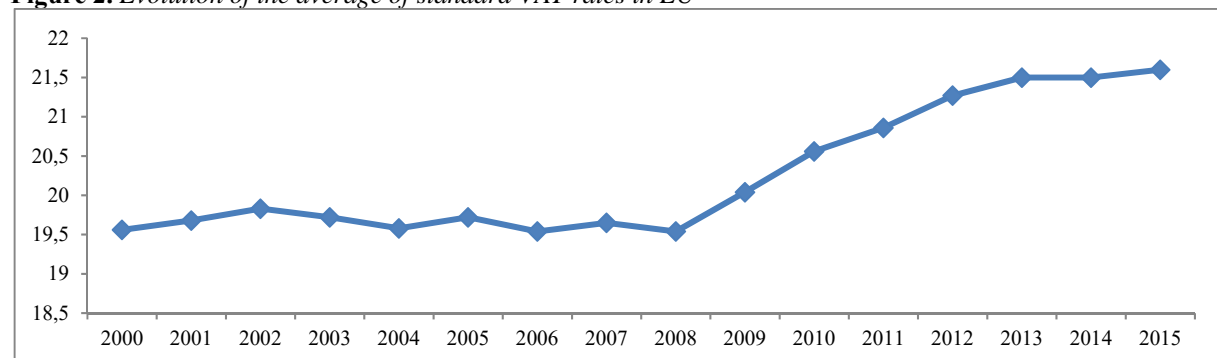
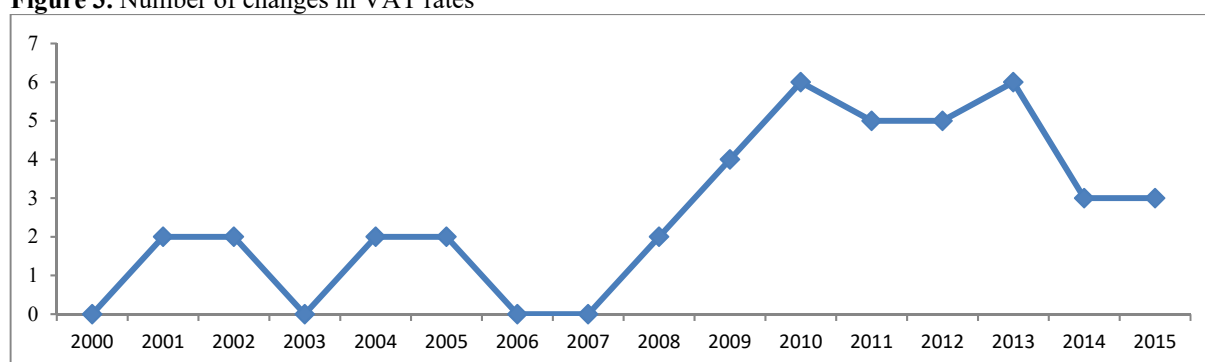**Source:** European Commission Report.

The evolution of the VAT rates showed in the Figure 2 it is not random and it affected most European countries. From tax perspective, in the lasts years the coordinates transmitted by the European Union were similar and were aimed at defining the main triangle of sustainability, growth and fairness. Although at first glance, to meet these three characteristics seems impossible, directions indicated by the European Commission can insure during time a stable fiscal system, steady economic growth, a competitive labor market by adopting a balanced tax system and by continuously improving it (EU Commission Report, 2014). In this sense, two of the most important priorities, set by European Commission in its annual growth survey in the lasts years, were: shifting taxation away from labour in countries where is particularly high and limits job creation on the one hand and increasing tax revenues by broadening the tax base, rather than raising taxes or introducing new ones, on the other hand. Basically,

countries had to reduce direct taxes and encourage in this way the labour market, but in the same time to increase their budget revenues. And how can you do this? By increasing indirect taxes. This can be a plausible explanation of the evolution of VAT standard rates.

It is also worth to mention that countries like Belgium, Luxembourg, Spain, Latvia and Poland took another measure to broad the tax base in terms of VAT in 2013: they applied the extension of the standard VAT by dropping in some cases the application of reduced VAT rate. For example, in Spain, the rate of VAT applicable in tourism or cultural activities is not any more a reduced one, but the standard is applied (Vlad et al., 2015).

Beside the growth for budget revenues, changes in VAT rates can cause instability in the macroeconomic environment. If in the past the trend for VAT rates was a normal one, without big changes, suddenly governments had to modify this "quietly". We can see in the Figure 3 the number of changes in VAT rates in the period 2000-2015. Most of the counted changes represented increases in standard rates of VAT, in order to face the consequences of the crisis.

Figure 3. Number of changes in VAT rates

Source: Own calculation using European Commission Report.

We chose to calculate the number of changes in VAT rates because we believe that the more complex and difficult the VAT system is the lower VAT compliance is. The population behaviour and their response to many changes can affect the economic cycles and the macroeconomic indicators. VAT is a tax that applies to all goods purchased and influences every stage of production or acquisition. So, a modification up or down of its rate cause fluctuations in the inflation rate, can adjust supply and demand, can bring new decisions in business cycles or in international negotiations etc. What we want to highlight is that a small "move" in the VAT percentage can reach major changes in the macroeconomic scale. In the next chapter, we will take the Romania case and we will discover how these changes in VAT rates are likely to affect the price stability.

3. VAT and inflation

The question of VAT impact on inflation is of special importance for Romania, as the price stability is the main objective for the monetary policy and on the other hand, in fiscal area, there were two major adjustments in the tax rate during the recent years. Standard VAT rate was increased in July 2010 from 19% to 24%. Starting with January 2016, the standard VAT tax rate was reduced to 20%. The reason for the increase with 5% in 2010 was to increase the budget revenues, VAT share being one of the most important for fiscal system in our country. There is no doubt that such revisions in VAT rate have affected inflation; however, a mechanical assessment of the impact that is based on the assumption of 100% pass-through of tax changes to consumer prices may lead to wrong conclusions in cases of incomplete pass-through (Benkovskis, 2013). If we assume that when standard VAT rates change, retailers do not adjust before-tax prices and pass on these changes in full to after-tax prices, then the two VAT increases should affect directly the price stability, giving a theoretical impact from the

VAT changes to inflation starting with July 2010. But the pass-through of VAT changes to inflation may be slow and partial. For example, if the before-tax price is not changed, the after-tax price reflects only the change in VAT rate. This effect corresponds to full pass-through of the change in VAT to the after-tax price. In case the retailers adjust the before-tax price (to decrease the impact of the VAT increase on demand, for example) to maintain a constant after-tax price. This effect corresponds to no pass-through of the VAT change.

In order to discover how the VAT changes affected the inflation rate, we built an econometric model based on a simple linear regression with the following formula:

$I = a + c \times V,$
where:
I – the inflation rate (dependent variable);
V – the VAT revenues as percentage of GDP;
 a and c – constants.

Regarding the period, we chose the lasts 21 years, 1995-2015 in order to see the two variables are correlated in an interval that includes an expansive economic situation, a crisis and a recovery period. For this period, the two variables turned to be negative correlated, meaning that an increase with one unit of VAT revenues as percentage in GDP, inflation rate will decrease with 21 units. This can be observed also in the figure below, were using Eviews program, resulted the shares for every analyzed year, starting with 1995 from the left to the right and ending with 2015, where the inflation rate is very small comparing with the VAT revenues as percentage from GDP.

Figure 4. *The shares of inflation rate and VAT revenues (percent of GDP) in 1995-2015 period*
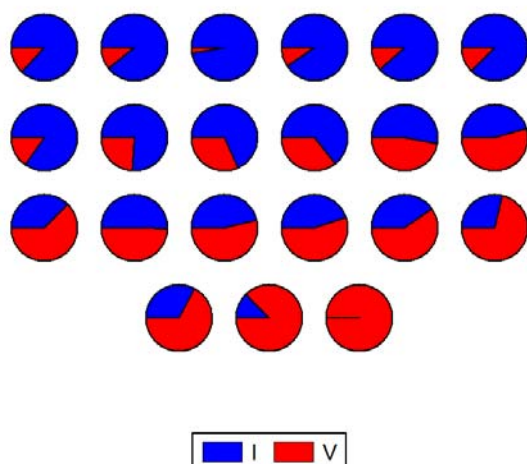
Source: Own representation using Eurostat data and Eviews program.

In the period we analyzed with this model, Romania passed through a lot of changes from strong fluctuations of macroeconomic indicators such as inflation rate (32% in 1995 and -0.6% in 2015) or VAT revenues (4,9% GDP in 1995 and 8.1% GDP in 2015) to changes in fiscal and monetary policies. Also, a very important fact is that in this period, in 2007 Romania joined European Union, fact that influenced its strategies. Beside the efforts to get the targeted inflation rate, had to maintain a budget deficit of 3% and the increase in VAT rates was a tool to accomplish this objective.

Using Eviews programs, beside the representation above, we obtained the results that can be seen in Figure 5. It can be noticed that through estimation, R-sqared and also the adjusted R-squared, have values of 54% and 52%, which means that there is a correlation between the two fiscal indicators and the model demonstrates that the inflation rate and the VAT revenues as shares of GDP are correlated. Also the Durbin Watson test confirm this, with a value less than 2 (1.86). The value of Prob (F-statistic) obtained it is very low, less than 1%, so not all

the coefficients are null (if we take into consideration a significance level tested at least 1%), without referring to the constant coefficient, which confirms again that between the two indicators exists a linear connection.

Figure 5. *The results obtained with a simple linear regression*

```
Dependent Variable: I
Method: Least Squares
Date: 01/24/17   Time: 17:16
Sample: 1995 2015
Included observations: 21
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
V	-21.11009	4.387403	-4.811523	0.0001
C	171.4569	30.98549	5.533459	0.0000

R-squared	0.549237	Mean dependent var		24.49048
Adjusted R-squared	0.525513	S.D. dependent var		34.64689
S.E. of regression	23.86583	Akaike info criterion		9.273165
Sum squared resid	10821.98	Schwarz criterion		9.372644
Log likelihood	-95.36824	F-statistic		23.15076
Durbin-Watson stat	1.861632	Prob(F-statistic)		0.000121

Source: Eurostat data, own calculation.

According with the representation presented and the results obtained through our regression, the increase of Value Added Tax rates did not brought an increase of inflation rate, at least reporting to the annual evolution. Our model gave us general results, that may cover the effects on short term or on specific categories of goods. Basically, we agreed from the beginning that the price response to VAT changes could be partial, as VAT changes may lead to changes in behaviour by consumers and companies. For example, following a VAT increase, consumer demand may decline, especially if the increase in VAT is large, and an increase if 5% can be called large. In this way, the companies may absorb some of the VAT increase into their margins to prevent an excessive slump in demand. The reaction by companies might thus depend on the size of the reaction by demand to changes in VAT rates and the level of competition of each market. Furthermore, the price adjustment could be progressive as prices are not changed continuously by retailers, and the impact of a change in VAT could then be transmitted slowly to inflation (Baudry et al., 2005). The relative infrequency of price changes may be due to the related costs, such as relabeling, data collection and other costs. It is thus possible that following an economic shock, companies may not immediately change their prices. Finally, the process of gathering information on the economic environment before a price change may be costly for retailers. Spacing out price changes over time makes it possible to lower these informational costs and might lead retailers to revise their prices only at certain periods of the year (Gautier et al., 2004).

Another important fact that may lead to this model is that, as we mentioned earlier the analyzed period includes the year that Romania joined EU and also some years of economic crisis and the side effects of these may cause distorted results.

Some uncertain factors may affect the assessment of the upward impact of VAT changes on inflation. The increase in the standard rate implies small price hikes. For many psychological prices, ending in "9" or "0", which are by nature relatively stickier and usually subject to large changes (Levy et al., 2011), this change may be expected to exert a weak impact, resulting in a smaller short-term inflationary impact than forecast. These prices mostly concern manufactured goods. Given the weak theoretical impact of the standard rate increase, it is likely that a portion of the VAT increase might be offset by a reduction in the before-tax price. In addition, in a setting of slowing consumer spending, retailers might trim their margins (Gautier et al., 2014).

4. Conclusion

Considering the analysis performed we can conclude that in the latest years, indirect taxes, especially VAT, were the main tool for European Union member states in achieving one of the most important goal: increasing budget revenues. In order to cover the losses caused by a general unstable economic environment from the crisis period, governments resorted to increased VAT rates. In this sense, the average of standard rate increased by 2 percentage points between 2008 and 2014 (from 19.5% to 21.5%). Also, the number of changes in VAT rates increased a lot starting with the first quarter of 2009 and this can affect the population behaviour and bring fluctuations in the inflation rate.

The purpose of this paper was to verify whether the VAT can influence the inflation rate. Theoretically, an increase in VAT brings an increase in the final price paid by consumers, so if all others variables stays the same, will bring an increase in the inflation rate. We built an econometric model for Romania case and we took as a dependent variable inflation rate and as an independent variable VAT expressed as percentage from GDP in the period 1995-2015.

The conclusion from this model was that the two indicators are medium correlated with an adjusted R squared of 52%, but with a negative connections. This means that in the last 21 years, the increase of VAT as percentage from GDP caused a decrease of inflation rate. How this could be possible? First of all, the period we had chosen, contains more than one big change regarding Romania's situation from economic and politic point of view: in 1995 Romania was trying to recover after the communist regime, in 2007 joined EU, in 2008 the economic crisis came and after this faced the recovery period after crisis. It is not easy to control macroeconomic indicators and if in 1995 the inflation rate was 32%, in 2015 in negative (-0.6%). Also it has to be mention that the consumption grew a lot after 2000 and starting with 2007, Romania had to apply EU strategies and be complied with. The restriction of budget deficit, or of the public debt and the influence of other member states, influenced the evolution of the consumption and monetary policy.

As we mentioned, VAT can cause the increase of inflation if the other variables remain constant. But not always the full increase of VAT is paid by consumers, especially when we talk about a big increase. Romania faced an increase of 5% in VAT rate in 2010, so for sure the producers, and the retailers in general decreased their margins in order to maintain their position on the market, especially that the supply and the competition are very strong, so some prices didn't suffer big changes. Also, an increase in VAT can have effects on the population behavior: the demand may decrease, because people become more aware of the effects that may come, so inflation rate will not be so affected.

Our study has also its limitation. We believe that there were periods expressed in months, not in years, that were affected by the VAT increase; so we planned that next study will analyze monthly or at least quarterly data. Also, the study may be developed for the other European countries and will be interesting to compare the results obtained for South and Central European countries, were the fiscal system is similar with the Romanian one, with results obtained for Western Europe, were the most important taxes as share of GDP are direct ones.

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The role of education in poverty alleviation

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Abstract. *An in depth analysis shows the effects that poverty generates on a nation's well-being by measuring the quality of its human capital. The importance of education as a governmental action against poverty has been broadened. Nowadays, education level is used to measure the poverty rate. School attendance, enrolment and academic level have been correlated with generated income. This paper studies the social and economic effects that poverty inflicts on OECD countries by using relevant indicators to show the relationships between educational level and poverty rate over a ten-year period, proving that there are some academic achievements connected with well-being.*

Introduction

Poverty, through its critical factors that it employs on a nation's prosperity, is one of the key elements that influence macroeconomic policies that governments endorse, as it generates a series of effects upon the fund distribution mechanism, affecting both the source and destination of public financial policies. These elements stimulate the macroeconomic status of a nation, proposing new targets and trajectories for action, thus creating potential for development of the nation's fiscal and budgetary system.

Education is an important element for developing new opportunities and individual empowerment in order to increase a nation's human capital. It is often used by authorities for its potential effects on the financial system, such as the evaluation of income distribution and its ability to provide sustainability.

The paper tries to answer the questions: "Is education a feasible way to end poverty?", "What instruments are needed in order to boost a nation's welfare by developing its human capital?". The subject was chosen due to the complexity of public finance and the multidimensional implications of poverty, as a way to enrich the classic patterns of public resource collection and allocation.

This study was structured based on a logical manner that mirrors a research thesis and focuses on analyzing the potential correlations that might occur between the social and economic indicators that mirror a nation's poverty rate and education levels, trying to prove the beneficial effects that education could have as a governmental instrument for alleviating poverty. In the first section of the paper, the subject was treated on a theoretical level by studying the existing published literature. The second part reviews three multiple regressions based on panel data series that try to prove the statements implied by the main theme. The third part reveals the conclusions of said study, chapter that exposes the results in a synthetic fashion to design a general perspective on the relevant social and economic features.

Literature review

Encountered within published literature, poverty and inequity, considering the interaction between the economic and non-economic criteria that they involve, are one of the most delicate subjects that human society is confronting still represent a pressing issue in most nations around the world – Haushofer and Fehr (2014), Harkness et al. (2012). Under the banner of poverty, there are many factors to be considered, besides the tangible aspect involved, one can discern more collateral components such as access to essential needs. Although many published studies in literature that treat poverty as the main subject are built around – a financial perspective, an in-depth look would suggest that there is a dire need for further analysis beyond this measurement-led conceptualization (Johnson, 2004; Brewer and O'Dea, 2012). In order to understand the various factors that indicate the evolution and dynamics that determine the chronic poverty, one must take into consideration the astringent vulnerabilities of the lower class people, such as basic healthcare, satisfactory sanitation with minimum comfort and adequate nutrition to ensure a proper livability (Brewer and O'Dea, 2012).

Poverty has a number of harmful effects on society, its weight is an indicator that measures a nation's well fare as it can lead to civil unrest, destabilization and unbalance not only from an economical perspective, but also from a social and political standpoint (Craig and Porter, 2003). "What constitutes poverty is neither obvious nor universal" (Green and Hulme, 2005), so in the fight with this phenomenon, the governments cannot adequately identify, quantify, target and suppress the roots and origins from which it spawns. The issue of poverty can be dated back to the ancient civilizations (Hazlitt, 1973), throughout history a set of policies and

measures were created in order to eradicate poverty, but they haven't always had the targeted effect, even this day humanity still struggles with this battle (Mkandawire, 2005). Nowadays the concept has been widened not only as a relatively straightforward concept of quantifiable characteristics, but within the new approach converge more philosophical perspectives including personal competence, potential and freedom (Bradshaw, 2006).

Between myth and reality, theory and practice, the effects that poverty creates on a nation's welfare are mirrored by the value of its human capital (Thrupp, 1999). Human capital, as an aggregate of an individual's abilities and knowledge, is the quintessential factor of its lifetime income (Razzaz, 2001). One cannot underestimate the importance of education in an individual's life, knowledge being a foundation on which a nation's future is built. People without the option of benefiting from basic skills and knowledge that education provides have lower marginal productivity than those with a straightforward access to information, therefore creating a susceptibility towards poverty (Albin, 1970). This vulnerability determines a predictive status-quo of entire groups of individuals, so that the majority of policies that governments apply, in order to decrease the number of persons affected by poverty and social exclusion phenomena, are based on the productive function of education (Abraham and Kavi Kumar, 2008).

Everyone seems to have accepted James Mill's dictum that "if education cannot do everything, there is hardly anything it cannot do". Education is often used by researchers and governments for its economical properties, such as the potential to quantify the income distribution dispersion and to accelerate economic growth, thus it can be regarded as a poverty alleviation policy (Ushadevi, 2001; Psacharopoulos and Patrinos, 2004).

One fundamental direction for the fight against poverty from a governmental point of view is the investment in education, and indirectly, in human capital, towards securing a sustainable future economic development (Ushadevi, 2001). Knowledge and information improve the overall quality of life and increase an individual's productivity, thus creating an environment prone to economic and technologic growth (Blankeneau and Camera, 2009). Studies show that governmental investments in public education have higher social returns by comparison with added benefits at an individual's level, thus at a nation-wide level, the eradication of the vicious circle of poverty could be addressed by increasing the quality of public education (Casse and Jensen, 2009; Blankeau and Camera, 2009).

A starting point for addressing poverty alleviation should be the analytical overview of all poverty factors that can be quantified among a specific group of people, in this case, school children, that would result in an informed perspective upon poverty nationwide. Thus, the governments could use school attendance as both an indicator and a target in measuring and monitoring the poverty rate. It is revealed that basic education attainment and completion rates are higher among the higher level of income groups of individuals and lower among the poor (Filmer and Pritchett, 1999).

Studies suggest that there is a clear correlation between the poverty level of a family and the school outcome of their young mainly because disadvantaged children are more deprived in their quest for higher education than their higher income families counterparts (Plug and Vijverberg, 2005). More research is suggested to be assigned to this subject, as governmental programs and policies would use public resources to unburden poor families, it is important to provide with information on whether family income is the origin for school outcome (Becker and Tomes, 1986; Duncan and Brooks-Gunn, 1997). An in-depth analysis on the returns of public education in the form of human capital quality reveals that students tend to become under-achievers. This problem is faced quite often in public educational systems and can be averted or, at least, dampened by the introduction of alternative incentives, be them positive or negative (Blankenau and Camera, 2009).

One important lesson to be highlighted from the case studies of India and China represents the payoff resulted from the public investments domains such as education, agriculture and infrastructure to the significant reduction of the poverty rate. It is specified that government expenditure on education showed the most significant effect in diminishing rural underdevelopment and regional disparity while boosting production rates (Thorat and Fan, 2007).

From Levin and Riffel's perspective, governments tend to lower the standards of achievement in crucial fields such as science and mathematics to improve the functionality of the educational system in order to strengthen one's abilities to face social and economic challenges.

The negative effect that poverty employs on educational and life accomplishments is debated in numerous studies (Corak, 1998; Connell, 1994) and, although there are theoretical grounds for governmental intervention, the legislative fight does not mirror the seriousness of the impact, current education policy and practice is not helpful as to ameliorate poverty.

According to Casse and Jensen (2009), although public expenditure in primary education cannot be directly associated to poverty reduction or economic gain, investments in secondary and tertiary education programs and policies, in a life-cycle approach, become attractive to lower income groups of individuals, allowing them to benefit sooner or later by distributing the cost of education from a short-term income transfer into a long-term flow of taxes (Crean, 1975). Thus, a solution that could emerge is that a proper redistribution of income to certain underprivileged groups of people could very well create the desired effect to reduce the poverty rate (Crean, 1975).

"A decent provision for the poor is a true test of civilization" (Johnson, 1751). Another way for governments to tackle and combat poverty is through unemployment benefits – a welfare measure designed to prevent relative poverty and to provide a basic income to the jobless. This practice, although initially designed as a mean to fight poverty, actually increases the chances of poverty, "in the mid-70's the Poverty Commission identified unemployment as a major cause of primary poverty" (Saunders, 2002). The leading explanation for this shift can be explained by the lengthier periods of time people were spending out of work, switching from a temporary into a semi-permanent state of deprivation.

The unemployment rate is directly linked with the labor market, thus the greater the opportunities an area has, the more attractive it becomes in the eyes of working individuals. One of the most crucial effects that regional disparity involves is the discrepancy in life quality metrics between rural and urban areas that represents the origin for the process of urbanization (Grimes and Reinhardt, 2015).

Urbanization refers to the ongoing process of population transfer from the rural environment to urban areas that started as a consequence of demographic expansion in the context of technological advancement of the industrial revolution and continues as a direct result of today's globalization. This migration takes place as an individual movement towards an improved well-being.

The development of one's well-being can be directly traced back to education, as a result of its contribution towards individual development and not only as potential earning capacity. Hence, one can quantify poverty not only related to income alone but in conjuncture with achievements in other fields that could eventually contribute to a higher income level. Thus, a determinant factor for an individual's flight from rural to urban areas can be considered the poverty level via welfare perspective (Abraham and Kumar, 2008).

In spite of recent global educational accomplishment increases, rural areas still have significantly reduced school attainment than urban centers. The quality in education is also

diminished in villages due to the lower skill levels required by employers in this area, at the same time the lack in demand of a highly educated workforce is a key motivation for the urban migration. Hence, migration and education have a dependence to one another as proposed by the human capital theory, migration is involved when an area doesn't have adequate educational or employment opportunities. The published literature illustrates a straightforward result of education on household poverty and invalidates, at the same time, the indirect result that migration has on eventual poverty status. As such, migration has little or no impact on poverty status, unlike poverty that has a direct, viable influence on migration (Weber et al., 2006).

In poverty-stricken nations, household often find themselves in the situation of being unable of fulfill their basic needs due to the lack of enough family income, often being forced to otherwise condone and approve to child labor.

Child labor has always been a phenomenon of grave economic and social concern throughout the contemporary world, and, even though it is considered one of the most delicate subjects in modern society, the extent of research on the subject doesn't mirror its consequences. More comprehensive studies propose a shift in perspective on the subject - from a loathsome and immoral practice to an ordinary action derived from extraordinary circumstances (Baland and Robinson, 2000; Basu, 1999). This way, the concept is stripped of any emotional connections, making it possible to be analyzed more accurately, showing that these practices aren't deliberate or intentional, but in fact, involuntary and constrained by the status-quo.

Some studies suggest that the data gathered doesn't outright demonstrate that poverty is the origin for child labor, but "poverty is significantly correlated with the decision to send children to school, and there is a significant negative relationship between going to school and working" (Canagarajah and Harold, 1997). Although poverty levels cannot be unequivocal held accountable for the practice of child labor, it can be viewed as one of the key determinants, because of a faulty resource allocation process that is, in fact, leading to a need of human resource that cannot be met by other means (Grootaert and Kanbur, 1995). These practices come to light even if the parents are entirely altruistic concerning their children. There is an interdependency between the impact of child labor and the inheritance that the offspring stands to receive (Canagarajah and Harold (1997). The impact that labor has on future income is marginally higher to children that stand to inherit large bequests than those cases where there is a balance between family income and future possible heritage, parents investing more in the household's well-being (Baland and Robinson, 2000).

In the case of families that allow their children to work, the returns that education could possibly provide are mostly seen and perceived as marginal versus the immediate effects that such labor produces, in other words, if the earnings resulted from such activities are satisfactory higher relative to a child's "expense", it becomes profitable to raise children while educating them is expensive (Ennew, 1982). Research attests that compulsory education in combination with social benefits could be considerably improving towards underinvested children (Becker and Murphy, 1998). Underinvested children are the result of income-struggling families that cannot afford the development of their human capital.

Compulsory education is suggested as one of the best approaches towards the diminishing of child labor practices due to the ease of creating such legislation as well as enforcing it through school presence. Recent finds show that child labor and education have a more interlaced relationship, not only are they not mutually exclusive but they can be complementary in some cases the children's contributions to family income makes educational attainment possible, though this case can only be taken into account in some extreme cases while the activity is part-time (Basu and Kaushik, 1999). While child labor might be causing drops in school enrollment, the human capital production is dwindled furthermore by shortened study time

and years of school completed (Levin and Riffel, 2000; Levin, 1995). These indicators, school attendance and enrollment, while capable of assessing child labor ratio, cannot quantify for the quality of human capital that can be comprised by the sum between the educational outcomes and individual non-cognitive development (Gunnarsson et al., 2006).

Another course of action that governments can undertake to ensure the abolishment of child labor is by introducing a much more severe legislation to prohibit such activities altogether. This approach, while theoretically more prone to show significant results, is more difficult to implement because of the lack of ways to ensure its compliance (Gunnarsson et al., 2006; Patrinos and Psacharopoulos, 2004).

Although gender equality is, nowadays, a common goal for societies, it is also beneficial from an economic point of view as it increases human capital development and reduces poverty (Morrison et al., 2007).

Gender discrimination is an age-old issue that can be encountered in almost all social fields, most importantly in education and work. It can be traced back to ancient times, the status of women was, almost in all cases, seen as inferior to that of men. Modern societies pay more attention to this phenomenon, thus nowadays we are witnessing a decline in this type of practice, although it is very far from being abolished altogether.

There is a reciprocal connection between inequity and the poverty rate, as shown by the published literature, educational achievement differences can be trailed back to family income. One such a problem is the affordability of education in a household, an issue that poverty predisposed families tend to solve by financing only the male children's education, because of higher perceived returns (Appleton, 1997). The female susceptibility to this phenomenon can be attributed to school underachievement in poor households, qualified by school outcome results in underdeveloped societies versus more developed countries where girls are outperforming boys (Appleton, 1995) for Kenya, Cooksey and Ishumi (1986) for Tanzania. These poor education outcomes come from the fact that schoolgirls from poor environments have extra household tasks to handle than their male counterparts, thus having less study time. Papers show that while girls are less likely to be in school than boys, girls that do get education come from higher-income households and attend higher quality schools, thus gender attendance and gender school outcomes could be used as an indicator not only for the poverty rate but also for the quality of education in an area (Baden et al., 1998; Appleton, 1995).

Another effect of the aggregate between knowledge and income on human capital is the way that people behave. The lower layers of society create an auspicious environment prone to deviant behavior that could possibly lead to delinquency, originated by the uncommonness of fundamental education (Ehrlich, 1975).

Although the published literature is abundant with papers and theses that treat the correlation between delinquency and education accomplishment (Hannon, 2003; Hagan, 1993; Laub and Sampson, 1993), the connections of these two factors with the social status and it's impacts were rarely considered or investigated. In accordance with the subject, two absolutely different theories come to light: the cumulative-disadvantage approach and the disadvantage-saturation hypothesis.

One may find that throughout contemporary research, the common acceptance that education is an important and crucial factor for an individual's behavior and, *in extenso,* his life choices. This obvious connection is highlighted in some studies that analyze the impact of household income and school attendance in connection with offspring behavior, thus, while delinquency has a straightforward negative fallout on school accomplishment, "educational attainment absorbs the negative effect of delinquency on occupational attainment" (Hannon, 2003), balancing it out.

The cumulative-disadvantage hypothesis implies that while the underprivileged have less room for mistakes, they also stand against an unforgiving environment and social stereotyping, idea extrapolated from the inverse of the cumulative advantage theory of Robert Merton (1973). Many studies (Sampson and Laub, 1997; Bushway, 1998) come in support of this claim, showing that social status has a big weight in quantifying one's crime and the extent of the punishment, thus, higher-class delinquent offspring are more likely to "get away with it" than poverty stricken children. As such, the theory speculates that children that come from poor households are inclined to experience more severe consequences after producing an offense.

The disadvantage-saturation (Sulivan, 1989) premise, on the other hand, suggests that the poor not only have lower chances for forgiveness but they also have fewer opportunities for social promotion aside of one's criminal status. The constraints that the disadvantaged youth must face increase proportional with the financial difficulties they encounter, a fact that can lead to a point of saturation, creating a threshold where the possible benefits of delinquency outweigh the opportunities of education. The lack of outcome in social advancement of poor youth that attained school and the hardships they had to overcome could possibly result in a delinquent behavior.

Empirical study regarding the existing correlations between the educational indicators and the level of poverty

Justifying the variables' choice and the aim of the study

In order to highlight the potential correlations that might be visible between the educational and poverty indicators, a panel data model was decided to be used in order to point out the influences that might be exercised among the previously mentioned variables. The panel data model has been chosen as its use facilitates the modeling of a more complex data series to a greater extent than the single cross selections. In this study's case the subjects are 36 countries, reviewed in a ten year time frame thus we decided to use panel data in order to see the aggregate impact of the independent variables on the dependent ones. The pooling eliminates the heterogeneity and individuality of said countries, as they are not equally developed, and fall in different areas of influence (Hsiao, 2007).

In this case, key indicators were chosen and mathematically exposed as time series in order to capture, in a significant way, the social-economic reality of the states included in OECD plus Romania, in the 2005-2014 timeframe. These countries are diversified from a development point of view, as we have highly developed nations on one side, and other, less developed states on the other side. Included in OECD are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Israel, Ireland, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherland, New Zeeland, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States of America.[1]

Although in the first section of the study, some stand points were theoretically exposed regarding the correlations that might appear while enclosing these two areas with high social impact at macroeconomic level, in the second side, we will try to demonstrate these influences in order to see the practical applicability of the analytical background that was previously presented.

As a starting point for this study, some models, extracted from previously and similar studies, were used and otherwise adjusted to suit this paper's needs – in order for both inputs and outputs that conducted to the visibility of the existing correlations. This study will try to find some indicators that express the effects of these social elements – poverty and education – but

also to detect the strength of the existing influences between the dependent and independent variables.

The most important study that was used in this case was the one signed by Weber et al. (2007) which presented the correlation between the migration of the people located in rural areas to urban areas in order to achieve a better life and the poverty level. This number of migrations reported to the local population was significantly influenced not only by the level of education of said individuals, but also by, in smaller degrees, the age, gender, race, family stage and marital status, etc. Another relevant study that was used as reference for the actual research paper is the one signed by Appelton in 1997, in which the author identified the main reasons for such a big gap between women's and men's education in Cote d'Ivoire. There were some indicators chosen based on Brunello and Checchi (2007), indicators that are correlated to the level of knowledge and education of a society's population.

This research paper was created in order to meet the actual problems that a society faces regarding poverty, as well as to indicate possible means to diminish its rate. At the same time, the study proposes the possibility for poverty to be used as an indicator for measuring and targeting the level of education of a nation or area.

The source of the data series

The OECD group was chosen as sample as it comprises of both highly and less developed countries in somewhat equal proportions. Regarding the addition of Romania, the latter has a strategic objective to join the OECD list, so this study could pioneer the following studies that would treat OECD as a subject. In this article, annual data was used, which summarize some economic and social characteristics for the 36 countries that are under the banner of the Organization for Economic Cooperation and Development. The series of data describe a period of ten years (between 2005 and 2014), identifying the mathematic representation of some significant socio-economical aspects.

The data was extracted from the OECD and World Bank database. All the data gathered was represented as ratios in order to keep a similarity between the input observations, so the results could be considered relevant. It must be mentioned that some data was not available in the studied databases, e.g. some countries had some yearly data missing on few indicators.

Describing the model, the equations and the variables used

The research question for the regressions are: If there is a correlation between a welfare indicator, educational attainment and unemployment level, between educational attendance, delinquency level and the number of people in risk of poverty and between the academic achievement, unemployment, a social income segregation index and the number of severely materially deprived people.

As an original element of this study, it could be mentioned that the correlations between social and economic factors in the OECD countries were analyzed, whilst the impact that lower income population has on the academic achievement within the study group was consistently taken into consideration.

This study has three regression equations, that were compiled using Eviews 7 and panel data series. Each of them organized by using four dependent variables. The form of the equations used in the present model can be seen below:

Equation number 1:

$$xt1 = \alpha1 + \beta11 \times yt11 + \beta12 \times yt12 + \beta13 \times yt13 + \beta14 \times yt14 + C$$

Equation number 2:

$$xt2 = \alpha2 + \beta21 \times yt21 + \beta22 \times yt22 + \beta23 \times yt23 + \beta24 \times yt24 + C$$

Equation number 3:

$$xt3 = \alpha3 + \beta31 \times yt31 + \beta32 \times yt32 + \beta33 \times yt33 + \beta34 \times yt34 + C$$

As dependent variables, some indications were used to show the direct effects of poverty on a society's population like: children employed divided by the total number of children with ages between 10 and 14 years, the severely materially deprived people divided by the total population of a state, the population that is in significant risk of poverty divided by the total population and the human development index.

As independent variables, indicators were used that fly off on a tangent with both social and economic areas as follows: the total level of public expenditure with education issued by a state divided by its total governmental expenditure, the total level of public expenditure with social protection issued by a state divided by its total governmental expenditure, the total level of public expenditure with social exclusion issued by a state divided by its total governmental expenditure, the GINI index, the percentage of children out of school from total number of children[2], the educational attainment of the population in the tertiary level divided by the total population, the educational attainment of the population in the primary, secondary level divided by the total population, the report between unemployed persons divided by the total persons that are able to work (considering the International Labor Agency requirements), the number of adolescents[3] that are out of school divided by the percentage of adolescents, the percentage of youth that are not involved either in education, training or work divided by the number total of youth, the number of children out of school divided by the total number of children, the total number of delinquencies that happened in a state during an year divided by the total number of population, the population that is in significant risk of poverty divided by the total population, the percentage of population unemployed that completed just the first level of education divided by the total number of persons unemployed, the percentage of population unemployed that completed just the second level of education divided by the total number of persons unemployed, the percentage of repeaters involved in the first level of education divided by the total persons integrated in the first stage of academic levels.

The first equation presents HDI as the dependent variable while the independent are: the percentage of people that have a highly significant risk of poverty divided by the total population, unemployed persons that have achieved either just the first stage of education, either both first and second divided by the total number of unemployed persons and the number of persons that repeated one/more years in the first stage of education.

The second equation exhibits the GINI index as the dependent variable while the independent are: the educational attainment of the population in the first level divided by the total population, the number of adolescents that are out of school divided by the percentage of adolescents and the completion rate of the people enrolled in the first level of education.

The second equation reveals the total number of delinquencies that happened in a state during an year divided by the total number of population as the dependent variable while the independent are: the educational attainment of the population in the tertiary level divided by the total population, the percentage of children out of school from total number of children and the percentage of people that are not employed divided by the total population able to work

The equations used in this study were as follows:

Hypothesis 1: There is a negative correlation between the percentage of people that have a highly significant risk of poverty divided by the total population and the human development

index. As the HDI is a composite index that shows the well-being of a nation, it is obvious that when the number of people dramatically affected by the poverty effect will rise, the human development index of that country would fall (Easterly et al., 1994; Bentolila and Saint Paul, 2003). Regarding the interaction between the human development index and the number of unemployed persons that have achieved either just the first stage of education, either both first and second divided by the total number of unemployed persons, one can identify a negative correlation. Anyhow, between a higher unemployment rate and the HDI there is a significant correlation in an opposite way, more that the level of well-being of a country is also measured through its employment rate. It needs to be pointed out that in the period of time that had been chosen in this study, the effects of the 2007-2008 economic crisis were dramatically felt, so the number of unemployed persons in said period have dramatically risen, resulting that this indicator is without a doubt important in the socio- economical analysis. There are lots of studies in the economical literature that had shown the negative effect of the unemployment on the well-being of a nation, such as Winkelmann et al. (1998), Sulivan et al. (2009), Classen et al. (2012), which had shown the significant correlation between the unemployment rate and the GDP per capita (indicator that is traditionally used in the literature in order to express the well-being of a nation). It needs to be pointed out that in the HDI calculation formula the level of health of a country's population is taken into consideration. There are some studies in which the negative impact of a high unemployment rate upon the health of a population within a state is shown, either at a micro level (regarding the exactly persons that lost their jobs (Clark et al., 2002) either at a macro level – as a high unemployment rate would create an unbalance on the entire national psyche (Reifschneider, 2007). Regarding the number of persons that repeated one/more years in the first stage of education, it needs to be said that a high number would definitely be a warning sign for the governmental institutions- why are there so many repeaters in the educational system? Which is the cause of the phenomenon? How can it be solved? – and the main causes would be: the low income of the family of the children (Levin and Riffel, 2000; Broucker and Lavallde, 1998), the discrimination and/or social exclusion (Appleton, 1997), the quality of education provided at school – if these levels are too high, there might be a collective abort (Levin and Riffel, 2000), etc.

Hypothesis 2: The correlation between the GINI index and the ratio of persons with a severely material deprived situation. The GINI index was created in order to measure the income/ wealth distribution through the residents of a state in order to quantify the level of inequity that might exist into a nation- International Labor Office (2010). The greater a nation's GINI index is, the more inequity is felt in that particular nation. It needs to be mentioned, in this case, that the values of the GINI indicator are spread between 0 and 1 and that 0 means the lack of inequality between the distribution of income through the residents of a state, while 1 means the absence of equality between the wealth dispersed between the population of a state. In this case, we can mention that ,based on the definition of the GINI index previously mentioned, the higher the value of the GINI indicator is, the more people that have a severely lack of income should be. Also, in the first chapter, we proved that there is a highly significant connection between the school attendance and the family's income, so we can sustain that there should be a positive correlation between the total number of adolescents that left the school (measured as percent of total adolescents) and the number of persons that have a severely material deprived situation (Fan, 2004; Plug and Vijverberg, 2005). Regarding the same dependent variable – the number of persons that have a severely deprived situation divided by the total number of population and the completion of the first level of education and the school attendance at the first level, a negative correlation was assumed to be. Because of the family's income, more and more children decided to leave the school from very small ages. In this case, the attendance and completion of the first level of education should be significantly affected (Becker and Thomas, 1985; Appadurai, 2002).

Hypothesis 3: Between the number of people that are in risk of poverty divided by the total number of population and the unemployment rate, there should be a direct correlation, so the more people are in risk of poverty, the more the number of people that do not work is (Hong and Ahmed, 2009; Casse and Jensen, 2009). Regarding the delinquency rate and the number of people that are in poverty risk, there should also be a direct link as the studies showed that the lack of income affects people behavior (Abraham and Kavi Kumar, 2008). Regarding the educational attainment at the third level and the number of people that are in poverty risk divided by the total number of people there is a negative correlation, as the studies showed, the higher the poverty level is the lower the school tracking, attendance and the completion of the school levels is (Blau, 1999; Cameron and Taber, 2001).

The regressions analysis

Hypothesis 1: The regression equation has as dependent variable – HDI, and as independent variables: the percent of unemployed individuals that completed the first level of education from the total population; the percent of unemployed individuals that completed the second level of education from the total population; the percent of repeaters in first level education from the total of pupils, and the percent of people that are in risk of poverty from the total population.

Table 1. *Hypothesis 1 results*

Indicator	Coefficient
Unemployment_secondary level of education	-0.001783***
Unemployment_first level of education	-0.001330***
Repeaters_first level of education	-0.005763***
People_risk_poverty	-0.003067***
C	1.080962***
R^2	0.77
Observations	119
F-stat (p-value)	96.60 (0.00)

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.001$.
Source: made by the author based on the results from Eviews outputs.

Based on the results shown in Table 1, that corresponds to Hypothesis 1, all the variables of this regression are valid, as all the probabilities associated with them are less than 1%. This study showed that there is a negative relation between all the independent and the dependent variables thus, in this case the hypothesis of the study is validated based on the output obtained and presented previously in the Table 1. That would mean that when the percent of unemployment people that completed the first or secondary level of education from the total population would rise with 1 unit, the HDI would diminish with 0.001330 or respectively 0.001783. Also, if the percentage of people that are in poverty risk measured at the total number of population would increase with 1 unit, then the HDI would fall with 0.003067 units. Because of the value of 0.77 of the R^2, the level of correlation between the variables from this regression is highly significant, as such we can state that the present study is valid. Although this value is not even close to the maximum of 100%, it represents a considerable value, as the type of the model is panel. In other words the R2 value shows that the total variation of the dependent variables is explained by the approximately 77% variation of the independent variables. Also, we can claim that the present test is valid as the probability associated with the Fischer test is of 0 and, although the high F-stat value means that the data does not well support the null hypothesis, meaning the alternative hypothesis could be compatible with the observed data, the results support Hypothesis 1, thus, in these circumstances we accept the first hypothesis as being true.

Although the value of the coefficients is not a considerable, while explaining this regression, one must take into consideration that the HDI is an composite index and its value depends on a lot of factors, so, the factors that we presented previously are just a small part of its calculation formula, so these values for the coefficients were expected.

Table 2. *Pearson's correlation matrix for Hypothesis 1*

Correlation	Unempl_prim	Rep_first	People_risk	HDI	Unempl_sec
Unempl_prim	1.00				
Rep_first	0.06+	1.00			
People_risk	0.14+	0.31***	1.00		
HDI	0.05+	-0.38***	-0.79***	1.00	
Unempl_sec	-0.87***	-0.03+	-0.08+	-0.22**	1.00

$*p \leq 0.1$; $**p \leq 0.05$; $***p \leq 0.001$; $+p > 0.1$.
Source: made by the author based on the results from Eviews outputs.

Pearson's correlation coefficient shows the association between two variables, effectively measuring the strength of the linear relationship through a value that ranges from +1 to -1. A positive correlation (>0) indicates that the two variables share the same direction, moving in a linear pattern. As the value moves closer to +1, the positive relationship between the variables is tighter, similarly, the closer the value gets to -1, the stronger the negative relation is (Artusi et al. (2002). Based on the results in Table 2, there are some independent variables that have a negative high correlation, such as unemployment with primary education and unemployment with secondary education or HDI with people at risk of poverty. In both cases, the variables were expected to be correlated, in the first case, both indicators have total number of unemployed people as common denominator, in the second case, HDI has in its base for calculation the number poor people. A high correlation is considered when the correlation coefficient is higher than 0.7, therefore, one must take into consideration the presence of a strong relationship between the variables. In this scenario, as mentioned previously, HDI is a composite index and its formula takes into consideration the number of people that might be in risk of poverty.

Table 3. *Descriptive statistics for Hypothesis 1*

Indicator\Value	Mean	Median	No. of observations
Unempl_prim	29.49	28.90	119
Rep_first	1.14	0.75	119
People_risk	24.42	20.60	119
HDI	0.86	0.87	119
Unempl_sec	52.41	52.9	119

Source: made by the author based on the results from Eviews outputs.

According to the mean and median data for the "unemployment with primary level of education" variable, the mean value is higher than the median, revealing that the data set is swayed to the left. The observations determine that the average value of the variable reported in each of the studied countries is 29.49% and the median value, that can be found at exactly the middle point of the data series, is 28.90%. The fact that these statistics have similar values translates to a high precision data set with little or no discrepancies.

For the variable "repeaters in the first stage of education divided by the total number of the ones that are enrolled in the first level of education", both mean and median values have very low quantum, 1.14 for the mean value and 0.75 the median. As such, because the mean is lower than the median, the data series is inclined to the left. As expected, based on the low values of these statistics, we can conclude that there are not that many individuals that repeat one or more years of the first stage of the educational level. This fact can be explained

because the first stage of education provides the basic knowledge to the people, the courses are easy and it is free and compulsory is free and compulsory for each and every of the countries involved in the study.

In the case of the variable that represents the "number of people that are in risk of poverty", the mean and median value have a higher gap that can be explained by the disparity between the development level of the studied countries, that range from emerging to developed countries. In the emerging countries, the percent of people that are in risk of poverty is usually higher than that of the countries that have well established economies. As the mean value of the series is about 24.42, this is the most common percent of people that are in risk of poverty. Also, because of the lower value of the median compared to the mean, there are more deviations in the right side of the series, that imply there are some countries (perhaps the less developed) that have higher percent rates in the previously mentioned variable.

Regarding the HDI variable, one can state that, because its mean and median values are very close, (respectively 0.86 and 0.87) it reveals a data series without that many outliers, thus, the data set is stationary.

In reference to the data set that reveals the "number of unemployed people with the secondary level of education graduated divided by the total number of unemployed people", both mean and median values are very close. But unusually, the results show that the percent of the people unemployed that have graduated the secondary level of education is way higher than the mean and median values of the people that have graduated just the first level of education and are not employed. This is a very interesting point of view and brings the opportunity for further research as this is not a common or anticipated phenomena. It is expected that the higher educational level somebody achieves, the greater the chances he would get for obtaining a job. In order words, this study reveals that there is a higher percent of unemployed people with secondary level of education than those that have graduated the first level of education. This fact could be perhaps explained by thinking that the people with lower studies accept with ease under paid jobs, as compared to individuals that have a higher level of education and will try to get a better job, thus they rather be unemployed than having a job that doesn't suit their needs.

Hypothesis 2: The regression equation has as dependent variable – severely materially deprived people, and as independent variables: GINI index, percent of educational attainment in first level education from the total of population, the percent of adolescents out of school from the total population and the completion rate from the total number of pupils in first level education.

Table 4. *Hypothesis 2 results*

Indicator	Coefficient
GINI	1.449070**
Educational attainment at first level	-1.274874***
Adolescents_out of school	1.696870*
Completion rate_ first level of education	-1.095827*
C	192.63**
R^2	0.56
Observations	52
F-stat (p-value)	15.18 (0.00)

*p ≤ 0.1; **p ≤ 0.05; ***p ≤ 0.001.
Source: made by the author based on the results from Eviews outputs.

Even though the value of R^2 is not a substantial, at just 56.37%, we can assume that because of the panel type of the model, it represents a significant value, so we can assume that the total variation of the dependent variables is explained by the independent ones. Also, the test proves valid, as the probability associated with the Fischer test is 0.Although the high F-stat

value means that the alternative hypothesis is compatible with observed data, the results still support the second hypothesis.

Based on the results shown in Table 4, we can assume that when the GINI index would rise with 1 unit (so the level of inequity would dramatically grow) then the percentage of the people severely materially depreciated in the total number of population would rise with 1.44 units. Regarding the educational attainment at first level, we can assume that, when this ratio will drop with 1 unit, that would cause an increase of the percentage of the people with very low income levels in the total level of population. Also, the completion rate of the first level of education seriously affects the percentage of people that have severe issues with the personal wealth. While the completion rate would diminish with 1 unit, the percentage of those people previously mentioned would rise with 1.09 units measured as percent in the number of total population. Regarding the percentage of adolescents that left the school in the total number of adolescents, we can assume that if their number would rise with 1 unit that would have a highly significant impact of 1.69 units on the percentage of the people with very low-income levels in the total level of population. Based on the facts mentioned above and mathematically revealed in the Table 4, the second hypothesis of the study is validated.

Table 5. *Pearson's correlation matrix for Hypothesis 2*

Correlation	Severely_dep	GINI	Adol_out	Educ_att_pr	First_compl
Severely_dep	1.00				
GINI	0.66***	1.00			
Adol_out	0.32**	0.24*	1.00		
Educ_att_pr	-0.51***	-0.64***	-0.27**	1.00	
First_compl	-0.14+	0.10+	-0.47***	-0.34**	1.00

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.001$; +$p > 0.1$.
Source: made by the author based on the results from Eviews outputs.

Based on the results in Table 5, there are some variables that have a positive high correlation, such as GINI index with the severely materially deprived people and there are some that show a negative correlation – GINI indexes educational attendance at first level. In both cases, the indicators were expected to be correlated, in the first case, as GINI has, as its defining limits, the severely materially deprived people on one end and the wealthy people on the other, in the second case, as described in literature review, the family income affects school attendance (Becker and Tomes, 1986; Duncan and Brooks-Gunn, 1997).

A strong correlation was expected to show up between the number of severely materially deprived people and the educational attendance at primary level as people that have a very low income per capita in the family usually don't pay that much attention to their family members education, as opposed to the income that family member could bring to the household. In this case, the parents tend to rather influence their children to work, than study. It needs to be mentioned that in the present study a high correlation is considered if the coefficients of correlation from Pearson's matrix are in high proximity of 0.7, thus the 0.66 value that represents the correlation coefficient between the GINI index and the severely materially deprived people or 0.64 which is the correlation coefficient between the GINI index and the educational attendance at first level of education translate in an almost thigh correlation, that can be attributed to the way the GINI index is calculated. Thus, if these previously mentioned indicators – such as the quantum of income per capita and the level of education of people in a country are taken into consideration while calculating the GINI index, itis anticipated that there is a strong correlation between the previously mentioned variables.

Table 6. *Descriptive statistics for Hypothesis 2*

Indicator\Value	Mean	Median	No. of observations
Severely_dep	17.84	11.30	52
GINI	33.35	34.50	52
Adol_out	2.77	1.72	52
Educ_att_pr	94.10	96.10	52
First_compl	98.43	98.53	52

Source: made by the author based on the results from Eviews outputs.

Between the mean/median values for the "number of the severely materially deprived people divided by the total number of persons in a country" variable there is a significant gap, thus these values reveal that this data set has some deviated values. As the mean value is higher than the median the deviations can be found in the right side of the data series, resulting in the fact that there are countries where the number of the severely materially deprived people is way higher that in others. This fact can be easily explained by the gap in development the studied countries show.

Regarding the GINI index, as with the HDI index studied before, its mean and median values do not present such a big gap between them. This can be explained as the calculation basis for both these indexes was not changed during the period that the data for the study was extracted, thus there are not that many discrepancies. In order to clearly see the impact of the governmental policies for reducing the income gap between social classes, a longer period of time should have been taken into consideration, or some gaps should've been introduced in the data series.

The variable "percent of the adolescents out of school in the total number of adolescents" displays a mean value of 2.77%, and a median value of 1.72%, results that show most of the countries drive the mean value higher that the median. The data set is inclined to the median's right.

Regarding "educational attendance at first level" variable, there is a very high percent of attendees to the first level of education. This fact was expected, as this level of education is compulsory for all citizens in a country as it provides basic knowledge to the people. As the mean and median values have a low gap between them, almost all the people in a country have/ had attended first stage of education.

As with the case of the previous variable, the "completion level of the first stage of education" has a value in close proximity of 100%, and, at the same time, very close mean/median values, concluding that almost all the people that attended to the first level of education also graduated it.

Hypothesis 3: The regression equation has as dependent variable – the percentage of people in risk of poverty from total population, and as independent variables: the ratio of delinquencies divided by the total number of population, the percent of educational attainment at tertiary level from the total population, the percent of children out of school from the total population and the unemployment rate out of the total labor force.

Table 7. *Hypothesis 3 results*

Indicator	Coefficient
Total number of delinquencies_%total number of population	4.24987***
Educational attainment at tertiary level	-0.562970***
Children out of school	2.059202***
Unemployment rate_labor force	0.471970***
C	25.1440***
R^2	0.68
Observations	125
F-stat (p-value)	66.62 (0.00)

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.001$.
Source: made by the author based on the results from Eviews outputs.

The test proves valid, as the probability associated with the Fischer test is 0. Although the high F-stat value means that the alternative hypothesis is compatible with observed data, the results still support the second hypothesis.

Based on the value of the coefficients from the previous table, we can assume that at a rise of one unit of the percent of delinquencies in the total number of population indicator, the level of population that is on poverty risk divided by the total number of population will grow with 4.24 units. Regarding the educational attainment at tertiary level, we can assume that at the event of its fall with 1 unit, the percentage of people that are in poverty risk in the total number of population would rise with 0.56 units. Regarding the percentage of the children out of school in the total number of population, we can assume that at the rise of this indicator with 1 unit, the dependent variable would be impacted with 2.05 units. Regarding the unemployment rate, we can assume that at a growth of its value (calculated as percent from total active population), the level of people in risk of poverty in the total number of population would rise with 0.47 units. Based on the information mentioned before and also by analyzing the values provided in the Table 7, the hypothesis of the study is confirmed based on the results obtained and presented in the previous table.

Table 8. *Pearson's correlation matrix for Hypothesis 3*

Correlation	People_risk_ poverty	Delinquencies_ t_pop	Edu_att_ third	Children_ out _school	Unemployment_t_ labor
People_risk_poverty	1.00				
Delinquencies_t_pop	0.54***	1.00			
Edu_att_third	-0.61***	-0.13+	1.00		
Children_out _school	0.57***	0.28***	-0.37**	1.00	
Unemployment_t_lab or	0.37***	0.47***	-0.17**	-0.09+	1.00

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.001$; +$p > 0.1$.
Source: made by the author based on the results from Eviews outputs.

Based on the previous table, it can be said that there are some independent variables that have a high correlation, such as people in risk of poverty with children out of school and educational attendance at third level with people in risk of poverty. Regarding the educational attainment at the third level and the number of people that are in poverty risk there is a negative correlation, as the studies showed, the higher the poverty level is the lower the school tracking, attendance and the completion of the school levels is. The correlation between the number of children out of school and the people in risk of poverty is expected, as described in literature review, the family income affects school attendance (Becker and Tomes, 1986; Duncan and Brooks-Gunn, 1997). Based on the literature review presented in the first chapter of the paper, a strong positive correlation between the number of delinquencies and the number of people in poverty risk was expected. At the same time, it is expected that a strong negative correlation between the percent of people that graduated university studies and the percent of people in poverty risk should exist, mainly because the higher an individual's level of education is, the better the chances of having a higher income, reducing the likelihood of poverty.

Table 9. *Descriptive statistics for Hypothesis 3*

Indicator\Value	Mean	Median	No. of observations
People_risk_poverty	24.56	20.80	125
Delinquencies_t_pop	0.12	0.10	125
Edu_att_third	25.91	27.29	125
Children_out _school	1.80	1.00	125
Unemployment_t_labor	8.91	8.00	125

Source: made by the author based on the results from Eviews outputs.

Based on the results outlined in the previous table, it can be said that regarding the series, educational attendance at third level education completion, they are leaning to the right, while the rest are inclining to the left.

As mentioned before, there is a high gap between the mean and median value for the "number of people that are in poverty risk divided by the total number of people in a country" variable, due to the level of development of the countries that were chosen as subjects for the present test.

The variable "number of delinquencies reported by the total number of population", was expected to yield subunitary results, as the nations have the need to drive this particular variable's value to a minimum or even to 0. As the mean and the median values don't show a big gap, the OECD policies for combating the criminality and dropping the number of delinquencies are uniformly applied and their effects are almost the same among all the nations involved in the 2005-2014 – time frame.

Observing the variable "number of children that are out of school from the total number of children in a country" one can easily see that the, data set is swayed to the right, and that there are more consistently values in the right side of the data series, after the median value. This aspect can be attributed to the development level of the countries involved. Kaufmann and Siegelbaum, revealed in their 1997 study that the crime rate is higher in emerging countries than in more developed nations.

Regarding the "educational attendance in the third level" variable, the mean and median values do not show a great gap, as the mean value is 25.91% and the median is 27.29%. From these values it is revealed that the data series is inclined to the left and that there are much more values with mathematical impact that are located to the left side of the median value, creating a lower mean value. In other words, in OECD countries and Romania, between2005 and 2014 almost 25.91% of the people attended to university.

By studying the data series that reveals the "percent of the unemployed people in the total people that are able to work", based on the requirements of the International Labor Agency, in OECD countries and Romania, in the 2005-2014 period, almost 8.91% of the people that were able to work did not have a job. Also, it is visible in Table 9, that there is an almost 1% gap between the mean and the median value, and, although it's not big, it can be assigned to the differences in development of said countries that were selected for this paper.

Conclusions

This study empirically analyzes the correlations between some socio-economic indicators from the area of poverty and regarding the educational field in the OECD countries in the period 2005-2014. The results of the study were highly relevant, so we can assume that there are some strong connections between the social and the economic aspects both at micro and macro levels. We can assume that there are some social indicators that have a highly significant impact on the economical ones, but there are also some quantifiable indicators which have a big influence on some relevant aspects of the society's life.

In this study, in the first chapter, we theoretically analyzed some connections between the poverty rate and the educational level, trying to understand the source and the impact of the input given by an indicator on other's indicator's output.

Then, we tried to practically apply the connections that we discovered in the theoretical part, so we can have a clear view of the impact that the education has on the poverty rate. We discovered that the educational level at macroeconomic perspective and the income of the families are highly correlated, that the child labor caused by the lack of the money of the

families affects children's education, that the school tracking, school attendance and completion of education affects the level of poverty, etc.

Further research

Based on the complexity of this study, we can assume that there are many directions in which this study can be extended and developed. We could analyze how the distribution of the hours spent by the children in school/at work would affect the poverty level. But, in this case, it needs to be mentioned that there are some studies in which the authors have highlighted that the most important is the quality of hours spent the children in school and not their quantity- so this would be a limitation of a future model.

There are also others indicators like gender, age of completion school, age of starting school, number of years of compulsory education can be used in further studies on the educational side of this study. In the area of "poverty" of the present study, we assume that there are some other significant indicators that could have been used in order to show the existence and persistence of poverty in the OECD countries, indicators like: the value of the minimum wage, the distribution on the Lorenz curve of the data used in the present study as a validity of the test, etc.

Notes

[1]   https://www.oecd.org/about/membersandpartners/
[2]   Children were considered the individuals whose age is between 10 and 14 years old.
[3]   Adolescents were considered the individuals whose age is between 14 and 16 years old.

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