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# The importance of the transition to IFRS for insurance companies in Romania

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**Abstract.** *Despite the ongoing debate on the difficulties of harmonizing national accounting systems from different countries or different areas belonging to national economies and the fact that much of accounting standards is still a dynamic and continuous process improvement in the IASB the adoption of IFRS are included in the new policy for the globalization of the world economy, allowing both external partners (customers, investors and supervisors) and representatives of companies involved in this process (shareholders, managers, analysts) have access to a new category of information with a higher level of quality and transparent.*

**Keywords:** IFRS, national accounting system, insurance company, insurance market.

**JEL Classification:** G22, M49.

## 1. Background on the transition to IFRS for companies in Romania

International Financial Reporting Standards (IFRSs) is a set of rules published as standard by the International Accounting Standards Board (IASB), the body that is involved in developing globally in the public interest, a single set of financial reporting standards, high quality, easy to understand and interpret applicable and accepted by the majority of economic entities, based on clear principles enunciated.

IASB, based in London, was founded in 2001, being elected, supervised and funded by the IFRS Foundation, which in turn is financed through national funding schemes which include fees and payments from standardization bodies and regulators, international organizations, and other accounting bodies. Since the beginning of IASB activity, the number of countries using IFRS or undertake to adopt IFRSs has increased substantially, IFRS Foundation focusing on encouraging and supporting a consistent global adoption of IFRS. Thus, according to the latest estimates, due to the collection and processing of information globally, out of a total of 154 countries analyzed with reference to economic entities listed on the domestic stock market:

- 24 countries prohibit IFRSs;
- 26 countries permit the adoption of IFRSs;
- 11 countries compel certain economic entities to adopt IFRSs;
- 93 countries undertake to all economic entities to adopt IFRSs.

### 1.1. How to implement new standards in the Romanian legislation

In Romania, companies listed on the BSE (regulated market) are required to apply Financial Reporting Standards (IFRS - International Financial Reporting Standards) from fiscal year 2012. According to OMPF 881/2012 of 25 June 2012 on application by companies whose securities are admitted to trading on a regulated market, International Financial Reporting Standards, published in the Official Gazette no. 424 of 26 June 2012 from the financial year of 2012, companies whose securities are admitted to trading on a regulated market are required to apply International Financial Reporting Standards (IFRS) in individual annual financial statements.

The 1286 O.M.P.F. of 1 October 2012 for the approval of accounting regulations in conformity with International Financial Reporting Standards applicable to companies whose securities are admitted to trading on a regulated market, published in Official Gazette no. 687 of 4 October 2012, as amended and supplemented, International Financial Reporting Standards (IFRS) are standards adopted under the procedure laid down in Regulation (EC) no. 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards.

To be applicable to entities in Romania and in other EU countries, accounting standards issued by the IASB are subject to review at EU level and formal voting in committees established at this level especially, the ending by issuing Community regulations adopting the standards.

Regulation (EC) no. 1606/2002 aims adoption and use of international accounting standards within the European Community to harmonize the financial information submitted by entities applying IFRS to ensure a high degree of transparency and comparability of financial statements and, therefore, operation efficient capital market and the Internal Market Community.

As defined in Regulation (EC) no. 1606/2002, International Accounting Standards means the International Accounting Standards (IAS), International Financial Reporting Standards (IFRS) and interpretations corresponding (SIC-IFRIC interpretations), subsequent amendments made

to these standards and interpretations in future standards and related interpretations issued or adopted by the International Accounting Standards Board (IASB).

European Commission decide on the applicability within the Community of international accounting standards with the procedures, principles and criteria of the Commission.

All European regulations adopting international accounting standards issued by the IASB issued under Regulation (EC) no. 1606/2002. The latest official consolidated text which contains the text of international accounting standards approved by the EU adopted under Regulation (EC) no. 1606/2002, approved by the Commission Regulation 1606/2002 (EC). 1126 of 3 November 2008 for adopting certain international accounting standards.

Following the publication of Regulation (EC) no. 1126 of 3 November 2008, as international standards suffered IASB amendment made by the issuing body or as the IASB has published new standards, as appropriate, the European Commission issued the Community regulations that have been adopted these amendments or new standards for use by European entities.

On the basis of Order no. 881/2012 companies whose securities are admitted to trading on a regulated market are required to apply International Financial Reporting Standards (IFRS) in individual annual financial statements since 2012. Under the O.M.P.F. 1121/2006 these entities were option (but not obliged) to draw up a separate set of financial statements in accordance with IFRS for users other than state entities. It has made a transition from voluntary application of IFRS mandatory application.

Order 881/2012 repeals Article 4 of Decree 1.121 / 2006 requesting entities applying IFRS to prepare financial statements and comply with national accounting regulations. Standards issued by the IASB are subject to an approval process at EU level. The companies covered by the Order 881/2012 should follow the reporting date stage adoption of standards, interpretations (or their amendments) in the European Union under the procedure laid down in art. 6 par. (2) of Regulation (EC) no. 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards. If certain standards are approved by Regulation published in the Official Journal of the balance sheet date but before financial statements signing these can be used to the extent that early application is permitted by the Regulations and approved standard.

Entities covered by the Order 881/2012 shall prepare and publish separate financial statements under IFRS in Romanian and in national currency. Annual financial statements prepared under IFRS for the year 2012 are subject to statutory audit. Concerned entities should ensure continuity of application of IFRS, even in the event that further their securities are not admitted to trading on a regulated market.

## 1.2. Relevance of the transition to IFRS to the banks

Issuance of Order 881/2012 confirms the growth strategy of the scope of IFRS in Romanian economic environment. Since the year of 2012 credit institutions (banks, credit unions, savings and loan banks in the housing and mortgage branches of foreign banks in Romania and the Romanian foreign credit institutions) are required to apply IFRS as accounting basis. Also, according to Order no. 116 of 21 December 2011 entities authorized, regulated and supervised by C.N.V.M. – actual A.S.F. (financial investment companies, investment management companies, collective investment schemes, central depositories, clearing houses and market operators / system) are required to prepare for the years 2011 and 2012, for information, a second set of annual financial statements in accordance with International Financial Reporting Standards, situations that are obtained by restating the information presented in the annual financial statements prepared in accordance with national regulations. Order makes clear that the financial statements prepared under IFRS are intended solely for use by those entities, their shareholders and C.N.V.M. – actual A.S.F. and it can't be

invoked as the basis of investment decision. Based on this order, entities regulated and supervised by C.N.V.M. – A.S.F. are required and disclosure differences between accounting treatments according to national and treatments provided by IFRS financial statements for each element along with corresponding explanations.

According of Order No. 1121/2006, companies whose securities at balance sheet date are admitted to trading on a regulated market consolidated financial statements are prepared in accordance with IFRS. The consolidated financial statements of credit institutions are increasingly prepared according to IFRS. Other public interest entities (as defined in the Accounting Law) can be consolidated financial statements under national regulations consistent with the Seventh Directive or under IFRS.

In this regard, the following should be considered:

- Rules of development, approval, audit, filing and publication of financial Situation.
- Issues relating to Directors' Report.
- Rules of evidence of the economic and financial operations.
- IFRS - Chart of Accounts including the content and rules of the accounts as well as the transposing balances.
- Additional requirements presentations of the IFRS requirements.

The Official Gazette (Part I) no. 857 of 18 December 2012 was published Ministry of Finance Order no. 1690 amending and supplementing certain accounting regulations, including amendments to the provisions of Order no. 1286/2012. This order introduces a number of accounts to reflect transactions and events in accordance with IFRS and contains a number of additional provisions relating to registration of restating the end of 2012, reporting requirements for entities that have opted for a financial year other than the calendar year, how to record income tax under IAS 12, capitalization of expenditures and Recognition of income from services, recognized according to the stage of completion of the transaction at the end of the reporting period and contractual revenues associated with the contract construction, recognized according to the stage of completion of the contract at the end of the reporting period and that have not been charged yet.

Entities that have opted for a financial year different from the calendar year prepare annual financial statements resulting from reprocessing and situation including the results of the Restatement, the date chosen for their preparation. Therefore, if these entities at 31 December 2012, the annual accounting reports referred to in art. 37 of Law no. 82/1991, as amended and supplemented, was based on information from accounts held under the accounting regulations compliant with Directive IV - the European Economic Communities, approved by Ministry of Public Finance no. 3.055 / 2009, as amended and supplemented.

The Official Gazette of Romania, Part I no. 100/2013 was published Order of the Ministry of Public Finance no. 213/2013 regarding the completion of the Accounting Regulations compliant with International Financial Reporting Standards applicable to companies whose securities are admitted to trading on a regulated market, approved by Order no. 1286/2012 (Order no. 213/2013).

If credit institutions apply Order no. 27 approving accounting regulations compliant with International Financial Reporting Standards ("IFRS") as amended and supplemented. NBR Order no. 27/2010 is applicable to all credit institutions which run their activity in Romania, including branches in Romania of foreign credit institutions and foreign branches of credit institutions, Romanian legal entities.

Recently, the Ministry of Finance has proposed on 23 October 2014 for discussion, two projects as follows:

- Project - Order approving the Accounting rules regarding the individual annual financial statements and the consolidated annual financial statements, and

- Project - Order regarding the amending and supplementing of the Accounting rules according to IFRS applicable to commercial companies whose securities are admitted to trading on a regulated market.

These rules will translate into Romanian legislation, starting on January 1, 2015 the provisions of Directive 2013/34 / EU of the European Parliament. Thus, during the implementation of these rules, it will consider and review accounting treatments to ensure their consistency with the treatment provided by IFRS on accounting policies, the introduction of new accounts distinct, strengthening jointly controlled entities and other aspects (for companies whose securities are admitted to trading on a regulated market) and additional requirements for information to be reported (for companies whose securities are admitted to trading on a regulated market).

### 1.3. Adoption of IFRS by the Romanian insurance market

The application of IFRS in the insurance-reinsurance market has started since 2012 by organizing a pilot group made up of the top 10 insurance companies, reinsurance based on gross written premiums, which went through a gradual process of transition to IFRS. Companies initially included in this pilot project are:

- Insurance Reinsurance Company Astra SA;
- Allianz-Țiriac Insurance SA;
- Omniasig Vienna Insurance Group SA;
- Groupama Insurance SA;
- Romanian Insurance - ASIROM Vienna Insurance Group SA;
- Generali România Insurance Reinsurance SA;
- UNIQA Insurance SA;
- ING Life Insurance SA;
- BCR Life Vienna Insurance Group SA;
- Metropolitan Life Insurance SA.

On 9 July 2014, the FSA – ex ISC published a draft rules for the application of International Financial Reporting Standards by insurance-reinsurance companies, whereby these companies will prepare and publish annual financial statements prepared in accordance with IFRS as basic individual single accounting, beginning with fiscal year 2015. Within the meaning of Rule, IFRS means the standards adopted under the procedure provided for in art. 6 par. 2 of Regulation No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application on the international accounting standards.

To ensure the opening balances at 1 January 2015, presented in the statement of financial position at 31 December 2014, the insurance companies will do the restatement according to IFRS accounting principles Scheduled in accounting information organized of in accordance with European directives compliant accounting insurance domain, approved by Order of the Insurance Supervisory Commission no. 3129/2005, with subsequent amendments and completions.

For the pilot group companies, mentioned above, which compiled, published and submitted to the FSA, the Second set of financial statements in accordance with IFRS opening balances for the financial year 2015 will be the balances of closing of the financial year 2014, taken from financial statements prepared in accordance with IFRS.

## 2. The general implications of the transition to IFRS as a basis of accounting.

International Accounting Standards Board (IASB) took the beginning of its all International Accounting Standards (IASs) issued by its predecessor, the Council of the International

Accounting Standards Committee, publishing and current rules adopted as standard called International Standards Financial Reporting (IFRS).

The term “International Financial Reporting Standards” includes IFRSs, IASs and interpretations issued by the Interpretations Committee (IFRIC) or the former Standing Interpretations Committee (SIC).

Develop an International Financial Reporting Standards involves a process of open public debate and an assessment of the technical elements of the input data obtained through various mechanisms, IASB publishing for public comment and discussion document an exposure draft for each standard. Opportunities for stakeholders to participate in the development of IFRSs include the following:

- Participation in working groups, public hearings and the preparation of projects;
- Submission of comment letters in response to projects and documents on display.

Full list of international standards, according to the official rules issued on 1 January 2013, which includes standards that come into effect after this date, is as follows:

- IFRS 1 – First-time Adoption of IFRS;
- IFRS 2 – Share-based Payment;
- IFRS 3 – Business Combinations;
- IFRS 4 – Insurance Contracts;
- IFRS 5 – Non-current assets held for sale and discontinued operations;
- IFRS 6 – Exploration for and Evaluation of Mineral Resources;
- IFRS 7 – Financial Instruments: Disclosures;
- IFRS 8 – Operating Segments;
- IFRS 9 – Financial Instruments;
- IFRS 10 – Consolidated Financial Statements;
- IFRS 11 – Joint Arrangements;
- IFRS 12 – Disclosure of Interests in Other Entities;
- IFRS 13 – Fair value measurement;
- IAS 1 – Presentation of Financial Statements;
- IAS 2 – Inventories;
- IAS 7 – Statement of Cash Flows;
- IAS 8 – Accounting Policies, Changes in Accounting Estimates and Errors;
- IAS 10 – Events after the reporting period;
- IAS 11 – Construction Contracts;
- IAS 12 – Income Taxes;
- IAS 16 – Property, plant and Equipment;
- IAS 17 – Leases;
- IAS 18 – Revenue;;
- IAS 19 – Employee Benefits;
- IAS 20 – Accounting for Government Grants and Disclosure of Government Assistance;
- IAS 21 – The Effects of Changes in foreign exchange rates
- IAS 23 – Borrowing Costs;
- IAS 24 – Related Party Disclosures;
- IAS 26 – Accounting and Reporting by Retirement Benefit Plans;
- IAS 27 – Separate Financial Statements;
- IAS 28 – Investment in associate and Joint Ventures;
- IAS 29 – Financial Reporting in Hyperinflationary Economies;
- IAS 32 – Financial Instruments: Presentation;
- IAS 33 – Earnings per share;
- IAS 34 – Interim Financial Reporting;

- IAS 36 – Impairment of Assets;
- IAS 37 – Provisions, Contingent Liabilities and Contingent Assets;
- IAS 38 – Intangible assets;
- IAS 39 – Financial Instruments: Recognition and Measurement;
- IAS 40 – Investment Property;
- IAS 41 – Agriculture.

The list is completed with international standards related interpretations (IFRIC and SIC).

An important element in the overall implications of adopting IFRS refers to the uniqueness and harmonization of financial reporting globally element which coincides with the main objective of the IASB to develop, in the public interest, a single set of high quality standards, easy understood and applied globally accepted based on principles presented in a clear manner.

Another implication general, the transition to IFRS, is the fact that new financial reports prepared under IFRS interpretation supports the full set of financial statements and also improves users' ability to make effective business decisions.

IFRSs are designed to apply to general purpose financial statements and other financial reports for-profit entities, including companies engaged in commercial, industrial, financial or other similar activities. Also, this standard establishes provisions for the recognition, measurement, presentation and description in connection with transactions and events important for general purpose financial statements, but also can establish provisions for transactions and events that may occur in specific areas.

A complete set of financial statements include:

- A statement of financial position;
- A statement of comprehensive income;
- A statement of changes in equity;
- A statement of cash flows;
- The accounting policies and explanatory notes.

Another factor arising from the adoption of IFRS is related to permission application of different treatments for certain transactions and events, while IASB objective is to require that transactions and similar events to be accounted for and reported similarly and transactions and events different to be accounted for and reported differently both within an entity over time and between entities IASB intention being to not allow alternatives regarding the accounting treatment.

## 2.1. The impact of the adoption of accounting standards on the main insurance companies in Romania

Insurance companies in Romania used as the legal basis for the obvious financial accounting and reporting, Order 3129, adopted in 2005, which meant regulation when adopting an important step towards harmonization of global accounting in that it represented a change in terms of the principle of bookkeeping, insurance companies moving from one accounting records of financial flows based directly on the accounting records based on accrual.

Since 2012, the Insurance Supervisory Commission - official supervisory body at the time, actual FSA - started a process of application of IFRS by companies operating on the Romanian insurance market by organizing a pilot group consisting of the first companies top insurance - depending on the volume of gross written premiums in the insurance market in late 2011, as follows:

**Table 1.** *Statement of insurance companies in the pilot group in order underwritings volume recorded in 2011*

Company name	Total gross written premiums (lei)	Total market share (%)
ASTRA SA	1,008,544,317	12.89
Allianz - Tiriac SA	898,416,364	11.49
VIENNA INSURANCE GROUP SA OMNIASIG	761,548,812	9.74
Groupama Asigurari SA	708,275,597	9.05
VIENNA INSURANCE GROUP SA ASIROM	627,995,991	8.03
ING Life Insurance	554,442,021	7.09
GENERAL INSURANCE SA	511,437,851	6.54
UNIQA INSURANCE SA	383,348,634	4.90
BCR Life VIG SA	344,646,130	4.41
Alico Insurance ROMANIA SA	206,948,419	2.65
Total gross written premiums	6,005,604,136	76.78
Total insurance market in 2011	7,822,309,952	100

The companies listed have come a gradual process of adopting the new standard of financial reporting, reporting in parallel, since 2012, both financial statements prepared under IFRS and financial statements prepared in accordance with Order in force, the number 3129 of 2005. Thus, these companies were drawn to January 1, 2012 - in the first set of IFRS reporting - the first financial purpose financial information, its main purpose the establishment and reconcile differences between the statutory balance sheet, prepared for December 31, 2011 - according to Order 3129 / 2005 - and the situation of opening of financial position - report is the starting point for the first time for adoption of International Financial Reporting Standards - in accordance with International Financial Reporting Standards 1 (abbreviated and IFRS 1). It should be noted however, that these insurance companies as their main activity issuing insurance policies (and possibly reinsurance) and related claims management for life insurance or non-life insurance, life insurance respectively, were found in pilot group companies practicing one category of insurance or both - in which case the insurance business is a composite - the situation is presented below:

**Table 2.** *The situation of insurance companies in the pilot group by type of activity*

Company name	Type of business insurance	Total market share (%)
ASTRA SA	Activity composite	12.89
Allianz - Tiriac SA	Activity composite	11.49
VIENNA INSURANCE GROUP SA OMNIASIG	Activity composite	9.74
Groupama Asigurari SA	Activity composite	9.05
VIENNA INSURANCE GROUP SA ASIROM	Activity composite	8.03
ING Life Insurance	Life Insurance	7.09
GENERAL INSURANCE SA	Activity composite	6.54
UNIQA INSURANCE SA	Activity composite	4.90
BCR Life VIG SA	Life Insurance	4.41
Alico Insurance ROMANIA SA	Life Insurance	2.65
Total companies active composite	7	62.64
Total life insurance companies	Three	14.15

Relevance analysis of the type of work in accordance with the market share of these companies in the insurance market in 2011 is that most companies have a composite activity (7 companies that have a market share of 62.64% cumulative). Adoption of IFRS for these companies had more powerful impact due to the high degree of complexity of the work done, while 3 companies, which have a combined share of 14.15% of the total insurance market place only life insurance business, impact on these companies is one important only in terms of the specific problems of this type of insurance.

Presenting Information with Special Character to January 1, 2012 in order to adopt international financial reporting standards, companies in the pilot group were generally

reported in a series of standards relevant to the insurance market, selected from the official rules available at that time, presented as follows:

- IFRS 1 – First-time Adoption of IFRS;
- IFRS 4 – Insurance Contracts;
- IFRS 5 – Non-current assets held for sale and discontinued operations;
- IFRS 7 – Financial Instruments: Disclosures;
- IFRS 9 – Financial Instruments;
- IFRS 13 – Fair value measurement;
- IAS 1 – Presentation of Financial Statements;
- IAS 7 – Statement of Cash Flows;
- IAS 8 – Accounting Policies, Changes in Accounting Estimates and Errors;
- IAS 12 – Income Taxes;
- IAS 16 – Property, plant and equipments;
- IAS 18 – Revenue;
- IAS 29 – Financial Reporting in Hyperinflationary Economies;
- IAS 32 – Financial Instruments: Presentation;
- IAS 37 – Provisions, Contingent Liabilities and Contingent Assets;
- IAS 38 – Intangible assets;
- IAS 39 – Financial Instruments: Recognition and Measurement.

In the main purpose information submitted to January 1, 2012, the pilot group companies have developed and introduced a set of significant accounting policies in accordance with IFRS as adopted by EU standards applicable for the purpose of drafting a set of financial statements, policies especially information included on Basis of preparation of financial reports and accounting policies detailed as follows:

- Intangible assets - Subsequent expenditure;
- Tangible assets - assets held for sale;
- Financial Instruments - Classification, recognition, valuation and depreciation;
- Classification of insurance contracts and investment contracts - significant insurance risk;
- Technical reserves related to insurance contracts;
- Liability adequacy test;
- The effects of hyperinflation - inflation treatment under IAS 29;
- Convert currency;
- Deferred acquisition costs (DAC);
- Receivables from insurance and setbacks;
- Capital;
- Receivables or payables to reinsurers;
- Cash and cash equivalents;
- Other liabilities associated with insurance contracts;
- Trade payables and other payables;
- Debt postponed;
- Revenue Recognition - Revenue deferred income from investments;
- Acquisition expenses;
- Deferred income tax;
- Current income tax;
- Leases;
- Significant accounting judgments and estimates;
- Investments in associates;
- Provisions for risks and charges;
- Recognition paid benefits, allowances and spending to;
- New standards and interpretations not in force;
- Goodwill;

- Going concern;
- Determination of fair value;
- The legal reserve;
- Employee Benefits;
- Dividends;
- Business Combinations.

Depending on the accounting policies set out in line with the new accounting standards adopted, companies have drawn up the balance sheet at 1 January 2012, the first case showing the assets and liabilities balance sheet at 31 December 2011 - according to Order 3129 / 2005 (similar to the situation corresponding to 1 January 2012), and on the other hand, the same situation resulting from adjustments made to transition to new accounting standards IFRS. After analyzing information presented by companies, the following was (as of January 1, 2012, amounts presented in RON):

**Table 3.** *The profile of the insurance companies from the pilot group. Differences between items on the balance sheet following the adoption of IFRS for the first time*

Company name	Assets = Liabilities according to the Decree no. 3129 / 2005	Assets = Liabilities according to IFRS	Dynamic IFRS vs. Decree no. 3129/2005	Dynamic IFRS vs. Decree no.3129/2005 %
ASTRA SAT	1,490,132,173	1,336,068,246	-154,063,927	-10.34
ALLIANZ - TIRIAC ASIGURARI SA	1,964,919,289	1,973,953,115	9,033,826	0.46
OMNIASIG VIENNA INSURANCE GROUP SA (*)	2,438,607,950	2,121,820,895	-345,100,879	-12.99
GROUPAMA ASIGURARI SA (**)	1,354,480,661	1,315,623,940	-38,856,721	-2.87
ASIROM VIENNA INSURANCE GROUP SA (**)	1,192,617,553	1,197,947,799	5,330,246	0.45
ING ASIGURARI DE VIATA SA	2,264,506,167	2,263,720,890	-785,277	-0.03
GENERALI ASIGURARI SA	1,225,231,195	1,213,997,658	-11,233,537	-0.92
UNIQA ASIGURARI SA (**)	1,002,075,394	995,800,705	-6,274,689	-0.63
BCR ASIGURARI DE VIATA VIG SA	NA	NA	NA	NA
ALICO ASIGURARI ROMANIA SA	NA	NA	NA	NA
<b>TOTAL</b>	<b>12,932,570,382</b>	<b>12,418,933,248</b>	<b>-513,637,134</b>	<b>-3.97</b>

**Notes:**

(\*) Merger by absorption with BCR Insurance VIG SA (difference include the amount of £ 28,313,818, representing receivables from reinsurance operations reclassified).

(\*\*) Adjustments made on December 31, 2012.

As can be seen in the situation above, addressing new financial reporting standard IFRS reduced significantly in the balance sheet assets and liabilities only for two of the companies listed, with -12.99%, respectively -10.34%, both companies having a composite activity, due to a high degree of complexity of the business of Insurance and cumulative market share of 22.63%. A relatively significant reduction of -2.87% was recorded in the case of another insurance company, also a composite society, with a high market share of 9.05%. In case of other companies, due to variations IFRS approach were rated at an insignificant level of  $-/+$  1%. For the entire group of companies analyzed, was recorded a reduction of balance sheet assets and liabilities -3.97%, considered as a low negative influence due to the adoption of new accounting standards.

If the two companies presented, which recorded negative variations balance sheet of assets and liabilities that exceeded the level of 10%, corresponding adjustments aimed specifically following balance sheet items:

- For the first company analyzed, targeted adjustments and approving the transfer of the portfolio of general insurance from OmniaSIG VIG S.A to BCR Insurance VIG SA, starting on May 1, 2012 took place and fully effective transfer of all rights and obligations arising from insurance contracts, the merger BCR Insurance company name being changed in OmniaSIG VIG SA. Thus, in order to determine the base corresponding balance sheet items, in order to apply the adjustments related to IFRS, the former statutory balance OmniaSIG

VIG SA was added to the statutory balance sheet of the former BCR Insurance VIG SA and then were applied IFRS restatement results are presented below:

**Table 4.** Differences in the balance sheet situation following the adoption of IFRS for the first time

ASSETS	Amount (million RON)	Applicable standards
INVESTMENTS	-88	IAS 39
Share of technical reserves ceded	-112	IFRS 4
ACCOUNTS PAYABLE	-215	IFRS 4
HOUSE AND BANK ACCOUNTS	74	IFRS 1
Prepayments	-4	IFRS 4
<b>TOTAL</b>	<b>-345</b>	<b>-</b>
LIABILITIES	Amount (million RON)	Applicable standards
SUBSCRIBED CAPITAL	3	IAS 29
First Capital	-65	IAS 29
RETAINED EARNINGS OF APPLICATION IAS	39	IFRS 4
TECHNICAL RESERVES	-275	IFRS 4
LIABILITIES	-49	IFRS 4
Deferred income	2	IFRS 4
<b>TOTAL</b>	<b>-345</b>	<b>-</b>

- For the second company analyzed, changes made on the financial statements in order to align with IFRS requirements, focused on the following issues:
  - Grouping more items into broader captions;
  - Adjustments of balance sheet items in accordance with IAS 29 - Financial reporting in hyperinflationary economies (given that the Romanian economy was a hyperinflationary economy until December 31, 2003);
  - Adjustments on the classification of insurance contracts under IFRS 4 - Insurance Contracts;
  - Adjustments for recognition of assets and liabilities Deferred income tax, in accordance with IAS 12 - Income tax;
  - Disclosure requirements under IFRS.

The results are presented below:

**Table 5.** Differences in the balance sheet situation following the adoption of IFRS for the first time

ASSETS	Amount (million RON)	Applicable standards
AFS - FAIR VALUE	13	IAS 16
Other loans and receivables	96	IAS 1
INVESTMENT held to maturity	-67	IAS 7
Investments at fair value	-21	IFRS 9
TECHNICAL RESERVES ceded	-92	IFRS 4
DEBT OF REINSURANCE	-23	IAS 1
RECEIVABLES FROM INSURANCE	-31	IFRS 1; IFRS 4
Other claims	-96	IAS 1
HOUSE AND BANK ACCOUNTS	67	IAS 7
<b>TOTAL</b>	<b>-154</b>	<b>-</b>
LIABILITIES	Amount (million RON)	Applicable standards
ELEMENTS TREATED AS CAPITAL	287	IAS 29
REVALUATION RESERVES	-6	IAS 29
OTHER ITEMS OF EQUITY	-4	IAS 29
Earnings	-326	IFRS 1
TECHNICAL RESERVES	-81	IFRS 4
LIABILITIES OF REINSURANCE	-22	IFRS 4
LOANS	25	IAS 17; IAS 1
OTHER LIABILITIES	-25	IAS 17; IAS 1
TAX Deferred income	-2	IAS 12
<b>TOTAL</b>	<b>-154</b>	<b>-</b>

After analyzing variations of the two companies analyzed it can be concluded that the impact of the adoption of accounting standards - IFRS was significantly, registering decreases in balance sheet assets and liabilities of over 10%. Also, changes were recorded in the balance sheet structure by re-classification of certain elements according to IFRS requirements. Negative changes on the balance sheets were mainly due to the adoption of the following standards:

- IFRS 4 - Insurance Contracts:
  - provisions of this standard had an effect mainly on technical, meaning-recognition of certain stocks such as catastrophe reserve and equalization reserve in case of general insurance, but also because loss reserve adjustment after applying liability adequacy test;
  - application of this standard had an impact on debt adjustment reinsurance receivables from insurance concerned;
  - in the case of life insurance, IFRS 4 had an impact on the separation of insurance contracts to investment contracts, insurance contracts where the investment component of unit-linked;
- IAS 29 - Financial reporting in hyperinflationary economies - both companies were founded before 2004, considered by this standard as a limit to adjust subscribed capital and other items on equity;
- IFRS 1 - First-time Adoption of IFRS - IFRS 1 is mandatory standard applied by all companies adopting IFRS, establishing rules for evaluation and presentation of information following the adoption of IFRS;
- IAS 1 - Presentation of Financial Statements - IAS 1 is the required standard to be applied by all companies that present information under IFRS, establishing rules for the presentation of financial statements, and the structure and composition;
- IAS 39 - Financial Instruments: Recognition and Measurement:
  - This standard has had a major impact on investments and financial instruments held, meaning their recognition and measurement at fair value;
  - Also, the application of this standard resulted in a change of the presentation structural availability and short-term investments balance of the two companies, meaning re-classification of the respective amounts of investments held in the position representing the current availability in cash and current accounts are the amounts placed in -a term up to 90 days.

## 2.2. Influences generated on shareholders, authorities and other business partners

Despite the ongoing debate on the difficulties of harmonizing national accounting systems from different countries or different areas belonging to national economies and the fact that much of accounting standards is still a dynamic and continuous process improvement in the IASB the adoption of IFRS are included in the new policy for the globalization of the world economy, allowing both external partners (customers, investors and supervisors) and representatives of companies involved in this process (shareholders, managers, analysts) have access to a new category of information with a higher level of quality and transparent.

In Romania, the project on adoption of IFRS for insurance-reinsurance market has emerged as a preliminary measure and binding and future due to a new solvency regime, but also as a tool for enhanced surveillance of FSA. Also, the adoption of new standards - involving employment in a transparent and harmonized information in the financial reports financial reporting - provides support for analyzing and interpreting modern technique for the main internal and external user groups mentioned above. On the other hand, the adoption of IFRS requires the definition of universal accounting policies and principles, with a minimum degree of detail of the information presented, and a growing involvement and responsibilities of managers of their respective companies.

The main standard relating to insurance and reinsurance market, namely:

- IFRS 4 - Insurance Contracts;
- IFRS 7 - Financial Instruments: Disclosures;
- IAS 32 - Financial Instruments: Presentation;
- IAS 39 - Financial Instruments: Recognition and Measurement.

aim to increase transparency in order to charging, insurance and reinsurance contracts, the profitability of different types of insurance and reinsurance practiced and risk management and investments. Following the adoption of these new standards will redefine the rules of competition pursued by insurance companies, because insurers will report under IFRS will be able to understand their financial performance and better manage their affairs in accordance with the new way reporting in a more transparent, hovering eventually in an advantageous position compared to other companies available on the market

In order to achieve optimal framework for adopting IFRS, insurance companies must take into account the following aspects:

- Applying IFRS companies increase operational risk involved due to the high degree of technical complexity and due to the involvement of various categories of staff (previously not involved in the financial reporting system), such as actuaries, risk assessment specialists, specialist in investment and not least, company management;
- Applying IFRS requires increasing the volume of data and information analysis and also the time required interpretation and analysis of results, these having the effect of increasing the involvement of specialized staff; therefore, it is necessary to ensure a qualified and sufficient in order to cover the minimum requirements of the standard;
- Updating and possibly changing information systems and databases to ensure - sufficient volume and history - in order to ensure minimum requirements provided analysis and reporting; In this regard, the adoption of IFRS may result in the initial stage the need for investment in the modernization and harmonization of systems.

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# The effect of implementation of insurance transparency mediation on the Danish and Finnish insurance markets

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**Abstract.** *The introduction of transparency of insurance remuneration for intermediaries on the Danish and Finnish market for the period of 2005-2011 were analysed in order to see possible effects that implementation of IMD2 will have on the Romanian insurance market. The legislation introduced in Finland and Denmark that banned brokers from receiving insurance commissions lead to an immediate decrease of the insurance brokers revenues and market shares. The transparency helped clients to better understand the role of the insurance intermediaries and move towards the insurance distribution channel that provided them the best value added for their needs.*

**Keywords:** IMD2, insurance, insurance brokers.

**JEL Classification:** G22, G29.

## Introduction

European Commission has put forward in 2012 a new directive called Insurance Mediation Directive 2 (IMD2) that has been put to vote to the European Parliament in 2014 and once adopted, it is expected that the member states of the European Union to be asked to implement it starting with 2017. This new directive follows the Insurance Mediation Directive 1 (IMD1) that is already in place that established the rules on where insurance agents and brokers can sell (the free movement of services) as well as the professional requirements (knowledge) of the people involved in the insurance intermediation. The new directive IMD2, extends the scope of IMD1 to all sellers of insurance products (including insurance companies, ancillary services such as loss adjusters and claims handlers) and is meant to manage and mitigate conflicts of interest, raise the level of harmonisation of administrative sanctions and measures for breach of key provisions IMD1, enhance the suitability and objectiveness of insurance advice, ensure sellers' professional qualifications match the complexity of products sold. Amongst other provisions in IMD2 is included also the transparency of remuneration disclosure requirements (nature, source and amount) for parties involved in insurance intermission businesses.

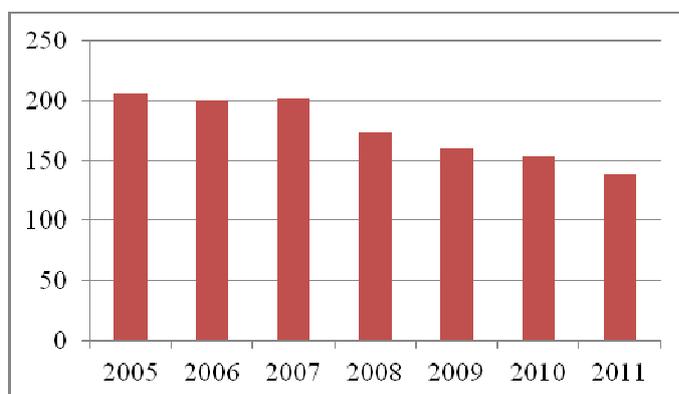
Although IMD2 remuneration transparency has not been adopted in Romania, the decision of the Romanian Financial Supervisory Authority from 2014 to impose a transparency for the insurance product that has highest sales on the Romanian market (Motor Third Party Liability – MTPL) has raised very strong debates and strong resistance against its implementation from the local professional association of brokers, UNSICAR.

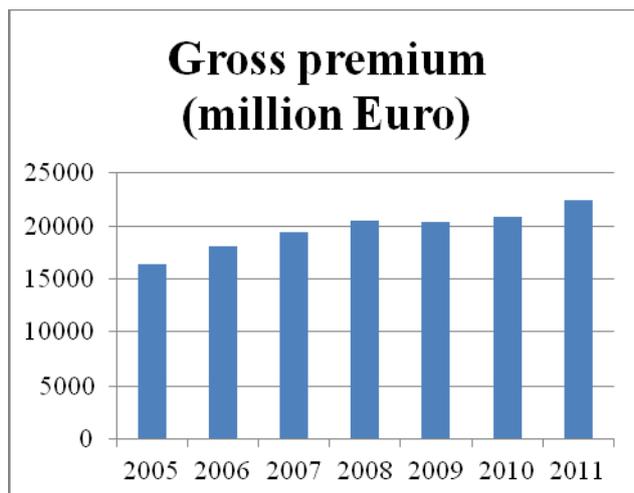
Long before IMD2 has been proposed by the EC, Nordic countries (Denmark, Finland, Norway and Sweden) have voluntarily adopted the transparency of the insurance remuneration starting with 2005 onwards. Hence in this paper we are analysing the effect of transparency had on the Danish and Finnish insurance markets for the period 2005-2011 in the light of future implementation in Romania as well.

## Denmark

The Danish insurance market is one of the most developed in Europe. The insurance penetration of 7.6% of GDP and it is just below the EU average of 7.8%. The average insurance spent per capita in 2013 was about USD 5780. Denmark specificity consists in the high penetration and density of the life insurance sector (4.9% of GDP) because life insurance and pension schemes are offered as a combined package by the insurance companies. The number of insurance companies was almost constant for the analysed period until 2008 (see Figure 1) when it decreased substantially mainly due consolidations as a result of financial crisis and the low interest rates.

**Figure 1.** Evolution of no of insurance companies in Denmark



**Figure 2.** *Evolution of gross premium written in Denmark*

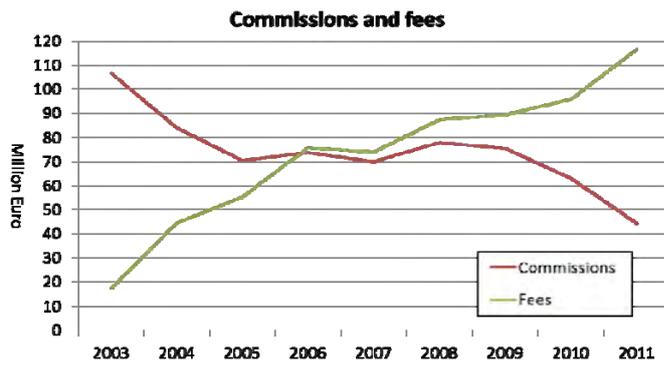
In Denmark most of the insurance mediation is done through direct sales and agents, that distribute and sell mostly retail products, the insurance brokers dealing mainly with commercial insurance for large clients. In 2011 the main distribution channel for insurance was through agents (more than 60%) than followed by brokers (about 25%), the rest being formed from bank assurance, direct sales and other channels.

In 2006 the Denmark's insurance regulator introduced amendments to the insurance legislation with regard to broker's and agent's remuneration called Danish Insurance Mediation Act (DIMA) in which was mentioned that brokers were not allowed to receive commission or remuneration from insurance companies for the services provided to their clients. Although introduced in 2006 there was a transition period and full implementation finished only in 2011. The ban on commission was because it was supposed that insurance brokers must provide independent advice to their clients and do not have to be bound to the insurance companies when remunerating their services. This provision did not apply to insurance agents that were considered as representing insurance companies and not expected to present an independent advice. However agents were obliged to present to clients their link with the insurance company and that their remuneration is included in the premium. Upon request from their clients, insurance agents had to disclose the level of remuneration they receive from the insurance company which they were representing.

When an insurance broker that is not licenced in Denmark notifies the Danish Financial Services Authority that wants to do business in Denmark it is informed about the conditions that it has to comply with the ban of receiving commissions from the clients. If the insurance is provided from an insurance company that is not registered in Denmark, the broker is allowed to receive commission, but it has to pay it back to the client. If there is a cross-border insurance program that covers amongst others also Denmark, but not placed with a Danish insurer, the broker is allowed to receive commission.

Following the implementation of this legislation the level of remuneration of insurance intermediation in Denmark started to drop and to be split as it can be noticed from Figure 2 and, as from 2006, the level of fees increased while the level of commission went on a downwards slope with overall figure of commissions and fees reaching the level before transparency only in 2011. The implementation of DIMA led to a segregation of the market, the retail and SME's life and non-life insurance market started to be intermediated only by agents or direct distribution whereas the commercial large business remained mainly to brokers.

**Figure 3.** *The effect on insurance commissions and fees of DIMA*

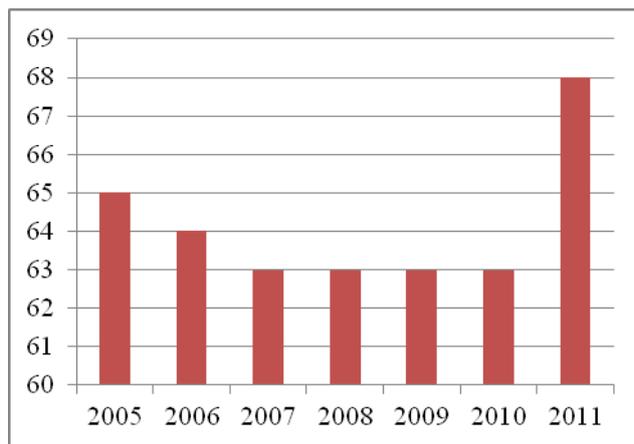


**Source:** Danish Financial Services Authorities based on intermediaries reported data.<sup>6</sup>

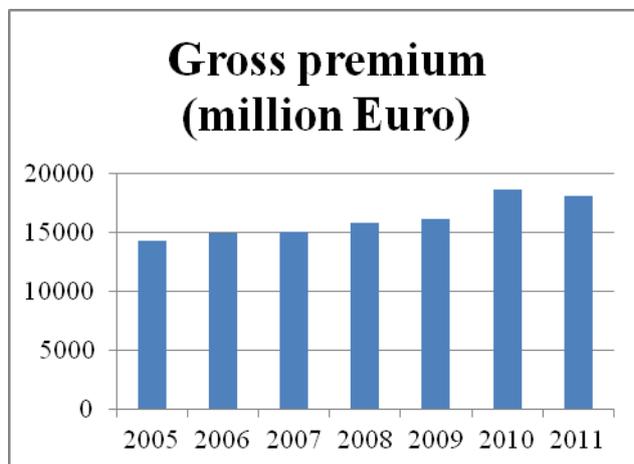
**Finland**

Finland is a mature insurance market with the insurance penetration of 10.3% larger than the EU average and with an average insurance spending of Euro 4,064 per capita in 2012. The number of the insurance companies remained almost constant in the period 2005-2011 and it is believed that the legislation that prohibits the insurance brokers from receiving commissions from the insurance companies have acted as a barrier to entry for foreign insurers.

**Figure 4.** *Evolution of no of insurance companies in Finland*



**Figure 5.** *Evolution of gross premium written in Finland*



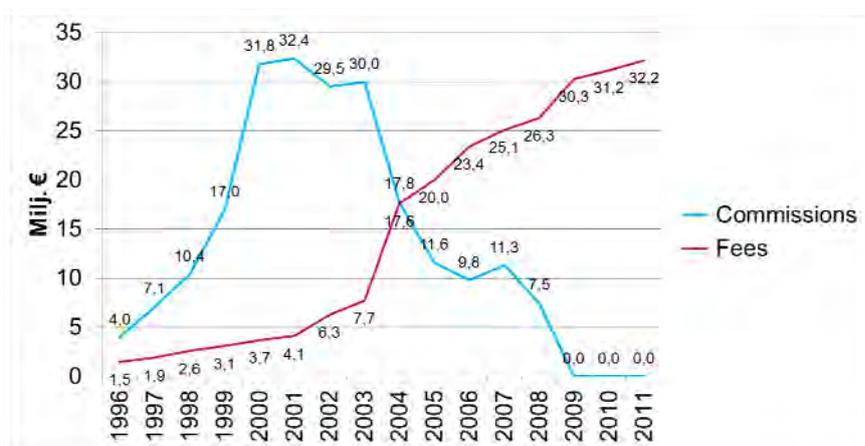
The main insurance channels distribution in Finland in 2011 were direct sales (42%) and other channels (38%) the rest of the market being formed from insurance brokers (8.4%) and bank assurance and agents.

Finland has implemented in 2005 Finish Insurance Mediation Act (FIMA) a piece of legislation that bans insurance brokers from receiving insurance commissions from the insurance companies allowing them to receive remuneration (fees) only from their clients.

Just like in the case of Denmark the reason for this new piece of legislation was to underline the independent advice role of the broker when dealing with its client. Agents and direct businesses (sales directly from the insurance companies) did not fall under FIMA as they were considered to represent the interests of the insurance companies. What was different from Denmark is that prior to FIMA the insurance brokers were allowed to receive commissions, but they had to disclose it to their clients, therefore even before this legislation they had to be transparent. Nevertheless some of the brokers prior to 2005 were acting more like multiple agents for insurance companies and they were not properly offering independent advice, hence the regulator (Federation of Finnish Financial Services) considered the necessity of this legislation in order to protect consumers from conflicts of interests. Besides, in the SME clients segment, the level of knowledge towards disclosure of the commission was low, hence brokers were not being transparent regarding the remuneration they were receiving from the insurance companies.

Following the implementation of FIMA the level of awareness for the consumers has increased with regard to the role of brokers, agents and their transparency towards revenues and has also led to an increased competition amongst insurance intermediaries and moved the focus from the 'price mainly' to the 'price versus quality of services' provided. The immediate effect of FIMA was that the premium intermediated by insurance brokers decreased by 24% and their market share on the insurance intermediaries market dropped by 42% (between 2003 and 2009). The sources of revenues (see Figure 6) however for the intermediation as one could have expected from almost a pure commission based in the early 2000 to 'pure fees' in 2011. Another effect of the commissions ban was the cross-border brokers that have started to do business in Finland creating a very competitive market that led to a drop of the Finnish brokers revenues and market shares. One of reasons and the main difference from Denmark is that the Finland's regulator does have little control the insurance brokers outside Finland. As regards to the level of revenues following the implementation of FIMA the peak level of 2001 was reached only in 2011.

**Figure 6.** *The evolution of revenues of insurance intermediaries 1996-2011*



**Source:** Ministry of Social Affairs and Health, Insurance Supervisory Authority, Financial Services Authority, Finland.

## Conclusions

The effects the introduction of transparency on the Danish and Finnish markets could be viewed three-fold: from the intermediaries, insurers and clients perspective.

Thus transparency helped insurance consumers to better understand the role of the brokers and agents and their added value and paid for the advice being aware for the level and quality of services provided. Linked with the value added chain was the segregation of insurance intermediaries markets in: retail including SME's (agents, bank assurance etc.) and commercial insurance (mainly brokers).

Brokers, although initially have been affected from a revenue point of view and they started to be paid by the clients the fees have recouped after about 5 years the lost revenues from commissions and they reached about the same level before the transparency was not introduced on these markets. Nevertheless the level of fees received after the transparency was introduced on the markets was below the level of commission as a percentage of the total cost for the client (premium + broker's compensation). The average level of commission, before the transparency legislation was introduced, was about 15% and then, the level of income (fees) dropped to about 11-12% of the premium intermediated.

As regards to insurers the net quoting (net quoting – quoting insurance premiums without insurance commission) helped the insurance companies to keep the premium levels below the level when sold through its own channels, however it affected negatively some of their key ratios.

Although Romania is a young market, that has a lot to recoup in order to reach the level of the Danish or Finnish markets, it can be argued that is crossing a transition period from the transparency point of view of insurance commissions before the implementation of IMD2, similar to the one in Denmark. Starting with 1st of January 2015, the Romanian Financial Services Authority has imposed to the insurance market to write the insurance commissions on the MTPL policy (both as a percentage and as absolute value). If we consider the experience of the Danish and Finnish insurance markets, this measure of the Romanian insurance regulator will most probably raise awareness of the insurance consumers on how and how much the insurance intermediaries get paid as well as help them put in balance the value of service they receive from the intermediaries versus the commission they pay for the services they provide. It is probably too early to see if there will be a segregation of the market following the transparency of insurance commissions in Romania, even if it is not for all insurance products, and whether the retail consumers will migrate towards agents insurance distribution or bank assurance and the commercial customers will choose brokers. However, even without compulsory transparency, clients seem to choose their distribution channel similar to Denmark and Finland before the legislation in this countries banned insurance commissions, namely there are insurance brokers that are acting more like 'multiple insurance agents' which have as client base namely retail customers (including SME's) whereas large companies are choosing some insurance brokers that are specialised in dealing with this market segment, namely representatives of large foreign insurance brokers.

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# The insurance market in 2014. Europe vs Romania

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**Abstract.** *This article treats the insurance market in the first time at European level noting the changes in the principals' indicators. Thus it was shown that the trend largely preserved without significant changes from the previous year. In Romania the insurance market is still characterized by a downward trend, development which, coupled with greater economic growth resulted in reduction of financial intermediation. Considering the situation described on insurance market can be shaped certain threats for 2015. Such recommendations are made considering the implications of Solvency II and, also alarm signals are pulled over imbalances in certain markets.*

**Keywords:** insurance market; ROE; ROA; premiums; claims.

**JEL Classification:** G22.

## Introduction

In this time the insurance companies are still exposed to the low interest rate environment. It was shown that the long-term interest rates are especially of importance to life insurers, because in this day the market rates are low than the obligations on long-term that institutions have to the policyholders.

Also, a prolonged period of low interest rates may have an adverse impact on non-life insurers pursuing a business model where investment returns are used to compensate for weak underwriting results.

## Market growth on life and non-life insurances in the European insurance sector

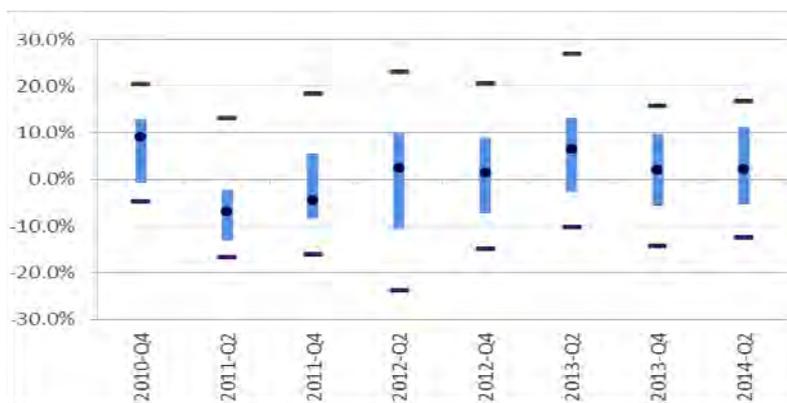
In life insurances the primary means by which the impact of low interest rates affects the financial position of firms is the reinvestment risk. This risk involves that the assets are (re)invested at low(er) rates and so the achievable spread recorded between returns on assets and guaranteed rates decrease.

To reduce the effects of the reinvestment risk we should address through more medium term measures, such as enhancing asset-liability management, increased reserving, reducing profit shares or setting-up specific reserve funds or additional technical provisions.

Political uncertainties remain high on the agenda in many countries and in some countries life insurance contracts also no longer benefit from fiscal advantages.

Nevertheless, life insurance premiums continued to grow in many cases by about 2% until Q2 2014 as Figure 1 shows.

**Figure 1.** Year-on-year growth Gross written premiums - Life. Median, interquartile range and 10th and 90th percentile



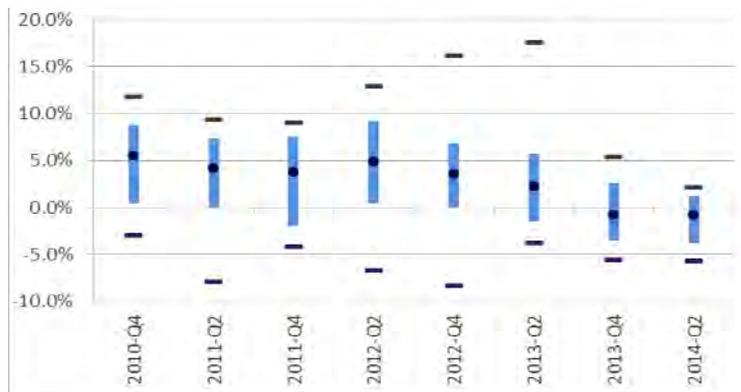
**Source:** EIOPA (sample based on large insurance groups in EU and Switzerland).

This increase is due on the one hand on the increase people's distrust in sustainability of State-provided retirement and health benefits and secondly is based on the demographic trends and increase in life expectancy. And also we do not forget that the longevity risk has risen.

Because many insurance type are mandatory, non-life premiums are more stable than life premiums.

So, non-life insurance premiums have stabilized over the Q4 2013 and the previous drop in premium did not repeat itself in Q2 2014 (Figure 2).

**Figure 2.** Year-on-year growth in gross written premiums, non-life. Median, interquartile range and 10th and 90th percentile



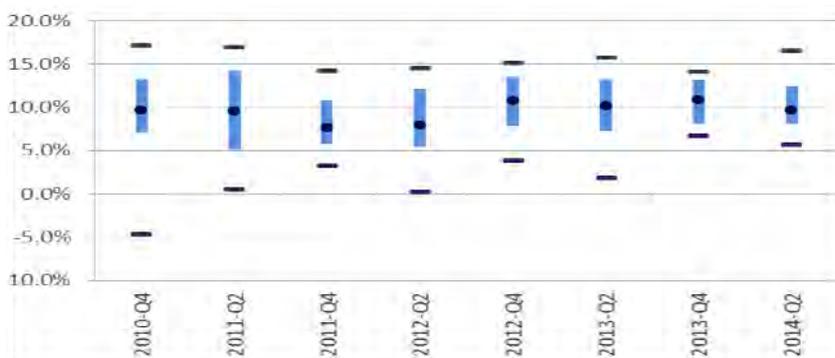
**Source:** EIOPA (sample based on large insurance groups in EU and Switzerland).

The premium growth in both insurers type is still driven by the emerging markets, whilst advanced markets are saturated. So, emerging markets contributed according to EIOPA statistics to 6, 4% of life premium growth in 2013. Non-life premium growth in these markets is looking even better.

**ROE/ ROA on life and non-life insurers**

Although the last quarter showed a slight decline in ROE on a low volatility in recent years, the results have shown relative stability and we are at approximately 10% in mid-2014 for the median company. (Figure 3)

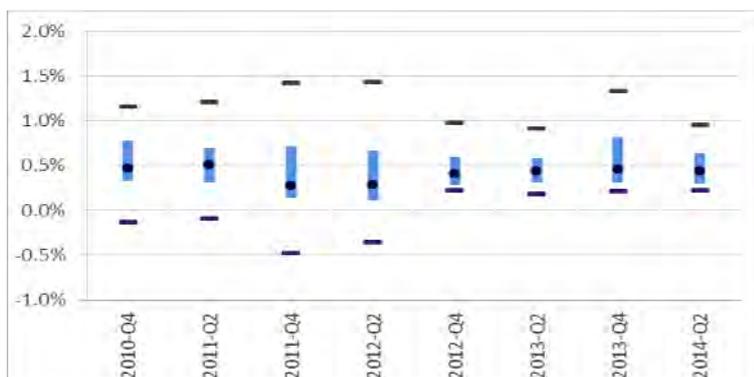
**Figure 3.** Return on Equity – Total, Median, interquartile range and 10th and 90th percentile



**Source:** EIOPA (sample based on large insurance groups in EU and Switzerland).

As ROE, Return on assets (ROA) also continues to be stable with a value relatively low and close to 0.4% in Q2 2014. (Figure 4).

**Figure 4.** Return on Assets – Total, Median, interquartile range and 10th and 90th percentile



**Source:** EIOPA (sample based on large insurance groups in EU and Switzerland).

What is good to remember is that many companies in the market have already taken steps to improve their operational efficiency as Solvency II approaches.

Solvency II will be applicable in Europe starting from 1 January 2016 when the new supervisory regime it will consist in:

- looking at all risks (total balance sheet approach);
- introducing risk-based capital requirements;
- strengthening the role of risk management;
- requiring more disclosure of information to the public;
- introducing the Supervisory Review Process (SRP) allowing supervisors to identify potential problems earlier, and
- strengthening the role of the group supervisor.

According with this proposals the Financial Supervisory Authority from Romania has proposed the following for 2015:

- The transposition of Directive no. 2009/138 concerning insurance scheme (Solvency II) into national legislation;
- Preparing for the application of the insurance market Solvency II standards from 1 January 2016;
- Auditing assets/liabilities balance sheet for the insurance market;
- Implementation and strengthening supervision combined (offsite/onsite) based on risk;
- Establish rules and modern mechanisms of intervention (resolution) at the companies with problems

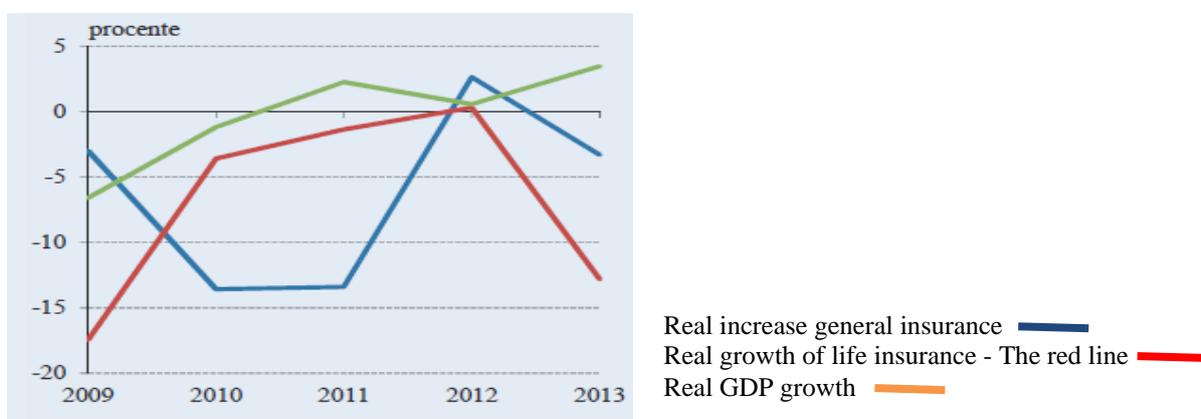
#### Insurance market in Romania. Developments of 2014 and expectations of 2015

Influenced by the global developments the Romanian insurance market was marked by negative as positive trends.

The decrease in gross written premiums of 1.6% recorded in 2013 continued in 2014 when in the first half was faced with 3.97 billion (gross written premiums), down 6.8% compared to the same period last year.

Thus, both 2013 and 2014, despite the accelerating economic growth, the general insurance market returned to a real trend of decreasing, while life insurance market recorded the most significant decline in least years. (Figure 5)

**Figure 5.** *The correlation between the insurance sector and growth dynamics*



**Source:** ASF, BNR, INS.

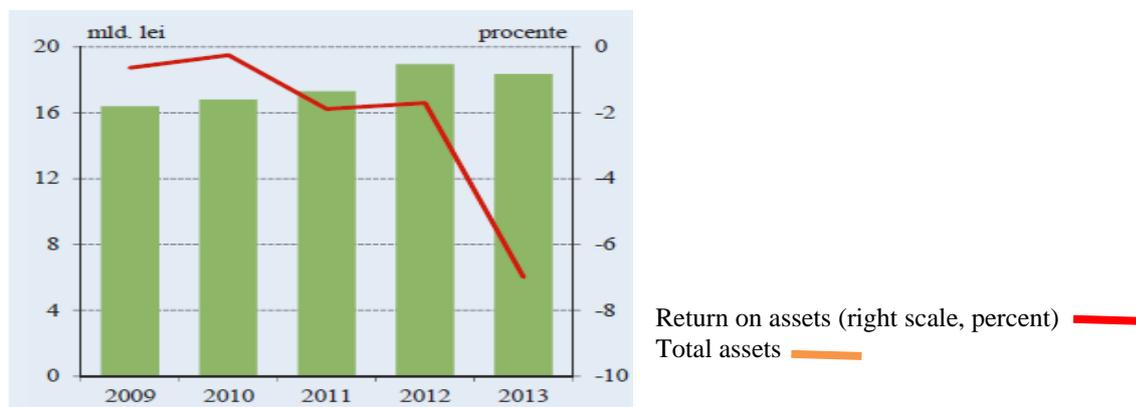
In the period 2013-2014 the insurance market concentration remained at a high level, the market share of the top ten insurance companies exceeding 80 percent for the first time since the financial crisis. The ownership of these insurance companies are predominantly foreign

(over 80%), the main countries of origin were Austria, France and the Netherlands. This has a positive influence on the financial soundness of their respective companies and facilitates the uptake of this know-how and best.

If we make the ratio of gross claims paid to gross written premiums for insurance we will get the lowest level in five years with a value that falls below 65%. This fact confirms the importance of better management of direct and indirect distribution costs and the need to find new ways to increase this segment.

Since the net result of insurance activity continued to be negative, the total assets of insurance companies fell at 3.2% while the rate of return on their reached at -7%. This is the lowest recorded of 2009-2013 (Figure 6) and this situation continues in 2014 without having the exact figures yet.

**Figure 6.** The insurance sector - the rate of return on assets



Source: ASF.

Also increased attention should be paid to the evolution of the insurance density (the ratio between the euro value of gross written premiums and total population). As in the first half of the period 2011-2014 shows that the value of this indicator in the first semester of 2014 fell below that of the same period of 2011.

## Conclusions

Thus considering the situation described above on the insurance market in Romania can be shaped certain threats for 2015.

- One of the main threats is represented by the losses in the aggregate market for years, mainly due to the auto segment. It must change the customer orientation to the lowest price but we must not forget how important the implementation of the prudential strategy, realistic, which focused especially on the financial stability of the company in the long term, so as to maintain customer confidence in the insurance market.
- Economic and political instability.
- Distrust potential consumers in the insurance market

However the insurance market can benefit from existing instruments such as:

- Increase the absorption of European funds which could stimulate the development of dedicated SME segment and commercial insurance;
- health insurance segment that can be developed for remuneration packages;
- online sales;
- diversifying the portfolio of products and flexible contractual terms.

Using such tools Romania's insurance market in can follow the trend given the EU average.

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# Specific procurement procedures – sources of risk in the management of Structural Funds in Romania

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**Abstract.** *Grants management system in Romania is a complex one, requiring a large amount of resources and regulations, but also flexible procedures for planning, evaluation, contracting, monitoring, control and audit. Risk management is also a key issue as the authorities have the mission to efficiently use the public resources.*

*The current risk procedures used in the public sector in Romania proved to be only theoretical and need improvement, including consideration, analysis and action regarding the public procurement related risks.*

*Almost yearly legislative modifications lead to new major risks, which impacted with financial correction established by the EU to Romania.*

**Keywords:** Risk management, procurement procedures, grants, structural funds.

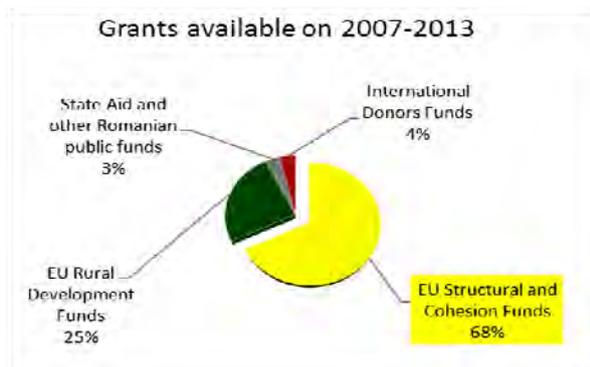
**JEL Classification:** G32, H89.

## Grants management system in Romania

Grants are a source of growth of an economy and as a Member State of the European Union Romania should use this opportunity as better as possibly.

The main categories of grants are the structural and cohesion funds, respectively the rural development funds, both part of the EU development policy. Together with Romanian public budget funded grants, plus those from other international donors (ex: World Bank, USAID, SEE and Norwegian Funds, etc.), in 2007-2013 the grants accounted for almost 4 bill. Euro annually, which represents about 3% of Romania's GDP<sup>(1)</sup> in 2013.

**Figure 1.** Grants available on 2007-2013



**Source:** Romanian National Institute of Statistics (2013).

Access to these funds is done mostly through grant schemes for the management of which have been created or organized many public authorities and institutions, from ministries and government agencies, to non-governmental organizations of public interest (ex: regional development agencies), acting at national, regional or local level. Over 100 such authorities and institutions are currently responsible for managing grants, and within these thousands of civil servants and contractual employees are working.

In terms of projects approved for funding from the structural and cohesion funds, on 31/01/2015 there were 45,075 projects with a total of 19,213,036,712 Euro financial allocation<sup>(2)</sup>. To this we have to add the funded projects for rural development, which on 11/06/2014 they numbered 96,332 and allocations totaled 7,169,711,121 Euro<sup>(3)</sup>, but also other thousands of projects financed from national budgets or other international sources.

As a result, it follows that grants management system in Romania is a complex one, requiring a large amount of resources and regulations, but also flexible procedures for planning, evaluation, contracting, monitoring, control and audit.

Even if Romania, as a member state of the European Union, manages these grants through its own institutions and authorities, the European Commission and the control institutions at EU level permanently monitor and influence the whole process requiring the adoption and use of certain rules.

The complexity of the grants management system is also given by the broad range of funding beneficiaries, covering almost all the organizations recognized by Romanian law (public authorities and institutions, companies, NGOs, religious organizations, trade unions, employers, etc.). This involves the application of specific rules to manage funding schemes, which makes it even more complicated the process of using the funds.

## The risk management of the grants system in Romania

In any public system, as well as in the complex process of grants management, risk management is a key issue. On the one hand it is meant to prevent major deviations from planning, and secondly to validate the correct operation of the system, within certain limits of tolerance.

In Romania, the risk management in the activity of the public authorities and institutions is regulated as a standard of internal control / management within the Order of Ministry of Public Finance no. 946/2005, further amended and supplemented<sup>(4)</sup>. This Order defines risk management as the *"methodology aimed at providing a comprehensive risk control, allowing the maintaining of an acceptable level of risk exposure for the public entity, with minimal costs"*.

Also this regulation states that *"the manager is required to create and maintain a health system of internal control / management, mainly by:*

- *identifying the major risks that may affect the effectiveness and efficiency of operations, rules and regulations, confidence in the financial and internal and external management, protection of property, fraud prevention and detection;*
- *defining the acceptable level of exposure to these risks;*
- *evaluating the likelihood that the risk will materialize and the size of its impact;*
- *monitoring and evaluation of risks and the adequacy of internal controls to manage risks;*
- *verifying the budget execution reporting, including the one based on programs"*.

Based on this regulation at the level of the public authorities and institutions responsible for managing grants were adopted and are in place risk management procedures.

Despite the fact these procedures flow from the same regulation, risk definitions varies depending on the public authority. Thus, within the procedures applicable to Sectorial Operational Program Human Resources Development (SOP HRD) the risk is defined as *"potential danger, for a system or entity, that, by producing some events/actions or by lack of action, the goods and/or reputation or objectives fulfillment for all the system/entity components is affected"*.

Within the procedures applicable to Regional Operational Program (ROP) and Fishing Operational Program the risk is defined as *"problem (situation, event, etc.) with didn't occur but that can occur in the future, in which case reaching the planned results is threatened or boosted. In the first case the risk represents a threat, while in the second risk is seen as opportunity. The risk represents the uncertainty in reaching the envisaged results and has to be treated as a combination of probability and impact"*.

Within the procedures applicable to Romanian national funds for SMEs, the risk is defined as *"the possibility to produce an event which might have an impact on objectives fulfillment"*.

These definitions are in line with the provisions of the ISO 31000:2009<sup>(5)</sup> standard and with the PMBOK Guide<sup>(6)</sup>, which defines it as an event or uncertain condition, which, if appears, has a positive or negative effect on one or more of the project objectives.

A slightly different approach has the European Commission which, in the PCM Guidelines<sup>(7)</sup>, defines it as *"the probability that an event or action may adversely affect the achievement of project objectives or activities. Risks are composed of factors internal and external to the project, although focus is generally given to those factors outside project management's direct control"*. We can see that, for its aid programs the European Commission treats risk only as a problem, not as an opportunity.

In the economic theory there are many definitions of risk, some of it depicting only the negative aspects: potential loss, loss caused by the evolution of risk factors to the contrary of

the expected results<sup>(8)</sup>. Other definitions<sup>(9)</sup> focus on the financial negative aspects involved by risks.

Comparing the definitions in the procedures adopted in Romania by the public authorities and institutions responsible for managing grants with those from different international bodies or those in the economic theory, we note that the first refer to positive aspects and opportunity although the state has the mission the efficiently use the public resources. We consider that the state authorities should use risk management as tool for minimizing negative effects and increase the degree of objectives fulfillment.

Defining risk as opportunity in the public sector seems inappropriate, especially in the context in which none of the risks identified by the above mentioned authorities refer to a positive situation of opportunity in terms of delivering the public services in a better manner.

The analysis of these risk procedures<sup>(10)</sup> showed that it represents in fact only reproductions more or less complete of the *Methodology of implementation of internal control standard "Risk Management"*<sup>(11)</sup>.

In these circumstances, the only official and useful sources for the risks identified in the management of grants are the laws and regulations in force, which identifies as main risks the ones concerning procurement procedures.

### The procurement procedures used within the grant projects

In most projects financed by grants procurements is crucial, both in value and in terms of objectives and achievement of the planned results. In this respect, it is absolutely normal that procurement procedures are subject to detailed and comprehensive regulation.

In 2014, for the use of structural and cohesion funds, we have outlined two major procurement regulations, the distinction in using it being strictly related to the status of grant recipients:

- public procurement procedures;
- specific procurement procedures.

Public procurement procedures have to be used in all cases where recipients of funding are public authorities or institutions, known as "contracting authority"<sup>(12)</sup>. The obligation to apply these public procurement procedures have also the private organizations if they fulfill the following conditions:

- the works contract is financed/subsidized directly, in a proportion higher than 50%, by a contracting authority and the estimated value of the respective contract is equal or higher than the equivalent in RON of 5,000,000 Euro;
- the services contract is financed/subsidized directly, in a proportion higher than 50%, by a contracting authority and the estimated value of the respective contract is equal or higher than the equivalent in RON of 200,000 Euro.

For all other procurement made by private organizations within structural and cohesion funds financed projects (ex: businesses, NGOs, unions, etc.) and which does not fall under the above conditions specific procurement procedures are in place.

Thus, with regard to structural and cohesion funds, as from 22/11/2013, the specific procurement procedures are regulated by the Order of the Ministry of European Funds no. 1120/10.15.2013 regarding the approval of the simplified procedure applied by private beneficiaries under projects financed from structural instruments, "Convergence" objective, and projects funded under the EEA and Norwegian Financial Mechanisms for awarding contracts for the supply, service or works<sup>(13)</sup>.

## Inventory of risks related to specific procurement procedures

As stated above, there are in place legal regulations that relate to risks that underline possible risks related to procurement procedures.

First, the Government Emergency Ordinance no. 66/2011 on preventing, finding and punishing irregularities occurred in the collection and use of European funds and / or their respective national public funds refers to *"introduction of measures to prevent the occurrence of irregularities in the management of EU funds (especially those concerning conflicts of interest), in absence of which in the ongoing process of project selection there is a permanent risk of funding projects / contracts for which payment cannot be requested / reimbursed by the European Commission"*.

This law defines the prevention of irregularities as *"identifying and managing risks, development and the implementation of management procedures and other instruments of internal control to ensure the accuracy of granting and use of European funds and / or their respective national public funds"*. The law also presents deviations / deficiencies in compliance with procurement for which percentage reduction / financial corrections will be applied.

The Government Emergency Ordinance no. 66/2011 defines 25 misconduct / irregularities in public procurement procedures and only 3 such cases related to the special procurement procedures established by Ministry of European Funds Order no. 1120/2013. These three potential deviations are defined as follows:

- "Non-compliance on ensuring adequate publicity and transparency in publishing simplified procedure"
- "Non-compliance on ensuring adequate publicity and transparency to designate the winner"
- "Non-compliance on ensuring a sound financial management on applying the principles of economy, efficiency and effectiveness"

These definitions/provisions are broad and leave place to subjectivity, from both the authorities and the recipients of funding which apply the procedures.

Another important regulation is the Order which establishes Guide regarding the main risks identified on public procurement procedures and the European Commission's recommendations to be followed by the managing authorities / intermediate bodies in the process of verifying the procurement procedures starting with 04/06/2013. But this regulation refer only to public procurement procedures, not to specific procurement procedures.

However, we believe that, in applying the principles of efficient and effective use of grants, as well as equality and non-discrimination, the general rules on carrying out procurement procedures should be the same for public authorities and institutions as well as private organizations. In other words, these principles should be similar for both public procurement procedures and the specific procurement procedures.

## Sources of risks in specific procurement procedures

A comparative analysis of Government Emergency Ordinance no. Order No 34/2006<sup>(14)</sup> and the Order no. 1120/2013<sup>(15)</sup> leads to the identification of the following sources of risk in specific procurement procedures:

- 1) in the case of special procedures is not mandatory and is not a rule ***establishing criteria for qualification of bidders***;
- 2) in the case of special procedures is not mandatory, nor recommended ***guarantee request from the participants to the procedures*** (bid bonds or performance bonds like);

- 3) in the case of special procedures it is not required to *use of an award criteria*. The regulation states that, in accordance with the principles of economy, efficiency and effectiveness, private beneficiary will choose offer with the most benefits to the project purpose. Also in the explanatory note award will be presented technical and financial benefits that motivate the choice; in the document "Technical Specifications" will be presented, in order of priority, the elements taken into consideration for delimiting the offers.
- 4) in the case of special procedures *the existence of a tender evaluation committee is not mandatory*. The regulation states that the private beneficiary shall appoint the person who will prepare and sign the award explanatory note; not expressly require that this person to be a specialist in a particular field or in applying procurement procedures.

Risks and specific effects arising from these regulatory "gaps" are presented in the following table.

No.	Regulatory "gaps"	Specific risks	Specific effects
1.	L.1.1 establishing criteria for qualification of bidders is not mandatory	R.1.1 organizations participating in the procedure are created especially to obtain the contracts	E.1.1 authorities intervention for irregularities / fraud and cancellation of the procedures
2.	L.2.1 requiring guarantees from the participants to the procedures is not mandatory	R.2.1 successful bidder refuses to sign the procurement contract R.2.2 the quality of the products, services or works delivered does not match the offer	E.2.1 delays in execution of the procurement contract and potentially of the project E.2.2 the beneficiary does not obtain the products, services or works needed thus the project objectives being potentially affected
3.	L.3.1 use of an award criteria is not mandatory	R.3.1 the winning bidder is discretionary designated by the beneficiary R.3.2 unsuccessful bidders submit complaints about the outcome of the procedure	E.3.1 the offer with the best price it is not chosen (this violates the principle of efficient use of public funds) E.3.2 delays in procedure execution, signing of the contract and implementing the project
4.	L.4.1 the existence of a tender evaluation committee is not mandatory	R.4.1 the designated person does not have the right skills for choosing the best bid or it acts discretionary	E.4.1 the winning bid is not the best in terms of achieving project objectives

### Effects of not complying the EU rules of grants management

The aggregate effect if these risks materialize consists of difficulties in Romania's settlement with the European Commission for the amounts spent on projects in various funding programs.

Thus, for the financing period 2007-2014, the European Commission suspended payments on several programs, including those for which specific procurement procedures were applied (Sectorial Operational Program Human Resources Development – SOP HRD, Sectorial Operational Program Increase of Economic Competitiveness – SOP IEC, Regional Operational Program - POR). Moreover, in 2012, the Romanian Government had to apply financial corrections amounting over 200 million for these 3 financing programs<sup>(16)</sup>. Other financial corrections were applied and SOP HRD and SOP IEC in 2013<sup>(17)</sup>.

Compared to the total value of the three programs mentioned (11,484 billion Euro), financial corrections are nearly 2%.

For financial programming period 20014-2020, financial allocations related to the three funding programs mentioned are about 11,239 billion Euro.

While maintaining the risks that led to financial corrections in 2012 and 2013, including risks related to procurement, the probability of applying financial corrections for the projects undertaken during the financial period 2014-2020 can be translated into a financial effort for the public budget of about 200 million Euro.

This effort must be complemented with the effects that the financial corrections may have on private organizations implementing projects which can translate to loss of market share,

decreased productivity and even bankruptcy. Not to mention the fact that the application of corrections may hold the financing as unattractive for the private entities, thus the state being in the position not to spend all the available funds.

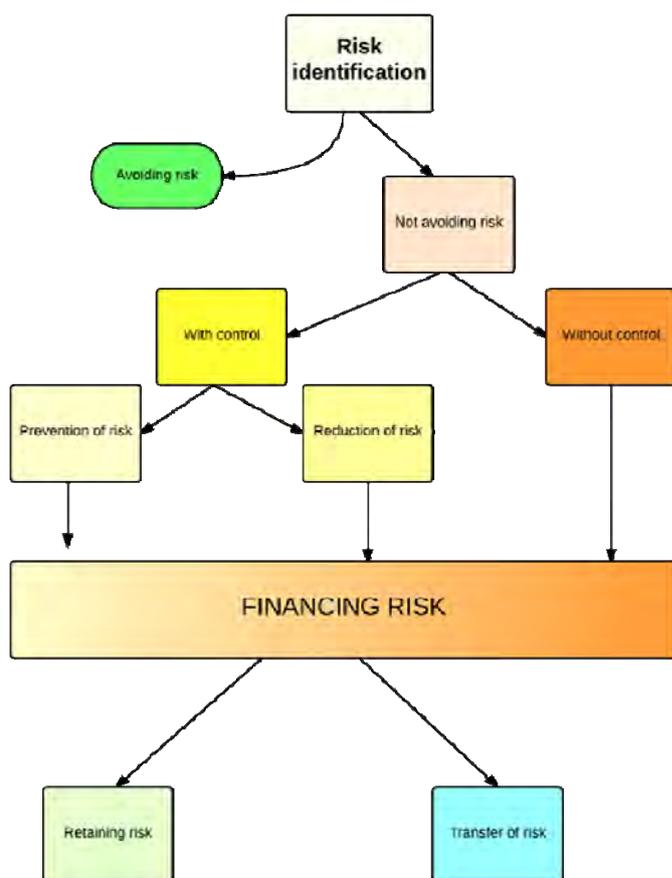
But the amount of the total corrections applied to Romania related to Structural and Cohesion Funds for the period 2007-2013 could be a lot bigger. In this respect the former minister of European funds in Romania, Mr. Eugen Teodorovici declared in March 2015 that “*The financial corrections on the current financial framework today we estimate to one billion euros. These are financial corrections coming on the particular system, the public procurement the most of it. That is the price paid by Romania for having put people in key positions, which, unfortunately, were not to be there. And especially in the area of public procurement*”<sup>(18)</sup>.

### Dealing with the risks arising out of the specific procurement procedures

As mentioned above, the existing risk management procedures adopted for the activity of the authorities and institutions managing structural and cohesion funds are theoretical and not practical.

Using the “tree of risk management solutions”<sup>(19)</sup>, as presented below, the specific risks identified above for the application of the specific procurement procedures can be analyzed in order to find the best ways to reduce the costs of its producing.

**Figure 2.** The tree of risk management solutions



**Source:** Badea, D., *Insurance and reinsurance*, Economica, Bucharest, 2003.

Let's take as example the 200 million Euro amount not reimbursed to Romania by the European Commission as “financial corrections” as the total possible costs of the risks arising out of the specific procurement procedures. Obviously, each phase has its own weight. Let's consider the following empirical distribution of total costs:

- Avoiding risk: 0% - 0 mill. Euro;
- Prevention of risk: 10% - 20 mill. Euro;
- Reduction of risk: 30% - 60 mill. Euro;
- Retaining risk: 50% - 100 mill. Euro;
- Transfer of risk (insurances): 10% - 20 mill. Euro.

No.	Risk	Activity	Costs of contingency
1	R.1.1 organizations participating in the procedure are created especially to obtain the contracts	Avoiding risk: changing legislation - establishing criteria for qualification of bidders mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the necessary documents to be submitted by bidders	1 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	3 mill. Euro
		Retaining risk: not changing the legislation	5 mill. Euro
		Transfer of risk: make insurances	1 mill. Euro
2	R.2.1 successful bidder refuses to sign the procurement contract	Avoiding risk: changing legislation - requiring guarantees from the participants to the procedures becomes mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the necessary guarantees to be requested from bidders	2 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	6 mill. Euro
		Retaining risk: not changing the legislation	10 mill. Euro
		Transfer of risk: make insurances	2 mill. Euro
3	R.2.2 the quality of the products, services or works delivered does not match the offer	Avoiding risk: changing legislation - requiring guarantees from the participants to the procedures becomes mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the necessary guarantees to be requested from bidders	2 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	6 mill. Euro
		Retaining risk: not changing the legislation	10 mill. Euro
		Transfer of risk: make insurances	2 mill. Euro
4	R.3.1 the winning bidder is discretionary designated by the beneficiary	Avoiding risk: changing legislation - use of an award criteria is becomes mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the necessary criteria to be used for designating the winners	8 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	24 mill. Euro
		Retaining risk: not changing the legislation	40 mill. Euro
		Transfer of risk: make insurances	8 mill. Euro
5	R.3.2 unsuccessful bidders submit complaints about the outcome of the procedure	Avoiding risk: changing legislation - use of an award criteria is becomes mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the necessary criteria to be used for designating the winners	3 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	9 mill. Euro
		Retaining risk: not changing the legislation	15 mill. Euro
		Transfer of risk: make insurances	3 mill. Euro
6	R.4.1 the designated person does not have the right skills for choosing the best bid or it acts discretionary	Avoiding risk: changing legislation - the existence of a tender evaluation committee is becomes mandatory	0 mill. Euro
		Prevention of risk: elaborating instructions about the competence and activity of the evaluation committee	4 mill. Euro
		Reduction of risk: applying financial corrections for the identified cases	12 mill. Euro
		Retaining risk: not changing the legislation	20 mill. Euro
		Transfer of risk: make insurances	4 mill. Euro

As we can see above, a certain distribution of costs among the identified risks and phases of action on those risks leads to a certain “weight” of each risk. In the example above, the risks that have the biggest costs on all phases of action are:

- 1) the winning bidder is discretionary designated by the beneficiary – 80 mill. Euro;
- 2) the designated person does not have the right skills for choosing the best bid or it acts discretionary – 40 mill. Euro.

In our opinion these two risks should be dealt with primarily in order to reduce the possible costs of financial corrections imposed by the European Commission to Romania.

Obviously, the best solution to reduce the costs of all the identified risks is changing the legislation.

## Conclusions

The specific procurement procedures used by the private organizations within the projects financed from the Structural and Cohesion Funds in Romania are sources of risk in the management of these funds.

As the risks arise from the regulation itself, the best solution to avoid these risks is changing the legislation. On long term this is the only efficient solution.

If the regulation will not change too soon, the best solution for reducing the costs if the risks occur is preventing the risks and transferring the risks. The two risks that should be addressed primarily are:

- the winning bidder is discretionary designated by the beneficiary;
- the designated person does not have the right skills for choosing the best bid or it acts discretionary.

Control activities and training activities should be the most efficient directions to follow in this respect.

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## Notes

- (1) “*Estimated GDP for 2013 was 631,130.1 mill. lei, current prices*” Source: Romanian National Institute of Statistics - [http://www.insse.ro/cms/files/statistici/comunicate/pib/a13/pib\\_trimIVr2013\\_1.pdf](http://www.insse.ro/cms/files/statistici/comunicate/pib/a13/pib_trimIVr2013_1.pdf)
- (2) Source: “The situation on 31 January 2015 for submission and approval of projects, signing of contracts and financing of payments to beneficiaries” published by the Romanian European Funds Ministry at <http://www.fonduri-ue.ro/>
- (3) <http://www.apdrp.ro/>
- (4) Order of the Minister of Public Finance no. 946/2005 for the approval of the Code of internal control / management, including internal control standards / managerial within public entities and develop internal control systems / management.
- (5) The standard ISO 31000:2009 was developed by the International Organization for Standardization. ISO 31000:2009, *Risk management – Principles and guidelines*, provides principles, framework and a process for managing risk. It can be used by any organization regardless of its size, activity or sector. Using ISO 31000 can help organizations increase the likelihood of achieving objectives, improve the identification of opportunities and threats and effectively allocate and use resources for risk treatment.
- (6) The PMBOK Guide, 5<sup>th</sup> edition, revision 3, 2014, page 338. The PMBOK Guide (A guide to the Project Management body of knowledge) was developed by the Project Management Institute, the world's leading not-for-profit professional membership association for the project, program and portfolio management profession, founded in 1969.
- (7) Project Cycle Management Guidelines, vol. 1, 2004, page. 145, published by the European Commission and available at [https://ec.europa.eu/europeaid/sites/devco/files/methodology-aid-delivery-methods-project-cycle-management-200403\\_en\\_2.pdf](https://ec.europa.eu/europeaid/sites/devco/files/methodology-aid-delivery-methods-project-cycle-management-200403_en_2.pdf)
- (8) See Bârsan-Pipu, N., Popescu, I. – Risk management: concepts, methods, applications, Braşov, Romania, Transilvania University Publisher, 2003, pag. 2, 44-49
- (9) See Robert I. Mehr and Stephen W. Forbes - The Risk Management Decision in the Total Business Setting - The Journal of Risk and Insurance, Vol. 40, No. 3 (Sep., 1973), pp. 389-401
- (10) The analysis of the risk procedures was carried on in January 2015, using the provisions of the Law no. 544/2001 on access to public information. It implied preparing and submitting formal requests to 50 major authorities/institutions involved in grants management. We received 10 positive answers (meaning we were submitted the risk management procedures in force), 6 invitations to consult procedures at the authorities/institutions headquarters and 14 negative answers (mainly stating the risk management procedures are not public). 20 authorities/institutions didn't submit any answer.
- (11) Methodology for implementation of the internal control standard "Risk management" developed in 2007 by the Ministry of Finance - Central Harmonization Unit of Financial Management and Control Systems.
- (12) Art. 8 of Government Ordinance no. 34 of 19 April 2006 concerning the awarding of public contracts, public works concession contracts, and services concession contracts
- (13) The provisions were detailed by Order no. 1191/2014 approving the Order of the Minister of EU funds related Instruction no. 1.120 / 2013 approving the simplified procedure applied by private beneficiaries under projects financed from structural instruments, "Convergence" objective, and projects funded under the EEA and Norwegian Financial Mechanisms for awarding contracts for the supply, service or works.

- <sup>(14)</sup> Government Emergency Ordinance no. Order No 34/2006 concerning the awarding of public contracts, public works concession contracts, and services concession contracts
- <sup>(15)</sup> Order nr. 1120/2013 of the minister of the European Funds in Romania regarding the approval of the Simplified procedure used by the private beneficiaries within the projects financed from Structural Instruments, Convergence objective, as well as within the projects financed by the SEE and Norwegian financial mechanisms for awarding the supply, services and works contracts
- <sup>(16)</sup> These corrections were regulated through:
- Government Decision no. 1160 of 27 November 2012 on financial corrections required by the European Commission on expenditure financed by the Regional Operational Program
  - Government Decision no. 1212/2012 on the application of financial corrections required by the European Commission on expenditure financed by the Sectorial Operational Program Human Resources Development
  - Government Decision no. 1287/2012 on the application of financial corrections proposed by the European Commission on expenditure financed by the Sectorial Operational Program Increase of Economic Competitiveness
- <sup>(17)</sup> These corrections were regulated through:
- Decision no. 485/2013 on financial corrections required by the European Commission on expenditure financed by the two requests for proposals relating to the operation 4.2 "Supporting investments in new capacity development and modernization of electricity and heat production by harnessing renewable resources: biomass, hydropower resources (in units with installed capacity exceeding 10 MW), solar, wind, biofuels, geothermal and other renewable energy resources under Priority Axis 4 of the Sectorial Operational Program Increase of Economic Competitiveness"
  - Decision no. 680/2013 on the application of financial corrections in the Sectorial Operational Program "Human Resources Development" 2007-2013 as requested by the European Commission
- <sup>(18)</sup> See the article "Romania will pay one billion Euro financial corrections for the past budgetary framework" available at <http://www.agerpres.ro/economie/2015/03/19/teodorovici-romania-va-plati-un-miliard-de-euro-corectii-pentru-cadrul-financiar-trecut-15-09-31>
- <sup>(19)</sup> See Badea Dumitru, *Insurance and reinsurance*, Economica, Bucharest, 2003.

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- Order of the Minister of Public Finance no. 946/2005 for the approval of the Code of internal control/management, including internal control standards / managerial within public entities and develop internal control systems/management
- Press release of the Romanian National Institute of Statistics no. 53 from 5<sup>th</sup> of March 2014 "GDP in the fourth quarter and 2013"
- The situation on 31 January 2015 for submission and approval of projects, signing of contracts and financing of payments to beneficiaries, published by the Romanian European Funds Ministry at <http://www.fonduri-ue.ro/>

# Study regarding financial sustainability in Romania's health system

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**Abstract.** *The Romanian healthcare system faces the problem of insufficient resources to meet the anticipated healthcare needs of the citizens. Ageing population, longer life expectancy, increasing demand for services, new technologies and new medicines all contribute to the financial pressure. Therefore, health system financial sustainability represents a priority comprising activities which imposes a strategic approach at national level. With a define purpose of supporting a financially sustainable and high performing health system, the paper analyses the health financing policy in Romania and recommends options for strengthening health financing policy. In conclusion, the Romanian healthcare system needs to reinvent itself if it is to emerge stronger from the current economic challenges.*

**Keywords:** financing, health policy, sustainability, efficiency, health system reform, universal health coverage.

**JEL Classification:** G28, I15.

## Introduction

Health is an essential component of well-being with major socio-economic implications. The organization and functioning of the health system depends on ensuring adequate funding. The World Health Organization has developed in its Annual Report for 2010 the guidelines to ensure the sustainability of health financing. Health financing is an important part of the overall effort to ensure social protection as the healthcare system is considered an important component of the social security apparatus. Romania must develop its health strategy in the context of European Union policies. These policies are based on values and principles such as promoting universal protection against financial risk, promoting a more equitable distribution of the financing burden, promoting equitable provision and use of services relative to need, improving the transparency and accountability of the system to the public, promoting quality and efficiency in service delivery, improving administrative efficiency, while ensuring the financial sustainability of the health system. The financial sustainability of the health system requires the balance of revenues and expenditures while spending wisely in order to provide a stable financial basis in the long term to develop the sector and ensure services for the population. The Romanian healthcare system is based on the social insurance or the Bismarck model that includes payments from employers and employees to finance these sickness funds and participation is compulsory.

## Literature review

Designing and implementing health finance strategy involves continuous adaptation rather than linear progress as the countries they serve also change: disease patterns evolve, resources ebb and flow, institutions develop or decline (Health Systems Financing: The path to universal coverage 2010). Financial sustainability is now a top priority for the health systems.

European Coordination Committee of The Radiological Electromedical and Healthcare IT Industry (COCIR Report, 2013: pp. 15) presents four key recommendations which ensure that European healthcare systems maintain their financial sustainability in the coming years:

- Better use of healthcare and ICT technology and solutions which can help improve patients' health, Europe's healthcare system efficiency and economic recovery.
- Managed Services (MSs) and Public Private Partnerships (PPPs) should be considered in all Member States as part of the solution for providing and maintaining high quality health services.
- "You get what you ask for" – procurement criteria need to match the demand of the healthcare provider and not ask for one thing, but expect another.
- The European Commission should ensure and facilitate, at national and regional level, the use of Cohesion Policy funds and encourage Managed Services and Public Private Partnership projects.

The health financing policy should contribute to more efficient and sustainable healthcare system. In the sense of the above mentioned, Văcărel (2007) was noticing: "In the current era, the authorization for making a specific expense without previously knowing what economic efficiency or social effectiveness or of other nature shall produce each Leu spent is not unconceivable. The fact that the financial resources – as well as the currency or the material ones – are limited, and their destinations are competitive, claims their use with maximum efficiency... Today the financial policy cannot be satisfied anymore with the promotion of an economy regime in terms of expenses, but it must follow the systematic increase of expenses' efficiency (effectiveness)".

Romanian healthcare system has been growing rapidly and constantly since the beginning of the 90's and has identified as one of the National Key Economic Areas under the National Plan of Development 2014-2020. Healthcare in Romania has undergone radical

transformations. However, today's healthcare system is continuously facing poor achievement of system function, lack of comprehensive long-term care strategy, low levels of public investment in health, inefficient use of resources, improper health infrastructure.

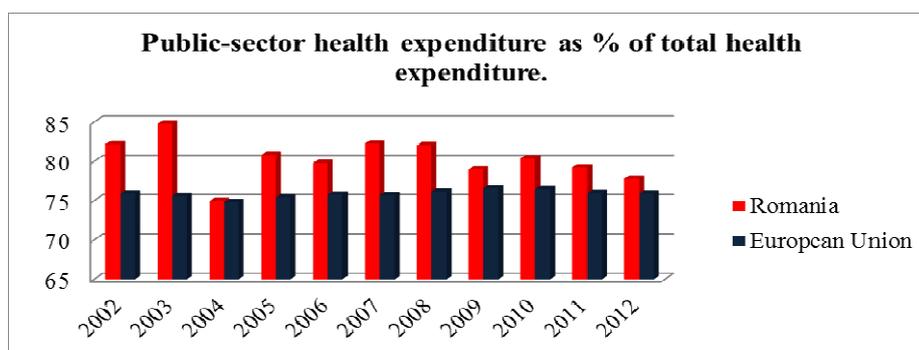
Detailed analysis of Romanian health system accomplished by Vlădescu et al. (2008), has emphasized recent degradation of several aspects of population health, despite its comparability to western Europeans in the 1960's and many health reforms.

Another important research was realized by Vlădescu and Buşoi (Healthcare policies in EU, 2011) who have highlighted that European institutions influence the functioning of the health systems and the providing health services in Romania and in Europe. The authors describe the legal framework and the health systems in different countries, their financing and organization, the differences between them and the measures taken for their standardization.

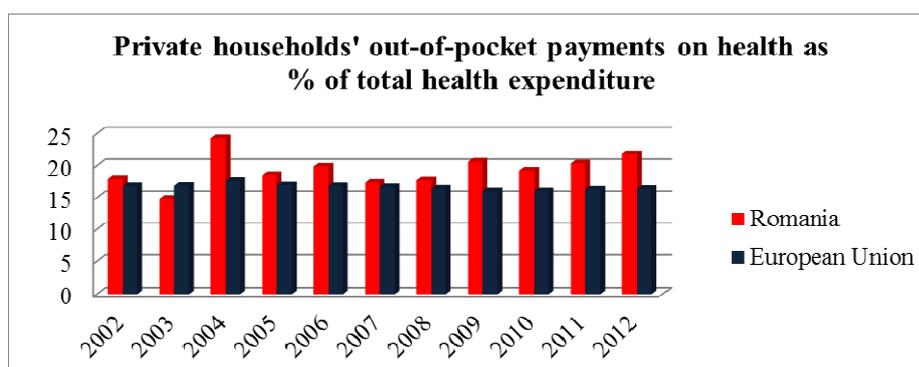
### Assessment of health financing policy

The Romanian health system crossed serious transformation during the last two decades and struggled to find a vision for its future. In Romania the healthcare system is financed by public and private financial resources, mainly by the majority of the public ones. The public resources for health financing system are: the Unique National Fund of Social Health Insurance; the national budget; the local budgets; own resources; donations and sponsorship. In the case of private financial resources, most of them come from direct payments or co-payments and charges for health care services.

In recent years, the Unique National Fund of Social Health Insurance proved to be financially unsustainable and has experienced persistent deficits covered by transfers from the national budget. In Romania the private sector share in total health expenditure is among the lowest in the European Union. In 2012, only 21.78% of total health expenditure came from private sources such as co-payment, informal payment and payments from private insurance companies.



**Source:** Compiled by the author based on European Health for all database.



**Source:** Compiled by the author based on European Health for all database.

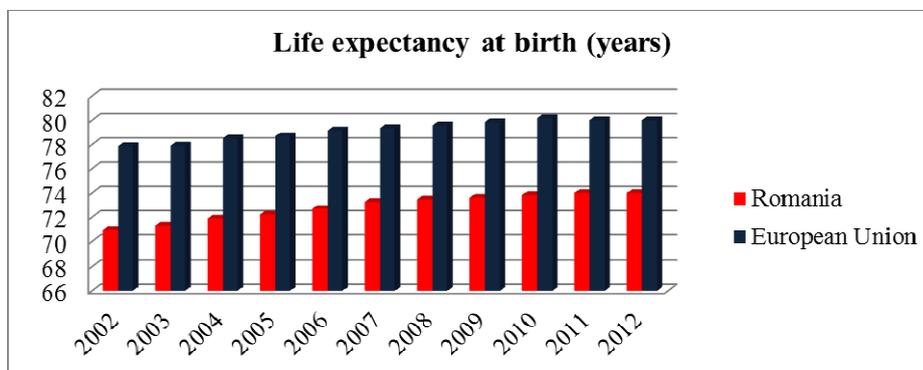
In Romania, the main source of government revenue for health care, are the health insurance contributions, which are compulsory.

In the context of measures taken to supplement the revenue sources, the Romanian health system identified two more sources: claw-back taxation and vice taxation. The claw-back tax represents a tax obligation owed by all manufacturers of drugs on the Romanian market through marketing authorization holders of medicines in Romania or their legal representatives, to finance the necessary health services for the entire community. The vice tax is payable by legal entities that produce or import tobacco products, entities that produce or import alcoholic beverages other than beer, wine, fermented beverages and by entities who derive revenues from advertising activities on tobacco products and alcoholic beverages.

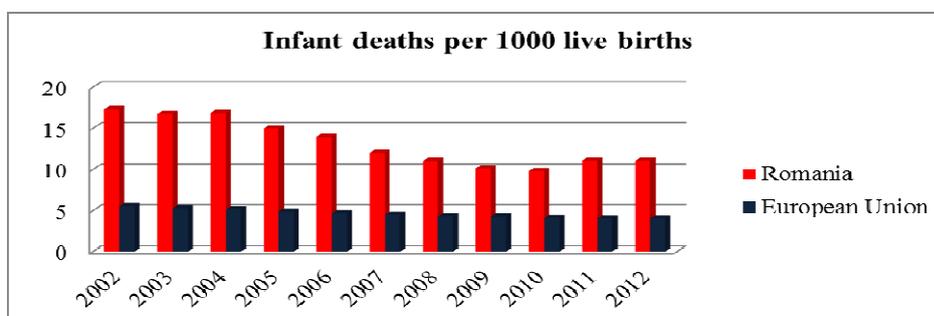
Except for special incomes, the health care system is financed from the state budget grants, namely from general taxation.

An alternative to cover healthcare segments in Romania is the voluntary health insurance system. This is a voluntary scheme through which an insurer sets up, on the mutuality principle, an insurance fund based on contributions of insured persons exposed to disease and pays compensations in the terms stipulated in the insurance contract for those who suffer injury. In practice, the number of private health insurance beneficiaries is limited and the majority of the population has to pay out-of-pocket when they have a health problem.

The total expenditure on health in Romania increased steadily but improving the health of the Romanian population has not kept pace. The Romanian health status indicators have low levels. For example, despite the positive trend, life expectancy at birth in Romania is lower than in most European Union countries. Infant mortality rate, one of the most important health status indicators, shows the same situation. Romania has the highest infant mortality rate among EU countries.

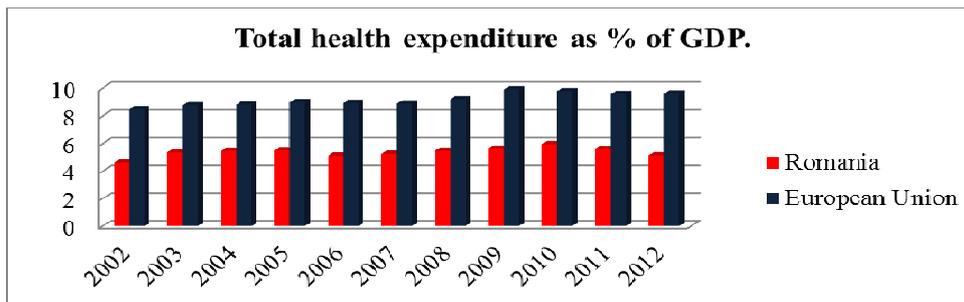


**Source:** Compiled by the author based on European Health for all database.



**Source:** Compiled by the author based on European Health for all database.

These results are related to the level of resources for health. However, compared with the EU countries, in 2012 Romania had the lowest percentage of GDP spent on health of 5.12%. Moreover, several studies have shown that effective health expenditure in Romania is low compared to other EU countries.



**Source:** Compiled by the author based on European Health for all database.

Referring to the distribution of funds within the health system, the hospital sector spends more than primary care and outpatient sector together. This encouraged a high induced consumption of medical services unrelated to the real needs of the population. Also, there is a relatively high share of expenditure on medicines in total health expenditure.

The indicators presented above provide the image of the Romanian health system which has been improving over the years but is still behind other EU healthcare systems.

### Recommendations for strengthening financing policy to meet Romanian health system objectives

Health financing policy in Romania faces several challenges, such as low public investment in health, weaknesses in resource allocation, purchasing and provider payment. All these issues may be solved strengthening financing policy to meet health system objectives.

- First. One way of balancing the revenue – expenditure gap is to broaden the public revenue base through greater reliance on non-employment-based taxes on capital and consumption and increased transfers from the central government budget to the health sector while ensuring transparency and stability. The central government should devote more of its resources to health, to provide additional funding and broaden the public revenue base. There are different ways the government can increase its budget to finance the health care system: raising VAT, raising alcohol excise tax, raising tobacco excise tax, introducing taxes on some types of food and drink, raising environmental and other taxes.
- Second. It is necessary to improve financial protection and equity in financing especially among poorer and older householders payments, due to the rapid growth of out-of-pocket payments. The Romanian health system needs to ensure more solidarity between rich and poor, between those who are active in the labor market and some of those who are not and between people in good health and people in poor health. The Ministry of Health should continue to supervise the financial protection in the health system and assure that services such as primary care continue to be free. Moreover, the Ministry of Health should take action to encourage their policy on the rational use of drugs, introducing clear incentives for enforcing the compulsory generic prescription policy and establishing a policy of generic substitution for pharmacists.
- Third. Strengthening financing policy requires to improve health system performance through better resource allocation and purchasing and recommends actions in the following areas: stronger oversight of capital investment in infrastructure and equipment; more and better investment in public health contributing to healthy ageing and economic development; strong responsible and free primary care at the center of the health system; incentives aligned across the health system and greater use of technology. Numerous reports by international organizations such as World Health Organization and the World Bank acknowledge the low performance of the Romanian health system in relation to other countries. Thus, there is sense for realizing further efficiency by improving investment and resource allocation processes. There are different areas in which the process of allocating

resources and purchasing health services could be strengthened. The Ministry of Health should develop a stronger strategy for guiding investment in and design of hospital infrastructure and should establish a central policy to control investment in expensive equipment in hospitals. In order to alleviate cost pressures associated with the burden of chronic ill health, the Ministry of Health should work closely with other ministries to generate sufficient investment in public health programmes and prevention. Also, the ministry should reinforce the role of primary care.

- Fourth. The health system financial sustainability demands strong governance of the health system that includes political decisions about how and how much to invest in health and how resources should be allocated. In the interest of a strong governance of the health system, the Ministry of Health should provide policies directions for the whole health system, ensuring a sufficient flow of resources into the health sector, should continue to invest in and improve the monitoring and evaluation of provider activity across the health system and should work closely with other ministries and highlights the positive economic effects of investing in health.

## Conclusions

The general framework, principles and procedures regarding the formation, administration and use of public healthcare funds, as well as the responsibilities of the public health sector authorities are analyzed from a financial perspective, precisely to identify the directions of action which are meant to guarantee the performance of the Romanian health financing policy.

Concerning the economic downturn of the recent years, the central objective of the health financing should focus on identifying solutions for rising sufficient resources for health while ensuring efficiency in resource use.

The Romanian health system financing should be done by following some broad ways: increasing efficiency, both in revenue collection and expenditure of funds for health, innovative financing, attracting funds from foreign sources and especially considering health a priority investment area in its national plans.

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**Appendix 1**

Total health expenditure as % of GDP											
Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	10.12	10.3	10.44	10.42	10.22	10.26	10.5	11.24	11.64	11.34	11.48
Belgium	8.46	9.98	10.02	9.98	9.48	9.54	9.92	10.6	10.5	10.52	10.8
Bulgaria	7.58	7.58	7.32	7.32	6.9	6.82	6.98	7.24	7.58	7.28	7.42
Croatia	6.28	6.44	6.66	7	7.04	7.54	7.8	7.8	7.82	6.82	6.82
Cyprus	6.12	6.84	6.42	6.38	6.28	6.06	6.9	7.4	7.36	7.42	7.32
Czech Republic	6.8	7.14	6.9	6.94	6.7	6.52	6.82	7.96	7.42	7.48	7.66
Denmark	9.34	9.52	9.68	9.78	9.92	10	10.18	11.48	11.08	10.88	11.2
Estonia	4.86	4.92	5.12	5.02	5	5.1	5.96	6.78	6.28	5.84	5.94
Finland	7.82	8.16	8.22	8.44	8.34	8.04	8.32	9.18	9	9	9.16
France	10.56	10.84	10.98	11.02	10.96	10.88	11.02	11.74	11.68	11.64	11.76
Germany	10.72	10.92	10.68	10.82	10.64	10.48	10.7	11.76	11.56	11.34	11.28
Greece	9.1	8.94	8.68	9.66	9.76	9.82	10.14	10.04	9.38	9	9.28
Hungary	7.6	8.58	8.22	8.46	8.26	7.68	7.46	7.74	8.04	7.9	7.82
Ireland	7.04	7.28	7.54	7.58	7.52	7.9	9.06	10.02	9.32	8.8	8.1
Italy	8.2	8.18	8.5	8.74	8.84	8.5	8.9	9.4	9.42	9.24	9.18
Latvia	6.3	6.16	6.52	6.38	6.8	7.02	6.64	6.84	6.5	6.02	6
Lithuania	6.4	6.5	5.68	5.84	6.2	6.22	6.6	7.54	7.06	6.7	6.66
Luxembourg	8.28	7.68	8.2	7.96	7.76	6.8	7.34	8.02	7.22	6.7	6.86
Malta	7.94	8.18	8.6	9.12	9.02	8.46	8.16	8.34	8.5	8.76	9.1
Netherlands	8.88	9.78	9.98	10.88	10.76	10.76	11	11.88	12.08	11.94	12.44
Poland	6.34	6.24	6.2	6.22	6.2	6.34	6.88	7.2	7	6.84	6.72
Portugal	9.3	9.74	10.06	10.36	10.04	10	10.22	10.82	10.8	10.24	9.46
Romania	4.6	5.34	5.44	5.48	5.1	5.24	5.44	5.64	5.96	5.62	5.12
Slovakia	5.64	5.82	7.22	7.04	7.36	7.76	8.02	9.16	9	7.94	7.8
Slovenia	8.62	8.66	8.36	8.36	8.28	7.86	8.36	9.2	8.88	8.86	8.76
Spain	7.26	8.16	8.22	8.3	8.4	8.5	8.94	9.62	9.62	9.3	9.62
Sweden	9.24	9.32	9.1	9.06	8.96	8.92	9.24	9.94	9.48	9.48	9.62
United Kingdom	7.64	7.84	8.04	8.28	8.44	8.5	8.96	9.92	9.56	9.42	9.44
EU	8.45	8.76	8.81	8.98	8.93	8.88	9.19	9.9	9.78	9.58	9.61

**Source:** European Health for all databases (HFA-DB).

**Appendix 2**

Public-sector health expenditure as % of total health expenditure											
Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	74.78	74.5	74.7	75.32	75.66	75.82	76.32	76.22	74.68	75.34	75.56
Belgium	73.8	75.2	76.02	76.12	73.84	73.36	74.9	76.06	75.1	75.92	75.92
Bulgaria	61.26	62.12	60.76	60.92	56.96	58.2	58.54	55.36	55.7	55.32	56.3
Croatia	80.06	82.62	81.06	86.02	86.08	87.04	84.88	84.9	84.8	82.5	82.32
Cyprus	44.98	45.14	43.84	41.82	42.44	42.6	41.36	44.74	43.28	43.28	43.14
Czech Republic	90.48	89.8	89.16	87.32	86.74	85.2	82.56	83.96	83.76	84.18	84.82
Denmark	84.5	84.56	84.28	84.48	84.64	84.4	84.66	85.04	85.14	85.3	85.54
Estonia	77.12	76.8	75.9	76.94	73.7	76.46	79.04	78.3	79.58	80.48	79.92
Finland	72.46	72.78	73.3	73.82	74.86	74.38	74.5	75.2	74.76	75.44	75.42
France	79.66	77.82	77.7	77.72	77.22	77.26	76.82	77	76.94	76.76	76.96
Germany	79.06	78.48	76.78	76.62	76.42	76.38	76.44	76.8	76.74	76.46	76.28
Greece	57.1	58.8	58.2	59.3	61.2	59.58	64.74	69.48	67.86	66.08	67.52
Hungary	70.22	71.1	69.6	70.04	69.78	67.26	67.06	65.68	64.8	65.04	63.64
Ireland	76.4	76.84	77.26	75.96	75.38	75.7	75.38	72.58	69.56	66.96	64.46
Italy	75.9	76.16	77.38	77.94	78.16	78.26	78.94	78.88	78.52	77.84	78.18
Latvia	52.14	52.82	56.58	57.06	64.1	60.7	62.22	59.52	59.56	57.1	56.74
Lithuania	74.92	76.02	67.56	67.78	69.52	72.98	72.4	72.82	72.9	71.44	70.82
Luxembourg	85.54	84.22	84.82	84.92	85.14	85.62	88.46	86.58	85.54	84.08	84.46
Malta	69.6	70.02	68.54	68.66	69.34	66.92	64.9	64.82	64.26	63.94	65.6
Netherlands	62.46	61.18	59.84	64.66	78.28	78.24	78.9	79.58	79.64	79.54	79.82
Poland	71.16	69.94	68.62	69.38	69.98	70.44	71.82	71.76	71.6	70.62	70.08
Portugal	68.56	68.7	68.08	67.96	67	66.68	65.3	66.54	65.94	65.02	62.64
Romania	82.2	84.8	74.96	80.78	79.8	82.26	82	78.94	80.36	79.22	77.74
Slovakia	89.06	88.32	73.78	74.4	68.32	66.86	67.76	65.7	64.48	70.94	70.52
Slovenia	73.38	71.64	73.14	72.7	72.3	71.9	73.98	73.72	74	73.72	73.3
Spain	71.3	70.24	70.54	70.9	71.58	71.86	73.04	74.74	74.2	73.06	73.56
Sweden	81.42	82.02	81.38	81.16	81.14	81.36	81.5	81.5	81.52	81.62	81.7
United Kingdom	79.44	79.48	81.04	80.96	81.32	80.16	81.06	82.6	83.56	82.84	82.52
EU	75.88	75.6	74.79	75.38	75.75	75.67	76.13	76.51	76.42	75.96	75.87

**Source:** European Health for all databases (HFA-DB).

**Appendix 3**

Private households' out-of-pocket payments on health as % of total health expenditure											
Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	16.06	16.32	15.82	15.6	15.8	15.34	14.52	14.22	15.24	15.34	15.2
Belgium	21.34	19.84	19.02	18.84	20.92	21.36	20.78	19.62	20.66	19.68	19.68
Bulgaria	38.16	36.98	38.22	37.9	41.8	40.6	40.38	43.38	42.88	43.26	42.3
Croatia	18.64	16.68	18.18	13.42	13.36	12.46	14.52	14.5	14.58	13.76	13.9
Cyprus	52.78	43.44	46.5	47.04	46.64	47.78	49.7	48.32	49.38	49.38	49.48
Czech Republic	9.54	9.96	10.36	10.7	11.3	13.18	15.74	14.44	14.86	14.74	14.16
Denmark	14.12	13.98	14.22	14.06	13.84	13.96	13.56	13.18	13.2	12.82	12.62
Estonia	20.08	20.42	21.42	20.48	25.24	22.16	19.96	21.14	18.74	17.82	18.42
Finland	21.28	20.9	20.5	20.08	19.08	19.34	19.1	18.48	19.76	18.62	18.6
France	6.98	7.06	6.92	7.02	7.36	7.26	7.54	7.42	7.42	7.46	7.4
Germany	10.66	10.98	12.3	12.24	12.46	12.4	12.14	11.88	11.9	11.98	12.06
Greece	35.02	34.26	35.22	34.84	32.88	34.56	34.82	28.44	29.24	31	29.68
Hungary	26.28	25.5	24.92	25	24.22	25.4	25.7	25.36	26.28	26.04	27.08
Ireland	14.56	16.12	15.64	15.32	14.34	13.54	14.14	11.58	12.86	13.96	15.02
Italy	22.68	22.78	21.48	20.84	20.18	20.44	19.9	19.8	19.92	20.54	20.24
Latvia	45.18	45.68	40.68	40.7	32.46	34.9	33.68	35.32	34.88	37.08	37.4
Lithuania	24.64	23.18	31.94	31.76	29.98	26.56	27.04	26.46	26.4	27.92	28.54
Luxembourg	11.82	12.24	11.64	11.6	11.54	9.38	9.16	9.32	10.02	11.54	11.24
Malta	28.36	28.84	27.82	28.78	29.96	31.24	33.04	32.46	33.36	33.82	32.26
Netherlands	8.02	7.32	7.16	7.54	6.22	6.06	6.18	5.34	5.32	5.54	5.58
Poland	25.44	26.44	28.12	26.16	25.62	24.62	22.82	22.76	22.24	22.4	22.82
Portugal	23.22	23.36	23.44	23.88	25.12	25.46	26.88	25.88	25.82	27.32	31.66
Romania	17.82	14.82	24.26	18.54	19.84	17.3	17.62	20.62	19.22	20.34	21.78
Slovakia	10.3	10.38	25.58	22.62	25.4	26.04	24.88	25.34	25.66	22.5	22.84
Slovenia	11.5	11.88	11.76	12.62	11.74	13.2	12.1	11.8	12.2	11.8	11.94
Spain	23.72	23	22.74	22.14	21.12	20.46	20.3	18.92	19.78	20.66	20.26
Sweden	16.24	15.9	16.32	16.7	16.64	16.5	16.36	16.4	16.36	16.2	16.14
United Kingdom	11	12.74	12.34	11.68	11.36	11.48	10.78	9.9	9.36	9.76	9.94
EU	16.76	16.8	17.56	16.88	16.77	16.61	16.38	15.96	15.98	16.25	16.34

**Source:** European Health for all databases (HFA-DB).

**Appendix 4**

Life expectancy at birth (years)											
Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	79	79	79	80	80	80	81	81	81	81	81
Belgium	...	78	79	79	80	80	80	80	80	80	80
Bulgaria	72	72	73	73	73	73	73	74	74	74	74
Croatia	75	75	76	75	76	76	76	76	77	77	78
Cyprus	77	80	80	79	81	80	81	82	82	81	82
Czech Republic	76	75	76	76	77	77	77	78	78	78	78
Denmark	77	78	78	78	79	...	...	...	...	79	80
Estonia	71	72	72	73	73	73	74	75	76	76	77
Finland	78	79	79	79	80	80	80	80	80	81	81
France	80	79	81	80	81	81	82	82	82	82	82
Germany	79	79	79	80	80	80	80	80	81	81	81
Greece	79	79	79	79	80	80	80	80	81	81	81
Hungary	73	73	73	73	74	74	74	74	75	75	75
Ireland	78	78	79	79	80	80	80	80	81	81	81
Italy	80	80	...	...	82	82	82	82	83	82	83
Latvia	70	71	71	71	71	71	73	73	74	74	74
Lithuania	72	72	72	71	71	71	72	73	74	74	74
Luxembourg	79	78	80	80	80	80	82	82	81	82	82
Malta	79	79	79	79	80	80	80	80	82	80	81
Netherlands	79	79	79	80	80	81	81	81	81	81	81
Poland	75	75	75	75	75	75	76	76	77	76	77
Portugal	77	78	78	...	...	79	80	80	80	80	81
Romania	71	71	72	72	73	73	73	74	74	74	74
Slovakia	74	74	74	74	75	75	75	75	76	76	76
Slovenia	77	77	77	78	78	79	79	79	80	80	80
Spain	80	80	80	80	81	81	82	82	82	82	82
Sweden	80	80	81	81	81	81	81	82	82	82	82
United Kingdom	78	78	79	79	80	80	80	81	81	80	81
EU	78	78	79	79	79	79	80	80	80	80	80

**Source:** European Health for all databases (HFA-DB).

**Appendix 5**

Infant deaths per 1000 live births											
Countries	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	4	4	4	4	4	4	4	4	4	4	3
Belgium	...	4	4	4	4	4	4	3	4	4	3
Bulgaria	13	12	12	10	10	9	9	9	9	11	11
Croatia	7	6	6	6	5	6	4	5	4	4	4
Cyprus	5	4	3	5	3	3	4	3	3	3	3
Czech Republic	4	4	4	3	3	3	3	3	3	3	3
Denmark	4	4	4	4	3	4	4	3	3	3	3
Estonia	6	7	6	5	4	5	5	4	3	3	3
Finland	3	3	3	3	3	3	3	3	2	2	2
France	4	4	4	4	4	4	4	4	4	3	3
Germany	4	4	4	4	4	4	4	4	3	3	3
Greece	5	4	4	4	4	4	3	3	4	4	4
Hungary	7	7	7	6	6	6	6	5	5	5	5
Ireland	5	5	5	4	4	3	4	3	4	3	3
Italy	4	4	...	...	4	3	4	4	3	3	3
Latvia	10	9	9	8	8	9	7	8	6	7	8
Lithuania	8	7	8	7	7	6	5	5	4	5	4
Luxembourg	4	5	3	2	2	2	1	2	3	2	2
Malta	6	6	6	6	4	6	8	5	5	5	6
Netherlands	5	5	4	5	4	4	4	4	4	3	3
Poland	8	7	7	6	6	6	6	6	5	5	4
Portugal	5	4	4	...	...	3	3	4	3	3	3
Romania	17	17	17	15	14	12	11	10	10	11	11
Slovakia	8	8	7	7	7	6	6	6	6	7	6
Slovenia	4	4	4	4	3	3	2	2	3	2	3
Spain	4	4	4	4	4	3	3	3	3	4	4
Sweden	3	3	3	2	3	3	2	2	3	2	2
United Kingdom	5	5	5	5	5	5	5	5	4	4	4
EU	5	5	5	5	5	4	4	4	4	4	4

**Source:** European Health for all databases (HFA-DB).

# Fraud in car insurance

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**Abstract.** *Insurance and Reinsurance Market in Romania has continued to decline both in nominal terms and in real terms, the evolution being influenced by the events and trends of the external financial markets. Of the total gross net retained premiums for general insurance, the largest share was owned by the vehicle liability insurance, the fully comprehensive car insurance policy ones being on a downward trend along with the onset of the financial crisis, despite the efforts made by large insurance-reinsurance companies. The rising unemployment, the decrease of incomes and hence of the living standards have determined the increase of the fraudulent activities in insurance field in general, but mainly in the vehicle insurance field. According to Insurance Europe's assessments, the insurance fraud amounts to 10% of total compensation but in the opinion of many experts, the actual size of this phenomenon is greater, the percentage being of almost 15%.*

**Keywords:** fraud, insurance, reinsurance, vehicle, premiums, underwriting offense.

**JEL Classification:** M10; M15; M19.

## Introduction

About the phenomenon of financial fraud, whether we refer to the banking sector, or to the capital market and insurance sector, they have always spoken with great caution and estimates of losses were a subject of dispute for statisticians. The financial crisis has generated an increase in crime in all areas and the global financial fraud took on an unexpected form. Tax evasion has remained the most common offense but insurance fraud has become the second.

According to recent estimates, worldwide insurers pay more than 100 billion dollars due to fraudulent claims for damages and there are serious doubts about the efficiency with which this phenomenon is managed globally.

The degree of penetration of insurance in our country, calculated as the ratio between the value of gross written premiums and gross domestic product is around 1.40% and places our country on one of the last places in the hierarchy of the European Union countries, Romania having one of the lowest insurance density values as well.

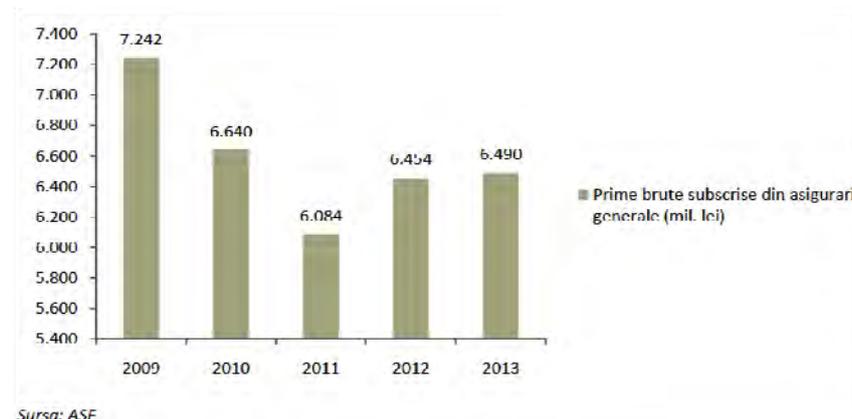
**Table 1.** *The degree of insurance penetration in GDP (%)*

Symbol	Degree of insurance penetration in GDP (%)	2008	2009	2010	2011	2012
AT	Austria	5.73	5.94	5.87	5.50	5.30
BE	Belgium	8.45	8.35	8.32	7.95	8.59
BG	Bulgaria	2.58	2.43	2.28	2.11	2.03
CH	Switzerland	9.37	9.67	9.62	9.55	9.63
CY	Cyprus	4.50	4.83	4.85	4.80	4.72
CZ	Czech Republic	3.37	3.61	3.89	3.83	3.79
DE	Germany	6.65	7.22	7.17	6.82	6.81
DK	Denmark	8.72	9.12	8.85	9.33	8.60
EE	Estonia	2.01	2.20	2.06	1.75	1.70
ES	Spain	5.45	5.85	5.38	5.69	5.45
FI	Finland	8.52	9.39	10.42	9.61	10.32
FR	France	9.48	10.59	10.70	9.47	8.89
GR	Greece	2.18	2.33	2.36	2.34	2.23
HR	Croatia	2.82	2.86	2.86	2.78	2.75
HU	Hungary	3.35	3.24	3.18	2.97	2.74
IE	Ireland	7.45	7.68	8.05	6.99	6.47
IS	Iceland	2.71	2.72	2.77	2.72	2.75
IT	Italy	5.84	7.75	8.10	6.98	6.71
LU	Luxemburg	4.56	4.60	4.85	3.89	4.43
LV	Latvia	2.08	1.70	1.48	0.94	0.93
MT	Malta	4.60	4.77	5.03	4.59	3.86
NL	The Netherlands	13.21	13.55	13.27	13.15	12.54
NO	Norway	4.08	4.34	4.34	4.31	4.49
PL	Poland	4.63	3.82	3.82	3.71	3.88
PT	Portugal	8.91	8.61	9.45	6.82	6.61
RO	Romania	1.74	1.77	1.59	1.40	1.41
SE	Sweden	7.50	8.03	8.13	7.63	6.37
SI	Slovenia	5.42	5.84	5.90	5.60	5.72
SK	Slovakia	3.15	3.23	3.03	2.92	2.97
TR	Turkey	1.21	1.29	1.28	1.32	1.40
UK	Great Britain	13.48	12.90	11.95	12.05	12.51

From the report published by the Financial Supervision Authority for 2013, the gross written premiums came down up to 91.83 Euro / capita.

**Table 2.** Insurance density (Euro/capita)

Symbol	Insurance density (Euro/capita)	2008	2009	2010	2011	2012
AT	Austria	1948,4	1967,9	2002,5	1961,3	1932,5
BE	Belgium	2734,5	2635,7	2720,9	2674,0	2921,1
BG	Bulgaria	120,0	112,0	109,0	110,6	110,9
CH	Switzerland	4348,5	4551,7	5124,0	5758,0	5966,1
CY	Cyprus	982,2	1008,2	1018,0	1009,5	967,7
CZ	Czech Republic	498,2	489,0	553,8	567,6	550,8
DE	Germany	2003,6	2093,6	2187,5	2177,6	2216,7
DK	Denmark	3731,9	3691,8	3771,5	4028,8	3771,8
EE	Estonia	243,3	229,2	221,0	211,4	221,5
ES	Spain	1299,9	1332,4	1222,1	1291,4	1214,3
FI	Finland	2975,9	3030,8	3473,7	3367,5	3667,2
FR	France	2856,5	3097,2	3199,4	2910,9	2761,6
GR	Greece	454,6	480,4	469,5	439,2	389,4
HR	Croatia	311,0	297,7	295,2	287,0	281,5
HU	Hungary	352,7	295,6	306,4	294,7	267,6
IE	Ireland	2987,4	2747,2	2790,5	2483,0	2309,9
IS	Iceland	873,6	739,9	827,3	861,1	907,4
IT	Italy	1538,0	1957,1	2078,6	1815,2	1726,0
LU	Luxemburg	3483,2	3283,8	3753,7	3124,8	3578,6
LV	Latvia	218,6	147,0	127,1	92,7	101,8
MT	Malta	670,6	689,0	783,0	738,2	633,6
NL	The Netherlands	4775,7	4699,7	4688,0	4717,7	4485,9
NO	Norway	2665,4	2454,2	2819,4	3072,9	3484,5
PL	Poland	441,3	311,0	352,0	356,6	384,5
PT	Portugal	1442,8	1365,2	1536,1	1098,6	1031,4
RO	Romania	118,2	102,7	97,4	91,6	92,1
SE	Sweden	2712,6	2525,9	3032,0	3114,3	2729,9
SI	Slovenia	998,5	1013,9	1022,1	986,5	981,6
SK	Slovakia	375,7	374,1	367,2	373,3	391,2
TR	Turkey	85,1	78,8	96,7	99,3	n.a.
UK	Great Britain	4032,2	3322,4	3323,2	3402,4	3794,1

**Figure 1.** Evolution of gross written premiums for general insurance between 2009 and 2013

Gross written premiums from general insurance (million lei)

Source: FSA.

From the dynamic of figures it is clear that the car insurance as a business is not profitable and it is possible that this will not change anytime soon as long as the system is defrauded both from the inside and from the outside.

This would not be possible without the complicity of people inside the system. The fraud scourge includes all links in the insurance process: insurers, reinsurers, brokers, agents, insured and varies significantly from country to country being largely determined by law and by the dominant classes of insurance.

Car insurance legislation makes the figures vary significantly from country to country both in terms of the number of policies underwritten and of the amount of compensation awarded, the most important difference being the percentage of fraud of the total compensation.

Fraud in insurance has seen a constant evolution and it is considered that the complete eradication of the phenomenon is a utopia, as the insurers must seek and find solutions to master as good as possible this scourge of the modern world.

Sociologically, things seem complicated because many people treat insurance fraud as a petty offense, many of them being willing to submit a fraudulent claim for compensation to the insurance company.

In order to combat this phenomenon, European countries had different approaches concentrating mainly on the discovery and proof of fraud attempts and on the possible reduction of compensation paid.

In the period of time between 2008-2013, on the territory of countries such as Great Britain and France, where proven fraud exceeded 4 billion Euro, they have taken the measure of changing the criminal law so that offenses in the insurance field can be punished more severely, thus favouring the appearance on the market of specialized bodies that promote the fight against insurance fraud, prepare investigators in the field and gained powers in detecting organized networks.

Examples: -Insurance Fraud Bureau – UK

- Agence pour la Lutte Contre la Fraude a L'assurance.

Also, one of the main objectives in the fight against fraud is the work with state authorities having the necessary powers, so that they can receive qualified assistance without having to waste financial resources.

### Typology of car insurance frauds

When discussing about insurance, we establish a direct relationship with the risk as probability of occurrence of a loss. An adjuster should cause the occurrence of an insured damage and the amount of this damage (Badea, Naghi, 2014).

Although there are two broad categories of fraud, the underwriting and claims, they have in turn a lot of subcategories. Analyzing the whole system, we can conclude that we cannot talk about fraud patterns but we can identify the factors that generate and customize this phenomenon.

In general, fraud can be divided into:

- *internal fraud*;
- *external fraud*.

**Internal frauds** are produced by people within the insurance system, or with their complicity and are extremely difficult to recover.

The most common methods used by them are:

- *The issue of insurance policies* by insurance agents or brokerage assistants, who acquire the premiums collected. It is good to know that, if the policy seller does not deposit the money, the insured is covered provided they have original documents.
- *Damage inspector* performs fictitious findings and proposes for payment inexistent damage or damage that is produced by an uninsured risk.
- *Accounting department* - which can authorize favourably an unlawful claim for compensation.
- *Internal control bodies* who knowingly ignore clues that could lead to the discovery of the fraud attempt determining thereby the granting of compensation.

**External frauds** are caused by natural or legal persons outside insurance companies. Either they are called insured, beneficiaries of insurance policies (policyholders), repair shops or others through their actions, they produce legal consequences by means of the unjustified collection of amounts of money.

The most common methods used by the insured are:

- *The change of the place* where the event occurs and declaring other circumstances than those that generated the accident.
- *Organizing groups* in order to direct accidents by using the same vehicle and declaring the insured events at different companies.
- *The assuming of guilt* by another person when the one truly involved is intoxicated, has the driving license withheld or holds an inappropriate category.
- *Declaring another calendar date* of occurrence of the insured event to be covered by the term of the policy.
- *Simultaneous initiation* of proceedings for compensation, at several insurance companies after the same event.
- With the complicity of insurance agents or brokerage assistants, policyholders, *present for underwriting counterfeit documents* or *amend* in the documents certain technical characteristics of the vehicles, managing to pay considerably lower premiums. These are considered “papers for police” because they are given only in the event of control by the traffic control authorities. In this case, the policyholder does not make use of it and if a road accident occurs it bears the cost from its own funds.
- *Overvaluation of damage* by repair service, despite the introduction of systems to calculate AUDATEX estimates;

### Consequences

The effects of insurance fraud affect first honest policyholders because, in determining insurance premiums they take into account specific indicators such as the frequency of damage and paid average compensation.

Payment of compensation in cases of unproven fraud files has direct effects on the amount of insurance premium set each year, but the effects do not stop there. Insurance companies record direct financial loss by paying for fraudulent claims for damage and the state when it fails to collect the tax on the income unachieved by insurers.

### Conclusions

The fierce battle for supremacy winning on the car insurance market often leads to management errors. The main vulnerabilities of the insurance system remains the lack of communication and the lack of a common database.

Insurance fraud must be notified to prosecutors offices attached to courts by insurance companies. The most widespread legal classifications are fraud, false statements and documents, use of forgery and false identity noting that the legislature has regulated the sanctioning of attempt.

Wishing not to alter their image, insurance companies do not open criminal proceedings against the employees found to have been involved in fraud and, unfortunately, they rarely opt for notifying the competent authorities, settling for the withdrawal of claims for compensation by the perpetrators.

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Government Decision no. 1391 of October 4, 2006 for the approval of the Government Emergency Ordinance no. 195/2002 on public roads traffic (updated).  
Law no. 286 from 2009 - Penal Code.  
Law no.136 / 1995 on insurance and reinsurance.  
Law no.32 / 2000 on insurance companies and insurance supervision.  
Order no.12 / 2008 for the implementation of the Regulations on the procedure for preparing and issuing the document introducing the repair.  
Order no.14 / 2011 for the implementation of the Regulations on compulsory civil liability insurance for damages caused by vehicle accidents

# Modern indicators of measuring the societies' ability to create value

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**Abstract.** *This paper presents both theoretical and practical, the modern indicators of measuring the society's ability to create value. These indicators are used in the financial analysis, in order to assess the society's performance. Treating this issue ensures the premises to formulate some realistic goals of the economic entity and also a rational and a sustainable strategy of managing the available resources in order to increase them. At the same time, an important advantage of the analysis of these modern indicators is the fact that they offer the possibility to make comparisons regarding the financial performance of a society during a period of time, or between different societies. The study conducted during the period 2007-2013, on two Romanian societies from the construction sector, listed on the Bucharest Stock Exchange, leads to the conclusion that because of the financial crisis, the financial performance of the societies, estimated through the modern indicators of measuring the societies' ability to create value, was significantly affected.*

**Keywords:** value creation, investors, modern indicators, financial performance, the cost of the capital.

**JEL Classification:** G32.

## 1. Introduction

The international financial crisis increased the challenges which the business environment must face. The globalization, the deregulation and other factors of change contributed to the manager's orientation towards value creation. The concept of creating value for the shareholders developed at the same time with the formulation of the Capital Asset Pricing Model. This model demonstrates the fact that the shareholders incomes are influenced by the level of the risk associated to the financial securities owned. The efficient investments should create value, which involves obtaining a profitability superior to the rate of return required by the shareholders. Despite the fact that the traditional indicators are widely used in order to estimate the performance of the economic entity, they provide only historical results. Also, they do not consider the cost of the capital and they are not relevant in assessing the future performance. Instead, the modern indicators of measuring the societies' ability to create value are considering the cost of the capital and the risk and are focusing on the value creation. Therefore, a high value of these modern indicators reflects a high global value of the society.

## 2. Literature review

The value represents one of the oldest concepts from the economic field. It can be defined as the monetary level of a product or service (Robu et al., 2002: p. 3). Also, the value highlights the importance given to the products and to the services at a certain moment of time. In this paper, we will focus on the shareholders value, obtained when the profits generated by the investments are superior to the cost of the capital. This concept appeared in the 1950's - 1960's and developed at the same time with the formulation of the Capital Asset Pricing Model. The concept of value creation became well known after 1990, after the McKinsey group publications, which underlined the fact that, the value creation benefit all the stakeholders.

## 3. Characterization of the main modern indicators of measuring the societies' ability to create value

### 3.1. Economic value added (EVA)

It is the most famous and used indicator of measuring the managerial performance based on the value created for shareholders. General Motors introduced in 1920 this concept, which was not widely used until the 1980's, when the consulting firm Stern-Stewart & Co. from New York abandoned the traditional methods of measuring the value and used the concept of economic value added (Black, 1998, pp: 59). According to the existing publications, a growing number of societies are determining their performances and are establishing their corporate policies using EVA. Numerous studies highlighted the fact that the utilization of this modern indicator, determined the increase of the course of the societies shares (Burkette et al., 1997: pp. 46-49). EVA's utilization motivates the managers, because it brings material rewards according to the value created for shareholders. Statistical reports demonstrate that EVA quantifies also the quality of the managerial decisions and forecasts the future growth of the society. The indicator highlights the weaknesses and the strengths of a society, representing in the opinion of many specialists, the most important indicator for measuring the value creation.

EVA represents the difference between the net operating profit after tax (NOPAT) and the product between the weighted average cost of capital and the capital. More exactly, the indicator determines the wealth obtained or lost by the society over a period of time.

$$EVA = NOPAT - (CMPC \times \text{Total capital}),$$

Where:

NOPAT = the net operating profit after tax;

CMPC = the weighted average cost of capital.

The main advantage of EVA is that it facilitates the decision-making, because it is considered that the society creates value when the indicator values are positive. One of the disadvantages of EVA is that it is impossible to make relevant comparisons between societies based on this indicator, because EVA is influenced by the society's size and by the size of the employed capital. Therefore, a smaller society but which operates in an efficient manner can obtain an EVA indicator inferior to a large society, but which does not operate as efficient as the small society. A solution to this problem is to use the EVA/Capital indicator. Thus, it will be considered more efficient the society that will obtain an EVA/Capital superior to the other society.

### 3.2. Market Value Added (MVA)

Market Value Added (MVA) reflects the value created by a society, above the value of the invested capital, for a certain period of time. By increasing its EVA, the society will increase its market value added. The MVA indicator highlights the management efficiency in using its available financial resources. MVA is determined as difference between the market value and the book value of the society's equity (Kus, 2000: p. 23).

$MVA = \text{The market capitalization} - \text{The book value of the equity.}$

MVA determines the value obtained or lost by the society through the investments conducted by its shareholders. The MVA value depends on the size of the rate of return compared to the cost of the capital. If MVA records positive values, then it is created value for the shareholders, the society being managed in an efficient manner. Instead, an MVA indicator with negative values reflects the fact that the shareholders wealth was reduced, the amount of capital invested at the beginning of the analyzed period being higher than the market value of the capital. When the MVA is zero, the society recovers only the cost of the capital.

The indicator also reflects the investor's confidence in the society. So, if they consider that the business is profitable, they will acquire shares and as a consequence their price will increase (Kus, 2000). The size of the profits obtained in the past by the society is important only if it changes the expectations regarding the performances that will be achieved in the future. For this reason, the MVA analysis is completed with the analysis concerning the Total Shareholders Return (TSR), which determines the society's performance, according to the expectations and to the variations in the expectations of the financial markets.

An important advantage of the MVA indicator is that it highlights the management contribution at the society's position on long-term, because the market includes the present value of long-term gains. Also, the market considers the level of the risk associated to different fields, therefore the indicator must be adjusted at risk.

One of the disadvantages of the indicator is that its value is not representative for decision-making, because the market evolution can influence the society's shares on short term more than the managers' decisions. Also, its calculation is not possible for all the societies, but only for those which are listed. Some experts consider that MVA represents a complement of the TSR indicator and that using only these two indicators in order to compare the societies' performances is not providing reliable results. Besides, the society's market value can be the result of the previous management decisions, which means that we can not certainly know when the value of the society was created. In consequence, it is impossible to determine if the society's value is sufficient to cover the shareholders expected return.

### 3.3. Total shareholders return (TSR)

The indicator is also called „*Holding Period Return*” and it represents the gain obtained by the investors from the shares that they own during a period of time. If it is necessary to determine the indicator for a longer period of time, the dividends from each year must be considered. TSR is calculated according to the model below (Tache, 2007: p. 167):

$$\text{TSR} = \frac{D + (P_t - P_{t-1})}{P_{t-1}} * 100.$$

Where:

D = dividend per share;

P<sub>t</sub> = the share price at the end of the year;

P<sub>t-1</sub> = the share price at the beginning of the year.

An important advantage of this indicator is the fact that it facilitates the comparison of the performances between societies or between societies and the market, because it is determined as a percentage. Also, TSR is difficult to manipulate and it provides early information concerning the financial situation of the society (Black, 1998: p. 98). TSR indicator has some disadvantages, like the fact that it can be determined only for the listed societies. As well, it is difficult to quantify the investors' expectations regarding the society's shares.

### 3.4. Return on Investment (ROI)

The indicator determines the investments efficiency and it is considered to be one of the most popular tools for measuring the societies' performance. Most experts consider that the societies with a high value of the ROI indicator, obtained the highest value for the investors. Instead, there are experts who consider that the increase of the indicator does not necessarily imply a value creation for shareholders. They believe that the value can be created only when the ROI indicator is superior to the cost of the employed capital. Rapaport, a supporter of this concept, affirms that ROI and the cost of the capital are difficult to compare, because they are incompatible sizes. ROI considers only a period of time, but it is possible to determine an average ROI for several periods. The indicator is determined according to the model (Tabără et al., 2013: p. 93):

$$\text{ROI} = \frac{\text{The accounting profit}}{\text{The book value of the investment}} * 100.$$

One of the ROI advantage is that, unlike the MVA and the TSR indicator, it can be determined also for the society's departments. A disadvantage of the indicator is the fact that it can be manipulated. Also, it is possible that some investments with a low ROI to be rejected in the societies with a high ROI, even if the investments would offer gains superior to the cost of the capital. But it is also possible that, a society with a low value of ROI to accept investments with a higher level of ROI, but insufficient to exceed the cost of the capital.

## 4. Research regarding the evolution and the analysis of the modern indicators of value creation at two societies listed on the Bucharest Stock Exchange

In order to highlight the modality to determine the value created for the shareholders, it was calculated and analyzed the evolution of the main modern indicators of measuring the societies ability to create value, at two Romanian societies from the construction sector that are listed on the Bucharest Stock Exchange, at the first and at the second category.

The research is conducted over a period of seven years, more exactly from 2007 to 2013. We considered that the selected period is representative, because it includes both a pre-crisis period and the period that followed the crisis. The calculation and the indicators analysis were realized based on the information provided by the financial situations and by the annual

reports published on the Bucharest Stock Exchange site ([www.bvb.ro](http://www.bvb.ro)) and on the site of the analyzed societies, respectively Impact Developer & Contractor SA and Transilvania Construcții SA (<http://www.impactsa.ro/>; <http://www.transilvaniaconstructii.ro/>).

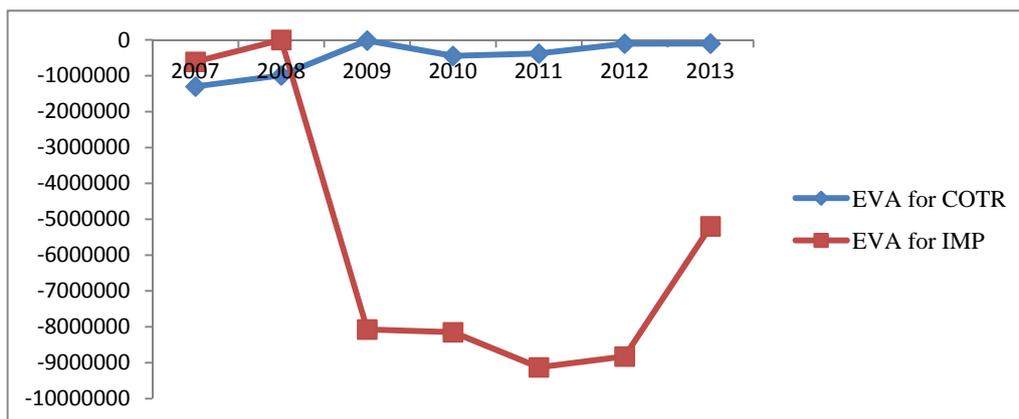
Impact Developer & Contractor SA has as main activity the imobiliar development (promotion), NACE code 4110. The society is listed on the Bucharest Stock Exchange since 1996, and has a subscribed capital of 197.866.574 lei. In 2006, its shares were promoted to the first category of Bucharest Stock Exchange, and the society became the most successful in the construction sector from Romania. Its capital is divided into 197.866.574 common shares, with a nominal value of 1 leu per share.

Transilvania Construcții SA is one of the most successful societies in the construction market from Cluj. The society's activity is to provide construction services for residential and non-residential buildings, NACE code 4120. The society is listed on the Bucharest Stock Exchange since 1997, and since 2008 its shares promoted at the second category. Transilvania Construcții SA has a subscribed capital of 31.211.499 lei, divided into 945.803 common shares, with a nominal value of 33 lei per share.

#### 4.1. The evolution and the analysis of the Economic Value Added (EVA)

During the period 2007-2013, the evolution of the EVA indicator for the analyzed societies is presented in the Figure 1.

**Figure 1.** The evolution of the EVA indicator during the period 2007-2013



An	2007	2008	2009	2010	2011	2012	2013
NOPAT COTR	8.110.179	5.532.676	302.977	335.165	1.085.936	2.156.606	2.701.287
CMPC*Cap total COTR	9.410.091	6.522.806	320.201	780.216	1.465.576	2.261.980	2.803.032
EVA COTR	-1.299.912	-990.130	-17.224	-445.051	-379.640	-105.374	-101.745
NOPAT IMP	7.401.076	8.258.687	141.540	-17.546.665	-22.261.046	-74.892.467	-42.457.620
CMPC*Cap total IMP	8.010.899	9.807.811	8.213.518	-9.398.844	-13.133.021	-66.067.899	-37.260.353
EVA IMP	-609.823	-1.543.124	-8.071.978	-8.147.821	-9.128.025	-8.824.568	-5.197.267

**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor SA and Transilvania Construcții SA society.

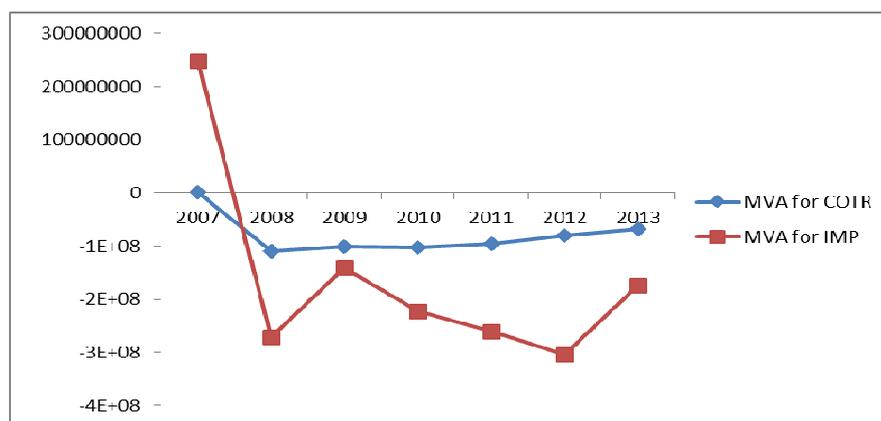
From the EVA's evolution (Figure 1) it can be noticed the fact that the indicator records negative values for both societies and for the whole analyzed period, the shareholders value being destroyed. In the case of the COTR society, the highest negative value of EVA was recorded in 2007, and in the coming years it was observed a tendency of improvement in the value of the indicator, even if it still recorded negative values. The EVA's negative values are the consequence of the significant decrease of the net operating profit after tax during the period 2008-2013 compared to 2007, caused by the construction market fall and by the reduction of the society's turnover, at the same time with the crisis arrival.

At the IMP society, the value of the indicator is negative and very low during the whole analyzed period. At this society, the main cause of the decrease in the indicator value was also the net operating profit after tax that decreased significantly, the society recording loss since 2010.

#### 4.2. The evolution and the analysis of the Market Value Added (MVA)

During the period 2007-2013, the MVA evolution of the studied societies is presented in the Figure 2.

**Figure 2.** The evolution of the MVA indicator during the period 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Kb COTR	32,311,065	13,939,517	21,207,318	21,400,579	14,237,813	32,189,329	45,483,600
Cap pr COTR	31.598.632	123.065.693	122.881.534	123.216.699	109.669.336	111.825.942	113.392.256
MVA COTR	712.433	-109.126.176	-101.674.216	-101.816.120	-95.431.523	-79.636.613	-67.908.656
Kb IMP	574.286.075	62.800.000	141.000.000	94.020.000	36.400.000	22.754.656	107.639.416
Cap pr IMP	326.702.495	333.718.186	281.430.496	315.930.582	296.828.111	326.121.387	281.430.496
MVA IMP	247.583.580	-270.918.186	-140.430.496	-221.910.582	-260.428.111	-303.366.731	-173.791.080

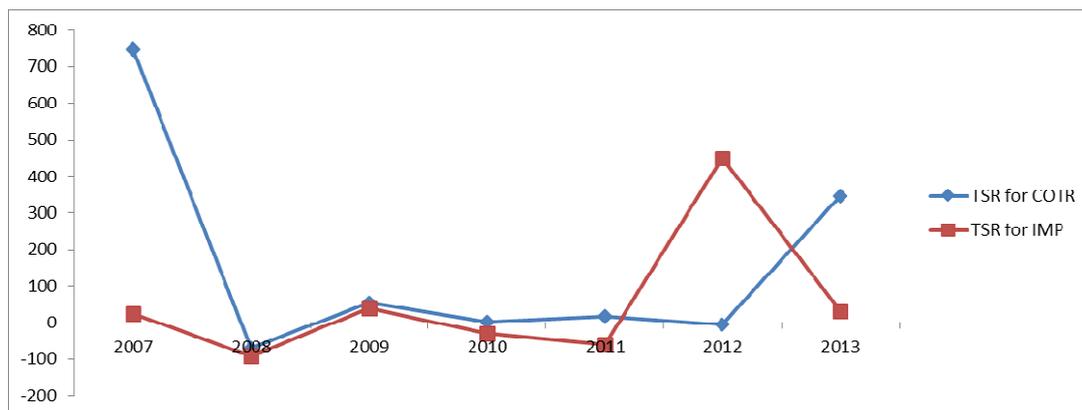
**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor S.A. and Transilvania Construcții SA society.

Like the EVA's indicator, MVA records negative values for both societies during the 2008-2013 period. For the COTR society, MVA records positive values only in 2007, before the economic crisis, which means that the society created value for the shareholders in that year. Since 2008, the decrease of the market capitalization, and implicitly the decrease of the investor's confidence in the society, led to a loss of value for the shareholders. Even if the society's equity are rapidly increasing from 2007 until 2010, it can be noticed a decrease of the market capitalization and implicitly a MVA decrease. Despite the fact that in the last three years, we are witnessing at a slight increase of the market capitalization, the value of the MVA indicator still records negative values.

Also, in the case of the IMP society, the market capitalization is superior to the equity only in 2007. In 2008, because of the economic crisis, we can observe a significant reduction of the share's price due to the decrease of the confidence in the society, and hence of its market capitalization, followed by a slight recovery in 2009. Since 2010 until 2012, the indicator is in a continuous decrease, followed in the last analyzed year by a significant increase, but it still records negative values.

#### 4.3. The evolution and the analysis of the Total Shareholders Return (TSR)

During the period 2007-2013, the TSR evolution of the studied societies is presented in the Figure 3.

**Figure 3.** The evolution of the TSR indicator during the period 2007-2013

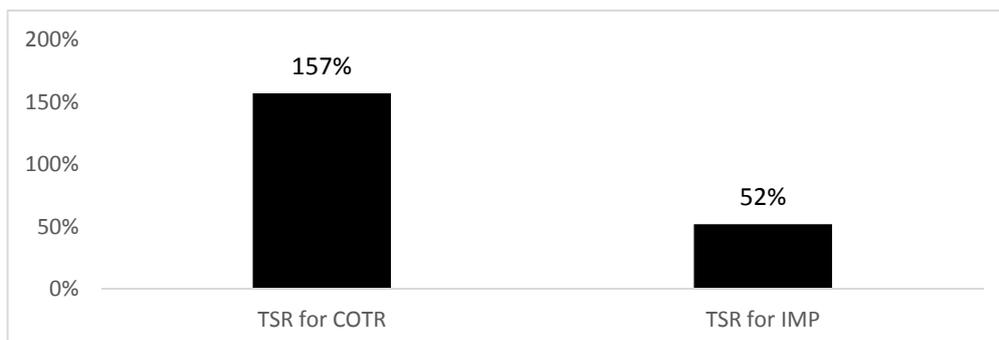
An	2007	2008	2009	2010	2011	2012	2013
Pt COTR	63.4	19.2	29.7	30.5	36.1	33.8	48.2
Pt-1 COTR	67	63.4	19.2	29.7	30.5	36.1	33.8
TSR COTR	747	-70	55	3	18	-6	347
Pt IMP	0.73	0.05	0.07	0.05	0.02	0.11	0.54
Pt-1 IMP	0.59	0.73	0.05	0.07	0.05	0.02	0.11
TSR IMP	24	-93	40	-29	-60	450	32

**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor S.A. and Transilvania Construcții SA society.

According to the Figure 3, it can be noticed the fact that the TSR value at both societies decreased a lot in 2008, compared to 2007, recording in that year negative values. At both societies, it can be observed an increase of the indicator in 2009, mostly due to the increase of the share's price at the end of the year. In the case of the COTR society, it was created value for the shareholders in 2007, 2009, 2010, 2011 and 2013 when the TSR indicator recorded positive values, and it was destroyed value in 2008 and 2012. It is obvious the fact that during the analyzed period, the indicator doesn't record a constant evolution, its value being different from one year to another. This situation was caused by the uncertainty and the volatility from the capital market generated by the economic and financial crisis, which reflected directly in the variation of the society's share price.

Regarding the IMP society, the TSR indicator recorded positive values only in 2007, 2009, 2012 and 2013, being created value for the shareholders. It can also be noticed a nonlinear evolution of the indicator, due to the same reasons reported for the COTR society.

The calculation of the average value of the Total Shareholders Return (Figure 4), led to the conclusion that the COTR society created more value for the shareholders during the analyzed period than the IMP society.

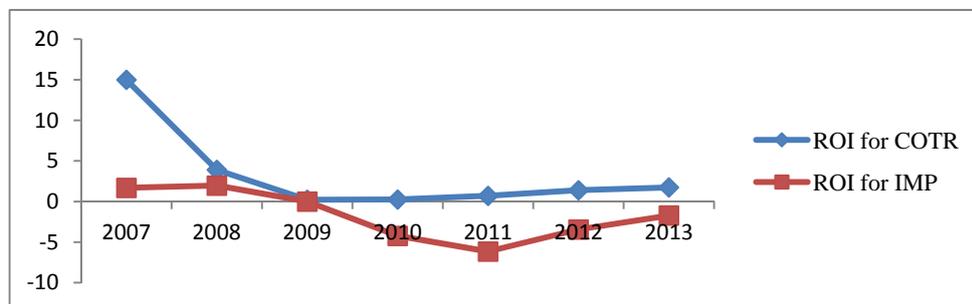
**Figure 4.** The average values of the TSR indicator during the period 2007-2013

**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor SA and Transilvania Construcții SA society.

#### 4.4. The evolution and the analysis of the Return on Investment (ROI)

During the period 2007-2013, the ROI evolution of the studied societies is presented in the Figure 5.

**Figure 5.** The evolution of the ROI indicator during the period 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Pf ct COTR	8.110.179	5.532.676	302.977	335.165	1.085.936	2.156.606	2.701.287
V ct. inv COTR	54.067.860	141.863.487	137.716.818	134.066.000	155.133.714	158.573.970	155.246.379
ROI COTR (%)	15	3.9	0.22	0.25	0.7	1.39	1.74
Pf ct IMP	7.401.076	8.258.687	141.540	-17.546.665	-22.261.046	-74.892.467	-42.457.620
V ct. inv IMP	440.540.238	421.361.581	0	414.814.775	3.613.806	21.771.066	24.684.663
ROI IMP (%)	1.68	1.96	0	-4.23	-6.16	-3.44	-1.72

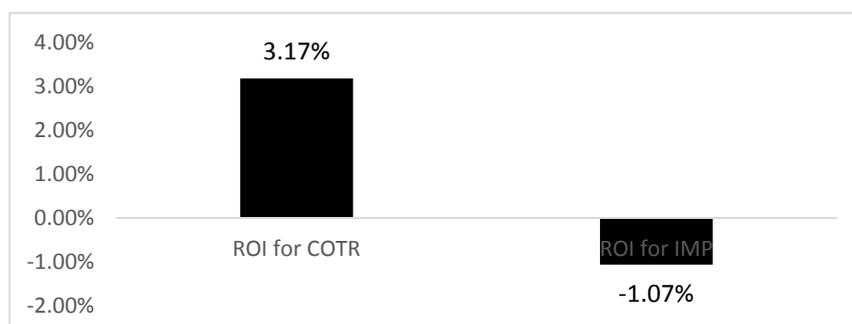
**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor SA and Transilvania Construcții SA society.

Regarding the COTR society, the ROI indicator, even if it decreased since 2008 compared to 2007, it recorded positive values on the entire period. It can be noticed, however, a very pronounced downward trend of the indicator since 2008, caused by the significant decrease of the accounting profit during the period 2008-2013 and by the sustained growth of the investments value. The financial crisis which started in 2008, reduced the size of the society's profit, mostly because of the construction market fall and because of the decrease of the market demand, the construction sector being extremely affected.

In the case of the IMP society, the situation is different because only in 2007 and in 2008 it was created value for the investors, ROI having a positive value. Since 2010, the indicator value is negative, as a consequence of the loss recorded, so the shareholders value was destroyed. It can be noticed the fact that only in the first three years it is obtained profit, since 2010 until 2013, the society recording loss.

From the Figure 6, it can be observed the fact that only the COTR society records average Return on Investment during the analyzed period. In the case of the IMP society, the indicator records negative values.

**Figure 6.** The average values of the ROI indicator during the period 2007-2013



**Source:** Own processing of the data provided by the portal [www.bvb.ro](http://www.bvb.ro) - Impact Developer & Contractor SA and Transilvania Construcții SA society.

## 5. Conclusions

The indicators concerning the value creation, selected in order to elaborate the case study, present both advantages and disadvantages, this being the reason to interconnect them, with the purpose to formulate relevant conclusions. It can be observed the fact that in 2008, at the same time with the economic crisis arrival, in general, the analyzed indicators recorded a significant decrease compared to 2007. The decreases of the indicators value are maintaining in most of the analyzed period, being noticed however, in overall, a tendency of slight increase of their value in 2012 and 2013. The only indicator that recorded positive values in all the analyzed years was ROI and only in the case of the COTR society. The other indicators concerning the value creation generally recorded negative values for both societies. This reflects the fact that in most of the years, the societies lost the shareholders value.

The comparative study of the indicators concerning the value creation for COTR and IMP societies, leads us to the conclusion that the values are higher in the case of the COTR society. This demonstrates the fact that, in order to create value for the shareholders, it doesn't necessarily matter the size of the society (the COTR society being listed at the second category at the Bucharest Stock Exchange and the IMP society at the first category), but especially the management performance, being extremely important the reorientation towards investments, which represent the engine of a sustainable development.

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# Microeconomic factors affecting financial performance of Romanian companies listed on Bucharest Stock Exchange

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**Abstract.** *The financial performance is a desirable matter for any company and, therefore, it is imperative to understand its behavior and the factors that make it to be better or worse. Having this issue in view, this paper is analyzing the microeconomic factors which affect a firm's financial results. The study is focusing on 15 companies from different economic sectors listed on Bucharest Stock Exchange for the period between 2003 and 2013. The dependent variable used to measure performance is return on assets and the independent variables are firm's size, firm's age, debts to assets ratio, accounts receivable, financial leverage and net result. Model estimations leads to the conclusion that firm's age and net results affect positively the financial performance, firm's size and debts to assets ratio affect negatively the dependent variable, while accounts receivable and financial leverage have no significant impact on return on assets. However, further investigation is needed in order to find some other microeconomic factors that influence financial performance.*

**Keywords:** financial performance, return on assets, microeconomic factors, firm's size, firm's age.

**JEL Classification:** D22, O12.

## 1. Introduction

The performance of an enterprise is not a given fact of its activity, but a result of efforts towards achieving prosperity. Therefore, it depends on a number of factors. It is highly recommended for any company to know which those factors that influence its financial results are in order to manage them. Also, sometimes it is good to know these factors so the firm could prevent a crisis or a considerable financial loss. In the literature, these factors, that can influence performance both positively and negatively, are classified as microeconomic factors (or internal factors) and macroeconomic factors (or external factors). The first category is the one that includes those elements that depend on the firm's activity and its actions. Therefore, these factors can be controlled. The other category comprises factors that are outside the company, do not depend on the activity of the enterprise itself and cannot be controlled, such as: the economic environment, the technological environment, the social, political, demographic and cultural environment. It is vital for the company's leading board to know all the elements that may have an impact on its financial results. If this is happening, then the management can make decisions to prevent, to manage or to reduce unpleasant events. This paper is studying the issue of microeconomic factors on Romanian companies from different economic areas analyzed between 2003 and 2013.

## 2. Literature review

The subject of factors determining financial performance has been studied in a considerable extent in the last few decades. Early studies have treated both microeconomic and macroeconomic factors in order to analyze why some firms thrive and other do not. Over time, the investigations have become more specialized and have started to treat separately the micro and macro determinants of the performance. The scope of this topic is very broad and this is the reason for studies carried out so far are treating different economic sectors.

In the last century the internal factors have been studied less than the external ones. So, starting with 1990, different works began to explain that the macroeconomic framework is not the only element of importance in impacting performance. Thus, Capon, N., Farley, J.U., Holnig, S. (1990) studied both microeconomic and macroeconomic factors. So, concentration, growth, size and organizational elements were taken into consideration. Jensen, J. B. and McGuckin, R.H. (1997) also put in the foreground the microeconomic framework. Kakani, R. K., Saha, B. and Reddy, V.N. (2001) studied the Indian economy having in view both internal and external factors. From the first category, they concluded that the leverage and the firm's ownership composition have a considerable impact on financial results. Hawawini, G., Subramanian, V. and Verdin, P. (2002) also investigated both categories of factors. Their objective was to determine if the industry has a more important effect than microeconomic factors. Finally, they showed that this assumption was true. Fitzsimmons, J. R., Steffens, P. R. and Douglas, E. J. (2005) elaborated a study on Australian firms to understand if firm size, firm age and industry have an impact on financial results.

On this topic there are more recent studies than works from the period of last century. Liargovas, P.G. and Skandalis, K.S. (2010) analyzed the impact of leverage, export activity, location, size and management on return on assets, return on equity and profit margin and discovered that all of them have a significant effect on Greek firms' performance. Burja, C. (2011) showed in a paper the relationship between factors influencing profitability and managerial decisions. Almajali, A.Y., Alamro, S.A. and Al-Soub, Y.Z. (2012) studied the effect of leverage, liquidity, size and management on financial performance - expressed as return on assets - of Jordanian insurance companies and found out a positive impact. Omondi, M.M. and Muturi, W. (2013) investigated factors affecting firms' performance in Kenya. They took into consideration as microeconomic factors the leverage, liquidity, company size

and company age on return on assets. Their conclusion was that the leverage has a negative effect and the liquidity, age and size have a positive effect. Bashir, Z., Abbas, A., Manzoor, S. and Akram, M.N. (2013) analyzed the issue of factors affecting performance on firms from food sector in Pakistan. Their dependent variable is return on investment and the independent variables are the leverage, growth, size, risk measured as a ratio between earnings before interest and tax and earnings after interest and tax, tax measured as a ratio between current year's tax and earnings before tax, tangibility which is fixed assets in total assets, liquidity and depreciation. The conclusion is that the performance of the firms from the sector taken into consideration depends on size, risk, tangibility, depreciation and long term leverage. Hunjra, A.I., Chani, M.I., Javed, S., Naeem, S. and Ijaz, M.S. (2014) studied the effect on return on assets and return on equity of four internal factors, respectively: age, leverage, size and growth. This study was made on cement sector in Pakistan. The authors found out a positive impact in case of age, a negative effect in case of size and a positive impact in case of leverage and growth for ROA. Regarding ROE, they concluded that there is a positive impact in case of age and a negative one in case of leverage and growth, meanwhile the size has no significant effect on performance. Xu, M. and Banchuenvijit, W. (2014) also analyzed this issue on firms listed on Shanghai Stock Exchange. They investigated the impact of liquidity, leverage, size and asset utilization on return on assets and return on equity. Their conclusion was that asset utilization has a positive impact on performance, leverage has a negative effect, size has a negative impact on ROA and no significant impact on ROE and liquidity no significant effect. Boldeanu, D.M. and Pugna, I.B. (2014) investigated the factors influencing the performance of pharmaceutical companies in European Union. They considered in their study the impact on ROE of different factors, such as: net profit margin, earnings before interest and tax margin, current ratio, quick ratio, debt to total assets. Khalifa, K.M. and Shafii, Z. (2013) also investigated the microeconomic factors that influence firms' performance. Their work take into consideration non-oil industrial companies from Libya and their model has in view the return on assets as dependent variable and current ratio, quick ratio, net working capital, inventory turnover ratio, account receivable turnover ratio and debt to equity ratio as explanatory variables. The authors conclude that current ratio, quick ratio and account receivable have a negative effect on performance, while net working capital and inventory turnover ratio have a positive impact and debt to equity ratio has no significant effect.

Besides these works, there are studies with a different approach. For example, Mao, Z. and Gu, Z. (2008) are analyzing the restaurant firms, Chavalit N., Jirasek T. and Wannoo F. (2014) are testing the impact of firm strategy on performance. Also, Kalyar, M.N., Rafi, N. and Azeem, M. (2013) are analyzing the effect of customer relationship management on firm performance and Almazari, A.A. (2014) is testing the effect of internal factors on bank profitability.

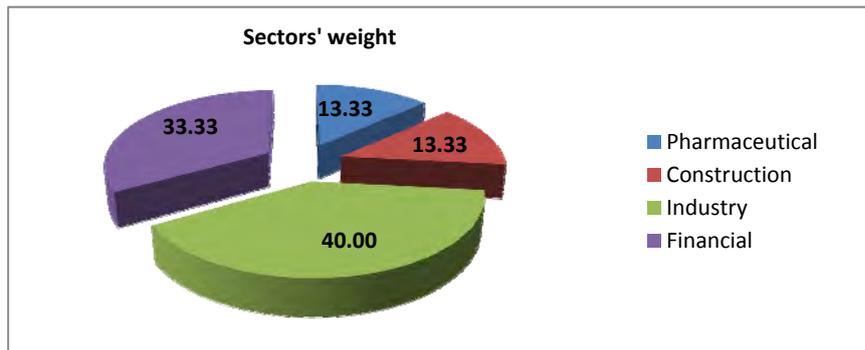
### 3. Data and methodology

This paper examines the impact of the microeconomic factors on the firms' performance. In order to achieve this objective, an econometric model which contains a panel data has been developed. The data collected consists of 15 Romanian firms from different economic areas analyzed between 2003 and 2013 (11 years). The information sources used are the balance sheets, financial reports and the profit-and-loss statements.

In the Table 1 and Figure 1 it is shown the sample's composition on economic sectors.

**Table 1.** *Sample composition*

Economic sector	Number	Weight
Construction	2	13.33%
Industry	6	40%
Financial	5	33.33%
Pharmaceutical	2	13.33%

**Figure 1.** *Sample composition*

In the literature there is a consensus regarding the best way to express the performance, which is the return on equity. This is why, first, ROE has been chosen as dependent variable for this model. Further, because the model results shown that the factors taken into consideration have no impact on ROE, finally ROA (return on assets) remained as dependent variable. Starting from the different models developed in the literature, this model uses as explanatory variables: firm's size determined as natural logarithm from assets (SZE), debts to assets ratio (DTA), accounts receivable (ARC), firm's age (AGE), net result (RN) and financial leverage (LEV).

Size of the firm is determined by natural logarithm of total assets. In literature it is said that a higher value of assets ensure better financial results. For this reason, it is expected that size to have a positive impact on performance.

Debts to assets ratio is calculated as a relation between debts and assets and this is the proportion of assets which is financed by debts. As debt's weight increases, it is expected that the company's performance decreases. In other words, the higher this ratio is, the greater is the risk associated with firm's operation.

Accounts receivable are expected to have a positive impact on results as the higher their value is the better since this means the firm has to collect money in its account in a very near future. Even so, sometimes, when this value is too higher, the firm could have some problems in receiving its accounts receivable if the granted trade credit period is too large.

Firm's age is a measure of experience. In the literature, it is considered that firms with a considerable period of existence on the market have some advantages in comparison with the new ones. Here, age is a dummy variable which is equal to 0 when the firm has a maximum of 16 years of experience and is equal to 1 when firm's experience is greater than 16 years. It is expected that age to have a positive effect on performance.

Net result is a very important indicator of firm's performance. Obviously, it is influencing positively the performance since when its value is higher, return on assets increases, too.

Financial leverage is the ratio between total debt and shareholders' equity. This is the proportion of debts in capital used to finance assets. The lower the value is the better. So, it is expected that this indicator to have a negative impact on performance. If this increases, than this is because debts increase, which leads to lower performance.

**Table 2.** Model expectations

Variable	Calculation	Expected impact
ROA	Net result/Assets	-
Size	Natural logarithm of Assets	Positive
Debts to assets ratio	Debts/Assets	Negative
Accounts receivable	-	Positive
Age	Dummy	Positive
Net result	-	Positive
Leverage	Debts/Equity	Negative

Taking into consideration the expectations (shown in Table 2) regarding the relationships between the dependent variable and the independent variables, the research hypotheses are formulated as follows:

H1: There is a positive relationship between firm's performance and the size of the firm.

H2: There is a negative relationship between firm's performance and the debts to assets ratio of the firm.

H3: There is a positive relationship between firm's performance and the accounts receivable of the firm.

H4: There is a positive relationship between firm's performance and the age of the firm.

H5: There is a positive relationship between firm's performance and the net result of the firm.

H6: There is a negative relationship between firm's performance and the financial leverage of the firm.

#### 4. Results and findings

Having in view the discussed variables, the model has the following form:

$$ROA = \alpha_0 + \alpha_1 \times SZE + \alpha_2 \times DTA + \alpha_3 \times ARC + \alpha_4 \times AGE + \alpha_5 \times NR + \alpha_6 \times LEV$$

A short analysis of the data series for the dependent variable and explanatory variables is shown in the Table 3.

**Table 3.** Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. Dev.	Observations
ROA	4.222969	26.02445	-14.53133	5.482123	165
Size	21.29522	25.48754	16.95345	2.258298	165
Debts to assets ratio	43.34114	98.44392	0.000000	30.98439	165
Accounts receivable	17.84783	21.90718	1.000000	2.334855	165
Age	0.800000	1.000000	0.000000	0.401218	165
Net result	15.75886	22.30004	1.000000	5.741098	165
Leverage	73.8346	232.400	0.000000	20.7012	165

It can be seen that return on assets records a mean of 4.22% meanwhile its standard deviation is 5.48%. The size has a mean of 21.29 and a standard deviation of 2.25. Debts to assets ratio has a mean of 43.34% and a standard deviation of 30.98%. It can be observed that the minimum value for this variable is 0 as in some cases the value for debts was 0. The maximum value for debts to assets ratio is almost equal to 99%, which means a very high proportion of debts related to assets, value registered in the financial sector. Account receivable has a mean of 17.84 and a standard deviation of 2.33. Net result has a mean of 15.75; meanwhile its standard deviation is 5.74. Age is a dummy variable which has a mean of 0.8. Financial leverage has a mean of 73.83% which means the value of debts is less than the value of equity and this is a desirable situation, but its maximum is 232.4% which means two times higher debts than shareholder's equity. Its standard deviation is 20.7%.

**Table 4.** Correlation matrix

	ROA	SZE	RN	LEV	DTA	ARC	AGE
ROA	1.000	-0.279	0.335	-0.210	-0.297	-0.120	0.201
SZE		1.000	0.322	0.425	0.584	0.373	0.040
RN			1.000	0.141	0.199	0.129	0.212
LEV				1.000	0.628	-0.037	0.201
DTA					1.000	0.046	0.186
ARC						1.000	-0.165
AGE							1.000

The correlation matrix drawn in Table 4 shows that performance is positively correlated with net result and firm's age and negatively correlated with size, financial leverage, debts to assets ratio and accounts receivable. It can be also noticed that size is positively correlated with all other independent variables. Net result is also positively correlated with all other independent variables. Financial leverage is positively correlated with size, net result, debts to assets ratio and age and negatively correlated with accounts receivable. Debts to assets ratio is positively correlated with all other independent variables. Accounts receivable are positively correlated with size, net result and debts to assets ratio and negatively correlated with age and leverage. Finally, age is positively correlated with all independent variables except accounts receivable. It is very important to notice that there is no value greater than 0.8 which means there is no a multicollinearity between independent variables. Hence, explanatory variables can all be used together in the same econometric model.

By estimating the model the data indicated in the Table 5 is obtained.

**Table 5.** Model estimation results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SZE	-0.608632	0.222735	-2.732543	0.0070
AGE	2.244843	0.942176	2.382616	0.0184
LEV	-0.000518	0.000796	-0.650622	0.5162
RN	0.421422	0.066920	6.29736	0.0000
ARC	-0.113006	0.171826	-0.657675	0.5117
DTA	-0.041116	0.016696	-2.462630	0.0149
C	4.687690	4.207776	3.015296	0.0530

From the results shown above it can be seen that the significance level of 5% is met just for a part of the indicators. It is clear that not all of them have a significant impact on the dependent variable. Hence, the size of the firm has an evolution in the opposite direction as performance and that suggests a negative relationship. It is not the influence expected. Assuming the theory that a large company has higher costs than a small one, the negative relationship between performance and size could be determined by the costs generated when a company is too large. The probability of 0.007 is less than 0.05 which means the impact is significant. If this variable is increasing with 1%, then ROA is decreasing with 0.6%. So, H1 hypothesis stating that there is a positive relationship between firm's performance and the size of the firm has to be rejected. This result is consistent with Almazari, A.A. (2014). Further, age is influencing positively the dependent variable. If firm's age is greater than 16 years, ROA gains a plus of 2.24%. The probability of 0.0184, less than 0.05, shows that the impact is significant. Hence, H4 hypothesis stating that there is a positive relationship between firm's performance and the age of the firm is accepted. This result is consistent with Omondi, M.M. and Muturi, W. (2013) and Hunjra, A.I., Chani, M.I., Javed, S., Naeem, S. and Ijaz, M.S. (2014). The financial leverage has a negative impact on performance, but its 0.5162 probability greater than 0.05 means this influence is not significant. So, the H6 hypothesis which stated that there is a negative relationship between firm's performance and the financial leverage has to be rejected. It is hard to make a comparison with the literature since some studies found a

positive impact and others a negative one (more information at Literature review section). As expected, the net result has a positive impact on return on assets. If the net result goes up with 1%, the dependent variable increases with 0.42%. The probability, less than 0.05, shows that this is a significant impact. Thus, the H5 hypothesis stating there is a positive relationship between firm's performance and the net result is accepted. Further, against the expectations, accounts receivable seem to have a negative impact on performance which can happen due to a long granted trade credit period, but its probability is greater than 0.05. Then, the accounts receivable have not a significant impact on performance which means the H3 hypothesis stating that there is a positive relationship between firm's performance and the accounts receivable is rejected. Finally, as expected, between debts to assets ratio and performance there is a negative relationship. When this ratio goes up with 1%, return on assets decreases with 0.04%. Taking into consideration the probability of 0.0149 lower than the significance threshold, H2 hypothesis is accepted.

Thus, in the Table 6 there is the synthesis of all assumptions formulated at the beginning.

**Table 6.** Assumptions' synthesis

Hypothesis	Description	Result
H1	There is a positive relationship between firm's performance and the size of the firm.	Rejected
H2	There is a negative relationship between firm's performance and the debts to assets ratio of the firm.	Accepted
H3	There is a positive relationship between firm's performance and the accounts receivable of the firm.	Rejected
H4	There is a positive relationship between firm's performance and the age of the firm.	Accepted
H5	There is a positive relationship between firm's performance and the net result of the firm.	Accepted
H6	There is a negative relationship between firm's performance and the financial leverage of the firm.	Rejected

Eliminating the variables with a probability greater than 0.05, the coefficients' estimating leads to the formula:

$$ROA = 4.6876 - 0.6086 \times SZE - 0.0411 \times DTA + 2.2448 \times AGE + 0.4214 \times NR$$

Further, the validity of the model is needed to be tested. Thus, the indicators in the Table 7 are obtained.

**Table 7.** The validity of the model

Parameter	Value
R-squared	0.437457
Adjusted R-squared	0.412298
Durbin-Watson	1.801150
F-statistic	13.41254
Prob(F-statistic)	0.000000

As can be seen, the probability of F-statistic is less than 0.05. The model fits in the limits of confidence level. This means the model is valid with a 95% probability. The ratio of determination R-squared shows that 43.74% of the variance in units of the return on assets is explained by the factors taken into account. Adjusted R-squared also shows that 41.22% of the variance in units of the return on assets is explained by the considered factors. The difference between the two ratios of determination is low and Durbin-Watson is 1.8011 which means the model is valid and the errors are not correlated.

## 5. Conclusions, limitations and further research

This paper's objective was to determine how the performance is influenced by certain microeconomic factors. The study was conducted on 15 Romanian firms from different economic areas analyzed between 2003 and 2013. The performance was measured by return on assets. The independent variables taken into account are firm's size, debts to assets ratio, accounts receivable, firm's age, net result and financial leverage. The results showed that size and debts to assets ratio have a negative impact, age and net result a positive one while financial leverage and accounts receivable have no significant impact. Assuming the theory that a large firm has higher costs than a small one, the negative relationship between

performance and size could be determined by the costs generated when a company is too large. If debt's weight increases, then the company's performance decreases because the higher this ratio is, the greater is the risk associated with firm's operation. Age adds a plus for performance in case of companies older than 16 years because age means, in fact, experience gained in time. The validity was met since the model fits in the limits of confidence level. The group of selected explanatory variables influenced the dependent variable in proportion of 43.74%.

This study has some limitations. First of all, the sample is small and it is possible that using a larger one the results to change. Secondly, the sample includes firms from various economic sectors which may lead to some distortions since every area has specific attributes and different values for indicators. Thirdly, data for smaller time periods is not available for all companies.

Thus, for further research a larger sample is needed. Also, a sample that is considering only one economic sector so that firms' results are comparable is helpful. The list of microeconomic factors included in the model could be extended.

To conclude, it is clear that firm's age and net result are important in gaining financial performance. Moreover, debts to assets ratio has a negative impact on performance which means special attention should be paid to this indicator's value.

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# Legal framework of corporate governance in Romania and Greece: a comparative study

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**Abstract.** *This study has the scope of presenting the legal framework regarding corporate governance in Romania and Greece. The main objective is to analyse the content of corporate governance regulations by identifying the principles that are implemented in laws and CG codes. The study is structured in three parts: the first presents a synthesis of the main official documents on the subject in both countries, the second part is an analysis of the content of corporate governance regulations and the third focuses on a comparison of corporate governance regulation in Greece and Romania, which represents the main contribution of the author.*

**Keywords:** corporate governance, legal framework, comparative study, CG Code Romania, CG Code Greece.

JEL Classification: F42, G18, G38.

## 1. Introduction

The traditional definition of corporate governance refers to relations between a company's senior management, its board of directors, its shareholders and other stakeholders, such as employees and their representatives. It also determines the structure used to define a company's objectives, as well as the means of achieving them and of monitoring the results obtained (Green Paper of EC, COM 2010 with reference to OCDE, 2004).

Corporate governance is the umbrella under which the mission, values and strategy of a company are translated into concrete rules regarding the structure of the board of directors and the executive management as well as the organization of the current activities developed by all the employees. When evaluating a company's activity, the examination of the revenues, the profit and other financial variables should be completed by a comprehensive assessment regarding the manner in which the company operates. Here we include the evaluation of the manner in which corporate governance principles are defined and applied by the company, because this determines the ground structure that lies at the heart of any public or private organization.

Broadly examined in theory and confirmed in nowadays practice, the crisis and post-crisis period led to profound changes at political-national and organizational-corporate levels, claiming for economic and social solutions aimed to mitigate the subsequent negative effects (Iamandi and Munteanu, 2014).

This has drawn much attention on corporate governance principles and on the assumption that had these rules been better applied by global companies and financial institutions, maybe the international economic environment might have been more healthy and resistant in front of the effects of the crisis, or even that it could have been prevented.

A research conducted by Androniceanu and Drăgulănescu (2012, p. 377) on the “sustainability of the organizational changes in the context of global economic crisis” concluded that “managers' professionalism and their ability to innovate and adapt to change, combined with consistent and coherent governmental measures of economic, social and fiscal policies, are essential for successful businesses in a turbulent and vulnerable national and international environment”.

Mature capitalism and market economy realities become intelligible also by scrutinizing their “prodigal children”: modern business corporations. But these are not some undivided entities. Beyond the place in the global division of labour, they are fiefs of in-built specialization among the corporate governance stakeholders, each of them representing individual-based aggregations of pure catalytic functions (Jora et al., 2015).

A great accent is emphasized on the fact that the principles of good corporate governance are defined in order to ensure the sustainable development of any organization by maintaining a strong relationship with all the stakeholders, based on correct and transparent dissemination of information regarding the leadership, the current activity and the overall results of the company.

The growing recognition of the need to ensure healthy ecosystems, social equity and good organizational governance is determining the corporate performance in relation to the society in which the company operates and to its impact on the environment when it comes about measuring its overall performance and its ability to continue operating effectively (Filip et al., 2012).

Greece is considered to be one of the most controversial EU member state in terms of economic growth, external debt and governmental policies. Though the population of Romania is almost twice bigger than the Greek one, Greece has a bigger GDP and the GDP per capita is more than double compared to the one in our country. This paper focuses on a

comparative study regarding the regulations in the area of corporate governance in Romania and Greece.

## 2. Methodology

This study was developed as a result of a transnational mobility at Athens University of Economics and Business and it has the purpose of sharing light on the matter of implementation of corporate governance principles in the legal frameworks of Romania and Greece.

The research methodology is focused on a parallel presentation of corporate governance regulation in Greece and Romania. The comparative study is structured in three areas: presentation of basic corporate laws, types of businesses and Corporate Governance Codes in Greece and Romania, a content analysis of the main official documents and a comparison of CG regulation in both countries. As the first part is mainly concerned with the identification and presentation of legal framework, types of businesses and the development of Corporate Governance Codes in Greece and Romania, the documentation is based on primary and secondary resources. In the first category I included the publications of laws and other official documents as national methodological norms, capital market related decisions or green papers and other guidance released by the EU institutions. The second category is represented by scientific articles and studies published by specialists in the area of corporate governance and other complementary topics.

For the second part of the paper I used the content analysis method in order to conduct a comprehensive study on the main corporate governance principles that are included in the CG Codes currently available in both countries. I identified the key corporate governance issues that are reflected in the structures of these official documents and synthesized the main provisions for each of them, with emphasis on the principles that are stated and the manner of implementation that is recommended by the institutions responsible for the development and enforcement of corporate governance rules in the two countries.

The third part of the paper focuses on a parallel presentation of similarities and differences that were identified between the two corporate governance codes. The main contribution of the author is the synthesis of these similarities and differences as a result of extended research on the matter of corporate governance rules and to which extent they are applicable to companies.

As it can be observed, the methodology for the development of this study is mainly based on qualitative methods as content analysis, comparison and identification of similarities and differences.

## 3. The legal framework of corporate governance in Romania and Greece

### 3.1. Main corporate laws and entrepreneurship

The first stage of my documentation was focused on identifying the main sources of laws regulating the establishment and organization of businesses on the markets of the two countries. In Appendix 1 and 2, I synthesized the main laws that determine the basic framework within the companies should be formed and developed, as well as the manner in which they conduct their activity according to the general rules of the national economic environment.

In Romania, the legal framework regarding the formation and business operation was quite a handful for new entrepreneurs, but in the past years efforts have been made in order to simplify the regulation system and also to adopt the European mandatory legislation.

As for the corporate governance regulation in Greece, we can say that efforts and progress has been made in the last years to converge with the European Directives and recommendations. Still there are particularities as the predominant patterns of ownership in the Greek market reflects that market a majority of listed companies are controlled by specific major shareholders whose interests are potentially in conflict with those of minority shareholders, as very well Yannikas (2014) points out in his work.

In Romania, according to Law 31/1990, the **business organizations** shall be organized in one of the following forms: **Partnership, Limited partnership, Limited partnership by shares, Joint-stock company, Limited Liability Company** (the definition for each form can be consulted in Appendix 3).

The main law regulating the establishment and activity of companies in Greece is Law 2190/1920, which was amended in 2007 (Law 3604/2007) and in 2010 with Law 3873/2010 and Law 3884/2010. According to this law the **main types of businesses** in Greece are: **Stock corporation** (societe anonyme) (AE), **Limited liability Company** (EPE), **Private Corporation** (IKE) (Appendix 4).

AEs are the most commonly used business entities for medium- to large-sized enterprises in Greece. A stock exchange listing is possible but not required. Unlisted AEs must have an issued share capital of at least 60,000 EUR. An AE is simple to establish and flexible to administer. Listed companies are additionally governed by the applicable capital market legislation. EPEs are primarily used by small- to medium-sized enterprises. Unlike AEs, EPEs have certain inflexibilities, do not have the prestige of an AE, and generally have fewer activities and a more personal character, being preferred for family business vehicles. Shares of an EPE cannot be listed, but can be traded privately, although notarization is required. An EPE must have an issued share capital of at least 4,500 EUR. IKE is a newly introduced (in 2012) corporate form, which is expected to gradually replace the surviving EPE companies, the EPE form having not been attractive to the Greek business community due to its inflexibilities. Most Greek enterprises above a certain size use a company form with limited liability (such as an AE), which are conceptually addressed to larger scale companies and industries. The IKE is intended to cover this gap and therefore it does not have a minimum share capital requirement and allows for flexibility regarding the management and the shareholders' relations, among other things. It remains to be seen how welcome the IKE will be in the market (Yannikas, 2014).

After the presentation of basic corporate laws and types of businesses in Romania and Greece, we can conclude that both legal frameworks have flexible approaches regarding the forms that a new business can take according to the interests of the founders and investors and the initial financial possibilities.

Some studies have been conducted regarding the entrepreneurship development, with reference to the number of new businesses that are established every year. Recent research conducted by Munteanu et al. (2015) has found that “Romania is the most worrying case – the last positioned in the ranking and at large distance from all the others – with two times weaker results than Greece and four times worse than UK for developing the entrepreneurial character”.

A thorough discrimination of the entrepreneurs' position inside the corporate field and, respectively, of the “natural” vs. “allowed” decision spheres can generate sounder judgments about the well-structured and poorly-structured companies (good vs. poor corporate governance) or about institutions found to be business (un)friendly (good vs. poor corporate law-making). We define “good governance” at the level of the corporate form the situation when incentives are aligned with rights and obligations, and the “good law” the norm which

does not alter the common sense of property rights and freedom of contracting. Without knowing them, any legal organization of the corporate form will be fraught with problems (Jora et al., 2015).

### 3.2. Development of Corporate Governance Codes in Greece and Romania

In **Romania**, the Bucharest Stock Exchange (BSE) was the first institution to promote CG principles in 2001, by introducing the category “Plus” for stock exchange listing and by adopting the first Board and Management Code for listed companies. This code offers enhanced premises for fair and equal treatment of shareholders, provides a rigorous framework to ensure respect and protection of minority shareholders rights, detailing the contents of shareholders' rights and increasing managers' responsibility to shareholders (BSE, 2014).

Following the recommendations formulated by the joint World Bank-IMF in the Corporate Governance Assessment published in 2004, with regard to the CG regulation, BSE created a **Corporate Governance Institute**, which is committed to educate quoted issuers regarding the compliance with appropriate corporate governance standards, and has been an active participant in the discovery of **best practices on corporate governance**, contributing to the adoption of **White Paper on Corporate Governance in South Eastern Europe countries** (BSE, 2014).

The Bucharest Stock Exchange first adopted a Code for Corporate Governance in 2001 and revised it in 2007-2008 and published a **Guide for Implementing the Code for Corporate Governance** in 2010. Starting with the year 2008, all listed companies were obliged to publish the declaration “**comply or explain**”.

The BSE Corporate Governance Code refers to the following issues:

- Shareholder's rights.
- Role and structure of the Board.
- Directors remuneration.
- Internal control mechanism.
- Financial reports and transparency.
- Conflict of interests.
- Corporate social responsibility.

The compliance with the BSE Corporate Governance Code is voluntary but if a listed company does not apply all the principles enunciated, they have to explain the reason for the disregard of a provision of the Code in the “comply or explain” declaration.

Although it is intended for listed companies, all Romanian companies should try to improve the manner in which they conduct their business, by adopting the guidelines of the BSE Corporate Governance Code.

In **Greece**, the SEV Hellenic Federation of Enterprises drafted the first **Corporate Governance Code** for Listed Companies in 2010, as part of its mandate to promote the continuous enhancement of the Greek corporate institutional framework and broader business environment as well as the improvement of the competitiveness of its members and of the Greek economy as a whole. In engaging in this initiative, SEV was motivated by the absence in Greece of a widely endorsed and applied “comply or explain” corporate governance code setting out standards of good practice for Greek companies. The Code is inspired by best practice corporate governance as set out in the OECD Principles of Corporate Governance and recommendations of the European Commission, and takes into account both the Greek regulatory framework and established practices and cultural characteristics in Greece (ECGI, 2014).

The SEV Corporate Governance Code covers the following **areas of corporate governance**, including:

- The board: role, size and composition.
- Duties and conduct of board members.
- Nominating of board members.
- Board evaluation.
- Internal control system.
- Level and structure of remuneration.
- Shareholders: communication, meetings.

In principle, the SCGC **applies to all Greek AEs**. It is relevant to companies admitted to trading on a regulated market (listed companies) in particular but may also prove useful to those that are not. To ensure its relevance to a wide variety of companies, the SCGC is divided into **two types of provisions**:

- General principles, which are addressed to all companies, whether listed or not.
- Special practices that concern only listed companies.

The SCGC follows the **“comply or explain” approach** and requires listed companies that choose to implement it to:

- Disclose its use as a reference framework.
- Either comply with the special practices given by the SCGC or explain reasons for non-compliance with specific provisions.

**Source:** Adapted by the author based on information from SEV Corporate Governance Code and Yannikas, 2014

#### 4. Analysis of Corporate Governance Codes in Romania and Greece

A content analysis of each Corporate Governance Code (from Romania and Greece) was conducted, in order to make a comparison between the principles that are stated and the manner of implementation that is recommended by the institutions responsible for the development and enforcement of corporate governance rules. In this section of the paper, the results of this comparative study are synthesized and presented, underlying the main provisions of the CG Codes in the two countries.

**Table 1.** *Specific provisions of each Code on key issues of corporate governance*

Key corporate governance issue	Provisions of national CG Code applicable to listed companies and recommended to all companies in:	
	GREECE	ROMANIA
The applicability of the Corporate Governance Code	The implementation of the Code is undertaken on a <b>voluntary basis</b> by each company. The Code provides practical policies and processes that Greek companies can use as a tool to achieve good governance practice.	The companies admitted to trading on the regulated market of the Bucharest Stock Exchange (BVB) (“issuers”) shall adopt and comply with the provisions of the Corporate Governance Code (“CGC” or the “Code”) on a <b>voluntary basis</b> .
Role of the Board	The role of the board and the role of management should be clearly defined and documented in the company’s statutes or its internal regulations or other similar documents. The board should provide <b>effective leadership and direct the company’s affairs in the interest of the company and all shareholders</b> , ensuring that management properly implements the company’s strategy.	The board of an issuer will be responsible for its management. It will <b>act to the best interests of the company and will protect the general interests of the shareholders by ensuring the sustainable development of the company</b> . It will function in a well-informed manner as a collective body.
Structure and composition of the Board	The board should contain <b>no fewer than 7 and no more than 15 members</b> . The board should comprise <b>independent non-executive members</b> who are free of material conflict of interest with the company and do not have close ties with the management, controlling shareholders or the company. The independent members of the board should account for at least one third of the members	The composition of an issuer’s board <b>should ensure a balance of executive and nonexecutive directors</b> (and in particular <b>independent non-executive directors</b> ) insofar that no individual or small group of individuals can dominate the board’s decision taking. The Board of Directors shall evaluate the independence of its non-executive members.

Key corporate governance issue	Provisions of national CG Code applicable to listed companies and recommended to all companies in:	
	GREECE	ROMANIA
	of the board.	
Meetings of the Board	The board should meet <b>sufficiently regularly</b> to discharge its duties effectively. At the beginning of every calendar year, the board should adopt a calendar of meetings and a 12-month agenda.	The board should meet as often as it is necessary for the effective discharge of its obligations. It would be appropriate for the board to meet <b>at least once a quarter</b> , in order to monitor the development of the company's activities.
Board evaluation	The board should undertake a <b>regular evaluation of its own performance</b> . The evaluation of the performance of the board and its committees should take place <b>at least every 2 years</b> in line with a clearly established procedure.	<b>Directors should update their skills and improve their knowledge</b> of the company's activity, as well as of the corporate governance best practices, with a view to fulfilling their role both on the board and, where relevant, on committees of the board.
System of internal controls	The <b>establishment of an audit committee</b> is a legal requirement for all listed companies. In line with European best practice, the Code recommends the establishment of audit committees composed in their majority of independent non-executive board members. The board establishes an <b>internal audit department</b> in accordance with Greek legal requirements, which operates under written terms of reference. <b>External auditing</b> is also required.	The board should <b>establish an audit committee</b> , from among its members, to assist in the discharge of its responsibilities in the areas of financial reporting, internal control and risk management. The audit committee should be composed exclusively of non-executive directors; it should contain a sufficient number of independent directors. The audit committee should monitor the independence and objectivity of the <b>external auditor</b> .
Directors remuneration	The remuneration setting <b>process should be performed with objectivity, transparency and professionalism</b> , and be free from conflicts of interests. For this purpose, the process should be assigned to a <b>board remuneration committee</b> , entirely composed of non-executive members the majority of whom should be independent members. The Code recommends that the remuneration of non-executive board members <b>reflect their time commitment and their responsibilities</b> .	The company will secure the services of good quality directors and executive managers by means of a <b>suitable remuneration policy that is compatible with the long-term interests of the company</b> . The board should establish a <b>remuneration committee</b> from among its members, to assist in <b>formulating a remuneration policy</b> for directors and managers and it should define the committee's internal regulations. The total amount of direct and indirect remuneration received by directors and executive managers by virtue of their position should be <b>disclosed in the annual report</b> .
Transparency of information regarding the Board members/candidates	A corporate <b>governance statement included in the annual report</b> should provide information on the <b>board's composition</b> and include the names of the chairman, the vice-chairman, the chief executive, as well as the heads and members of all board committees and the company Secretary. In addition, the Statement shall name the non-executive members the board considers to be independent. The corporate governance statement should state <b>the term of appointment of each board member and contain a brief curriculum vitae of each member</b> , as well as a brief curriculum vitae of the company Secretary. The Code recommends that the board provides a list of nominees for approval by the general meeting of shareholders, accompanied by adequate and timely information on the profile of the nominees.	The appointment of Directors should be a formal, rigorous and transparent procedure. The <b>lists of candidates to the office of director, accompanied by exhaustive information on the personal traits and professional qualifications of the candidates</b> , with an indication where appropriate of their eligibility to qualify as independent directors shall be deposited at the company's registered office at least fifteen (15) days before the date fixed for the shareholders' meeting.; the lists shall be published, in due time, on the company's website.
Equitable treatment of all shareholders	The board should ensure the <b>fair and equitable treatment of all shareholders</b> , including minority and foreign shareholders. Ensuring that shareholders are kept <b>well informed of corporate developments</b> is a key prerequisite if they are to perform this duty effectively. In addition, shareholders' participation in key strategic decisions is essential. The board should maintain a <b>continuous and constructive dialogue with the company's shareholders</b> . Greek company law provides significant <b>rights to minority shareholders</b> . The new law ensures adequate shareholder information with regards to all items on the agenda of the general meeting of shareholders as well as information on their shareholder rights.	The issuers shall respect the <b>rights of their share- and other financial instruments holders and ensure they receive equitable treatment</b> . All financial instruments holders, of the same series of a class, in the issuers must be treated equitably. The issuers shall use their best efforts to <b>facilitate the participation of their shareholders to the Shareholders General Meetings (SGM)</b> , as well as the full exercise of their rights. The issuers shall use their best efforts to ensure their shareholders' <b>access to the relevant material information</b> , so as to allow the same to fully exercise their rights in an equitable manner. To such purpose, the issuers shall establish a specific <b>section on their web page</b> that may be easily identified and accessed, in which the above-mentioned information is available.

Key corporate governance issue	Provisions of national CG Code applicable to listed companies and recommended to all companies in:	
	GREECE	ROMANIA
Disclosure of information regarding the governance and ownership of the company	A corporate governance statement included in the annual report should provide information on the board's composition and include the names of the chairman, the vice-chairman, the chief executive, as well as the heads and members of all board committees and the company Secretary. In addition, the Statement shall name the non-executive members the board considers to be independent. The company should maintain an active and up-to-date website that includes a description of its corporate governance, its management structure, its ownership, contact information and other useful shareholder and investor information.	The issuers will adopt a clear and transparent corporate governance framework, which shall be adequately disclosed to the general public, containing information about the ownership of the company. In the annual report, the issuers shall provide a Corporate Governance Chapter describing all the relevant events connected with corporate governance that took place in the preceding financial year.
Transparency of annual financial and governance reports	The board establishes an audit committee responsible for the financial reporting process, the integrity of the financial statements of the company and public disclosures. For each financial year a company should include in its annual report a separate section with the corporate governance statement.	The corporate governance framework must ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership and governance of the company. The issuers shall prepare and disseminate relevant timely and continuous information in accordance with high quality standards of accounting and financial and nonfinancial disclosure, i.e. ESG (environment, social and governance) reporting.
Conflicts of interests	The board should comprise independent non-executive members who are free of material conflict of interest with the company and do not have close ties with the management, controlling shareholders or the company. It is the responsibility of the Board to be alert to and adequately addressing actual and potential conflicts of interests between the company, on the one hand, and its management, board members or major shareholders, on the other (including shareholders with a direct or indirect power to control the board's composition and behaviour). The board should establish committees to prepare its decisions and ensure that the decision-making process is free from material conflicts of interests.	The directors will take decisions in the interests of the company and will refrain from taking part in any deliberation or decision that creates a conflict between their personal interests and those of the company or any subsidiary controlled by the company. Each director should take care to avoid any direct or indirect conflict of interest with the company or any subsidiary controlled by the company.
Corporate Social Responsibility	The Greek Corporate Governance Code has no section dedicated to CSR activity of the companies. Among the responsibilities of the board it is stated: taking into account the interests of key stakeholders such as employees, clients, creditors, and the communities in which the company operates.	The corporate governance framework must know and recognize the legally established rights of stakeholders and encourage active co-operation between corporations and stakeholders in creating wealth, jobs, and the sustainability of financially sound enterprises.

**Source:** By the author based on information provided in the latest versions of SEV Corporate Governance Code (2013) for Greece and BSE Corporate Governance Code for Romania (2008).

## 5. Comparative study regarding the corporate governance codes from Romania and Greece

As a result of the content analysis performed on the CG Codes from Romania and Greece, the following similarities and differences were identified:

**Table 2.** Similarities and differences between the Hellenic CG Code in Greece and BSE CG Code in Romania

SIMILARITIES	DIFFERENCES
1. While the Codes are intended predominantly for listed companies, the principles are recommended to all companies, in order to improve their governance practices and enhance their economic performance and competitiveness.	1. The Greek Code requires that the board should contain no fewer than 7 and no more than 15 members, while the Romanian Code does not have any provision regarding the number of board members.
2. The implementation of the Code is undertaken on a voluntary basis, but if a listed company does not apply all the provisions of the code they must explain: both countries use the "comply or explain" approach.	2. The Greek Code requires that the board should be sufficiently regularly and should adopt a calendar of meetings and a 12-month agenda, while the Romanian Code considers appropriate for the board to meet at least once a quarter or as often as it is necessary.

SIMILARITIES	DIFFERENCES
3. The role of the Board is to manage the business in order to ensure sustainable development and protect shareholders rights.	3. The Greek Code requires that the board should undertake a <b>regular evaluation of its own performance</b> , while the Romanian Code has no mention of any mandatory evaluation.
4. Both Codes require the board to have <b>executive and nonexecutive directors</b> (and in particular <b>independent non-executive directors</b> - who are free of material conflict of interest with the company).	4. The Romanian Code states that the total amount of direct and indirect remuneration received by directors and executive managers by virtue of their position should be <b>disclosed in the annual report</b> .
5. In both countries The <b>establishment of an audit committee</b> is a requirement for all listed companies.	5. In Greece, the corporate governance statement for listed companies should state the <b>term of appointment of each board member and contain a brief curriculum vitae of each member</b> , as well as a brief curriculum vitae of the company Secretary. This provision is not written in the Romanian Code, but it can be found in the "Apply or Explain" standard declaration.
6. In order to determine the level of directors and managers remuneration, both Codes stipulate that the process should be assigned to a <b>remuneration committee</b> .	6. In the Romanian Code, the <b>appointment of Directors</b> should be a <b>formal, rigorous and transparent procedure</b> and the lists of candidates to the office of director, accompanied by exhaustive <b>information on the personal traits and professional qualifications</b> of the candidates must be deposited at the company's registered office <b>at least 15 days before the shareholders' meeting</b> . The Greek Code recommends that the board provides a <b>list of nominees for approval</b> by the general meeting of shareholders, accompanied by <b>adequate and timely information on the profile of the nominees</b> .
7. The board should ensure the <b>fair and equitable treatment of all shareholders</b> .	
8. A corporate governance statement included in the annual report should provide information regarding <b>management structure, its ownership and contact information</b> .	
9. The issuers shall prepare and disseminate relevant timely and continuous information in accordance with high quality standards of accounting and financial and nonfinancial disclosure.	
10. It is the responsibility of the Board to be alert to and adequately addressing actual and potential conflicts of interests between the company, on the one hand, and its management, board members or major shareholders, on the other.	
11. The company contribution to the welfare of the stakeholders and the community is encouraged.	

**Source:** By the author based on information provided in the latest versions of SEV Corporate Governance Code (2013) for Greece and BSE Corporate Governance Code for Romania (2008).

As a result of the content analysis performed on the CG Codes from Greece and Romania, it can be observed that there are more similarities than differences between the principles applied in each country.

## Conclusions

The Greek corporate governance framework has mainly developed through the adoption of European mandatory legislation or regulation, as the author Yannikas (2014) also concluded. In Romania, the legal framework is also in accordance with the European Directives. Both regulatory frames respect the main principles of corporate governance defined by OECD.

With regards to the basic legal framework, both legislations are based on laws regulating the establishment and activity of companies: in Greece there is Law 2190/1920 further revised in 2007 and 2010 and in Romania, Law 31/1990 latest amended in 2014. The types of business that can be created differ in the two countries. The core corporate laws are better developed in Greece, including some basic OECD principles in this area, applicable to all Greek Companies.

The comparison between the two legal frameworks reveals different backgrounds but since both countries are EU members and have to comply with the Directives regarding the area of corporate governance, the latest amendments on national legislation refer to similar key issues that are regulated.

As for the development of Corporate Governance Codes, Romania was ahead of Greece, publishing the first Code in 2001. Both countries have special entities created to promote and monitor the implementation of corporate governance principles, as defined in the legislation and in CG Codes: in Romania – the Corporate Governance Institute and in Greece – The Hellenic Corporate Governance Council. Still, the most important role in the enforcement of CG Codes is held by The Bucharest Stock Exchange in Romania and by the Hellenic Exchanges and SEV Hellenic Federation of Enterprises in Greece.

Based on the identification of key issues present in the CG Codes we can state that they both originated from the OECD Principles and have similar structures.

With regards to the comparative study between the CG Codes we can conclude that there is a high degree of similarity due to the fact that the origins of the principles stated are in the OECD guidance in this area. The detailed analysis and comparison presented in Table 2 represents the main contribution of the author.

According to the findings of this study the corporate governance systems in Greece and Romania have similar patterns and have slight particular approaches of some issues due to the cultural differences.

The entrepreneurial spirit is better developed in Greece, probably influenced by the more accessible legislation regarding the development of new businesses and the cultural environment. An influence factor might be also the educational system, as in Greece the undergraduate level studies are 100% public funded and in Romania only part of these are available to students for free and the other part is represented by individual private funding studies. The influence of the educational system organization on the development of entrepreneurial spirit can be a direction for future research.

A distinct type of organizations is represented by universities, which cannot be considered as classic economic entities but rather as public institutions, though some of them are partially or totally financed by private sources. In this sense, a new direction for exploration has been identified: “future research should be developed in order to find out in what proportion universities respect the good governance principles and what are the effects of this compliance on the performance of that university” (Crețan and Gherghina, 2015, pp. 19-20).

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## Appendix 1. Relevant Romanian laws and regulations regarding corporate governance

- Company Law no. 31 of 1990 as amended, regarding the **formation and operation of business organizations**, the Alteration of the Incorporation or Partnership Contract of By-Laws, Exclusion of Partners and Shareholders, Dissolution and Merger of Companies, Liquidation of Partnerships and Companies; contains also provisions regarding the Infringement on Law Concerning the Partnership and Companies
- Law no. 26 of 1990 regarding the **Trade Registry**; The Trade Registry is the authority of **registration of the Romanian companies**. Any third party may obtain upon request certified copies of the corporate records of a Romanian company which are on file at the Trade Registry.
- Methodological Norms no. 608/773 of 1998 regarding the Trade Registry
- Decree-Law no. 122 of 1990 regarding the **Authorization and Operation of the Representative Offices of Foreign Companies**; the legal status of a Representative Office: it is a mere extension of the parent company and it can represent in Romania one or more foreign companies. The object of activity of the Representative Office is limited to the promotion and marketing operations conducted in the name of the parent company.

**Source:** Adapted by the author from BUZESCU Ca, Attorneys at Law, 2014.

## Appendix 2. Regulation in the area of corporate governance in Greece

- The Law 3016/2002, “On **corporate governance, board remuneration and other issues**”, as in force, sets the main requirements for the Corporate Governance of listed companies. Indicatively it includes requirements for the participation of non-executive directors and independent non-executive directors on the Boards of Greek listed companies, and the establishment of an internal audit function.
- The Law 3873/2010, as in force refers to the requirement for **disclosure of an annual corporate governance statement** as a specific section of the annual report.
- The Law 3693/2008, as in force refers to the requirement for the establishment of an **audit committee**.
- The Law 2190/1920, as in force includes **core governance rules** for Societes Anonymes.
- The Law 4261/2014, as in force includes additional corporate governance requirements for credit institutions.
- The Hellenic Capital Market's Commission Decision 5/204/14.11.2000 as in force includes, among others **obligations of companies listed** on the Athens Stock Exchange (official website: <http://www.hcmc.gr>).
- The Bank of Greece Governor's Act 2577/9.03.2006 as in force, includes a framework of **operational principles and criteria of the Organization Corporate Governance Framework and Internal Control Systems** of credit and financial institutions, and relevant powers of their management bodies (official website: <http://www.bankofgreece.gr/Pages/el/Supervision/default.aspx>)

**Source:** Deloitte, 2014.

### Appendix 3. Main types of business entities that can be formed in Romania

- **Partnership**, whose obligations are guaranteed by the capital and by the unlimited and joint liability of the partners;
- **Limited partnership**, whose obligations are guaranteed by the capital and joint liability of the general partners; the limited partners are liable only up to the value of their interest;
- **Limited partnership by shares**, whose capital is divided by shares, and whose obligations are guaranteed by the capital and by the unlimited and joint liability of the general partners; the limited partners are liable only for the payment of their shares;
- **Joint-stock company**, whose obligations are guaranteed by the capital; the shareholders are liable only for the payment of their shares;
- **Limited liability company**, whose registered obligations are guaranteed by the registered assets; the shareholders are liable only for the payment of their contributions.

Source: Law no. 31/November 17, 1990.

### Appendix 4. Main types of businesses that can be established in Greece

- **Stock corporation** (societe anonyme) (AE). AEs are the most commonly used business entities for medium- to large-sized enterprises in Greece. A stock exchange listing is possible but not required. Unlisted AEs must have an issued share capital of at least 60,000 EUR. An AE is simple to establish and flexible to administer. Listed companies are additionally governed by the applicable capital market legislation.
- **Limited liability Company** (EPE). EPEs are primarily used by small- to medium-sized enterprises. Unlike AEs, EPEs have certain inflexibilities, do not have the prestige of an AE, and generally have fewer activities and a more personal character, being preferred for family business vehicles. Shares of an EPE cannot be listed, but can be traded privately, although notarization is required. An EPE must have an issued share capital of at least 4,500 EUR.
- **Private Corporation** (IKE). This is a newly introduced (in 2012) corporate form, which is expected to gradually replace the surviving EPE companies, the EPE form having not been attractive to the Greek business community due to its inflexibilities. Most Greek enterprises above a certain size use a company form with limited liability (such as an AE), which are conceptually addressed to larger scale companies and industries. The IKE is intended to cover this gap and therefore it does not have a minimum share capital requirement and allows for flexibility regarding the management and the shareholders' relations, among other things. It remains to be seen how welcome the IKE will be in the market (Yannikas, 2014).

# Discussing three pillars of corporate governance

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**Abstract.** *This paper is a meaningful attempt to critically analyze the cohesion and relationship between three fundamental pillars of the corporate governance system: the shareholders, the board of directors and the employees. We present the characteristics of each pillar and discuss its relevance in corporate governance. A couple of world-renowned corporate governance models are considered. A synthetic conclusion is drawn based on information presented.*

**Keywords:** board of directors, corporate governance, corporation, employees, shareholders.

**JEL Classification:** G30.

Nowadays, the paradigm of corporate finance is raising the enterprise value, namely the value of the capital invested by the shareholders and the creditors in the company's assets. More recently, this model is referring to a sustainable growth of invested capital's value, ensuring, at the same time, the social and ecological responsibility of enterprises. Nevertheless, maximizing shareholders' wealth is the main objective of corporate finance and corporate governance.

Considering the fact that a company functions in a competitive financial environment, we might question whether an external investor has any real opportunity to earn more than in any other area of investment. The notion of "investor" refers to equity shareholders and to lenders, which provide credit loans. Both the shareholders and the creditors expect the highest possible return for the capital invested in the company, compared to any other area of investment (Stancu and Stancu, 2012: pp. 287-288). They both need to assess the opportunity cost of capital.

Corporate governance is about coordinating the interests of the stakeholders of the enterprise: the shareholders, the managers, the employees, the creditors, the clients, the suppliers, the state etc. In every enterprise, there is a specific assembly of relationships born between the physical and juridical persons that have a stake in the company. The studies regarding corporate governance focus on the way in which the suppliers of corporate capital funding make sure their investments bring benefit. Thus corporate governance is fulfilled by means of corporate finance.

Corporate finance is subordinated to maximizing shareholders wealth; consequently, we consider *shareholders* to define a major factor, a key element – namely a "pillar", of corporate governance. The *board of directors* is also a corporate "pillar"; it is the highest authority in corporate management. It is in fact defined as a corporate body. Its members are appointed by the shareholders. Not the least, the *employees* constitute the fundamental "pillar" of corporate governance, because all corporate activity is based on the process of value generation, a process which is sustained by the employees. In synthesis, the corporate governing of the enterprise is based on coordinating the interests of these three pillars. In our opinion, the employees represent the most important pillar of corporate governance. We will argue this affirmation.

To a critical researcher's eye, focusing exclusively on shareholder value may seem exaggerated. One must never forget managerial decisions do impact investors, but they also employ externalities on several "natural stakeholders" who have an intrinsic relationship with the firm: suppliers, customers, employees, communities where the plants of the enterprise are located, etc. These externalities are substantial. For example, the closure of a plant by a major employer has dramatic consequences for its workers and for the local economy. Not a single stakeholder should be ignored when analyzing negative externalities (Tirole, 2001: pp. 1-35).

The *shareholders* are the corporation's owners. A corporation has limited liability. This implies that the shareholders cannot be held personally responsible for the firm's financial obligations. Suppose, for example, that such an enterprise were to go bankrupt, no one could demand that its shareholders raise more money to pay off the debt. The most a shareholder can lose is the amount invested in a share. While the shareholders of a corporation are the ones that own the company, they usually do not manage it. This separation between ownership and management is a distinct characteristic of corporations. Moreover, this separation gives corporations permanence, as compared to other types of businesses. For example, a sole proprietorship cannot survive indefinitely and will have an end because the proprietor is mortal. But shareholders can sell their shares to new investors, without disrupting the operations and continuity of their business (Brealey and Myers, 2003: pp. 3-4).

The *board of directors* is a body of elected members. The shareholders elect the directors, which in turn appoint the managers. The board represents the shareholders and is supposed to ensure management is acting in the owners' best interests. The financial managers of a corporation are responsible, by way of top management and the board of directors, to the shareholders. Financial managers are supposed to take those financial decisions that serve the interests of the shareholders. Because of the importance of many financial issues, ultimate decisions often rest by law or by custom with the board of directors. Often, the chief financial officer (CFO) of a corporation is also a board member (Brealey et al., 2001: pp. 5-14).

It is very important to distinguish between governance and management. Management involves the activities of directing a part of the business. Governance implies setting the conditions within which others can manage effectively; it refers to the oversight of the entire corporation on behalf of the shareholders. Nowadays it is very easy to be extremely critical of the governance breakdowns at the top of some very big and notorious companies. We are usually inclined to consider every member of the board of directors must be completely independent. This is true according to law and as a good management practice. Also, any member of the board must be diligent and well informed about the business. However, a major issue in corporate governance is creating these (ideal) conditions. Specifically, it is not easy to find people (for board membership) who are fully independent, especially in small business communities.

The *employees* represent a particular group of company stakeholders. Large companies had worked out personnel policies that establish employees' rights and responsibilities. But one cannot define strict written rules that cover every possible future event. Thus written contracts are supplemented by understandings. As an illustration, managers understand that in return for a big remuneration they are expected to work hard and not spend the firm's money on unwarranted personal luxuries (Brealey et al., 2001: pp. 21-22).

According to management theory, personnel and human resources management provide an organization with competent employees by means of selecting, training and rewarding them for achieving the firm's objectives. In this respect, human resource management is a process by which individuals are included in the appropriate positions in the structure of the organization. This process is carefully carried out by identifying the company's necessities of personnel recruitment, selection, hiring, evaluation, compensation and training (Ursachi, 2005: pp. 168-197). The survival and development of an organization depend more on the direct investment in its staff than on investments in equipment, facilities, technology or marketing; not just for increasing productivity and competitiveness in a dynamic environment, which is usually unstable and uncertain, but also for motivating organizational attachment. By investing resources for training and professional development, the organization invests both in its future and in the future of each individual employee. Thus we conclude employees are vital for a corporation.

According to certain pieces of literature, employees need lesser corporate protections than shareholders do, whose capital investments are sunk. Because they get paid almost instantly for their efforts, the employees are generally in a much better position, as compared to the shareholders. Employees can threaten to quit the firm at any time. Nevertheless, in countries with weak legal systems, personnel rights are violated flagrantly. In Russia for example, managers threaten shareholder-employees with layoffs unless they vote with the management. All in all, these aspects differ notably across countries (Shleifer and Vishny, 1997: pp. 737-783).

There are three main corporate governance models: traditional model, co-determination model and stakeholder model (Onofrei, 2007: pp. 36-40). The *traditional model* is specific to the North American corporate governance systems and is based on three hierarchical levels: shareholders, directors and managers. The authority of managers stems from the authority of directors. The *co-determination model* is specific to the countries of Western Europe.

Participants are classified on four levels: shareholders, directors, managers and employees. The model is representative for Germany, whose economy is based on social co-determination. Social categories make efforts for raising social welfare. The *stakeholder model* is specific for the states in Southeast Asia and is also based on four hierarchical levels. It differs from the co-determination model because of the complex relationships that are formed between stakeholders.

We endorse the co-determination model and acknowledge employees' role in the value-creating process of a firm. Firstly, the co-determination model accepts employees as defining a distinct corporate governance level; thus this model supports social welfare. Secondly, this support is justified because the employees represent, de facto, the "engine" of a corporation. According to high reputed literature, value is made up of *substance*, *information* and *energy* (Bran, 2003: pp. 15-18). This special group of stakeholders is responsible for sustaining genuine value-adding activities, namely providing "energy" for the enterprise. Therefore they personify the fundamental corporate governance pillar.

This approach can be further developed by way of the *corporate social responsibility* paradigm. The latter refers to involving the corporate employees through: staff consultation and information procedures, collective bargaining (as main channel for social dialogue) or even financial participation; this may be achieved by equity sharing (stock option plans and stock bonus plans) and by profit sharing (cash-based or deferred profit sharing plans).

Going through corporate social responsibility (CSR) literature, we identified many significant definitions for this concept. Any thorough analysis on this aspect will reveal that, besides business ethics, governance or environmental concerns, CSR is firmly related to workplace and human rights issues, labor conditions, working with employees and their families (Dumitrescu and Simionescu, 2014: pp 19-36). Consequently, it can be easily observed the theory and practice of corporate social responsibility puts special emphasis on the human resource. For this reason, future analyses are needed in this direction (required they follow this approach).

In conclusion, we anticipate that special future research efforts should be attributed to personnel position in the corporate governance system and their role in the value-adding processes of a corporation. Given that, in recent years, in our country, workers' rights were severely restricted by the labor legislation, we reckon future studies should focus on the important role of the human resource in achieving performance and give employees the attention they deserve. They constitute the "life force" of an enterprise.

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# Influences on the profitability of the pharmaceutical industry in Romania

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**Abstract.** *The pharmaceutical industry is considered one of the largest and profitable industries in the world. As any economic sector, it was not protected from the harmful effects of the global financial crisis, which affected the entire Romania. Because of the importance of this sector for the final consumers and for the Romanian economy, we found this theme worthy of being studied. The issue under discussion refers to the impact of the economic and financial factors on the profitability of the pharmaceutical industry, based on the assumption that the profitability of an industry can be considered as a barometer for the economy of the country of which it is part of. The aim of the paper is to capture the Romanian pharmaceutical industry performance, taking into account the influence of economic and financial indicators provided by financial statements and external indicators with a significant impact on the Romanian economy. The pharmaceutical market has proved more resilient to economic cycles than other sectors, maintaining an inelastic demand even in crisis.*

**Keywords:** return on equity, asset structure, clawback tax, pharmaceutical industry.

**JEL Classification:** G32.

## 1. Introduction

The pharmaceutical industry is a strategic sector for Romania which has an important contribution to the real economy. The activities of pharmaceutical companies provide, currently, about 8,000 jobs in Romania and contribute about 1.5% of Romania's Gross Domestic Product (GDP).

During 2001-2007, the Romanian pharmaceutical market registered an upward trend, reaching a growth rate of 22.5%. The harmful effects of the financial crisis, which were felt in Romania since the autumn of 2008, left their mark on the profitability of pharmaceutical companies. Thus, between 2008 and 2009 the average growth rate dropped to 6%. The year 2010 proved to be a very productive year, maintaining the upward trend in the coming years.

This paper aims to capture the Romanian pharmaceutical sector performance and the impact on its internal and external indicators, on the assumption that the pharmaceutical market can be a barometer of the economic situation in a country.

The paper is structured in six parts, the first two covering theoretical aspects concerning the relationship between corporate performance and the economic environment of the country in which they operate. Chapter 3 contains a description of the data used in Chapter 4 and 5 in order to estimate the model and interpreting the results and key findings are highlighted in Chapter 6.

## 2. Literature review

Currently, the pharmaceutical industry is considered one of the largest and profitable global industries. Pharmaceutical products have become indispensable in the life of any human being. They play a vital role in the development of people through improved quality of life and reducing the time spent in hospitals. Thanks to innovative pharmaceutical products almost all epidemics and chronic diseases are curable.

For this reason, we believe it is important to pay close attention to the evolution of profitability of pharmaceutical companies and, generally, to the financial management of a company.

The company is the main cell of the economy (Gavrilă and Lefter, 2007) based on the role of providing goods and services to meet consumer needs. Efficiency of an enterprise can be defined by four key elements: efficiency of production, the company's ability to grow and develop and customer satisfaction (Tabară and Horomnea, 2007). Financial aspects of performance are presented using indicators such as return on equity (ROE), return on assets (ROA), profit margin (PM) etc. (Robu and Sandu, 2006).

*Return on Equity (ROE)* is the ratio between net income and average shareholders' equity and measures how well management has used the capital brought by shareholders. Also, return on equity reflects the ultimate shareholders' goal expressed by the rate of remuneration of the capital invested by them in procuring company's shares or the rate of remuneration of the reinvested capital which they own. (Vintilă, 2006).

This ratio helps management to identify how much return it was able to generate for shareholders. If the value is not consistent with their expectations, management has to improve the company's strategy. This means sales increasing, a better investment policy or costs reductions. This ratio influences all kinds of future decisions that managers make: investment decisions, disinvestment decisions, financing decisions and profit distribution decisions.

*Return on Assets (ROA)* is a profitability ratio that is determined by dividing net income to average total assets (Stancu, 2003). It shows the company's ability to make money with its assets or the net income returned by each monetary unit of assets. The value for this indicator varies from one industry to another, but the higher, the better for the firm is. A high value

means that the company is earning more money on less investment. In order to obtain it, the management must make wise decisions in allocating company's resources.

*Profit margin (PM)* is the ratio between net income and sales and shows how much profit can be generated with one monetary unit or if the company is able to maximize the profit with the cheapest resources. Management is interested in having a high value which can be obtained by reducing costs and by increasing sales. This ratio varies from one industry to another and there are industries where high values cannot be obtained due to the huge costs of production or to the fact that the price depends on the market and cannot be modified. Anyway, a company that manages to get a high value for profit margin, in comparison with its competitors, it has a competitive advantage in what concerns the cost of products.

Indicators and performance measures being taken to determine the financial status of a company should not be sensitive to the choice of methods and accounting procedures. They must accurately assess current management decisions, investment decisions risks and helps manage situations that cannot be controlled easily (Damodaran, 2002).

### 3. Data sample

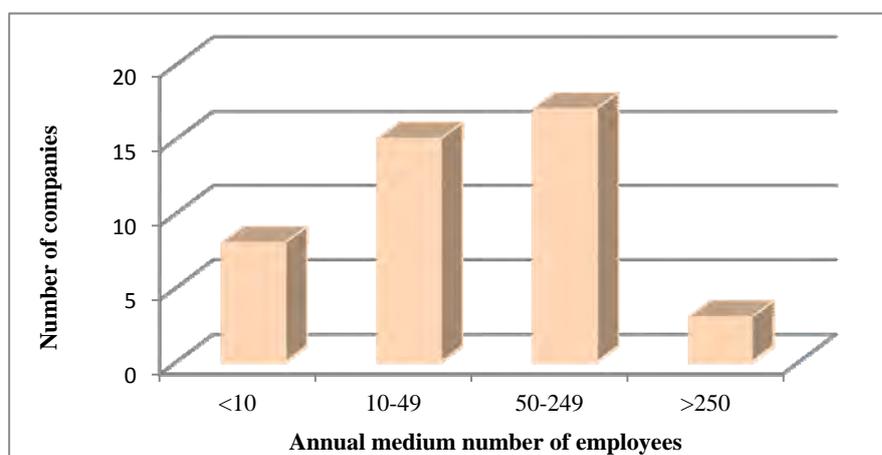
The sample of companies used for this paper was selected from the Ministry of Public Finance (MPF) website – Tax information and balance sheets section – and consisted of all active companies in Romania with NACE Rev. 2 code for the primary activity 21 – Manufacture of basic pharmaceutical products and pharmaceutical preparations (the list of companies was obtained from the National Institute of Statistics).

For this study we used the following variables: the net income, the total assets, the fixed assets, the current assets, the shareholder's equity and the current liabilities. The companies for which data were not available for all the needed variables were removed from the sample. Because of this adjustment, the final sample consists of data for 43 companies from 2005 to 2013 (387 observations).

In order to capture the elements that influence the profitability of the pharmaceutical industry we also used an additional parameter as proxy to measure the government healthcare policies. Therefore, we used the healthcare expenses as a percentage of the GDP for each observed year, collected from EUROSTAT database, to highlight the contribution to the performance of the pharmaceutical sector of the allocations to the healthcare sector.

The company's distribution based on the number of employees is presented in Figure 1.

**Figure 1.** *Company size based on the number of employees – 2013*



**Source:** MPF, author's calculations.

In order to have a better overview of the pharmaceutical sector we classified the 43 companies from our sample according to the criteria used by the Bucharest Chamber of Commerce and Industry<sup>(1)</sup> for the company classification as part of the elaboration of the Bucharest companies ranking based on the available data reported for 2013 on the annual average number of employees and the annual net turnover (Figure 2).

**Table 1.** *Company classification based on the size classes - 2013*

Size class	Criteria for classification	Number of companies
Micro Enterprises	Companies with up to 9 employees and an annual net turnover or total assets of up to EUR 2 million, in RON equivalent	8
Small Enterprises	Companies with 10 to 49 employees and an annual net turnover or total assets of up to EUR 10 million, in RON equivalent	15
Medium Enterprises	Companies with 50 to 249 employees and an annual net turnover of EUR 50 million, in RON equivalent, or total assets not exceeding the RON equivalent of EUR 43 million	17
Large Enterprises	Companies with 250 to 999 employees	3
Very Large Enterprises	Companies with more than 1000 employees	0
		43
For companies with no more than 249 employees, overcoming one of the criteria for classification determines the company's transition to the next size class.		

**Source:** Bucharest Chamber of Commerce and Industry, author's calculations.

#### 4. Methodology

In this article we intend to model the impact of various internal and external factors on the profitability of the Romanian pharmaceutical industry based on a sample for which data were available. Given the restrictions on data series of just a 9 year period, that makes the number of available observations unsatisfactory for a time series model, we used a model of panel data.

The available information for the healthcare expenses as percentage of the GDP vary over time but remains constant across the companies for a given year, while the value of the other used variables differs depending both on year and on company.

With the collected data we computed a model to capture the impact of internal and external factors on the profitability of the companies from the pharmaceutical industry based on the following assumptions:

1. According to the 2014 EU Industrial R&D Scoreboard, the Pharmaceuticals & Biotechnology<sup>(2)</sup> sector keeps the first position in the R&D ranking (with a share of 18% of the total R&D investment, followed by the Technology Hardware & Equipment sector (16.1%) and the Automobile & Parts sector (15.5%)), similar to the situation encountered in the recent years. If a company has a high level of *fixed assets related to the total assets*, this may be an indicative of a higher level of technology. In such a case, we expect a higher level of performance, taking into account that the pharmaceutical sector is sensitive to innovation.

$$\text{Fixed asset ratio} = \frac{\text{Fixed Assets}}{\text{Total Assets}} \quad (1)$$

2. The influence on the company's performance may be due to the method used for the assets financing, which can be achieved either by shareholder's equity or by borrowings. As a measure for the financial leverage of a company we calculated the *equity multiplier* based on the below formula.

$$\text{Equity multiplier} = \frac{\text{Total Assets}}{\text{Shareholder's Equity}} \quad (2)$$

### 3. Liquidity ratio

*Current Liquidity Ratio (CLR)* is the ratio between current assets and current liabilities. Current assets include cash, inventories, accounts receivable, marketable securities and prepaid items. Current liabilities contain salaries payable, taxes payable, accounts payable, notes payable and current maturity of long-term obligations.

The ratio's value varies from one area of activity to another. The higher the value is, the better is the company's ability to meet short-term obligations. This fact occurs due to the accounts receivables' and inventories' liquidity. It is considered that this ratio must be proportional to the operating cycle. Generally, a low result means insolvency problems and this fact will reduce company's chances of being funded. In order to avoid this issue, the management should make some decisions regarding encashment speeding, faster selling and obtaining longer payment terms. This fact will keep the firm away from cash impairment.

$$\text{Liquidity ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (3)$$

4. Since the company's financial performance is measured by profitability indicators such as return on equity (ROE), return on assets (ROA) and profit margin, we selected *ROE* as the dependent variable to test our assumptions because of the importance that this indicator has for investors.

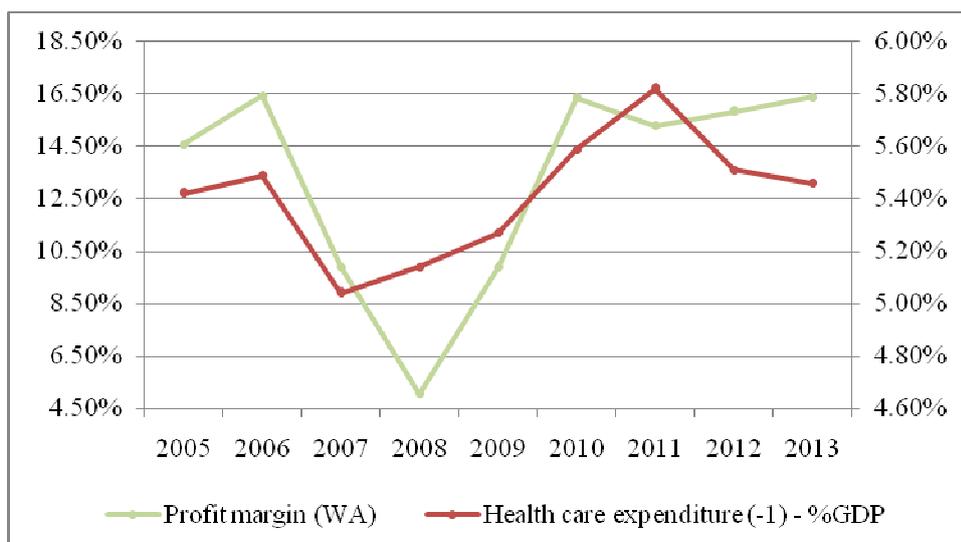
$$\text{ROE} = \frac{\text{Net\_income}}{\text{Shareholder's\_equity}} \quad (4)$$

For developing the model we used also two external factors:

### 5. The healthcare expenses

Illustrated in Figure 2 is the correlation between the industry profit margin and the healthcare expenditure for the selected years. The industry profit margin was computed as a weighted average taking into account the share of the companies' individual turnover in the total industry turnover for a given year and was plotted together with the healthcare expenses as percentage in the GDP considering a lag of 1 year.

**Figure 2.** Correlation between the profit margin and the healthcare expenditure (2005 – 2013)



**Source:** MPF, author's calculations.

According to the graph in Figure 2, the profit margin and the healthcare expenditures had approximately the same trend except for the last 3 years (2011-2013) where the trend was

opposite. This may be due to the establishment of the clawback tax in 2011 in order to balance the health budget which led the companies to focus their activity on export.

6. The *clawback dummy variable* was introduced in order to measure the effect of the clawback tax imposed in October 2011 by the *Government Emergency Ordinance no. 77/2011 establishing a contribution to finance health expenses*, subsequently amended and supplemented. According to the above mentioned legislation, the contribution is calculated on the revenues obtained from the selling of the pharmaceutical products in order to help financing the public health system. In developing our model we assumed that the establishment of this tax adversely affects the industry's profitability.

For developing the analysis we estimated a panel data model by pooled ordinary least squares (OLS) method using Eviews 8.

The equation of a panel data model can be written as follows:

$$y_{it} = \alpha + X'_{it}\beta + \mu_i + \vartheta_{it}, \quad I = 1, \dots, N; t = 1, \dots, T \quad (5)$$

Where: I – the cross-section dimension (e.g. the company's from the pharmaceutical industry), t – time (the time-series dimension),  $\alpha$ ,  $\beta$  – coefficients of the equation,  $X_{it}$  – the observation it on the explanatory variables,  $\mu_i$  – the unobservable individual-specific effect and  $\vartheta_{it}$  – the remainder disturbance;

The econometric application may estimate two types of models: the fixed effect model or the random effect model. In order to select the best model, we applied the specification test proposed by Hausman ( $H_0$ : the random effect model is appropriate).

## 5. Empirical results

For our study, we considered ROE as dependent variable, while the fixed asset ratio, the equity multiplier, the liquidity ratio and the percentage of healthcare expenses in the GDP as explanatory variables. We also added a dummy variable in our model which takes the value of 1 for the years when was in force the clawback tax and 0 otherwise.

**Table 2.** Correlation matrix

	ROE	ASSET_STRUCTURE	EQ_MULTIP	LIQUIDITY	HEALTH_EXP
ROE	1	-0.22	0.23	0.04	0.01
ASSET_STRUCTURE	-0.22	1	0.07	-0.30	-0.10
EQ_MULTIP	0.23	0.07	1	-0.16	-0.03
LIQUIDITY	0.04	-0.30	-0.16	1	0.03
HEALTH_EXP	0.01	-0.10	-0.03	0.03	1.00

**Source:** author's calculations.

In order to model the influence of the independent variables on the return on equity, we started by analyzing the correlation coefficients between the variables which are illustrated in Table 2. The correlation matrix revealed that there is only a very weak correlation between the individual variables.

According to the Hausman test, the model with random effects is suitable for the estimation of the equation (Table 3). Because of the value of the probability we cannot reject de null hypothesis, so the appropriate model to estimate is the random effect model.

**Table 3.** Hausman test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.940509	4	0.4141

**Source:** author's calculations.

The first estimated equation by the random effects model included all 5 explanatory variables considered in the development of the assumptions (please see Table 4). The estimated equation is illustrated below.

$$\text{ROE} = C(1)*\text{ASSET\_STRUCTURE} + C(2)*\text{EQ\_MULTIP} + C(3)*\text{LIQUIDITY} + C(4)*\text{HEALTH\_EXP} + C(5)*\text{TAX\_DUMMY} + C(6) + [\text{CX}=\text{R}] \quad (6)$$

It can be seen that the coefficients for the liquidity ratio, the health expenses and the constant term are not statistically significant considering a significance threshold of 5%.

**Table 4.** First estimation output

Variable	Coefficient	t-Statistic	Prob.
ASSET_STRUCTURE	-39.375070	-2.815439	0.005100
EQ_MULTIP	1.477865	5.713010	0.000000
LIQUIDITY	-0.206729	-0.248635	0.803800
HEALTH_EXP	2.370147	0.276388	0.782400
TAX_DUMMY	-11.274920	-2.435044	0.015300
C	18.214150	0.382418	0.702400

**Source:** author's calculations.

The fact that the health expenses indicator is not statistically significant strengthens the theory (Rattinger, Jain, Ju, Mullins) that the demand on the pharmaceutical products and preparations market is inelastic. Therefore, the quantity consumed, affecting the profitability of the companies from this industry, is unresponsive to changes in price or budgetary allocations. The performance of the pharmaceutical companies is rather influenced by internal factors, such as their ability to adjust to the innovation in this sector.

According to the prior findings, we removed the two explanatory variables from the model. The second estimated equation is illustrated below.

$$\text{ROE} = C(1)*\text{ASSET\_STRUCTURE} + C(2)*\text{EQ\_MULTIP} + C(3)*\text{TAX\_DUMMY} + C(4) + [\text{CX}=\text{R}] \quad (7)$$

For this estimate all the coefficients of the explanatory variables are statistically significant considering a significance threshold of 5% (the results are illustrated in Table 5).

**Table 5.** Second estimation output

Variable	Coefficient	t-Statistic	Prob.
ASSET_STRUCTURE	-39.049100	-2.965935	0.003200
EQ_MULTIP	1.480031	5.757982	0.000000
TAX_DUMMY	-11.159870	-2.442453	0.015000
C	30.379820	4.792418	0.000000
R-squared		0.108199	
F-statistic		15.489410	
Prob(F-statistic)		0.000000	

**Source:** author's calculations.

The regression coefficient for the variable representing the asset structure is negative and signifies an indirect correlation between the two variables. At an increase with 1% of the fixed asset ratio, the impact on ROE is of -39%. In order to increase ROE, a company must decrease its fixed asset ratio which implies that the fixed assets must have a low value. Economically, this may be interpreted as a specific feature of this industry which tends to be very specialized and of which results have very high added value. The investments are made also in human resources in order to bring on the market high qualitative products. As we said before, the pharmaceutical industry is sensitive to innovation.

The equity multiplier positively influences ROE. This may suggest that there is a higher level of the total assets in the shareholder's equity translated by the fact that financing asset purchases through debt increases the profitability in the analyzed industry.

The coefficient of the dummy variable shows an inverse relationship between the profitability and the establishment of the clawback tax. From the economic point of view, this finding means that the profitability of the companies from the pharmaceutical industry was adversely influenced by the clawback tax.

As expected, the high value of the constant term is showing that there are also other variables influencing the return on equity than those found in our model. In addition, the value of R-squared, of only 10.82%, suggests that all our considered variables influence the return on equity only to a small extent.

## 6. Conclusions and future areas of research

The pharmaceutical market is considered one of the most profitable industries in the world. In Romania too, the profitability of pharmaceutical industry keeps a rising trend, except for the 2008-2009 period, when it felt slightly harmful effects of the financial crisis. However, market demand remains inelastic because consumers tend to buy as many drugs or, even more, by setting up a contagion phenomenon.

As shown by financial indicators used in the present work, the pharmaceutical sector has proved more resilient to the global financial crisis than other sectors, being less sensitive to economic cycles. Thus, since 2010, pharmaceutical companies recorded profit again, being one of the most profitable years. Although it continues to be profitable, being on an upward trend until the end of the review period including 2013, clawback tax introduced in October 2011 has less favorable effects on the market makers.

The industry profitability is based also on innovation in human capital and technology by using high quality over a long time period.

But the profitability of an industry depends on a variety of financial indicators as great value recorded by the constant term and low value of R-squared recorded show us. For this reason, we propose as future research directions, including more independent variables that influence the profitability of pharmaceutical industry in Romania.

Also, it can be made a comparison with the pharmaceutical market from other countries with similar characteristics.

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## Notes

<sup>(1)</sup> See <http://www.ccib.ro/ro/CCIB/4/24/139/metodologia+de+realizare+a+topului+firmelor.html> (accessed January 2015).

<sup>(2)</sup> See <http://iri.jrc.ec.europa.eu/scoreboard14.html> (accessed January 2015).

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# Mechanisms to optimize expenditure on social protection

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**Abstract.** *In times of economic crisis it is especially important to define a relationship between a set of indicators that characterize poverty and other indicators (such as the demographic or the economic) to quantify the effectiveness of public income redistribution in social assistance. The correlation between quantitative indicators of poverty and social satisfaction and other indicators that characterize the economic environment will be studied below, using regression, as a quantitative tool.*

*The study was performed using European Union countries statistics and aims to highlight the opportunity of state intervention in the politics of redistribution and taxation.*

*The results reveal that income inequality causes social dissatisfaction higher than low per capita income.*

*The conclusion of the study generated the necessity of including property taxes in the universal tax policy, fact that leads to a greater social satisfaction while facilitating investments in the social economy based on a mechanism to increase aggregate utility at disadvantaged groups.*

*This tendency towards capital income redistribution (characteristic of free market economy) can be tempered with an appropriate system of income redistribution that is using social investment and wealth tax dimensioning.*

*This study offers solutions for building a mechanism that is maintaining a high social satisfaction rate in the context of a coherent economic growth.*

**Keywords:** social assistance, social services, institutional development, social protection, poverty and social exclusion.

**JEL Classification:** E24, H59.

## 1. Introduction

As long as using a poverty map does not provide an estimation of the causes of poverty we need other models and representations. Therefore, researchers have sought empirical links between poverty and socio-economic indicators using statistical methods.

In their study, Mwabu et al. (2000) used regression analysis to identify the determinants of poverty: size of household, places of residence (urban or rural), level of education.

In other study Oyugi et al. (2000) used a Probit model to analyze the welfare of the population and Rodriguez and Smith (1994) used a logistic regression model to estimate the effect of different economic and demographic variables of the possibility of the poverty phenomenon in Coasta Rica. Their results showed that poverty was higher in the areas with low levels of education.

Also, Bane and Ellwood (1986), Ruggles and Williams (1989) and Stevens (1995) mentioned in their research "Slipping Into and Out of Poverty: The Dynamics of Spells" about the estimated poverty rates in the United States. Mahler conducted empirical studies to establish the determinants of poverty in 17 OECD countries during 1960-1980.

This study attempts, in the context of the above research, to determine the influence of income inequality (the failure in the development of capitalism, as Karl Marx had been anticipated since the nineteenth century) on poverty.

Although the idea seems obsolete in the years of economic crisis, Nouriel Roubini reaffirms: "the capitalism can destroy itself because you cannot transfer income from labor to capital without having to register excess production capacity and a lack of aggregate demand."

Akerlof Shiller and Kranton reiterates the need for the active role of government in economic policy, recovering the idea of „animal spirits”, a phrase used by J.M. Keynes, but they also pleaded social satisfaction of individuals by reporting community members to a group (Akerlof, Shiller, 2009).

The utility function depends on both the individual level and income level of an individual component values affiliation to a group (practically constant comparison with other group members).

A dispersion lower income groups explains why some people are happier even with lower income but in terms of caste determined (India, gitanes groups).

## 2. Econometric study of the influence of income inequality to social satisfaction

In order to determine the influence of income inequality on poverty we performed a statistical analysis covering representative indicators.

Statistical analysis was performed on data for EU countries using public data sources: Eurostat, Esspross.

In the study were considered some indicators that characterize poverty such as:

- At-risk-of-poverty rate (AROP) (37\_EUROPE\_2020\_AT\_RI01) is the share of population with a disposable income less than 60% of median national income.
- At risk of poverty of social exclusion (\_37\_EUROPE\_2020\_AT\_RISK) are people who are at the risk of poverty and are deprived material.
- Severe material deprivation rate (\_37\_EUROPE\_2020\_SEVERAL\_) represents the share of total population having less than four of the following indicators below:
  1. can pay current utilities;
  2. an adequate housing;
  3. cope with unexpected expenses;

4. eat protein at least once every two days;
5. afford holidays;
6. have a car;
7. own a washing machine;
8. hold TV;
9. have phone.

and indicators that quantify the economic environment such as:

- gross domestic product per capita ( $\_0GDP\_PERHEAD\_OFPOPULATI$ );
- share of tax evasion ( $\_0SIZE\_OFSHADOWECONOMY$ );
- income quintile ratio represented by ( $\_38\_INCOME\_INEQUALITIES\_$ ) is the ratio between the income held by 20 percent of the richest people compared to 20 percent of the poorest.

We present in the table below indicators described above:

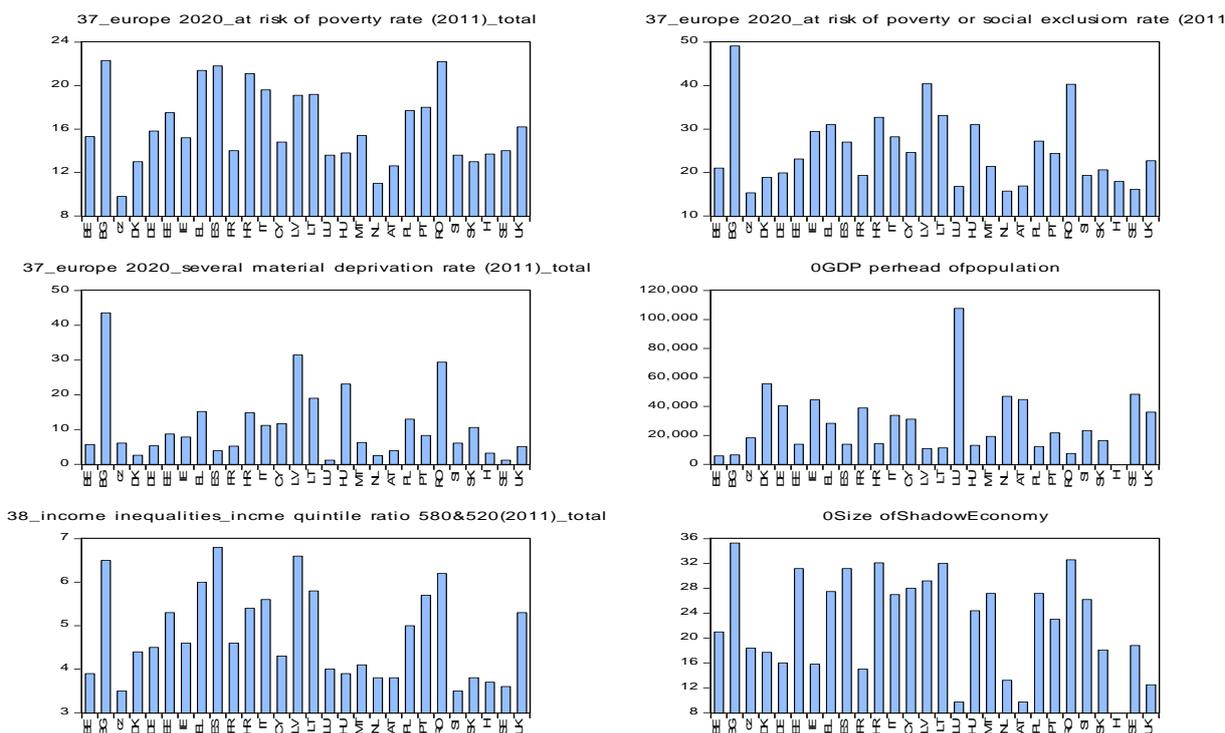
**Table 1.** *Indicators of analysis*

Country	$\_37\_EUROPE\_2020\_AT\_RISK\_$	$\_38\_INCOME\_INEQUALITIES\_$	$\_0SIZE\_OFSHADOWECONOMY$	$\_0GDP\_PERHEAD\_OFPOPULATI$	$\_37\_EUROPE\_2020\_AT\_RISK\_$
BE	15.3	3.9	21.0	5779	21.0
BG	22.3	6.5	35.3	6479	49.1
CZ	9.8	3.5	18.4	18227	15.3
DK	13.0	4.4	17.7	55636	18.9
DE	15.8	4.5	16.0	40498	19.9
EE	17.5	5.3	31.2	13934	23.1
IE	15.2	4.6	15.8	44506	29.4
EL	21.4	6.0	27.5	28260	31.0
ES	21.8	6.8	31.2	13934	27.0
FR	14.0	4.6	15.0	38893	19.3
HR	21.1	5.4	32.1	14183	32.7
IT	19.6	5.6	27.0	33793	28.2
CY	14.8	4.3	28.0	31174	24.6
LV	19.1	6.6	29.2	10869	40.4
LT	19.2	5.8	32.0	11321	33.1
LU	13.6	4.0	9.7	107643	16.8
HU	13.8	3.9	24.4	13061	31.0
MT	15.4	4.1	27.2	19340	21.4
NL	11.0	3.8	13.2	46816	15.7
AT	12.6	3.8	9.7	44691	16.9
PL	17.7	5.0	27.2	12301	27.2
PT	18.0	5.7	23.0	21650	24.4
RO	22.2	6.2	32.6	7540	40.3
SI	13.6	3.5	26.2	23245	19.3
SK	13.0	3.8	18.1	16381	20.6
H	13.7	3.7	NA	NA	17.9
SE	14.0	3.6	18.8	48358	16.1
UK	16.2	5.3	12.5	36053	22.7

**Source:** Eurostat data.

Regression analysis was preceded by the graphic representation of chosen variables:

**Figure 1.** Graphical analysis indicators



**Source:** done by the authors.

Econometric approach consisted in explaining poverty-related variables from other variables using regression.

A first study will consider at risk of social exclusion of poverty (37\_EUROPE\_2020\_AT\_RISK\_) as an indicator that includes both aggregate and material deprivation AROP and to income inequality and GDP (gross domestic product) per capita.

**Figure 2.** Regression multivariate at risk of social exclusion poverty of (GDP per capita and income inequality indicator)

Dependent Variable: _37_EUROPE_2020_AT_RISK_				
Method: Least Squares				
Date: 05/30/14 Time: 06:53				
Sample: 1 28				
Included observations: 27				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
_38_INCOME_INEQUALITIES_	5.798024	0.285555	20.30443	0.0000
_OGDP_PERHEAD_OFPOPULATI	-9.48E-05	3.98E-05	-2.379684	0.0253
R-squared	0.667013	Mean dependent var		25.38519
Adjusted R-squared	0.653694	S.D. dependent var		8.462528
S.E. of regression	4.980010	Akaike info criterion		6.119928
Sum squared resid	620.0126	Schwarz criterion		6.215916
Log likelihood	-80.61903	Hannan-Quinn criter.		6.148470
Durbin-Watson stat	2.103272			

**Source:** done by the authors.

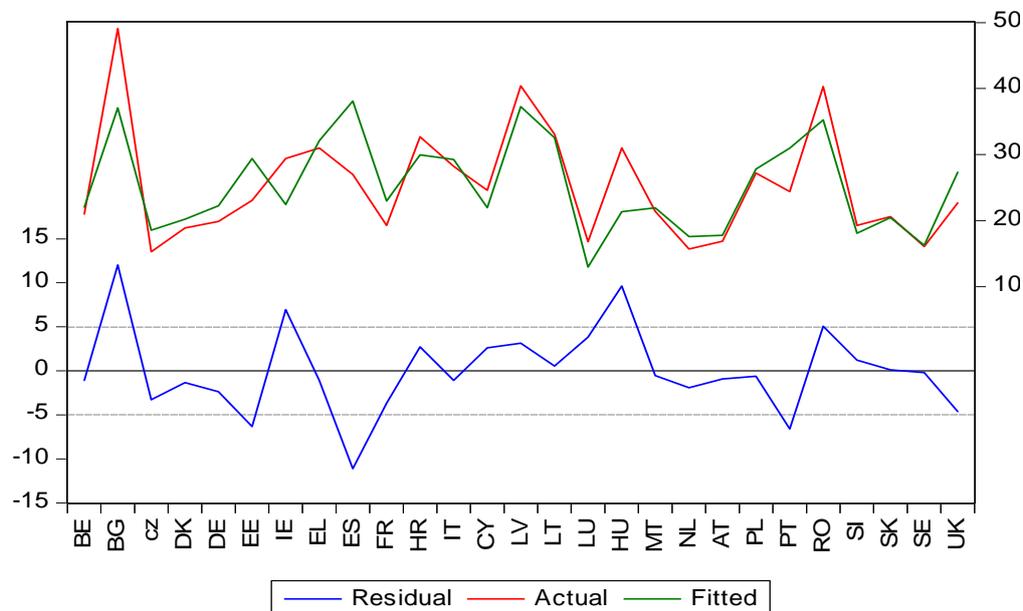
Note that an increase of income inequality and a low GDP per capita increases this indicator. This finding provides two levels of action in poverty control, an obvious one: the growth of GDP / capita and other one, less obvious at first view: the income inequality reduction.

The study confirms the results of other studies (Akelhof, Kranton, 2011): the utility function depends on the report to other group members, besides the income level.

If we consider the analyzed countries as separate groups, we will notice that not the level of income per capita is important in poverty, but rather the human differences and the level of society development.

Next it was performed an analysis of regression errors to reveal the exceptions rules:

**Figure 3.** Multivariate regression analysis error at risk of social exclusion poverty of (GDP per capita and income inequality indicator)



**Source:** done by the authors.

By analyzing the regression error we can easily observe that in Bulgaria and Hungary AROP at risk of social exclusion of poverty is higher than the general rule of the model and in Spain this indicator is less than expected. By analyzing the characteristics of the economies of the three countries we can observe that the share of indirect taxes is different (that is much lower) in Spain compared to Bulgaria and Hungary.

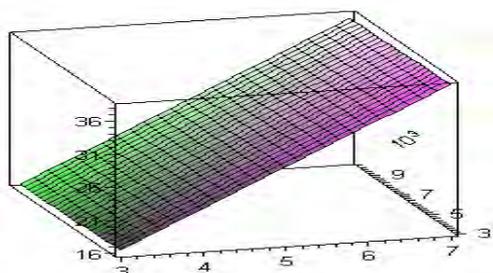
To analyze the sensitivity of indicators (GDP / capita and heterogeneity of income distribution) we will plot the regression equation indicator of poverty „at risk of poverty of social exclusion”.

$$f := (x, y) \rightarrow 5.79 * x - 9.48 * \frac{y}{100000}$$

Where: x = level of income inequality, y = GDP per capita, f = At risk of poverty of social exclusion

We will consider the indicator of income inequality between 3 and 7 and „y” GDP per capita between 3000 and 10000.

**Figure 4.** Sensitivity analysis of dependence at risk of social exclusion poverty



**Source:** done by the authors.

The chart above shows that the indicator of poverty „At risk of poverty of social exclusion” is determined mainly by income inequality and less by GDP per capita.

This finding confirms the importance of maintaining income inequality in reasonable limits besides a stable economic growth.

Next we try to define a model of balance by creating a system of simultaneous equations encompassing both poverty indicators but also other macroeconomic indicators.

In this case the endogenous variables at risk of social exclusion and poverty of the level of income inequality as exogenous variables GDP per capita and the share of tax evasion. The simultaneous equation becomes:

**Figure 5. Simultaneous equations model**

System: SYS01				
Estimation Method: Least Squares				
Date: 05/30/14 Time: 06:57				
Sample: 1 28				
Included observations: 27				
Total system (balanced) observations 54				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	5.457146	0.169181	32.25628	0.0000
C(2)	-5.99E-05	3.34E-05	-1.794943	0.0785
Determinant residual covariance		109.1269		
Equation: $\_37\_EUROPE\_2020\_AT\_RISK\_ = C(1)*\_38\_INCOME\_INEQ$				
$UALITIES\_ + C(2)*\_0GDP\_PERHEAD\_OFPOPULATI$				
Observations: 27				
R-squared	0.648033	Mean dependent var	25.38519	
Adjusted R-squared	0.633954	S.D. dependent var	8.462528	
S.E. of regression	5.119975	Sum squared resid	655.3536	
Durbin-Watson stat	2.096290			
Equation: $\_37\_EUROPE\_2020\_AT\_RISK\_ = C(1)*\_38\_INCOME\_INEQ$				
$UALITIES\_ + C(2)*\_0SIZE\_OFSHADOWECONOMY$				
Observations: 27				
R-squared	0.582797	Mean dependent var	25.38519	
Adjusted R-squared	0.566108	S.D. dependent var	8.462528	
S.E. of regression	5.574306	Sum squared resid	776.8221	
Durbin-Watson stat	2.061263			

**Source:** done by the authors.

### 3. Efficient mechanism of fiscal policy and spending on social assistance

From the previous analysis we can observe that maintaining life quality depends on per capita income growth (or as compensation effect of increasing tax evasion).

When economic growth is negative, for maintaining social satisfaction, it is possible increase tax evasion as compensation response of economic actors trying to maintain social satisfaction (stolen), a phenomenon that has been observed in various economies.

In terms of strengthening the capacity of the administration and enforcement state power (anti corruption systems, tax administration) maintaining social balance can be achieved by reducing income inequality, fact that becomes a binding measure for not disturbing the social peace required for the existence of a free market economy.

This effect can be achieved primarily by imposing direct taxes raised.

Therefore an efficient leverage social satisfaction is the construction of property taxes reducing income differences, according to their endurance by payers.

The measures to increase taxation of assets must be made in the above context and by using the resources obtained in the financing of government spending to participate also in GDP growth (for example increasing the state's role in the financing of social economy enterprises that may cause the reducing of poverty by reducing the income inequality indicator and an active social participation of disadvantaged groups) (Hillman, 2003).

This reform of the tax system by resizing wealth tax and financing public investments leading to reduction of income inequality, and creating groups that develop a social satisfaction thru the influence of caste becomes an imperative requirement of the state, especially in the countries with a high degree of income inequality and with drastic measures to reduce corruption and tax fraud).

This mechanism can be a major factor in combating social exclusion, an economic growth factor thru the multiplier role of public investment, creating also jobs with a stabilizing role in economic crises and even groups of people with increased social satisfaction level.

As the authors have been demonstrated in another study, effectiveness of public investment in social can be increased by attracting private investment in social care, stimulated with state support and having as a financing source the wealth tax.

To develop a theoretical model of intervention let's assume that there are "n" people and "g" groups (can be local, ethnic groups, communities) which are characterized by a level of income "ni" and a coefficient of belonging to a group "Ngi" and a degree of satisfaction due to this affiliation "Kng".

**Figure 6.** *Theoretical model of intervention*

person	income level	maximum group level	level of satisfaction due to group membership
n	ni	ng	Kng

**Source:** done by the authors

The state's role is to discover these groups (the values, the cost of exit or entry into group) with social studies (the social inspection has this objective) and to maximize social satisfaction level inside these groups by creating social enterprises with public or private investment. The satisfaction of belonging to a particular group will increase the social satisfaction (especially in disadvantaged groups) (Vintilescu, 2013).

The marginal effect of decreasing the income in groups who have high wealth (wealth tax) is much smaller than the effect of increasing the satisfaction of disadvantaged groups, by using the transfers from the taxes on wealth in the development of investment that increases the level of satisfaction from belonging to a group. The optimization of this process is given by maximizing a utility function units:  $F = \text{Max} (\Sigma f (s, K_{ng}))$  (Vintilescu, 2014).

If individual incomes can be easily quantified, the state, through social audit should easily determine the groups and the degree of satisfaction due to group membership.

As an example we can take: directing a portion of a common wealth tax to developing a social enterprise (as were the structures of cooperatives) to aim the capitalization of a local economic potential. The effect would be not only income growth in the community but also the growth of social cohesion in this group, which will eventually stabilize social satisfaction in the whole country.

## Conclusions

This study proposes based on an analysis, a set of active measures to increase social satisfaction in the context of the tendency of the market economy to move towards the capital a greater share of income.

Such a policy could include, for example, the financing of social assistance in a higher proportion from taxes on estates owned by rich people (which would reduce income inequality indicator) and funding from this source social economy (which would increase social involvement and increase gross domestic product per capita, but would also help to reduce the informal economy) but without the tax burden to affect this type of taxation.

The evaluation of this policy must be preceded by the analysis of existing groups in an economy and the impact of social investment to the utility function of groups by assessing the change of the social satisfaction level in disadvantaged groups thru the transfers of property taxes.

Future research will be in developing a complex macro-model of allocations in social assistance.

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# Results of the survey for the improvement of the performance of the public administration in Romania

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**Abstract.** *In all organizations, the people are the key resource, the vital energy of today and tomorrow, ensuring the survival, development and competitive future success. All the organizations and the links established between them are forming the modern society we currently live in. The Public Administration in Romania is currently passing a transformation period and in order to increase the satisfaction and correctly supply the needs of the tax payers, the Human Resource Management needs to improve fast. In order to research the Human Resource Management of the Romanian Public Administration, there were issued questionnaires to 41 cities and communes from the Ilfov County. On one hand there were questions that helped to better sketch a picture of the current standing, but also generate hints for future development and improvement techniques. In addition there were 4 interviews with 3 city mayors and the President of the Ilfov County Council. The results were quite surprising and in the context of Romania being already a member of the European Union, there is still a long way to go for the improvement but also for reaching some basic European standards. Romania is still a country where the political aspect predominates in the field of the Public Administration and the professional background of a person is not fully promoted. It would be interesting to conduct a follow up survey after 2 years and after comparing the results, to analyse the evolution of the improving of the Human Resource Management in the Public Sector.*

**Keywords:** Public Administration, Human Resource Management, European Union, Public Servant, Public Policy, Public Strategy, Budget.

**JEL Classification:** H83.

## 1. Introduction

The Human Resources are considered the first strategic resources in the organization, are unique in terms of their potential for growth and development and their ability to know their own limits and overcome them, in order to face the new challenges and demands of the present and future.

Due to their particularities, the Human Resources are the only inexhaustible source of creativity, of brilliant solutions and new ideas, both original and valuable, which can lead to the development of the organizations and society as a whole, but can just as well destroy or cause huge disasters. Therefore it is understandable the concern of the organizations for the formation of high quality Human Resources, considering that people are the most valuable asset they possess.

The Human Resources are one of the most important investments of an organization. It is proven that investing in people is the surest way to ensure the survival of an organization or to ensure the development, competitiveness and future expansion.

## 2. What is Human Resource Management

Human Resource management decisions are among the most difficult, as they interconnect individual, organizational and situational factors which influence and are found in those decisions. These decisions always need to be taken according to the person referred to and its personality.

Personal decisions vary from one organization to another, from a subdivision to another, from one country to another, because decisions must comply with their needs and their importance is not the same in all cases. Personal decisions must assess situation with dual, moral or ethical and legal aspect, and are extremely complex. They must be very responsible in terms of social responsibility and examined in terms of social impact.

Man by nature, its mentality and culture constitute a biological entity that, even in the context of genetic revolution, remains a great unknown. Human potential and how its way of manifesting differs from one individual to another, being genetically, biologically, socially, culturally, educationally influenced and also by other factors specific to each individual, each activity or each organization.

Hence, Human Resources represent a special human potential, which needs to be understood, motivated and trained in order for the employees to engage as fully as possible to achieve the organizational goals.

### 2.1. Main activities of the Human Resource Management

Most experts believe that Human Resource Management, like any other scientific field, is the result of specialized research and enrolls on the trajectory of rapid development and diversification, process that is also encountered in other areas of activity.

Depending on the purpose, the undertaken research and the addressed issues, the general management is divided into a variety of specialized areas, among which is included the Human Resource management, one field that over time experienced significant changes. "Human Resources Management" is a relatively recent, more modern term of what was traditionally called "personnel administration", "industrial relations", "personal leadership activities", "employee development", "personnel management" etc.

In the '80 and '90, in American universities appears the concept of Human Resource Management and the professionals guide their concerns to determine the human dimension of organizational change, in order to increase the attention to employee involvement and the

relational system, as well as the integration of human resource strategies in the overall strategy of the organization.

According to the literature, "Human Resource Management" requires a holistic, interdisciplinary and professional approach of the personnel issues inside an organization. Human Resource Management involves continuous improvement of employee activity in order to achieve specific tasks and organizational goals. Successful implementation of Human Resource Management involves a system of performance evaluation and a system of employee incentive and rewarding good results.

Human resource management is of particular importance as it provides the function of personal achievement within the organization function, which serves a dual purpose: provides integration of the interests of each employee inside the general interests of the organization and ensures coordination of various aspects of proper staff management.

## 2.2. The public servant

The mutual and sustainable relationship between state and society, whatever its variations, was the foundation on which modern states have developed. Active actor, perhaps the most active, of state-building, the administration shared the same faith with the state, so that the state reform and political and philosophical debates that it accompanies, starts exactly by redefining the role of the administration.

The recurring theme in Western Europe, where the process of European unification aims at adapting and reforming the administrative structures to new economic, social and political realities, modernization of the civil function is also one of the key themes of Administration Reform in Central and Eastern Europe, being one of the foundations for strengthening of the transition and reform.

The most common approach to the relationship between state and administration is represented by the model focused on the market, according to which the public sector have to perform the same tasks in the management and supply of services just as private sector organizations, the used techniques are the same and once hierarchical structure removed, the talent and administrative skills of the civil servants will also increase public sector efficiency.

Regarding the issue of public office and status of those who exercise it, it is good to know that the first statute of the civil servants was made by Emperor Hadrian. Ancient Rome was concerned with the proper administration of the state and in Byzantium, the public services, as they were later called in theoretical texts, were organized into ten branches, with many ministries.

## 3. Research methodology

The investigation of the impact this doctoral research had on the target group was performed by the indirect method, based on a questionnaire with questions of opinion.

As for the type of sampling, there was chosen the simple random sampling, which did not involve any preliminary operation for grouping the respondents: the individuals that make up the sample were chosen uniformly and with virtually identical probability for each.

There were nearly 500 respondents (civil servants, senior civil servants, Public Managers and contracted staff) of public institutions and local government authorities in the Ilfov County urban area - eight cities and in rural area - 42 communes, women and men, occupants of command and execution positions.

The accuracy of the research depends heavily on the size of the sample - the results are more accurate, as the research sample is bigger (the law of large numbers).

The statistical test, a survey of a number of 300-350 is shown as a rule, on striking representation, that will provide the same number of significant information as a sample of 10 or 100 times higher.

In general, a threshold probability of 95% is considered acceptable for good accuracy research.

To be sure of reaching the number of respondents, we distributed a questionnaire to 250 individuals printed on DIN A4 paper and with the help of Google Forms we distributed the questionnaire by using Internet and Intranet in the institutions in electronic form to be completed by the employees of different municipalities and public institutions Ilfov County.

The survey is representative for the target group and area of deployment Ilfov County, with a margin of error of  $\pm 3.1\%$  for a confidence interval of 95%.

The questionnaire was designed to investigate the local human resource management issues and policy and includes 50 questions of different types: closed, open, bifurcated and some even contain one short explanation on how to complete.

The questionnaire consists of several parts and is anonymous in nature to encourage subjects to give fair and impartial answers.

The first part consists of descriptors and includes, in addition to characterize the sample questions (age, sex, education, type of city), questions about the position occupied by the respondent of the acting institution, and characterization of the type of public institution.

The second part contains questions about the management of human resources within the organization, divided into several sections, such as: details about career development, the existence of a mentor or how to assess employee performance.

The third part includes questions aimed in particular at aspects of development and implementation of public policies in public institutions of Ilfov County.

The last part included aspects related to internal audit and risk management.

With the help of the proposed questions, I wanted to capture the attitude towards the value of internal audit in the public institutions in the sample, because I think it plays a very important role to continuously improve the performance of human resource management within the local government.

Complementary to the research in this area, which is primarily based on quantitative data, this doctoral study uses a range of qualitative data in order to achieve deeper insights into the dynamics of the relationship between Human Resource Management in the Public Administration and internal audit correlated with improved performance in the medium and long term.

#### 4. Findings and future research agenda

The undertaken study has identified in the public entities of the Ilfov County at least two profiles of employees: on the one hand there is the capital dedicated to career and devoted to the profession and on the other hand passive human resource.

If the former are keen to promote, are concerned about performance, are ambitious and with spirit of initiative, not allowing to be diverted from their professional road, the latter are concerned with rather achieving tasks in a less competitive frame without too high aspirations but put emphasis on job security to secure a notably quiet family life.

Related to those concerned with their career, the motivations that urge them to persevere are related to: job security, material and financial wellbeing, performance driven work

environment, the feeling of self-fulfillment, belonging to a group of professionals, social status, sincerity and safety at work.

This category is concerned with the need for personal self-improvement and continuous improvement by participation in internships and intra- and inter-institutional exchanges in the country and abroad, sharing professional experience acquired by members of the public entities with their younger colleagues who are in their early career phase. They are concerned with their development, promotion and mobility.

In order for the results obtained from the local administration to grow, for the local government to have the utmost part of capable and competitive human resources to effectively contribute to solving local communities, there is a need of innovative local government policies and strategies that need to be implemented in the most efficient way.

Investigations showed that the majority of government employees said the incidence of achieving performance appraisal is done at least once a year.

Half of the respondents said it is necessary to make changes to the methodology for the assessment of employees in the administration and among the suggestions offered, I have synthesized:

- Eliminate the appearance of formality.
- Provide objective and impartial evaluation. For this you need to define measurable criteria, relevant efficiency indicators to eliminate the possibility of subjective judgment or discretion.
- Employees marks must be consistent with the overall performance of the institution, the audit reports and the conclusions of the control the entity.
- Working scoring method based on characteristics of the activity.
- Assessment should be carried out by those working directly with staff without being influenced by the organization's leaders.
- More demanding tasks in the verification of service.

As the correlation with monetary stimulation mechanisms in the transition from the previous system to the new salary took into account that no person may not register a monthly salary decrease or employment benefits enjoyed by crude.

From a financial perspective, phased implementation of the new legislative framework involved framing the amounts allocated to the annual consolidated budget laws. Also, wage increase in the system requires their application to the financial resources, no automatic application ranking coefficients.

How the annual amounts allocated by the laws of the consolidated budget to be distributed on budget staff and wage levels are determined by the laws of special annual law enforcement framework.

They effectively determine the reform in which I stopped, including correlation with structural changes of government: reducing the number of positions in the public sector, the gradual transition to nominal wages, improved hierarchies within budget and system domains degrees, gradations and salary increments.

Greatest satisfaction would be if, by following contents present approach, decision makers could achieve a step towards improving human resource management performance of the target system so that the citizen can be informed and in a reasonable time.

It would be also nice if a follow up study will be conducted in 2-3 years, with the same questions, in order to analyze the differences.

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# Romania-between decentralization and deconcentration

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**Abstract.** *The present paper studies the level of local financial autonomy in our country, in relation to the capacity of communities to face local public expenditures. Our analysis targets local own revenues and main components, discussing the impact that transfers and subsidies may have on the degree of local financial decentralization, as they are considered or not own revenues. According to the results of our research, Romania's present time reached only the stage of deconcentration, because of two reasons: poor local financial decision independence and reduced and unproportional economic development.*

**Keywords:** financial decentralization, Hunter's index, own revenues, deconcentration, public transfers and subsidies.

**JEL Classification:** H72.

## 1. Introduction

After 1990, democracy system implementation in Romania gave to local communities new responsibilities, especially in the management of public affairs of the town or the county, due to the need of compatibility with the situation in European public administration. Thus, in our country have been developed a series of regulations that targeted financial and decisional decentralization of public services by local government, most often unsuccessful due to lack of local institutional capacity to effectively manage these responsibilities, the restricted freedom of decision, the funding problems, the lack of transparency induced by incomplete legislation and some other problems.

The deficiencies of decentralization implementation process were and still are many, and most have been generated as a result of the fact that the central public administration fails to lead reform. Change is incipient in all areas, but basically incomplete because of political instability and legislative inconsistency.

In the process of decentralization of public finances, Romania is facing numerous problems: the distribution of the deducted amounts from income tax and value added tax, the undervaluation of the regions' role, the lack of independence in setting local taxes, the local loan limit, the absence of citizen involvement in public affairs, the overlap of authority, etc.

## 2. Research stage

Decentralization is a complex process, with inter-sector implications. No centralized system can respond to the infinite variety of needs of local communities as well as local authorities elected, which respond for their acts in front of citizens. The decentralization process is conducted for the benefit of individual, by strengthening the power and role of local government in order to provide economic and social development of administrative-territorial units.

Identified as the starting point for economic and social progress (Fague, 2002; Manor, 1999), decentralization of public finances brings many benefits in terms of serving the needs of the population (Uchimura, Jütting, 2009), because governments become more attentive and responsive to specific local needs (Wallis and Oates, 1988; Manor, 1999; Pirion-Sall, 1988; Smoke, 2001; Rondinelli et al.,1983), enhancing citizen access to public services by community right (and obligation) to participate to the decision-making process and its implementation. The theory of fiscal federalism (Musgraves, 1959; Oates, 1972) emphasizes that folding taxation and public spending on taxpayer' needs and capacity increases the individual welfare, which represents the objective of public finances.

The financial decentralization is extremely delicate and complex, having as determinants central and local government quality, the quality of democracy, the size of the country (the homogeneity of preferences strongly manifests as country is smaller and financial decentralization no longer serves any purpose), and income differences between localities or regions (larger discrepancies involves central government intervention by public money redistribution, so decentralization is no longer attractive to rich areas) (Thießen, 2000). Also, the level of urbanization and the diversity of ethnic groups have a significant impact, as the different cultural population generates a diversification of the range of preferences.

The financial decentralization refers to the local government right to collect own revenues according their specific needs. In the same time, financial decentralization requires freedom of targets selection of local revenues to be directed, meaning free destinations and unrestricted local public spending (respecting, of course, local budget capacity). So, decentralization can be studied in terms of local public income and the independence and flexibility in selecting and setting them according to community's financial capacity, but also through the local

public expenses and the freedom to choose between investment or consumption objectives (and their typology in terms of public services), according to own local specific needs.

The degree of authority, accountability and financial resources redistribution, necessary to provide public services at different levels of government decentralization offers three distinct manifestations: devolution, delegation and deconcentration (Vazquez, McNab, 1997).

Devolution is a bottom-up process, that supposes the local government is constitutionally entitled to manage permanently its business, including the possibility of introducing or increasing/decreasing local tax and fees, to establish local public expenses destinations and the amounts allocated on each of these, of course, with limited interference from the government. The process involves almost entirely the transfer of authority in terms of management decisions from general government to autonomous local authorities and the state involvement on local public affairs to be only by general regulations. This type of decentralization is specific to federal states.

Delegation is a top-down process, which implies that the state gives to local governments executive powers and the right to adjust the local public resources in accordance with the delegated functions but with certain and explicit rules that can later be changed or revoked by the central government. Although we can identify some decisional freedom, local government actions are controlled by central government, which also assures a specific financial mechanism as part of financial resources that local administrative units need to cover the expenses associated to own decisions or delegated local public tasks. This type of decentralization is specific to unitary states.

Deconcentration is the least representative form of decentralization. This kind of system is followed more by centralized forms of government, in order to increase efficiency and flexibility providing of goods and services by central government through local offices. Characterized as the early stage of decentralization, the deconcentration of decision-making power transforms local governments in executants, because they receive target allocated resources and fully comply to central decisions.

Both delegation and devolution can produce favorable results through efficient allocation of resources, but the differences are in terms of interests served. Thus, the delegated systems serve the national interest meanwhile the devolution prevails local interest in equilibrium with the national one (Bird, Vaillancourt, 1997).

However, any of these methods are used, they are enabling local and regional economic development, corruption decreasing, social welfare increasing, local budget balance deficit and democratic governance (Constantinescu, Mosteanu, 2011). The decentralization process, recognized as the act through government is brought closer to the citizen, strengthened local autonomy, allowing local communities define their own rules of action and choose own means of intervention in public affairs, according to their specific needs and financial power. This way, the local management act is properly, efficiently, timely realized in cost-saving conditions (Mosteanu, Lacatus, 2009).

### 3. Methodology of research

In this paper we analyzed local public revenues and expenditures from 2006 to 2013 timeframe, especially looking for local public decentralized service funding sources and administrative units' capacity to face their own decided and delegated expenditure by own resources or transferred ones from state budget. We also submitted for discussion the legislation which is regulating local public finances, highlighting various aspects of the local funding, respectively the degree of financial independence and decision-making. The results

of both studies, combined, allowed us to formulate a conclusion about the financial decentralization in our country.

#### 4. Research results

##### 4.1. Legislative gaps

Romania's transition from centralized to decentralized system had and still has many obstacles generated by poor regulation. Central public administration passed the responsibility for numerous local public services to local public administrations and the transfer of responsibility has been accompanied by transfers of public money which meant to help local governments to face new public spending induced. The first Law on Local public Finance No. 189/1998 represents a fundamental step in terms of winning local financial autonomy. Subsequently, the Law of Public Finance no. 273/2006 completed the first rules in the local public domain. Progress was obvious because there have been introduced clear rules for distribution of budget balance transfers. Unfortunately, even after the changes made in 2010, the transfers which finance the delegated public services still miss distribution regulations. The shares from value added tax are allocated respecting the annual budget laws to some public services which are better represented at local level, as child protection, persons with disabilities' assistance, various school programs with the objective of encouraging healthy eating, public population record institutions, decentralized cultural institutions, special education and educational assistance, nurseries, social aid for house heating, school education etc. If state budget law exactly establishes the amounts of public money allocated separately to child protection and for assistance of disabled persons, for all the other cases is specified a general amount of money, covering a sum of delegated public services. The situation provides to local public administration the freedom to allocate the respective amounts in discretionary terms between any fields required by law, without certain rules. So, the main objective is not to allocate efficiently, to the areas which really need funding, but to spend the transfers on a least one of the fields specified. Unfortunately, there is a strong heterogeneity between areas set as destination of these public transfers, so the substitution in financing a public service to others cannot bring the benefits of the interchangeable public policies that generally do.

The distribution of the amounts deducted from the added value tax which support delegated public services needs priority to take into account the subjective situation and specific needs of each community. Unfortunately, in this regard, the law gives no explanation, so we conclude that the allocation of transfers is according to criteria more or less subjective, most likely political. However, imbalances between territorial administrative units are imminent because of subjectivity in public needs financial evaluation. We think there is an urgent need to establish by law methods and criteria for basing the judicious expenditure level for each area of decentralized public services. Also, there is a need for some reference levels of local public expenditures related to delegated public services funded by transfers. Only this way we consider there can be prevented subjective allocation of public money, which undermines the general interests of society and public money can be allocated in terms of efficiency.

The example above is not the only one who reveals the non-transparent allocation of public funds from the central to local level. The Article no.34 from the Law on Local Public Finance gives to under-governmental units the right to receive money from the state budget, as subventions, to finance national, county or local social development programs. Therefore, in the absence of eligibility criteria, the allocations of public money have no predictability. The areas covered by these kind of subvention have many directions of money allocation, neither one is specified in official regulations, there are no sets of standard returns to compare the infusion of public money with the results. In addition, the existence of a financing contract does not guarantee any priority or opportunity for respective public expenditure, this meaning it is impossible to realize any effective control of financial and material flows.

Although the shares deducted from income tax rates currently follow a series of rules (the 82 percent of income tax collected at the county level are distributed to different level of local public administration according to their fiscal capacity, area and population), the way they are distributed induce, if not accentuate, financial imbalances between communities, because those ones which enjoy a better fiscal capacity receive the most consistent amounts of money. So richest counties benefit from higher infusions of public money to balance their budget (and to spend for their citizens benefit), which enable the diversification and the growth of the volume for local public services, including access to new sources of financing for local investments, which is considered a local development ramp (the law is not specifying the need to balance current expenses with current revenues and capital spending with capital revenues, so local authorities may use current revenues, as transfers are, to sustain investment expenses, instead to finance consumption). Instead, the poor counties will remain poor, because the balance transfers are extremely low because of poor amount of local income tax redistributed. A rethinking of the transfer system at the regional level, with an expenditure equalization model depending on proper local needs and public expenditure per capita on each area of public services which are locally managed, not only on financial capacity, would have positive effects in terms of citizens' access to goods and public services they really need. Also, we consider that population and county surface do not represent proper criteria for transfer distribution. A poor county with small population and huge surface will receive lower amounts comparing a reach county, with huge population and small territory. These criteria only aggravate the discrepancy between the efficiency in public goods supply between counties with different level of economic development.

After transfers, local taxes are the most important sources of income for local budgets. The right of local government to establish autonomously the local taxes is provided in Article 9 of the European Charter of Local Self-Government, with the main objective of bridging the volume and quality of goods and services with specific needs and desires of citizens and also with their financial capacity. In Romania, fiscal autonomy is minimal, local authorities have only the right to increase local taxes and fees established by the Tax Code with up to 20% compared to the level calculated according to the law. Also, they offer a bonus of 10% if payment of taxes is fully made in advance (Law of Fiscal Code, no. 571/2003). In the context that local authorities have no right to set local fiscal taxes, it would be welcomed an increase of freedom seeing the right to increase or decrease the tax amounts by a higher level than 20%. That will surely have effects as local authority responsibility growth and the increase of financial autonomy.

In addition to fiscal revenues and transfers, local borrowing have a very important role in terms of financing and gaining financial and decisional local independence, with long-term effects in terms of economic development. Under current legislation, local governments are unable to increase local public debt (loans, interest and commissions related) proportionally to their needs, and this situation limits their funding possibilities. Thus, the total annual debt representing rates of the loans contracted and/or guaranteed, interests and related commissions, including the loan to be contracted and/or guaranteed year cannot exceed 30% of the total own income (Law of local public finances, no. 273/2006). So, local public administrations cannot enlarge their investment horizon, even some of them demonstrate sufficient financial and management capacities (Lacatus, Vaduva, 2009).

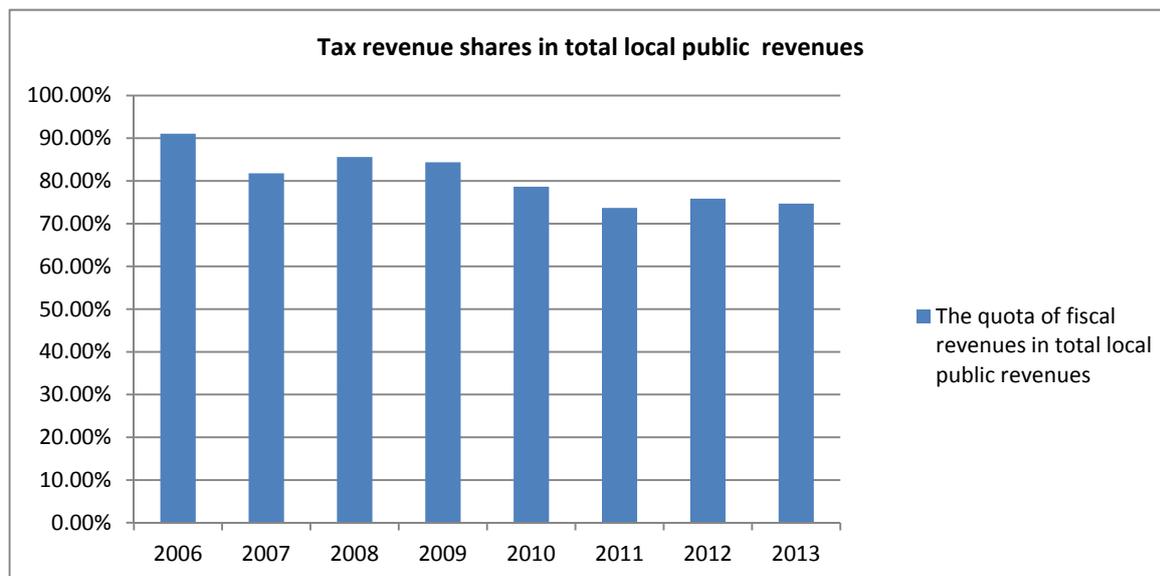
The correlation between local public financial autonomy and financial market funding is positive and interdependent (Mosteanu, Lacatus, 2008), so we suggest local public borrowing liberty should grow in terms of some conditions, as the financial capacity of collectivities and the success of local public projects previously funded by such sources.

## 4.2. Statistics

Looking to historical data for the period 2006-2010, we concluded that own local fiscal revenues of local administrative units are completed in a large volume with transfers, namely shares and amounts deducted from income tax or amounts deducted from VAT. Overall, these resources are the basis of local public funding, covering, as shown in chart 1, over 75% of all funding sources.

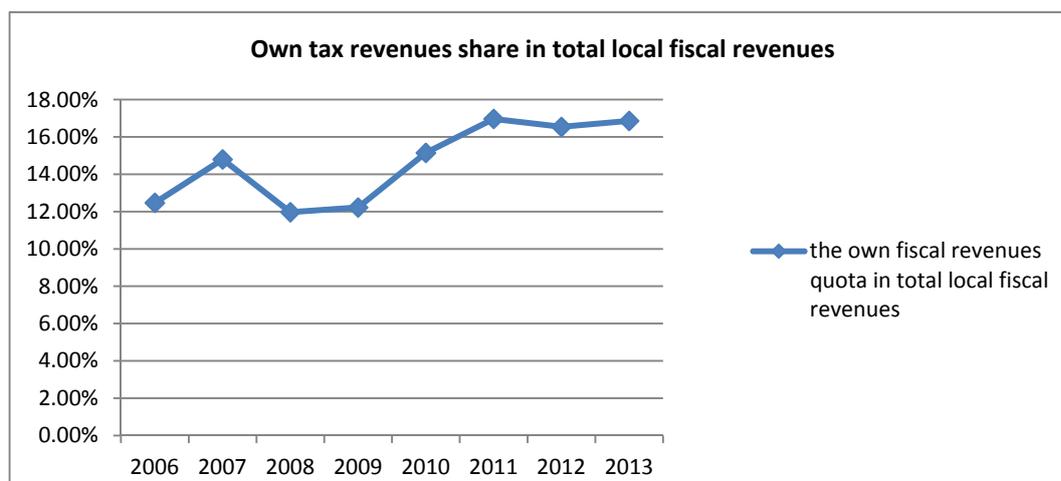
Within these tax revenues, local taxes have a small but a rising role (Chart 2). Amid the financial crisis which started in 2008, their level decreased. We discover the same evolution for the tax revenues and total public revenue, signaling there were some troubles in collecting local tax from population and public services funding problems also.

**Chart 1.** *Share of tax revenue in local government revenues*



**Source:** authors' own processing, based on data provided by National Institute of Statistics, [www.insse.ro](http://www.insse.ro)

**Chart 2.** *The share of own local taxes in total tax revenues*

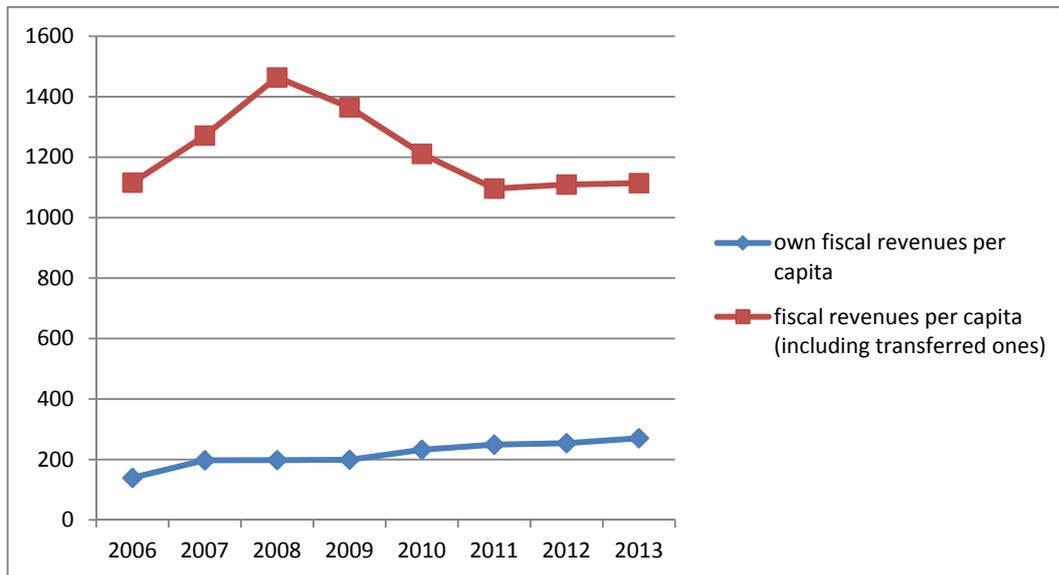


**Source:** authors' own processing, based on data provided by National Institute of Statistics, [www.insse.ro](http://www.insse.ro)

Population fiscal capacity, reflected by the size of local own tax revenue (property taxes) per capita is slightly increasing, exceeding 200 lei in 2010 (Chart 3). But if we refer to all of the taxpayer's tax debt that is the source of local budget, including shared taxes, we observe

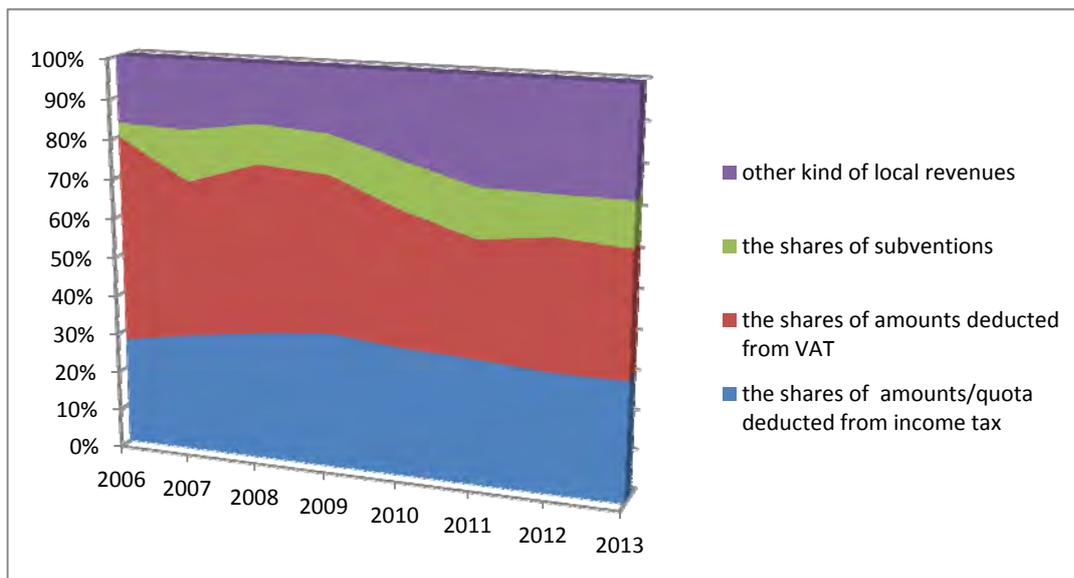
strong reduction after 2008, explained by lower economic activity, lower incomes and the reduction of consumption.

**Chart 3.** Tax revenue per capita



**Source:** authors' own processing, based on data provided by National Institute of Statistics, www.insse.ro

**Chart 4.** Share of various local financial resources in total local revenues



**Source:** authors' own processing, based on data provided by National Institute of Statistics, www.insse.ro

**Table 1.** Share of various categories of local revenues in all local funds (%)

Index / Year	2006	2007	2008	2009	2010	2011	2012	2013
Share of amounts/quota deducted from income tax	27.25	30.16	32.64	34.45	32.62	31.79	30.45	30.40
The VAT share	52.47	39.54	42.71	39.63	34.11	29.41	32.87	31.69
Share of subsidies	3.67	12.98	9.96	10.06	12.05	12.54	10.21	11.27
Total share of transfers	79.72	69.70	75.35	74.08	66.73	61.19	63.32	62.09
Share of the amounts received from other levels of public administration	83.39	82.68	85.31	84.14	78.79	73.74	73.53	73.35
Exclusively own revenue ratio	16.61	17.32	14.69	14.24	16.10	18.23	18.78	17.86

**Source:** authors' own processing, based on data offered by National Institute of Statistics, www.insse.ro

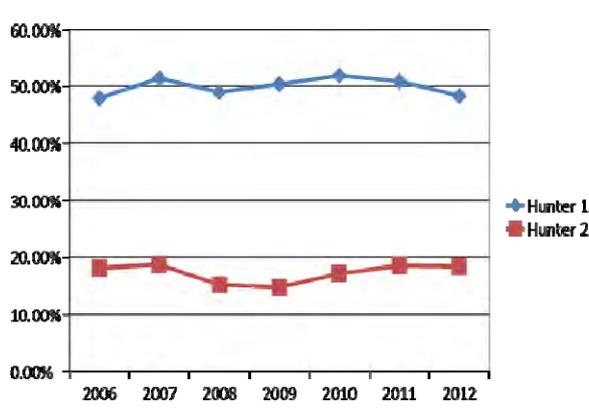
As can be observed, tax revenues as amounts deducted from VAT and amounts/quota deducted from income tax cover over 60% of local revenues and, together with other category of budgetary transfers, reaches about 73-83% of local government revenue. As seen in Chart 4 and in Table 1, the percentage of external local funding is declining. Also, we identified a growth of own tax revenues combined with an increasing interest for alternative local financial resources, as bond issue or bank credits (Constantinescu (Lacatus), 2010). All these facts suggest an increasing local capacity for self-financing.

Reporting local public government revenue to local public expenditure we identify the coverage level of local needs by local funds. Indicators from this category include relevant data about the financial capacity of the community and its dependence or independence of external sources of funding, such as grants. In Romania, local revenue are regulated by law (Law of local public finances, no. 273/2006) and the main elements of classification are: own revenues (taxes, contributions, amounts and quota deducted from income tax), amounts deducted from certain income of the state budget, grants/subventions received from state budget and other budgets. The report between the public own revenue and public expenditure is an indicator often used in the literature related to financial decentralization, namely Hunter index. According to the statistic data, Romania register a high level of fiscal decentralization, since over 50% of local government expenditure is financed by own revenues.

Classification of local revenues escapes the fact that income tax and VAT are both state budget revenues, although they are generated, indeed, locally and are strongly influenced by the local community and its economic strength. Even if some of this amounts of money remain and are used at local level, they still represent transfers from state budget, so it is questionable to consider them own income.

Funding decentralized public expenditure is based on both kinds of transferred amounts, specific allocations by budget laws and balancing amounts. So we consider the classification provided by the Public Finance Act inappropriate because splits the amounts deducted from VAT from own incomes, even the law considers the transfers from budget revenues own sources. So, we propose a more suggestive classification, which to take into consideration local financial capacity: own regular revenues (local tax, bank credits, municipal bonds), transferred revenues, including subventions (grants), exceptional revenues. Under this new structure, the Hunter index reduces substantially, down below 20% (Chart 5).

**Chart 5.** Hunter's indicator, calculated from two perspectives

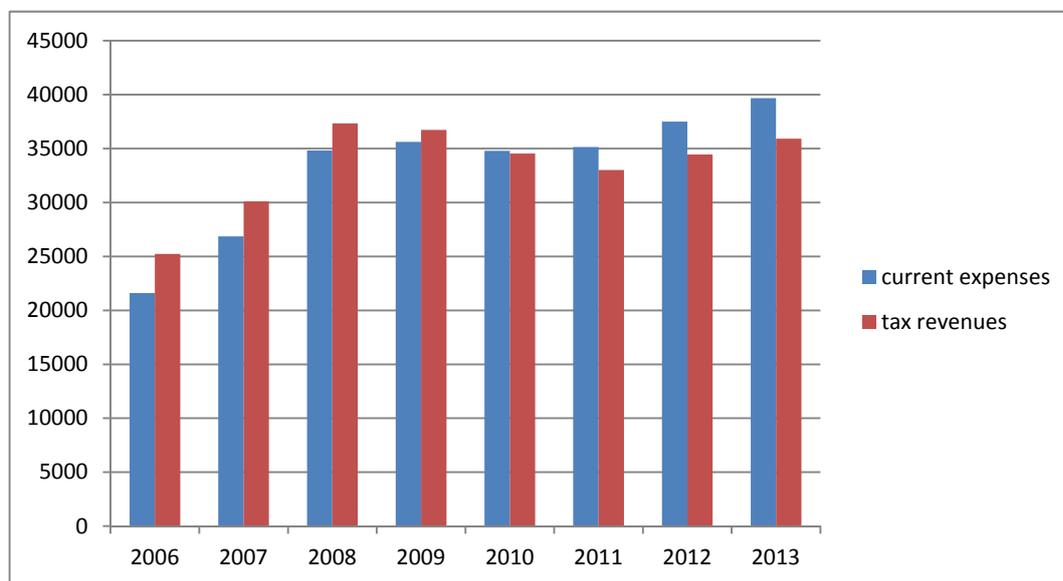


**Source:** authors' own processing, based on data provided by National Institute of Statistics, [www.insse.ro](http://www.insse.ro)

Another aspect of the analysis is the level of public budget balance. In the context that total public revenues are slightly in excess to public spending, tax revenues (including transfers) are able to cover more than 90% of current expenditure, which is a signal of sufficient funding (Chart 6).

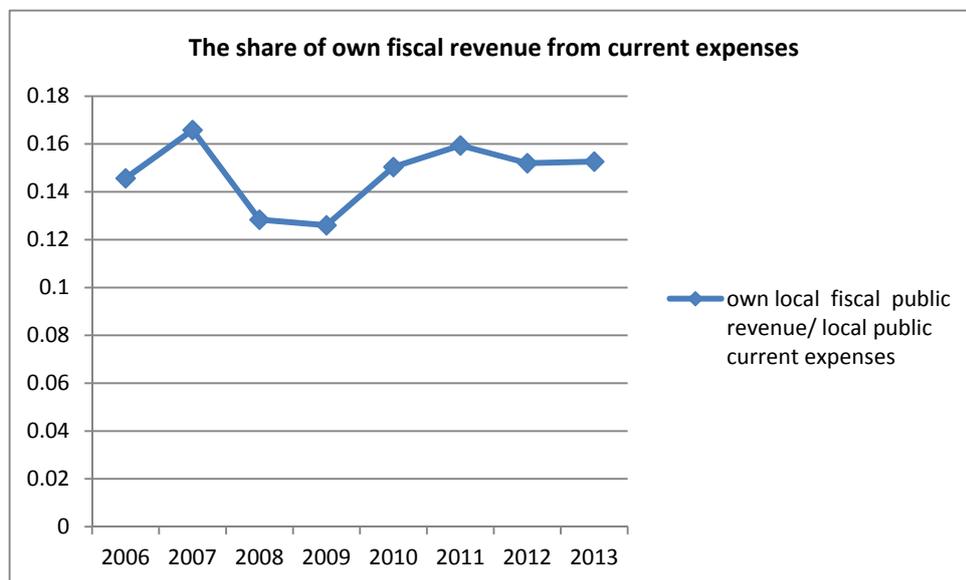
In contrast, own tax revenues manage to cover no more than 15% of current expenditure (Chart 7), which demonstrates the impossibility of the local government to be financially independent, in the context of a multitude of decentralized public services to serve, of the limited local funding sources and limited access to market capital (Constantinescu, Tanasescu, 2014).

**Chart 6.** Evolution of local tax revenues relative to local current expenditures



**Source:** authors' own processing, based on data provided by National Institute of Statistics, [www.insse.ro](http://www.insse.ro)

**Chart 7.** The share of local own fiscal taxes in local public current expenses



**Source:** authors' own processing, based on data provided by National Institute of Statistics, [www.insse.ro](http://www.insse.ro)

So, after we concluded that regarding local public funding, territorial administrative units have extremely limited independence, we may discuss about the independence which local authority benefits in establishing local needs, local priorities in delivering public services and allocating own and transfer sources to different objective Functional structure of public expenditure (Table 2) clearly reveals the areas where the local authority has specific responsibilities: public services and development, housing, environment and water, health, education, culture, recreation, religion, business areas, including also decentralized public services financed by transfers. Although the territorial administrative units generally enjoy

freedom in choosing their objectives, the restrictions and the lack of flexibility and freedom of money allocation is coming from the delegated public services, that do not always implies full funding through grants (such as education) but should be supported and provided. Also, because of these responsibility transfers, local authorities are forced to spend some public money in areas that do not always represent a priority for community, because decisions of funding are made nationally, not locally. So, even theoretically communities benefit of freedom of their action and choose, there is a high volume of public expenditure which has obligatory to be sustained by local authorities because of the delegated services. In the context of limited local own tax sources and limited access to financial market, the financial pressure is too big and collectivities rarely establish own achievable objectives which to afford to finance. As a result, we cannot discuss about a real decisional local independence, neither in objectives, neither in money allocation.

**Table 2.** Shares of various local public expenditure in total public expenditure-functional classification of public expenditure (%)

Weight of public spending in a specific functional category in total public expenditure / Year	2006	2007	2008	2009	2010	2011	2012
Local government expenditure / total public expenditure	24.47%	20.39%	25.12%	24.44%	24.00%	26.25 %	26.37%
General Public Services	29.91%	24.59%	23.97%	29.61%	25.78%	19.91%	19.71%
Defence	0.20%	24.26%	24.22%	19.71%	16.36%	31.00%	36.17%
Public order and national security	3.93%	4.62%	6.36%	6.90%	4.73%	4.33%	4.63%
Economic Affaires	23.18%	27.29%	29.02%	24.60%	26.39%	29.50%	28.43%
Environment	69.92%	73.88%	75.75%	80.97%	60.61%	61.77%	69.65%
Housing and public utilities	60.70%	65.72%	71.65%	75.15%	73.76%	73.56%	84.61%
Health	1.68%	1.70%	1.59%	5.47%	22.37%	37.47%	41.16%
Culture, recreation, religion	66.24%	61.38%	65.83%	68.45%	62.31%	69.68%	70.19%
Education	65.06%	66.15%	57.24%	62.88%	61.34%	57.35%	64.29%
Social protection	13.45%	14.64%	13.35	11.88%	11.00%	10.21%	10.38%

**Source:** Authors' own processing of the data provided by [www.eurostat.org](http://www.eurostat.org)

## Conclusions

Although financial decentralization process started for more than 20 years, local governments of Romania enjoy a minor financial independence and decision-making. Central government authorities are still those ones that draw national and local objectives, the funding and allocation of public money. Even local responsibilities have increased (as many public services have been delegated from the central to local level) the freedom of selecting and measuring local funding sources and the possibility to choose local objectives and financial ways to achieve them remained limited. In such restrictive funding conditions stipulated by law, with so many delegates tasks to solve, local governments are dependent on transfers from the state budget, which hampers decentralization. In addition, the specific regulations for this domain have enough gaps that allow discretionary funding and allocation of public money at local government level. The absence of clear or justified criteria for public transfers from central level to local level leads to the waste of public money. So, inefficient local or national public allocation and public money spending allows rich areas to grow economically and stops the development of poorer areas. Thus, public spending is in total disagreement with the real needs of the population.

As a conclusion of our study, Romania has a public finance system that presents more deconcentration features than decentralization features. The public financial and decisional decentralization is incipient and is requiring numerous legislative revisions as to achieve its objective, namely the citizen public need satisfaction in best conditions, regardless of its financial capacity, in terms of efficiency, priority and opportunity.

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# How to defend the profit shifting in front of the tax authorities?

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**Abstract.** *Nowadays, multinational companies are playing an important role within the worldwide economy. One of the main tax areas investigated by the tax authorities and detailed by the authors in this paper, refers to the reduction of the tax burden by a multinational company in the country where its activities are carried on, by shifting its income away from the entitled jurisdiction. Thus, it is essential to understand the way such companies operate (e.g. the functions, assets and risks assumed) and shift their profits among different countries. Identifying the proper allocation keys and implementing a feasible method to allocate the expenses and revenues represent an important step in the fight with the tax authorities.*

*In light of the above, this paper presents a program that can be used by companies for allocating automatically the expenses and profits booked. The program developed employs limited resources and it is complaint with the domestic and international tax rules.*

**Keywords:** MCs, allocation keys, method, profit shifting.

**JEL Classification:** H22, H25.

## Introduction

The role of multinational companies (“hereinafter MCs”) within the international trade has increased significantly over the last years. The technological progress is a major factor that contributed to the spread of economical activities carried on by a single entity in several countries. Nowadays, the Top 500 multinational corporations account for nearly 70 percent of the worldwide trade; this percentage has steadily increased over the past twenty years (WTO).

The MCs can be seen as important investors, bringing significant benefits for both home and host country: the spread of technology and the development of the human capital. However, the rapid spread of the MCs revealed complex tax issues, that both tax authorities and the MCs themselves are dealing with, as the MCs activity are carried on in different countries and each country has its own taxation rules. As such, in the last years, the cost of compliance became significantly for MCs in comparison with the local enterprises that operate within a single tax jurisdiction.

One of the main tax areas investigated by the tax authorities and detailed by the authors in this paper, refers to the reduction of the tax burden by a MC in the country where its activities are carried on, by shifting its income away from the entitled jurisdiction (OECD, 2013). It is very common for MCs to set up an entity, within a certain jurisdiction, that incurs significant costs by carrying on specific activities (e.g. centralised support services) for the benefit of the rest of the companies within the same group. The costs are subsequently allocated to the beneficiary companies. The cost optimisation is one of the main reasons for implementing such a business model. For example, the support activities, such as accounting, marketing, are commonly provided by entities located in law tax jurisdictions for tax optimisation purposes. Moreover, such jurisdictions are benefiting from good infrastructure, lack of transparency in the operation of legal and administrative provisions, protection of personal information, skilled workforce.

In light of the above, the present paper presents a model developed by the authors that can be used by MCs for the allocation of the expenses and revenues to a certain line of business or to other entities that benefited from a certain transaction. The model provides proper results when dealing with a large amount of data. Last but not least, it can be used as a tool for monitoring the financial performance of a company/line of business.

## Literature review

A MC is “a firm that conducts its activities in more than one country” (Zurawicki, 1996). Thus, a MC must comply with the tax and legal provisions of each country where the activities are carried one. Such enterprises “should comply with both the letter and spirit of the tax laws and regulations of the countries in which they operate” (OECD, 2011).

From a tax perspective, a MC is defined “as a group of companies, which are tax resident in several countries” (EJTPF, 2011). According to the international taxation principles, the resident country is entitled to tax the worldwide profits derived by its residents, while the source country is entitled to tax the income derived by a company within its borders. Considering the global dimension of MCs, it is obviously that the MCs are dealing with the source-resident conflict. Thus, it is advisable, that MCs to identify those jurisdictions that concluded conventions for the avoidance of double taxation, MCs being able thus to deal with the source-resident conflict (Cojocaru and Frateanu, 2000).

In addition, considering that the goal of a company is to maximise its profits, the goal of a MC is to be economically active and to achieve profits for its shareholders. Thus, in order to optimise its resources it is very common for MCs to set up a company in a certain location that carries on activities for the benefit of one or more entities within the group. As such, the

costs incurred by the aforementioned entity are allocated to each company. A critical element in any analysis of intra-group services is the analysis of the benefit derived by the recipients. To qualify as beneficial, the activity must provide the respective local entity with economic or commercial value to enhance its commercial position (OECD, 2010).

There are situations when the costs can be directly linked to a unique activity and entity; however in most cases, the costs are not directly linked to a specific transaction. In practice, the division of the combined profits is generally achieved using one or more allocation keys (OECD 2010). The allocation key can be a figure, or a variable (e.g. relative value of participant's marketing expenditure or other possible keys as discussed below). "Where more than one allocation key is used, it will also be necessary to weight the allocation keys used to determine the relative contribution that each allocation key represents to the earning of the combined profits" (van Raad, 2013). In practice the following type of allocation keys are used: allocation keys based on assets and capital (operating assets, fixed assets, intangible assets, capital employed) or costs (relative spending and/or investments in key areas such as research and development). However, "depending on the facts and circumstances of a transaction the following allocation keys such as: headcount, number of servers, time spent may be used" (van Raad, 2013). As regards the cost-based allocation keys may be used if it is a direct linked between the expenses incurred and the benefit derived. As Kees van Raad observed the "cost based allocation key" have the advantage of simplicity.

In respect of the allocation keys, two particularly relevant OECD comments worth to be mentioned:

- "Any indirect- charge method should be sensitive to the commercial features of the individual case (e.g. the allocation key makes sense under the circumstances), contain safeguards against manipulation and follow sound accounting principles and be capable of producing charges or allocations of costs that are commensurate with the actual or reasonably expected benefits to the recipient of the service" (OECD 7.23, 2010).
- "To satisfy the arm's length principle the allocation method chosen must lead to a result that is consistent with what comparable independent enterprises would have been prepared to accept." (OECD 7.24, 2010)

As outlined above, in case, the tax authorities in a specific country do not agree with the allocation performed, there is a high risk that such cost not be treated as business costs, and as a consequence the tax authorities may challenge their deductibility for corporate income tax purposes. In order to mitigate this risk, a MC will try to reallocate the costs to another entity. However, in such a case it is unlikely that the country that gets the costs to accept them (EU, 2010).

Under the domestic tax legislation (Law no. 571/2003 regarding the Fiscal Code and the related Methodological Norms), expenses are deductible for corporate income tax purposes if are incurred with the purpose of generating taxable revenues. Moreover, there are specific provisions related to the deductibility of service expenses. These provisions refer to the existence of an agreement or any other contractual form required by Romanian legislation and that the "proof of performance" and "benefit" tests are passed:

- Proof of performance test - in order to ascertain whether the services were actually rendered and the availability of supporting documentation in order to meet the requirements of Romania fiscal legislation.
- Benefit test - in order to ascertain whether the services provided bring economic and commercial value that enhanced its commercial position.

Thus, the taxpayer must prove with appropriate supporting documentation that the services were actually rendered for its benefit.

## Guidelines for preparing a feasible procedure for allocating the expenses

### 1) Identifying the nature of the expenses incurred and the corresponding beneficiary

In order to prepare a feasible strategy to be used in allocating the expenses, it is critical for a company to identify the nature of the expenses it incurs during a certain period. As presented above, a company may incur two types of costs:

- Directly attributable costs: are those that can be directly linked to a particular activity (i.e. expenses incurred with the acquisition of raw materials).
- Non-attributable costs: are those that cannot be linked to a specific activity. These may be expenses common to a number of activities (i.e. salary expenses). Allocating these expenses would require an approach that somehow can spread the costs across the various activities.

In order to allocate these costs it is necessary to identify the group of entities that benefited from a specific transaction (e.g. provision of marketing services.)

### 2) Identify the proper allocation key.

As outlined in the previous section of this paper, the domestic and international tax legislation does not provide clear rules in respect of the allocation key to be used by companies. In this respect, the authors believe that it is essential that whatever allocation key is decided to be used it should be constantly applied. Nevertheless a review must be performed on a regular basis in order to assess whether the conditions that lead to its development have changed.

It is worth mentioning the conflict between the experts that sustain that a sophisticated key is more appropriately to be used than a simple key. The authors consider that a balance should be found between a key that can be easily applied and the burden that would be generated further to the creating a complex key that may bring an insignificant improvement to the allocation process. The pragmatic approach outlined above is that whatever allocation key is decided upon it must be capable of being justified and applied consistently.

For exemplification purposes the authors decided to choose the following allocation keys:

- *Time spent key* – This key is used to allocate the expenses that are linked to the time spent by a company's ("X") employees for performing activities in the benefit of another company ("Y"), such as utilities expenses, insurance expenses, marketing expenses, management expenses etc.. The time spent key may be computed as an average of the total time spent by X's employees from a specific department for performing activities to the benefit of Y.
- *Surface key* – This key was used to allocate the expenses such as: renting expenses, logistic expenses, insurance. This key represents the link between the spaces used by the company for carrying on activities to the benefit of another company. The key may be computed as the total surface covered by Y's products divided to the total space.
- *Headcount key* – This key was used to allocate the expenses that can be linked to the IT Department and HR Department such as: labour costs, training and consulting services etc. The key was computed as the number of X's employees that work for Y divided to the total number of employees.
- *Turnover key* – This key was used mainly for allocating financial expenses and revenues such as: interest expenses, foreign exchange gains etc. The key was computed as Y turnover divided to X turnover.

### 3) Develop a program that automatically allocates the expenses

After defining the keys, the authors created a program that can make the link between the allocation key and a company's financial statements. The program allows the allocation of the expenses and revenues in five minutes by using four buttons. The program was created by using VBA codes.

The main VBA subprograms developed are the following:

a) Determining the number of employees from each department

Assuming that each department has an identification code, in the below example C1, the function created determines the number of employees of each department. Furthermore, the function determines the average time spend by the employees from a certain department to perform activities to the benefit of another company.

```
Sub calcul_management()
Dim i As Integer
Dim average As Double
ival = 0
sum = 0
For i = 2 To 4000
If Cells(i, 3) = "C1" Then
ival = ival + 1
sum = sum + Cells(i, 10)
End If
ActiveWorkbook.Worksheets("Steps").Cells(1, 1) = ival
ActiveWorkbook.Worksheets("Cost Center").Cells(1, 13) = sum / ival
Next i
End Sub
```

b) Extracting the necessary information

The function presented below creates a link between the account title and account number.

```
Sub v_description()
Dim result As Variant
Dim i As Long
Cells(1, 3) = "English Description"
For i = 2 To 60000
On Error Resume Next
result = Application.WorksheetFunction.VLookup(Cells(i, 1), Sheet4.Range("B2:D5000"), 3, False)
If Err.Number = 0 Then
Cells(i, 3).Value = result
End If
On Error GoTo 0
Next i
End Sub
```

A similar function was used to extract the cost center title, the allocation method of each account and the accounts designated by the company's management to be allocated.

c) Computing the allocated amount

The subprograms depicted below determine the amount allocated by using the established allocated key. The program goes through all the company's accounts and based on the designated allocation key it determines the allocated amount.

```
Sub amount_alloc()
Dim i As Long
Cells(1, 14) = "Allocated Amount"
For i = 2 To 60000
If Cells(i, 13) = "" Then
ElseIf Cells(i, 10) = "Time spent" Then Cells(i, 14) = Cells(i, 5) * Cells(i, 12)
ElseIf Cells(i, 10) = "Turnover" Then Cells(i, 14) = Cells(i, 5) * Sheet6.Cells(3, 2)
```

```

ElseIf Cells(i, 10) = "Headcount" Then Cells(i, 14) = Cells(i, 5) * Sheet6.Cells(2, 2)
ElseIf Cells(i, 10) = "Surface" Then Cells(i, 14) = Cells(i, 5) * Sheet6.Cells(4, 2)
Else: Cells(i, 14) = ""
End If
Next i
End Sub

```

d) Computing the allocated amount per each cost center

The author created a filter that determines automatically the allocated amount for each cost center. The series of functions used are depicted below:

```

Sub Pivot()
Dim Pt As PivotTable
Dim PtCache As PivotCache
Dim pageField1 As String
Dim pageField2 As String
Dim pageField3 As String
Dim rowField1 As String
Dim rowField2 As String
Dim rowField3 As String
Dim rowField4 As String
Dim colField As String
Dim dataField As String
On Error Resume Next
Application.DisplayAlerts = False
Sheets("Pivot Sheet").Delete
On Error GoTo 0
Application.DisplayAlerts = True
Set s = Sheets("Data")
With Worksheets.Add
    .Name = "Pivot Sheet"
End With
pageField1 = s.Cells(1, 9).Value
rowField1 = s.Cells(1, 2).Value
rowField2 = s.Cells(1, 4).Value
dataField = s.Cells(1, 14).Value

Worksheets("Data").Activate
ActiveSheet.Range("a1").Select
ActiveSheet.Range(Selection, Selection.End(xlToRight)).Select
ActiveSheet.Range(Selection, Selection.End(xlDown)).Select
Selection.Name = "Items"

Set PtCache = ActiveWorkbook.PivotCaches.Add( _
    SourceType:=xlDatabase, _
    SourceData:=s.Range("Items"))

Set Pt = PtCache.CreatePivotTable( _
    TableDestination:=Sheets("Pivot Sheet").Range("A3"), _
    TableName:="QualCodeTable")

With Pt
    .PivotFields(rowField1).Orientation = xlRowField
    .PivotFields(rowField2).Orientation = xlRowField
    .PivotFields(pageField1).Orientation = xlPageField

```

End With

```
With Pt.PivotFields(dataField)
    .Orientation = xlDataField
    .Function = xlSum
```

End With

```
Worksheets("Pivot Sheet").Columns("A:DD").AutoFit
Application.ScreenUpdating = True
```

```
On Error Resume Next
Application.DisplayAlerts = False
```

```
Sheets("Pivot Chart").Delete
```

```
On Error GoTo 0
```

```
Application.DisplayAlerts = True
```

End Sub

#### 4) Creating a friendly interface

The excel worksheet represents the interface between the program user and the VBA codes created. The program consists of 5 worksheets, whereas only one worksheet must be filled in by the program user, while 3 of them must be updated if changes arise in the structure of the company's business model.

##### 4.1) Worksheets

- Summary – it illustrates the key used to allocate the costs and the total amount allocated;
- Steps – it illustrates the steps to be followed in order to get the allocated amount;
- Data worksheet – it comprises the necessary data for computing the total allocated amount; it includes the company's accounts and the amounts recorded each month;
- Employees involvement – it illustrates the time spent by company's employees for performing activities to the benefit of another company;
- Account allocation and Cost center allocation – it presents whether an account/ cost center is allocated or not, illustrating also the allocation key;

##### 4.2) Steps to be performed by the end user for computing the allocated amounts

###### a) *Update the Employees involvement worksheet*

If during the month the status of the employees has changed, then *Employees' involvement* worksheet should be updated in order to reflect whether a new employee joined or left the company, if the time spent for performing a certain activity to the benefit of another company has changed.

###### b) *Fill in the columns within the Data worksheet*

Under this step the program user should fill in the Data worksheet with financial information from the company's trial balance.

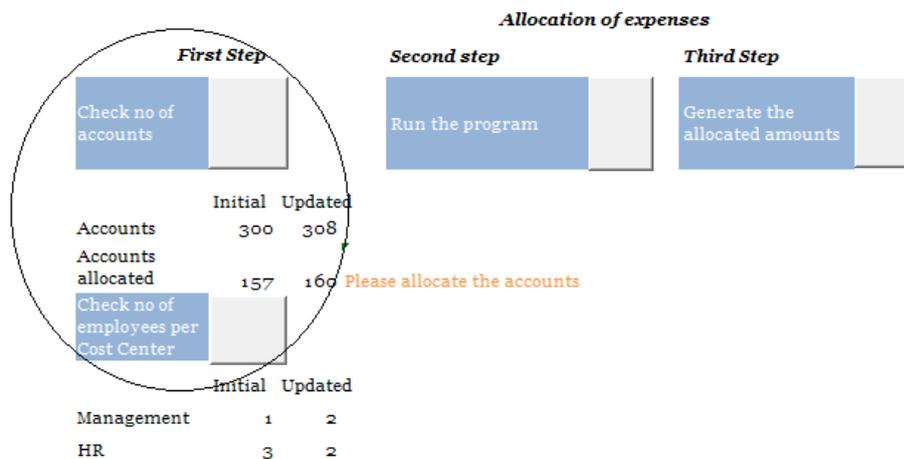
###### c) *Account allocation and Cost center allocation*

Under this step the program user should decide if an account or cost center must be allocated or not.

#### Running the program

After the above mentioned steps were performed, the program user must use 3 buttons placed within the sheet Steps in order to generate the total allocated amount.

**Figure 1.** The table below illustrates the worksheet Steps that represent the interface between the program user and VBA codes



### Results derived further to running the program and conclusions

The main benefits derived by using such a program are:

- The program performs the allocation of expenses and revenues, in maximum three minutes, after the input data was introduced according to the predefined template. The running time depends on the number of accounts, cost centers to be allocated.
- The manual errors are mitigated.
- The friendly interface facilitates the utilisation of the program.
- Further to this allocation, a company has a clear overview of the actual level of revenues and expenses incurred during a certain period of time. Thus, it obtains the accounting profit that can be used to compute various indicators that measure the financial performance of the company such as: return on assets, return on equity and return on capital employed.
- The program created may also be used by companies that are carrying one more than one activity. In this case, the program may be seen as a tool for assessing the performance of each line of business.
- From a tax perspective, the results derived by the program allows for the computation of the corporate income tax and the effective tax rate. Furthermore, in front of the tax inspectors a company may be able to prove that the services incurred are related only to its business and thus the taxable base is not disrupted. Furthermore, it can prove that the expenses incurred are not overestimated.
- The program ensures that the identified allocation keys are used on a constant manner.
- The program for allocating the expenses is transparent and can be easily documented in order to defend the deductibility of the expenses in front of the tax authorities.
- On the other hands, the correspondent entity will be able to prove in front of its tax authorities that the expenses are reasonable allocated based on a comprehensive methodology. If requested, the company may provide the correspondent company with timesheets and other supporting documentations (invoices, reports etc.) that can prove that the expenses allocated are not overestimated.

A major step in defending the deductibility of the service expenses in front of the tax authorities will be made by taxpayers if a feasible methodology for allocating the expenses is prepared and properly implemented. The authors will continue to perform further research in order to identify methods and procedures that can be used by the taxpayers to reduce their tax burden. As a next step, considering that the transactions take place within a Group, it is advisable that a transfer pricing policy and documentation file to be prepared by the taxpayers

in order to prove that the prices used respect the arm's length principle. Thus, further fines and transfer pricing adjustments may be avoided. Furthermore, proper procedures should be prepared and implemented by companies in order to gather the justifying documentation and to support the deductibility of the expenses incurred for corporate income tax purposes.

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# An analysis of regional tax convergence in the European Union

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**Abstract.** *The current study is a sigma-convergence approach to establishing whether there is any evidence of regional tax convergence in the European Union. The Member States of the European Union have been divided into four regions. The tax system of each Member State is defined using the annual overall tax burden. For each of the four regions, fiscal convergence is analyzed using the coefficient of variation and the Gini index. The results revealed the existence of certain tax convergence periods for each region, but did not lead to any distinct overall conclusions for the entire European Union.*

**Keywords:** taxation, convergence, tax burden, European Union.

**JEL Classification:** H29.

## 1. Literature Review

The European Union has set a large number of objectives for its Member States in all the areas that are considered to be of common interest. One of these areas is fiscal policy and, regarding fiscal policy, one of the main established goals is to achieve fiscal convergence among the Member States. Tax competition is a highly debated issue and it gives rise to an unlimited number of dissensions among the Member States. These are some of the reasons why fiscal convergence is currently an area of high interest for researchers.

When it comes to defining fiscal convergence, there are mainly two approaches in the relevant literature. Some authors (De Bandt and Mongelli, 2000, Blot and Serranito, 2006, Kocenda et al., 2008) refer to convergence to the Maastricht criteris as being fiscal convergence. For other authors, fiscal convergence refers to taxation and they call it tax convergence (Esteve et al., 2000, Sosvilla et al., 2001, Zodrow, 2003, Delgado, 2006, Kemmerling, 2010, Delgado and Presno, 2011). The current study subscribes to this second view regarding fiscal convergence.

Tax convergence is often considered to be tax burden convergence. The current study combines and expands on some of the ideas used previously by other researchers. Gemmel and Kneller, 2003 combine the two previously mentioned definitions and regard fiscal convergence as being the intersection of three different components: (1) the level of taxation and the type of taxes used, (2) the fiscal deficit and (3) public expenditure. In their study, the authors analyze the impact of these three components on the economic growth rate. They use a database constructed of information regarding ten EU Member States and they conduct their research for the time period between 1970 and 1995, which they divide into sub-periods of 5 years each. Another aspect of their study that must be underlined is the fact that they also use the Gini index for the sigma-convergence analysis as we will also attempt to do in this study.

Using a combination of sigma and beta-convergence, Esteve et al., 2000 find evidence of tax burden convergence in the European Union for the period from 1967 and 1994. In a similar fashion, Sosvilla et al., 2001 analyze tax burden convergence using beta-convergence as well as sigma-convergence based on the standard deviation. They use a database constructed for the EU15 and containing information for the time period between 1967 and 1995. They reach the conclusion that there were two tax convergence periods: from 1967 to 1974 and from 1984 to 1995. Delgado, 2006 uses three different methods to analyze the tax mix convergence in the European Union: sigma-convergence, beta-convergence and gamma-convergence. His database includes information for the time period between 1965 and 2003. His results indicate the existence of strong fiscal convergence during the period between 1975 and 1990.

The current study is a continuation of previous work in the area of tax convergence research. Fiscal convergence is regarded as convergence of taxation, where a tax system can be defined using the overall tax burden (the percentage of total tax revenues in the GDP). The goal is to find evidence of tax convergence using sigma-convergence based on the coefficient of variation and on the Gini index. The element of novelty is the regional approach to the study of fiscal convergence in the European Union.

## 2. Research methodology

The current study aims to establish if evidence of regional tax convergence can be found throughout the European Union. In order to reach this goal, the Member States of the European Union have been divided into four regions, as follows: *West EU* (France, Germany, Ireland, the United Kingdom, and Austria), *North EU* (Belgium, the Netherlands, Luxembourg, Denmark, Sweden, and Finland), *South EU* (Italy, Greece, Cyprus, Portugal, Spain, and Malta) and *East EU* (Hungary, Poland, Slovakia, Latvia, Lithuania, Estonia, Slovenia, the Czech Republic, Bulgaria, Romania, and Croatia). For each region, tax

convergence will be analyzed using sigma-convergence based on the coefficient of variation and on the Gini index.

In order to define a country's tax system, the overall tax burden was used as a proxy. Consequently, the database on which the results are based contains information regarding the annual overall tax burden for each of the Member States. The overall tax burden is calculated as the percentage of the GDP that is represented by the total government revenues obtained from taxes. The data was extracted from the Eurostat database as well as from the OECD online database.

The time period considered is different for each region, depending on the data available for the Member States included in that specific region. Therefore, the most extensive time period, starting in 1965 and ending in 2013, was used for the West EU region and for the North EU region. For the South EU region, data regarding the overall tax burden was available only for the period between 1995 and 2013. For the last region, East EU, information regarding fiscal pressure was available only from 2002 up until 2013 which reduced the time period to only 12 years. This might be seen as a weakness of the research. However, if we consider that Croatia is part of this last region and it only applied for membership in 2003, we may argue that any data previous to 2002 would be irrelevant to our research anyway since Croatia was not yet considering EU membership and, therefore, was making no efforts to align itself to EU standards.

One of the methods most frequently used to study convergence is sigma-convergence. Sigma-convergence can be based on a number of different coefficients that measure dispersion. In our research, we have chosen to use the *coefficient of variation* because it is most often used to analyze dispersion and the *Gini index* in order to further consolidate the results yielded by the analysis based on the coefficient of variation.

The coefficient of variation (CV) is calculated annually, for each region, based on the formula presented in equation (1).

$$CV = \frac{\sqrt{\frac{1}{n} \sum_{i=1}^n (Y_i - \bar{Y})^2}}{\bar{Y}}, \quad (1)$$

The number of Member States included in each region is represented by the variable  $n$ , the overall tax burden for Member State  $i$  is represented by  $Y_i$ , while the average tax burden for one region for each year is  $\bar{Y}$ . The CV was calculated separately for each of the four regions, for each year included in the time period considered in the research for that particular region. For example, for the West EU region, the CV was calculated for 5 Member States, for each year between 1965 and 2013.

The Gini index was included in the research mainly in order to confirm and reinforce the results obtained using sigma-convergence based on the CV. The Gini index was also calculated annually based on equation (2).

$$GINI = \frac{1}{n} \left[ n + 1 - 2 * \left( \frac{\sum_{i=1}^n (n+1-i) * Y_i}{\sum_{i=1}^n Y_i} \right) \right], \quad (2)$$

The variables are the same as in equation (1):  $n$  represents the number of Member States included in each region and  $Y_i$  represents the overall tax burden for country  $i$ . However, in order to calculate the Gini index, the Member States must be arranged in ascending order (from the smallest tax burden to the largest, for each year) and, consequently,  $i$  will represent their place in this order.

The sigma-convergence analysis based on both the CV and the Gini index was conducted for each of the four regions and the research results are presented in the following section.

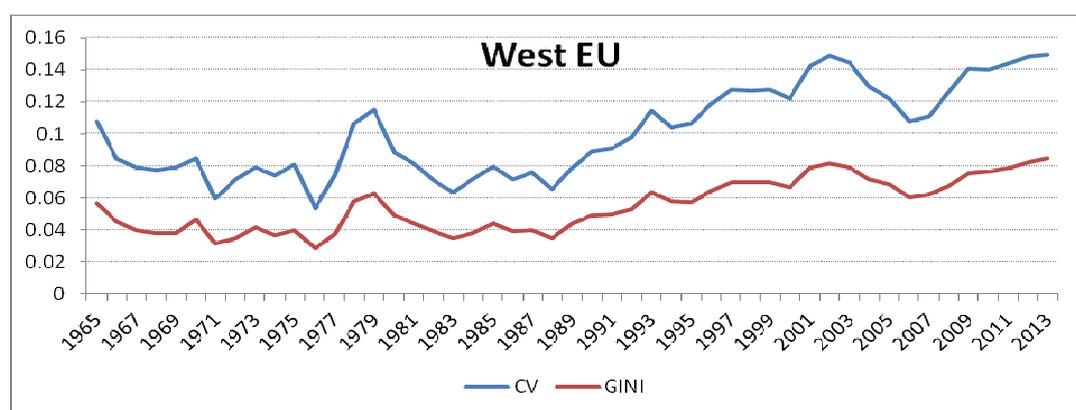
### 3. Research results

In order to establish if there is any evidence of regional tax convergence in the European Union, a sigma-convergence analysis was realized using the CV and the Gini index. The results varied from one region to the next, but were consistent for both coefficients for each region, as can be seen in this section of the paper.

#### 3.1. Results for West EU

Chart 1 shows a comparison between the evolution of the CV and the Gini index for the West EU region. The overall trend for both coefficients is an ascending one which points to the conclusion of a lack of tax convergence in the West EU region for the period between 1965 and 2013. However, if we consider more limited time periods, we can observe that there were clear convergence tendencies for the period between 1979 and 1984, as well as between 2003 and 2007. Still, for the most recent years, 2007 to 2013, both the CV and the Gini index show a growth tendency which points to the conclusion that the five Member States included in the West EU region have decided to sacrifice tax convergence objectives in order to address to more immediate issue of the financial world crisis and its consequences.

**Chart 1.** Sigma-convergence tendencies in the West EU region (1965-2013)



**Source:** own calculus.

Table 1 presents the minimum and maximum values reached by the CV and the Gini index for the West EU region. One of the remarkable conclusions of the table is the fact that both coefficients reach their peak and their low, respectively, in the same years.

**Table 1.** Maximum and minimum values for CV and GINI index for the West EU region

	CV		GINI	
	Value	Year	Value	Year
Max	0.149465	2013	0.084453	2013
Min	0.053259	1976	0.028818	1976

**Source:** own calculus.

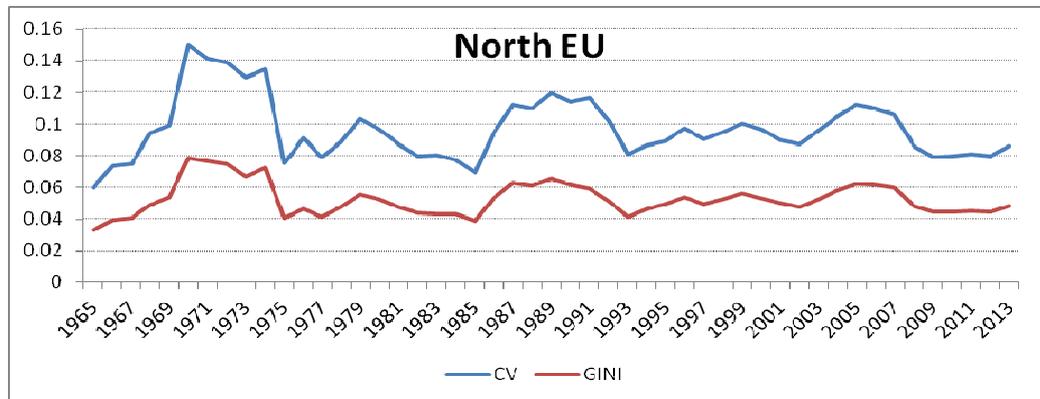
Another significant result that can be observed in Table 1 is the fact that the peak of tax convergence for the West EU region was in 1976, while in 2013 the tax systems of the Member States included in this region further from each other than they had ever been before.

#### 3.2. Results for North EU

For the North EU region, the research points to different conclusions to those presented for the West EU region. The overall tendency for both the CV and the Gini index is slightly descending, which leaves the existence of tax convergence up for debate. It is not possible to reach a definite conclusion for the entire time period between 1965 and 2013. However, there were briefer periods of time when tax convergence tendencies can be observed such as the period between 1970 and 1976 or between 1979 and 1985. More recently, there was tax convergence in the North EU region between 1999 and 2003.

In the last few years, the lines on Chart 2 are almost parallel with the horizontal axis, which means that there were no changes in taxation trends in this region. Still, in the last year, both lines on the chart seem to rise and any increase in the value of the two coefficients points to a lack of tax convergence in the North EU region.

**Chart 2.** *Sigma-convergence tendencies in the North EU region (1965-2013)*



**Source:** own calculus.

Tax convergence in the North EU region, according to the information in Table 2, reached its peak in 1965, the first year in the time period included in the analysis. However, the difference between the value of the CV and the Gini index in 1965 and those from recent years is not very large (0.02 for the CV and 0.01 for the Gini Index, calculated using the values from 2012), which leads to favorable conclusions regarding the future evolution of tax convergence in this region.

**Table 2.** *Maximum and minimum values for CV and GINI index for the North EU region*

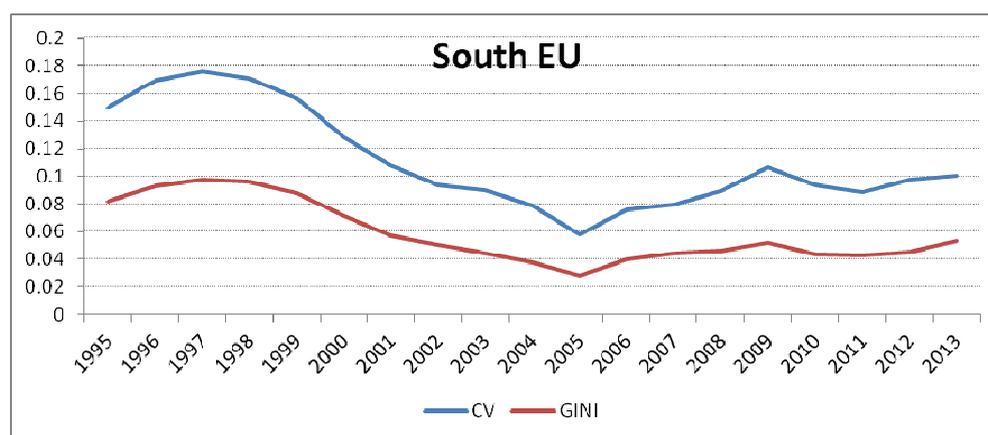
	CV		GINI	
	Value	Year	Value	Year
Max	0.150041	1970	0.078828	1970
Min	0.059977	1965	0.033298	1965

**Source:** own calculus.

The maximum value for both the CV and the Gini index were reached in 1970, which means that was the year when the tax system of the Member States included in the North EU region were the most different. As the values for both coefficients decreased significantly since 1970, we may conclude that there are slight tax convergence tendencies in the North EU region.

### 3.3. Results for South EU

The research results for the South EU region are interesting because both lines in Chart 3 show a distinct descending tendency for the time period included in the study. Therefore, we may say that for the South EU region, there are tax convergence tendencies for the period between 1995 and 2013. Tax convergence clearly existed between 1995 and 2005. However, after that year, the descending trend is less pronounced for both coefficients. After a slight increase from 2005 to 2009, both coefficients started to decrease again which is a positive result for tax convergence. Still, the less encouraging find is the fact that in the last year (2013), both coefficients started to grow which shows a lack of tax convergence.

**Chart 3.** *Sigma-convergence tendencies in the South EU region (1995-2013)*

**Source:** own calculus.

The peak of convergence for the South EU region was achieved in 2005, when both the CV and the Gini index reached their minimum values. Unfortunately, after that year, the values of both coefficients started to rise and the values for 2013 are significantly higher than those of 2005. This points to tax divergence in the South EU region in the present.

**Table 3.** *Maximum and minimum values for CV and GINI index for the South EU region*

	CV		GINI	
	Value	Year	Value	Year
Max	0.176417	1997	0.097368	1997
Min	0.058232	2005	0.028203	2005

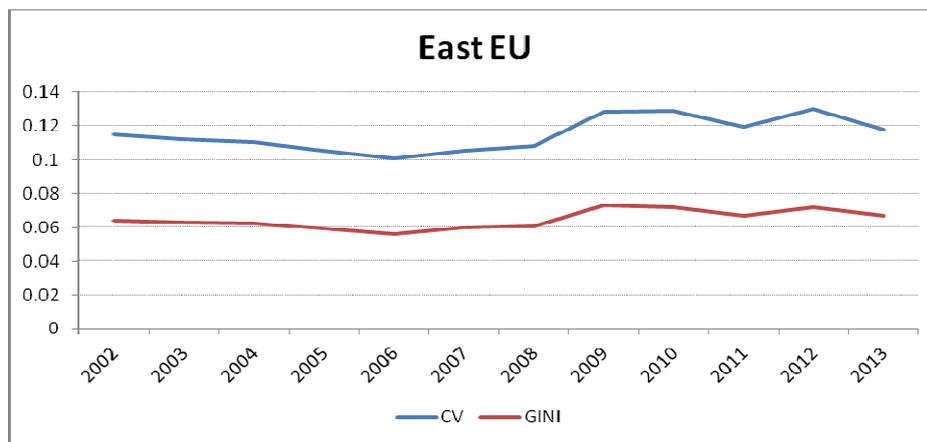
**Source:** own calculus.

Nevertheless, the current values are much smaller than those from 1997, when both coefficients registered their maximum values and the tax systems of the Member States included in the South EU region were the most different.

### 3.4. Results for East EU

The East EU region is the largest of the four in terms of number of Member States included and, consequently, number of tax system considered in the analysis. Still, the research results for this region are not unfavorable to tax convergence. The overall trend for both the CV and the Gini index is slightly ascending, however, that cannot lead to a clear conclusion of lack of tax convergence. This is due to the fact that, for most of the years included in the studied time period, both lines in Chart 4 are almost parallel to the horizontal axis. This observation points to acknowledging no significant changes in taxation in the East EU region for the period between 2002 and 2013.

Another aspect that must be underlined is the fact that the research for this region was only conducted for 12 years. Though this is the most extensive period available for analysis at this time, the results are not as conclusive as those for some of the other regions.

**Chart 4.** *Sigma-convergence tendencies in the East EU region (2002-2013)*

**Source:** own calculus.

The tax systems of the Member States included in the East EU region were at their most divergent in 2009 and 2012 when the coefficients reached their maximum values. Unlike the results for the other three regions, for the East EU Member States both coefficients do not reach their peak in the same year. The most unfavorable aspect to tax convergence is the fact that one coefficient reached that maximum in 2012, very recently.

**Table 4.** *Maximum and minimum values for CV and GINI index for the East EU region*

	CV		GINI	
	Value	Year	Value	Year
Max	0.129719	2012	0.072869	2009
Min	0.100999	2006	0.055686	2006

**Source:** own calculus.

The peak of convergence of the East EU region appeared in 2006, when both the CV and the Gini index registered their minimum values. One positive observation regarding future tax convergence tendencies is the fact that both coefficients decreased in value in 2013 by comparison to 2012. This shows that, in future years, tax convergence might be present in the East EU region.

## Conclusions

The current research focused on establishing the existence of regional tax convergence tendencies in the European Union. The Member States of the European Union were divided into four regions. For each region, a sigma-convergence analysis based on the coefficient of variation and the Gini index was conducted. The results revealed the existence of certain tax convergence periods for each region, but did not lead to any distinct overall conclusions for the entire European Union.

For the West EU region, the overall conclusion was a lack of tax convergence, but tax convergence periods were established between 1979 and 1984, as well as between 2003 and 2007. For the North EU region, the overall conclusion was the existence of slight tax convergence tendencies. Tax convergence periods for this region existed between 1970 and 1976 and between 1979 and 1985. More recently, there was tax convergence in the North EU region between 1999 and 2003.

For the South EU region, the overall conclusion was the existence of tax convergence. However, the latest tax convergence period started in 2009 and seems to have ended in 2012. As far as the East EU region is concerned, the overall conclusion was that of slight tax divergence. Nevertheless, the tax convergence period registered from 2009 to 2012 seems to be continuing in 2013.

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# Financial and accounting regulations applicable to the cult units within the Romanian Patriarchy

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**Abstract.** *The cult units and subunits within the Romanian Patriarchy are organized and structured according to the Statute for the Organization and Functioning of the Romanian Orthodox Church published in the Romanian Official Gazette, Part I, no.50, on January 22nd 2008. Also, on must abide by the regulations of Law 489/2006 regarding the religious liberty and the general regime of the cults, published in the Official Gazette, Part I, no.11/01.08.2007, as well as by other special laws dealing with the organization structure, and only tangentially with the financing of the Romanian Orthodox Church and of the other cults equally recognized by the Romanian State, according to the law for cults.*

**Keywords:** words: cult units, financing, legislation, financial discipline.

**JEL Classification:** G02, G32, Z12.

## 1. Legal grounds applicable to the economic activity undertaken by cult units

Article paragraph (1) of the accounting law states that the Ministry of Economy and Finances is responsible for elaborating and issuing “norms and regulations in the field of accounting, a general accounts plan, models for financial reports, registries and common forms about the financial and accounting activity, methodological norms about their completion and use.”

In what concerns the diversity of economic activities undertaken by cult units, it is taken into account that they are legal persons without a lucrative purpose. The Holy Synod of the Romanian Orthodox Church issues internal regulations in accordance with Article 18 from the accounting regulations of 1993, which will be completed by the MFP norms no. 460/2001. These legal regulations will entitle the cult units to keep track using single-entry bookkeeping. This right will be sanctioned by Annex no. 2 OMFP no. 1969/2007 (Greceanu-Cocoş, 2010, p. 5).

Thus, OMFP no. 1969/2007 is applicable to religious cults in Romania which come into being through special laws, which develop activities with no patrimonial purpose. The financial annual reports which must be completed by these entities are: the balance; accounting profit or loss and the substantiation reports to the financial annual reports.

If no economic activities are developed, simplified annual reports will be compiled which will contain the following documents: the shortened balance, shortened accounting of profit or loss, simplified substantiation reports and simplified annual financial reports.

We should also mention that all these reports must be accompanied by a written affidavit from the management staff of the legal person for the correct compiling of the annual financial reports. (Bădoi, 2013, p. 47)

The budget of cult units plays a double role, both as an illustration of income and expenditures and it is considered a control element for cash flow.

When elaborating the budget of income and expenditures the following must be taken into account: the preliminary realizations will be located in the first column, while the actual realizations in the second column.

Drawing up the budget entails five different phases (Floca and Joantă, 2006, p. 80). They are the following:

- preparing and elaborating the budget;
- approving the budget by the parish and diocese authorities;
- budgetary execution;
- budgetary closing;
- budgetary control.

The income and expenditure budgets are completed and filed at the Parish District to be centralized and approved after thorough inspection by the diocese center to which the parish or the parish district belongs, from an administrative point of view. The parish budgets are transmitted separately from those of the parish districts, reporting their activity distinctively, on the same model form. The parish districts must not compile a centralized balance, and, for the subsidies received from the state and the way of using the monetary funds, they will report directly to the diocese, which will communicate it further to the State Secretariat for Cults (Greceanu-Cocoş, 2010, p. 97).

For cult units which are legal purpose and do not have a lucrative purpose, financial and accounting records will be kept using single-entry bookkeeping as regulated by OMFP no. 2329/2001, published in the Romanian Official Gazette no. 20/01.15.2002. All these dispositions are applicable from January 1<sup>st</sup> 2002.

To the associations belonging to religious cults the provisions of Government Decision 26/2000 are not to be applied. As they are of public utility they cannot use single-entry bookkeeping, and they are required to use double-entry accounting as long as they function (Greceanu-Cocoş, 2010, p. 20).

If we talk about other cult units, different from religious associations, which provide economic activity, the accounting will be kept using double-entry. Very important in this respect is OMFP 1752/2005 which approves the account plans of economic operators harmonized with the national standards of accounting in accordance with the accounting regulations as per the 4<sup>th</sup> Directive of European Economic Communities, an integrant part of accounting regulations within the European directives approved through the Order of the Ministry of Public Finances no. 3055/2009, published in the Romanian Official Gazette no. 766 bis on 11/10/2009. Thus, it is extremely important to take into account the national accounting law, i.e. Law no. 82/1997 republished in the Official Gazette no. 454/6.18.2008, and the regulations of the fourth and seventh directives of the European Economic Community (CECCAR, 2011, pp. 20-25).

The author of a work dedicated to the accounting treatment applicable to religious cult units notices the fact that it is complicated to separate the economic activities of cult units from those dealing with the general missionary interest. This, because the legal regulations which are in effect at this moment “prove contradictory and insufficient as they do not treat distinctly these aspects” (Greceanu-Cocoş, 2010, p. 5).

On the other hand, the same author, (Greceanu-Cocoş, 2010, pp. 46-47), brings into discussion the way the church units from abroad are financed. It is noticed that “the legal basis for the accounting of these cult units and their goods” is inexistent, to the detriment of the Romanian accounting law, which includes in article 47 that it can be applied to subunits without legal personality from abroad that belong to the persons mentioned in article 1 of the same law. To this extent, the author arguments that the cult units from abroad belong to the ones in Romania. The cult units from abroad, according to article 175, paragraph (1) from the Statute “can own goods whose situation is regulated according to the provisions and laws of the state on whose territory the properties exist.”

The author wishes to demonstrate that the cult units from abroad are public, not private, legal persons, as they are considered in the statutory regulations. The author is thus interested in the point of view of the Accounting and Financial Reporting Council within the Ministry of Public Finances regarding the inexistence of the legal basis for the accounting of these goods, as well as the financing legal grounds of “the properties of the Romanian state given into administration to these units from abroad and not supervised in any way by the Romanian state which owns them”. (Greceanu-Cocoş, 2010, p. 47).

We believe that the answer to this matter can be found within article 175, paragraph (2) of the Statute which stipulates that “the situation of church or similar goods from abroad, owned by the Romanian state, given into administration to the Romanian dioceses from outside the borders of the country, will be regulated on demand, through bilateral agreement between the Romanian Patriarchy, the interested party and the Romanian state.” These agreements express the volition of the involved parties, providing thus true legal grounds.

According to article 16, paragraph (1) from the law for cults, religious cults are required to do their bookkeeping in the Romanian language. As per paragraph (2) of the same article, it is stipulated that the official relations of the cults with the state will be carried out in Romanian. However, a big omission of the law is that it does not stipulate the actual way in which bookkeeping will be done by religious cult units (Greceanu-Cocoş, 2010, p. 19).

In general, religious cults are not retailers but are subject to tax law. As such, they are required, as per article 72 of the Tax Code, to be fiscally registered and receiving a unique registration code. This is attributed by the National Agency of Fiscal Administration through the representative under whose jurisdiction the respective cult unit can be found.

OMFP no. 2329/2001, published in the Official Gazette no. 20 from January 15<sup>th</sup> 2002, offered in article 1, the right to religious cult units to organize and do their accounting as simple-entry bookkeeping. This regulation was replaced on January 1<sup>st</sup> 2008 by OMEF no. 1969/2007, Annex no. 2, published in the Romanian Official Gazette no. 846 bis/2007.

Religious cult units, parishes in this case, which keep their accounting using single-entry bookkeeping, do not need, according to article 7, Annex 2 of Order no. 1969/2007, to establish an account of execution and a financial balance, but only the archpriestship and the dioceses within the Orthodox Romanian Church. Parishes will draw up every month, and will report every six month, "The report on assets and liability items", code – 14-630/d. these will be centralized separately as stipulated in Annex no. 2 of OMEF 1969/2007 (Greceanu-Cocoș, 2010, p. 44).

## 2. Internal provisions regarding the financial and accounting discipline of religious cult units and subunits within the Romanian Orthodox Church

Article 40, paragraph (1) from the Statute stipulates that the component units of the Orthodox Romanian Church, organized as a Patriarchy, are:

- a. The parish.
- b. The monastery.
- c. The archpriestship.
- d. The vicarage.
- e. The diocese (archiepiscopate and episcopate).
- f. The mitropoly.

Article 40, paragraph (2) states that associations can come into existence and organized, foundations and institutions with an economic character to sustain the social-philanthropic, social-medical, cultural-educational, and missionary activities of the Church with the blessing of the bishop and of the Permanent Diocese Council.

From the beginning, we must mention that according to article 40, paragraph (3), each of the component units of the Church, in accordance with the dispositions of the current Statute, has the right to run and administrate itself autonomously from another component of the same level, and may participate, through its elected representatives, clerical or lay, in the case of parishes and dioceses, at the proceedings of the superior component units. Also, we should mention that article 40, paragraph (4), requires that the ways in which they are constituted and they way they function, in the case of the component units and local organisms of the same level, be the same for the entire Romanian Orthodox Church.

From an economic and legal point of view, we must record the provisions of article 41, paragraph (1), which stipulates that the Patriarchy, mitropoly, archiepiscopate, episcopate, vicarage, archpriestship, monastery and parish are private legal persons of public utility, with rights and obligations stipulated in the current statute. Article 41, paragraph (2), remarks that these legal persons have the right to two unique registration codes, both for their non-profit activity, and for the economic one. It is relevant to mention the stipulations of article 42 according to which the setting up and closing of Church component units is communicated, for evidence, to the relevant central public administration unit.

An author remarks very well (Harosa, 2011, pp. 426-427) that within the Orthodox Church, according to the canonical law, the characteristic of the entire economic activity of administrating Church goods resides in the principle of leading the entire ecclesiastical administration by an executive body, i.e. the Holy Synod. The leading of the administration is done by the Holy Synod in various forms and in all phases of the activity, starting with the legislative initiative, by discussing the projects of regulations which will be debated within the

National Church Assembly, or through the obligatory guidance for the inferior organisms in the hierarchy.

At all administrative levels of the Church, financial control, as well as the control of the entire church activity, is done by church bodies and also by state bodies with the respecting of legal dispositions (Floca and Joantă, 2002, pp. 193-197).

According to article 11 of the Statute, the Holy Synod represents the highest authority in the Romanian Orthodox Church. This central deliberative body has the right to decide in all aspects of church life. For example, through the Holy Synod decision no. 4577/2011 it approves starting with January 1<sup>st</sup> 2002, the generalization and use, in all ecclesiastical entities within the Romanian Patriarchy, of the forms for double-entry bookkeeping. The documents used in church administration (Armand-Munteanu, 2003, p. 4), are the following:

- The general framework for incomes
- The general framework for expenditures
- The receipts and disbursements journal
- Journal for the evidence of incomes
- Journal for the evidence of expenditures
- Payment orders
- Double entry ledger for materials
- Inventory book
- Fixed asset records

Article 171 of the statute stipulates that all goods belonging to parishes, monasteries, archpriestships, vicarages, archiepiscopates, episcopates, mitropolies and the Patriarchy, to the associations and foundations constituted by the Church, funds designed for a church purpose, as well as the belongings of fundational churches make up the church patrimony. The regime for these goods is regulated by *The Statute for The Organization and Functioning of the Romanian Orthodox Church*, published in the Romanian Official Gazette, Part I, no. 50, on January 22<sup>nd</sup> 2008. Goods which are in the use of administrative church units have the same regime as church goods and are part of the church patrimony. The financial control of patrimony church entities desires an optimal organization of work, the strengthening of financial order and discipline in what concerns the economic-financial activity of all corporations belonging to the Romanian Orthodox Church. Decision no. 8783 from October 25<sup>th</sup> 2011 of the Holy Synod of the Romanian Orthodox Church regarding the co-responsibility of ministers and parish or monastery organisms about respecting accounting discipline is very important in this sense. The information is taken from the official site of the Romanian Patriarchy ([www.patriarhia.ro/ro/documente/hotararisfsinod](http://www.patriarhia.ro/ro/documente/hotararisfsinod), accessed in October 2012). Similarly, one should take notice of Decision no. 8578 from October 25<sup>th</sup> 2011 of the Holy Synod about the necessity to complete the provisions of article 14, paragraph (2) and article 88, paragraph (2) from the Statute for the Organizing and Functioning of the Romanian Orthodox Church, in the sense of exercising the moral and legal right of the Romanian Patriarchy, to verify through its Financial control and internal audit body the associations and foundations which function with the blessing of the Holy Synod, Patriarchy and bishops ([www.patriarhia.ro/ro/documente/hotararisfsinod](http://www.patriarhia.ro/ro/documente/hotararisfsinod), accessed in October 2012).

Religious cults are legal persons of public utility as per article 8, paragraph (1) of law 489/2007 and may undergo financial control or audit. In this sense a major role is attributed to control organisms to discover the non-respecting the legal provisions regarding the administration of financial funds and goods of cult units (Greceanu-Cocoș, 2010, pp. 276-278). Control over the incomes and expenditures of a patrimony church entity is in accordance with the Romanian Accounting Law (Accounting law no.82/1997, republished in the Official Gazette no. 454 from June 18<sup>th</sup> 2008).

As per article 34, paragraph (1), of the accounting law, “the annual financial reports of the legal persons of public interest may undergo statutory audit, which is done by statutory auditors, authorized natural or legal persons, according to current laws”.

Controlling (Ethical Code, 2011, 16) “starts from the annual financial reports, drawn up in accordance with the applicable accounting regulations, and they must offer a truthful image of the financial position and other information, according to law, about the undertaken activity”, as per article 9, paragraph (1) of the accounting law.

The ecclesiastical patrimony entity may be financially verified by its own control bodies, as well as those of the bishopric and patriarchy, but also by the control body of the State Secretariat for Cults, when the object of the inspection is the subsidies received and the justification of expenditures with salaries and investments from its own funds and from the subsidies (Greceanu-Cocoș, 2010, p. 277).

Cults which receive help from the Romanian state will keep their expenditures and incomes accounts available for the Ministry of Culture, cults and National Patrimony, which will control, through its own organisms, if the granted sums were used in accordance with their approved destination by the State Secretariat for Cults. Within the Ministry there is a body of inspection and financial control. The religious cult will have to report, on the basis of the accounting balance the expenditures related to the obtained financing. The state financial control body will check the justifying documents and their conformity to the current legal provisions. **State control must differ from that done by the religious side** (Government decision no. 22/2010, published in the Official gazette no. 17/2010), as, in accordance with the current legal provisions, the self control organized by the cults is considered insufficient (Law for public finances, no. 500/2002, published in the Official Gazette, nno.597/2002; Government decision no. 119/1999, published in the Official Gazette 430/1999 regarding public audit; Law no. 672/2002, published in the Official Gazette no. 953/12.24/2002, for public funds granted to cult units).

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# The fiscal system in Romania vs the fiscal system in the European Union member states

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**Abstract.** *Fiscal environment appears to be a factor of instability in the development of Romanian economy and that is because during the last ten years, it suffered the most important tax changes, either too quick or too slow. No matter the type, location and size of a business, the fiscal system represents a major factor in the investment decision. Thus, this paper aims to emphasize the differences between the Romanian fiscal system and those of the other states of the European Union, especially within the area of profit tax and VAT. The results show that consistent efforts were made to redesign the tax systems of the Member States in a way in which to put even more emphasis on creating new jobs and growth, but essentially, to ensure fairness.*

**Keywords:** fiscal system, taxes, contributions, competitiveness, strategy.

**JEL Classification:** H11, H21, H32, H25.

## Introduction

The diversity of the fiscal systems is due to geographic and historic conditions of country developments, but also to the influence of political decisions. Fiscal systems are very different and, for a comparison, key reference elements need to be found in order to develop an economic and financial analysis.

Thus, for a detailed analysis of taxation in the European Union Member States, these can be grouped according to the degree of taxation, into four distinct categories, according to the level of the fiscal pressure, such as: countries with a low tax rate (below 30%) - Bulgaria, Latvia, Lithuania, Romania, Slovakia and Ireland; countries with average tax rate (30-35%) - Poland, Greece, Spain, Estonia, Malta, the Czech Republic and Portugal; countries with high tax rate (between 35-40%) - Cyprus, Luxembourg, Hungary, UK, Slovenia, the Netherlands and Germany; countries with very high tax rate (40%) - Finland, Italy, Austria, France, Belgium, Sweden and Denmark.

The tax burden in the European Union, calculated as the all taxes (including social contributions) as a percentage of GDP, is relatively high compared to international standards. As a general trend, the degree of tax increases recorded until 2007 followed a gradually decrease within the next years as a consequence of the economic crisis on the national economy. But, the year of 2010 brought an increase in the level of taxation in most Member States, i.e. the level of taxation in the European Union reached 39.5%, more than a third higher than those of the US and Japan.

Within the European Union, the overall level of taxation has different values and fiscal policies are also heterogeneous. Differences between states arise depending on geographical location and the time of accession to the EU, but the causes are even more diverse. In order to harmonize, the tax systems of the Member States great changes emerged over the years, especially within the structure of the fiscal system, as a result of the changes brought to the tax base, but also due to the parallel operations of national economies.

Within the last years, the EU countries accounted for changes in tax systems in order to reduce deficits and overcome the economic crisis, amid slow recovery of the European economy.

The need to overcome the economic crisis by the euro and non-euro states lead to the adoption of certain measures and regulations embodied in the Treaty of fiscal stability entered into force on the 1<sup>st</sup> of January 2013, for the 16 countries that have achieved ratification prior to that date. From the 1<sup>st</sup> of April 2014 it has been ratified and entered into force for all 25 signatories. The Treaty on Stability or the Fiscal Stability Treaty is an intergovernmental treaty introduced as a new stricter version of the Stability and Growth Pact, signed on 2 March 2012 by all member states of the European Union (EU), except the Czech Republic, the United Kingdom, and Croatia (subsequently joining the EU in July 2013). While the entire treaty applies to ratifying Eurozone states, only Title V, automatically applies for ratifying non-Eurozone member states. However, these states can attach a declaration to their instrument of ratification stating their desire to also be bound by the treaty's fiscal provisions (Title III) and/or enhanced economic coordination provisions (Title IV).

Member states, bound by the fiscal provisions of the treaty, will face annual fines up to 0.1% of GDP, if one year after the Fiscal Treaty enters into force, they have failed to enact a domestic "implementation law" establishing a self-correcting mechanism, guided by surveillance of a governmentally independent fiscal advisory council, which shall guarantee that their national budget shall be in balance or surplus, under the treaty's definition. The treaty defines a balanced budget as a general budget deficit not exceeding 3.0% of the gross domestic product (GDP).

## 1. Legislative progress

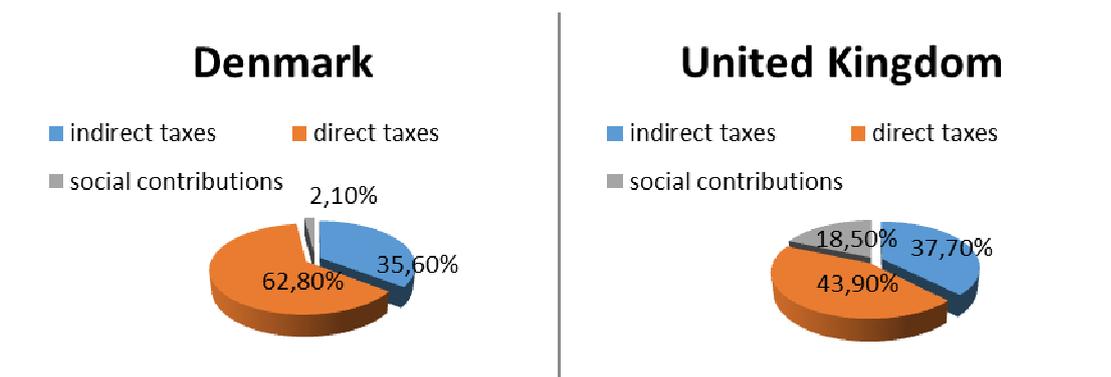
Several progresses in Romanian legislation must be mentioned: unique taxing quota and harmonization with European legislation. Clearly, as any other system, the fiscal system in our country has several deficiencies: legislative instability (which makes it impossible for businesses to establish and track a coherent strategy and a long term budget), the lack of clear procedures in fiscal administration, high number of fees and taxes, insufficient training of public employees and others.

*Functioning fiscal systems* are based on the country's obligation to meet public needs and correct some dysfunctionality in the real economy. These differ according to the nature of predominant taxes and to the intensity of the fiscal pressure, as follows:

- Considering the nature of predominant taxes:

a) **Fiscal systems with predominant direct taxes:** here are included systems instituted by the first state type of administrative-political entities, as well as contemporary systems, instituted in economically developed countries, based on net revenue taxes and business taxes (enterprises and companies). Within this category we can include the following countries: Belgium (38% of all fiscal income), Denmark (62.8% of all fiscal income), United Kingdom (43.9% of all fiscal incomes) and the Netherlands with 38.4%.

**Figure 1.** Shares for direct, indirect taxes and social contributions, for EU member countries

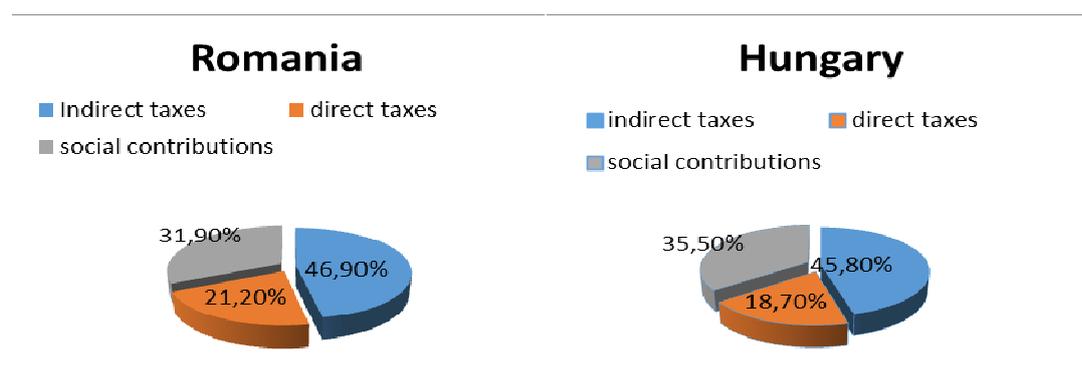


**Source:** processed by the authors based on the data from <http://ec.europa.eu/taxation>, retrieved from „Taxation trends in the European Union, Data for the EU Member States, Iceland and Norway, edition 2013, pages 178 - 186 and 194

In Denmark's case we can say that the percentage in direct taxes (62.8 %) is way above the average of the EU-27, in 2011, which was representing 38.7 %, and is below the average in social contributions, i.e. 2.10 % compared to the average of 30.9 % registered in the EU, meaning that this country's fiscal system is based on direct taxation.

In 2011, the UK had the second largest percentage of direct taxes among all the EU member states, i.e. 43.9 %. Thus, we can state that the direct taxing system is the main source for budget incomes. Indirect taxes are at 37.7 %, while social contributions are only at 18.5 %, representing the fourth smallest share registered within all EU member states after Denmark, Ireland and Malta.

b) **Fiscal systems with predominant indirect taxes:** specific to economically underdeveloped countries, or countries in recession or experiencing military conflicts; this translates to a mass diffusion of fiscal pressure on the final consumer regardless of personal circumstances. Countries with such a taxation system are: Bulgaria, Estonia, Greece, Cyprus, Latvia, Lithuania, Hungary, Malta, Austria, Poland, Portugal, Romania and Finland. Examples of countries with a fiscal system predominantly based on indirect taxes (in 2011) are represented in figure 2.

**Figure 2.** EU member states with predominant indirect taxes

**Source:** processed by the authors based on the data from <http://ec.europa.eu/taxation>, retrieved from „Taxation trends in the European Union, Data for the EU Member States, Iceland and Norway, edition 2013, pages 178-186 and 194.

Compared to the EU-27 average of 38.7%, Romania has a 46.9% share of indirect taxes in the total fiscal revenues; this makes it dependent on this system (indirect fiscal system) and puts it in the third place among the EU states, starting from 2010. The share of social contributions was 31.9% (compared to 30.9% in the UE-27 countries), while the share of direct taxes in the total revenues was only 21.2% (30.6% in the EU-27).

Hungary has a share of 45.8% indirect taxes in the total fiscal revenues; contributions are at 35.5%, most of these being paid by the employers. Direct taxes are only at 18.7%, VAT related incomes represent 8.7% of the GDP, 1.1 % above the EU-27 average.

c) **Fiscal systems based on general taxes:** with predominant direct taxing on the value of net incomes from tax payers as well on the gross turnover or value added tax – general taxes on consumption.

d) **Fiscal systems with complex predominance:** with close percentages resulting from direct and indirect taxes, specific to economically developed countries with social-democratic regimes and balanced economic and social structures.

e) **Fiscal systems with predominant particular taxes:** characterized by fixed taxes on certain categories of incomes and wealth, specific to economically underdeveloped countries.

- Considering the intensity of fiscal pressure:

a) **Heavy fiscal systems:** defined by a high percentage of fiscal absorption from the total public budget incomes (between 80% and 90%) and a high percentage in the GDP (between 25% and 30%). These systems are found in economically and socially developed countries, where public services are highly developed and intervention in real economy is reduced. Heavy fiscal systems are found in former socialist countries with high fiscal burdens on the tax payers. Here we can include Ireland – 39.4% direct taxes and 43.4% indirect taxes, Italy – 33.8% direct taxes vs. 34.7% indirect taxes, Luxembourg and Sweden - 42% indirect taxes versus 42.2 % direct taxes.

b) **Light fiscal systems:** have a low percentage of fiscal absorption in the GDP (between 10 and 15%), fiscal obligations are easily absorbed by the tax payers. These systems are found in places generally referred as “fiscal paradises”, such as: Lichtenstein and Monaco, Austria, Switzerland, Luxembourg, the Netherlands, Panama, Singapore, Hong Kong, Liberia, Bermuda Islands, Bahamas and Cayman Islands, Costa Rica, Andorra and so on. Economically underdeveloped or emerging countries have this type of system.

## 2. Profit Tax

For a long term strategy plan to ensure efficient management of day to day business, a simple, stable and transparent fiscal system is required. In difficult times, decision factors should intervene to help the business/entrepreneurial area out of a crisis, by lifting the fiscal burden off their shoulders.

Thus, EU efforts have focused on tax reforms to boost competitiveness by reducing the corporate tax rate or by encouraging tax measures to foster research, investment and entrepreneurship.

The quotas used for profit tax in the EU-27 countries and different particularities reached within each state are presented in Table 1.

**Table 1.** Profit tax in EU member states

No.	Country	Standard quota (%)	Particularities
1	AUSTRIA	25	Depreciation rate for buildings is 2%; losses in the starting period can be recovered at 75% of the taxable profit, but the carry over period is uncertain.
2	BELGIUM	33.99	This includes the crisis quota of 3%. Small and average size business with incomes less than 322.500 EUR get tax exemptions: 24.9% for incomes up to 25.000 EUR, 31.93% for incomes between 25.000 and 90.000 EUR and 35.54% for incomes between e 90.000 and 322.500 EUR, all including the 3% crisis quota.
3	BULGARIA	10	Companies involved in area with an unemployment rate higher than 35% are exempted from tax. Losses are recovered in 5 years and redemption for initial investment, computers and software is 50%.
4	CYPRUS	10	Companies can report the loss for 5 year, but they cannot deduce it form the taxable profit. For registered companies a 350 EUR yearly tax is collected.
5	CZECH REPUBLIC	19	Interests, dividends and copyright revenues are taxed at 15% for residents and non-residents, companies or individuals.
6	DENMARK	25	Local authorities get a share of incomes resulted from the profit tax. Depreciation of buildings used for business (not offices) is done linearly over 20 years. For buildings, the depreciation rate is 4 % over an extended period of 25 years.
7	ESTONIA	21	Tax is applied on gifts, donations, personal expenses and supplementary wage advantages for resident companies and permanent business locations registered in Estonia.
8	FINLAND	24,5	Yearly depreciation rates are at 25% for cars and equipment, and between 4% and 7% for buildings; expense depreciation for acquiring non corporate buildings is done linearly over 10 years. Losses are reported over 10 years, but are not deducted from the taxable revenue.
9	FRANCE	34,43	Large companies with turnovers higher than 7,630,000 EUR and taxable profit of over 2,289,000 EUR, pay supplementary profit tax of 3.3% for taxes over 763,000 EUR. Companies with turnovers higher than 250 mil. EUR pay supplementary profit tax of 5% (from the 31 <sup>st</sup> of December 2011 to the 30 <sup>th</sup> of December 2015).
10	GERMANY	15,83	A solidarity tax of 5.5% is applied and any commercial business performed in Germany is commercially taxed. With the local commercial tax the general quota is about 30%. At the source, a tax of 25% is taken for interest payments, dividends and most forms of capital gain.
11	GREECE	26	Dividend tax and capitalized income tax is 10%. Companies with simple entry bookkeeping pay a profit tax of 26% for taxable incomes smaller than 50,000 EUR and 33% for incomes above this threshold. A 3% tax is applied for real estate properties, but not more than the profit tax.
12	HUNGARY	19	If the profit tax base is smaller than 500,000 HUF (1.78 mil. EUR), a quota of 10% is applied.
13	IRELAND	12,5	A 12.5% quota is applied for incomes in trading activities and for other types of incomes a 25 % quota. Incomes form land sales are taxed at 35 % and dividends at 20 %.
14	ITALY	27,5	There are special conditions for investment companies, pension funds and nonfunctional companies. Resident companies are taxed on profits obtained anywhere in the world and non-resident companies are taxed for profits obtained only in Italy. Losses can be carried over infinitely and can be deduced up to 80% of the taxable revenues.
15	LATVIA	15	Dividends are exempted from tax if they are received from local or EEA countries, or if they are received from other countries, if the receiving Latvian company owns more than 25 % of the social capital; all other dividends are taxed at 10 % or 5%, if paid through a bank.
16	LITHUANIA	15	Companies are taxed at 5% if they have less than 10 employees and the taxable income is no greater than 290,000 EUR. Losses are carried over for 5 years.

No.	Country	Standard quota (%)	Particularities
17	LUXEMBOURG	21	7% work force occupation solidarity tax and municipal tax brings the profit tax quota to 29.22%.
18	MALTA	35	SMEs (up to 10 employees) get a 40% tax discount for investments in technology or creation of new jobs.
19	NETHERLANDS	25	For profits up to 200,000 EUR the profit tax quota is 20%. Special conditions for Research and Development companies.
20	POLAND	19	-
21	PORTUGAL	25	For incomes between 1.5 and 7.5 mil. EUR a supplementary tax of 3 % is added and 5 % for incomes higher than 7.5 mil. EUR. Local institutions can charge a tax of 1.5 % of the taxable profits.
22	ROMANIA	16	A Romanian legal body that distributes/pays dividends to another Romanian legal body is obliged to retain, declare and pay dividend tax by applying a 16 % quota on the gross dividend distributed/paid to a Romanian legal body. Capital earnings are subjected to tax profit regulations.
23	SLOVAKIA	23	Distributed profits are not taxed.
24	SLOVENIA	17	0% tax for investment funds, pension funds, insurance companies for pension plans, joint venture companies.
25	SPAIN	30	A 35% quota for companies involved in exploration, research and oil extraction. The turnover for small and middle enterprises is 10 mil. EUR/year, with a quota of 25% for a taxation level of less than 300.000 EUR.
26	SWEDEN	26,3	Paid dividends are nondeductible for taxable profit calculations; losses are deductible and can be continuously carried over.
27	UNITED KINGDOM	23 or 20	There is a main tax rate and a small profit tax rate. The first was dropped to 23% starting from 2013 and is applicable for profits greater than 300.000 EUR, and the second is applied to companies with profits less than 300.000 de euro.

**Source:** processed and adapted by the authors, using data from <http://ec.europa.eu/taxation> - Taxation trends in the European Union, Data for the EU Member States, Iceland and Norway

The smallest tax quota is 10% in Bulgaria and Cyprus, followed by 15% in Germany, Latvia and Lithuania and then Romania with a quota of 16%. The highest values are registered in Malta with 35%, France with 34.43% and Belgium with 33.99%.

Romania has a 16% quota, Hungary 19%, Greece 26%, Denmark 25%, France 34.43% and Germany 15%; it can be stated that Germany has a good business environment with employees taking most of the fiscal burden.

*1<sup>st</sup> Scenario:* Assuming a company producing common consumption goods, provides consulting services and practices double entry bookkeeping, has at the end of 2012 a taxable profit of 500,000 euro. How much will this company pay for tax profit in the analyzed countries and how much will be left as net profit?

Country	Tax quota	Particularities	Tax profit value (euro)	Remaining net profit (euro)
Romania	16%	Does not apply.	80,000	420,000
Bulgaria	10%	If the company activates in an area with an unemployment ratio of more than 35%, then it will not pay the profit tax.	50,000	450,000
Denmark	25%	-	125,000	375,000
France	34,43%	Only companies with a turnover higher than 7,630,000 euro and a taxable profit of 2,289,000 euro pay a supplementary tax of 3.3%. Not applied at this point.	172,150	327,850
Germany	15,83%	Plus a 5.5% solidarity tax.	79,150 + Solidarity tax 27,500 Total = 106,650	393,350
Greece	26%	Does not apply.	130,000	370,000
Hungary	19%	The taxing base is smaller than 1.78 mil. euro, the applied quota is of 10%.	50,000	450,000

Considering tax profit, the most expensive country is France where the net profit remaining for the company is 327,850 EUR, and among the “cheapest” are Bulgaria and Hungary (for the current example).

### 3. Value Added Tax

Current VAT quotas among EU member states are those presented in Table 2.

**Table 2.** VAT quotas in the EU member states

Country	Quota (%)	Reduced quota (%)	Super reduced quota	Who does it apply to
Romania	24	9 or 5	-	A quota of 9% is applied for medicines, access for museums, castles and historical monuments, fares, botanic gardens and zoo's, exhibitions and cultural events, movie theaters while a 5 % quota is applied on the taxing base for house sells in certain conditions.
Hungary	27	5 or 18	-	18% quota for milk and dairy products, bread and bread products, accommodation and heating services. There is a 5 % quota more medicines, newspapers and books.
Bulgaria	20	9	-	
Greece	23	6,5 or 13	-	13% quota for goods such as: fresh products, pharmaceuticals, electrical energy, passenger transportation, services provided by doctors and dentists. A reduced quota of 6.5% is applied for hotel services, newspapers, magazines, books, medicines and human vaccines.
Denmark	25	-	-	Newspapers are not taxed.
France	19,6	5,5 or 7	2,1	The 5.5% quota is applied for basic goods and 7 % is applied for real estate, accommodation services and restaurants. For newspapers, theatre and medicines a 2.1 5 quota is applied.
Germany	19	7	-	The reduced quota is applied for food products, public transportation, books, hotels and guest houses. VAT exemptions for rental and medical services.

**Source:** processed and adapted by the authors, using data from <http://ec.europa.eu/taxation> - Taxation trends in the European Union, Data for the EU Member States, Iceland and Norway

*2<sup>nd</sup> Scenario:* assuming we want to buy a computer worth 500 EUR, VAT excluded. What is the value of the VAT and what do we end up paying for the budget of each of the countries considered for a good that has the same VAT excluded price.

-euro-

Country	VAT Quota	VAT Value	Price paid by the end consumer
Romania	24%	120	620
Hungary	27%	135	635
Bulgaria	20%	100	600
Greece	23%	115	615
Denmark	25%	125	625
France	19,6%	98	598
Germany	19%	95	595

For the same computer the end user could pay at least 595 EUR (in Germany) or 636 EUR at most (in Hungary). Romania holds the fifth place in this example (the consumer pays 620 EUR). Considering the EU-27 member states, the highest VAT quota is registered in Hungary (27%) followed by Demark (25%), and the smallest quota of 15% is in Luxembourg.

*3<sup>rd</sup> Scenario:* Assuming we are going on a vacation in the analyzed countries. A hotel room is about 100 EUR/night, VAT excluded. We are faced with a situation in which the husband/wife catches an autoimmune virus on the plane and a box of autoimmune medicines is 15 EUR, VAT excluded (we consider no price difference for goods and services, only the taxation level differs).

Country	VAT accommo- dation quota	VAT accommo- dation value	Cost of accommodation	VAT quota for medicines	VAT value for medicines	How much does the medicine cost
Romania	9%	9	109	9%	1,35	16,35
Hungary	18%	18	118	5%	0,75	15,75
Bulgaria	9%	9	109	9%	1,35	16,35
Greece	6,5%	6,5	106,5	6,5%	0,97	15,97
Denmark	25%	25	125	25%	3,75	18,75
France	7%	7	107	2,1%	0,31	15,31
Germany	7%	7	107	7%	1,05	16,05

Considering the VAT for accommodation in the analyzed countries, the smallest taxes are perceived in France and Germany; this probably contributes to tourism development in these countries. At the other end of the scale Hungary has the highest quota (18%) for EU-27; while in France or Germany one night of accommodation will set us back 107 EUR, in Hungary the same room will cost 118 EUR.

As for the VAT for medicines, except Denmark, Romania has the highest quota off all countries considered in this study. If the medicine costs 15.31 EUR in France, the same medicine will cost 16.35 EUR in Romania.

#### 4. Conclusions

Form the conducted study we can conclude that the country that has drawn up the most fiscal revenues (taxes and fees including mandatory social contributions) for the state budget is Germany with a total of 1,002,620 mil. EUR collected in 2011. Also in the top five, right after Germany, we find France with 876,343 mil. EUR collected from fiscal revenues, Italy (671,489 mil. EUR), United Kingdom (631,521 mil. EUR) and Spain with 334,016 mil. EUR. Malta, a state known as a fiscal paradise is at the opposite pole with only 2,139 mil. EUR collected from taxes in 2011. Romania occupies the 17<sup>th</sup> position out of the 27 EU member states, with a fiscal income of 37,055 mil. EUR. Hungary follows closely with 36,931 mil. EUR, and Bulgaria holds the 22<sup>nd</sup> place, with 10,484 mil. EUR collected in 2011 from taxes and fees.

Considering the profit tax, the most favorable countries in the EU-27 area are: Bulgaria (with a 10 % quota and eventual exemptions), Cyprus (10%), Ireland (12.5% for incomes obtained from trade), while the least favorable are: France (34.43% or more), Belgium (33.99% and exemptions for SMEs), Italy (27.5%), the Netherlands and Portugal with a quota of 25% applied on taxable profits.

There are countries with predominant direct taxes, such as Denmark, United Kingdom and Belgium, countries that are socially, economically and culturally developed with significantly higher wages compared to Romania and with prices to match. There are also strongly developing countries with a fiscal system based on indirect taxing: Romania, Bulgaria, Greece, Hungary, Portugal and Finland, to mention just a few. Besides these countries, there are some other with fiscal systems based on general taxes, with complex predominance of particular taxes. There are also heavy fiscal systems such as those in Ireland, Italy, Luxembourg and Sweden and so called light systems, also known as fiscal paradises, such as Monaco, Switzerland, Isle of Man, Cyprus, Singapore and Honk Kong, where taxes are either insignificant or inexistent. These are the fiscal systems chosen by those that want to avoid taxation in their origin countries. Such operations can be done through fictitious companies or offshores; it can be said that countries with fiscal paradises have a solid legislation, infrastructure and some of them are preferred holiday destinations for actor and business men.

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# Features of the German taxation system

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**Abstract.** *The taxation system in Germany has a long tradition and many particularities for various reasons. The paper addresses the features of three taxes: business tax (Gewerbesteuer), solidarity surcharge (Solidarit tszuschlag) and church tax (Kirchensteuer).*

**Keywords:** business tax, solidarity surcharge, church tax, tariff area, Zerlegung.

**JEL Classification:** H29.

Germany became a unitary state in the second half of the 19<sup>th</sup> century following the gradual unification of a variety of states of different areas, each with its own traditions and taxation-related characteristics. In 1871, when Germany formally became a unitary state, over 240 different taxes and duties were being levied. They were gradually harmonised up to early 20<sup>th</sup> century. The interwar and the immediate post-war periods witnessed the taxation system reorganisation and the reduction of the number of duties. After the German reunification in 1990, the taxation system underwent uniformisation.

Similar to other federal states, the right to set and collect taxes was exercised at three levels: the federal government (*Bund*), the provinces (*Länder*) and the local collectivities (*Gemeinden*). There were state-owned taxes (involving a single fiscal creditor) and community taxes (involving several fiscal creditors). The taxes levied at central level covered customs duties and monopoly duties, while the local consumption taxes were applied at the province level.

Most taxes, however, were levied in variable percents at two or three levels. Therefore, the income tax (*Einkommensteuer*) was levied as follows: 42.5% by the federal government, 42.5% at the province level and 15% at the local collectivities level. The capital yields tax (*Zinsabschlag*) was collected by the federal government at a rate of 44%, the same percentage of 44% was applied at the province level, while 12% was the value levied at the local communities level. The value added tax (*Umsatzsteuer*) was applied as follows: 51.41% by the federal government, 46.52% at the province level and 2.07% at the local collectivities level.

The tax authorities are hierarchically structured by four levels. The *ultimate authority* in the field at central level is the Federal Ministry of Finance (*Bundesministerium der Finanzen*), the provinces also have a Ministry of Finance (*Landesministerium der Finanzen*), while the financial senators (*Finanzsenatoren*) govern the *Land*-cities. The *higher authorities* are the Federal Authority for Finance (*Bundesamt für Finanzen*) and the State Monopoly Administration (at central level) and the data processing centres at the province level. The *Intermediate authorities* are the financial divisions operating at the level of the provinces. The *local authorities* are the Customs Offices and Tax Offices (*Finanzamt*), operating in cities and large towns and the Revenue Offices (*Steueramt*), operating in small towns and in villages.

Most taxpayers pay their taxes and duties directly at the tax offices. We will further address the organisational and staff structure of tax offices.

A tax office is run by a Chief (*Vorsteher*), who may hold the title of governmental director or coordinating director (*leitender Regierungsrat*). It is structured on 6 to 8 departments (*Sachgebiete*), each of them in charge with a field. For instance, Department I covers the general administration, human resources and secretariat areas, Department II is in charge with the wage tax and enforcement areas. A department is run by a Head of department (*Sachgebietsleiter*), who may hold the title of government advisor (*Regierungsrat*), tax advisor (*Steuerrat*) or senior tax inspector (*Steueroberinspektor*). Each department is divided into divisions (*Arbeitsgebiete*). For example, Department I may consist of 2 divisions: (1) General Administration and Secretariat and (2) Human resources. Department II may cover 3 divisions: (1) wage tax (letters from A to L), (2) wage tax (letters from M to Z) and enforcement. A division is run by a Head of division (*Sachbearbeiter*), called senior tax inspector or tax inspector (*Steuerinspektor*).

Further on, we will address three taxes currently levied in Germany: business tax, solidarity surcharge and church tax.

Business tax (*Gewerbesteuer*) is one of the oldest taxes in Germany, going back to the Middle Ages. It belongs to the real taxes and is levied on the income resulted from handicraft and industrial activities. The implementation of this tax is grounded on the equality principle,

according to which the losses and the inconveniences suffered by the local communities (for example, river water and air pollution) following the negative effects resulted from the operation of handicraft shops and later of the extractive industry plants, should be compensated for. Currently, this principle is not acceptable, for a direct relationship between the entrepreneur's tax performance and the local community's counter-performance cannot be established, the inland receipts being subject to depersonalization.

In the Middle Ages, business tax was implemented in other European states as well, given that the income tax was not applicable. In the Romanian Principalities, a similar tax was levied on the income derived from salt mines exploitation. However, even after the implementation of the income tax, business tax (or other related taxes) was maintained in various countries. For instance, in Romania it was levied between 1934 and 1937, being applied in case of environment polluting enterprises.

In Germany, business tax is applied on the income resulted from the activity of two types of enterprises. On the one hand, there are the enterprises with permanent location (*stehende*), the Headquarters, branches, shops or factories, retail stores or acquisition offices of which are located on the commune's territory. If the enterprise consists of several units, their income is cumulated. On the other hand, there are the enterprises with no permanent location (*Reise-*). Pursuant to the effective German laws, business tax is levied on the income obtained by both partnerships (*Personengesellscaften*) and companies with share capital (*Kapitalgesellschaften*) and cooperatives (*Genossenschaften*). The tax base is the income derived from handicraft and industrial activities (*Gewerbeertrag*), determined, as appropriate, as income of natural persons (for individual entrepreneurs and for partnerships) or as profit (for companies with share capital).

The fiscal debtor is the individual entrepreneur, the partnership, the company with share capital or the cooperative, as appropriate. The local collectivities are the beneficiary. Once determined, the income derived from handicraft and industrial activities is rounded down to a multiple of €50. The value thus obtained is deducted only in case of individual entrepreneurs and partnerships. No deduction (*Freibetrag*) is performed in case of companies with share capital.

For individual entrepreneurs and partnerships, the income tax is levied based on the bracket system. Therefore, the first €12,000 are taxed by 1%, the next €12,000 are taxed by 2%, going further to 3% and 4% rates. For larger amounts of money, a tax rate of 5% applies. For companies with share capital, the 5% flat income tax applies. This way the value of business tax is considerably higher for companies with share capital, equal to the tax levied on the income derived from industrial activities.

Based on the industrial activities tax statements, the tax office sets the due amount. In case the economic entity has several offices in various localities, the tax is subject to division (*Zerlegung*) according to the contribution in each such locality.

Solidarity surcharge (*Solidaritätszuschlag*) was implemented in June 1993 as an additional tax to the income tax and capital yields tax. It had never been applied in Germany before. The implementation of such a surcharge was grounded on the huge expenses imposed by a unitary social and economic development of the entire German territory, following the 1990 reunification.

Solidarity surcharge was levied differentially according to three tariff areas.

In Tariff Area 1, also called the zero tariff area, covering income up to €972 (€1,944 for married couples), solidarity surcharge does not apply. The tax-exemption threshold is periodically reviewed depending on the population's income fluctuation.

In Tariff Area 2, also called intermediary area, the solidarity surcharge rate increases progressively to a value of 20%; it applies on the difference between the tax-exemption threshold and a reduced tax base and covers below average income.

In the regular tariff area which covers most of the income of natural and legal persons in Germany, the solidarity surcharge rate reaches 5.5% when the annual income tax exceeds € 1,340.69 (€2,681.38 for married couples).

Solidarity surcharge does not belong to the deductible expenses category. It leads to a tax rate increase by 1.1%.

Church tax (*Kirchensteuer*) is levied by the legally-established religious communities (Roman Catholics, Protestants, the Orthodox, Moslems, Muslims and the like). The legal basis for this practice is the German Constitution of 1949. Confessional communities may collect the church tax in two ways, as follows:

If they choose to require the state tax authorities to collect the fees, the members of such confessional communities are to be entered on a tax document (*Lohnsteuerkarte*). The employer has to withhold church tax prepayments from the income of the employee in addition to other tax prepayments. In connection with the final annual income tax assessment, the state revenue authorities finally assess the church tax owed.

If they collect the fees themselves, the members of the religious communities require the tax authorities to reveal the taxation-related data of their members in order to calculate the contributions and the prepayments.

This tax is applied at the province level. The fiscal creditors (*Steuergläubiger*) are the places of worship in the provinces (e.g. the episcopates and the like), while the taxpayers are the people attending such places of worship.

The tax base is the taxpayers' taxable income. It is in fact a fictitious taxable income, calculated especially for the establishment of the church tax. The tax rate is 8-9% of the taxable income depending on the province. For example, a single person earning €30,000 may pay an average income tax of 14%, resulting in €4,200. The church tax is then an additional 8% or 9% of that €4,200.

Lately, in some regions, a maximum 3-4% rate has been applied. Such a tax is levied on the payments in advance made by the taxpayers during the year. Regularisation is performed at the end of the year.

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# The analysis of the evolution of fiscal pressure in correlation with the budget deficit in EU

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**Abstract.** *The paper presents the European tax system referring to the evolution of fiscal pressure in two different periods of time. In the first part, we present general directives of European Union regarding fiscal policies applied in the member states, highlighting the general European priorities. In the second part, we analyze the evolution of tax revenues in EU countries and we correlate them with the rate of budget deficit. We chose the first period of time (2008-2010) to observe how the crisis influenced the analyzed indicators and then we compared the situation with the second period (2011-2013), when European Commission started to send signals in order to recover fiscal stability. In the last part, we presented the main requirements of the European Commission for 2015 and we emphasized the conclusions obtained with this paper.*

**Keywords:** taxation, fiscal pressure, budget deficit, public expenditure, fiscal policy.

**JEL Classification:** H25, H61, H68.

## 1. European taxation and fiscal conditions

In the last three decades, the fiscal environment had changed dramatically. Globalisation and digitalization increased mobility of the tax base and multinational companies had begun to play a decisive role in international business development. In response to these pressures, governments adopted various tax reforms adapted to each country's economy. These reforms had targeted tax cuts and fiscal revenues based on indirect taxes. At the same time, many governments around the world and even in the European Union included the increased tax revenues as a tool in achieving an important macroeconomic goal: reducing the budget deficit (Owens, 2013). The data provided in the midst of a strong tax competition, finding a balance is needed.

In order to achieve this balance, the European Commission established a set of priorities for EU Member States, communicating an annual growth survey. This survey is published at the end of the year (usually in November), before the countries are finalizing the state budget, it is applied the following year and it includes economic objectives and priorities to be pursued by Member States during the year and evaluated at the end.

From tax perspective in the last two years (2013 and 2014), 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 (European Commission, 2014). In this sense, the priorities of the European Commission submitted in 2012 or 2013 were:

- Shift taxation away from labour in countries where is particularly high and limits job creation.
- Increased tax revenues by broadening the tax base, rather than raising taxes or introducing new ones.
- Reform real estate and housing taxation to prevent the recurrence of financial risks in the housing sector.
- Reducing corporate tax debt bias (European Commission, 2013).

Based on these objectives, the European Commission monitors and evaluates fiscal policies applied in Member States.

In this regard, in 2012, 11 countries of the European Union (Austria, Belgium, Czech Republic, Germany, Estonia, Spain, France, Hungary, Italy, Latvia and Slovakia) received a statement referring to shifting taxation away from the labour or reducing the labour tax burden on specific groups; not to destabilize suddenly the tax revenues, European Commission has provided an alternative possibility of increasing indirect taxes. In early 2013, the European Commission noted that indeed those states increased indirect taxes, but without diminishing any other tax. The recommendations were retained for 2013, excluding Estonia and Spain.

Consequently, in 2013, in Germany, Belgium, Italy and France decreased labour tax burden, the measures taken being appreciated by the European Commission. The same thing happened in Latvia and Hungary, but European officials considered that the taxes are still too high. Moreover, Hungary, after this reduction, increased income tax rate, which does not lead to a healthy economic growth. The remaining states – Austria, Czech Republic and Slovakia-not only that they did not decreased taxation, but they even increased them. This led to the preservation of this recommendation in 2014 also (Garnier et al., 2013).

In terms of broadening the tax base, were considered two issues: the extension of the standard VAT applied by dropping in some cases the application of reduced VAT rate and increase revenues from income taxes through non-deductibility of certain expenses. Broadening the tax base for value added tax was adopted in 2013 by five Member States: Belgium, Luxembourg,

Spain, Latvia and Poland. For example, in Spain, the rate of VAT applicable in tourism or cultural activities is not a reduced one, but the standard is applied. Regarding the deductibility, most states did not change; moreover, in business taxes were down, in order to be competitive for European companies.

The recommendation to reduce the benefits from accessing certain debts by companies came with the spread of a tax system that favours the debt financing, and not from its own sources. In this regard, most states allow deduction of interest expenses generated by borrowing, which eventually lead to the reduction of income tax. To combat this, Member States such as Spain, Malta, France, Portugal, Finland and Sweden had restricted the deductibility of interest expenses by setting a maximum threshold (e.g. in France and Portugal, the deduction of interest expenses is limited to 3 million Euro) or completely eliminated it.

Reform real estate and housing taxation is a very important issue, especially in this post-crisis period. In the Commission's view, this system must be modified because in most Member States the buildings had not been revalued, leading to an outdated tax assessment. For example, in Romania, the real estate market values should have been would increased by about 16% in 2013-2014. There are also countries like the Czech Republic, which in 2013 increased the fees for real estate transactions (European Commission, 2013).

Analyzing the behaviour of Member States in terms of tax, we can say that there has been progress in implementing tax policies with the introduction of these priorities and objectives of the European Commission, but implementation of these recommendations should be followed and even further developed in order to achieve the main goal: the creation of a single market, with similar objectives and practices.

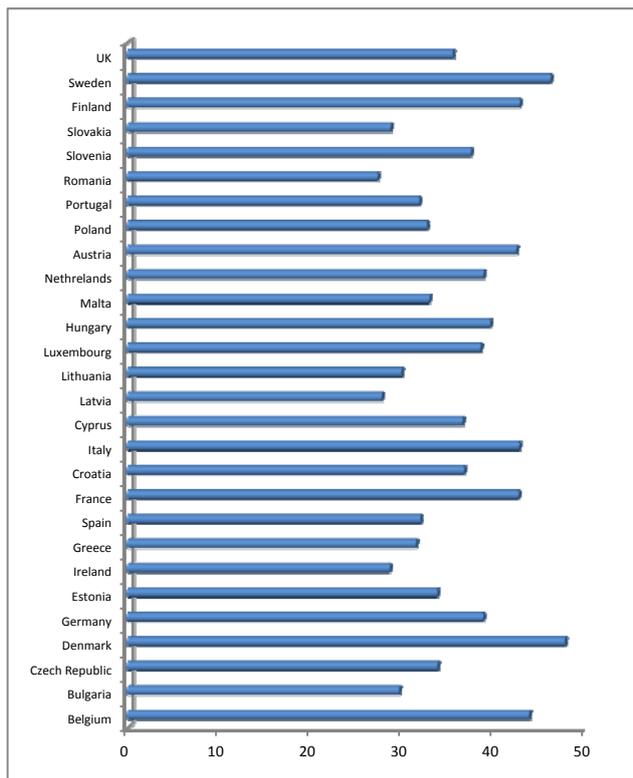
## 2. Fiscal pressure and budget deficit

European Union and the euro area expanded gradually and the progress of the macroeconomic harmonization process was obvious in the last decade. However, significant differences are remarkable between monetary and fiscal policy of the European countries: while the European Central Bank keeps control in monetary policies adopted in euro area countries, fiscal policies are still controlled by national authorities (Rozmahel et al., 2014).

Just because Member States are free to decide their own tax system, there was the need to compare the systems in EU Member States. One of the indicators by which this comparison is made is the tax burden or fiscal effort, regarded as a reflection of the tax return or as a way of redistributing value by reflection from the economy. Of course, the tax burden can be defined in the economy, at sectoral level or at the level of taxpayer – individuals or legal entities (Vacarel, 2006). Fiscal pressure is on the other side the expression of tax competition, often used as a measure for attracting new multinational companies (Vintila, Tibulca, 2012).

The period 2008-2010 was a period of economic and financial changes in the European Union. At the tax level, this statement is argued by the alarming increase of the medium primary budget deficit up to 7% and public debt up to 80% of GDP. Relating to the percentages specified in European politics (a maximum budget deficit of 3% of GDP and public debt exceeding 60% of GDP), the evolution of these indicators was unfavourable for the European economy (Wielechowsky, 2011). In this situation, the European Commission publishes its first Annual Growth Survey in 2011.

**Figure 1.** The average of the fiscal pressure in EU in 2008-2010 period

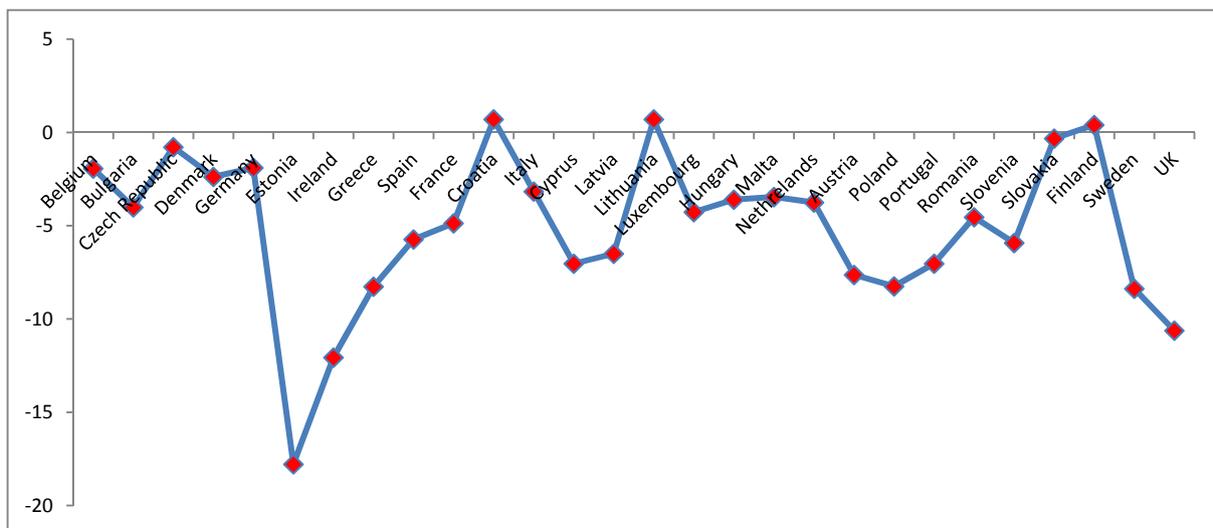


To analyze the behaviour of the Member States during the economic crisis and during its subsequent, from 2011, when the European Commission publishes its first annual growth survey, we plotted the average fiscal pressure in 2008-2010, in the EU Member States, which we then compared with the evolution of the same indicator in 2011-2012. In Figure 1, we can see that in the analyzed period, the highest "tax burden" is registered in Denmark and Sweden, where it is close to 50% of GDP. Also, countries such as Finland, Italy, France and Belgium have an average fiscal pressure over 40% of GDP. The opposite position is occupied by Romania, with an average of 27.23% of GDP, followed by Latvia, Slovakia, Lithuania, Ireland and Bulgaria, all hovering below 30% of GDP.

**Source:** Own calculation, Eurostat Data.

In 2008-2010 period, the fiscal pressure level had influenced the values of the European budget deficits. Considering the economic crisis, the problems of public debt and budget deficit became difficult to be solved for both 'old' EU countries such as Italy, France, UK, Portugal and Greece, and the Eastern European states that joined the EU later (Romania, Bulgaria and Hungary) (Dinca, Dinca, 2010). In Figure 2, is plotted the average of the primary budget deficit/ surplus in the European countries in 2008-2010 period.

**Figure 2.** The average of the primary budget deficit/surplus (%GDP) in EU in 2008-2010 period



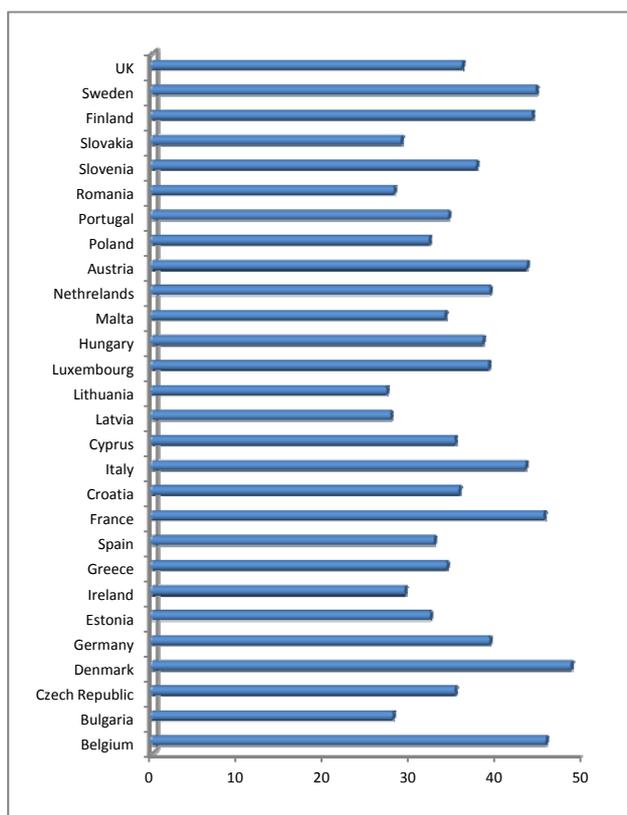
**Source:** Own calculation, Eurostat Data.

As you can see from the graphic representation, very few European countries have managed to meet the 3% of GDP limit, namely: Belgium, Czech Republic, Denmark, Croatia, Lithuania, Slovakia, Germany and Finland. Three of these countries had recorded in the analyzed period also the largest average tax burden in the European Union. In contrast, with

the highest average budget deficit is Estonia and Ireland (-17.7% of GDP, respectively 12% of GDP). Besides the crisis felt in all Member States, an explanation of these may be the fiscal policies. For example, Ireland's economy was strongly affected starting with 2007 because the forecasts of economic growth and tax revenues were dependent on real estate transactions and construction domain, the hardest hit during the recession (Beker, 2014). Also, countries with developed economies and stable fiscal policies have managed to record budget deficits during this period from 5% to 10% of GDP (e.g. UK, Sweden, Spain, Austria etc). With the exception of Sweden, all the Member States mentioned recorded an average fiscal pressure between 30-40% of GDP. The upward trend of the budget deficit was attributed to economic crisis which started in late 2007 - early 2008 and to bad management of fiscal system: large budgetary expenditure or small revenue collected.

In this situation, the European Commission began in 2011 to establish clear priorities and objectives in order to improve fiscal indicators: the budget deficit, fiscal pressure, public debt, etc. To analyze the effects of these priorities but also how much they were respected, in Figure 3, is represented the average fiscal pressure in 2011-2013 in European Union Member States. Compared with the previous period analyzed (2008-2010), in the next three years, most states saw increases of the tax burden as a percentage of GDP. Most of these increases were registered in the indirect taxes category (mainly VAT).

**Figure 3.** *The average fiscal pressure in EU in 2011-2013 period*



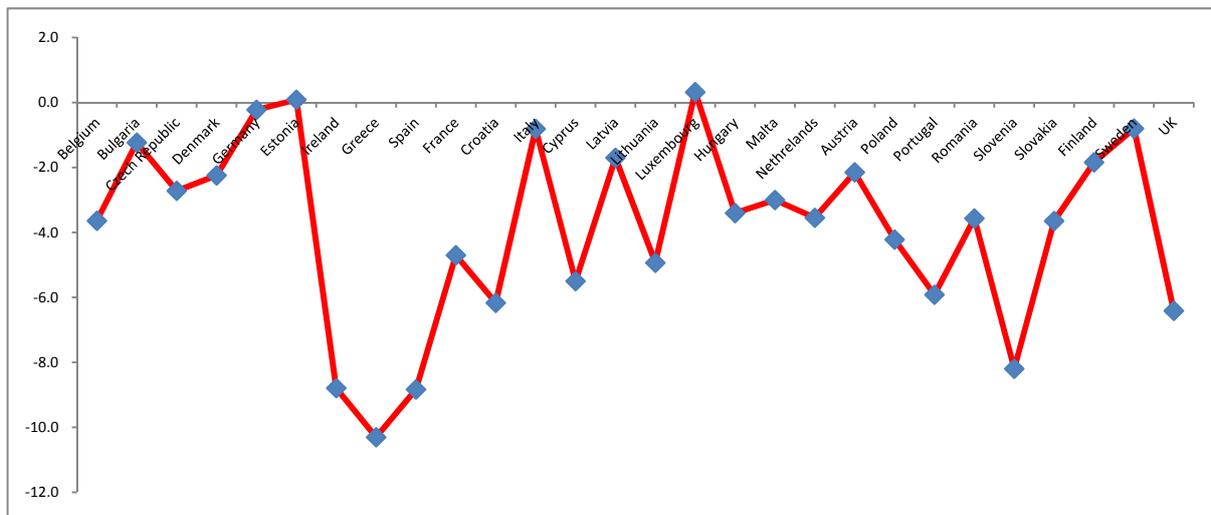
In terms of ranking, we don't have significant changes; the highest average tax burden is found in Denmark, Sweden, Finland, Belgium. The lowest average tax revenue it was registered in Lithuania (27.12%), Latvia, Bulgaria, Ireland, Romania and Slovakia. The first three countries mentioned, even decreased the tax revenues comparing to 2008-2010 period. It is worth mentioning that Lithuania, Latvia, Ireland and Bulgaria had not increased the standard VAT rates in 2011-2013. Romania increased the standard VAT rate in mid-2010, which led to an increase in tax burden. Bulgaria has increased by 2 percent the reduced VAT rate in April 2011, but did not had so much impact in raising the tax revenues (European Commission, 2014).

**Source:** Own calculation, Eurostat data.

The tax revenues increase in the period 2011-2013, had led to the start of balancing the primary budget deficit. In Figure 4 it can be seen that several states had begun to get close to the 3% of GDP limit. There are spectacular developments in this regard such as Estonia, which in 2008-2010 recorded an average of the primary budget deficit of about 17%, and two years later a surplus of 0.01% of GDP. In a similar situation are also Italy and Luxemburg who had in the previous period a primary deficit of 3.16% and 4.26% of GDP and in the

current surpluses. Also, countries such as Austria, Bulgaria and Sweden had an average of the primary deficit below 3% during the three years analyzed.

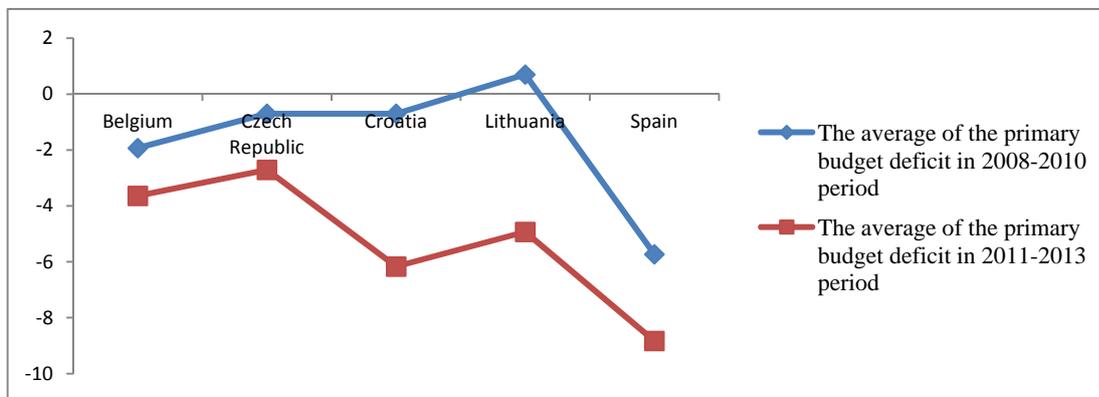
**Figure 4.** *The average of the primary budget deficit/surplus (%GDP) in EU in 2011-2013 period*



**Source:** Own calculation, Eurostat data.

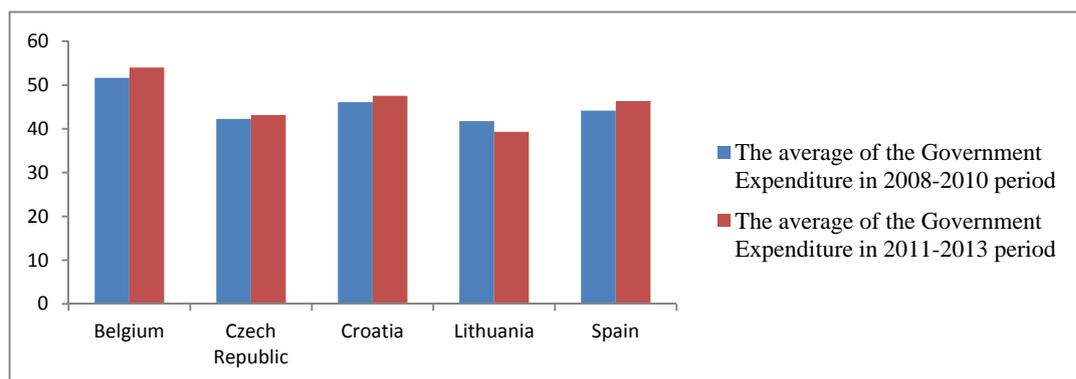
There are also states that could not keep control on the budget deficit. In this situation are mentioned Lithuania, Croatia, Spain, Czech Republic and Belgium. These European Union Member States not only failed to reduce the primary budget deficit, but they saw strong and visible increases, as can be seen in the figure below.

**Figure 5.** *The average of the primary budget deficit (%GDP) compared*



**Source:** Own calculation, Eurostat data.

For Lithuania and Croatia a first explanation is the declining tax revenue in the period 2011-2013 compared to the previous period with 9,17%, respectively with 3%. Another factor that increased the primary budget deficit in the mentioned states, is the expenditure level. Public expenses occur as a result of the state exercising its role of public authority and economic agent and it influences budget deficit and public debt (Paun, Brezeanu, 2013). As shown in the chart below, Spain, Belgium and the Czech Republic saw increases of spending. Of course, in these three states, tax revenues have also registered growth, but not significant, resulting a higher budget deficit.

**Figure 6.** *The average of the Government Expenditure (%GDP) compared*

**Source:** Own calculation, Eurostat data.

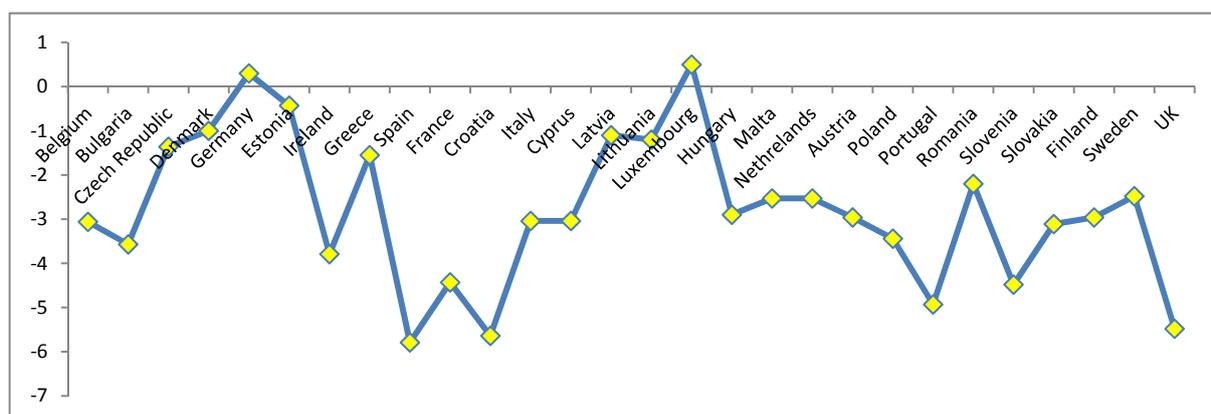
### 3. Predictions and forecasts

After a strong economic crisis and after 5 years when the financial environment had suffered, the European Commission noted since the second quarter of 2013 results of economic growth. Although these results were shy, their growth and strengthening were predicted and prioritized ahead.

In order to better monitor the behavior of the Member States and to coordinate fiscal policies, the European Commission asked for the first time in 2013 for Euro area countries, except those implementing a macroeconomic adjustment programme, submission of the draft budgetary plans for the coming year. The role of the Commission is to review whether Member States are adopting the necessary measures to achieve the objectives agreed at EU level, before budgets are finalised at national level (European Commission, 2013).

For 2014, fiscal targets were kept, given that most countries have improved their macroeconomic indicators in previous years. But appeared another new objective, referring to the budget deficit and public debt. It is about creating a mix of spending and tax revenues which should have results in economic growth and strengthening fiscal policies.

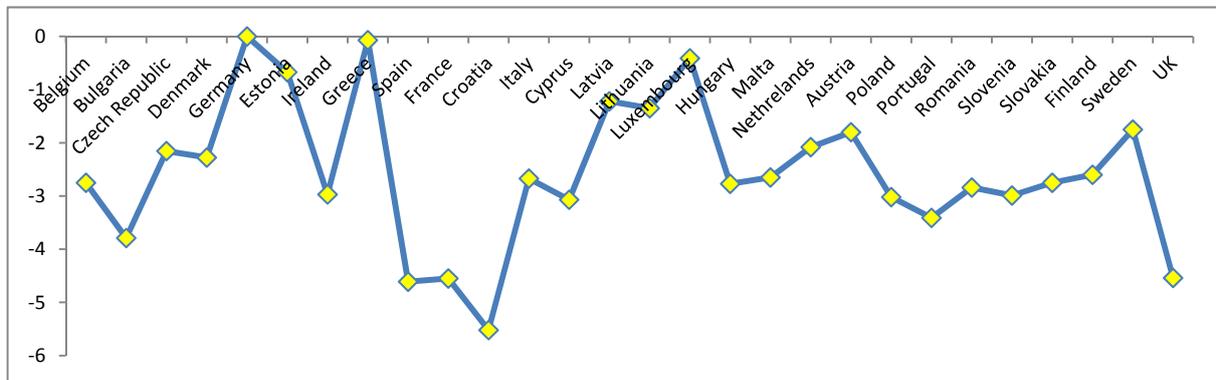
European Commission encourages the stimulation of private investment and consumption by reducing taxes and social contributions. This also comes in completing a well organized system of budgetary expenditure and structured so that the spending could be reduced (European Commission, 2013). The budget deficit for 2014 predicted by European Commission in 2014 autumn for each Member State it can be seen in Figure 7. As the graphic shows, in 2014 the objectives settled by European Commission started to take shape and the Member States applied different fiscal measures in order to get close to the 3% of GDP limit.

**Figure 7.** *Budget deficit (%GDP) for 2014 (Predicted by European Commission in 2014, autumn)*

**Source:** Own calculation, European Commission Report.

For 2015, the priorities set out by the European Commission have been slightly modified, since economic growth forecasts have failed and the process had been slowing down starting even in the spring of 2014. In this situation, the budget deficit as a percentage of GDP is expected to be reduced over the next two years, although in 2013 and 2014 it reached an average of approximately 3% of GDP for the EU and 2.6% of GDP for the Euro area. The forecast for 2015 is designed in Figure 8.

**Figure 8.** Budget deficit (%GDP) for 2015 (Predicted by European Commission in 201, autumn)



**Source:** Own calculation, European Commission Report.

According to the European Commission's forecast, the average of the budget deficit in 2015 should get to 2.54% of GDP in EU. Under these conditions, several EU member states had to predict a budget deficit below 3% of GDP, the limit accepted in the Maastricht Treaty. In this situation, there is also Romania, which targets a budget deficit down to around 1.4% of GDP. Achieving this unusual size, considering historical patterns, is, in the opinion of the Fiscal Council very difficult to achieve, while maintaining budgetary expenditures in the draft budget parameters and considering that, following an analysis, aggregate tax revenues appear as potentially overstated by approximately 0.33% of GDP. Furthermore, also in view of the Fiscal Council the fitting in the category of expenditures on goods and services - which is the main factor of structural adjustment programmed - appears as uncertain in terms of historical developments, the more it is not clear which are the specific sources of planned expenditure savings (Fiscal Council, 2016).

Another priority of fiscal European Commission is reorganizing public finances in the Member States by improving budgetary expenditure and increasing tax revenues, not by increasing taxes, on the contrary, by reducing their spaces and creating favorable business environments. It is also discussed the need for effective measures to combat tax evasion (European Commission, 2014).

## Conclusions

Considering the analysis performed, we can conclude that although the fiscal pressure is not the only variable on which the budget deficit rate depends, it has a big influence on its evolution. As we observed, in both periods of time, the countries that registered big tax revenues, they also registered small budget deficit. Also, most of the countries with big budget deficit during the first period, increased the tax revenues and started to get close of the 3% of GDP limit established in the Maastricht Treaty.

Another conclusion is referring to the evolution of the macroeconomic indicators in European Union. We saw that starting with 2011, when first appeared the Annual Growth Survey and the fiscal system started to be well monitored, there have been improvements. Member States began to follow the European fiscal priorities and this was visible in our graphs. But, the

results were under the expectation, so Member States should further improve their fiscal policies in order to achieve the established goals.

For 2015, it's interesting the European Commission's approach. They encourage the member states to decrease taxes and social contribution in order to get new investments, to reduce the unemployment and to grow the demand but also they forecast a budget deficit below 3% of GDP. This means that most of the countries have to have a low budget deficit comparing to last years but they can not obtain it through tax revenues increase, at least not through direct taxes increase; and as we specified in the paper, most of the countries had increased already the indirect tax revenues and another change it will be hard to do it. In this case, there are two ways to get the established budget deficit at the end of the year: raising general government revenues without touching the fiscal pressure or managing more efficient the government expenditures. Both of the ways are embraced by European Union.

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# The transition from private debt to public debt – A case study of Romania

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**Abstract.** *This paper tries to analyze the process in which Romania went in just two years from an economic tiger in Eastern Europe to a country that uses a rescue package from the famous troika: IMF, World Bank and European Commission. As the IMF agreements end in mid-2015, we come to some interesting conclusions and see some of the IMF conditions put into practice, like the fiscal buffer. This paper investigates the relationship between public debt, public deficit and economic growth in Romania over a period of 25 years, starting in 1990. The period under review has two important events regarding the impact of public debt on economic growth rates: the EU accession and the financial crisis of 2007-09, followed by the euro zone debt crisis.*

**Keywords:** public debt, private debt, IMF.

**JEL Classification:** F34, H63.

## Introduction

For Romania and the countries in the Central and Eastern Europe, the major economic objective is to bring living standards to the EU15 levels. Abiad (2006) argues that the catching-up period has some similarities to other regions, but the advantages offered by the European Union namely: competition, pressure for reforms and financial integration offers unique opportunities for CEE then other countries in developing.

In a recent paper, Fincke and Greiner (2010) suggest that developing countries are more vulnerable to debt crises than the developed countries, due to dependence on export of raw materials, but most of all, developed countries debt is in foreign currencies and is usually held by foreign investors.

The signs for a possible crisis were recognized by Sorsa et al. (2007) as they identified foreign capital inflows into Eastern Europe Economies as a source of vulnerability for these economies, and stated that if those risks materialized, it would end in significant fiscal adjustments. Romania, was analyzed alongside Bulgaria and Ukraine in Duenwald, Gueorguiev and Schaechter (2005) paper regarding the credit boom and conclude that the recent credit expansion appeared to have been excessive, being evidenced by widening current account deficits.

In other studies, Barrell et al. (2006), it was analyzed the costs involved in financial instability and GDP decreases following financial crises. The authors look at the effects of a crisis on banks and currency in 19 OECD countries and show how consumption is an important part of post-crisis adjustment. It is also shown how the effects of a crisis can be amplified by the leverage effect of a high ratio of debt / income. The article, drew attention on two fundamental aspects: increase leverage in the banking system and the negative impact on smaller countries in the euro area.

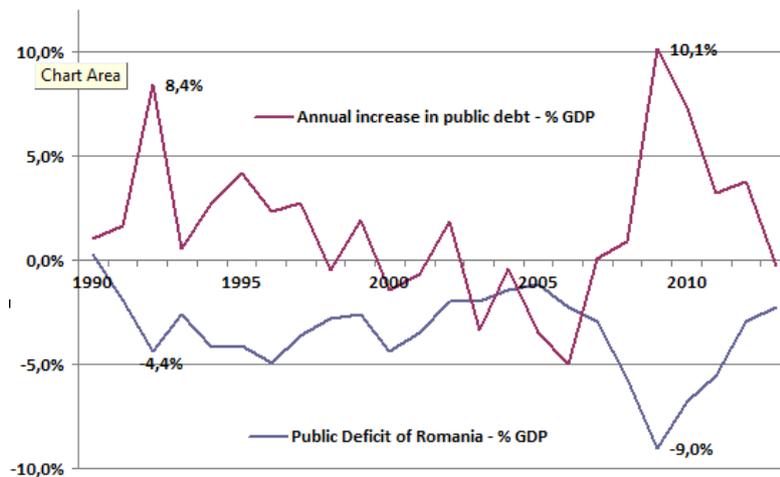
Abbas and Christensen (2007) developed a model and a database covering 93 countries developing for the period 1975 to 2004 and showed that a moderate level of debt may lead to economic growth as a higher level of debt may reduce it over time.

When Romania signed an agreement with IMF in May 2009, the institution was already providing joint assistance to two other Eastern European countries: Hungary (November 2008), Latvia (December 2008). The late response from the Romanian authorities might be the fact that in late 2008 there were general elections and in 2009, presidential elections.

## Public deficits and public debt

Romania's debt increase as a percentage of GDP (1992 and 2009) exceeded the size of the budget deficit in respective years. For example, since 2009, the Ministry of Finance and the Central Bank tried to create a fiscal buffer to ensure the financing of the deficit or to ensure medium-term growth of foreign reserves (presented as a "safety belt"). By 2014, the currency reserve available at State Treasury was EUR 6.8 billion, and provided coverage to 5.8 months of gross financing needs for the year 2014.

The European Fiscal Compact aimed at strengthening fiscal discipline at European level through the introduction of automatic penalties and enhanced surveillance of Member States. The Treaty includes a requirement that national budgets to be balanced or in surplus. This requirement will be met if the annual structural deficit would not exceed 0.5% of GDP. The conclusion of the Fiscal Council in Romania (2012): on medium and long term, the limit of 0.5% of GDP structural deficit lead to a decrease of public debt as% of GDP.

**Figure 1.** Annual increase in public debt vs public deficit in Romania, 1990-2013

Source: IMF Historical Public Debt Database, The annual reports of NBR.

### Public debt and growth in Romania

The relation between the public debt and economic growth was analyzed by Reinhart and Rogoff (2010, 2012). They focused on the concept of debt intolerance, the relationship between government debt and GDP growth. Thus in this paper Growth in a Time of Debt (2010) they've concluded:

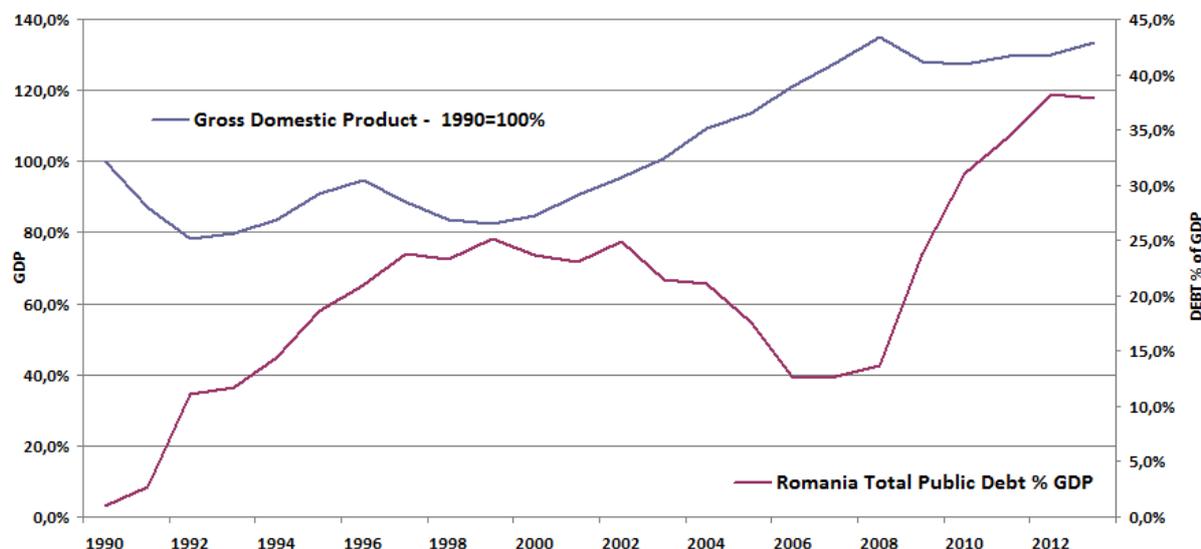
1. The relationship between government debt and GDP growth: debt to GDP ratio over 90% growth decreases. This is true in the advanced and in developing economies.
2. In emerging economies, debt tolerance threshold is lower than in developed countries. When debt reaches 60% of GDP, growth rates decrease by 2%.
3. There is no apparent connection between inflation and public debt for advanced economies. For emerging markets, however, inflation increases simultaneously with the increase in the debt.

These results were recently challenged by Herdon et al. (2013), which show that the threshold effect tends to disappear after an error correction in coding and using a different weight in data. Also, if calculated correctly, they show how the average growth rate of GDP for countries which have a public debt in GDP of over 90 percent is actually 2.2 percent, not 0.1 percent. It also shows how the relationship between public debt and GDP growth vary significantly by country.

In other findings, Kumar and Woo (2010) used a regression for the years 1970 to 2007 in developed countries and the research results have shown 10 Percent Increase in how the debt in GDP is associated with a slowdown in GDP growth rates by 0.2%. Cecchetti et al. (2011), using data on 18 OECD countries over the period 1980-2010 found that a 10 percent increase in public debt reduces the growth rate of GDP by 0.17 percent per year. On the other hand, Presbitero and Panizza (2012) failed to demonstrate that, in the medium term, a high level of public debt has implications for future economic growth in advanced economies. Therefore, given the results of the research, believes that a high level of debt should not be used as an argument in support fiscal consolidation. The financial instability has a negative impact on GDP growth, a significant example in this case was Mexico, which came to have a fall during the economic crisis by 6% in 1995, after it had an increase of 4% in the previous year. Mishkin (1999) believes that the magnitude of these oscillations 10% are similar to what has made the United States during the Great Depression. People involved in public debt management must face two key issues: how to reduce the risk of a crisis and how to cope when it appears.

For Romania, the graphical analysis of the evolution of public debt and GDP in the period 1990-2013 (Figure 2) shows two important thresholds for public debt as percentage of GDP: app. 25% in 1999 and 40% in 2012. The threshold of 40% places the Romanian economy in the threshold of the emerging economies (debt intolerance). The threshold of 40% is also recognized by the National Bank of Romania (2012) for debt sustainability in the group of emerging economies, for moderate interest expenses and their impact on primary deficit.

**Figure 2.** Evolution of Romania's GDP compared to total public debt



**Source:** IMF Historical Public Debt Database, The annual reports of NBR.

If it is considered the financial currency reserve available to the State Treasury, the net government debt would be at 34.2% of GDP at the end of May 2014, compared to 36.2% of GDP at the end of 2013.

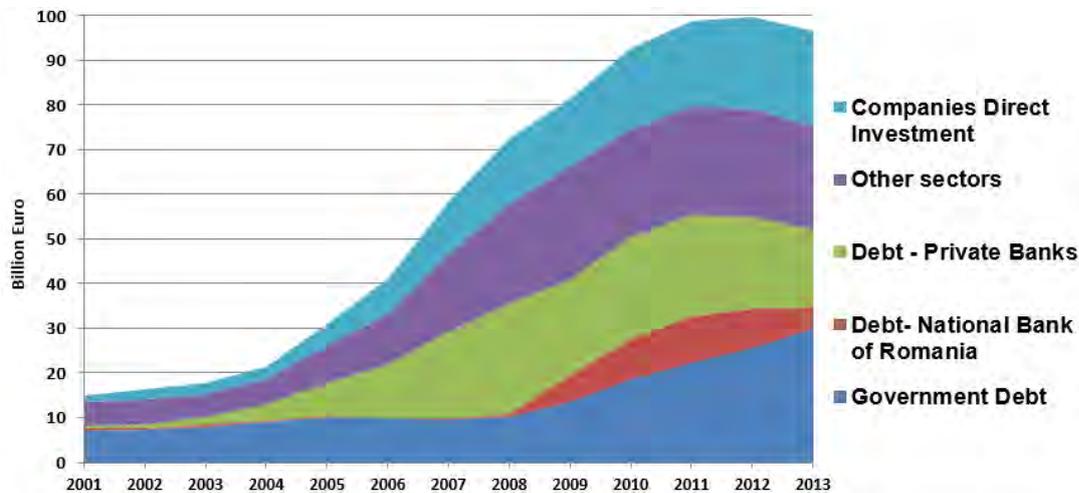
### Building up the external debt 2004-2008

When the global financial crisis hit Europe in 2008, many countries in Central and Eastern Europe were vulnerable because of high levels of private debt to foreign owned banks and foreign-currency exposure. Marer (2009) considers the global crisis that hit the new EU members during 2007-2009 as one of 3 independent crises: the financial crisis, liquidity crisis and a crisis in the real economy. The 10 CEE countries were hit first by a liquidity crisis, and a massive decline in capital inflows and a decline in exports. Differences in how CEE countries reacted can be explained by factors such as fixed rate regimes, the currency borrowed households in these countries and the pre-crisis monetary and fiscal policies. Also, inadequate structure of public debt lead to the inability of institutions to take effective counter-cyclical policy on public debt management. Das et al. (2010) believes that this is because market participants reconsider debt risk likelihood of rapid and substantial reduction of the sovereign rating. This will lead to a decrease in the number of potential investors and increased costs of issuance.

Since 2008 public external debt had an upward trend due to the financing needs of the Romanian government. Romania total financial package from IMF/EC/WB/EBRD/EIB during 2009-2011 totaled 20.0 billion. Euro. From this, the most significant amounts were borrowed from IMF: 9.7 billion. Euro, amount held by the central bank to support the balance of payments and 2.3 billion. Euro for Ministry for Public Finance - amount drawn to finance the state budget deficit. At the time of the agreement the size of the package was app. 20% of Romania's GDP.

External debt of banks decreased significantly from 2010 to 2014 although international lenders have slightly reduced contribution due account repayments occurring for the financing agreement in 2009.

**Figure 3.** Analysis of the structure and evolution of Romania's foreign debt in the period 2001-2013



**Source:** National Bank of Romania.

The significant financial package received in 2009 by the Romanian government made it possible for the private banks to reduce their exposure. At the same time, Romania's local capital market was and is underdeveloped and couldn't be an alternative source of local and foreign currency funding. Beside the financial package, the authorities signed the Vienna Initiative, to keep under control the risk of capital outflows from the banks. The Euro adoption process that started in Romania on 1 January 2007 will allow the elimination of exchange rate risk, and it will be easier for the National Bank to access loans from European Central Bank, including the quantitative easing programme that started in January 2015.

## Conclusions

The large capital inflows of capital that entered in Eastern European Countries, including Romania, included some positive effects: income convergence toward EU levels, economic development and a booming property market. All these came with high vulnerabilities: a high percentage of GDP in external imbalances, credit in foreign currencies, including exotic currencies like the Swiss franc or Japanese yen. Even if most of the countries in CEE had a low level of debt comparing with the Western Europe, except for Hungary with app. 80% of GDP, they are still exposed to financial crises, as there is very difficult to obtain financing.

In the case of Romania, there are two thresholds for the level of indebtedness of GDP: 25% and 40%, same as other thresholds identified by other studies for emerging economies. In Romania, reaching the first threshold in 1999 was followed by a period of fiscal consolidation and economic growth.

During the two crises (1999, 2009), governments have increased the public debt more than it was necessary to finance the budget deficit. The governments tried to ensure anticipated borrowing needs or to increase foreign exchange reserves, but the costs and conditions were higher and tougher in both cases, as Romania went to the International Monetary Fund as a lender of last resort. Through the European Fiscal Compact, Romania assumed a maximum structural deficit target of 0.5% of GDP. Dumitru (2012) shows how with economic growth averaging 5% per year, Romania's public debt will fall to 20% of GDP.

Between 2004 and 2011, Romania's total external debt (public and private debt) increased five times, from 20 billion euro to almost 100 billion euros. During the boom years, most of the debt increase due to private banks. After the financial market froze, the Romanian government and the central bank had to take urgent measures, including a 20 billion financial package and sign an agreement with foreign owned banks not to withdraw their capital from the country. This actions gave some space for the authorities to finance in the short term and enter the financial markets when conditions were better.

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# Asymmetric information versus financial markets

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**Abstract.** *During the post-crisis, financial markets are characterized by differences in information between buyers and sellers. Financial markets, information asymmetries are particularly pronounced. Borrowers typically know their guarantees, diligence, and moral rectitude better than creditors; entrepreneurs have information "inside" on their projects requesting funding.*

*Creditors could benefit from knowing the true characteristics of borrowers. But moral hazard prevents the direct transfer of information between market participants. Debtors cannot be expected to be fully directly on their characteristics or entrepreneurs about their projects, as there may be substantial rewards for exaggerating positive qualities.*

**Keywords:** asymmetric information, financial markets, moral hazard, crisis.

**JEL Classification:** G14, G31, G32.

## 1. Introduction

Information asymmetry deals with the study of decisions in transactions where one party has more and better information than the other party. This creates an imbalance between transaction partners unfair results. Such asymmetries are wrong choice and moral hazard. Most often, information asymmetries are studied in the context of principal agent problems. In 2001, the Nobel Prize in Economics was awarded to George Akerlof, Michael Spence, and Joseph E. Stiglitz "for analyzing markets with asymmetric information."

Foundations of this theory were made in the '70s by G. Akerlof, M. Spence, J. Stiglitz. Mentioned authors proposed a common explanation to a number of questions of interest for different areas of the economy: what is the explanation for the excessive interest rates on credit market in underdeveloped countries; why those who want to buy a second-hand car dealer addresses good seller and not particular; which is the explanation that a company pays dividends to shareholders even if taxed more in relation to earnings; why is advantageous for insurance companies to offer customers a list where higher deductibles are replaced with lower compensation; and so on Arguments initiators markets with asymmetric information theory related to the definition of asymmetric information: part of traders in the market have more information than the other party. The lenders know more than borrowers about timing of future payments, the seller knows more about quality than the buyer machine, chairman of the board know more about the company's profitability, etc.

Economic theory appealed for a long time, on the assumption that economic agents have equally necessary and sufficient information in decision-making, so problems of distribution of information within markets are given unimportant. The three economists have observed and investigated the following phenomenon: in economic activity there is a wide range of markets where information is asymmetrically distributed and how it propagates from one trader to another influences the behavior of individuals in that market. If, in the traditional economic theory, questioning, first, the problems of supply and demand balance, the way in which income is distributed in exchange, or the efficient allocation of resources, the new microeconomics proposed a novel approach - most of the shortcomings of markets may be the result of asymmetric distribution of information. Mentioned authors found one element of the market with asymmetric information:

Akerlof - adverse selection (adverse selection).

Spence - signaling (signaling).

Stiglitz - selectarea- screening (screening).

G. Akerlof published in 1970 *The Market for Lemons*, introducing the first formal analysis of a market difficulties. He thus develops a new theory which states that because of imperfect information of borrowers and car buyers, borrowers with bad or reimbursement systems vendors poor quality machines can remove other competitors on the market, in other words, asymmetric information agents can lead to adverse selection in the market. Akerlof's arguments resulting from market analysis of property where the seller has more information than the buyer about the quality of products, namely, second-hand car market "lemon"(old cars and defective). Akerlof's conclusion shows that information hypothetical difficulties can lead either to collapse the entire market, or to transform it by adverse selection, poor quality products being chosen instead of superior quality. Asymmetry of information to spur economic theories unexpectedly interventionist who were in this phenomenon justification for a more active state involvement in economic activity. In reality, the market is not formed, there arises to fail, even if that market is experiencing specific problems, it will adapt its operation mechanism so as to provide an internal solution to his problems. Businesses that operate in a market with asymmetric information try, on the one hand, to exploit the information asymmetry in their favor, and, on the other hand, to ensure the necessary conditions for that market to operate and does not disappear for that with the disappearance of

the market to their advantage disappears. The key problem is that economic agents may have strong incentives to counteract the adverse effects of difficulties in information on market efficiency. It is possible that many market institutions are interested to propose a solution to the problems caused by asymmetric information offering different types of contracts, used car dealers offer guarantees to the buyer.

Michael Spence looked for a way better informed individuals on a market can submit "to signal" reliably, to the less informed, the information they hold, so as to avoid some problems associated with adverse selection. Market signaling requires the existence of agents to take expensive but easy to see behaviors to convince other businesses on their skills or on the amount and quality of their products.

Michael Spence in 1973 published a study entitled "Job Market Signaling" which identifies education as a "signal" of the labor market productivity. An employer cannot distinguish the more productive people less productive. Consequently, he will choose the most productive of less productive applicants only if they consider less expensive than others being more educated than the less educated. Spence has found waiting under different equilibrium points, conditional on education and income (e.g. men and white receive a higher wage than women and black with the same productivity). Further research have extended the theory to explain other types of "signals", confirming the importance of "signaling" in different markets (costly advertising as a sign of productivity, financing by issuing bonds as a signal of profitability tactics to postpone the wage offer that signal negotiation ability, aggressive price cuts as signals of market power, etc.).

The theory provides an explanation for shareholders dividends paid by companies, although it is known that they will pay an additional tax for these additional revenues. Why choose firms to pay dividends instead to pursue a simpler way, i.e. to retain profits within the company favoring shareholders through capital growth and shareholder value? An answer in the sense theory "signaling" is that dividends can be a good sign of future investments, companies pay dividends because the market this is interpreted as a good sign, which will mean a higher price of the shares. This strategy is part of the company's financial communication and aims to attract or maintain ownership. A company that provides dividends is a stable and prosperous, so purchase shares of that company is a portfolio favorable to shareholders. The idea is that the higher price of the shares will offset losses from shareholders additional taxation of dividends.

Joseph Stiglitz, along with various collaborators, complete the analyzes of Akerlof and Spence conduct research uninformed traders in the market with asymmetric information, namely the insurance market where insurance companies have no information about the actual risk to which they are subjected to customers. Joseph Stiglitz and Michael Rothschild shows how uninformed the insurance company, its customers, can determine the informed party to reveal information about their risks by "screening". Based on information "screened" ("selected"), the insurance company distinguish between different classes of risk to policyholders, giving them the opportunity to choose from a list of alternative contracts where lower compensation can be replaced with large deductibility.

Applications of the theory of markets with asymmetric information are multiple: from financial markets - monetary and insurance market, the labor market and consumer goods.

Now more than five years, researches have promoted major crisis theory that introduced the idea that many important phenomena in corporate finance are explained due to considerations of moral hazard in the relations between a contractor and his sponsors. Since then, a large research effort has gone into investigating what exactly are the different types of moral hazard implications for financing a business. Some recent developments suggest that initial post-crisis theory approach must be modified substantially. In what follows, I will try to evaluate

these developments, stating in particular why I think they involve a change of perspective rather than a minor adjustment to the initial approach. I begin by briefly reviewing the post-crisis approach to the theory itself.

## 2. The post crisis theory research

Addressing post-crisis theory can be summarized by the following proposals:

- a) Any outside financing involves "agency costs" deviations from first-best efficiency, because ( ) behavior contractor manager cannot be fully controlled and no cost for external funders, and at least some of the consequences of entrepreneurial behavior affect external donors rather than to.
- b) The forms of financing outside (debt, equity, etc.) involving different types of moral hazard and therefore different types of agency costs. Moreover, to some extent, an investment in joint activities and costly monitoring may serve to reduce moral hazard and agency costs.
- c) In equilibrium, the company's capital structure and the monitoring and bonding are chosen so as to minimize the sum of all costs of the agency, monitoring, and bonding. The level of activity of the company is usually less than complete information, the first-best level since the edge, cost of financing outside agency involves costs, monitoring and liaison, and the simple opportunity cost of funds.

In the post-crisis approach to theory, the theory of corporate finance is part of the general theory of optimal constructs in situations of moral hazard. The object of this theory is to characterize (best) optimal contracts in situations of moral hazard and to interpret and explain the contracts they actually see the (Pareto) optimal under certain constraints stimulation. Similarly, financial institutions such as banks and non-bank intermediaries must be explained as effective mechanisms to reduce certain types of moral hazard through "delegated monitoring".

In this approach, contract theory, behavior is seen as a response to any stimuli simple optimization are obtained from financial contracts, incentive systems, controls, and the like. Game theoretical considerations of mutual interdependence plays no role, although to some extent they may be implicit in the idea that "market competition" leads to a choice of the second best contracts and institutions.

Theoretical approach to corporate finance contract gave some interesting details. Among the most important are:

Observing the post-crisis various forms of moral hazard affects different forms of financing outside different: whereas moral hazard in terms of choosing the contractor effort hurt outside equity financing over debt finance outside, the opposite is true of moral hazard in regarding the riskiness of choice entrepreneurial strategy.

Our observation that monitoring involves natural economies of scale that provides a justification for the endogenous emergence of mediation: Even without ad hoc assumptions about the usefulness of mediation, mediation can reduce financing costs outside because (i) monitoring by an intermediate monitoring is cheaper than ten thousand shareholders and (ii) the intermediary itself costs of outside funding agencies for intermediate may be small if its own portfolio is well diversified.

However, in addition to these embodiments, there are also some shortcomings that limit the usefulness of this approach. First, the contract does not own theoretical approach to explain why particular financial structure of the firm. The mere observation that debt finance and equity finance involving different types of moral hazard does not warrant the conclusion that

the financial structure of the company is based on an optimal compromise between these different types of moral hazard (in addition to the fees and costs of bankruptcy). Such a conclusion would be justified if the company as a priori limited to issuing debt and equity, but in the context of abstract problem stimulant post crisis put theory there is no reason for debt and equity should be only sources of outside funding. In principle, it should be admitted any set of financial instruments.

If any set of financial instruments is admitted, there is no reason why a combination of debt and equity should generally appear optimal incentive contract for outside funding. To be sure there are certain cases where a combination of debt and equity are actually optimal. However, it is also easy to give examples of optimal incentive contracts for outside funding are qualitatively very different from any combination of debt and equity. To see this, note that in any combination of debt and equity, residual income entrepreneur is a non-decreasing function company profit before debt service. This property of monotonicity means that the entrepreneur is rewarded for achievements of great profit, even if a great achievement entrepreneurial profit may indicate a risky strategy, rather than a high effort. To avoid excessive risk-taking might be more appropriate to punish high achievements entrepreneur profit. Indeed, for a proper specification of the underlying stochastic technology, optimal incentive contract will involve rewards for achievements and penalties for both interim profit, profit-very small and very large - one to the other to discourage Evasion discourage excessive risk-taking. In this case, residual income left to the contractor is monotonous, first increase and then decrease in income before debt service company. Given such a result, the question is what additional considerations may justify limiting debt and equity financing that we observe in practice.

### 3. Asymmetric information in financial relations

A most fundamental objection concerns the static character of post-crisis theory approach. In their analysis, moral hazard refers to a single set of options that are all taken at the same time. At a later time, after being taken all relevant options, company profits are realized and distributed among different parties.

In reality, financial relations are not a one shot deal. Barring any mishaps (or fraud!), Companies have a certain permanence, and their managers see themselves in position for a long time. Meanwhile, managers make their choices in order, one after another, and at least a portion of the profits are made and (partially), distributed in between.

The relative timing of managerial choices and achievements of profit is quite different from what post-crisis theory assumes to be.

Long-term nature of financial relations changes the nature of the stimulus zero.

Even when there are updates, long-term relationships between a company and its financiers can be quite different from what might suggest an optimal incentive contract period. As an example, consider the simple proposal that in a time frame, finance independent state debt interest is effective if donors cannot be seen without any cost profit company achievements. In an environment with the same period many hypotheses information, this proposal no longer available. Instead, it is always desirable to motivate entrepreneurs to reinvest any profits above average achievements. Necessary adjustment loan terms following incentive compatibility that is required falls short of the benefits from reinvestment, so donors can acquire some of the benefits for themselves. Unlike the results of a period, the optimal incentive contract in a time frame many state-dependent involve payment by the contractor that allows donors to share in unexpected achievements above average profits (and, therefore, to obtain better conditions previously checked).

However, as in the static case, we encounter the difficulty that financing contracts that we observe in practice are much simpler than optimal incentive contracts long-term theory. In particular, real emergency clauses in contracts are much less developed than would be expected. To take the example just given, barely any current funding agreement contains a provision reinvestment detailed in windfall profits and state-dependent adjustment of terms followed by further funds.

In this context, it is sometimes argued that long-term financial relationships involve implicit and explicit agreements. The relationship between a firm and "its" bank may involve an understanding of the nature of the relationships being far exceeds her explicit financing contracts actually write. Indeed, it was suggested that stability" house bank relationship in Germany or Japan is advantageous precisely because businesses located implicit agreements allow partners to exploit the long-term gains, unlike short-term incentive contracting.

Now, however, we must ask to what extent an implicit contract term can be made compulsory. Regarding the previous example, why should accept entrepreneur to reinvest profits in exceptional circumstances which are effectively financier unexpected weight? Ex ante could do this in order to get better terms for a loan before, but ex-post, ie after receiving unexpected, he might find it profitable to seek a renegotiation, or even take its business to another sponsor to obtain better conditions. If the ex ante contract was initially implicit rather than explicit, the bank has no remedy against such opportunistic behavior. Enforcement mechanisms available to the bank is therefore less than optimal contract theory assumes.

The different mechanisms implementing an implicit understanding usually do not provide a perfect alternative for explicit agreement enforceable at no cost. Incomplete contracts must be considered explicitly seen as an essential feature of the ongoing financial relationships. We must ask ourselves, why are incomplete contracts, which are the real implications of incomplete contract? Regarding the first question, it is useful to note that the important distinction is between explicit and implicit agreements, but agreements between small and large cost of application. If an explicit agreement is too complicated, appeals against failure may be too costly and too unreliable to be effective. This in itself may be a reason to prefer a contract more easily enforceable incomplete.

Regarding the second question, incomplete contract makes the important point that changes the nature of the contract itself. Parties shall take them unilaterally? If so, what? Or need an additional agreement? If so, what are the respective negotiating positions? The answers to these questions will to a certain, depend on the initial contract. If the original contract can not specify all options for all risks can still specify a system of rules for how to be taken when there are unforeseen elections. Most importantly, it may provide a rule for assigning control over company assets in different circumstances.

We continue to believe that the transfer of control rights is not effective in any given case. It is noted that any unilateral transfer of control is likely to entail agency as control agent neglect the external effects of their actions on other participants. However, because different agents are affected differently by a particular decision, the size of these agency costs will depend on who is actually in control. The question is then which control rights of future missions to minimize costs actually unilateral control agencies. (1988, this issue) provides a remarkable application of these ideas to corporate finance. They note that the institution of bankruptcy involves the transfer of control from entrepreneur or manager of a receptor that acts in the interest of foreign creditors. Under this regulation, the combined use of debt and equity financing provides the company with a quota allocation of control rights statement: In the non-bankrupt firm control of assets returns entrepreneur in bankruptcy states, control shifts to foreign creditors. Our findings argue that such assignment state contingent control rights is preferable to a unconditional when ranking documents for different control rights in relation to the costs of agents depends events occur. Thus, a combination of debt and equity with a

probability of bankruptcy strictly between zero and one is effective if the creditor control agency costs are relatively lower in states bankruptcy and agency costs of control are relatively smaller directory non-bankrupt state. In the absence of other considerations, the optimal capital structure of the company is one that induces appropriate division of bankrupt and non-bankrupt state so as to minimize the expected total costs of contracting agencies incomplete.

#### 4. Contract theory, game theory, competition and efficiency incentive

In a sense, incomplete-contract our research documents remain honest in traditional contract theory. As a post-crisis theory, these authors assumed that the contracting parties always get a result that is efficient, given the constraints in the feasibility and stimulation. Efficiency is considered to be an implication of "rationality" in negotiations or competition. The standard paradigm research, competition for the right to sign a contract requires participants to offer a potential partner contract that maximizes his expected gain on the set of all contracts that are worth to them under the constraints given.

General presumption of effectiveness of contracts under given constraints should still be questioned. First, post-crisis theory results show that the property of Bertrand competition efficiency not automatically generalize to the case of a single market for several interdependent markets. If simultaneous competition in a market entry and market exit bidder's ability to serve the market production "depends on its success in the market entrance. As standard, our competition may force competitors to provide the suppliers of inputs good condition that you can provide. However, this may require now a competitor to attract all entries, so he can monopolize the market output and extract a rent that allows him to pay a premium for its inputs. When apply this reasoning to model research intermediary post crisis theory notes that the solution to the problem of constrained optimization cannot be considered as a competitive equilibrium research, and (ii) the emergence of endogenous intermediary is not necessarily linked to the relative efficiency of intermediation with direct funding.

To be sure, the research results depend very much on game-theoretic specification chosen, in particular the assumption that intermediaries compete primarily on inputs (deposits) and then to customers for their outputs (loans) rather than vice versa . Also, it is not yet clear whether it emphasizes the difficulties inherent difficulties in functioning competition between intermediaries, or if these difficulties are due research competition model with the assumption that the lowest advertised price difference can be pivoted around the market from a competitor another. However, its results show clearly that the (constrained) efficiency result in financial markets under asymmetric information cannot be taken for granted, but must be derived from a game theoretical analysis explicitly. In the particular context of mediation, any such analysis will have to be reconciled with the observation that in a competitive market and market power in another market may be mutually reinforcing.

There are still, even deeper objection to the presumption of efficiency, the incentive constraints and feasibility. Implicitly or explicitly, efficiency argument assumes that when an agent or accept the proposed terms of the contract, he knows exactly what he expected payoff to associate with these terms. This assumption is problematic when the contract fails to provide a complete specification of all mandatory payoff variables and actions. If contracts are incomplete or renegotiable, behavior and subsequent rewards are determined automatically by the initial terms. Then there is a question on which participants predict behavior when proposing and accepting the initial contract.

Theoretical Approach contract simply assume that after conclusion of contract any agent makes his choices in a way that is "optimal" for it. However, in most relationships in progress, behavior is a matter of strategic interaction, rather than unilateral optimization. In this case, the notion of behavior "optimal" should be replaced by a notion of behavior "balance".

There are two opposite cases such linear contracts:

1. Contract cost-plus-fixed-fee or cost-plus ( $b = 0$ ). In this case the company shall cover the total cost,  $C$ , and receives additional amount  $t$ . Cost-plus contract is a contract incentive extremely low power.
2. Fixed-Price Contract ( $b = 1$ ). The company receives in this case a lump sum,  $t$ , which should cover its costs and to appropriate the profit and stay. Fixed-price contract is a contract incentive for power.
3. Contracts linear slope  $b$  strictly between 0 and 1 are called "incentive contracts".

Actual contracts are often linear, but others have nonlinear characteristics that the maximum level of transfer from the Parliament or guarantee that the company will lose money.

Incentive contracts reveal feasible regulatory instruments, they suggest the main problems facing regulation. Current incentive contracts can be analyzed from two perspectives.

The first is whether the principal is authorized to subsidize firms regulated and whether regulators may receive public funds that this does not cover all costs through direct charges to private customers. The transfer may take several forms: direct subsidies, loans at low interest or government grants, government guarantees when firms borrow on the private market or transfers of public consumption at low prices etc. Such transfers to occur only company in the context of public procurement projects such as the purchase of weapons.

The second perspective is given by the power of incentive contracts, which represents the link between the transfer of the company Principal and / or the company and its cost price or performance thereof. This perspective is important because it highlights three major classes of incentive contracts falling within the practice described in Table. 1.

We note that there is a major difference between theory and their application incentive contracts. Economic and political considerations have induced some convergence between limit and regulate prices cost of service type, for example.

**Table 1.** *Common power incentive contracts known*

Power	Transfer allowed	
Very large	Contracts with fixed price ( fixed price contracts)	Limitations price (price caps)
Intermediate (cost or profit split)	Incentive contracts	Regulatory incentive
Very small (Principal and consumers residual claimants)	Contracts cost-plus	Regulations type cost- service

## 5. Conclusions

It is difficult to obtain external financing, mainly because the financiers cannot reliably distinguish between a good company from a bad company? Or is difficult because financiers suspect that a firm may use a funding for other purposes than indicated or take other actions that jeopardize repayment? The literature suggests that received these two phenomena, moral hazard and adverse electoral issues are the primary sources of frictions in capital markets, but offers almost no evidence on how prevalent and are empirically relevant. In this paper, we develop a theoretical framework primarily simply to guide our empirical analysis. We then address the above questions using an empirical approach simple and transparent unique data at firm level study of our research. Our main findings are as follows:

- Firms positions survey questions suggest that adverse selection is empirically more prevalent than moral hazard.
- Estimated effects of adverse selection and moral hazard on the availability of capital is consistent with the predictions of economic theory received. Our Proxy adverse selection has more explanatory power in regression modeling availability of capital than our proxy for moral hazard. A series of robustness tests also shows that the effect of adverse selection is robust and larger than the effect of moral hazard.

It also proposes and implements a new test (1989) hypothesis that Diamond adverse selection and moral hazard are inversely proportional to the age of firms. That is exactly what we find to our proxies for adverse selection and moral hazard negatively correlated with firm age. The finding provides an explanation for the conventional wisdom that financial constraints are particularly acute for small companies.

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# Was RASDAQ doomed from the start?

## Further investigations

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**Abstract.** *The present paper continues the investigations on RASDAQ market initiated by Pop et al. (2014) by extending the period under scrutiny to December 2014. The changes that took place during 2014 are highlighted and the hypothesis formulated by Pop et al. (2014) reinvestigated. The current findings confirm the hypothesis previously formulated. RASDAQ has been under the influence of Bucharest Stock Exchange (BVB) and overshadowed by it; therefore RASDAQ was only secondarily considered as an alternative for portfolio investments. The January effect and the weekend effect became even weaker by extending the investigation period confirming the fact that RASDAQ was rather ignored by portfolio investors. By adding new independent variables in investigating the trades' variability, it was reinforced that RASDAQ was used mainly by the existing shareholders involved in the ownership concentration process.*

*Further, the paper tried to establish how many companies would be interesting to be transferred at BVB Standard tier. The investigation took into consideration the similarity of company profiles based on market capitalization, trades within 52 weeks, debt to equity ratio, net profit or loss ratio, and Tobin's  $q$ . A number of 39 companies were identified, a little higher than that mentioned by BVB general director.*

*Overall, the current investigations confirm the main conclusion of Pop et al. (2014) that the RASDAQ played its role as intermediary of ownership concentration for the listed companies*

**Keywords:** equity market, Granger causality, January effect, weekend effect, RASDAQ.

**JEL Classification:** G14, G19.

## 1. Introduction

The end of October 2014 brought a significant development for RASDAQ market through Law no. 151/ 2014, followed in November by the Romanian Authority for Financial Supervision Rule no. 17/ 2014. Both regulations, after a much delayed decision, address the status of the RASDAQ listed companies and present the alternatives those companies have either to be transferred on Bucharest Stock Exchange (BVB) main market or on the available alternative (AeRO) trading system, or to be delisted. While the regulations do not state explicitly, without any listed companies RASDAQ market segment is expected to be closed by the end of October 2015.

The regulations have their critics and, in some commercial lawyers' opinion, important commercial litigations might arise. Thus, through these regulations at least a clear decision was taken regarding RASDAQ: that the role it played in listing the companies resulted from the mass privatization program is over and that the willing companies must comply with the rules of regulated trading systems if they choose to continue as public companies. The evolutions of 2015 will be interesting to follow.

The present paper continues the research on RASDAQ of Pop et al. (2014). The research results of this paper will be merged with the research published in 2014. Therefore, the paper will focus on the developments of 2014 related to RASDAQ and, where appropriate, the period under scrutiny will be extended until December 2014. No new academic study was published during 2014 regarding RASDAQ; therefore there is nothing to be added regarding the literature review.

The results of the present research confirm the main findings of Pop et al. (2014).

## 2. RASDAQ evolution in 2014

The year 2014 began for RASDAQ with the hope that some decision will be taken regarding the future of this market segment. It was also expected that the decision will be to dissolve or to close RASDAQ. As such, no new company was listed, as Table 1 shows. Thus, the number of delisted companies was lower than that of 2013 and 2012. Only one of the RASDAQ delisted companies was transferred on BVB main market within the 3<sup>rd</sup> tier (symbol SCPS). Seventy percent of the delisted companies were already suspended for various reasons, including pending withdrawal from RASDAQ.

**Table 1.** *Listed companies at BVB and RASDAQ*

Year	BVB			RASDAQ		
	Number of listed companies	Newly listed	Delisted	Number of listed companies	Newly listed	Delisted
1996	17	8	0	1,561	1,561	0
1997	76	59	0	5,367	3,911	105
1998	126	50	0	5,496	236	107
1999	127	15	14	5,516	44	24
2000	114	1	14	5,382	77	211
2001	65	3	52	5,084	82	380
2002	65	1	1	4,823	61	322
2003	62	0	3	4,442	20	401
2004	60	3	5	3,998	17	461
2005	64	5	1	3,683	10	325
2006	58	2	8	2,420	3	1,266
2007	59	3	2	2,019	3	404
2008	68	10	1	1,753	3	269
2009	69	3	2	1,561	4	196
2010	74	5	0	1,309	1	247
2011	79	6	1	1,184	0	125
2012	79	2	2	1,086	1	99
2013	83	4	0	982	1	105
2014	83	2	2	911	0	71

Note 1: the data are reported as of the end of the year.

Source: Based on the data available at <http://www.bvb.ro/TradingAndStatistics/GeneralStatistics.aspx>

As Graph 1, Graph 2, and Table 2 show, RASDAQ market capitalization and turnover continued to decline under the grim perspective of its closure. Less than 10% of the companies were traded daily during 2014, with an average volume of less than 2,000 shares per day and an average daily turnover of about 200,000 EUR. None of the listed RASDAQ companies paid dividends for 2013 (Table 4). Thus, since the number of RASDAQ dividend paying companies was small in 2013, the influence of this factor over the trading decision could not be determined.

Just one important difference was registered during 2014: the percentage of purchasing offers and takeover bids increased 4 times compared with 2013, indicating in some cases the exits of SIFs from the respective companies' ownership structure, and for all companies a further concentration of ownership in view of future important decisions regarding the delisting or continuing listing.

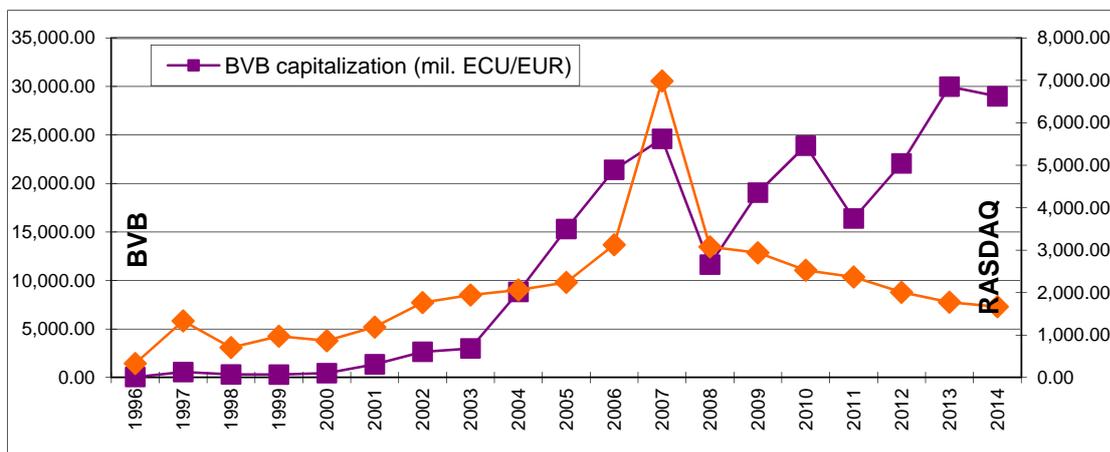
Graph 3 presents the performances of RASDAQ in comparison with BVB, through BET-C index, the inflation rate and the interest rate for bank deposits. As it can be seen, while the inflation rate is very low for 2014, RASDAQ managed only a negative performance, similar to BVB. Thus, BVB annualized return is much closer to zero.

Annex 1 presents the details regarding the RASDAQ 1<sup>st</sup> and 2<sup>nd</sup> tier. During 2014 two more companies were delisted from the 2<sup>nd</sup> tier, reducing their number at 5 (Table A1-1). The importance of these two tiers/ categories at 2014 level continued to decline within RASDAQ market capitalization. In the case of RASDAQ turnover, the first category became almost negligible, while the second category managed to concentrate little above 1%. The dedicated indices for these two categories exhibits for 2014 negative performances, in the case of the first category much larger than RASDAQ-C index and the second category index (Graph A1-1). The main differences that occurred in the 1<sup>st</sup> and 2<sup>nd</sup> tier companies' equity capital were generated by the variations in the exchange rate. Just one company (symbol TEHO) registered an important drop in its free float (under the accepted limit) indicating a concentration in ownership (Table A1-2).

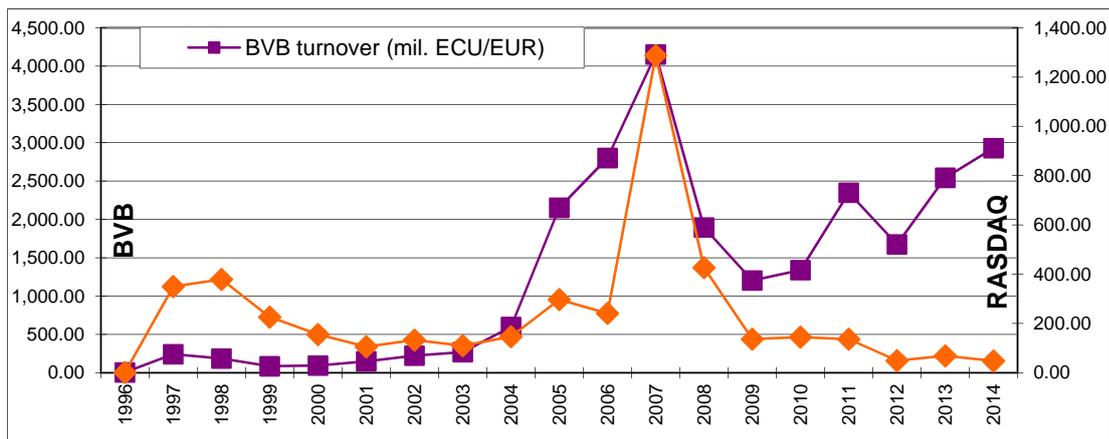
As Table A1-3 shows, the 1<sup>st</sup> and 2<sup>nd</sup> tier companies remained in 2014 also outside the top traded companies (with 500 trades or more). In two cases (symbols TEHO and CMVX) the trades dropped with 50% compared with 2013, in 3 cases (symbols UPET, BRRCR and SEVE) the trades remained almost at the same level, while in other 3 cases (symbols PTRO, FLAO and INOX) the number of trades increased with 50% or more. However FLAO and INOX registered a negligible number of trades, less than 100 in 52 weeks.

As stated by Pop et al. (2014) findings, 1<sup>st</sup> and 2<sup>nd</sup> tier companies did not manage to be top companies within RASDAQ, despite their enhanced transparency.

**Graph 1.** BVB and RASDAQ capitalization



**Source:** authors' compilation based on data available at [www.bvb.ro](http://www.bvb.ro)

**Graph 2.** BVB and RASDAQ turnover

Source: authors' compilation based on data available at [www.bvb.ro](http://www.bvb.ro)

**Table 2.** The trading activity at daily level on BVB and RASDAQ

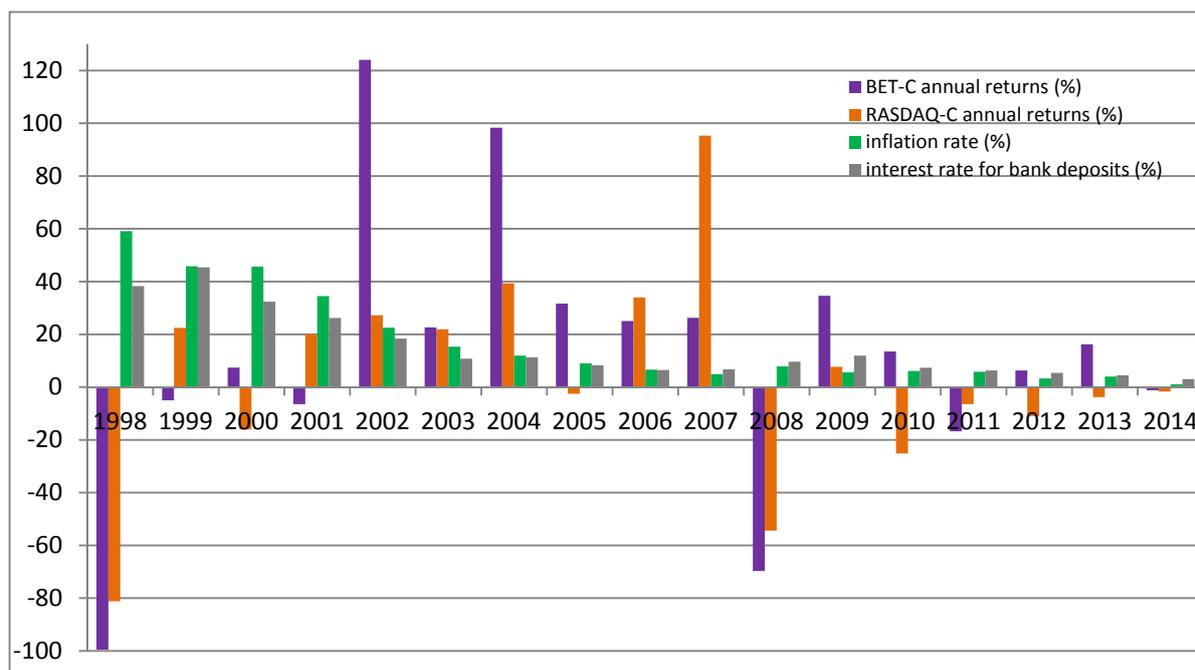
Year	BVB – daily averages				RASDAQ – daily averages			
	Number of traded companies	Number of trades	Volume (thou)	Turnover (mil. ECU/EUR)	Number of traded companies	Number of trades	Volume (thou)	Turnover (mil. ECU/EUR)
1996	11	213	14	0.05	479	n/a	220	0.03
1997	42	2,949	2,871	0.12	523	1,938	3,415	1.51
1998	84	2,283	4,300	0.85	683	2,136	5,483	1.50
1999	74	1,611	4,076	0.34	473	1,088	8,719	0.96
2000	58	1,968	7,098	0.37	322	561	4,850	0.63
2001	52	1,416	8,947	0.59	220	354	3,125	0.42
2002	47	2,680	16,142	0.91	160	270	8,686	0.56
2003	44	1,776	13,386	1.05	143	285	3,579	0.45
2004	44	2,494	51,205	2.34	144	440	4,756	0.57
2005	46	4,487	67,282	8.63	128	583	7,073	1.20
2006	48	5,789	54,925	11.27	129	575	4,813	1.02
2007	52	6,112	55,333	16.47	243	2,673	17,476	5.10
2008	53	5,317	50,031	7.54	208	1,486	7,965	1.70
2009	51	5,248	57,594	4.80	93	748	6,203	0.55
2010	51	3,467	52,259	5.21	92	826	6,097	0.56
2011	54	3,507	64,844	9.17	74	447	4,893	0.53
2012	51	2,576	50,103	6.67	56	271	2,896	0.20
2013	52	2,519	52,236	10.14	52	258	2,744	0.27
2014	54	3,139	46,442	11.69	51	255	1,801	0.19

Source: authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro)

**Table 3.** The structure by types of trades at RASDAQ (% of total trades as of the end of every year)

Year	Regular trades	Deal (special) trades	APAPS/ AVAS	Ministry of Finance	Purchasing offers & takeover bids	Sales offers & special sales	Other offers
2000	65.28	n/a	7.99	6.95	19.37	0.41	-
2001	56.92	n/a	0.54	7.08	28.39	7.07	-
2002	39.36	n/a	0.65	0.00	55.58	4.41	-
2003	37.21	5.02	0.17	0.00	52.71	4.90	-
2004	63.15	5.17	0.08	0.00	30.14	1.46	-
2005	57.95	34.65	0.00	0.00	5.74	1.66	-
2006	81.84	10.31	0.00	0.00	4.76	3.09	-
2007	72.04	23.37	0.00	0.00	2.63	1.96	-
2008	71.39	20.50	0.00	0.00	7.37	0.74	-
2009	64.49	24.87	0.00	0.00	10.63	0.00	-
2010	70.24	28.24	0.00	0.00	1.48	0.03	-
2011	43.03	51.21	0.00	0.00	2.63	3.12	-
2012	48.90	48.22	0.00	0.00	1.93	0.95	-
2013	50.84	31.99	0.00	0.00	4.21	0.40	12.51
2014	55.40	26.62	0.00	0.00	16.24	1.74	0.00
Average	58.54	25.85	0.66	0.94	16.25	2.13	6.28

Sources: Authors' compilations based on CNVM annual reports for the years 2000 to 2006 (<http://www.cnvmr.ro/raportanual.htm>) and based on BVB monthly reports for RASDAQ for the years 2007 to 2013 (<http://www.bvb.ro/TradingAndStatistics/Bulletins.aspx?t=1>)

**Graph 3.** *BET-C and RASDAQ-C annual returns, annual inflation rate, and bank deposit interest rate*

**Note:** BET-C index was discontinued June 20<sup>th</sup> 2014 and replaced with BET-Plus. In this graph, the annualized return of BET-C was used.

**Source:** authors' compilation based on data available at [www.bvb.ro](http://www.bvb.ro) and at [www.bnro.ro](http://www.bnro.ro)

**Table 4.** *Dividend paying companies at BVB and RASDAQ*

Year	BVB listed companies that paid dividends	RASDAQ listed companies that paid dividends
2000	56	79
2001	46	99
2002	34	103
2003	34	80
2004	28	81
2005	26	36
2006	26	35
2007	26	77
2008	27	72
2009	26	66
2010	26	33
2011	31	1
2012	33	52
2013	31	0

**Source:** based on data provided by BVB at <http://www2.bvb.ro/ListedCompanies/StatusDivid.aspx>

### 3. The Granger causality between RASDAQ and BVB, the January effect and weekend effect

The results for the Granger causality, January effect and weekend effect are presented in Annex 2. It must be mentioned that in order to have continuity in data, the returns of BET-C, discontinued as of June 20<sup>th</sup> 2014, were replaced with BET-Plus returns, the index that replaced the former BVB composite index.

For the Granger causality (*RASDAQ-C does not Granger cause BET-C and it is not Granger caused by it*), the results remained unchanged confirming Pop et al. (2014) finding that one can consider that BVB has an influence over RASDAQ that might be explained under the presumption that some of investors might consider RASDAQ, depending on BVB evolution, as a secondary alternative for diversifying their portfolios. The finding is partly confirmed by the findings of Stefanescu and Dumitriu (2009).

The presence of anomalies (formulated as *RASDAQ exhibits a January effect*, and *RASDAQ exhibits a weekend effect*) was investigated in order to see if RASDAQ really represents an interesting alternative for portfolio investments. By extending the period under investigations, the January effect and the weekend effect became weaker, almost negligible, for RASDAQ. Therefore one can consider that the anomalies are absent and that RASDAQ market was rather dedicated to ownership concentration for the listed companies than a market for portfolio investments, as Pop et al. (2014) showed. The absence of anomalies was confirmed by Dumitriu et al. (2011).

#### 4. The ownership structure of RASDAQ tradable companies

In order to support the findings revealed by the Granger causality, the ownership structure was further considered. The percentage of tradable companies controlled by a single entity 50% or more remains around 66% in 2014, similar to 2013. When looking at the data in Table 6, it can be observed that the level of ownership concentration grew for the companies that registered just one trade, indicating that in the case of these companies the controlling entity is seeking to have a dominating influence over the future decisions and, probably, to delist the respective company. This finding suggests that the interest of portfolio investors for such highly controlled companies can be only a limited one, while most trading occurred initiated by the existing shareholders in order to concentrate the ownership or to withdraw from the respective company.

**Table 5.** *The ownership structure for the RASDAQ tradable companies (%)*

Category	75% or more owned by one entity (state, company or individuals)		between 50% and 74.99% owned by one entity (state, company or individuals)	
	2013	2014	2013	2014
Never traded	48.28	48.15	34.48	29.63
Odd lot trades	66.67	50.00	16.67	37.50
0 trades	39.41	40.00	28.57	28.95
1 trade	29.79	40.74	31.91	27.78
2 or more trades	33.49	33.76	30.93	29.19

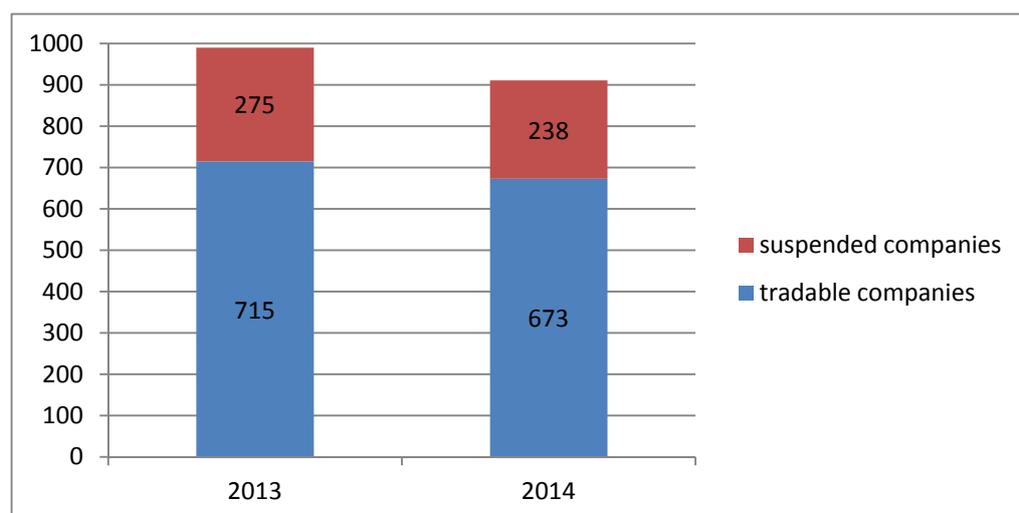
**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

The SIFs and Fondul Proprietatea's positions within the shareholder structure came up as a collateral finding in Pop et al. (2014) and were also investigated within this study. The comparative details are presented in Annex 3. All these closed end funds exit from 1 to 5 companies where they were present as minority shareholders and in two cases their control position decreased. While the number of SIFs and Fondul Proprietatea owned companies is relatively small (17.90% in 2013 and 16.20% in 2014 of RASDAQ tradable companies) these funds are well known by Romanian shareholders and investors and their operations are closely followed.

The Granger causality between the RASDAQ-C index and the dedicated BET-Fi index was investigated at the level of 2014. The results are presented in Annex 3, Tables A3-2 and A3-3. The results of 2013 remain unchanged. The indices seem to influence each other, with BET-Fi having a stronger influence over RASDAQ-C index. The finding further stress the idea that those trading the RASDAQ companies take into consideration the ownership structure and they are more likely to be the existing shareholders rather than portfolio investors.

#### 5. Investigating the trading frequency of RASDAQ tradable companies

Graph 4 presents the structure of RASDAQ listed companies as of December 9<sup>th</sup> in 2013 and 2014. Of the tradable companies, 4.06% in 2013 and 4.01% in 2014 were never traded since start listing; 28.39% in 2013 and 28.23% in 2014 registered 0 trades, while 0.84% in 2013 and 1.19% in 2014 registered only odd lot transactions.

**Graph 4.** *The structure of RASDAQ listed companies in 2013 and 2014*

**Source:** authors' compilation based on data available at [www.bvb.ro](http://www.bvb.ro)

Further, only the companies that registered at least 1 trade during the last 52 weeks were considered. The number of traded companies did not show an important decline in 2014 compared with 2013. This situation is due to the fact that 9 companies suspended in 2013 became tradable and registered trades in 2014. Moreover, one company that was never traded until December 9<sup>th</sup> 2013 registered 2 trades during 2014. One other company that registered only odd lot transactions in 2013 was traded in 2014. Selected findings are presented in Table 6.

The percentage of companies with low trading frequency (less than 1 trade per week) remained unchanged, at about 68.75% during both years. The percentage of low trading frequency companies with a free float lower than 25% increased from 69.82% in 2013 to 72.08% in 2014. The percentage of this category of companies trading on the XMBS segment is about the same, around 91%, in 2014, slightly but not significantly lower than in 2013. Also these companies are the most numerous without a website (47.26% in 2013 and 46.43% in 2014). It is interesting to mention that only 2 of the traded companies from last year decided to create their own website. The number of traded companies paying dividends at least once during the last 3 years decreased in 2014 from about 11% to 9% since no RASDAQ company paid dividends for 2013.

**Table 6.** *Selected findings regarding the RASDAQ companies that registered at least 1 trade*

Number of trades within 52 weeks	Number of companies		Of which with a free float < 25%		Number of companies with no websites		Number of companies that paid dividends during the last 3 years		Number of companies belonging to the respective trading segment			
	2013	2014	2013	2014	2013	2014	2013	2014	XMBS <sup>1)</sup>		RGSB <sup>2)</sup>	
1 to 49 trades	328	308	229	222	155	143	30	20	299	279	29	29
50 to 99 trades	59	51	40	29	18	10	9	4	47	39	12	12
100 to 499 trades	70	68	46	47	12	12	14	13	47	49	23	19
>500 trades	20	21	4	4	0	0	4	4	5	7	15	14
<b>Total</b>	<b>477</b>	<b>448</b>	<b>319</b>	<b>302</b>	<b>185</b>	<b>166</b>	<b>57</b>	<b>41</b>	<b>398</b>	<b>374</b>	<b>79</b>	<b>74</b>

**Notes:** <sup>1)</sup> A quote-driven market segment, using only indicative quotes that represent only the intention and not the obligation to execute an order. Further negotiation might occur and the final price might vary widely from the displayed intention. From anecdotal sources, most of Romanian brokers discourage the trading on XMBS in order to protect their clients.

<sup>2)</sup> An order-driven market, based on auction system, displaying firm quotes and representing the intention to buy/sell at the respective price. Considered a more reliable trading segment and preferred by investors, at the recommendation of their brokers. Apart from the Table 3, only anecdotal sources confirmed this situation.

**Source:** authors' calculations based on data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

Compared with 2013, the percentage of companies that registered more than 500 trades increased slightly from 4.19% to 4.69%. In 2013 ten of these companies registered more than 1000 trades, while in 2014 the number increased at 11. The company with the highest number of transactions is in both years PRSN (symbol) with 6,762 trades in 2013 and 7,302 in 2014. The existence of a website seems to be important for those who traded these companies, since only 4 of them within the group of more than 500 trades do not have a website. The analysis of this group of companies does not reveal a clear preference for a given activity sector or geographical location, as highlighted also in the 2014 research of Pop et al. (2014).

Annex 4 presents more details regarding the structure of RASDAQ companies by trading sectors and by development regions.

Further, the relationship between the trades (as dependent variable), the free float (independent variable) and the presence of a website (dummy variable; 0 when the website existed, 1 otherwise) was investigated at the level of 2014 too through an OLS multiple regression. The descriptive statistics of the variables are presented in Table 7. As it can be observed, for 2014 the number of trades slightly increased (a higher average and a larger maximum value).

The multiple regression results are presented in Tables 8 and 8a for 2013 and respective for 2014. As it can be seen, the results are similar. The relationship between variables is significant. Thus, for the companies traded in 2014 the model explains only 4.98% of the trade's variability, less than in 2013. Similar to 2013, the presence of an important free float increases the chances of a company to be traded frequently, while the absence of a website has a negative influence over trading decision.

**Table 7.** Descriptive statistics for trades and free float

	Trades (over 52 weeks)		Free float (as coefficient)	
	2013	2014	2013	2014
Average	128.36	135.40	0.2113	0.2131
Standard deviation	522.69	545.51	0.1710	0.1727
Minimum	1	1	0.0025	0.0027
Maximum	6,762	7,302	0.9975	1.0000
Coefficient of variation (%)	407.20	402.89	80.93	81.04
Number of observations	477	448	477	448

**Table 8.** Multiple linear regression results for 2013

Parameters	Estimate	P-value	R-squared adjusted
Constant	76.5444	0.0615	-
F <sub>t</sub> (free float)	565.6190	0.0000	-
W <sub>t</sub> (dummy website)	-174.4930	0.0003	-
Model	-	0.0000	5.4070

**Note:** at a confidence level of 95.00%

**Table 8a.** Multiple linear regression results for 2014

Parameters	Estimate	P-value	R-squared adjusted
Constant	84.9392	0.0525	-
F <sub>t</sub> (free float)	554.2090	0.0002	-
W <sub>t</sub> (dummy website)	-182.6090	0.0005	-
Model	-	0.0000	4.9846

**Note:** at a confidence level of 95.00%

At the level of 2014, the investigations over the trades were extended and the following factors were introduced: company's market capitalization, as of December 9<sup>th</sup> 2014, company's debt to equity ratio based on 2013 data, and company's net profit or loss ratio, also based on 2013 data. The descriptive statistics for these independent variables are presented in Table 9. It can be noticed that RASDAQ companies' capitalization is very low, with an average of about 12.7 mil. RON (2.8 mil. EUR). The average debt to equity ratio is also high, much higher than the accepted threshold of 1.5. The net profit to loss ratio for 2013 is

negative and this might explain the total absence of dividends for 2013 for RASDAQ companies<sup>(1)</sup>.

These three new independent variables were added to the previous two (the free float and the dummy for website) and the trades were considered as dependent variable. The relationship was investigated through an OLS multiple regression and the results are presented in Table 10. The relationship between variables is statistically significant and explains 14.57% of the trades' variability. While the influence of free float and the existence of the website remain undisputed, the market capitalization (which might be considered a proxy for company's dimension) seems to have an influence over trades, thus very weak. Debt to equity ratio is important within the model, thus at individual level its influence is significant only at 92% level of confidence. The net profit to loss ratio has no influence at all over the trades. This finding indirectly confirms that RASDAQ companies are rather traded by their existing shareholders, of which some search to concentrate their ownership, rather than by portfolio investors. This finding is also enhanced by the significance of debt to equity ratio, a factor taken into consideration rather by the existing shareholders than by domestic portfolio investors.

**Table 9.** Descriptive statistics for capitalization, debt to equity ratio, net profit or loss ratio (2014)

	Capitalization (RON)	Debt to equity ratio (coefficient)	Net profit or loss ratio (%)
Average	12,667,430.24	5.033	-69.12
Standard deviation	26,841,597.16	14.153	610.05
Minimum	12,058.48	0.000	-10,234.08
Maximum	184,604,256.00	174.767	2,457.61
Coefficient of variation (%)	211.89	281.20	882.60
Number of observations	448	440	430

**Table 10.** Multiple linear regression results for five factors 2014

Parameters	Estimate	P-value	R-squared adjusted
Constant	-47.522	0.3127	-
$F_i$ (free float)	759.3540	0.0000	-
$C_i$ (capitalization)	6.4946E-0.6	0.0000	-
$DE_i$ (debt to equity ratio)	-3.1015	0.0741	-
$PL_i$ (net profit or loss ratio)	-0.0068	0.8652	-
$W_i$ (dummy website)	-124.7000	0.0147	-
Model	-	0.0000	14.5698

**Note 1:** at a confidence level of 95.00%.

**Note 2:** in order to compensate for the missing data, for the 8 companies where the debt to equity ratio could not be calculated it was considered to be 2 (since the acceptable threshold is 1.5), while for the 18 companies where the net profit or loss ration could not be calculated it was considered to be 0. The number of missing observations is negligible and the influence of the chosen level is also very low.

## 6. Which RASDAQ companies have the potential to be transferred on BVB main market?

The regulations regarding the closing of RASDAQ, presented within Introduction, mention the alternatives for the listed companies. The most interesting one is that of being transferred on BVB main market, the most visible and well known Romanian equity market. This section will present several findings regarding the potential companies that might chose to be transferred and accepted by BVB listing committee.

As January 5<sup>th</sup> 2015, BVB changed its category/ tier structure; the Premium category/ tier replaced the former 1<sup>st</sup> category and the Standard category/ tier replaced the former 2<sup>nd</sup> and 3<sup>rd</sup> categories. Since the 22 companies within the Premium category are the largest Romanian companies and most of them considered blue chips, they are no match for the RASDAQ currently traded companies in terms of capitalization and trades registered within the last 52 weeks.

The Standard category is the most likely to accommodate some of the RASDAQ trades companies, given the profile of the listed companies. Table 11 presents the descriptive statistics for the BVB tradable companies, with data registered as of December 9<sup>th</sup> 2014 for trades, free float, and market capitalization. The data for debt to equity ratio, net profit or loss ratio and Tobin's q (total assets) were extracted at the level of 2013. In fact, the data in Table 11 depict a profile of the traded companies within the BVB Standard tier.

**Table 11.** Descriptive statistics for BVB standard category/ tier

	Capitalization (mil. RON)	Trades in 52 weeks	Free float (coefficient)	Debt to equity ratio (coefficient)	Net profit or loss ratio (%)	Tobin's Q
Mean	115.82	2,391	0.2723	2.913	-2.04	0.4082
St.dev.	298.81	3,797	0.1637	2.902	21.97	0.3460
Min.	1.08	54	0.0032	0.018	-92.45	0.0351
Max.	1,940.81	20,255	0.7032	13.278	55.69	1.7629
Count	53	53	53	53	53	53

**Note:** The suspended companies as of December 9<sup>th</sup> 2014 were not taken into consideration

Table 12 and 13 presents the descriptive statistics, respective the profile, of 39 selected RASDAQ traded companies. First, the split by trades was used and it yielded mixed results. It became clear that the market capitalization should be considered as main ranking criterion. As it can be seen, the 27 companies with a market capitalization larger than 50 mil. RON are somewhat similar with Standard BVB companies in terms of average market capitalization and Tobin's q, while the profitability seems better than that of BVB companies. Thus, the average free float is low (lower than required 25%) and the debt to equity ratio almost 2 times higher. Further 12 more companies were investigated. The main criterion remained the market capitalization, combined with the trades. This second group while does not have the average capitalization closer to the BVB Standard companies, it exhibit a minimum capitalization ten times larger than the lowest capitalization within BVB Standard tier. Moreover, the trades are closer to the BVB Standard companies than those of the companies within the first group. The free float, debt to equity ratio and Tobin's q are similar to the BVB Standard companies, while the profitability is better<sup>(2)</sup>.

The profile of the BVB ATS (AeRO) listed companies was not depicted due to two facts: only 3 Romanian companies were listed at the end of 2014 on this segment and their trading frequency was too low in order to provide an accurate company profile.

It remains to be seen which path these 39 selected companies will choose and if they will decide to try the listing on the BVB main market it will be interesting to be seen if they will be selected or not. According to the Romanian media, Ludwik Sobolewski, the general director of BVB, declared in November 2014 that BVB is interested in about 20 to 30 companies from RASDAQ (Tudor, 2014). The current research founds almost a similar number of companies to be interesting to follow.

**Table 12.** Descriptive statistics for selected 27 RASDAQ traded companies with a capitalization larger than 50 mil. RON

	Capitalization (mil. RON)	Trades in 52 weeks	Free float (coefficient)	Debt to equity ratio (coefficient)	Net profit or loss ratio (%)	Tobin's Q
Mean	105.49	685	0.1043	5.613	1.05	0.6619
St.dev.	39.76	1,713	0.0910	9.814	20.83	0.6889
Min.	52.15	1	0.0027	0.048	-37.41	0.0873
Max.	184.60	7,302	0.3247	36.119	62.19	3.0340
Count	27	27	27	27	27	27

**Note:** These 27 companies include one company from RASDAQ 1<sup>st</sup> tier (PTRO) and one company from RASDAQ second tier (CMVX)

**Table 13.** Descriptive statistics for selected 12 RASDAQ traded companies with a capitalization between 10 and 50 mil. RON and trades larger than 500

	Capitalization (mil. RON)	Trades in 52 weeks	Free float (coefficient)	Debt to equity ratio (coefficient)	Net profit or loss ratio (%)	Tobin's Q
Mean	24.39	1,323	0.3634	1.768	4.66	0.3150
St.dev.	10.48	929	0.2020	3.150	8.74	0.2217
Min.	11.03	232	0.0499	0.156	-13.34	0.0652
Max.	45.90	3,038	0.6662	11.478	23.73	0.6941
Count	12	12	12	12	12	12

**Note:** To the 9 companies identified, other 3 from 1<sup>st</sup> tier (UPET) and 2<sup>nd</sup> tier (BRCR and TEHO) were added; they registered over 200 trades within 52 weeks; the symbol INBI was eliminated because the data indicate a highly overvalued company (Tobin's q larger than 10) based on speculative reasons.

## Conclusions

The present paper continues the investigations on RASDAQ market initiated by Pop et al. (2014) by extending the period under scrutiny to December 2014. The changes that took place during 2014 are highlighted and the hypothesis formulated by Pop et al. (2014) reinvestigated. The current findings confirm the hypothesis previously formulated. RASDAQ has been under the influence of BVB and overshadowed by it; therefore RASDAQ was only secondarily considered as an alternative for portfolio investments. The January effect and the weekend effect became even weaker by extending the investigation period confirming the fact that RASDAQ was rather ignored by portfolio investors. By adding new independent variables in investigating the trades' variability, it was reinforced that RASDAQ was used by mainly by the existing shareholders involved in the ownership concentration process.

The decisions taken through the October and November 2014 regulations, Law 151/ 2014 and Rule 17/ 2014 established that 2015 will be the last year when RASDAQ remains open and confirms the main conclusion of Pop et al. (2014) that the RASDAQ played its role as intermediary of ownership concentration for the listed companies.

Further, the paper tried to establish how many companies would be interesting to be transferred within BVB Standard tier. The investigation were based on the similarity of company profiles based on market capitalization, trades within 52 weeks, debt to equity ratio, net profit or loss ratio, and Tobin's q. A number of 39 companies were identified, a little higher than that mentioned by BVB general director.

The year 2015 will be interesting to follow at RASDAQ from the continuing of ownership concentration point of view, which might even generate an increase in trading activity. Moreover, it will be interesting to follow if the selected 39 companies will be accepted to be listed on the main market. Also it will be interesting to see how many companies will chose to be transferred on BVB ATS segment. An overlooked alternative is the equity segment at SIBEX and some companies might choose it.

Nevertheless, 2015 will sign the end of the controversial RASDAQ market. At the end, a line could be drawn and one will be able to count what inheritance RASDAQ left behind for the Romanian security market.

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## Notes

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- (1) There was a trial to replace the free float with the number of shares available for trade but a number of traded companies registered changes (increase or diminish) in their equity capital and it would have been too difficult to track down when the change occurred.
- (2) Table A5-2 within Annex 4 presents the structure of RASDAQ traded companies based on market capitalization, debt to equity ratio, net profit or loss ratio and Tobin's q. The results are interesting and show how largely undervalued the RASDAQ traded companies are, while their profitability is low. The debt to equity ratio indicates an adequate situation for about 52% of the traded companies. About 23% of the traded companies exhibit a debt to equity ratio larger than 5, having an increased risk to become insolvent.

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## Annex 1

**Table A1-1.** First and second categories/ tiers at RASDAQ

Year	Number of listed companies		% of the tier in market capitalization		% of the tier in market turnover	
	1 <sup>st</sup> tier	2 <sup>nd</sup> tier	1 <sup>st</sup> tier	2 <sup>nd</sup> tier	1 <sup>st</sup> tier	2 <sup>nd</sup> tier
2002	10	25	n/a	n/a	7.53	1.31
2003	15	17	14.47	4.76	13.00	5.42
2004	11	17	7.16	9.03	21.45	4.39
2005	9	17	3.96	11.94	17.27	19.36
2006	9	13	6.40	4.31	7.61	3.18
2007	9	11	4.48	3.85	3.90	1.33
2008	7	9	5.22	3.88	3.32	12.74
2009	6	9	3.72	4.42	7.67	2.31
2010	5	9	1.86	4.17	11.14	1.14
2011	4	8	3.03	1.63	8.91	0.96
2012	4	7	3.52	2.18	5.44	1.98
2013	4	7	3.15	2.63	2.69	0.50
2014	4	5	2.23	2.58	0.68	1.36
average	-	-	4.93	4.62	8.51	4.31

**Note:** Figures reported as the end of the year

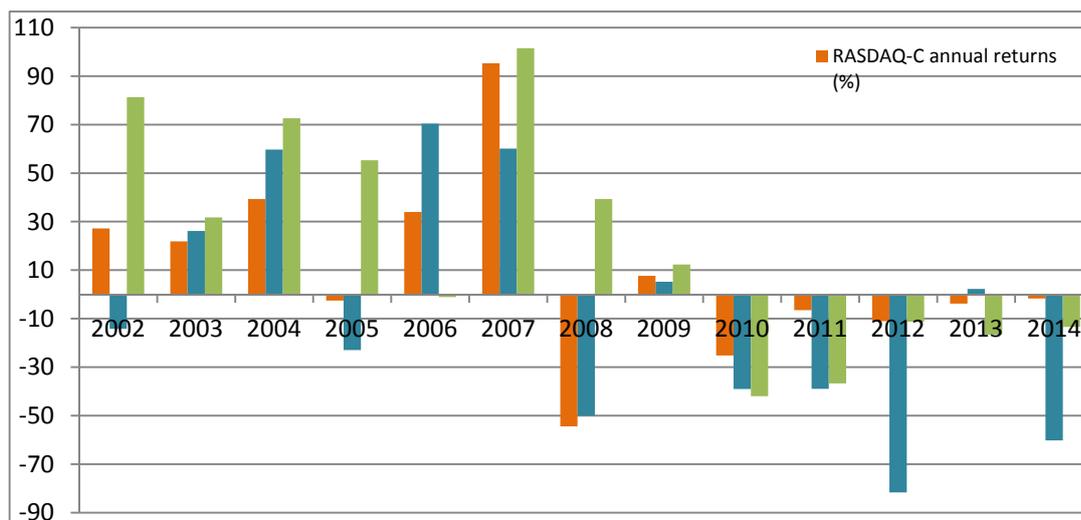
**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) and previously available at [www.rasdaq.ro](http://www.rasdaq.ro)

**Table A1-2.** Selected conditions for 1<sup>st</sup> and 2<sup>nd</sup> tier constituents as of December 2013

1 <sup>st</sup> category: equity capital = minimum 1 mil. EUR free float = minimum 15%					
Company symbol	Equity capital (mil. EUR)		Free float (%)		Comments
	2013	2014	2013	2014	
BRCR	1.0	1.0	58.02	57.27	-
PTRO	47.5	47.9	1.64	1.64	under minimum free float
SEVE	2.8	2.8	10.52	10.52	under minimum free float
UPET	6.7	6.7	34.00	34.00	-
2 <sup>nd</sup> category equity capital = minimum 0.5 mil. EUR free float = minimum 10%					
Company symbol	Equity capital (mil. EUR)		Free float (%)		Comments
	2013	2014	2013	2014	
AUTT	0.9	-	13.50	-	delisted
CMVX	3.2	3.2	8.63	8.63	under minimum free float
CONFM	0.6	-	49.05	-	suspended 2013; delisted 2014
FLAO	0.8	0.9	22.89	22.89	-
INOX	2.4	2.5	47.71	47.71	-
TEHO	1.2	1.3	12.75	7.24	under minimum free float 2014
UNISEM	8.4	1.8	23.05	23.05	-

**Source:** based on the data available at [www.bvb.ro](http://www.bvb.ro)

**Graph A1-1.** RASDAQ-C, RAQ-I, and RAQ-II annual returns



**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) and previously available at [www.rasdaq.ro](http://www.rasdaq.ro)

Table A1-3. The situation of the companies listed within the 1<sup>st</sup> and 2<sup>nd</sup> RASDAQ tiers

Company symbol	Number of trades over 52 weeks		Listing tier	Observations
	2013	2014	2013 and 2014	
TEHO	450	232	2 <sup>nd</sup>	
CMVX	377	172	2 <sup>nd</sup>	
UNISEM	352	n/a	2 <sup>nd</sup>	suspended 2014
UPET	253	265	1 <sup>st</sup>	
BRCR	215	262	1 <sup>st</sup>	
PTRO	143	301	1 <sup>st</sup>	
AUTT	50	n/a	2 <sup>nd</sup>	delisted 2014
SEVE	29	24	1 <sup>st</sup>	
FLAO	24	49	2 <sup>nd</sup>	
INOX	2	55	2 <sup>nd</sup>	
CONMF	0	n/a	2 <sup>nd</sup>	delisted 2014

**Source:** based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

## Annex 2

The general hypothesis: **RASDAQ-C does not Granger cause BET-C and it is not Granger caused by it**. In order to be tested, H1 and H2 were issued, with further two subsequent hypotheses for the sub-periods taken into considerations.

Using E-view, the hypotheses were tested for every lag from 1 to 5:

**H1: RASDAQ-C does not Granger cause BET-C for the entire analysis period, August 1998 - December 2014**

H1a: RASDAQ-C does not Granger cause BET-C for the sub-period August 1998 - December 2005

H1b: RASDAQ-C does not Granger cause BET-C for the sub-period January 2006 - December 2014

and

**H2: BET-C does not Granger cause RASDAQ-C for the entire period, August 1998 - December 2014**

H2a: BET-C does not Granger cause RASDAQ-C for the sub-period August 1998 - December 2005

H2b: BET-C does not Granger cause RASDAQ-C for the sub-period January 2006 - December 2014

The results are presented in the next tables below.

**Table A2-1.** The results for H1, H1a, and H1b

Lags	1	2	3	4	5
P-value for H1	0.3549	0.5583	0.5430	0.2438	0.0019
P-value for H1a	0.0337	0.0643	0.1058	0.1554	0.0479
P-value for H1b	0.8162	0.9419	0.8414	0.0477	0.0137

As it can be observed, H1 is accepted for 1 to 4 lags and rejected for 5 lags. H1a is rejected for 1 lag and 5 lags and accepted for 2 to 4 lags, while H1b is accepted for 1 to 3 lags and rejected for 4 and 5 lags.

**Table A2-2.** The results for H2, H2a, and H2b

Lags	1	2	3	4	5
P-value for H2	0.0000	0.0000	0.0000	0.0000	0.0000
P-value for H2a	0.0000	0.0000	0.0000	0.0000	0.0000
P-value for H2b	0.0000	0.0000	0.0000	0.0000	0.0000

Table A5-2 shows that all three hypotheses are rejected for all lags.

The situation is unchanged compared with the findings at 2013 level.

#### The January effect at RASDAQ and BVB

**Table A2-3.** The January effect for the entire period August 1998 - December 2013 & August 1998 - December 2014

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.067	0.041	0.020	0.020
$a_1$	-0.044	-0.032	-0.012	-0.023
$a_2$	-0.087	-0.051	-0.032	-0.031
$a_3$	-0.044	-0.016	-0.011	-0.007
$a_4$	-0.095	-0.040	-0.023	-0.031
$a_5$	-0.047	-0.136	-0.001	-0.005
$a_6$	-0.030	0.006	0.016	-0.011
$a_7$	-0.062	-0.032	-0.004	-0.004
$a_8$	-0.061	-0.056	-0.019	-0.022
$a_9$	-0.049	-0.046	-0.021	-0.020
$a_{10}$	-0.067	-0.040	-0.016	-0.022
$a_{11}$	-0.059	-0.032	-0.051	-0.049
$R_{t-1}$	0.194	0.055	0.075	0.1124

**Table A2-4.** *The January effect for the sub-period August 1998 – December 2005*

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.110	0.110	0.024	0.024
$a_1$	-0.092	-0.092	-0.011	-0.011
$a_2$	-0.153	-0.153	-0.049	-0.049
$a_3$	-0.085	-0.085	-0.011	-0.011
$a_4$	-0.086	-0.086	-0.029	-0.029
$a_5$	-0.078	-0.078	-0.011	-0.011
$a_6$	-0.104	-0.104	0.018	0.018
$a_7$	-0.069	-0.069	-0.021	-0.021
$a_8$	-0.100	-0.100	0.007	0.007
$a_9$	-0.089	-0.089	-0.006	-0.006
$a_{10}$	-0.091	-0.091	0.010	0.010
$a_{11}$	-0.102	-0.102	-0.055	-0.055
$R_{t-1}$	0.162	0.162	0.033	0.033

**Table A2-5.** *The January effect for the sub-period January 2006 – December 2013 & January 2006 –December 2014*

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.041	-0.031	0.023	0.025
$a_1$	-0.017	0.033	-0.008	-0.020
$a_2$	-0.028	0.052	-0.039	-0.036
$a_3$	-0.031	0.062	-0.027	-0.022
$a_4$	-0.116	0.000	-0.053	-0.058
$a_5$	-0.043	-0.149	-0.042	-0.046
$a_6$	0.004	0.092	-0.016	-0.014
$a_7$	-0.029	0.034	0.014	0.008
$a_8$	-0.038	0.007	-0.084	-0.075
$a_9$	-0.029	0.005	-0.015	-0.019
$a_{10}$	-0.048	0.012	-0.017	-0.026
$a_{11}$	-0.014	0.040	-0.029	-0.030
$R_{t-1}$	0.259	0.062	0.183	0.117

When the period under scrutiny was extended to December 2014, the July effect identified in 2013 completely disappeared, leaving only a very weak January effect.

For the first sub-period, at RASDAQ, a July effect, a September effect, and a November effect appeared. Being weaker than the January effect, they were ignored. For the second sub period, RASDAQ-C shows a weak August effect in both years. However, this effect is weaker than the January effect and could be ignored.

For the entire period, BVB exhibit a stronger January effect than RASDAQ and also a very weak July effect at 2014 level. For the first sub-period, BVB shows a January effect, five time stronger than in the case of RASDAQ. For the second sub-period, the pattern of BVB monthly effect changes compared with 2013. The January effect disappears, while it appears in the case of other 10 months of the year, with a stronger July effect. This indicate changes in BVB trading patterns, thus they are of no interest within the present research.

#### *The weekend effect at RASDAQ and BVB*

**Table A2-6.** *The weekend effect for the entire period August 1998 – December 2013 & August 1998 – December 2014*

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.0012	0.0005	-0.0004	-0.0013
$a_1$	-0.0014	-0.0034	-0.0009	-0.0008
$a_2$	-0.0006	-0.0008	0.0013	0.0022
$a_3$	-0.0004	-0.0004	0.0006	0.0014
$a_4$	-0.0001	0.0010	0.0013	0.0024
$R_{t-1}$	0.1755	0.1558	0.1920	0.2012

**Table A2-7.** *The weekend effect for the sub-period August 1998 – December 2005*

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.0011	0.0011	0.0003	0.0003
$a_1$	-0.0007	-0.0007	-0.0004	-0.0004
$a_2$	0.0002	0.0002	0.0000	0.0000
$a_3$	-0.0003	-0.0003	0.0014	0.0014
$a_4$	-0.0004	-0.0004	0.0006	0.0006
$R_{t-1}$	0.2611	0.2611	0.0719	0.0719

**Table A2-8.** *The weekend effect for the sub-period January 2006 – December 2013*

	BET-C		RASDAQ-C	
	2013	2014	2013	2014
$\mu$	0.0015	0.0008	0.0013	0.0009
$a_1$	-0.0022	-0.0054	-0.0010	-0.0013
$a_2$	-0.0019	-0.0018	-0.0016	-0.0009
$a_3$	-0.0010	-0.0008	-0.0018	-0.0010
$a_4$	-0.0006	0.0002	-0.0009	-0.0003
$R_{t-1}$	0.1143	0.0000	0.0644	0.0396

In the case of weekend effect, for the entire period and the two sub periods the situation remains almost unchanged. The only important change is that, where the weekend effect existed, it becomes weaker in 2014 compared with 2013 findings.

## Annex 3

**Table A3-1.** RASDAQ companies owned by the BVB listed investment companies

Investment company name & symbol	Owned companies' status	Owned companies						Total	
		75% or more		50% to 74.99%		less than 50%		2013	2014
		2013	2014	2013	2014	2013	2014		
SIF Banat-Crisana (SIF1)	Listed	3	2	0	1	20	18	23	21
	Traded	1	1	0	0	7	10	8	11
	0 trades	2	1	0	1	5	4	7	6
SIF Imobiliare plc* (SIF1)	Listed	6	6	2	1	0	0	8	7
	Traded	6	4	1	1	0	0	7	5
	0 trades	0	2	0	0	0	0	0	2
SIF Moldova (SIF2)	Listed	2	2	0	0	23	21	25	23
	Traded	2	2	0	0	12	15	14	17
	0 trades	0	0	0	0	6	5	6	5
SIF Transilvania (SIF3)	Listed	11	11	6	6	37	32	54	49
	Traded	7	8	6	6	24	19	37	33
	0 trades	4	3	0	0	7	8	11	11
SIF Muntenia (SIF4)	Listed	6	6	2	2	33	31	41	39
	Traded	5	2	1	1	27	21	33	24
	0 trades	0	0	0	0	4	6	4	6
SIF Oltenia (SIF5)	Listed	4	4	3	2	14	10	21	16
	Traded	4	4	3	2	13	8	20	14
	0 trades	0	0	0	0	0	1	0	1
Fondul Proprietatea	Listed	2	1	1	1	10	8	13	11
	Traded	2	1	1	1	6	4	9	5
	0 trades	0	0	0	0	3	2	3	2

**Note:** SIF Muntenia (SIF4) created at the end of 2013 a consultancy company that took over its holdings in several companies. Given the controlling position SIF4 has within this new company, the two RASDAQ listed companies were the new shareholder occurred were considered under SIF4 control.

Source: authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014

**H3: RASDAQ-C does not Granger cause BET-FI for the entire period (Nov.2001 to December 2014)**

*H3a: RASDAQ-C does not Granger cause BET-FI for the sub-period November 2001 – December 2005*

*H3b: RASDAQ-C does not Granger cause BET-FI for the sub-period January 2005 – December 2014*

and

**H4: BET-FI does not Granger cause RASDAQ-C for the entire period (Nov.2001 to December 2014)**

*H4a: BET-FI does not Granger cause RASDAQ-C for the sub-period November 2001 – December 2005*

*H4b: BET-FI does not Granger cause RASDAQ-C for the sub-period January 2005 – December 2014*

The results are presented in the following tables.

**Table A3-2.** The results for H3, H3a, and H3b

Lags	1	2	3	4	5
P-value for H3	0.0074	0.0235	0.0580	0.0025	0.0011
P-value for H3a	0.0100	0.0186	0.0332	0.1006	0.1989
P-value for H3b	0.1041	0.2560	0.4408	0.0109	0.0033

**Table A3-3.** The results for H4, H4a, and H4b

Lags	1	2	3	4	5
P-value for H4	0.0000	0.0000	0.0000	0.0000	0.0000
P-value for H4a	0.0004	0.0014	0.0002	0.0002	0.0006
P-value for H4b	0.0000	0.0000	0.0003	0.0007	0.0014

As the results show, for the entire period H3 and H4 are rejected for all considered lags. For the first sub-period, H3a is rejected for lags 1 to 3 and accepted for lags 4 and 5, while for the second sub-period H3b is accepted for lags 1 to 3 and rejected for lags 4 and 5.

H4a and H4b are rejected for all lags.

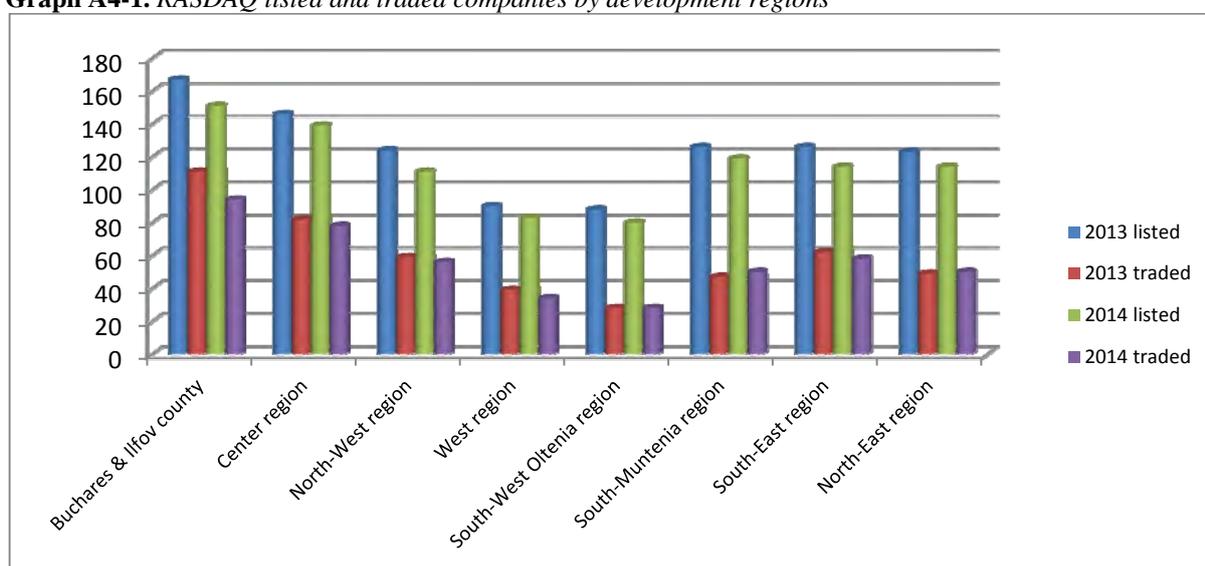
The situation remains unchanged compared with the results obtained at 2013 level.

## Annex 4

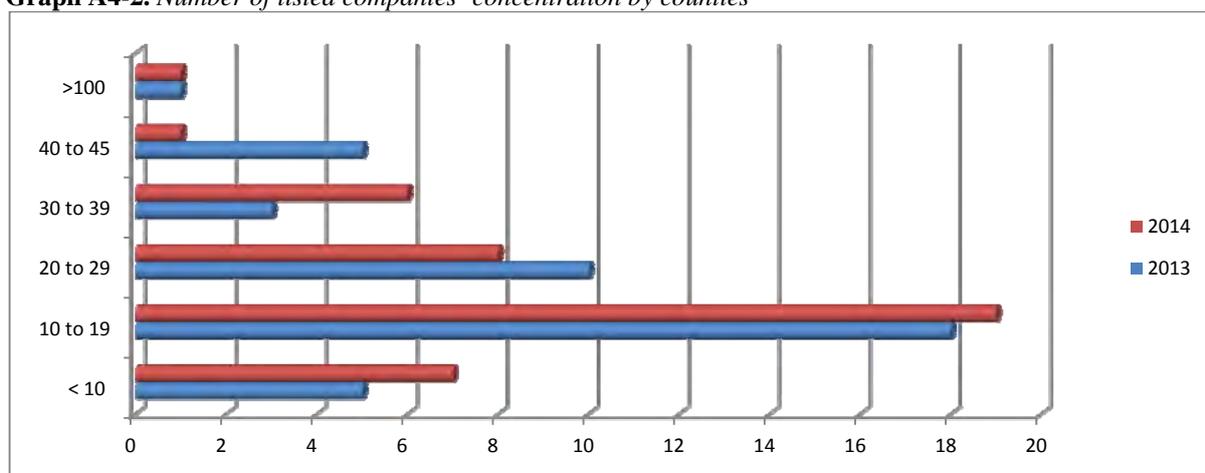
**Table A4-1.** RASDAQ listed and traded companies by sector (%)

Sector	Listed companies		Traded companies	
	2013	2014	2013	2014
Agriculture, forestry and fishing	7.83	8.17	5.03	5.13
Industry	43.78	43.83	46.33	47.10
Constructions	8.39	8.47	8.60	8.26
Services	13.15	13.08	13.84	13.84
Tourism & travel	8.11	7.88	8.81	9.82
Transports	6.99	6.84	4.40	9.38
Trade	9.65	9.66	9.85	9.38
Other sectors (science & technology, culture & recreation, financial intermediation)	2.10	2.08	3.14	2.46

**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

**Graph A4-1.** RASDAQ listed and traded companies by development regions

**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

**Graph A4-2.** Number of listed companies' concentration by counties

**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2013 and December 9<sup>th</sup> 2014.

**Table A4-2.** Structures of RASDAQ traded companies by capitalization, debt to equity ratio, net profit or loss ratio and Tobin's Q

Structure by capitalization		Structure by debt to equity ratio		Structure by net profit or loss ratio		Structure by Tobin's Q	
< 1 mil. RON (< 0.25 mil. EUR)	24.33%	0 to 0.999	43.41%	loss	42.33%	0.0000 to 0.0999	25.45%
1 to 4.99 mil. RON (0.25 to 1.12 mil. EUR)	32.37%	1 to 4.999	33.18%	0 to 0.99%	17.67%	0.1000 to 0.4999	47.95%
5 to 9.99 mil. RON (1.13 to 2.24 mil. EUR)	16.07%	5 to 9.999	12.95%	1 to 4.99%	17.91%	0.5000 to 0.9999	17.74%
10 to 49.99 mil RON (2.25 to 11.24 mil. EUR)	21.21%	10 to 49.999	9.32%	5 to 5.99%	7.67%	1.0000 to 4.9999	7.95%
50 to 99.99 mil. EUR (11.25 to 22.49 mil. EUR)	2.90%	≥ 50.000	1.41%	10 to 49.99%	10.47%	≥ 5.0000	0.91%
≥ 100 mil. RON (≥ 22.5 mil. EUR)	3.12%			≥ 50.00%	3.95%		

**Source:** authors' calculations based on the data available at [www.bvb.ro](http://www.bvb.ro) as of December 9<sup>th</sup> 2014 and <http://www.mfinante.ro/agentcod.html?pagina=domenii>

It must be mention the within the interval 0 to 0.999 of structure by debt to equity ratio, the bulk of companies register ratios between 0.100 and 0.499.

If the threshold for debt to equity ratio is considered 1.5, a number of 223 companies are under this limit; 217 companies overpass 1.5 and for 8 companies the information was not available.

While gathering the information for the data presented in Table A5-2 above, 235 companies displayed data form 2013 on BVB website, while 205 companies provided older data, from 2012 or older (in some cases from 2005); for 8 companies no data could be found for 2013 even on the Ministry of Finance website. This fact shows that for about 46% of the traded companies, the transparency regarding the financial data is not important. One only could conclude that most of these 205 companies along with the 8 with no data available are mainly or solely traded by the existing shareholders since a portfolio investor is supposed to look at this kind of transparency.

# Evaluating the performance of volatility forecasts with the aid of statistical criteria

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**Abstract.** *This paper focuses on the use of statistical criteria for evaluating the forecasting performance of volatility models. The empirical analysis included eight volatility models, ranging from the IGARCH to stochastic volatility, and produced out-of-sample forecasts for five stock indices considering two distinct time intervals: the crisis of 2007-2009 and the recovery period of 2012-2014. Individual rankings of the forecasts showed that evaluation results are heavily impacted by the choice of criteria, the choice of volatility proxies and the considered time intervals. On the other hand, the average rank indicated the superiority of asymmetric models in the case of stock indices, as well as the superiority of models based on heavy-tailed distributions relative to those with Gaussian errors. Aggregating the results, EGARCH and stochastic volatility emerged as the most accurate forecasts but the statistical criteria employed in this study were not able to delimit clearly the best of the two models.*

**Keywords:** volatility forecast, loss function, volatility proxy, GARCH models, stochastic volatility.

**JEL Classification:** C58, G17.

## 1. Introduction

Volatility models are widely encountered in all areas of finance. For example, as pointed out by Minovic (2009), they are employed for optimizing portfolio selection and asset allocation, for derivatives and asset pricing, for computing various risk measures and many other purposes. Considering the numerous ways in which volatility models affect financial theory and practice, it is quite natural to develop certain tools for assessing their performance. Indeed, the existing literature dealt with various issues related to the evaluation of volatility forecasts. Unfortunately, many contributions, while being very valuable, approach the subject from different angles and do not allow for obtaining a uniform set of evaluation criteria. Thus, the results may be sometimes contradictory and inconclusive.

Alexander (2001) divided the evaluation criteria into two categories: statistical and operational. While the first ones rely on various goodness-of-fit measures, the operational criteria are dependent on the specific application of the volatility model. For example, volatility forecasts may be evaluated by means of the profit they generate in certain trading or hedging scenarios. However, the ranking of the forecasts will be highly dependent on the considered trading/hedging strategies. On the other hand, if the volatility models are employed for risk management they can be evaluated by means of a risk measure (usually Value-at-Risk). To sum up, the obvious advantage of operational criteria is that the selected model will suit best the particular need of the researcher. Yet, the choice of models becomes much more subjective and, most likely, a different model will be selected if the aim of the research changes. Therefore, with the purpose to achieve more objective and generally applicable results, this paper will focus on statistical criteria.

Christoffersen (2003) described a very simple method for assessing the performance of a volatility model based on the fact that asset returns are affected by volatility clustering. A volatility model is expected to seriously ameliorate or even eliminate this feature. Thus, it can be evaluated by checking if the standardized returns are still affected by volatility clustering.

Another widely popular approach is to compare volatility forecasts by means of loss functions such as RMSE, MAE, MAPE and many others. For example, Brailsford and Faff (1996) evaluated the forecasting performance of eleven volatility models, ranging from the random walk to the GJR-GARCH, by means of various loss functions. They obtained conflicting results, concluded that ranking volatility models is quite sensitive to the choice of accuracy measures and recommended that the evaluation results should be interpreted with caution. On the other hand, Alexander (2001) made a strong case against the use of RMSE based on two reasons. Firstly, the RMSE applies to mean forecasts, not to volatility ones, because one of its hypotheses assumes that volatility is constant. Secondly, when used to compare the variance forecasts with the squared returns, it will lead to inaccurate results because the standard error is quite large. In a move towards developing the general theoretical framework of loss functions, Hansen and Lunde (2006) obtained a sufficient condition for the robustness of these criteria. Patton (2011) went further and formulated necessary and sufficient conditions for the robustness of loss functions. Moreover, he analyzed nine of the most popular ones and concluded that only two of them, namely the MSE and QLIKE, are robust to noise in volatility proxies. The results obtained by Patton and Sheppard (2008) also suggested that QLIKE loss function has the greatest power when it comes to ranking volatility forecasts. Additionally, they drew attention to the risk of using non-robust loss functions because they may lead to flawed rankings even when employing less noisy volatility proxies.

Numerous researchers evaluated volatility forecasts by means of the Mincer-Zarnowitz regression which is estimated between a series of forecasts and the series of a volatility proxy. Meddahi (2002) showed that the rankings based on the R-squared from the regression are robust if the volatility proxy is unbiased. Since squared returns are often used as a volatility proxy, Christoffersen (2003) pointed out that they are quite noisy which will lead to very low

values of the R-squared, usually around 5%. Consequently, he recommended the use of less noisy volatility proxies such as the intra-daily range and the realized volatility. Another solution for this problem would be to modify the regression so that it would be less sensitive to noise. Thus, Pagan and Schwert (1990) and Engle and Patton (2001) suggested a regression between logarithmically transformed variables. However, Hansen and Lunde (2006) showed that the R-squared from the logarithmic regression does not generate robust rankings of volatility forecasts. On the other hand, Patton and Sheppard (2008) proposed an improvement of the Mincer-Zarnowitz regression by using the generalized least squares method which enhances the power of this criterion for finite samples.

Another statistical criterion, described by Alexander (2001), is the out-of-sample likelihood of the returns taking into account the series of volatility forecasts. The model which yields the highest value of the likelihood may be considered the most suitable one. However, this method is highly dependent on the assumptions made for the distribution of the returns, so, if they are wrong, the rankings based on the likelihood are not reliable.

The vast literature dedicated to assessing the accuracy of volatility forecasts comprises many empirical studies concerning the performance of GARCH models. Thus, Hansen and Lunde (2005) developed an extensive comparison between 330 GARCH-type models and concluded that the simplest model, namely the GARCH(1,1), performs similar to more complex extensions of the GARCH class while, in the case of stocks, it is outranked by asymmetric models because they are able to capture the leverage effect. Awartani and Corradi (2005) confirmed that result pointing out that only asymmetric models are able to perform better than the GARCH (1,1) in terms of volatility forecasting. Matei (2009) also developed a critical analysis of the main volatility forecasting techniques and established that GARCH models are the most suitable option in the case of stocks when large data series are available. Chen et al. (2010) proposed enhancing the GARCH models with the aid of the support vector machine. Their model proved to be more accurate but the standard GARCH and the EGARCH also generated reliable forecasts. Chortareas et al. (2011) advocated the use of intra-day data when forecasting the volatility of exchange rates. Their results indicated that intra-day FIGARCH and ARFIMA models lead to better forecasts than traditional volatility models.

On the other hand, the more complex approach represented by stochastic volatility models emerged as the main competitor for GARCH-type models. Thus, from the simple stochastic volatility model, extensions have been formulated in order to address the features of asset returns. For example, Tsiotas (2012) proposed a generalized asymmetric stochastic volatility model which is able to capture both the volatility asymmetry and the non-normality of the returns and proved its superiority towards the existing models from the same class. Chan and Hsiao (2014) introduced a stochastic volatility model which can account for serial dependence among the errors, as well as for the heavy tails of the returns' distribution. However, while the performance of GARCH and stochastic volatility models seems to be comparable, sometimes one approach slightly prevailing over the other, GARCH models retain the advantage of being far more easier to estimate, most of them being also implemented in standard econometric software packages.

Concluding this short presentation of the main criteria used for evaluating and ranking volatility models, it is easy to notice that while there are many evaluation methods they tend to contradict one another, making it difficult to obtain a unitary conclusion when analyzing volatility forecasts. Therefore, based on previous research, this paper sets out to explore the use of the main statistical criteria in the context of forecasting the volatility of stock indices representing some of the major financial markets. The empirical study focuses both on the parameters that are involved in the evaluation process and may cause significant ranking differences but also on possibilities to formulate a general conclusion from contradictory individual rankings. Thus, from this point on, the paper is structured as follows: Section 2

describes the data series and the methodology of the analysis, Section 3 presents the main results of the empirical study while the last section gives the conclusions of the paper.

## 2. Data and methodology

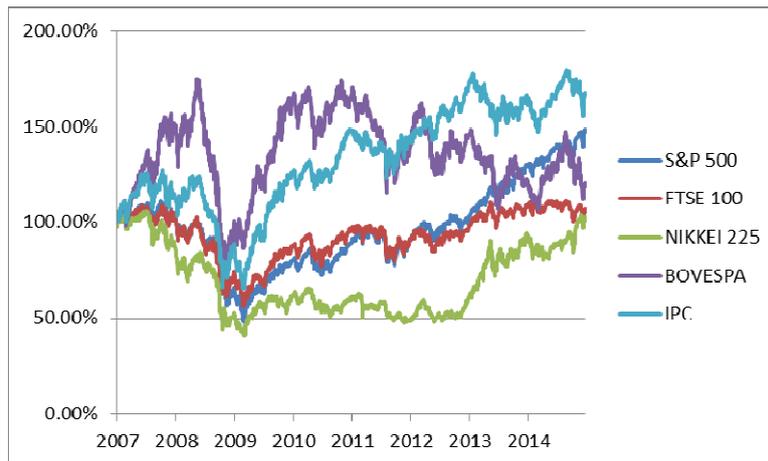
The empirical analysis was developed on five stock indices representing some of the most important financial markets in the world, both advanced and emerging ones, as follows: S&P 500 (for the US stock market), FTSE 100 (for the British stock market), NIKKEI 225 (for the Japanese stock market), BOVESPA (for the Brazilian stock market) and IPC (for the Mexican stock market). All the data series are daily and cover a 12 years interval between 2003 and 2014. The adjusted close values of the indices were obtained from Yahoo Finance and the study was based on the corresponding daily log-returns.

In order to cover some of the most popular approaches for volatility forecasting, as well as some more complex ones, the following models were considered:

- The IGARCH (1,1) model, taking into account that it is more flexible than the EWMA with a fixed parameter of 0.94, as proposed by RiskMetrics;
- The “plain vanilla” GARCH (1,1) which is the simplest model of the GARCH class but also a very effective one, as shown by previous research;
- The EGARCH (1,1,1) which is one of the most popular asymmetric volatility models that might be needed in order to capture the leverage effect of stock indices;
- A stochastic volatility model with MA errors (denoted SV), as described in Chan and Hsiao (2014).

While the selected models cover some of the most representative specimens of the GARCH class and of the more sophisticated stochastic volatility approach, it must be also taken into account that, according to the stylized facts of asset returns (Cont, 2001), conditional returns tend to exhibit heavy tails. Therefore, all the models were estimated assuming a normal distribution for the standardized returns (denoted N), as well as a t-Student distribution (denoted t) which is able to account for heavy tails. As a result, eight models have been employed in order to forecast the volatility of the five indices.

All the forecasts were done out-of sample, using a rolling window of four years of previous data for the estimation of the models and the following year for out-of-sample forecasting. Thus, the models were firstly estimated on the basis of the 2003-2006 interval and produced forecasts for 2007. Then, the estimation window rolled one year producing forecasts for 2008 and so on, the eight volatility models being recalibrated at every roll on the basis of the new data series. Moreover, in order to investigate the performance of volatility forecasts under quite different market conditions, the forecasting period has been split into two distinct intervals: the global market crash of 2007-2009 and the recovery of 2012-2014. Figure 1 depicts the evolution of the considered indices over the 2007-2014 period, emphasizing the differences between the considered intervals. In order to ensure the comparability of the data, the daily values of the indices are expressed as percentage of the first observation.

**Figure 1.** The evolution of the five indices between 2007 and 2014

All parameter estimations for the GARCH models were done in EViews while the stochastic volatility models were obtained via MATLAB on the basis of the methodology and code provided by Chan and Hsiao (2014). Each GARCH model was checked in order to ensure the significance of the coefficients, their positive sign (in the case of GARCH and IGARCH) and the stationarity of the volatility process (in the case of GARCH). In the very few cases when a model did not satisfy the above mentioned conditions, it was replaced by the model estimated for the previous window of four years. Estimation results indicated the presence of leverage effects captured by the EGARCH model, the asymmetry coefficient being statistically significant in all cases. Also, the models that were estimated based on the t-Student distribution proved to be statistically significant suggesting that the heavy tails of the conditional returns may require a heavy-tailed distribution instead the normal one.

The volatility forecasts obtained for each index and for each time interval were then ranked according to the following statistical criteria ( $h$  denotes a volatility forecast and  $\sigma^2$  is a conditionally unbiased volatility proxy):

- The MSE loss function:  $L(\sigma^2, h) = (\sigma^2 - h)^2$ ;
- The QLIKE loss function:  $L(\sigma^2, h) = \ln h + \sigma^2/h$ . The choice of loss functions is based on Patton (2011) who established that MSE is the only robust loss function based exclusively on the forecast error and QLIKE is the only robust loss function based exclusively on the standardized forecast error;
- The R-squared of the Mincer-Zarnowitz regression:  $\sigma_t^2 = \alpha + \beta h_t + \varepsilon_t$ , since Meddahi (2002) proved that the rankings based on it are robust to noise in the volatility proxy.

The choice of statistical criteria was restricted to the above three taking into account the following reasons: the autocorrelations of the standardized returns (Christoffersen, 2003) are used for in-sample model checking and not for assessing the accuracy of out-of-sample forecasts; the likelihood approach (Alexander, 2001) is heavily dependent on choosing a suitable distribution for the conditional returns; other loss functions are not robust according to Patton (2011) while other modifications of the Mincer-Zarnowitz regression may result in size distortions, according to Patton and Sheppard (2008).

Since each selected criterion relies on the use of an unbiased volatility proxy, there are three possibilities according to Patton (2011):

- The squared returns, which are rather noisy;
- The intra-daily range:  $RG_t^2 = (\ln S_t^{High} - \ln S_t^{Low})^2 / 4 \ln(2)$ , where  $S_t^{High}$  and  $S_t^{Low}$  are the highest and the lowest prices recorded during day  $t$ ;
- The realized volatility:  $RV_t^{(m)} = \sum_{i=1}^m R_{i,m,t}^2$ , where there are  $m$  observations per trading day, recorded at equal time intervals.

The realized volatility requires intra-day observations which were not available for the considered indices. As a result, the rankings were done using the squared returns and the intra-daily range in order to observe the implications of different volatility proxies on the evaluation of the forecasts.

Summarizing the methodology, the forecasts provided by the eight volatility models considered in this study (IGARCH, GARCH, EGARCH and SV with both normal and t-Student errors) were ranked for each of the five stock indices, taking into account two distinct forecasting intervals (2007-2009 and 2012-2014), on the basis of three statistical criteria (MSE, QLIKE and R-squared of Mincer-Zarnowitz regression) and two volatility proxies (the squared returns and the intra-daily range). In the case of MSE and QLIKE, the model with the lowest aggregate value of the loss function would be ranked first while, in the case of R-squared, the best model would be the one that recorded the highest value. Thus, each volatility forecast received a rank between 1 and 8 (because there are eight volatility models) for each criterion: 1 was awarded to the model with the best performance, according to that particular criterion, while 8 was assigned to the model with the worst performance. Since the rankings tend to be rather heterogeneous, sometimes with important variations from one criterion to another, the average ranking method (Jacob, 2004) was employed in order to aggregate the results. The average rank of a model was computed as the arithmetic mean of the ranks received by that model.

This concludes the presentation of the data and the methodology employed for assessing the performance of volatility forecasts with the aid of statistical criteria. The following section presents an overview of the rankings of the eight volatility models and further discusses the impact of different criteria, different proxies, different time intervals and different error distributions on the evaluation results.

### 3. Ranking of volatility forecasts

Table 1 presents the general rankings of the eight volatility models both in terms of individual rankings (how many times each model achieved a certain rank) and in terms of average ranks.

**Table 1.** *General rankings of the volatility forecasts*

RANKS	IGARCH-N	GARCH-N	EGARCH-N	SV-N	IGARCH-T	GARCH-T	EGARCH-T	SV-T
1	4	0	6	21	7	2	13	7
2	4	1	12	7	4	2	7	23
3	5	10	7	2	1	14	17	4
4	4	10	14	5	9	12	5	1
5	13	11	4	0	13	11	5	3
6	10	17	7	3	7	13	2	1
7	6	3	5	0	14	5	6	21
8	14	8	5	22	5	1	5	0
Average Rank	5.37	5.23	4.07	4.25	4.98	4.53	3.62	3.95

The above shown results point out a few characteristics of the ranking process. First of all, it is a difficult task to rank volatility forecasts by taking into account multiple criteria, multiple proxies and multiple time intervals because the results may prove to be quite heterogeneous. For example, with the exception of GARCH-N, all the models manage to be ranked first at least twice while, with the exception of SV-t, all the models are ranked last at least once. Moreover, even the performance of a certain model may vary greatly from case to case such as SV-N which recorded the highest number of both first (21) and last (22) places or as SV-t which recorded the highest number of both second (23) and seventh (21) places. On the other hand, the GARCH models (both with normal and t-Student error distributions) achieved mainly compact mid-table positions with few first and last rankings. Therefore, it may not be useful to consider too many parameters when assessing the performance of volatility forecasts because, instead of getting a clearer conclusion, chances are there will be no conclusion at all.

However, despite the heterogeneity of the individual rankings, the average rank makes it possible to obtain some general conclusions. To begin with, the use of t-Student distribution seemed to address better the heavy tails of the conditional returns leading to more accurate forecasts. Thus, each of the four volatility models based on this distribution achieved a better average rank than its counterpart based on the normal distribution. Secondly, the average ranks indicate the following hierarchy of the forecasts: EGARCH-t (3.62), SV-t (3.95), EGARCH-N (4.07), SV-N (4.25), GARCH-t (4.53), IGARCH-t (4.98), GARCH-N (5.23) and IGARCH-N (5.37). As it can be seen, the average rank provides quite a uniform perspective of the seemingly random individual rankings. The asymmetric EGARCH model and the SV approach emerge as the most accurate volatility forecasts while the “plain vanilla” GARCH and the non-stationary IGARCH rank on the last places. These results were to be expected because stocks and stock indices usually display leverage effects, thus, requiring an asymmetric model. On the other hand, it is interesting to notice that the forecasts generated by the SV models are comparable to the ones generated by the EGARCH. In order to obtain a better understanding of the general rankings, Table 2 presents the forecasts that performed best, in terms of average rank, for each index and each time interval.

**Table 2.** *First place ranking forecasts for each index and each time interval*

INDEX	2007-2009	2012-2014
BOVESPA	SV-t	EGARCH-N
FTSE 100	SV-t	EGARCH-t
IPC	EGARCH-N	EGARCH-t
NIKKEI 225	SV-N/SV-t	EGARCH-t
S&P 500	GARCH-t	EGARCH-t

As it can be seen, the general rankings seem to be confirmed by these results, in most of the cases one of the models that ranked in the top three being selected as the most accurate forecast for a particular index and a particular time interval. Thus, the EGARCH model appears to prevail being ranked first in 6 out of 10 cases. Moreover, the results suggest there could be a difference in model performance between the two time intervals. SV models perform better in the context of the 2007-2009 crisis while EGARCH models are clearly taking the lead during the much calmer 2012-2014 period. In order to further investigate this aspect Table 3 presents the average ranks of the models for each time interval.

**Table 3.** *Average ranks for each time interval*

TIME INTERVALS	IGARCH-N	GARCH-N	EGARCH-N	SV-N	IGARCH-T	GARCH-T	EGARCH-T	SV-T
2007-2009	6.00	4.97	4.43	3.23	5.73	4.60	4.03	3.00
2012-2014	4.73	5.50	3.70	5.27	4.23	4.47	3.20	4.90

Indeed, both SV models emerge as the best performers during the crisis period with significant better rankings (3 and 3.23 respectively) than the competing EGARCH counterparts (4.03 and 4.43 respectively). These results suggest that stochastic volatility may generate more suitable forecasts than the GARCH models during times of financial turmoil. On the other hand, the roles are reversed during the 2012-2014 recovery period when both EGARCH models clearly dominate the rankings. Therefore, it may be concluded that asymmetric GARCH models fit well the “normal” behavior of stock markets while, during periods of high volatility and extreme events, the stochastic approach leads to more accurate forecasts.

The analysis was further developed by taking into account the ranking differences between the three statistical criteria (see Table 4). As shown by the results, different rankings are generated by each criterion despite the fact that all of them are robust ones. Patton (2011) specified that, according to the definition of robustness, a robust criterion would always choose the true conditional variance over any other forecast. However, when two imperfect volatility forecasts are compared, the rankings can vary from one criterion to another. Thus, MSE and QLIKE rank the EGARCH-t first while the R-squared of the Mincer-Zarnowitz regression

grants very high rankings for both SV-N and SV-t and leaves the EGARCH models lagging far behind. Consequently, employing multiple criteria when ranking volatility forecasts is likely to generate conflicting results instead of clearing the picture. Nevertheless, using only one criterion limits the perspective so it may be useful to consider additional criteria in order to obtain a more realistic assessment of the volatility forecasts.

**Table 4.** Average ranks according to each criterion

CRITERIA	IGARCH-N	GARCH-N	EGARCH-N	SV-N	IGARCH-T	GARCH-T	EGARCH-T	SV-T
MSE	5	5.1	4.5	4.8	4.5	4	3.7	4.4
QLIKE	4.45	4.7	3.9	6.45	3.95	3.9	3.25	5.4
R-squared	6.65	5.9	3.8	1.5	6.5	5.7	3.9	2.05

Finally, the analysis focused on the ranking differences between the two volatility proxies employed in this study, the results being given in Table 5.

**Table 5.** Average ranks according to each volatility proxy

PROXY	IGARCH-N	GARCH-N	EGARCH-N	SV-N	IGARCH-T	GARCH-T	EGARCH-T	SV-T
Squared Returns	5.37	5.93	4.77	3.03	4.87	4.67	4.27	3.10
Intra-daily Range	5.37	4.53	3.37	5.47	5.10	4.40	2.97	4.80

Again, the same conflicting results between EGARCH and SV models can be observed as in the case of different time intervals and different ranking criteria. When the rankings are done with respect to squared returns, both SV models rank significantly higher than the GARCH models. On the contrary, when squared returns are replaced by the intra-daily range, EGARCH models get the pole-position (ranking 2.97 and 3.37 respectively) while their stochastic competitors remain far behind (ranking 4.8 and 5.47 respectively). Considering that intra-daily range is a better proxy, because squared returns are rather noisy, it may be stated that, in line with the general rankings, the asymmetric EGARCH model seems to yield on average better forecasts than the SV models. However, taking into account the big picture of all the different rankings explored in this study, it may be more realistic to conclude that both EGARCH and SV models proved to generate reliable forecasts and the choice between the two approaches may differ depending on the data series, the choice of criteria, the choice of volatility proxies and the considered time interval.

#### 4. Conclusions

This paper analyzed the use of statistical criteria in the context of evaluating the accuracy of volatility forecasts. With this respect, four volatility models, ranging from the IGARCH to a stochastic volatility model, were employed taking into account both Gaussian and t-Student errors. The models generated out-of-sample volatility forecasts for five major stock indices considering two distinct time intervals: the 2007-2009 crisis and the much calmer period between 2012 and 2014. Then, the forecasts were ranked according to three statistical criteria comprising MSE and QLIKE loss functions and the R-squared of the Mincer-Zarnowitz regression. The results of the analysis, presented in the previous section, account for a few general remarks.

To begin with, it may not be productive to employ too many decision parameters when ranking volatility forecasts. While the purpose may be to obtain a thorough evaluation, the use of multiple criteria, multiple volatility proxies and/or multiple time intervals may lead to quite inconclusive results instead of clearly ranking the models. On the other hand, relying on too few parameters may lead to clear but biased results because the perspective of the analysis would be limited. Moreover, as Hansen and Lunde (2005) explained, the main reason for employing multiple criteria resides in the fact that it is not clear which one is the most appropriate. Indeed, the results obtained in this paper showed that different criteria tend to favor different forecasts, the same being true with regard to the volatility proxies, while the behavior of the data series may require to switch from one model to another between different

time intervals. A similar conclusion was mentioned by Brailsford and Faff (1996) who established that no model is definitely superior because the results are sensitive to the choice of criteria. Hansen and Lunde (2006) also showed that the choice of proxy may affect the results of the evaluation process and even distort them. Thus, it may prove a difficult task to strike the balance between employing too many or too few parameters when evaluating volatility forecasts.

However, despite the conflicting results recorded throughout the empirical study, the average rank makes it possible to formulate the following conclusions which are in line with previous research:

- Volatility forecasts based on t-Student errors outperform the forecasts generated by the same models but with Gaussian errors, confirming that the heavy tails of conditional returns require leptokurtic distributions;
- From the considered GARCH models, EGARCH provided the most accurate forecasts confirming the need for asymmetric models when modeling the volatility of stocks and stock indices;
- The EGARCH and SV models emerged as the best performing models, confirming that the stochastic volatility approach is the most important competitor of GARCH-type models. However, as shown by other studies, it is difficult to establish which of the two approaches is better. While EGARCH seemed to slightly prevail in terms of average rank, a thorough analysis emphasized that these results are highly dependent on the evaluation criteria, the volatility proxies and the time intervals. Thus, the EGARCH seemed to perform better in calmer market conditions and obtained superior results with respect to the loss functions and the intra-daily range proxy. On the contrary, the SV models appeared to be more accurate during the financial crisis and outperformed EGARCH according to the R-squared of the Mincer-Zarnowitz regression and, also, according to the squared returns.

In conclusion, the popular EGARCH model and the more complex SV approach emerge as reliable tools for the forecasting of stock market volatility. On the other hand, the statistical criteria included in this study were not able to clearly delimit the two models leaving the question of GARCH versus SV open for future research. Also, in order to ensure a proper comparison between the two models, the analysis should be extended in order to include asymmetric stochastic volatility models.

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# The evolution of the main liquidity and solvency indicators of Pharmaceutical Groups Sanofi-Aventis and Bayer from 2008 to 2015

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**Abstract.** *One of the few industries that have remained true to their principles and good practices, even in times of difficulty, when the financial and economic crisis has left its imprint on the society, is the pharmaceutical industry, an industry that continues its tradition of investing into research and development. The aim of this article is to carry out an economic and financial analysis on the evolution of the liquidity and solvency indicators of the main players in the pharmaceutical industry in Europe from 2008 to 2013: the Bayer pharmaceutical group and the Sanofi-Aventis group. Furthermore, forecasts were made with regard to the indicators calculated and analyzed for the period 2014-2015 by using the growth tool in Excel. The research conducted has shown once again the financial strength of the pharmaceutical industry, the companies belonging to the groups having appropriate solvency and above par liquidity.*

**Keywords:** financial and economic crisis, the pharmaceutical industry, solvency, liquidity, forecasts.

**JEL Classification:** D58, O10.

## 1. Introduction

The current context of the national and global economy, the decline of the society and the sudden changes occurring more and more often in business entities have reinforced the idea of a careful analysis of the financial position of a company as, based on it, future financial strategies can be devised and accurate financial decisions can be made. Highlighting trends in liquidity and solvency indicators is a long-studied and long-researched process within organizations (Berman et al., 2011: pp. 58-63), since, once these indicators have been established, managerial and financial decisions with a strong impact on the future of companies can be made. The analysis and interpretation of both conventional and modern indicators that are typical of the economic and financial analysis may be keys to the success of leading companies or may represent the main pillars on which the reconstruction of companies going through difficulties is grounded, as the main trajectories of the analyzed industries or business entities can be established. Analyzing the situation of the company and the sector to which it belongs is one of the main objectives of financial management within any top or common company. In a rapidly changing society faced with an economic and financial crisis that leaves its deep mark on national and international companies, the liquidity and solvency analysis is a requirement in determining the financial strategies within economic entities.

## 2. Literature review

The current economic situation and the major changes occurring globally have reinforced the idea of a detailed analysis of the data reflected in a company's accounts in order to create certain scenarios that allow making the right financial decisions. Financial and accounting information is the foundation of all financial and economic analysis, mirroring the past events that took place within the business entity, on whose basis future events can be anticipated (Sintea-Anghel, 2014: pp. 319-320).

According to Order of the Ministry of Public Finance no. 1802/2015, the attributes that determine the usefulness of the information provided by financial statements are the following: intelligibility, relevance, reliability and comparability. The ease of understanding financial statements takes the form of intelligibility, an essential characteristic of accounting information, which involves all knowledge that users must possess in order to grasp and apply the economic phenomenon. In order to make accurate financial decisions, financial information must be relevant, so that users of financial statements may evaluate past, present, or future events. To determine the financial position of any entity, accounting information should be reliable, should not contain significant errors and should provide a high degree of confidence in financial and accounting records and ensure statements comparability of financial statements from one financial year to another so as to properly evaluate their position and financial performance. To take accurate decisions and measures and make forecasts, it is imperative to have data and information presenting the current situation of the enterprise as accurately as possible, on the basis of which economic and financial analyses will be made. The chief role of accounting information is thus to illustrate the economic, accounting and financial reality of the analysed entity. The sudden changes occurring in top companies and not only, the increase in the complexity of problems and the existence of risk and uncertainty in the society (Balteş et al., 2014: pp. 7-15) reinforce the idea of having financial and accounting statements that reflect reality as accurately as possible. In order to have an accurate view of the situation of a company, a close study of accounting information and data is needed. Users of financial information need to properly manage accounting information so as to illustrate the reality of the company, regardless of the results provided, so that corrective action may be taken to improve the activities of the analysed company, within the sector to which it belongs. An appropriate reflection of the company's position on the basis of

economic, accounting and financial information can be regarded as the key to success, especially due to the tremendous role that information plays in the decision-makers' present and future economic actions.

The speed of economic growth in rich countries and the decline of the society as a whole in poor and emerging countries have caused striking disparities between the two groups exemplified above, thereby causing serious disturbances, social dissolution and even economic imbalance. To avert crisis situations within large corporations, there must be an economic and financial analysis based on balance sheet items to help to prevent, detect and solve financial gaps. The durability of business entities and their sustainable development are ensured by the proper allotment and use of resources. Analysis is part and parcel of the process of knowledge. By resorting to it, not only experts in the field but also ordinary people can understand and investigate phenomena with a strong economic, financial and even social impact.

Vasile Robu exemplified in his book, *Analiza economico-financiară a firmei (The Economic and Financial Analysis of the Company)*, that in the social and economic world it is impossible to reach "ground zero of history", in other words corporations cannot be judged irrespective of their past, as the hysteresis effect is produced. Business entities are analysed especially according to their past, economic and financial analyses being thus performed for long periods of time in order to notice the evolution or regress they witnessed within the analysed period.

Economic and financial analysis is an important method of acquiring knowledge (Balteş et al., 2013: pp. 11-14), being regarded as a process that relies mainly on breaking down economic and financial phenomena, and generating a system of indicators which provides valuable information on assessing and making decisions that are necessary for the proper operating of the analysed entities. Economic and financial analysis tends to become more and more often a real instrument in providing financial data necessary for making managerial decisions, thus putting a modern approach to it, through a combination of financial, economic and stock exchange data. Thus, financial models that have a huge importance in drawing up forecasts have proliferated (Petrescu, 2010: pp. 9). This type of analysis gradually leads to financial diagnosis, which, together with accounting diagnosis, ensures the financial and accounting operation of the business, with particular emphasis on the profitability and risk of the business entities investigated. Financial diagnosis helps to draw conclusions on the strengths and weaknesses based on the analysis performed, the results of economic and financial analysis being used also to formulate assumptions, and being a support for financial decisions and forecasts that are necessary for the future development of the corporation. The need for economic and financial analysis appears especially in providing data and information with a strong impact on the decision-making process within any business, addressing traditional methods to determine the financial situation or providing methods that do not rely on the conventional analysis of financial accounts, focusing on the functional and economic analysis of the balance sheet, the stream analysis and even an analysis of the financial sustainability of the analysed companies.

### 3. Benefits vs. costs of adopting the International Financial Reporting Standards in the European Union

Recent years have been marked by strong economic, legislative, political and social changes in the area of financial accounting, a series of regulations being adopted, which, due to their complexity, have created an avalanche of risks that have more or less affected the economic activity of business entities. EU states underwent the transition towards adopting International

Financial Reporting Standards (IFRS), these being considered the “global evaluation tool as regards accounting results” (Briciu et al., 2013: pp. 4-5).

As of 2005, under the provisions of EC Regulation no. 1606/2002, each entity listed in the Stock Exchange in the European Union must prepare their consolidated financial statements in accordance with international accounting standards. The major benefit of this transition is to facilitate comparability between companies (Brochet et al., 2011), as there will be a shared reporting system so that the comparability of larger companies worldwide could be achieved by the same legal provisions. Another benefit of adopting International Financial Reporting Standards by a company is that of transnational transparency of financial statements by reducing asymmetric information, uncertainty and risk (Daske et al., 2007), thus strengthening stock market liquidity, decreasing transaction and capital costs, and the benefit of inevitably gaining improved reputation. Alignment with IFRS is a process that will change the way of working and thinking at the level of financial and accounting management, being considered a new performance evaluation system at the level of business entities (Căruntu et al., 2011: pp. 86-99).

In addition to the benefits listed, there are a number of obstacles in applying IFRS, as these standards are extremely complex and expensive, so they will adversely affect the relevance of financial statements. There are also political, legal, economic and cultural factors that may influence the adoption of IFRS in a certain state, and this may have considerable adverse impact on achieving comparability between countries (Pășcan et al. 2012: pp. 211-216). The costs of this transition relate primarily to staff training, purchase of specialised bibliography, hiring consultants, etc. These are costs that, in our opinion, bring benefits to business entities, too, by building up the specialised knowledge of the human resource. Although the complexity of these standards produces a slight confusion in the unfolding of business activities, although the adoption of IFRS involves additional costs, the implementation of these standards is absolutely necessary in order to improve the accounting system and to achieve the sustainable development of financial accounting. The application of International Financial Reporting Standards differs from one society to another, mainly because of the economic sector in which it operates but also because of the size of the company, creating increases or decreases in balance sheet items from one period to another. Considering both the benefits and costs of adopting IFRS in the EU, it is imperative to clarify the importance of attracting foreign investors by developing a “common language” to increase the transparency of financial information provided and to ensure the comparability of statements from one financial year to another.

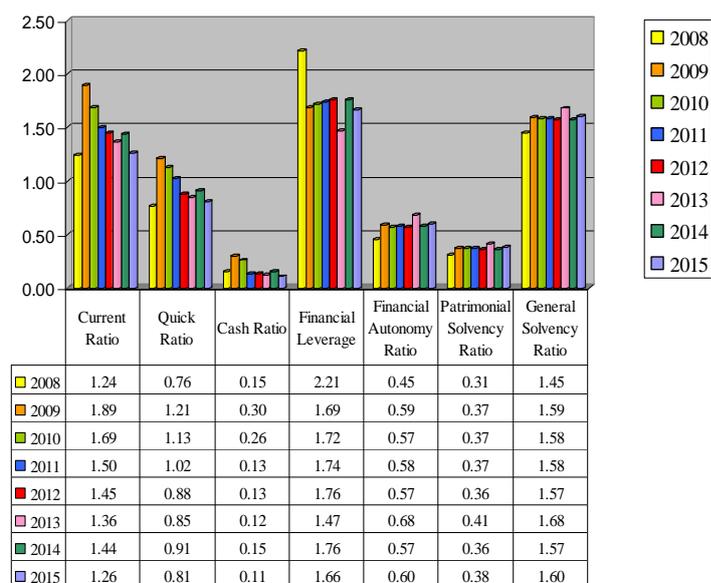
#### **4. The evolution of the main liquidity and solvency indicators of pharmaceutical groups Sanofi-Aventis and Bayer from 2008 to 2015**

In this article, we intend to examine the liquidity and solvency of the main players in the global pharmaceutical industry: pharmaceutical group Bayer and the Sanofi-Aventis group. Sanofi-Aventis is a pharmaceutical company based in France, which now occupies the second place in Europe and third in the world after GlaxoSmithKline and Pfizer. This business entity became the European leader in 2009 after the acquisition of Zentiva, which owns the Romanian company Zentiva SA (formerly Sicomed). In accordance with European Parliament and Council regulation no. 1.606/2002 on the application of international accounting standards, the Sanofi group has presented its consolidated financial statements in accordance with International Financial Reporting Standards ever since the beginning of 2005. The Bayer Group is also a pillar of the pharmaceutical industry, being among the top ten companies in Europe, with over 350 companies worldwide. The financial statements of the Bayer Group have been prepared in accordance with the provisions of Section 315a of the German Commercial Code on consolidated financial statements and International Financial Reporting

Standards, in particular IFRS 10 on consolidated financial statements and IAS 27 – on consolidated and separate financial statements.

By applying a shared financial and accounting language, the financial results of the two groups can be compared and interpreted according to the European provisions of International Financial Reporting Standards, the transparency of financial information being on the increase along with the alignment to IFRS. As regards the financial situation of the Bayer Group within the period 2008-2015, we can see the trend of the main liquidity and solvency indicators in the chart below.

**Chart 1.** *Liquidity and solvency situation in the Bayer Group between 2008 and 2015*



**Source:** Own calculations based on the financial statements prepared by the company: <http://www.investor.bayer.de/en/reports/annual-reports/overview/>

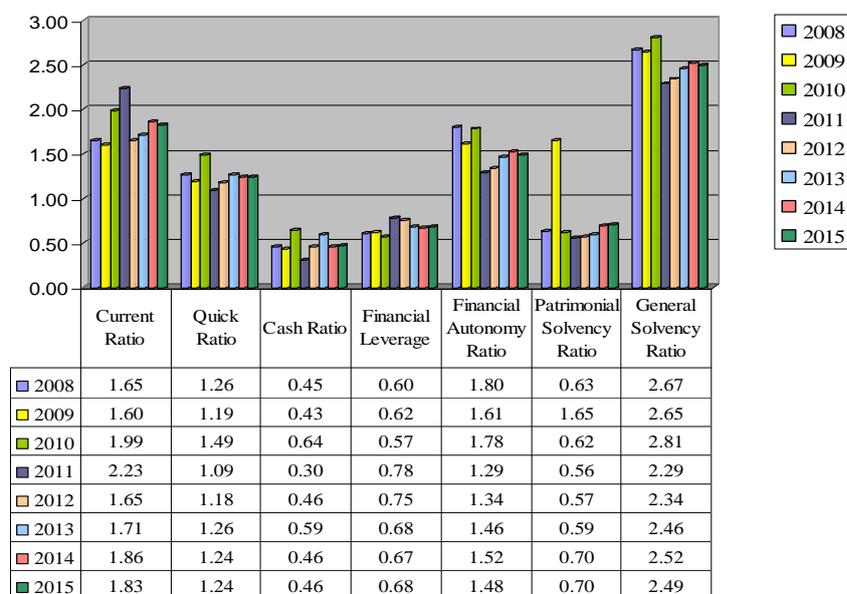
The overall liquidity indicates the proportion of current assets within current liabilities, expressing the degree of potential liquidity, i.e. short-term financial balance (Petrescu, 2010: p. 251). At group level, the value of general liquidity rate between 2008 and 2013 is above par, and even records an increase of 0.12 from 2008 to 2013, thus illustrating the capability of the company to cope with current outstanding debt, having the opportunity to quickly convert current assets into liquid assets. The quick liquidity ratio has a value of above 0.5, which indicates normal liquidity and the possibility of the company to repay short-term debt. The cash ratio reflects a guarantee of the liquidity, recording values of above 0.15 in the period under review. The lack of liquidity has a negative impact on the business, as it limits development, as well as on creditors, because massive loss of debt and interest payment occurs. In the present case, the Bayer Group records a satisfactory level of liquidity, being able to invest into research and development, as well as to pay its short-term debt within the analysed period (2008-2013), a period of crises and shocks experienced in the form of increased taxes and duties, especially within the pharmaceutical sector.

Financial leverage is the ratio of total liabilities to equity (Whitehurst, 2003: pp. 134-141), expressing overall borrowing rate, on the one hand, and the degree of financial interdependence, on the other hand. The effect of the increase in financial leverage may be either favourable or risky. If in 2008 the financial leverage indicated a value above 2, in 2013 its value fell to 1.47, as a result of the decrease in the ratio of debt to equity, in line with the decline in indebtedness and increased financial autonomy, as can be seen in the chart above. The general solvency ratio is an indicator of the degree of autonomy of the company. The analysed indicator represents the proportion of total assets within total liabilities; the higher the ratio, the more likely the refunding of debt on due dates. There is a relatively high share of

assets within the company's debt of about 1.5 throughout the analysed period, indicating the possibility of the company to meet its payment obligations. Solvency is the company's ability to cope with medium- and long-term maturities. During the eight years analysed, the indicator values are normal, the share of capital within total liabilities being less than 40%. Moreover, the general solvency values are normal, the indicator value hovering above 1 throughout the analysed period. The share of equity within long-term debt is almost double within the period 2008-2013. In what follows, we have used statistical function GROWTH in Excel, with the help of which we have anticipated future increase in the indicators analysed for the period 2014-2015. The analyses conducted show that liquidity rates will fall within the normal range in future periods, the rate of current liquidity recording a growth in 2014, from 1.36 in 2013 to 1.44 in 2014; yet in 2015 we will witness a decrease in this indicator to 1.26. Financial leverage will record high values on account of attracting external resources in 2015, its value reaching the threshold of 1.66, which represents a high risk for the group. In terms of overall solvency ratio, the company records a value of 2.50 in 2015, and this indicates that this company is able to cover long-term debt.

The chart below shows the evolution of the main liquidity and solvency indicators for the Sanofi-Aventis group.

**Chart 2.** Liquidity and solvency situation within the Sanofi-Aventis Group between 2008 and 2015



**Source:** Own calculations based on the financial statements prepared by the company: [http://en.sanofi.com/investors/regulated\\_info\\_france/annual\\_reports/annual\\_reports.aspx](http://en.sanofi.com/investors/regulated_info_france/annual_reports/annual_reports.aspx)

The general liquidity ratio of the Sanofi-Aventis group records values above par, which indicates that the group can cope with short-term debt. Compared to the Bayer group, the cash rate is higher, indicating a higher share of cash within the current debt, which increases with 0.8 from 2008 to 2013. As regards the overall liquidity ratio, this will increase with 0.13 from 2013 until 2015, the other two liquidity rates keeping almost the same trend as in 2013. Financial risk is much lower in this group, financial leverage not recording values greater than 0.78 in all the eight years analysed, the share of total debt within equity being under 78% in the period under review. If in 2011 financial leverage recorded the highest level of 78% of its equity, in 2013 it dropped to 68%, thus reducing financial risk. In 2015, the indicator will have a value of 0.68, which indicates a better management of internal resources and the maintenance of the same trend as in 2013 in terms of attracting external resources. The rate of financial autonomy has normal values, expressing the company's ability to cover debt from equity. The rate of debt (financial leverage) recorded subunitary values, thus confirming the company's financial autonomy. The patrimonial solvency ratio indicates the extent to which

equity covers long-term debt (Balteş, 2010: pp. 66-75). This indicator is above 0.5 throughout the analysed period, indicating a normal situation of the group analysed. As regards the overall solvency ratio, total assets within total debt are twofold, indicating financial independence and the capability of the company to meet its payment obligations.

## 5. Conclusions

The pharmaceutical industry is one of the most important industries in the world, actively participating in supporting and developing the economies of the world, notably through the payment of taxes and the creation of jobs. In this article, attention was directed towards the analysis of the main players in the global pharmaceutical market: the Bayer pharmaceutical group and the Sanofi-Aventis group. In assessing the “financial health” of large companies, one should not only consider the solvency ratios but also liquidity ones, since the company must not only be creditworthy, pay its debts on time, but it must also be liquid so as to be able to meet its payment obligations on due dates. If solvency concerns the ability of the company to meet its long-term debt, the two groups analysed have a high degree of solvency; liquidity concerns financial balance of the company in the short term, the Bayer Company having small problems with this respect. The Sanofi-Aventis Group records a high level of liquidity, being able to cover short-term liabilities with the help of current assets. Financial leverage indicates the indebtedness of the company, the Bayer group having a high financial risk, since this indicator throughout the period under review records above par values, while Sanofi-Aventis has a relatively low financial risk given the industry to which it belongs. Given the events that have taken place since 2008 and the economic, political and social crises that have befallen mankind, the pharmaceutical industry is one of the few industries that have been able to properly manage the situation and continue to invest into research and development, which are the “ingredients” without which we would not be able to speak about growth or development in our society.

## Acknowledgments

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# Study on the financial balance for the companies in hotel industry, listed on the Bucharest Stock Exchange

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**Abstract.** *This paper presents the analysis of the financial balance by means of the working capital for two Romanian companies in the hotel industry. The analysis is based on information provided in the financial statements of the two companies over a period of five years, from 2010 until the end of 2013.*

**Keywords:** financial balance, working capital, assets, debts, equity.

**JEL Classification:** G32, M49.

## 1. Introduction

One of the main objectives of financial analysis is to develop and use a set of tools, practices and standards in order to characterize a healthy and balanced financial management. In a general manner, the balance evokes the idea of harmony between the various elements of a system, which translates into an agreement between resources and needs.

Lorant Eros Stark and Ioan Marius Pantea (2001) state that the analysis of the financial stability for a company aims to reflect the ratio of equality between funding sources and uses of financial resources, between revenue and expenditure of the business' development on a long, medium and short term.

Financial balance is defined by Adina Elena Dănuleşiu (2006) as the state of quantity value in a company characterised by the existence of certain correspondences, reflected by a system of correlations between financial resource requirements – determined by the implementation of objectives - and actions appreciated as effective, concrete opportunities for procuring the needed funds, with minimum costs and risks. According to Ciuhureanu Alina Teodora (2009), the financial balance can be more simply understood as an expression of the equality and correlation status between the possibility of producing resources and the necessary financial resources to carry on the operating, financing and investment cycles.

Financial balance is analysed on specific terms, for example on medium and long term by comparing permanent capital assets to current assets, whereas on short term by comparing current resources to ACCT assets. The overall balance is analysed by comparing the working capital and the working capital requirements.

The concept of financial balance is found in several different areas and has specific interpretations. The term equilibrium derives from the Latin words "aegus" – which means equal – and "libra" – which means balance. This shows the equality of two measurable quantities and targets the consistency state between the interrelated elements and all variables of the social and economic activity.

For this study we used a number of tools, such as the balance sheet and the trial balance. Balance is the document which allows the exploration of the company's assets, considered by many economists as a condensed assets inventory. Analysing the financial balance indicators aims at identifying the state of equilibrium between companies, highlighting the long and short-term relationship between assets and liabilities.

## 2. Absolute indicators of financial balance

### 2.1. The net situation

It can be considered as a primary or preliminary indicator in an analysis, because it has the ability to reflect the management of enterprises (Petrescu, 2005: p. 121).

The Net situation = Total assets - Total debts.

This indicator expresses the value of realizable assets at a given time. The owners, shareholders and creditors are interested in knowing the net situation of an enterprise. On one hand, shareholders and company owners want to know the value they hold, on the other hand lenders want to know the realizable assets that constitute the pledge to their receivables. The net situation illustrates amounts incumbent to members and shareholders in the event of liquidation.

### 2.2. The working capital

The working capital is "a sensor", an indicator that focuses on the financial situation of the company at a given time, i.e. its state of equilibrium.

Net working capital represents the surplus of financial resources that derives from covering permanent assets from permanent resources. It can be used to finance current assets (Stark and Pantea, 2001: p. 151). Basically, net working capital is part of the equity that exceeds the net assets and is intended to finance current assets.

The working capital (WC) can be calculated in several ways:

a) using the top of the balance sheet, as the difference between permanent capital and net assets (Petrescu, 2008: p. 196):

$$WC = \text{Permanent Capital} - \text{Net Assets.}$$

In this case, the working capital marks permanent capital which is extra or available over the net value of assets that can be allocated to finance current assets;

b) using the bottom of the balance sheet, as the difference between current assets and total short-term debt (Petrescu, 2008: p. 196):

$$WC = \text{Current Assets} - \text{Short Term Debt.}$$

This time, the working capital marks assets financed from permanent sources or the excess of current assets over short-term debt.

The first way of expression is specific to the French practice and literature and the second, to the Anglo-Saxon countries. But it should be noted that, regardless of the calculation method, the financial logic mentions only one financial working capital.

### 2.2.1. Structure of net working capital

The financial working capital can be further analyzed depending on permanent capital structure (own or borrowed). Such an analysis highlights the extent to which financial balance is achieved through equity. Two indicators can be provided (Stark and Pantea, 2001: p. 153):

a) The proper working capital (WC<sub>p</sub>) - the part of shareholder's equity in excess of net assets, intended to finance current assets.

$$WC_p = \text{Equity} - \text{Net Assets.}$$

b) The foreign working capital (WC<sub>f</sub>) - the part of the medium and long-term debt in excess of net assets and intended to finance current assets.

$$WC_f = WC - WC_p.$$

### 2.2.2. Managing the working capital

The rotation-speed of the working capital by turnover is the safety margin and expresses the average number of days during which the working capital is reconstituted by turnover.

The Margin of Safety - Rms (Balteş, 2010: pp. 53) must be between 30 and 90 days, anything under this speed marks the "melting" of permanent resources in the way of downsiding the importance of the permanent funding source of activity, whereas over 90 days means "freezing" the permanent funds for the purposes of oversizing them in correspondence to the financing needs.

$$Rms = \frac{\text{Working capital}}{\text{Turnover}} \times 365.$$

### 2.3. Working capital requirement

Working capital requirement (WCR) is the surplus of cyclical financing needs which remain after covering current assets and that will have to be covered by permanent resources. (Stark and Pantea, 2001: p. 156). Basically, it represents the part of non-financial current assets which have to be financed by permanent capital.

$WCR = \text{Nonfinancial Current Assets} - \text{Nonfinancial Short Term Debt}$

$WCR = (\text{Stocks} + \text{Claims}) - \text{Short Term Debts Only Exploitation.}$

#### 2.4. Net Cash

Net cash represents the cash and cash equivalents left to the company, resulting from work carried out during the financial year. This is liquidity surplus remaining after covering the excess of cyclic needs (left uncovered) by the permanent capital surplus.

It faithfully reflects the short-term financial balance of companies, by comparing the working capital with the working capital requirement (Georgescu, 1999, p. 109).

$\text{Net cash} = \text{Working capital} - \text{Working capital requirement}$

### 3. Evolution of indicators based on financial balance and comparison of two Romanian companies in 2008-2013

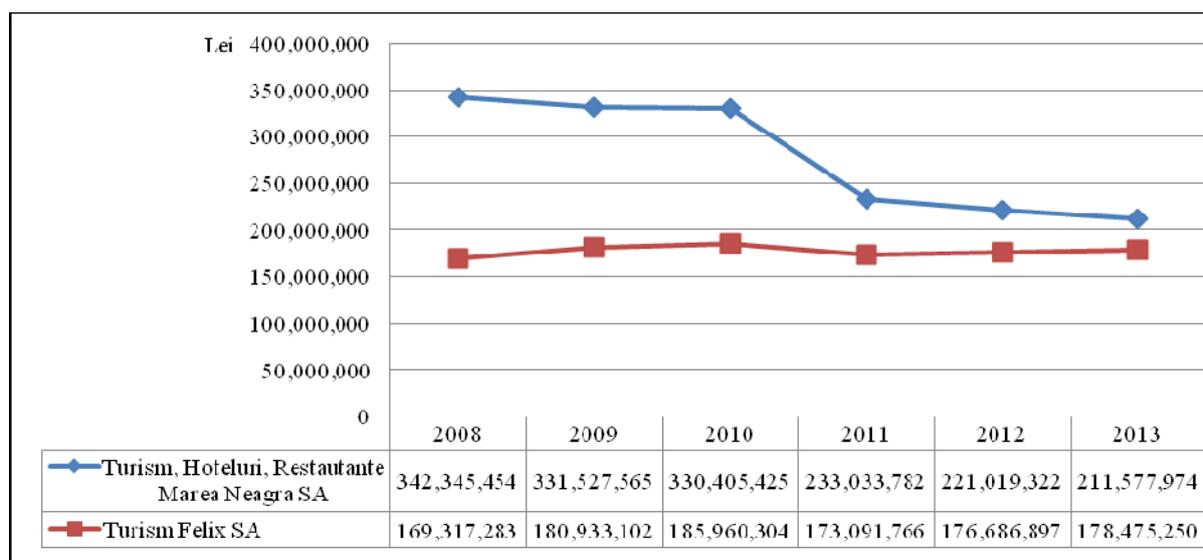
The companies on which the research is based are: TOURISM FELIX SA and Turism, Hoteluri, Restaurante Marea Neagră SA. Both companies share the classifier 5510, according to the NACE classification activity register. The companies have been listed on the Bucharest Stock Exchange since 2003, in 2nd category. The company Turism Felix SA has a shared subscribed paid capital amounting to 78,683,525 lei on 30.04.2014 and has 716 employees, while the company Turism, Hoteluri, Restaurante Marea Neagră SA is worth 57,894,994 lei and has 286 employees.

Studies of both companies sought to determine and to interpret the following indicators:

#### 3.1. Net situation analysis

According to the chart below, we see that the net situation in the company Turism Felix SA in the period under review was mixed: it increased by 8.83% in 2010 compared to 2008, followed by a decrease in 2011 and then continuing to grow in 2013. Although the net situation of that company is not in constant growth, it can be seen that it increased by 5.4% in 2013 compared to 2008, due to the company's decrease of medium- and long-term debt of approximately 29.2%.

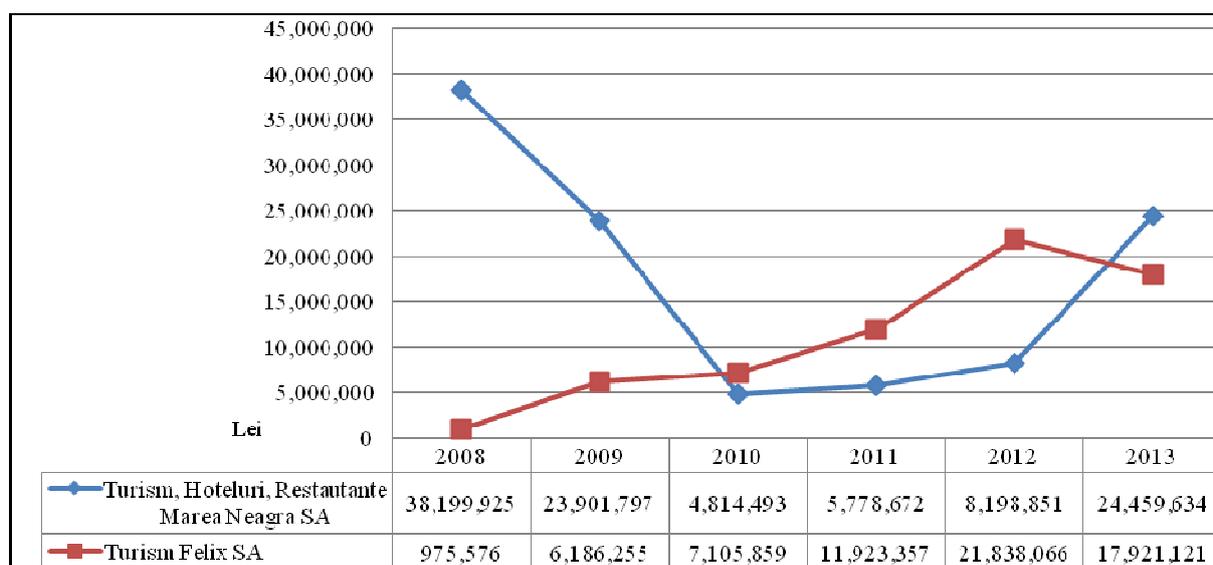
The company Turism, Hoteluri, Restaurante Marea Neagră SA has a decrease of over six years until 2010, but it is not a significant loss - only 3.49%. At the end of 2011, the total assets of the company decreased by 29.5 %, while total debt decreased by 25.4% compared to 2010. Although it is declining by 2013, it should be mentioned that total assets increased by a few percent compared to 2012 while total debt increased by 64.5%. This is due to the fact that the company reached long-term loans during 2013.

**Figure 1.** Evolution of the net situation between 2008 and 2013

**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA and Turism, Hoteluri, Restaurante Marea Neagră SA.

### 3.2. The working capital

Comparing the two companies, we see that the working capital is positive in both cases throughout the period under review, the difference between the two companies (see Figure 2) is that the SC Turism, Hoteluri, Restaurante Marea Neagră SA has had a decrease of 87.4% in the working capital in 2010 compared to 2008. This can be considered a negative situation because current needs are covered from permanent resources in a more limited extent, this being due to the increase of assets determined by investment and the decrease of permanent capital by reducing own capital. Starting with 2010 we observe an increasing trend of the working capital, but a significant increase occurred from 2012 to 2013 when the amount of the working capital was tripled, due to the increase in indebtedness through long-term loans, thus leading to the growing of long-term financial costs.

**Figure 2.** The evolution of the working capital between 2008 and 2013

**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA and Turism, Hoteluri, Restaurante Marea Neagră SA.

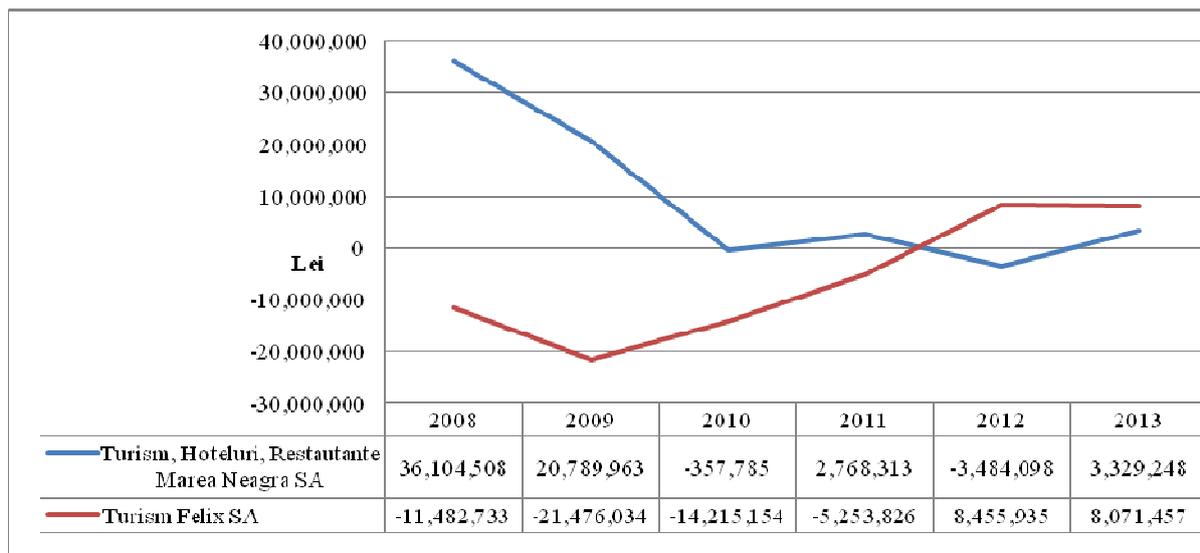
On the other hand, SC Turism Felix SA recorded an increase 22 times higher until 2012 than in 2008. This increase was influenced by the reduction of fixed assets, depreciation actions and very little permanent capital. Due to growing assets and repayment of medium and long-term loans, the working capital decreased by 17.9% in 2013 compared to 2012. Please note that throughout the period under review, the working capital is positive and increasing, which decreases the risk of insolvency.

According to Figure no.3 below, we can see that the proper working capital has a negative value during the first years of analysis until 2011 for SC Turism Felix SA and SC Turism, Hoteluri, Restaurante Marea Neagră SA has a positive value, then in 2012 it has a negative value only to become again positive in 2013.

Equity in SC Turism Felix SA fluctuated during the analyzed period, an increase of 9.84% can be observed by 2010 compared to 2008, then falling by 6.1% in 2011, then increasing by 2,91% in 2013 compared to 2011. Even though the proper working capital increases during the first period analyzed, it is not enough to cover the working capital.

Compared to SC Turism Felix SA, SC Turism, Hoteluri, Restaurante Marea Neagră SA has a downward trend throughout the period, equity recording a loss of 55.06% in 2013 compared to 2008.

**Figure 3.** Evolution of the proper working capital between 2008 and 2013



**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA and Turism, Hoteluri, Restaurante Marea Neagră SA.

Safety margin rate is considered optimal when it ranges between 30-90 days. This period of time means that the company provides its temporary resources from the working capital. By observing the table below, SC Tourism Felix SA falls in just three years during the period under review: 2009, 2010, and 2011 are even at the limit of 90 days, and SC Turism, Hoteluri, Restaurante Marea Neagră SA falls in 2010, 2011, and during the other years it exceeds the limit of 90 days.

The two companies Felix SA Tourism and Turism, Hoteluri, Restaurante Marea Neagră SA have their minimum, respectively their maximum in 2008. During the last year analyzed, the level indicator is not good and the safety margin is not within normal limits in any of the two companies.

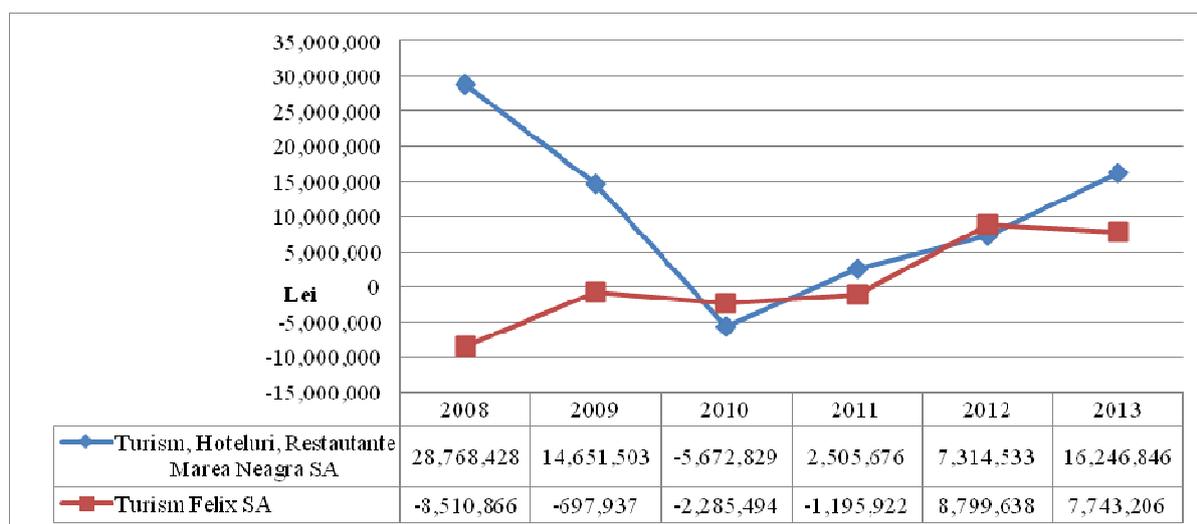
**Chart 1.** The evolution of safety margin between 2008 and 2013

Safety margin rate		2008	2009	2010	2011	2012	2013
Turism Felix SA	Number of revolutions (rpm)	56.8	8.4	6.8	4.1	2.2	2.6
	Rotation length (days)	6	43	53	90	163	138
Turism, Hoteluri, Restautante Marea Neagră SA	Number of revolutions (rpm)	1.0	1.3	4.4	4.6	3.7	1.2
	Rotation length (days)	355	289	83	80	99	317

**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA and Turism, Hoteluri, Restaurante Marea Neagră SA.

### 3.3. Working capital requirement

Working capital requirements in SC Turism, Hoteluri, Restaurante Marea Neagră SA has had a downward trend until 2010 when it reached a negative value because of the considerable decrease in stocks of about 10 times lower than in 2008, and increase in short-term debt in 2010 reached a value of 17,734,243 lei, i.e. three times higher than in the first year of analysis. However, since 2010 the company has been growing and this is due to the increase in stocks, higher by 783% in 2013 compared to 2010. While working capital requirements in this society has been increasing, we can not say it is a favorable situation, quite the contrary, the existence of stocks without moving or moving in slow-motion results in an unfavorable situation.

**Figure 4.** The evolution of working capital requirement between 2008 and 2013

**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA and Turism, Hoteluri, Restaurante Marea Neagră SA.

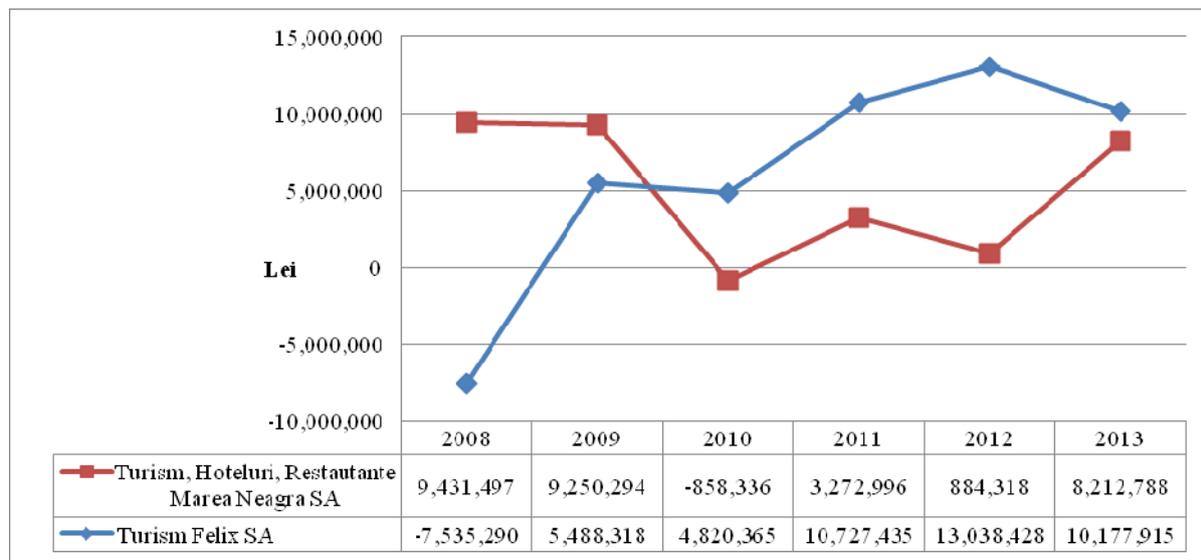
Turism Felix SA has been on a mixed, but growing trend, which has seen an increase in claims 5 times higher in 2013 compared to 2008. However, from 2008 to 2011 working capital requirement was negative, because the company had exploitation debt with longer, relaxing payment periods during the first period analyzed. In 2012 and 2013 the value is positive and as it is in a normal situation, it is mainly due to the increase in sales. In 2013 the working capital requirement decreases by 13.64% compared to 2012, due to the increase of 28.27% in short-term debt.

Rates of current needs was 67% (versus 50% maximum allowed) in SC Turism, Hoteluri, Restaurante Marea Neagră SA and 59% in SC Turism Felix SA following an analysis of the final year. This situation is unsatisfactory because cyclical needs could not be covered even in proportion of 50% from current resources. This indicates an imbalance in the current financing of business activities.

### 3.4. Net Cash

The evolution of net cash as highlighted in Fig. 5 shows that the two companies have both positive and negative values. The company Turism, Hoteluri, Restaurante Marea Neagră SA has negative treasury in 2010, when Turism Felix SA has negative treasury in 2008, which highlights a financial imbalance, because the need for working capital can not be financed entirely from permanent resources. Both companies have a fluctuating evolution, the significant increase in SC Tourism Turism, Hoteluri, Restaurante Marea Neagră SA was in 2013 as compared to 2012, and SC Turism Felix SA the increase took place in 2009, compared to 2008.

**Figure 5.** The evolution of net cash in 2008-2013



**Source:** Author's own based on data portal [www.bvb.ro](http://www.bvb.ro) Turism Felix SA și Turism, Hoteluri, Restaurante Marea Neagră SA.

### 4. Conclusions

Maintaining financial stability of companies is the essential condition of survival, therefore we can say that balance analysis is an important component to prevent the risk of bankruptcy. We want to mention that all the financial balance indicators used have both advantages and disadvantages, so we can not say that the financial balance of the two companies is highlighted by one of these.

This study was conducted on two companies listed on the Bucharest Stock Exchange between 2008 and 2013. During this period we observed significant increases and decreases in both companies, therefore we consider that the period selected is a representative one and it gives us the situation of the companies in all stages.

Company Turism, Hoteluri, Restaurante Marea Neagră SA has had working capital in ascending trend since 2010-2013, this being due to accessing long-term loans. Instead, the company Turism Felix SA suffered a decrease, due to low return medium and long-term loans from 2012 to 2013.

Both companies present a higher value of the working capital than of the working capital requirement (except for one year, which had negative values). This provides the possibility of making investments and holding of cash at hand. The companies are in a favorable situation, but with the mention that a positive cash is not always a sign of a favorable situation, because the company's aim is to train the resources in efficient activity. On the short term, treasury means achieving positive financial balance, but long-term use could mean insufficient use of liquidity with negative effects in capital payment.

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# The financial crisis – rethinking the economy

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**Abstract.** *The financial crisis was not only a short period of turmoil, but rather a vast phenomenon with grave long-term consequences on the financial sector and the real economy. It led to a rethinking of financial intermediation and its means as well as to the creation of new policy instruments designed to respond to a new category of problems that were considered secondary to financial stability, in the past. It also generated new problems for the economy that called for extraordinary, unconventional measures.*

**Keywords:** financial crisis, price stability, macroprudential policies.

**JEL Classification:** E69.

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<sup>(1)</sup>The opinions presented in this paper are the authors' and do not involve in any way affiliated institutions.

## Introduction

The causes of the recent financial crisis have been largely debated in economic literature and there seem to be more than a few opinions on the subject. There are some who consider that the financial crisis was triggered by the low rates the Fed maintained (Taylor, 2007). Others such as Borio and White (2003) or Goodhart (2007) consider that the problem resided in the distortions in the credit channel. And there are some (Bernanke, 2009, Mervyn King, 2010) who emphasize the role of capital flows between countries or some who take into account the role of international imbalances.

Of course there is a wider view that takes into consideration both internal and external factors that could have contributed to the financial crisis (Obstfeld and Rogoff, 2009; Ferguson and Schularick, 2010).

An analysis of the past 140 years conducted by Jorda, Schularick and Taylor (2010) shows a five big events that can be categorized as a crisis: the panic of 1890, the US crisis of 1907, the post war crises in 1921, the Great Depression 1930-1931, The Great Recession 2007-2008. A study at indicator level reveals that before these moments the growth rates were higher, but inflation was lower than the country average and short-term interest rates were very low. They also find that a crisis is preceded by an increase in credit and imbalances in the current account.

## What is different?

The similarities and differences between the recent financial crises and earlier crisis are largely debated in economic literature. There are those who consider that this episode was different because it was caused by an excess of liquidity worldwide that was being handled through a poorly regulated banking system (Krugman, 2009). On the other hand there are some who consider that this situation is similar to previous crisis due to the level of debt that was accumulated (Reinhart and Rogoff, 2009).

Another interesting fact that can be taken into consideration is the way the crisis started in the US and became global as well as its magnitude. Judging from this point of view, the recent crisis is different because of the financial turmoil it caused, the way it caused a fall in credit and in housing prices or other assets. One important consequence of this episode was the impact it had on international trade. The most affected were small economies that registered a fall in exports of up to 30%. So even the countries that weren't directly affected by the US crisis had something to lose.

The most affected were the producers because of a lack of financing that caused a decrease in production. On the other hand, given the uncertainty in the economy and the negative perspectives, demand was reduced and so was import.

Financial literature has shown that in such situations of credit crunches, countries with more developed financial institutions had an advantage judging from the point of view of the financially vulnerable sectors.

Iacovone and Zavacka (2009) concluded that the sectors that had their imports influenced were those dependent on external financing. Freund (2009) and Levchenko (2010) consider that the fall in international trade can be easily correlated with the fall in GDP, especially during financial crisis.

Some authors consider that financial imbalances are the result of the interaction between internal and external factors. The combination between a lax monetary policy, low interest rates, financial innovations and distortions in the credit market is very dangerous and to all these we add external factors such as the exchange rate or other countries' policies (Obstfeld

and Rogoff, 2009). One solution for limiting these imbalances would be a tax on financial flows (Goodhart and Tsomocos, 2010). Another solution is that suggested by Gros (2010) that consists in a way to limit the capital account.

Looking at a history of crisis, we can see that they are generally preceded by an increase in GDP and a fall in inflation. But one of the most worthy of attention variables seems to be the interest rate. The short term interest rates seem to be smaller in pre-crises periods, while money and credit seem to register increases and the current account deteriorates.

Generally a crisis is associated with a recession, but it would not be right to say that all recessions are crisis related. Schularick and Taylor (2009) consider that crisis related recessions are about one third more costly than a normal recession, and that the credit rate is reduced considerably and has a slower come back. From the current account point of view, we can see a reversal of the reduction trend that is registered during a pre-crises period.

The recent financial crisis was preceded by major unbalances of the current account and there are economists who consider this as a significant factor than can contribute to a crises.

### Macroprudential policies

The term “Macroprudential” has its origins in documents of the Cooke Committee and it referred to regulation at a macroeconomic level. Later in the 1980’s, George Blunden discussed the matter in a speech and in 2000 Andrew Crockett talked about it at the BIS. The term has become more and more used in economic literature and it has become a matter of study for many researchers.

Macroprudential policy is supposed ensure financial stability by offering resilience both to external shocks (Padoa-Schioppa, 2003) as well as to internal shocks or vulnerabilities (Borio and Drehman, 2009). Brunnermeier (2009) considers that it has an essential role in measuring risk in times of boom or bust. Landau (2009) argued it should prevent the forming of bubbles. Caruana (2010) stated the purpose of macroprudential policies is to limit systemic risk by addressing the links and exposure of financial institutions. Perotti and Suarez (2009) consider that it should limit individual bank strategies that could generate risk.

The new perception is that countercyclical measures should be implemented both by monetary policy and macroprudential policies. This should insure price stability as well as financial stability. This approach can prove to be very useful by supplying more instruments with better efficiency to authorities. There is, however a discussion about how monetary policy and macroprudential policies influence each other and how they can work together to obtain the same goal. A simple example is the effect that a change in the policy rate can have on risk taking in economy, credit or non-performing loans. Macroprudential policies should respond to these effects, but they might not be entirely effective. The situation can be reversed, as well. But the two could influence each other positively, as well, and that could lead to a overshooting of the target. So the need for coordinating the two arises as absolutely necessary.

But the problem is if one institution should be responsible for both (such as the central bank) or it would be better to have two separate institutions with clearly stated objective but working together.

The ECB’s goal is to maintain a price level, measured by the HICP of around 2% and due to anchored expectations, the crisis did not lead to deflation (Smets, 2010).

## The role of a central bank

Central banks played each of these roles according to the needs of each period in history and the characteristics of each financial crisis, in turn.

Many economists argue that the monetary policy should be blamed for the recent financial crisis, due to the low interest rates and the current account surplus in emerging countries, especially Asia and some oil producing countries, which generated a liquidity surplus that induced increases in asset prices. This is especially relevant in the real estate sector. When prices started going down, the crisis broke out. Therefore, it is believed that the monetary policy did not act in an efficient and timely manner and that it allowed for unbalances to emerge. But such increases in asset prices do not necessarily induce a crisis. We have to take into consideration the financial fragility that accompanied the process. The main reason behind this fragility is thought to be the continuous financial innovations, which caused great distortions that neither the markets, nor the authorities could foresee.

The monetary policy's role is to smoothen the economic cycles and to control inflation. A less restrictive monetary policy can induce an increase in credit and asset prices and, if it is too loose, it can boost even more an economic boom. However, such a monetary policy conduct is not enough to explain the financial crisis, because there are many countries where the policy rate was as low as the FED's and they had no problems.

Financial stability must be reached by means of system regulations that limit excesses. There may be situations in which they could derive from inflation targeting in order to address financial stability, but such situations should be rare. Monetary policy did not represent a trigger of the financial crisis as much as the financial innovations, the lack of restrictions and regulations, or the reduced standards for loans did.

Banks were tempted by such risky investments and a way to avoid such situations in the future would involve understanding the reason behind their actions.

Banks that are influenced by the information asymmetry can be tempted to assume higher risks. Banks that are risk neutral act as risk-loving agents, because they do not bear the burden of their losses, but transfer them through deposits and bonds. Such banks will prefer investments with higher risks and yields.

Moral hazard is also essential in avoiding future situations such as the financial crisis. So we must take into account the fact that the more a bank invests of its own capital, the more it may lose in case of a default.

De Niccolo (2010), Dell Ariccia, Laeven and Marquez (2010) consider the role of the policy rate in the level of risks assumed by banks. Normally, banks transform short-term funds into long-term loans. A reduction in the policy rate will determine a cut in the interest rate on deposits, but will only partly influence interest rates on loans. This translates into an increase in bank profits and a decrease in risk. Therefore, a cut in the policy rate will make risky assets less attractive.

Until the recent financial crisis, many economists believed that financial stability and monetary stability complemented each other, but the events of the past years have proved the contrary.

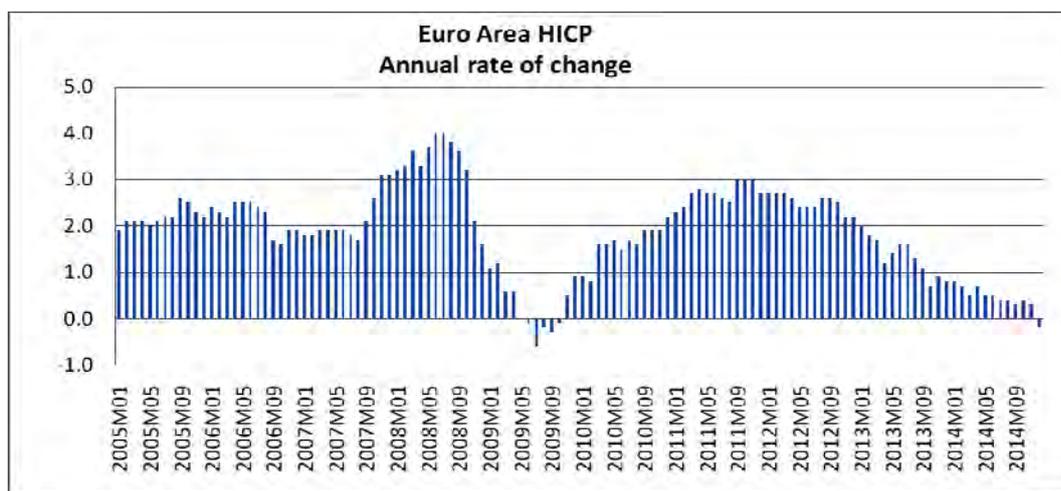
In order to face the problems generated by the crisis, many central banks lowered the policy rates to minimum levels. But once the economy is rebalanced, it is extremely possible that policy rates will be increased in order to address the regular issues such as inflation. At this moment, banks will have assets with fixed yields, while the cost of financing will be bigger. One way to avoid losses will be to take on loans with a high level of risk. Thus, judging from

the point of view of the relationship between the two types of stability, we can understand the possible conflict.

The conventional view before the crisis was that there was no trade-off between financial stability and monetary stability (Issing, 2003). Anna Schwartz (2000) stated that a central bank that was able to maintain price stability would minimise the risk of an intervention as a lender of last resort.

### Low inflation – the new challenge

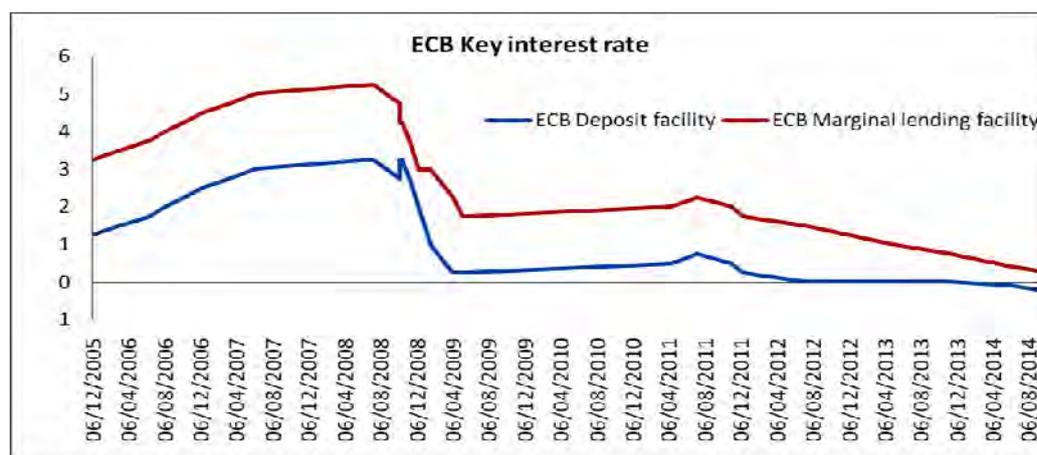
The recent inflation evolutions have brought in the spotlight its role and possible consequences in terms of financial stability. The ECB Board acknowledges the fact that the low interest rate levels were a necessary measure in order to obtain their main objective, but also considers the possible risks that can occur if such a situation is prolonged over an extended period of time. In order to determine banks to offer financing to the real sector, they reduced the refinancing rate and offered other such instruments, but it is difficult for troubled economies to adjust to such situations, especially since most instruments do not have an immediate effect, but rather a long-term one.



**Source:** Eurostat.

Some of the measures taken into consideration in this situation were mostly unconventional ones such as security purchase programmes or a revitalization of the asset-backed securities market by taking on the liquidity risk but not the credit risk.

The effects of a looser monetary policy manifest themselves on asset prices and this could lead to bubbles and to an increase in the level of debt. These are problems that could be addressed by using macroprudential policies such as capital requirements.



Source: ECB.

The recent economic turmoil has shown, at great costs, the hidden imbalances in the euro area and has determined a process of adjustment and institutional reform. The recovery process is a slow one with moderate growth and low lending.

The main objective of the ECB is formulated as a level of inflation of below, but close to 2%, but the way this objective is perceived differs. Moreover, the monetary policy of the euro area is regarded as a whole not at a county level. This objective must be obtained on a medium term rather than on a monthly constant basis that is how inflation expectations are made.

Monetary policy should not react to temporary changes in prices due to short-term developments. But a combination of factors such as lower oil prices, the appreciation of the currency and low demand could lead to a readjustment of inflation expectations and this could generate a spiral of falling prices. The current situation of low prices in the euro area could be the result of a readjustment process as a response to the financial crisis.

In June 2014 the ECB adopted three types of measures: interest rate cuts, improving the monetary policy transmission mechanism and further necessary actions if needed. The lowering of the interest rate was considered necessary due to low inflation projections for the year. But the actions took into consideration the interest rate corridor that could determine banks to continue trading on the interbank market and not to keep their excess liquidity at the ECB, but to search for investment opportunities.

Other types of measures are meant to address the fact that credit growth since 2012 has been declining and credit conditions are very restrictive. The ECB announced two long-term refinancing operations that were meant to help the business sector because of the still high levels in the interest rates for SMEs. This is due high credit risk or high levels of NPL's and this is a good because loose lending conditions would only be of benefit on a short term. The measures implemented offer help in terms of maturity transformation for banks and these combined with a general better economic situation should determine banks to be less restrictive. By using these tools, banks will have to prove an expansion in credit or they will have to repay the sums. But this are only be accessible to sound banks that have clean balance sheets and have enough capital.

But all these measures are will not have immediate effects, but rather medium-term effects. And even if these measures do not have the desired effect, the ECB assumed a commitment to use other unconventional measures in order to increase inflation.

The ECB also took into account the securitized loans market that needed to be encouraged due to the fact that asset-backed securities have been treated as a main culprit for the recent economic crisis. But the simple instrument is not at fault but rather the way it was transformed and reused in artificial transactions. This was a measure that considered the effect on SME

lending but has to be backed up by consistent capital requirements calculated based on risk assessments.

Long periods with low policy rates imply specific risks to financial stability due to the fact that there will be a declining risk aversion that could lead to bubbles or an increase in indebtedness, productivity losses or a reduced effect of monetary policy.

This is where macroprudential policies come in and the European Union has taken the necessary steps in the direction of ensuring not only the stability of each financial institution, but rather the relationship between macroprudential and microprudential regulations.

## Conclusions

The recent financial crisis has been a turning point in the design of financial and monetary policies due to the new problems it posed. The Central Banks and the international financial institutions took the necessary steps to encourage economic growth and to reestablish the trust in financial institutions. This meant using or even creating new instruments of a unconventional nature that could respond accordingly to the new economic conditions. But it is obvious that the effect of the crisis are still manifesting themselves and there are still risks for the economy that need to be considered and that require an effective response.

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# Determination of risk in financial markets using Extreme Value Theory (EVT)

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**Abstract.** *Financial Markets represents a financing source for public and private entities. The last crash of the banking system encourages the investors to be part of the capital markets and companies to be more flexible with their shares on stock exchange. In the last years, financial dates have been analyzed and its returns presented some characteristics like: leptokurtosis, serial dependence and fat – tailedness. Risk management is very important for both investors and companies. For that reason, risk managers and supervisors used the Value at Risk (VaR) to measure the losses for buying/selling position. Extreme Value Theory (EVT) is a complementary risk management tool that presents how the heavy tails can be used to allocate the capital for covering the risks.*

*In this paper I present the evolution of literature about risk management in financial markets and how EVT is used to measure the risks using different models.*

**Keywords:** financial markets, Extreme Value Theory, risk management, Value at Risk, BASEL agreement.

**JEL Classification:** G17.

## Introduction

Simultaneously to the first failure of the banking system, financial markets became an important financing source for companies' or state's activities and a major study object starting the previous century, its development determined by numerous expanding companies together with a banking system that is required to deliver solutions to all of the society's members. The capital market gained increased importance for every investor, their money being more frequently directed to a stock exchange as investments in different companies' shares or other instruments. The Basel agreements regulate world banking systems for adapting each bank capital to the economic framework. They were initiated by The Basel Committee on Banking Supervision. What the statements bring in refers to calculating in every moment the capital necessary of financial institutions so as to cover all expected and unexpected debts and losses. The risks referred to in these agreements are market risks, credit risks, and operational risks. In 1996 the first BASEL agreement is signed which aimed at measuring risks in the bank sector. Along with BASEL II, the market risk becomes the most important component of the risk supervision and control system, calculated based on Value at Risk (VaR). The maximum loss was determined for a 10-days period and under a 99% probability. This method has become very popular due to its fast and easy implementation. There were launched three BASEL agreements, the last one being effective as of 2011. BASEL III is stricter on capital related information transparency, this area being expected to improve by the end of program implementation. Banks should own more capital to cover the risk, and this decision has been taken after the last crush of the banking system.

The focus is now on risk management and prudential supervision and for this reason, a large variety of models have been developed. Risk managers and supervisors adopted rapidly the concept of Value at Risk (VaR) to measure the risk. In this moment, VaR is a non – consistent measure, and a new approach is very important for financial industry. This paper explains the limits of Value at Risk and test the fit of Extreme Value Theory as a complementary risk management tool.

This paper is dedicated to young researches and students because it presents an introduction to Extreme Value Theory and Value at Risk literature and it gives some well explanations about risk and how to manage it using existing models. The research is structured in four sections. The first section is about "Data Facts" and presents the stylized facts of extremes values such as: asymmetry, leptokurtosis and volatility clustering. The second section is "How to apply Extreme Value Theory" and we indicate the steps in applying EVT by modeling financial series. The third section is related with "Measuring Risk using EVT" and we present Value at Risk, Extreme Value Theory, Copula and how to apply them to determine the level of risk for financial data. The last section is for conclusions and personal perspectives on this topic.

## Data facts

Extreme events are happened in more areas as telecommunications, geology, climatology, biostatistics, computer science, insurance, financial markets and stock exchange. If we choose to evaluate the risk for financial markets, we must identify possible data series used. The researchers modeling share prices, exchange rates, financial assets yields or returns, stock exchange indices, and so on with their advantages and limits. Mandelbrot (1963) and Fama (1965) used financial assets yields on their studies for the first time and they presented some characteristics of this data like: leptokurtic, thick tails, asymmetry, "volatility clustering" phenomenon. In 1976, Black presented the negative correlation between assets prices and volatility movements, called leverage effect. Manganelli and Engle (2001) analyzed exchange rate and interest rate returns to establish that this series are not normally distributed, are not independent, but are skewed and other characteristics discovered by Fama and Mandelbrot.

Yields' movement for a normal distribution is of a two – three sigma order, but for financial assets this is of a four – six sigma order (Blum 2002). Mussa (1979) and Levich (1985) considered that exchange rates series are asymmetric. McNeil (1998) calculated quantile of risk for log daily returns on BMW stocks using Extreme Value Theory (EVT). Allen, Singh & Powell (2013) mentioned that returns data series of an asset or portfolio are not normally, and for this reason we apply extreme distribution based methods such as Extreme Value Theory.

### How to apply Extreme Value Theory

In the last section we discussed about stylized facts of financial data and this section is dedicated to the solutions of these facts, according to EVT and its application and how EVT is a good complementary risk management tool for financial series. The characteristic of stationary is very important because the value of shares, stock indices and exchange rate are difficult to compare to each other, for example, values are different from one index to another. In this case, it's eliminating the trend using daily returns. Allen, Singh & Powell (2013) implemented EVT for ASX – All Ordinaries and S&P – 500 daily log return data, to stock indices from Australia and USA. Embrechts et al (1999) used loss ratio of earthquake insurance in California from 1971 through 1993, yearly data, for applying the Extreme Value Theory. Marimoutou, Raggad and Trabelsi (2009) presented a study on crude oil market, using two types of prices: Brent and West Texas Intermediate (WTI). The data periods are: for Brent starts in May, 1987 and ends in January, 2006, and for WTI from April, 1983 to April, 2007. In their research, the series is daily log – returns because the prices are very volatile. Testing normality of series used is done using Jarque Bera test, based on the third and fourth moments of the distribution, skewness and kurtosis respectively. Alongside this test of normality, a graphical method can be used called QQ Plot. Mersic (2007) used this method to compare an independent and identical distributed data with a Normal Distribution and extended his comparison to a Gumbel Distribution. The phenomenon of volatility clustering is verified using stationary tests such as Augmented Dickey – Fuller unit root test (ADF) or Kwiatowski – Phillips – Schmidt – Shin unit root test (KPSS). The necessary condition for applying Extreme Value Theory is to have independent and identical distributed (i.i.d.) data. For this, autocorrelation and heteroscedasticity must be eliminated. We can test these two characteristics of a financial data using graphical methods such as Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) and representation of returns series.

Next step in applying Extreme Value Theory is determination of the extremes from analyzed series using some empirical or graphical methods. Mersic (2007) called the extreme values distribution as Extremal Limit Problem and the distributions for the application of EVT named the Domain of Attraction Problem. He used Block Maxima approach to solve the problem of Extremal Limit and used Gumbel distribution for the extremes. A similar vision about modeling extremes has McNeil (1998) by using the concept of Domain of Attraction and Block Maxima methodology. Allen, Singh & Powell (2013) used both *Block Maxima Model (BMM)* and *Peak over Threshold (POT)* methods to establish the tails' values. With POT approach we calculate the GPD mean excess function for every threshold  $\sigma$ , and establish using a graphical representation the right  $\sigma$ . The extremes are values bigger than  $\sigma$  for positive ones and smaller than  $\sigma$  for negative ones. McNeil, Frey and Embrechts (2005) applied Hill Estimator to build Hill Plot and indicate the value of the threshold. Dominicy, Ilmonen and Veredas (2014) presented a review of univariate Hill Estimator and illustrated the separating estimators with daily stock log returns of 21 majors' world – wide equity market indices. More research on graphical decision about threshold and extremes selection presented Scarrott and MacDonald (2012) in "A Review of Extreme Value Threshold Estimation and Uncertainty Quantification" and remembering about other threshold

estimation approaches such as Zea Bermudez and Kotz (2010), Thompson et al. (2009) and Cabras & Morales (2007).

In previous section we discovered that financial series are not normally distributed because they present extreme events like: big losses, big negative or positive returns and so on. For Extreme Value Theory, the problems of negative or positive values are the same, but very important is the distribution of data. The most common distribution used for series with extreme events is Generalized Extreme Values distribution (GEV). McNeil, Frey and Embrechts (2005) indicated some of the extremes values distribution likes: *Gumbel*, *Frechet* and explained the Domain of Attraction for this important classes of distribution. A data string like  $M_m = \max \{ X_1, X_2, \dots, X_n \}$  will be obtained, a string on which the distribution will be determined with the two theorems EVT – Fisher-Tippett Theorem, this being proved by Gnedenko. Fisher – Tippett Theorem (1928), Gnedenko (1943): Let  $(X_n)$  a series of independent and identically distributed variables. If there are the constants  $c_n > 0$ ,  $d_n \in \mathbb{R}$  and a depending no degenerate  $H$  so as

$$\frac{M_n - d_n}{c_n} \rightarrow H$$

then  $H$  will follow one of the three standard extreme values distributions:

- Fréchet:  $f_\alpha(x) = \begin{cases} 0, & x \leq 0 \\ e^{-x^{-\alpha}}, & x > 0 \end{cases}, \alpha > 0$
- Weibull:  $g_\alpha(x) = \begin{cases} e^{-(-x)^\alpha}, & x \leq 0 \\ 1, & x > 0 \end{cases}, \alpha > 0$
- Gumbel:  $h_\alpha(x) = e^{-e^{-x}}, x \in \mathbb{R}$

Fisher – Tippett Theorem indicated the fact that extreme values are distributed based on one of the above functions, regardless of the initial distribution they belonged to.

- $G_{\zeta, \sigma}(y) = \begin{cases} 1 - \left(1 + \frac{\zeta}{\sigma} y\right)^{-\frac{\sigma}{\zeta}}, & \zeta \neq 0 \\ 1 - e^{-\frac{y}{\sigma}}, & \zeta = 0 \end{cases}$  for  $y \in \begin{cases} [0, (x_F - u)], & \zeta \geq 0 \\ [0, -\frac{\sigma}{\zeta}], & \zeta < 0 \end{cases}$

$G_{\zeta, \sigma}$  represents the *Generalized Pareto Distribution – GPD* with  $\zeta$  form parameter and  $\sigma$  scale parameter, the latter measuring distribution dispersion. The GPD parameters can be estimated using *Maximum Likelihood – MLE* or using *Probability Weighted Method of Moments – PWM* method. Hosking and Wallis (1987) proved that for a parameter of a form bigger than -0.5, the method works. Rootzen and Tajvidi (1996) showed that for data series with thick tails and a parameter of a bigger form than 0.5, PWM offers subjective estimation, while MLE presents consistent estimation. Penalva et al. (2013) offered an implementation perspective for extreme values distribution using R – Statistics.

Determination of threshold and extremes values distribution is a very important step to applying EVT because the measurement of risk and capital allocation directly depends with the distributions. Embrechts et al. (1999) applied Extreme Value Theory using Generalized Pareto Distribution to 8043 industrial fire insurance claims and maximum – likelihood - based approach yields estimates the parameters of the extreme value. The results can be used as a tool in the final pricing of risks corresponding to high layers (catastrophic, rare events). Tsai and Chen (2011) presented numerical examples to compare capital requirement using Extreme Value Theory and using Basel formula.

## Measuring risks using EVT

According to the BASEL statement, Value at Risk it's a risk management tool used for banking system. Value at Risk (VaR) represents the maximum potential loss which a portfolio or an asset can register in a certain time frame and under a fixed probability in the case that major market alterations as price variations, interest rate, exchange rate. VaR can be determinate using parametric or non – parametric models. The three standard approaches for estimating value at risk are represented by the variance – covariance method (VCM), Monte Carlo simulation (MS) and historical simulation (HS). The detailed description of the three methods was elaborated by Joridon (1997) and Dowd (1998). Manfredo and Leuthold (1999) offered arguments for and against these ways to approach the value at risk. Piroozfar (2009) presented some general aspects about risk, types of financial risks and introduced Filtered Historical Simulation (HS) concept, as the fourth way to calculate VaR. Piroozfar (2009) also explained that HS (bootstrapping simulation) gather market raw values of risk in a special past period of time, and calculate their changes over that period to be used in the VaR measurement. Alexander (2008) presented very detailed Value at Risk (VaR), how we calculate VaR, which horizon, confidence level, the advantages and limits of VaR and other aspects on this topic. Danielsson and De Vries (2000) considered that VaR is not a consistent measurement of risk because it assumes that values are normally distributed. This hypothesis is not valid because, as we demonstrated in previous section, every financial data has extreme values and heavy tails. Also, this theory was supported by Mandelbrot (1963), Fama (1963), Mussa (1979), Andersen (1999) and Manganelli and Engle (2001). Hols and De Vries (1991), Huisman (1997), Huisman (1998), Wagner and Marsh (2003) and they have shown that financial assets have thick tails, and Extreme Value Theory offers better results in risk estimation. For this reason, Conditional Value at Risk (CVaR) or Expected Shortfall (ES) is a model used to calculate the value of tail risk and it is useful because is basically the mean size of losses exceeding VaR threshold and the semi-parametric model of VaR using Extreme Value Theory.

Proca (2010) presented the history of **Extreme Value Theory**. It was analysed through the probability theory, and its origin was found in the papers of M. Fréchet (1927), R. Fischer and L. Tippett (1928), R. Misses (1936) and it gains a general nature later with the research conducted by Gnedenko (1943); also, statistically, the theory was initiated by J. Pickands III (1975). The Extreme Value Theory offers the determination and estimation mechanisms for distributions' tails. Tails represent the extreme values of a distribution that exceed a certain value predetermined based on quantiles or on imposed maximum and / or minimum threshold. EVT offers an approximation of the maximum and minimum values distribution with random variables, having as a basic advantage the possibility of not having detailed information about the distribution of all values. Besides extreme distribution, this theory offers a conclusion on risk management. Gençay, Selçuk and Ulugülyagci (2003) studied EVT using ISE – 100 and S&P 500 and their results indicate that the existing Basel committee risk measurement and regulatory framework can be improved by incorporating costs of trading, costs of capital adjustments and the amount of losses into existing criterion to determine minimum capital requirements. Some of these remarks have been taken into consideration for BASEL III agreement, after 10 years. Tsai and Chen (2011) concluded that EVT gives more accurate results when tails of the financial data distribution deviate from normal than the formula from the Advanced Internal Ratings - Based Approach. Also their conclusion was that the BASEL formula tends to underestimate the capital requirement when the distribution has a heavy tail. Gavril (2009) applied EVT to four exchange rates returns series and analyzed the performance of four VaR models such as Historical Simulation, Hybrid Historical Simulation, Exponentially Weighted Moving Average and EGARCH. The conclusions is: EVT should oriented on stress testing or limit setting for long or short positions, as the limits set for

transactions highly depend on the probability of an extreme loss, that may not be easy to cover and EVT, by contrast to VaR, tells that such a probability is considerably high.

In order to apply EVT, we can use some of the models known such as ARCH, GARCH, EGARCH, Copula and so on. If the values are autocorrelated, we use an ARCH model and determine the conditional mean, necessary for applying EVT. Jánský, Rippel (2011) involved GARCH, EGARCH and TGARCH models for evaluation several hundred one – day – ahead VaR forecasting models on data from six world stock indices. Danielsson and De Vries (2000) used conditional volatilities, such as GARCH models based RiskMetrics method but they preferred semi – parametric method for estimation of tails probabilities. Copula models are used to determine risk for multivariate distribution. Necula (2010) presented the importance of Copula if we have a multivariate distribution and used it to determine the dependency between two pairs of stock indices, BUX vs. PX 50 and DAX vs. SP500 by estimating the empirical copula function. He concluded that using normal distributions for modeling financial returns, the risk is underestimated. Renard and Lang (2006) used Gaussian Copula model in hidrology and their conclusions was that this type of Copula can be used to simulate values with prescribed correlations and marginal distributions. Nevertheless, this tool is far from universal, as it is based on no theoretical justification.

### Conclusions and perspectives

Risk management gained importance in the last 20 years due to the development and the increase in the volatility of stock exchanges. A number of conclusions can be drawn based on the study. The most important aspect is that VAR models underestimate the risk of loss that can record for all the investors or banks. For this reason it was proposed to determine ES, as a measure that meets all the properties of a consistent indicator. Theory we get larger sizes for Value at Risk, which implies a more consistent allocation of capital to risk prevention. However there is a trade-off when considering how this information should be used: regulators would prefer more conservative measures, which diminish systemic risk but results into inefficient supplementary capital allocation; on the other hand, bank managers would assume the risks but prefer those models which result into low capital requirements. The rule that EVT VaR is better than VaR is not always true and for a normal distribution of returns, VaR is a good management risk tool. In order to apply EVT we must checked some characteristics: stationary, asymmetry, heteroscedasticity and so on. EVT is very volatile at threshold selection, and this step is very important to make the right decision about managing risks.

To continue this study, we intend to check whether there is a correlation between two or several emerging financial markets, taking into account countries such as Romania, Hungary, Czech Republic and Poland using Copula models. Another study can use data such as financial assets, stocks, portfolios, providing a broader view for application of Extreme Value Theory. An important component that can occur after determining the risk is the possibility of its reducing, an aspect that can be considered for a development of this paper.

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# Triggering factors for economic convergence and stability across central and eastern European countries

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**Abstract.** *The primary objective of this article is to evaluate the degree of convergence and establish the triggering factors of the economic growth process across the group of countries that joined EU in 2004 and 2007 for the time period between 1992 and 2012. To achieve this objective we developed an empirical analysis using the panel GMM methodology. The results provide guidance for future policies, emphasizing that the infusion of technological progress by increasing spending on research and development, increasing the degree of economic openness and rising the foreign direct investment flow represent the main sources of growth and convergence.*

**Keywords:** Economic and Monetary Union, macroeconomic policies, economic growth, market stability.

**JEL Classification:** F15, O11, O57.

## 1. Introduction

In the context of a continuous struggle for domination and international recognition, modern economies are facing not such a privileged position of capturing new techniques, instruments or methods that would enable them to obtain a considerable advantage over their main competitors. The primary objective of each economy is to ensure certain stability in what concerns the economic environment that due to the extremely high degree of interconnection with other elements of the global system leads to performance. Performance, whether we refer to the economic, financial or institutional one, is an absolute indicator of the ability to adapt to frequent macroeconomic changes, and once this indicator is fulfilled, the next natural step is towards economic growth and convergence. Economic growth accompanied by a high degree of convergence represents one of the major challenges of the modern world architecture. The interconnections of these two processes continue to raise the interest of economists, politicians, sociologists, business people or simple citizens, being an omnipresent subject within the current economic activities. The present paper concentrates upon some contemporary aspects regarding the evolution of the emerging economies of the New Members of European Union, focusing upon the main determinant factors of economic growth using as a sample of data the following countries: Hungary, Poland, Czech Republic, Malta, Cyprus, Slovenia, Slovakia, Estonia, Lithuania, Latvia (that joined EU in 2004), Romania and Bulgaria (that joined EU in 2007). Croatia was excluded from the analysis due to the fact it joined EU in 2013 and our study does not cover that period. The selected time period for the empirical survey was between 1992 (the year when the Maastricht treaty was signed, treaty that embodies the criteria a state should fulfill before adopting the common currency) and 2012, in order to capture both extension waves and the effects generated by the recent global economic crisis and the Eurozone turbulences. Although a number of studies concentrated upon the subject approached by the present paper, the novelty of our research is determined by the group of countries selected and also by the time horizon analyzed. Furthermore, after a rigorous investigation of the literature in the field, we aimed at developing an analysis based on a mixture of triggering factors that the previous researches highlighted to be the most significant.

The process of economic growth cannot be regarded merely from an economic perspective, since it embodies not only major transformations within the institutional, social and administrative structures, but also radical changes regarding human behavior, aspects that provides its multidimensional framework. Although the process of economic growth is often defined by reference to the national context, its achievement is influenced by changes in the international economic and social systems.

The dichotomy of the economic growth theories may be outlined evolving from historical to specific models. The historical perspective is concentrated upon the interconnection between events, cultures and economic institutions. The changes in the economic framework are perceived as both determinants and consequences of these interactions. The specific growth theories emphasize in a rigorous manner the impact of certain key parameters on production and development. A better understanding of the economic growth process emerges from the harmonization of both approaches (Todaro, 1994). Each of these theories offers a new perspective on economic growth, introducing an element of novelty in the interpretation of this complex subject. While the existence of convergence is considered an edifying element in the neoclassical models, the majority of the endogenous models advocate in favor of divergence.

The reminder of this paper is structured as follows: Section 2 highlights some main contributions in the area of research concerning the triggering factors of economic growth and convergence; Section 3 offers a methodology description of the econometrical model applied in analyzing the growth and convergence process by focusing on the GMM (Generalized

Methods of Moments) methodology. At the same time it describes the variables modeled in the empirical illustration. Section 4 presents the obtained results and in accordance to which we formulate some conclusions and policy implications in the final section of the paper. Also some limits of the research are emphasized.

## 2. State of the Art

Highlighting the factors that have a significant impact upon the dynamics of economic growth and convergence process, constitutes an extremely useful task, taking into consideration the high degree of heterogeneity that characterizes the contemporary economies. Furthermore, developing such an analysis proves to be very challenging, given the multitude of factors that this process embodies. The economic growth process is considered to be an extremely complex one, triggered by a number of political, institutional, cultural and social factors. The literature in the field offers a wide range of classification of these factors, each contributing with strong arguments to the overall framework of economic growth.

The concept *human development* is an extremely complex one, including a number of variables that influence in a certain way the economic growth. Human development is clearly linked to the development of human capital as an inner factor. The term *human capital* was introduced into the economy by The Nobel laureate, Theodore Schultz, who claimed in his paper from 1963 the need to invest in education in order to increase agricultural productivity in the USA. The link between human capital and economic growth is in our opinion one of the most important determinants of progress and performance of an economy. The education level of the population is an important factor in terms of growth rate of an economy. The relationship between economic growth and human development is one that works both ways. Initially, the economic growth provides the resources necessary to enable the development of human capital. On the other hand, improved labor quality is a decisive indicator of economic growth. The economic growth cannot be sustained unless it is preceded or accompanied by the qualitative improvement of human capital. Human capital combined with physical capital can generate a constant marginal product of physical capital, as human and physical capital act as complementary variables. Economies that have large stocks of capital, both physical and human, are growing faster than those economies where one of these resources is scarce. However, we have to mention the case of the African states that although they have a consistent stock of human capital and resources, the lack of effective strategies for development and a low degree of openness of the economy determines these economies to stagnate.

A large number of studies have focused on the interdependence between human capital and economic growth (Dewan and Hussein, 2001). In a study conducted on a sample of 98 economies in the period 1960-1985, Barro (1991) highlights the positive relationship established between the growth rate of GDP/capita and the initial level of human capital. Similar results were obtained by Sach and Warner (1997) and Gallup et al. (1998) who emphasized that an intense human capital development would lead to a quick transnational growth. Levin and Renalt (1992) also argue that investment in human capital through investment in education is one of the main sources of economic growth. De la Fuente and Domenech (2000) include in their analysis 21 OECD countries over a time horizon between 1960 to 1990 and provide a number of arguments in favor of positive correlation between human capital, quantifiable through the education level, and economic growth, suggesting that previous studies might have failed to highlight this correlation due to errors in quantization of human capital component. Engelbrecht (2003), investigating a group of OECD member states, obtains not only a positive relationship between the two variables but also an extremely strong one. Middendorf (2005) investigated, using panel methodology, the contribution of human capital to economic growth on a sample of 29 OECD countries over the period 1965-2000.

The model applied provided positive results on the relationship. Also more recent studies, such as the one implemented by Qadri and Waheed (2013) who tested the hypothesis of correlation between the variables mentioned above on a number of 106 economies between 2002 and 2008, confirm the existence of this interdependence. The New Member states of European Union focused over the last decade to improve their budget allocation towards education in order to stimulate human capital development, as illustrated in Table 1. This aspect offers us a very favorable starting point for performing the analysis of this factor's impact on economic growth.

**Table 1.** Evolution of Spending on Education in 1999 and 2010

Total spending on education (mil. Euro)			
Country	1999	2010	2010/1999 (%)
Bulgaria	1472	3309	2,25
Czech Republic	5066	8709,3	1,72
Estonia	644	:	-
Cyprus	590	1547,5	2,62
Latvia	876	1409,8	1,61
Lithuania	1511	2486,5	1,65
Hungary	4648	7751,9	1,67
Malta	246	590,7	2,40
Poland	15963	30471,8	1,91
Romania	3600	8622,5	2,40
Slovenia	:	2381,7	-
Slovakia	2077	4096,1	1,97

**Source:** Authors' calculations based on data provided by Eurostat.

The theories of economic growth of 1930s have paid attention to the problems of unemployment and the role of labor in production. After the Second World War economists have attributed an important role to another factor, quasi-neglected so far: *the capital*. In some recent studies, economists have performed pairing of factors such as capital, labor and technology, considering technological progress a key component when economic growth is concerned. In developed economies the impact of technological progress on economic growth reached a rate of 60-70% compared to other determinants (Qifan and Yang, 1985). Many authors have tried over time to analyze the relationship between the two concepts starting right from Adam Smith in *The Wealth of Nations* who highlighted the crucial role that the technological progress holds in ensuring sustainable economic growth. Early neoclassical models, such as that of R. Solow (1956), addressed the changes in technology as an exogenous variable, illustrating the idea that long-term economic growth depends exclusively on exogenous technological changes. Another important contribution belongs to Phelps (1966) who related technological resources engaged in work capacity in order to develop new ideas and technologies. Even more recent models belonging to Romer (1990) or Grossman and Helpman (1991) support the idea that an increase in the level of resources directed towards developing new technologies lead to further economic growth.

The openness of the economy is an indicator widely used in the literature on economic growth as one of its determinants. It influences economic growth through a variety of channels such as: operation of competitive advantage, technology transfer, growth of economies of scale and increased competition exposure (Chang et al. 2009). Specialized studies performed over time suggested a particularly complex but also ambiguous link between economic growth and the openness of an economy. A particularly important issue in analyzing the relationship openness – growth is the way the openness is measured, which is determined by the total volume of exports and imports relative to GDP. The literature on this subject is extremely wide. There are some studies claiming that those economies which have a higher degree of trade openness have a high rate of GDP/capita and are growing at a much faster rate than other economies (Dollar and Kraay, 2002;Edwrads, 1992;Romer, 1990; Grossman and Helpman, 1991). Complementary to the investigation of this correlation in theory, a number of empirical

studies have focused on analyzing this interdependence based on a series of econometric tools. In testing the correlation between the degree of openness of the economy and economic growth literature has identified an extremely large variety of measuring instruments as for example: average rates of tariffs; quantitative restrictions; non-tariff barriers. If we consider the category of empirical studies, we can distinguish between the following:

- studies using single or multiple regressions;
- studies using Granger causality tests, used to validate the hypothesis that a time series can be used to predict another (Granger 1969);
- studies using panel methodology.

Regarding the first category, Dollar and Kraay (2002) or Douglas and Tervio (2000) have provided positive results on this correlation. Dollar and Kraay (2000) used an important data set including about 953 observations of 137 countries between 1950 and 1999. The results show that the volume of trade is positively associated with economic growth process, although the coefficient of representativeness is not extremely high. The second category of studies, involving Granger methodology, provides mixed results on the correlation. Singh (2011) obtained negative results on the effect of imports on growth and Shahbaz (2012) argued in favor of the positive impact of trade on growth, showing that 1% increase in trade led to growth of 0.0707%. The third category of empirical studies, based on panel methodology is extremely vast. Relevant here are studies of Islam (1995), Gries and Redlin (2010) or Das and Paul (2011). Redlin (2010) applied the GMM panel methodology on a sample of 158 economies for 1970-2009, identifying the positive impact of trade on economic growth. Das and Paul (2011) involved the same methodology on a group of 12 emerging economies in Asia (Bangladesh, China, India, Indonesia, Korea, Malaysia, Nepal, Pakistan, Philippines, Singapore, Thailand and Sri Lanka) the results of processing statistical confirming positive interdependence between trade and growth.

A strong effort from specialized studies was geared toward understanding the main characteristics of the effects generated by the spatial distribution of foreign direct investments (FDI). Despite the increased globalization of economic activity, FDI decisions are based on a number of characteristics influenced by regional growth rates, labor costs, availability of a skilled workforce and technology or regulatory framework. Macroeconomic studies that have used FDI as a variable suggested the positive role held by it in generating economic growth, especially but not only in private sectors. Causal relationship established between FDI and economic growth is undoubtedly one of the most analyzed and tested correlations in the theory of economic growth, especially among emerging economies (Mihut and Lutas, 2012). De Mello (1999) argued that FDI is a good indicator to assess the degree of economic growth leading to technological progress, capital accumulation and improvement of labor. After a careful analysis of the literature, we have found that the relationship FDI – growth has been studied mostly through the interconnection with other indicators of which we consider to be the most relevant the following: financial sector development (Mihut et al., 2011), the initial development level of the economy, trade policy envisaged by each economy, and the stock of human capital.

If we consider the first category, namely FDI, financial sector and economic growth, the study prepared by Hermes and Lensink (2003) based on least squares methodology concluded that foreign direct investments show a positive and significant impact on economic growth only if the domestic financial sector is well developed. These results were confirmed by Alfaro et al. (2003), which involved a sample of 20 OECD countries and 51 non-OECD countries related to credit market indicators and 20 OECD countries and 29 states non-OECD indicators related to capital market, highlighting that FDI and portfolio promoted economic growth in the economy only if the internal financial markets were sufficiently developed. Omran and Bolbol (2003) applying OLS methodology on a sample of 17 Arab states, highlighted the

interdependence of FDI – domestic financial sector – growth. Chee (2010) applied the panel methodology to a group of 44 economies in Asia and Oceania, in 1996-2005, emphasizing that a stable financial sector allows an increase in the volume of FDI ultimately determining high rates of economic growth. When referring to FDI – human capital – growth correlation, Borensztein, De Gregorio and Lee in 1998 concluded that FDI has a positive effect on growth when the economy had a skilled workforce that enabled efficient combination between work and capital. Li and Liu (2005), based on a data set including 84 economies between 1970 and 1999, confirmed the catalytic role attributed to human capital towards attracting new foreign investment, which would eventually be quantified through a positive impact on economic growth.

Consequently, although not a decisive factor in the growth process, FDI links with a number of other variables such as openness of the economy, human capital and technological progress discussed above that contribute to creating a functional system to allow welfare and increased economic returns.

### 3. Methodology

In order to assess the impact that various economic, social and monetary factors have on economic growth, and hence on the convergence among states, we will test, using dynamic panel methodology, the correlations established between selected variables and the GDP/capita having as starting point the Mankiw-Romer-Weil model (1992). Using this model, we incorporate a number of variables in order to establish which factors mostly determine these economies to register positive growth trends. We also intend to establish if a model whose composition is given by these factors promotes real convergence between different economies.

To establish the correlations between these variables and the GDP/capita we will employ a dynamic panel model which allows a better assessment of the dynamics that are found in the variables used in the model. Dynamic panel methodology has been widely applied in various fields to obtain relevant results as well as for bringing arguments in support of various economic theories. Arguments in this area are studies developed by Balestra (1967) on the dynamics of demand for natural gas for 36 US states over a period of 13 years, Holtz-Eakin (1988) on wage dynamics, Arellano and Bond (1991) on a dynamic model of employment rate, or Islam (1995) on a model for testing convergence.

Dynamic relations are often characterized by the presence of lags of dependent variables, a mathematical representation taking the following form:

$$y_{i,t} = \delta y_{i,t-1} + x'_{i,t} \beta + u_{i,t} \quad (1)$$

For  $i = 1, \dots, N$ ;  $t = 1, \dots, T$ .

Over the years the literature has investigated, quantified and promoted a series of key factors that contribute to a greater or lesser extent to achieving sustainable economic growth. Endogenous growth models highlight a number of new factors of economic growth which have not been assigned an important role in traditional modeling. The model we propose is built from the model of Mankiw, Romer and Weil (1992) and it is improved by a number of variables that are the main channels through which the influx of new information occurs in an economy:

$$\Delta(\ln y_{i,t}) = a_0 + \beta \ln y_{i,t-1} + a_1 GPC_{i,t} + a_2 HC_{i,t} + a_3 GAP_{i,t} + a_4 DO_{i,t} + a_5 FDI_{i,t} + a_6 R\&DEX + a_7 ui + \varepsilon_{it} \quad (2)$$

Where  $i$  is the index of the country and  $t$  the corresponding index to the time variable.

The variables included in the model are:  
 ( $\ln y_{i,t}$ ) – natural logarithm of GDP/capita;  
 $GPC$  – a measure of physical capital;  
 $HC$  – a measure of human capital;  
 $GAP$  – technological gap;  
 $DO$  – degree of openness;  
 $FDI$  – Foreign Direct Investment;  
 $R\&DEX$  – government expenditures on research and development;  
 $u_i$  – time variable fixed effect;  
 $\varepsilon_{it}$  – random distribution.

**Table 2.** Definition and Source of Variables Included in the Model

Variable	Definition	Source
$y_{i,t}$ – GDP per capita	This indicator was chosen because it is more relevant in shaping economic performance data of various economies than using the absolute value of the indicator or growth rate.	Eurostat
$GPC$ – physical capital	Gross capital formation is the variable used as an estimator for physical capital, as a share of GDP.	WorldBank
$HC$ – human capital	The indicator used for human capital is the level of education. When we consider testing the connection between education and economic growth most economists choose to use the gross degree of enrollment in secondary education (e.g. Barro1991).	WorldBank
$GAP$ – technological gap	This indicator models particularly the degree of convergence of poor countries towards the developed ones, and it is determined by the difference between the GDP/capita of the best performing economies in a period of a year and the GDP/capita of a country, divided with the GDP/capita of the specified country. $TechnologicalGap = \frac{GDP_{Perf.ec.} - GDP_{i,t}}{GDP_{i,t}}$	WordBank
$DO$ – openness of the economy	This indicator, considered by many authors as a necessary criterion to meet for a real convergence between economies, quantifies the degree of interconnection between different countries based on a formula which is the sum of a country's imports and exports to GDP: $GDE = \frac{I_{it} + E_{it}}{GDP_{IT}}$	WorldBank
$FDI$ – Foreign Direct Investment	This is one of the most frequently used variables in the construction of growth determinants models; it represents the net FDI flow in the economy.	Eurostat
$R\&DEX$ – government expenditures on research and development	Source of information and technology input derived from the national level.	Eurostat

**Source:** Authors' elaboration.

As argued in the introductory section of the present paper, the period of time investigated is 1992-2012, yearly data, horizon that covers all the important moments we what to capture in our research. Table 3 provides the list of the countries included in the sample. The source of the data is Eurostat, and we performed the analysis using STATA11.

**Table 3.** Definition and Source of Variables Included in the Model

States that joined EU in 2004	States that joined EU in 2007
Hungary, Poland, Czech Republic, Malta, Cyprus, Slovenia, Slovakia, Estonia, Lithuania, Latvia	Romania and Bulgaria

**Note:** Croatia was excluded from the analysis due to the fact it joined EU in 2013 and our study does not cover that period.

The central element of this approach is the model developed by Mankiw-Romer-Weil (MRW) (1992), which aiming at improving the absolute convergence model developed by Barro (1991), proposed to introduce elements of measuring physical and human capital to provide information regarding the conditional convergence. Physical capital is represented in our case by gross capital formation and human capital by the level of education, given by the gross degree of enrollment in secondary education. Most specialized studies, both theoretical and empirical, instrument the variable of investment in human capital through education levels,

but it should be noted that there is a separate category of studies that consider various indicators of health as representatives for the development of production capacity of labor (Knowles and Owen 1995). The sample of countries considered for analysis in our case is generally characterized by a well-developed healthcare system during the analyzed time period, so the population health indicator has reached a relatively steady state that cannot still be considered a determining factor in the growth rate fluctuations.

The presence in the model of endogenous variables lags  $y_{i,t}$  raises the question of the inconstancy of the methodology for estimating fixed effects or variable effects for the panel. The question of endogeneity in the panel was addressed in two ways (Iqbal and Daly 2013). The first one refers to LSDV method which allows for correction of the fixed effects of the estimator through endogenous interference estimation (bias) (Kiviet 1995). This method has the advantage of using an instrumental variable, based on the assumption that the use of exogenous instruments improves the quality of estimators. The idea underlying these instrumental variables is to identify a set of variables, generically called *tools*, that simultaneously meet two conditions: 1) to be correlated with the explanatory variables in the equation; 2) to be uncorrelated with the residuals.

One of the first studies that suggested the inclusion of first order differences to eliminate fixed effects due to time invariability and the introduction of instrumental variable estimation was the one developed by Anderson and Hsiao (1982). The use of the estimator shortly called AH allows the estimation of a simple instrumental variable, where to each endogenous variable is assigned one tool. Although the results obtained using the AH estimators are statistically viable, there are at least two drawbacks that make them less effective, namely: they do not use all the available moment conditions, and they do not consider the differentiated structure of residuals.

The proposed solution to improve previously noticed inconsistencies was to develop a generalized form of the estimates which allows the number of instruments to be higher than that corresponding to the endogenous variables. This method is known as GMM (Generalized Method of Moments) developed by Hansen (1982). A very popular technique on GMM methodology is the one proposed by Arellano and Bond (1991), shortly AB that suggests using all available lags of all regressors as instruments. The core of this approach is that the use of first order differences allows for the removal of individual effects and also permits the inclusion of all prior information on  $y_{i,t}$  as viable tools.

If we consider only theoretical aspects, the Arellano and Bond (AB) estimator superiority on Anderson and Hsiao (AH) estimator is evident. However if we use this estimator on a panel model with a not very long time horizon, the opportunity for an AB strategy implementation is very limited. The application of that methodology would result in a reduced representation of the obtained results due to the poor handling of variables. The proposed solution towards solving this problem came from Arellano and Bover (1995) and Blundell and Bond (1998). They introduced further restrictions on the time zero on the assumption of stationarity in the time series, which together with AB estimator lead to what we call System GMM. This model is applied to a set of two equations, namely: an equation in differences investigated by the lags of levels and an equation in levels instrumented by the lags of differences. The advantages from the application of this methodology can be summarized as follows:

- System GMM is positioned between the lower and upper limits represented by OLS and LSDV;
- The instruments used are valid;
- There are notable advantages in terms of overall effectiveness of the model.

Baltagi (2005) provides a very good exposure of the estimator Arellano and Bover (1995) that allows identifying efficient variable tools in dynamic panel methodology. Both Arellano and Bover (1995) and Blundell and Bond (1998) propose the use of additional moment conditions taking into account the strict conditions of stationarity of the initially observed values.

There are a number of circumstances that permit the use of these two types of estimators, namely (Roodman, 2006):

- There is a not very long time horizon (T) and a large data sample (N).
- There is a linear relationship between variables.
- The independent variables included in the model do not fully meet the exogeneity condition, meaning that they can be correlated with information from the past and most likely with the current information regarding the error term.
- The variables can include individual fixed effects.
- There is the possibility of heteroskedasticity between variables in the individuals of the same group, but not between groups, and the possibility of autocorrelation.

The estimator methodology used by Arellano and Bover (1995) has been extensively debated in the literature, relevant in this respect being a series of studies developed over time and covering vast areas of research presented in Table 4

**Table 4.** Comparative look of the studies including the Arellano and Bover estimator (1995)

Authors and Title	Methodology implemented	Time horizon and the variables included	Results
Chong and Zanforlin (2001). <i>Technological Adaptation, Trade and Growth.</i>	GMM Estimator Arellano and Bover (1995).	1960-1995 The difference in GDP/capita, investment, level of education, infrastructure, technological equipment (electronics, agricultural, textile).	Long-term economic growth is supported by technological sector development, while trade manifests a positive influence if the economy has a significant contribution of human capital.
Carkovic and Levine (2002). <i>Does Foreign Direct Investment Accelerate Economic Growth?</i>	GMM Estimator Arellano and Bover (1995); Blundell and Bond (1998).	1960-1995 Dependent variable: GDP/capita Explainable Variables: initial GDP/capita, average education level, openness of the economy, governmental structure, private loans.	FDI does not have a significant positive impact on economic growth.
Beck and Levine (2004). <i>Stock markets, Banks and Growth: Panel evidence.</i>	GMM Estimator Holtz-Eakin, Newey and Rosen (1990), Arellano and Bover (1995); Blundell and Bond (1998).	1976-1998 Turnover – as an indicator of market liquidity, Traded value, Market capitalization, Bank credits.	Both the development of financial markets and the banking field have a significant economic and statistical impact on economic growth.

**Source:** Authors' elaboration based on the sources mentioned in the table.

With the development of panel methodology in economic studies but not limited to those, the estimator proposed by Blundell and Bond (1998) became extremely popular and widely used. Studies based on this indicator have proven their applicability in large areas such as (Bun and Kleibergen, 2010): international economics – effects of international trade and economic integration (e.g. Alguacil et al., 2011), macroeconomics – economic growth, optimum currency area (e.g. Bond et al., 2001), bank regulations, industry organization – mergers and acquisitions (e.g. Doytch and Cakan, 2011). Table 5 offers a synthesis of mentioned studies.

**Table 5.** Comparative look of the studies including the Blundell and Bond estimator (1998)

Authors and Title	Methodology implemented	Time horizon and the variables included	Results
Bond, Hoeffler and Temple (2001). <i>GMM estimation of empirical growth models.</i>	GMM Estimator Arellano and Bover (1995); Blundell and Bond (1998).	The Solow model of growth	The results achieved using the GMM estimator of Blundell and Bond offers improved performance compared to GMM estimation based on the first order differences. It also confirms the role of investment rates on growth.

Authors and Title	Methodology implemented	Time horizon and the variables included	Results
Alguacil, Cuadros and Orts (2011). <i>Inward FDI and growth: The role of macroeconomic and institutional environment</i>	GMM Estimator Arellano and Bover (1995); Blundell and Bond (1998).	1976–1980, 1981–1985, 1986–1990, 1991–1995, 1996–2000, 2001–2005 Dependent variable: growth rate of GDP/capita Explanatory variables: Natural logarithm of GDP/capita at the beginning of each study period, FDI, the degree of freedom of economy (EFW), external debt ratio in line with inflation and exports, urban population growth, the quality of local infrastructure. Control variables: population growth rate, gross capital formation (% of GDP).	The conclusion of the study highlights the extremely high importance attributed to internal and external macroeconomic stability adjoining the quality of institutions to assess the economic impact of FDI flows. The impact of FDI on economic performances varies by income level.
Doytch and Cakan (2011). <i>Growth Effects of Mergers and Acquisitions: A Sector-level Study of OECD countries.</i>	GMM Estimator Blundell and Bond (1998).	Dependent variables: GDP, the value added of the primary sector, value added of the manufacturing sector, value added of services expressed as a percentage of annual growth rates. Explanatory variables: gross physical capital, real interest rate, rate of enrollment in secondary education, political stability, government spending, the flow of capital to assets acquired.	Mergers and acquisitions do not show a significant positive impact on economic growth rates.

**Source:** Authors' elaboration based on the sources mentioned in the table.

The previously formulated hypotheses were detailed in several articles including Blundell and Bond (2000). Using a sample of 509 companies in research of industrial development in the United States and a time horizon of 8 years, the authors argue that the availability of tools in the production function derivative of first order is very small. Also, the use of additional tools to allow expansion of GMM estimator is beneficial both in terms of efficiency and in terms of supplying information on this context. The estimator thus obtained determines a visible improvement in the yields of estimated parameters. Also Hahn (1999) tested the validity of the estimator Blundell and Bond comparing semi-parametric information both if the assumption of stationarity is present on initial conditions and in the event that this hypothesis is not confirmed. Improvement of the quality of the results proves to be obvious. Another study meant to certify the importance of the results obtained by Blundell and Bond indicator is the one belonging to Bond and Windmeijer (2002). The overall conclusion of the study is that the use of Blundell and Bond estimator is more appropriate if the initial conditions correspond to the stationarity assumptions.

Thus the advantages offered by using a dynamic panel GMM methodology are obvious, being supported by a large number of studies in the literature. Although GMM methodology had as starting point the microeconomic level, where the sample number (individuals, companies) is very high compared with the time horizon which usually is not very long, the applicability of this model has proven to be extremely beneficial in macroeconomic analysis where the sample size (most often consisting of different economies, groups of countries or regions) is not very high in relation to the time variable.

In order to model the impact of different variables on the level of GDP/capita, we will use the above exposed methodology, having as main objective the identification of the key determinants of economic growth in the New Member states of the European Union. Moreover we intend to establish if the identified factors contribute to enhancing the convergence of economies, convergence previously tested both through Beta and Sigma coefficient. The results also aim to provide a framework of reference for certain macroeconomic policies that have as aim to meet two major objectives envisaged by any emerging economy: the achievement of a high degree of convergence towards better performing economies and the compliance with a trajectory enabling sustainable economic growth.

## 4. Empirical results

### 4.1. Results regarding the main characteristics of the variables and correlations between them

Prior to performing the system GMM panel's specific tests we investigate the main characteristics of the variables included in the model. Table 6 presents some information on the minimum and maximum values of variables and the mean and standard deviation. It can be noted that the oscillations between variables are very high. For example, the GDP per capita registers a maximum value of 27225.48 euro/capita in Slovenia in 2008, while at the opposite end we find Estonia with a minimum value of 2739 for the year 1993. For the openness of the economy, the values vary between 41, registered in Poland in 1993 and 191 in Malta in 2011. Severe oscillations are recorded regarding the composition of government expenditure on research and development (R&D) relative to GDP. Thus the corresponding minimum value of this indicator is 0.07 and is reported by Romania in 2001 and the maximum of 2.11 is recorded by Slovenia in 2010.

**Table 6.** Description of the main variables included in the Panel GMM

Variable	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
GDPC_LOG	240	9.500363	.4429663	7.915348	10.21191
DO	235	115.4383	35.05989	41	191
HC	231	92.85446	35.05989	76	108
GPC	235	22.86789	4.849727	11.1821	35.9755
GAP	240	.8477454	.8678471	.0283	5.9019
d_FDI	237	1.97e+09	2.90e+09	-1.31e+09	1.80e+10
d_R&DEX	236	5237288	.4007064	0.07	2.11

**Source:** Authors' calculations based on data provided by Eurostat.

Further a series of steps required by the statistical analysis of the time series were performed. From this point forward we operated with the logarithmic value of GDP/capita due to its better statistical properties. We tested the non-stationarity of the time series and according to the calculated value of t-statistic we constructed and continued the modeling using first order differences for FDI and R&DEX which proved to be stationary.

By analyzing the matrix of correlations between variables it can be seen that the explanatory variables included in the model are positively correlated with the dependent variable, aspect regarding which we expect positive results relying on the fundamentals of economic theory.

**Table 7.** The Correlation Matrix of Variables

	D.	gdpc_log	do	hc	GPC	gap	d_fdid_r&dex	
gdpc_log	D1.	1.0000						
do		0.0936	1.0000					
hc		0.0894	0.0425	1.0000				
gpc		0.1907	0.2562	0.0279	1.0000			
gap		0.0871	-0.4431	-0.3788	-0.2834	1.0000		
d_fdi		0.0621	-0.2231	0.0444	0.1833	0.0164	1.0000	
d_r&dex		0.0349	-0.0162	-0.2726	-0.2889	0.0181	-0.2583	1.0000

**Source:** Authors' calculations based on data provided by Eurostat.

### 4.2. Results regarding the System GMM Panel

The main purpose of this scientific approach has been represented by the objective to highlight which are the main factors enhancing the economic growth in the new Member States of the European Union. Testing different models of convergence has enabled us to highlight the extent to which the economies converge one toward another. However simply testing the convergence hypothesis does not reveal any information about the factors that

determine these economies to converge, or even more, to record positive growth trends. There are at least two arguments to support the validity of this model both in terms of theoretical research and in terms of the policies adopted by countries to improve their performance standards, namely: 1) The first one refers to highlighting different aspects associated with the experience of adherence of the new Member States to the EU; 2) the second argument consists in emphasizing the main channels through which technology is assimilated in an economy.

**Table 8.** Results of the System GMM Panel

D.pibc_log	Coef.	Std. Err	. z	P> z	[95% Conf.	Interval
gdpc_log   LD.	-.092688	.0462395	-2.00	0.045	-.1833158	-.0020602
DO	.0013114	.000298	-2.00	0.000	.0007274	.0018954
HC	.002363	.0012142	4.40	0.052	-.0000168	.0047428
GPC	.0073833	.0014909	1.95	0.000	.0044612	.0103053
GAP	.1137802	.0193203	4.95	0.000	.0759131	.1516474
d_FDI	5.10e-12	1.97e-12	5.89	0.009	1.25e-12	8.96e-12
d_R&DEX	.0597403	.0172674	2.59	0.001	.0258968	.0935837
CONST.	-.6247845	.1339767	3.46	0.000	-.8873739	-.3621951

**Source:** Authors' calculations based on data provided by Eurostat.

The results obtained with this model, as illustrated in Table 8, are consistent with the models of neoclassical economic growth, which argue in favor of absolute convergence, namely that poor countries are growing faster than rich ones, aspect given by the negative value of the coefficient GDP per capita. Furthermore this model complements the model developed by Mankiw, Romer and Weil which includes additional variables as human capital and physical capital. Thus, the significant results reveal that this group of countries register rapid restructuring and transformation processes by assimilating the best examples of the better performing economies. Moreover, the value of the coefficients included in the model certifies that the poorer a country, the more effective the import of new technologies on future developments of economic growth rates. Below we present a brief report of the main results of our research in regard with the studies previously developed.

The panel methodology was largely used to test correlations established between FDI and economic growth. Lee and Chang (2009) focused their study on correlations established between FDI, growth and financial development using a data set consisting of 37 economies and the time horizon 1970-2002. After applying causality panel tests, the authors obtained results of the interdependence of these variables in the long term, but the influence of direct investment on economic growth is lower than that shown by the financial development. However, the studies focusing on new EU Member States are rare. As we argued in theory, FDI component is a very important element when it is intended to study the main determinants of economic growth. The positive coefficient obtained by us from statistical processing, though not recording a high degree of representativeness, it is concordant with the results provided by previous research. The correlation between FDI and growth has been tested at national level by a series of empirical studies. Representative is the study prepared by Hudea and Stancu (2012) using a sample of seven countries in Central and Eastern Europe including Bulgaria, Romania, Moldova, Poland, Hungary, Czech Republic and Slovakia on a time horizon between 1993 and 2009. They obtained a coefficient of 0.06 for the FDI factor with a high degree of significance. FDI is also considered as explanatory variable of growth by Silaghi et al. (2010) who, after applying the methodology GMM, obtained a coefficient of 0.056 attributed to this factor.

If we consider the influence of level of education on economic growth, among the recent studies that included this variable in the set of determinants is the one developed by Fukase (2010) and Iqbal and Daly (2013). In both cases the level of education shows a positive influence on economic growth but the coefficient of significance varies by time, set of analyzed variables and group of countries. Also in our case, this indicator's influence on

growth is positive with a level of acceptable representativeness (0.052). So investment in human capital through education is an endogenous resource worthy of consideration in economic growth strategies that can have long-term positive influences whose effects can be quantified on several levels, namely: productivity, innovation, development and implementation of effective policies and strategies, competitiveness.

The degree of openness of the economy is also an indicator of positive influence on economic growth particularly in small economies focused towards trade. Gries and Redlin (2012), using a sample of 158 countries and a period between 1970 and 2009, reported a long-term highly significant correlation between the variables mentioned above. The coefficient value obtained by us is similar to the results of previous studies, moreover, resulting to be one of the factors with the highest degree of importance within the set of variables included in the model (0.000). The openness of the economy, especially in emerging economies of Central and Eastern Europe, is a resource with multiple implications, considering that for these economies the intensification of trade with other Member States of the European Union allows the flow of information, products and capital that contribute to improving trade relations between participating states, eventually leading to the stimulation of commercial transactions between states, and thus to economic growth.

The government expenditure with research and development proves to be a factor of fundamental importance. However, there are few studies that focus on the impact of this variable in the group of countries in Central and Eastern Europe (CEE). One of the possible explanations could be that this group of countries cannot afford to direct a significant proportion of the spending towards supporting this sector in relation to the more developed economies in which this sector holds a significant share. This represented one of the challenges of the model proposed by us. Moreover, another challenge is represented by the fact that when accounting for development level and convergence, not only the West – East (old members versus new ones) have to be kept in mind, but also North – South (richer versus poorer) convergence needs to be accounted for, as Mare and Pop (2011) proved by both spatial and econometric analysis that the convergence has to take place on two different directions: East – West and North – South.

The variable government spending on R&D was used in relation to economic growth in the CEE countries in the study prepared by Silaghi et al. (2012) whose results suggest that the impact of R&D is high taking into account long-term time horizon. The positive value attributed to this factor and the increased coefficient of signification obtained by us, confirm these results and can be a reference to guide future policy toward supporting this sector as one very important link with the growth process. Furthermore, the Community institutions admit the importance of supporting this sector as an engine of modern economies. The European Council adopted in June 2010 The Strategy Europe 2020 which main objectives mainly concern the research and development, namely improving the conditions for research and development, especially for combined levels of public and private investment in this sector to reach 3 % of GDP.

Gross capital formation, one of the two components of the model developed by MRW also shows a positive influence on economic growth, aspect also confirmed by the results of the study undertaken by Iqbal and Daly (2013). Moreover, in the model proposed by us, the significance level attributed to this coefficient (0.000) is very high which indicates that the level of gross capital formation is a good estimator of the growth process.

The technological gap variable is a significant determinant of economic growth. This result is fully consistent with the neoclassical growth theory which argues that to achieve a common state of equilibrium, the states act as examples for each other. The validity of the model we proposed for quantifying the main determinants of economic growth and convergence in the

new Member States is further tested through Sargan test of robustness. The coefficient value of this test confirms the validity of our results.

**Table 9.** *Robustness Tests – The Sargan Test*

**Sargan test of overidentifying restrictions**

**H0: overidentifying restrictions are valid**

**chi2 (133) = 139.1217**

**Prob > chi2 = 0.3407**

**Source:** Authors' calculations based on data provided by Eurostat.

We can also emphasize that the results of applying the methodology panel GMM in analyzing the new EU member states are more significant since very few studies have considered the correlation of factors we used in modeling economic growth.

## 5. Conclusions and final remarks

The harmonization of new Member States' interests to align with the general standards imposed by the European Union is an extremely important goal envisaged by national authorities with the support of the EU authorities. Frequent changes that have occurred in the structure of the world economy are good indicators of increased dynamics within economies. Moreover, recessions and economic downturns, although often generating extremely serious imbalances, can be perceived, in some cases, as generating progress. This is supported by the need for adaptation which requires the development of new policies and strategies in order to evolve.

The development of the proposed model proves to be very useful in providing guidance for future policies of those countries, both theoretically and empirically. The identification of the main factors that contribute to enhancing the convergence of economies and ultimately leading to economic growth allows decision makers in each economy to develop strategies focusing on those segments. The infusion of technological progress by increasing spending on research and development, increasing the degree of economic openness and rising the FDI flow is one of the main sources of growth and convergence for the new Member States, as demonstrated by GMM methodology and the highest values obtained for the coefficients. Focusing on the development of these sectors should be a key objective of the national authorities in these economies if they are to convergence and follow a sustainable economic growth trend. Long-term sustainability is also extremely important because finding compromising solutions that generate results only in small intervals of time is not a successful strategy and, moreover, may trigger a negative gear that could be felt after a certain time and can cause massive economic imbalances.

Although the results have a deep anchorage into the contemporary economic realities, some limits of this research should be mentioned. Among them, we may mention the difficulty in accessing the data on indicators used in modeling for periods preceding the reference year (1992) for the considered group of countries. Another aspect refers to not including economy specific factors that may have an impact on the developments, such as political or social changes.

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# FDI, trade and growth in the “late reformers” post transition

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**Abstract.** *We analyse the relationship between FDI, trade and growth during the 2001-2013 period in Albania, Bosnia and Herzegovina, Belarus, Bulgaria, Croatia, the Former Yugoslav Republic of Macedonia, Montenegro, Republic of Moldova, Romania and Serbia. The empirical estimates find positive long-run relationship between growth and all other indicators – FDI, export and import. Thus, we have identified that FDI-led growth and export-led growth hypotheses are valid for these countries. Positive association between imports and growth is probably connected with the structure of FDI in the analysed countries.*

**Keywords:** foreign direct investment, trade, growth patterns, SEE, transition.

**JEL Classification:** F29, O49.

## Introduction

The promise of prosperity connected with European integration has influenced the reform processes in many transition economies, even including those that had limited membership prospects (Landesmann, 2010). In an attempt to ensure fast catching-up to more advanced economies, most European transition countries adopted policies which implied high degree of liberalization – trade, capital movements and institutional changes. Within this economic policy concept, foreign direct investments (FDI) were widely accepted as a panacea for insufficient national investments and as a fast route to technology transfer. This strategy had been proven successful for the “early bird” club of new EU member states from Central and Eastern Europe (CEE). Indeed, evidence has shown that European transition economies have received unprecedented amounts of foreign finance during these early stages of transition, which have contributed to the rejuvenation of their industrial activity and faster convergence to the EU average income levels. This has resulted in the building up of positive expectations regarding the effects of FDI on the recipient country, and frequently advocated economic strategy recommendations oriented towards the importance of designing the policy mix to create and maintain investor-friendly country.

Simultaneously, the economies of Southeastern Europe (SEE) have experienced both politically and economically turbulent episodes. As a consequence, the decline in their industrial production has led to significant trade unbalances (Penev and Rojec, 2004). On top of that, the 2008 recession has perpetuated vulnerability of a number of transition economies in SEE that can be seen in the inability to recover to pre-recession economic growth levels (EBRD, 2010). Even though some of the countries were able to attract FDI (mostly through large privatization processes) and to improve their external position in certain periods, the question remains what are the growth prospects for this geographical area, and could we detect export-led and/or FDI-led growth patterns.

In this paper we focus on exploring the export-FDI-growth nexus in the “late reformers” economies during the post-transition period. As opposed to more successful transition economies, our sample consists of countries geographically more distant from the European core that had struggled more during their transition process. Common structural and development factors (lower level of GDP per capita than in CEE and EU average, as well as slow reforms processes) support the decision to jointly analyse following countries: Albania, Bosnia and Herzegovina, Belarus, Bulgaria, Croatia, the Former Yugoslav Republic of Macedonia, Montenegro, Republic of Moldova, Romania and Serbia. This choice presents our main contribution in the literature, since precisely this group of countries has been frequently omitted from similar studies, mostly due to the lack of data sources. The decision to focus the analysis on the late and for some countries post-transition period is connected to the data limitations. Although it would be interesting to discuss the reasons behind different performance of, for example, SEE countries in comparison to CEE countries during the early stages of transition within the topic of the present paper, the data limitations would restrict this analysis to qualitative observations.

Notwithstanding the large literature on the links between trade, FDI and growth, our study is probably most similar to the research by Fidrmuc and Martin (2011). The question they address is whether the long-term growth prospects have shifted for a group of countries apparently dependent on the foreign financial flows in their growth model. Besides analysing different group of countries, the main difference in our approach is that we seek for a unique answer for the whole sample. This presents the second contribution to the existing literature.

Structure of the paper is following. Next section contains literature review which provides theoretical concept for empirical segment of the paper. Relevant empirical studies are also reviewed in this section. Section 3 provides stylized facts for the analysed countries, as well as

some comparisons to other transition economies. Section 4 presents the empirical strategy, results and discussion. The last section summarizes conclusions.

### Literature review

The impact of FDI on the receiving economies has recently gained a lot of attention in the literature, even though the foundations for its analysis could be traced back to neoclassical growth model (Solow, 1956). Within that concept, FDI can be considered as additional capital, which together with labour and technology forms the production function.

Endogenous growth theory suggests that FDI is an important channel of technology transfer to host countries (Findlay, 1978; Wang, 1990; De Mello, 1997; Borensztein et al., 1998). The first way for FDI to influence growth is through an increase of capital per capita that will result in rising productivity. Secondly, new assumptions allow foreign investors to be creators of technological progress, on which impetus to growth is based. Thus, thirdly, FDI firm can unintentionally transfer its knowledge to other agents in the economy as learning from others, training at work, knowledge and experience of others are freely available to all in this model i.e. technological progress can spill over. The role of technology spillovers, which are not only related to tangibles, but more importantly intangibles, have caught much attention in discussions on restructuring process in the transition economies.

The explanation how FDI can affect restructuring and productivity growth of host country's manufacturing sector has been offered within the Flying Geese Model (Kojima, 2000). The model assumes that more advanced technology is transferred through FDI to developing country, which is, depending on the absorption capacity, being able to catch-up with more or less success. Within this framework, capital movements seem to reorganize production stages in a pattern where leader in technology keeps important position, while the technology transfer enables catching up in followers. This model seems to be more suitable in explaining effects when labour-intensive industries are considered. More recently, global supply chain models have been offered to explain vertical and horizontal specializations related to international capital movements (Baldwin, 2011). Within that concept, the whole production process has been fractionalised and dispersed. Fractionalization implies detailed sophisticated decomposition of production process, whose different stages are geographically distributed. It becomes increasingly difficult to track the different production stages on the country level, since each economy contains different composition of high and low technology intensive industries.

In addition to theoretical concepts, empirical studies on the relationship between FDI were frequent, probably also due to the reason that this relationship is both controversial and puzzling. Bruno and Campos (2013) find that FDI effects on performance tend to be larger in macro than in micro studies, and greater in low- than in high-income countries (using a meta-analysis of 549 micro and 553 macro studies). The variation in results is accounted to the choice of econometric method and specification. Aurangzeb and Stengos (2014) also point out to diverging results of micro- and macroeconomic research where cross-section framework of macroeconomic studies is supportive of FDI-growth relationship, while microeconomic studies most often are unsupportive of this relationship.

Since Central and Eastern European countries were deemed as relative success stories in their transition towards market economy, it might be expected that the findings from these studies are more harmonious. Yet, it can also be seen that while some studies have shown a positive impact of FDI on growth and productivity (Holland and Pain, 1998; Bijsterbosch and Kolasa, 2009; Weber, 2011), others have even found a negative relationship between FDI and growth (Mencinger, 2003; Lyroudi et al., 2004; Nath, 2009).

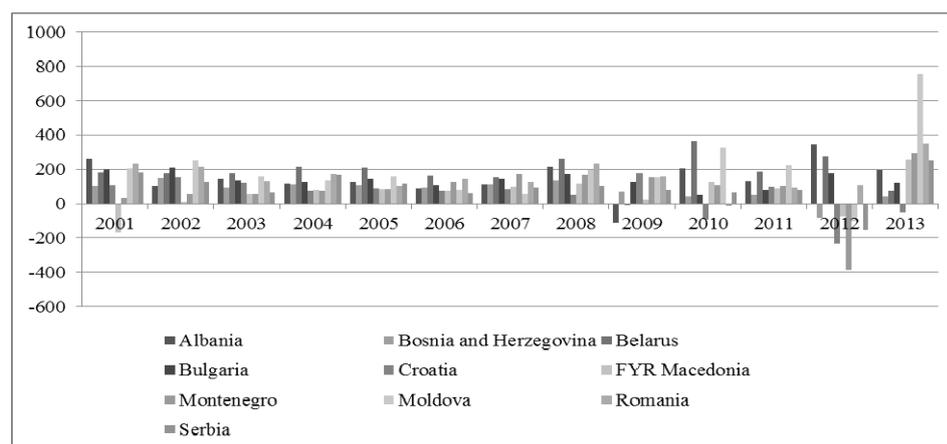
Fidrmuc and Martin (2011) provide important empirical study on Central, Eastern and Southeastern Europe. Specifically, their study includes: Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Analysing each country separately with VEC and Granger causality methodology, they have found cointegration between industrial production and exports, while the relationship between FDI and industrial production was weaker. Their results have also established that either industrial production or international capital flows are important for long-run growth of the analysed countries, thus confirming the export-led or FDI-led growth hypothesis. Specific results related to the countries in our sample point that in case of Bulgaria and Croatia, they have found that industrial production is not related to the external variable in the long run, while in case of Romania they have established impacts of exports and FDI on growth.

Links among FDI, growth and exports in European transition economies researched in the early 2000 were not entirely confirmed. Fabry (2001) uses bivariate Granger causality testing in identifying links among FDI, growth and exports for ten CEE host economies and finds Granger causality from FDI to growth only in the case of Albania and the Russian Federation. An overall conclusion was that exports seem to boost growth more than FDI. Mencinger (2003) focuses on a sample of eight CEE countries and also uses Granger causality test and a cross-country regression growth model. The relationship between FDI and growth was confirmed, but it was negative. The author explains this by takeovers as the main mode of entry, the unfavourable sectoral breakdown of FDI (mostly in services sector, in retail and banking) and the prevailing negative competitive effect. Stanistic (2008) examines a statistical relationship between FDI and growth in seven transition economies in SEE for the period 1997-2005 and fails to confirm it, explaining the missing positive effects with the transitional bias of the dataset i.e. that unfavourable values of variables are caused by structural reforms.

The studies frequently conclude that there are some special features of the analysed countries that cannot completely capture their relative poor performance in comparison to, for example, New Member States. This is frequently stated for the Western Balkan countries (Estrin and Uvalic, 2014). Explanations offered usually include institutional factors, structure of aggregate indicators or intangibles, such as rule of law. Even if we refrain from these factors, we could observe that at least some of the countries in our sample that enjoyed relatively high growth rates at the beginning of analysed period, at the same time developed underlying unbalances. Since the growth model relying on the increased consumption and relatively inexpensive international funding cannot be sustained in the aftermath of global economic crisis, the long-term prospects of the region are dubious. The next section presents deals with these issues in more details.

### Stylized facts

Even though frequently perceived as less successful than more advanced transition economies, at the beginning of 2000s the “late reformers” have started to catch up. This can be seen if we compare their growth rates to those in other economies. To that end, Figure 1 presents deviations of their achieved growth rates as comparison to the average of Central Europe.

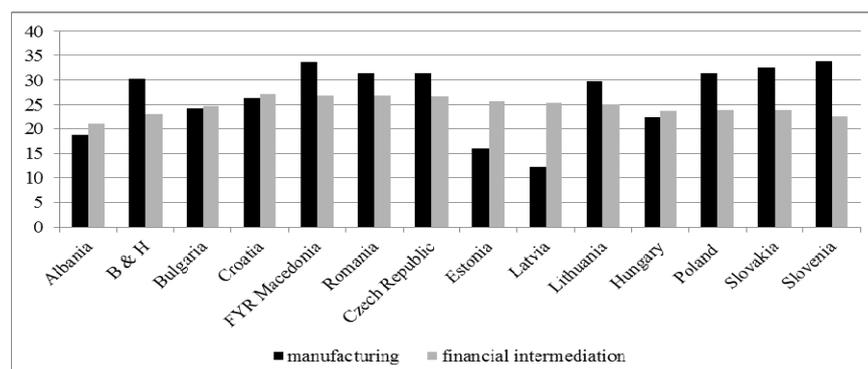
**Figure 1.** GDP per capita annual growth rate in selected countries, Central Europe and the Baltics=100

**Source:** World Development Indicators.

Most countries have, in the pre-crisis period enjoyed relatively favourable economic conditions, even though it has been emphasized that the growth had been consumption driven (EBRD, 2010). The effect of the crisis was uneven, and the period of exposure was different. While at the end of 2013 it could be said that most of the countries stabilized their growth paths, Croatia was still recording negative growth rates. The relative ability to cope with the crisis has been directly related to the growth model adopted. Although most of the countries enjoyed relatively high flows of international funding, the destination of these funds plays important role related to growth prospects.

Bogumil (2014) emphasizes the notion that sectoral composition of FDI is important for considering impact on overall economic growth in transition countries. Other authors offer same conclusions. For example, Mitra (2011) analysed the structure of capital flows in CEE and has found that FDI in non-tradables, such as financial or real-estate sector is related to higher GDP volatility. Due to the fact that non-tradables FDI in financial intermediation and real-estate is associated with additional funds to the household sector, it stimulates additional consumption which is associated with increased imports and widening of the trade deficit. As opposed to that, Kinoshita (2011) argues that FDI oriented towards tradable sector usually increases exports and improves trade balance.

To address this issue, we present the data on the share of FDI in manufacturing and financial intermediation in the analysed countries relative to the data from transition NMS. It has to be noticed that in order to provide such comparisons, we did not rely on a single year, since the data could vary from one year to the next. Also, we were not able to provide the cross section during the same period, due to the data availability. The Figure 2 consequently contains shares which present different periods for different countries, within the time span of 2001-2013.

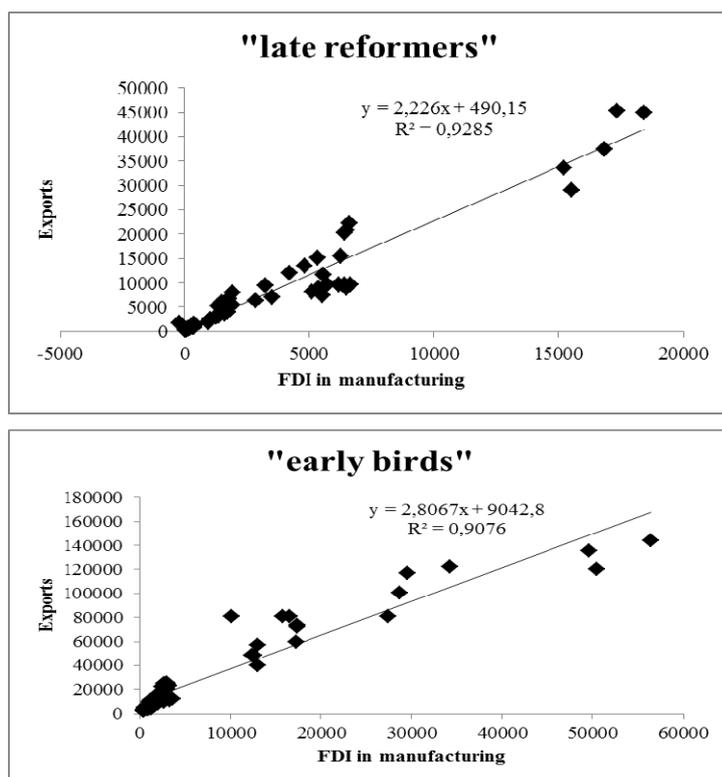
**Figure 2.** Share of manufacturing and financial intermediation in FDI inward stock in the selected countries

**Source:** WIIW FDI database.

The data shows that the share of FDI in financial intermediation is relatively high in some countries, and exceeding the share in manufacturing sector. This is particularly evident for Estonia and Latvia. In late reformers, the share of financial intermediation is also relatively high, although there are some examples where manufacturing sector attracted more investment. The question is whether this additional investment has been transformed into production and growth potential, or reflects the privatization of existing production processes thus not contributing to new value added.

The structure of international trade is also changing with globalization process, with the role of trade in services becoming more important. Even in the global supply chain models literature (Johnson, 2014; Baldwin and Lopez-Gonzales, 2014) it could be noticed that increasing share of fractionalization reflects the growing role of services. The statistics on the trade in services is, however, even less comparable across the analysed countries. Therefore, we focus on the link between capital flows and traditional exports. To explore this relationship, we analyse whether there are differences between the effect of FDI in manufacturing sector on the export performance in the analysed countries (“late reformers”) and countries that have joined European Union in the 2004 wave. Similar as before, the analysis contains all available data, regardless of the period. For example, the dots on Figure 3 cover the 2008-2012 period in case of Romania and 2001-2013 in case of Albania.

**Figure 3.** FDI in manufacturing and export performance



**Source:** WIIW FDI database.

Figure 3 reveals that in both groups there seems to be positive effect of the FDI directed to manufacturing sector on exports. This does not necessarily imply causal relationship, so we cannot actually claim that FDI is not serving as a substitute to exports. But, whatever the underlying mechanism – whether the FDI actually promotes exports within the receiving firm or stimulated exports through competition with host firms – it does seem that the countries that have received more FDI in manufacturing also exported more.

There are, however, differences between „late reformers“ and „early birds“. The slope of the average line is steeper in the case of „early birds“, which indicates that in those countries more FDI in manufacturing is associated with higher export performance.

This preliminary analysis has indicated that the growth performance of selected countries in the early 2000s outperformed other countries in the region. The growth was backed by foreign capital, which was not directed only to manufacturing, but also to financial and real-estate sector. The recent economic crisis brought sudden stop in the international financial flows. Since the analysed time period covers the crises effects, we explore the potential consequences for the „late reformers“ and their growth prospects.

### Empirical methodology and results

The empirical strategy in this paper is based on the endogenous growth theory. Within this framework, we rely on the growth equation, which augments the list of independent variables with trade and FDI indicators. We are interested in the question whether there is a long-term relationship between growth, FDI and trade in the analysed countries. In the empirical analysis below, following variables have been used (the data sources are listed in the Appendix):

- FDI: foreign direct investment: inflow as percentage of GDP
- GDP: per capita annual growth, an indicator of the growth
- GFCF: gross fixed capital formation: share in GDP, to represent the capital in the production function. Although there might be questions whether this is an appropriate variable, it has to be emphasized that this is one of the rare variables that could be associated with capital that is available for the analyzed group of countries. Estimates of capital are quite troublesome, and can vary significantly across different sources.
- IMP: imports of goods and services: share in GDP
- EXP: exports of goods and services: share in GDP
- LF: total labour force, logarithm. We use the logarithm of total labour force for two reasons – to downsize the numbers to comparable levels of other analysed variables and to reduce the variance of this specific indicator.

However, prior to this specification, we have to investigate whether there are any long-term relationships between the variables of interest. The first step in the analysis is investigation of the stationarity of the analysed series.

Since we analyse the dataset with fixed N and T with the assumption that autoregressive parameter is more likely to be panel specific than common due to the fact that we analyse different countries, we conclude that the results of IPS (Im et al., 2003) test are most appropriate for drawing conclusions. The IPS test was not able to reject the null that all panels contain the unit root in case of gross fixed capital formation, exports and labour force variables. It seems that GDP series does not include the unit root, and the test results for FDI and imports were not very decisive. The results are presented in the following Table.

**Table 1.** Panel unit root and stationarity tests

Variable	IPS	Hadri LM
FDI	-1.98*	4.49***
GDP	-2.46***	4.76***
GFCF	-1.40	7.45***
IMP	-1.98*	7.00***
EXP	-1.17	9.63***
LF	-1.53	18.55***
$\Delta$ FDI	-3.70***	-0.04
$\Delta$ GDP	-4.54***	-2.19
$\Delta$ GFCF	-2.43***	0.73
$\Delta$ IMP	-3.60***	-1.86
$\Delta$ EXP	-3.29***	-1.97
$\Delta$ LF	-3.00***	1.41*

**Notes:** \*\*\* denotes significance at 1 percent level, \*\* at 5 percent and \* at 10 percent.

**Source:** authors' estimates.

Most of the tests have unit-root null-hypothesis, only Hadri (2000) tests states the null in the form of stationarity. Since we have relatively small sample size, and the power of the tests in such samples could be small, posing unit root hypothesis as null in one test, and as alternative in another, provides less chances of reaching the false conclusions on the stationarity. Thus, as with the time series cases, it is always useful to consider both tests in combination when the dataset contains relatively few observations or methodologically inconsistent time series. Hadri test for levels in all cases strongly rejects the null that all panels are stationary, implying that in all cases there seems to be a unit root. The differences test implies that the series are probably I(1) with the exception of labour force series, which weakly indicates I(2) according to this test.

To determine whether there is a long run relationship between the variables of interest, we follow Westerlund (2007) procedure. Due to data constraints and the fact that unit root testing was not decisive, the procedure has been implemented on a set of different combinations of variable. It has to be noticed that a combination with all possible covariates has also been considered, but is not included in presentation here due to implausible results). The results are presented in following table

**Table 2.** *Panel cointegration test*

Variables combination	Statistics			
	Gt	Ga	Pt	Pa
GFCF, EXP, LF	-1,19	-2,08	-2,49	-1,77
FDI, GDP, IMP	-2,34***	-5,53	-6,65***	-5,21**
FDI, GDP, EXP	-2,36***	-5,71	-7,01***	-4,71*

**Notes:** \*\*\* denotes significance at 1 percent level, \*\* at 5 percent and \* at 10 percent.

**Source:** authors' estimates.

The first specification was considered due to the fact that IPS unit root test implied that these might be I(1) series, so it is highly important for the following analysis to consider if there is a cointegrating relationship between them. However, the results imply that we cannot reject the null hypothesis of no cointegration according to either of the considered statistics.

Since the main focus of this paper is on the relationship between foreign direct investment, growth and trade, we next test for the cointegrating relationship between the variables of interest. The results imply that in both cases some statistics were able to strongly reject the null hypothesis of no cointegration, implying that there is a long run relationship between those variables.

Since the analysis in this paper covers relatively short time period, we test for the cross-sectional independence in the residuals between the variables of interest. The results of the Breusch-Pagan LM test of independence, however, do not indicate the presence of common factors affecting the cross-sections.

Previous analysis does not give decisive conclusion on the order of the investigated series, or the long-run pattern between them. Thus, in order to empirically examine the relationship between the variables of interest we use Pesaran's pooled mean group (PMG) estimation, which is the extension of the single-equation autoregressive distributed lag estimator recently applied by Belloumi (2014) to test the relationship between FDI, trade and growth in case of Tunisia.

To estimate the long run relationship we proceed with the following procedure. We start with the mean group (MG) estimator, since it allows the long-run coefficients to be country-

specific. We have two basic specifications for the long-run relationship – the first one includes GDP, FDI and IMP and the second includes GDP, FDI and EXP. The short-run specification includes lagged values of all variables and following the general to specific approach we end with the preferred specification. This specification is then also estimated by the pooled mean group (PMG) estimator which imposes homogeneity constraint on the long-run coefficients (Blackburne and Frank, 2007). Both estimates of the long-run coefficients including the results of the Hausman test on the preferred specification are presented in the following Table 3.

**Table 3.** Long-run relationships between trade, FDI and growth

Variables	MG - coefficients		PMG - coefficients	
	1	1	1	1
GDP				
FDI	0,50**	0,53**	0,27**	0,26***
EXP	0,07*		0,09***	
IMP		0,04**		0,05***
Hausman			1,47	1,12

**Notes:** \*\*\* denotes significance at 1 percent level, \*\* at 5 percent and \* at 10 percent. The value of the Hausman test is in the preferred specification column.

**Source:** authors' estimates.

The Hausman test helps to identify whether the differences in the estimated long-run coefficients are not systematic, which is the null hypothesis. If we cannot reject the null hypothesis, the preference should be given to the PMG model, due to the fact that it requires less parameters in estimation and is consequently more efficient. Having in mind that we are dealing with short sample, this argument is even more compelling.

In both cases Hausman test indicated that the PMG estimates are preferred, so we proceed with the analysis with long-run estimates produced by this method. The estimated coefficients imply that in the long-run both trade indicators as well as FDI are significantly positively associated with GDP growth.

The next step in the analysis was to include the estimated error corrections into the equations of the following type:

$$\Delta GDP = \alpha + \beta_1 \Delta EC(-1) + \beta_2 \Delta FDI(-1) + \beta_3 \Delta EXP(-1) + \beta_4 \Delta IMP(-1) + \beta_5 \Delta GFCF(-1) + \beta_6 \Delta LF(-1) + \epsilon$$

Both versions of the error correction were tested in the equation of this type. Due to the relatively short time period, we only include one lag of the independent variables. Due to the same reason, we present the results of the pooled OLS estimates.

**Table 4.** Short term estimates

Variables	Estimated coefficients (standard errors)	
	Export specification	Import specification
Constant	-0,97** (0,45)	-0,62 (0,43)
Error correction	-0,47 (0,11)	-0,46 (0,11)***
FDI	0,12 (0,09)	0,12 (0,09)
EXP	0,06 (0,12)	0,09 (0,12)
IMP	-0,14 (0,10)	-0,16 (0,10)
GFCF	0,06 (0,17)	0,06 (0,17)
LF	-30,24 (18,82)	-29,21 (18,84)
Estimates information		
N (number of countries)	110 (10)	110 (10)
Wald chi <sup>2</sup> (6)	39,17***	40,00***

**Notes:** \*\*\* significant at 1 percent level, \*\* significant at 5 percent level.

**Source:** authors' estimates.

The estimates presented in the table clearly state that in both cases error correction term has negative sign and is significant. This implies that there is a convergence process towards the long-run equilibrium established by the panel cointegration. The short-term coefficients of the independent variables are, however, all insignificant. Since the estimated 5 percent intervals

of all the estimated coefficients entail zero, it would be unwise even to draw conclusions from their estimated signs. One of the reasons for this is certainly related to the relatively short data period analysed in the paper. More importantly, this period entails the effects of recent global economic crisis, which affected the countries in an adverse manner. Their reaction in the short period might be to heterogenous for the investigated indicators to capture the similar patterns.

The conclusion of this empirical exercise is that we can find that long-term growth prospects for the “late reformers” still depend on the international capital flows and external trade. The short term prospects are probably more under the direct influence of the specific economic conditions and policy measures in each country. Thus, the specific path to long-term growth in the short run is country specific and could not be discussed within the analysed empirical concept.

## Conclusions

The analysis in this paper aims to detect the underlying relationship between foreign direct investment, trade and growth in the group of post-transition economies that are classified as late reformers. The reason for focusing the analysis on this particular group of countries is the concern that, although they have enjoyed benefits of increased international capital flows at the beginning of 2000s, the recent economic crisis might have, due to the sudden stop on the financial market, affected their long-term prospects for growth.

The analysis has revealed the positive cointegrating relationship between growth and FDI and at the same time external indicators – both imports and exports. Thus, the results imply that we can confirm FDI-led growth hypothesis for the analysed countries, indicating that their growth prospects are vulnerable to the global financial flows. The restoring of the growth path after the crisis might be under the influence of available international funding.

Investigating the structure of FDI has led to another important constraint. Specifically, the countries have received large inflow of FDI into the financial and real estate sector. This is probably the reason why we have established positive relationship between imports and growth. The FDI in non-tradable sectors stimulates domestic consumption, which in the events of declining domestic production and restructuring, contributes to growing imports and external imbalances. However, this growth model has limited duration. Thus, in order to capitalize from the positive effects of foreign investment in the long run, exports promotion (including services) should be emphasized in national economic policies.

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**Appendix Data Sources**

Variable	Countries	Period	Source
FDI – foreign direct investment: inflow as percentage of GDP	All the countries in the sample	2001-2013	WIIW Annual Database
GDP – per capita annual growth	All the countries in the sample	2001-2013	WDI database
GFCF – gross fixed capital formation: share in GDP	All the countries in the sample, except bellow	2001-2013, except bellow	WDI database
	Bosnia and Herzegovina, Serbia	2013	National statistics
IMP – imports of goods and services: share in GDP	All the countries in the sample, except bellow	2001-2013, except below	WDI database
	Bosnia and Herzegovina, Serbia	2013	UNCTAD database
EXP – exports of goods and services: share in GDP	All the countries in the sample, except bellow	2001-2013, except below	WDI database
	Bosnia and Herzegovina, Serbia	2013	UNCTAD database
LF – total labour force: logarithm	All the countries in the sample	2001-2012	WDI database
		2013	UNCTAD database

# Trend analysis of foreign direct investment flows in Serbia with special reference to the evaluation of the investment environment

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**Abstract.** *With its numerous beneficial effects on reducing unemployment, increasing productivity, competitiveness of the economy on the global market and improvement of living standards, foreign direct investments are the engine of economy and economic development of any country. The Republic of Serbia has an ascending line of the foreign investment inflow, primarily due to a favorable geographic location and transport infrastructure that are a good starting basis. Presentation and promotion of the Serbian economy, its natural and human resources, informing foreign investors about the conditions and opportunities of doing business in Serbia are the most important tasks to be carried out. The aim of this paper is to analyze movement trends of FDI in Serbia as one of the leading country in Western Balkan region, with special emphasis on evaluation of the investment environment. In addition to the introduction and conclusion, the paper consists three parts, where the first refers to the global investment trends, the second analyzes trend, the level and structure of FDI inflows in Serbia and the third part relates to the assessment of investment activities in Serbia with recommendations for improvement.*

**Keywords:** trend analysis, FDI flows, Serbia, investment environment.

**JEL Classification:** F21.

## Introduction

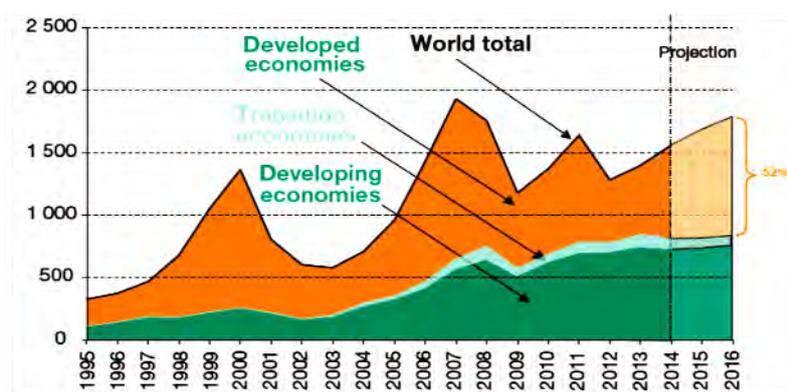
Foreign direct investment are long-term, international capital flow, which is defined as the riskiest forms of investment, but also investment which brings the highest yield. The main motives for the arrival of FDI are the location, internalization, avoiding customs, tempting subsidies, oligopoly download, download competing companies. Arrival of FDI realizes a direct impact on economic growth in key industries, trade, developing trade links with the world and technology transfer. The most important indirect effect is considered to build the institutional and legal framework necessary for the functioning of markets. This type of investment can accelerate economic growth, providing access to new technology transfer management and production oriented knowledge, while the corresponding policy of opening up domestic markets to foreign competition can create a long-term basis for the great benefit of the investment (Krugman and Obstfeld, 2009). Also, beside many positive effects of attracting FDI, there are some possible disadvantages, like crowding of local industry, repatriation of profits/dividends by investors, exploitation of local resources, effects on local culture and sentiments, etc.

Serbia is on the upward trend of inflow of foreign investments, because of favorable geographical position and transportation infrastructure, which represent a good starting basis. Particular attention receives alternative waterway transport, because of pretty loaded road transport in Europe, while European Corridors 7 (the Danube) and 10 (road and rail) connecting Western Europe with the Middle East, which pass through Serbia and meet in Belgrade. Current macroeconomic stability, market size, business costs, human resources, geographical location and investment infrastructure are the most important among the many reasons which makes Serbia one of the most attractive locations for business in this part of Europe. What lies ahead of Serbia is to provide the best possible business environment in order to attract the largest possible participation of FDI, because the increase in FDI is increasing the GDP, improving the standard of living and strengthen global economic stability of Serbia.

### 1. The global investment trends

In the long term, over the past twenty years, the movement trend of global investment inflows were highly variable, as it can not be regarded as surprising, considering that it is a long time interval in which the circumstances were different (Figure 1). Since the mid 90-ies of the last century, there was a strong trend growth, which since 2000 has been changed to a strong downward trend. Since 2004, after several years of exceptionally low levels of investment at the global level, a period of growth begins 2007 in which FDI achieved a historical record in terms of global investment level in one year. This is followed by decline during initial wave of global economic crisis. The recovery of world investment flows has been made during 2010 and 2011, due to the second wave of the global financial crisis again occurred stronger decline.

**Figure 1.** FDI inflows, global and by group of economies, 1995-2013 and projections, 2014-2016 (billions of USD)



**Source:** World Investment Report 2014.

As shown in the graph, speaking about groups of countries divided into developed economies, developing economies and transition economies, it can be concluded that the developed economies during this period were the main carrier of growth at the global level, but on the other hand, the decline in these economy was also the most powerful. Be sure that such investment climate affected developing countries and transition economies, but it can be said that before such conditions slowed the development and transition process, while the consequences of the developed countries were far more powerful.

In the analysis of the inward and outward of global investment flows, special attention is placed on the percentage share of the above mentioned regions, which best represents the relationship and distribution when it comes to the geographical distribution of FDI (Table 1). According to these percentages, once again confirms the reduction of investment power in developed economies, respectively the EU and North America, and strengthen the position of Asia, which belongs to the economy in the envelope. In 2013, over half of total FDI inflows globally 53.6% are poured into developing economies, which is expected, but in the region of Asia has been around 30% of total FDI inflows, while the European Union and North America at about 17%.

**Table 1.** FDI flows, by regions, 2011-2013 (per cent)

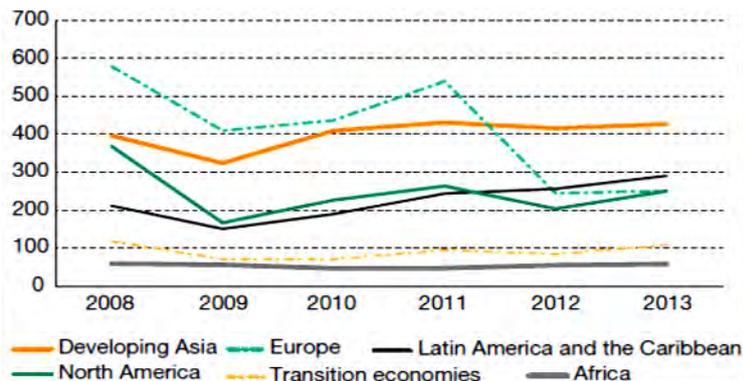
Percentage share in world FDI flows						
Region	FDI inflows			FDI outflows		
	2011.	2012.	2013.	2011.	2012.	2013.
Developed economies	51.8	38.8	39.0	71.0	63.3	60.8
European Union	28.8	16.2	17.0	34.2	17.7	17.8
North America	15.5	15.3	17.2	25.6	31.4	27.0
Developing economies	42.6	54.8	53.6	24.7	32.7	32.2
Africa	2.8	4.1	3.9	0.4	0.9	0.9
Asia	25.3	31.2	29.4	17.8	22.4	23.1
Latin America and Caribbean	14.3	19.2	20.1	6.5	9.2	8.1
Transition economies	5.6	6.3	7.4	4.3	4.0	7.0
Structurally weak, vulnerable and small economies	3.4	4.4	3.9	0.7	0.7	0.7

**Source:** World Investment Report 2014.

On the other hand, in terms of FDI outflows, investment power of developing economies grows and sets the record straight indicator. These countries have surpassed developed economies, while the Asian region has become a significant investor in the European Union and seriously threaten the power of North America, which will have happen in the coming years, at least according to all forecasts. However, still the developed countries have higher investment power on a global scale. Movements of FDI inflows by regions in the six-year period from 2008 to 2013 had a very dynamic course. The following Figure 2 brings some conclusions, particularly in connection with the level of FDI due to the impact of the global

financial crisis. Once again confirms that Asia is developing and the first wave of the crisis absolutely did not hit Asia, and that today FDI level in Asia is higher than before 2008.

**Figure 2.** FDI inflows, by regions, 2008-2013 (billions of USD)

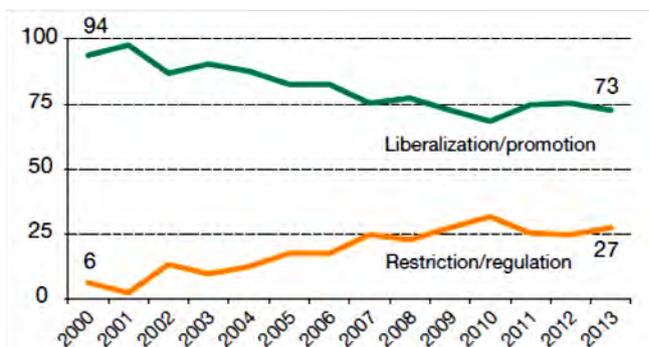


**Source:** World Investment Report 2014.

As seen in the graph, the waves of the global economic crisis is the most severely affected Europe, and it can be said that Europe still feels serious consequences, because the level of FDI inflows is far lower compared to 2008 when Europe was far ahead of all the regions. The decline in the reporting period was really dramatic. North America had a negative trend, but not so strong. Latin America since 2009 recorded a trend of slight but steady growth, while Africa and transition economies have the same level of FDI in the reporting period.

In the analysis of the growth and decline in the FDI level, special emphasis must be given on measures and regulations that are in a certain period introduced or eliminated, and which have a large impact on the investment climate that stimulate or discourage the inflow and outflow of FDI. The most investment policy measures remain geared towards promotion and liberalization, but the share of regulatory or restrictive measures increased. In 2013, according to UNCTAD, 59 countries and economies adopted 87 policy measures affecting foreign investment. Of these measures, 61 related to liberalization, promotion and facilitation of investment, while 23 introduced new restrictions or regulations on investment. The share of new regulations and restrictions increased slightly, from 25% in 2012 to 27% in 2013. Almost half of the policy measures applied across the board. Most of the industry-specific measures addressed the service sector.

**Figure 3.** Changes in national investment policies, 2000-2013 (per cent)



**Source:** World Investment Report 2014.

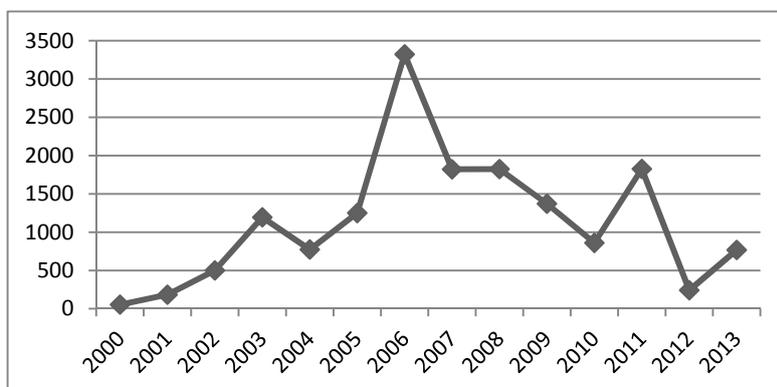
Total FDI inflows in 2013 amounted to 1 452 billion and increased 7 times the value in 1990. The FDI outflows amounted to 1 411 billion dollars. Transnational corporations and their international production are the most important characteristics of a globalized world in which we live and source of foreign direct investments. The total stock of capital invested in foreign transnational companies amounted to 25.464 billion dollars in 2013 and since 1990 has increased more than 12 times. While this is a total registered value of inflow, outflow

amounted to 26.313 billion dollars. At such a high rate of cumulative investment income (profit) amounted to 1.748 billion dollars, which the sum total invested capital rate of return is 6.8%. Profit has increased compared to 1990 year (79 billion dollars) 22 times. Transnational corporations more earned abroad in 2013, compared to the sum of new investment, which means that the net profit repatriation to their home countries amounted to 296 billion dollars. These are all nominal increase. Real values are smaller for inflation and cross-currency changes. Here we perform indirect indicators: (1) the share of foreign affiliates in world GDP reached exactly 10% (7,492 to 74,284 billion) and the share of profit in the newly created branch value was 23.3% (1,748 to 7,492 billion dollars). The total assets of foreign affiliates amounted to 96 625 billion dollars and increased by 24.8 times by value in 1990. This also means that the TNC managed apart from 25.464 billion equity, even with 71,161 billion dollars of debt, which is almost equal to the annual global GDP. The total value of exports of foreign affiliates amounted to 7.721 billion dollars in 2013 and accounted for 33.3% of world exports of goods and services. When we add the direct export of stem branches reach up to two-thirds of world trade is controlled by large multinational companies. Total investment in fixed assets in 2013 amounted to 17.673 billion dollars, which means that FDI accounted for 8.2%, or one twelfth part of total global investment. When these data add domestic investments parent company came to have reached a much larger share, or up to one fifth of the total investment.

## 2. The trend in the level and composition of inflows of FDI in Serbia

The trend in foreign direct investment in Serbia in the last fifteen years has been very dynamic and in line with the expectations imposed by the global investment trends. Since 2000, Serbia had evident growing trend of foreign direct investments, with variations characteristic of all European transition countries that are characterized by similar institutional environment and attracting FDI through the privatization process, as well as the negative impact of the global economic crisis. In the period from 2000 to 2007, the level of FDI inflows had an upward trajectory. Strong and steady growth was due to the market opening up and inclusion of Serbia into global trends. In particular, it can be pointed out a three-year period from 2005, when the inflow of foreign direct investments in Serbia was on the historically high levels, especially in 2006 when it stood at over US \$ 3 billion. The year 2008 was also very successful for Serbia by the amount of FDI, but from 2009 movement trend turned in the opposite direction (Figure 4).

**Figure 4.** FDI inflows in Serbia, 2000- 2013. (in millions of euro)



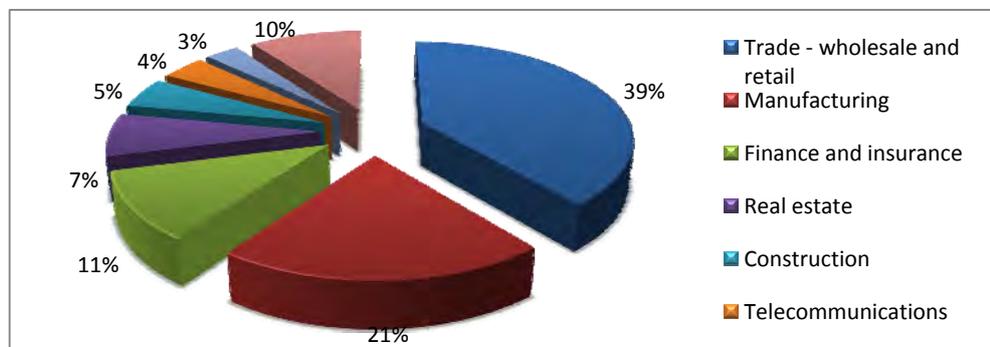
**Source:** authors calculation based on National Bank of Serbia.

Serbia was strongly felt the consequences of the first wave of the global economic crisis and unfavorable investment conditions, which were reflected in a decline in the level of inflows in 2009, which was even more drastic in 2010. This was followed by a strong recovery in 2011, even beyond expectations. The 2012 year was devastating for Serbia when it comes to the level of FDI because they amounted only 240 million. Certainly at the global level this year

was very poor due to the second wave of financial crisis, but on the other side, decline in world level of FDI was not as radical as in Serbia. This once again confirms that only the poor countries in transition that are highly dependent on foreign capital feel the strongest global predicament which is reflected in an unprecedented decline of the main macroeconomic indicators. Serbia has recorded a positive growth trend and the level of FDI inflows last two years, but it will take a few more years until it returned to the level before the crisis. Overall, Serbia is in terms of the level of FDI since 2000 to fully monitor the growth or decline tendencies of FDI globally. When we compare the trajectory of the global FDI inflows trends and in Serbia, it is evident that they are quite similar.

Further analysis is necessary to complement with the sectoral structure of FDI inflows. According to data for 2012, sector in which was placed the highest amount of foreign investment was wholesale and retail trade (788 million USD in absolute terms), followed by manufacturing (421 million USD), financial and insurance activities (222 million USD) and real estate (138 million USD). The percentage share is shown in the following Figure 5.

**Figure 5.** Distribution of FDI, by industry, 2012 (per cent of total value)

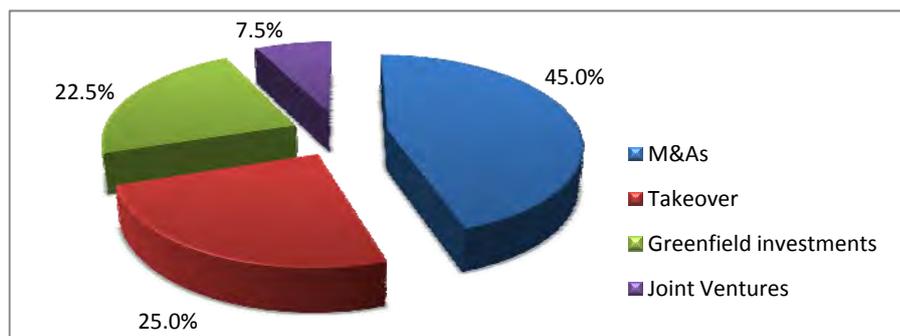


**Source:** authors calculation based on National Bank of Serbia.

In many transition countries, trade and finance had a dominant share. Such a relationship can be said that is especially characteristic for the transition economies in the region, including Serbia, but how good it is, the future course of economic development will show. Serbia has a solid share of the manufacturing industry, and that is positive fact but it would be better if the proportion is higher in comparison with the trade.

Since the beginning of the transition process, in the period 2001-2012 years, according to available data, in Serbia was invested over 17 billion USD. All types and models of FDI have been implemented. In absolute terms 7835.4 million EUR relating to mergers and acquisitions (M&As), 4,312 million EUR to takeovers (which are considered also fall in M&As), 3907.4 million in Greenfield investments and 1311.5 million in joint ventures. Following Figure 6 shows this numbers translated in the percentage ratio.

**Figure 6.** Realization model of FDI, cumulative 2000-2012 (per cent of total value)



**Source:** authors calculation based on SIEPA.

Origin analysis of the FDI inflows that are flowing into the economy is extremely important and gives us a lot of useful information that may be useful to a multiple further action in the field of attracting FDI. In the case of Serbia, since 2000, four-fifths of all realized FDI originating from European Union countries, indicating a critical role of European investors in the reporting period. The table number 3 was made according to the National Bank of Serbia data gives us a complete overview of the origin of FDI in the period from 2005 to 2013 and an accurate picture of the importance of individual countries in Serbia.

**Table 2.** Foreign direct investment by country - origin, 2005-2013 (in millions of euros)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL by country
Austria	168.864	409.815	848.627	330.567	234.149	145.850	154.693	55.275	40.646	2,388.486
Norway	0.024	1,296.061	2.326	4.025	-0.526	1.567	0.953	3.451	3.535	1,311.427
Greece	183.137	672.010	237.108	33.338	46.724	24.450	9.958	-296.053	29.057	939.729
Germany	154.868	645.370	50.516	59.572	40.101	32.921	76.591	43.444	48.391	1,151.774
Italy	14.759	49.087	111.504	333.665	167.386	42.296	128.068	81.709	43.912	972.386
Holland	80.387	-176.560	-24.199	336.711	172.267	200.100	240.840	1.386	131.094	962.026
Slovenia	149.854	154.529	64.033	70.659	34.290	80.859	-108.387	52.560	24.480	522.877
Russia	11.722	12.713	1.700	7.903	419.751	6.993	74.187	18.503	45.295	598.767
Luxemburg	88.331	4.839	185.226	48.576	6.002	6.739	812.829	64.435	22.604	1,239.581
Switzerland	45.922	-4.223	70.458	82.319	62.883	50.643	47.742	78.389	49.012	483.145
Hungary	24.613	179.260	22.901	21.891	17.787	15.488	67.591	0.504	45.686	395.531
France	34.816	79.087	61.548	53.810	7.150	17.089	113.652	14.304	-1.080	380.376
Croatia	30.356	17.446	26.802	100.428	19.938	37.928	4.918	118.959	-5.548	351.227
Great Britain	51.444	77.977	-21.054	10.122	51.842	53.344	-6.174	39.541	32.848	289.890
Montenegro	/	10.466	152.631	54.078	-3.608	-64.947	5.621	-8.747	0.102	145.596
SAD	16.067	-20.593	23.536	35.624	12.583	54.779	25.633	28.051	16.759	192.496
Bulgaria	0.651	42.034	34.350	14.605	1.291	9.745	0.793	29.654	7.587	140.471
Slovakia	21.578	15.959	2.320	0.935	24.512	32.531	-4.830	-13.449	2.661	82.266
Belgium	10.306	4.160	17.276	12.000	2.366	3.536	5.006	1.672	43.659	100.056
Israel	11.588	3.681	19.397	-0.494	0.052	1.703	0.223	1.042	2.041	39.332
Latvia	5.208	8.178	2.645	0.482	1.065	0.080	1.715	3.093	7.396	30.147
Liechtenstein	-32.839	-14.595	-1.916	3.375	0.174	0.814	9.867	-0.429	0.854	-35.221
Cyprus	56.697	-300.383	99.901	1.795	26.348	44.953	42.581	39.776	8.682	20.369
B i H	3.599	-13.582	-622.496	-47.327	0.340	-22.000	-9.800	0.143	5.559	-706.341
Others	118.317	169.871	455.780	255.755	27.605	82.665	132.637	-115.344	163.304	1,291.356
TOTAL	1,250.268	3,322.606	1,820.831	1,824.413	1,372.473	860.125	1,826.908	241.869	768.534	13,288.027

**Source:** authors calculation based on data National Bank of Serbia, Directorate of Economic Research and Statistics - Department of Balance of Payments Statistics.

The data presented suggest several conclusions. Absolutely the biggest investor in Serbia is Austria, which in observed period had FDI outflow to Serbia nearly 2.5 billion EUR. Behind of Austria, there are Norway, Germany, and Luxembourg that have invested over 1 billion EUR in Serbia in the same period. Approximately at the same level, slightly below one billion had Greece, Italy and the Netherlands, and about 500 million EUR were Slovenia, Russia and Switzerland. Given the size of its economy, it can be said that Hungary and Croatia with a slightly below 400 million EUR are also important investors in Serbia. The level of investment flowing into Serbia from Russia should be to a higher level, considering our overall political and economic relations. The same conclusion can be extended to Switzerland, since it is one of the largest investors in the world, very low level finished in Serbia, and certainly there is space for improvement. There are several countries that have a strong economy and a major investment power but they not present at the expected FDI level in Serbia. Primarily that refers to the USA, France and the United Kingdom. Also, China and Japan are important global investors are not among countries that invest capital in Serbia. Serbia has to find a modus to attract FDI from these two countries.

When it comes to the origin of FDI inflow and the countries that invested in Serbia the most, we can look back at the biggest individual investment projects that were implemented in Serbia since the beginning of the transition process (Table 3).

**Table 3.** *The largest investments in Serbia, 2001-2013*

Company	Country of Origin	Activity
Telenor	Norway	Telecommunications
GaspromNefit-NIS	Russia	Oil and gas
Fiat Auto Serbia	Italy	Automotive industry
Delhaize	Belgium	Trade
Stada-Hemofarm	Germany	Pharmaceutics
Mobilkom-VIP Mobile	Austria	Telecommunications
Philip Morris DIN	SAD	Tobacco Industry
BancaIntesa - Delta Bank	Italy	Finance
Eurobank EFG	Greece	Finance
Raiffeisenbanka	Austria	Finance
Salford Investment Fund	England	Food industry
StarBev - Apatinska brewery	Czech republic	Food industry
CEE/BIG shopping centers	Israel	Real estate
Agrocor	Croatia	Food industry
National Bank of Greece - Vojvodanska Bank	Greece	Finance
Merkator	Slovenia	Trade
US Steel	SAD	Metallurgy/metal, material handling
Credit AgricoleSrebia	France	Finance
Fondiarria SAI	Italy	Insurance and pension funds
Lukoil - Beopetrol	Russia	Oil and gas

**Source:** The National Bank of Serbia, Directorate of Economic Research and Statistics - Department of Balance of Payments Statistics

Note: These figures are based on research conducted by SIEPA and which include realized, and planned investments. The Agency does not accept responsibility for any errors in the data.

So far the largest single investment that occurred in Serbia is Telenor, which amounted about 1.3 billion EUR. This investment has positioned Norway among the top investors in Serbia and made 2006 a record year in terms of the level of FDI inflows, both in Serbia and in the region, as it was over US \$ 3 billion.

### 3. Rating investment attractiveness of Serbia and recommendations for improvement

Member companies of the Foreign Investors Council, in general, have a positive experience of operating on the Serbian market. Serbia set up the pillars of the market economy and can offer relatively stable macroeconomic and political environment. When it comes about the benefits of attracting foreign capital, several factors still favor Serbia in relation to emerging countries in the region. It is primarily its central geographic position. The geographical position makes Serbia attractive for investors to build the base for their business and thus provide easier access to different markets in the region. In addition, the legal framework is largely in compliance with EU regulations. Not negligible size Serbian market, and particularly important numerous free trade agreements that open the door to markets of CEFTA countries, Russia and the EU. *Doing Business Report 2015* has ranked Serbia 91st place on the ease of doing business. Simplified close the deal, issue laws on bankruptcy and liquidation of the company and the possibility of outside courts. Registering property in Serbia made transferring property more difficult by eliminating the expedited procedure for registering a property transfer (Doing business, 2015). Some of the main advantages of investing in Serbia would be (SIEPA, 2014):

- The favorable geographical position, which allows the delivery reach any location in Europe within 24 hours.
- No customs duties in trade with Russia.
- The possibility of duty-free exports of around 4,650 products in the USA.
- Highly educated and cheap labor force.
- Restructured and stable financial system.

- Simple procedures for the establishment and registration of companies, as well as to perform foreign-trade deal and the implementation of foreign investment.
- Goods walk-ability to about 800 million consumers on the basis of free trade agreements such as the agreement with EFTA and CEFTA agreement, agreements with Russia, Belarus, Kazakhstan and Turkey, and in February 2010 began the implementation of the Interim Trade Agreement with EU.
- Serbia in March 2012 was granted candidate status in the EU.

In comparison with other countries of the Western Balkans, it can be stated that Serbia has a favorable tax regime in which is the tax rate on earnings 12%, the rate of corporate income tax is 10% and the rates of value added tax are: general 20% and special 8%. Some countries in the region have far higher rates on existing taxes. In addition to the above, there is national treatment for foreign investors that includes (SIEPA, 2014):

- In the case of investments concession, the concessionaire shall be exempted from corporate income tax for a period of five years from the date of completion of the contracted concession investment.
- Exemption from income tax payment for large investments over a period of 10 years (investing more than £ 800 million, or about 8 million and employ more than 100 new employees).
- In proportion with investment, five years period exemption from the income tax payment, subsidies and tax incentives for the recruitment of new employees for investments in areas of special interest for the Republic of Serbia.
- Import of equipment as part of a foreign entity is exempt from customs duties, while for a number of raw materials apply lower tariff rates.

Support for foreign investors also is reflected in the fact that the investor, legal or physical person, may establish own company (up to 100% ownership), buy shares of the existing company, obtain a permit (concession) for the use of natural resources, goods in general use or perform activities of common interest, in accordance with the law, receives approval to build, exploit and transferred (BOT - Build operate and transfer) a specific facility or operation, as well as infrastructure and communications, acquire any other property right of foreign investors which he realizes his business interests, and so on. There are also various financial incentives available to foreign investors. They mainly include the granting of a certain percentage of funds for large and medium-sized FDI projects and projects of special importance (from 10 to 20% of the total value of the project that meets certain criteria in terms of the minimum amount of investment and the minimum number of new job created), as well as for FDI to subsidize new jobs.

Despite the positive aspects of investing in Serbia, there are a number of problematic issues that discourages FDI inflows and direct them in some other countries in the region. Stable, efficient and competitive business environment that attracts foreign investors is something that is building for longer period of time. The Government needs to implement much more decisive adopted legal decisions and improve business conditions. Too much red tape, lack of transparency and consistency in the application of the law, as well as corruption, are the main problems that need to be addressed. Investments should be encouraged in industries in which Serbia has comparative advantages, primarily in energy, agriculture and information technologies. In this regard, there are significant existing financial and tax incentives for new investments, especially for large companies and projects. Also it is important to mention the progress of Serbia towards European integration, having in mind that the European perspective of Serbia are key factor in attracting FDI, which is an important part of the mechanism for the continuation of economic reforms. Reforms in the area of fiscal policy, together with the continuous improvement of the business environment through structural reforms, can certainly constitute a good basis for better positioning of Serbia as an investment

destination in the future. Foreign investors and domestic companies' achievements puts in front of Serbian government task to continue building the foundations of the business-friendly country and create a stable environment for business. An identification of responsibilities and actions needed in order to enhance FDI flows at the national level is important because globalization has increased the competition for FDI flows among developing countries. Entrepreneurs recognize the scope of measures application that will improve the business climate, as well as the harmonization of legislation in accordance with the regulations of the European Union. Also simplifying administration and bureaucracy will contribute to faster economic development of the country and its competitiveness and solidify its position on the map of attractive investment destinations. Candidate status for membership in the European Union increases the reliability and stability of business operation in Serbia. This is a signal to investors that Serbia is moving in the right direction, to strengthen competitiveness and predictability of the business environment.

## Conclusions

After the 2012 slump, global FDI returned to growth, with developing economies maintaining their lead in 2013. Developing Asia continues to be the region with the highest FDI inflows in 2013, significantly above the EU, that is beside USA traditionally the region with the highest share of global FDI, but severely affected by the economic and financial crisis. Since 2000 Serbia has had a positive trend in the level of FDI inflows, which was twice slowed to a dramatic decline, due to the consequences of the first and second wave of the global financial recession. Following global trends, the FDI flows channeled towards Serbia have increased in the recent years, but still remain well below the pre-crisis levels. By economic activity, FDI is channeled primarily to the trade sector, followed by manufacturing sector and financial and insurance activities. Austria, Germany and Norway are among the major investors in Serbian economy.

There are many positive sides of investing in Serbia. In addition to low corporate taxes, the economy is booming and shows tendencies toward reform. Human capital is an important factor, because in comparison with the rest of Europe, very young, flexible, significantly educated, and almost half of the population speaks English. Weak points are political risk, compared with other countries in the region, followed by a very comprehensive procedure for setting up businesses. The Serbian government has adopted a series of measures to attract foreign capital: the allocation of subsidies to investors for job creation in the field of research and development, production and services; agreements have been signed with many countries to avoid double taxation. Creating recognition of Serbia as the investment opportunities country, market economy, open borders, ready to competitively participate in the European mainstream, represents the national interest of the Republic of Serbia. Strategic Serbian goals are active engagement in improving the country's economic development, increase exports and foreign direct investment, strengthening the competitiveness of Serbian economy and development of entrepreneurship, promote economic territory of Serbia as a respectable investment destination. The lack of transparency and consistency in the application of law, as well as corruption as the main problems that needs to be addressed by the government in order to facilitate the attraction of FDI flows. It is necessary maximum involvement of all relevant stakeholders to create an open, stimulating and prosperous economic environment. Representing the interests of stakeholders has a special importance in circumstances when the economic environment is faced with the challenges of economic activity on a global scale, whose weight is more complex internally because challenges of transition from one side and the challenges of adapting to economic criteria for membership of the EU, on the other side. Presentation and promotion of the Serbian economy, its natural and human resources, informing foreign investors about the conditions and opportunities of doing business in

Serbia, as well as the partnership linking the economy, are the most important tasks to be carried out. Only a stable and strong economy, improving the business and investment environment, can bring higher living standards and the development of Serbia.

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# Business cycle synchronization between Central and Eastern European countries and the Euro Zone

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**Abstract.** *This paper assesses the degree of business cycle synchronization between a group of Central and Eastern European (CEE) emerging economies and the Euro Zone in the context of the integration in the monetary union. The investigation is important in light of euro area integration of new member states, as well as for providing policy recommendations with respect to mitigation of macroeconomic fluctuation transmission. Therefore a very complex analysis must be conducted in terms of costs and benefits, both from the view of the candidate as well as from the monetary union's perspective. The results point towards a high degree of correlation with Euro Zone in terms of business cycle for some emerging economies in the Central and East Europe, like the Czech Republic and Hungary, while Romania seems to be among the countries least correlated. Nevertheless, the countries seem to have experienced a high degree of correlation during the crisis, especially when the turbulent economic developments reached their peak.*

**Keywords:** convergence, business cycles, economic growth, filtering methods, optimum currency area.

**JEL Classification:** E32, F15, F41, F42, F43.

## 1. Introduction

The convergence process between emerging economies aiming at integrating within the euro area has gained a lot of attention in the recent years, especially in the context of the financial and economic crisis. Being synchronized with the other countries of a monetary union became a matter of highly importance. For instance, divergent economies within a monetary union may have significant impact on efficiently implementing the common monetary policy across the zone. Moreover, the topic of business cycle synchronization has gained a lot of interest in the last years taking into account that the recent economic crisis has pointed weaknesses of some countries, which turned out to have different structural characteristics compared to the other economies of the Euro Zone.

For policymakers is a difficult task to identify the appropriate macroeconomic policies in response to such difficulties. In this context, it is of utmost importance for policymakers in the non-euro area EU member states which are in the process of integration to better understand, on one hand, the underlying channels and the transmission mechanisms of external shocks and, on the other hand, to which extent these mechanisms have impelled business cycle synchronization with that of the Euro Zone. Moreover, these aspects become even more important in the view of the convergence process towards the Euro Zone, in which all non-euro area EU members are involved, given the fact that the countries, which are hit by ample and asymmetric idiosyncratic shocks could experience significant economic costs in case they lack the independence of their monetary policy, once they enter Exchange Rate Mechanism II.

Irrespective of their nature, if external shocks contribute in a significant manner to macroeconomic fluctuations in a small open economy a lot of attention should be paid to external variables when designing domestic policies. In case of non-euro area emerging economies, the extent to which the share of the domestic economic activity fluctuations is explained by the external euro area or even global disturbances is of utmost importance from the viewpoint of policy implications. According to the Optimum Currency Area Theory, in case asymmetric shocks have a low probability of occurrence, implying that the small and more developed economies have more synchronized business cycles, the probability of losing independence over monetary and exchange rate policies is reduced. Cases of Greece or Spain from post-financial crisis period which experienced difficulties inside the Euro Zone offer strong support for the idea that it is important for a country to fulfil the above mentioned Optimum Currency Area criteria before joining the monetary union.

Within this context, the paper tries to respond to the question whether CEE countries, aiming at joining the euro area, have a common trend in terms of their business cycle with the monetary union, or not.

The paper is organised as follows: Section 2 presents a brief literature review regarding some studies focusing on business cycle synchronisation, section 3 realizes an overview of the methodology and data, section 4 describes the results of the empirical analysis, section 5 focuses on a different approach based on output comovement and section 6 concludes.

## 2. Related literature

Mundell (1961) assesses business cycle synchronization as being one of the most important factors a country should consider when entering into a currency union. This is mainly ascribed to the fact that the costs associated with losing the independence of the monetary and exchange rate policies are significantly lowered if the countries of the monetary union are synchronized in terms of their business cycles. Later on, Frankel and Rose (1998) argued that in order to enter a monetary union, a country may satisfy the criteria *ex post* mainly on the

account that, the capital flows, highly stimulated into a common currency area induce higher business cycle synchronization among countries.

In the perspective of some CEE countries entering the monetary union, a lot of studies devoted their work analysing the degree of business cycle synchronization between CEE countries and the Euro Zone. Bojeşteanu and Manu (2010) find that during the last decade Romania has made progress in terms of real convergence process with the Euro Zone, this being confirmed both through the improvement of the degree of correlation of its business cycle with that of Euro Zone as well as through the reduction of the dispersion associated with the bilateral correlation with each country member. Frenkel and Nickel (2005) state that Hungary, Estonia and Czech Republic have strong economic relationships with some countries within the Euro Zone. According to Darvas and Szapary (2004), Hungary, Poland and Slovenia have a high degree of synchronisation in terms of GDP and exports with European Monetary Union, while Bencik (2011) only finds a high degree of synchronization between CEE countries and euro area after the entry into the EU. Nevertheless, it must be stated that the results are highly sensitive to the methodologies employed and the data used for the analysis.

Moreover, many studies analyse the way in which external factors influence business cycle fluctuations, trying to identify the international transmission channels in case of Euro Zone, EU or OECD or in case of the candidate countries, as in case of Kim (2003). The conclusions are mixed and in some cases controversial. While the literature hasn't reached a clear consensus *vis-à-vis* the nature of the shocks that determine macroeconomic volatility, the channels through which they are propagated and the fact that shocks have long-lasting macroeconomic effects are widely recognized. Regarding the transmission channels of external shocks, Muraruşu and Bobaşu (2014) show that the strengthening of international financial and commercial linkages increased output comovements between regions and posed new challenges for the policy makers especially in case of small open economies. Also, the International Monetary Fund (2013) suggests that tighter financial and trade linkages amplified the output spillovers stemming from idiosyncratic shocks. Acharya and Schnabl (2010) and Bekaert et al. (2011) argue that during crisis external shocks are preponderantly transmitted through different channels than in normal economic situations: financial, uncertainty or confidence channels may be more relevant in times of crisis.

Linde (2003) argues that external shocks are very important in explaining the business cycle of a small open economy. Precisely, the external shocks explain a large portion of the low-frequency fluctuation of the Gross Domestic Product, while domestic shocks produce much of the high-frequency economic activity fluctuations. The methodology is based on different VAR models with two distinct blocks, one for domestic and one for external sector, allowing unilaterally for the transmission of impulses from the closed large economy to the small open one. External shocks can have a monetary nature or could be demand or supply driven, each case implying different identification schemes.

Artis (2007) pointed out that business cycles synchronization among countries is a necessary prerequisite to enter a currency area, otherwise giving up monetary policy sovereignty can be extremely costly. Canova (2005) investigates the transmission of shocks from US to Latin America, concluding that while the supply and demand shocks don't produce significant fluctuations in the small open economies, the monetary shocks explain up to half of the total variability of the analysed macroeconomic variables, leading in case of Argentina and Mexico to large crises. He uses a two-step procedure, first, the structural shocks originating in US are being identified extracting the orthogonal innovations from a structural VAR, and afterwards, the identified statistical shocks are introduced in VAR models for each small open economy. The empirical literature provides evidences regarding the effects of financial integration. Imbs (2006) suggests that financial integration leads to more similar macroeconomic fluctuations,

whereas Kalemli-Ozcan et al. (2013) study the impact of financial globalization on business cycle synchronization using a proprietary database on banks' international exposure for industrialized countries finding that bilateral financial flows lower the degree of output comovement.

### 3. Data and methodology

The analysis includes six non-euro area emerging economies which joined at different moments the European Union, namely: Czech Republic, Hungary, Poland, Romania, Bulgaria and Croatia. Out of all New Member States, only the Czech Republic, Hungary, Poland and Romania have independent floating within inflation targeting regimes while all the other countries have their currencies pegged to the euro. To these countries adds Euro Zone and European Union as a whole in order to assess the degree of business cycle synchronization between new member states and these zones as well as the comovement in economic growth during normal and turbulent times

The similarities among the six countries consist in the fact that they are small open economies being at the same time emerging markets. However, they have adopted their monetary policy and exchange rate strategy in different periods; the Czech Republic, Hungary and Poland have joined the EU in 2004, Romania and Bulgaria became member states three years later while Croatia acceded to the EU in 2013. The main trading partner in case of all six countries is the euro area.

Business cycle synchronization is measured based on different detrending techniques like Hodrick-Prescott, Band Pass or the quadratic time trend filters<sup>(1)</sup>. The analysis comprises an investigation based on different correlation measures between each country included in the analysis and the euro area in terms of the cyclical components of GDP. We use the seasonally adjusted GDP volume at a quarterly frequency. The data covers the period between 2000Q1 and 2014Q3 for all the countries and for reasons of comparisons, the GDP is expressed in millions of euro, ESA 2010 methodology.

In section 5 we employ a different methodology based on various correlation measures in order to assess the output comovement between different pairs of CEE countries and the EU. The correlation measures are presented within the section.

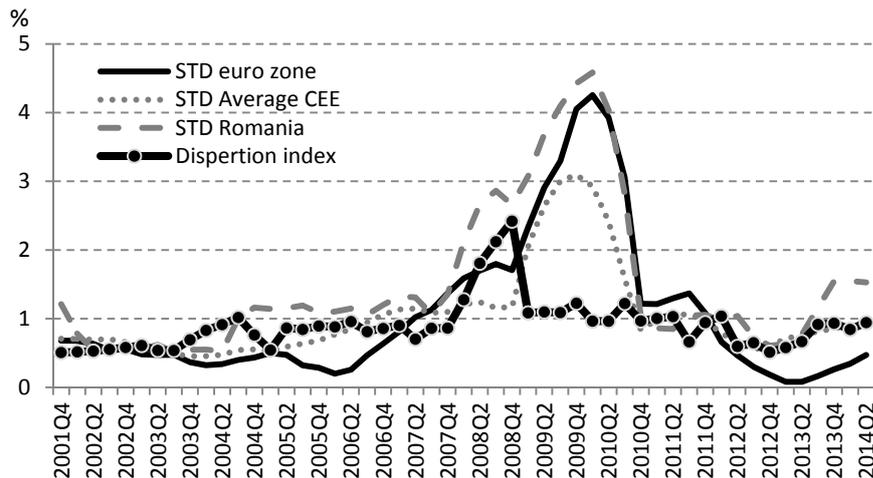
### 4. The analysis of business cycle synchronization between CEE countries and the Euro Zone

Business cycles are synchronized if the cyclical components of two countries or regions move in the same direction at the same time or they stay at the same value at a given time. The business cycles may diverge due to asymmetrical shocks which can affect either a particular country, for example a bad agricultural year or a counterproductive policy decision, or all countries, for example the recent international oil price decrease or the global financial crisis from 2008-2009. Based on cyclical component of real GDP, different synchronization measures can be computed. The dispersion of the output gap can be measured using the standard deviation of the output gaps in a rolling window sample of two years, for example. This synchronization measure makes it possible to evaluate whether the business cycles converge or diverge one to each other. This measure must be interpreted together with a correlation measure due to the fact that dispersion may be low as a result of low output gaps, even though they move in opposite directions. The correlation coefficient measures the degree of linear linking between two business cycles, the absolute size of them not playing any role.

The dispersion index exhibit a significant rise that begun earlier than the onset of the financial crisis in the European Union, more exactly in the beginning of 2008, when the standard

deviation fluctuates at a high level before diminishing again starting with 2010. The dispersion peaked when the turning point in the business cycle of Euro Zone was reached, the time at which most countries experienced a decline in GDP growth and dipped recession. Figure 1 shows that the increase in the dispersion index is associated with the increase of individual standard deviations of business cycles which indicate that the magnitude of the response of each emerging economy relative to external shocks was different and the degree of business cycle synchronization between CEE individual economy and Euro Zone was asymmetric across countries.

**Figure 1.** Euro area, CEE countries and Romania business cycles dispersion vs. individual volatility



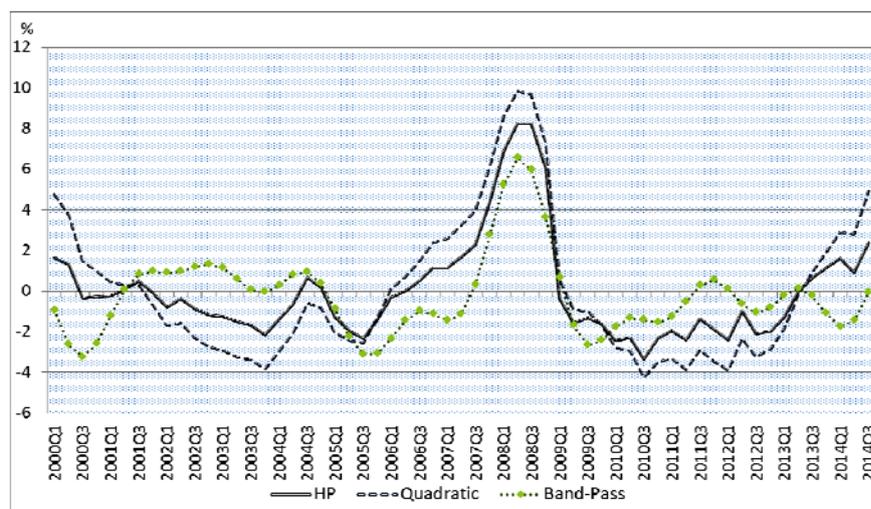
After computing the dispersion index, the Carree and Klomp (1997) test is used in order to establish whether the dispersion has changed statistically significant since the outbreak of the financial crisis. The Carree and Klomp test statistic is computed as follows:

$$T_{2,t,\tau} = (N - 2.5) \cdot \log \left[ 1 + \frac{0.25 \cdot (\hat{S}_t^2 - \hat{S}_{t+\tau}^2)^2}{\hat{S}_t^2 \cdot \hat{S}_{t+\tau}^2 - \hat{S}_{t+\tau}^2} \right]$$

Where:  $\hat{S}_t^2$  represents standard deviation of business cycles and  $\hat{S}_{t+\tau}^2$  the covariance of the business cycles at times  $t$  and  $t + \tau$ . Under the null hypothesis that standard deviation has not changed between two moments of time, the test statistic follows a  $\chi^2(1)$  distribution. The results of the test confirmed that dispersion has changed statistically significant since the outbreak of the financial crisis, the statistic being significant at 1% level.

Going forward, three different measures of the business cycle for each CEE economy and for the euro area respectively are computed using the Hodrick-Prescott, Band-Pass and quadratic time trend filters.

Figure 2 shows the evolution of the business cycle in Romania using different filtering methods. Analyzing the figure it can be observed that the cyclical component of the GDP has a similar path regardless the method employed, although the amplitude differs. The output gap filtered with Hodrick-Prescott and the quadratic time trend method resemble a lot, while the one computed using the Band-Pass filter has a different sign at the beginning and end of the sample as compared to the previous two and seems more volatile on different sub-samples. The business cycles estimated for every country are presented in Appendix 2.

**Figure 2.** Business cycle measures in Romania

In order to analyze the synchronization of the business cycles of CEE countries with the euro area, the Pearson and Spearman correlation coefficients are next computed. The first one is one of the most used measures in order to test the linear dependence between two times series, while, the latter, assesses whether the analyzed series run in the same direction.

**Table 1.** The degree of correlation of business cycles between CEE countries and the euro area

Pearson correlation coefficient						
Filter/Country	RO	BG	CZ	HR	PL	HU
<b>Hodrick-Prescott</b>	63.9	75.7	90.2	79.0	66.2	79.6
Rank	6	4	1	3	5	2
<b>Quadratic</b>	53.2	76.0	88.8	63.8	66.5	68.4
Rank	6	2	1	5	4	3
<b>Band-pass</b>	54.3	71.7	93.5	64.1	59.4	77.3
Rank	6	3	1	4	5	2
Spearman correlation coefficient						
Filter/Country	RO	BG	CZ	HR	PL	HU
<b>Hodrick-Prescott</b>	72.9	80.7	88.2	81.2	55.4	62.6
Rank	4	3	1	2	6	5
<b>Quadratic</b>	64.2	80.3	91.3	69.1	59.2	55.9
Rank	4	2	1	3	5	6
<b>Band-Pass</b>	50.9	70.1	91.1	66.5	63.8	73.4
Rank	6	3	1	4	5	2

As Table 1 shows, the country that exhibits the highest correlation with the euro area is Czech Republic, regardless of the correlation method or the filter methodology employed, followed by Hungary as far as the Pearson coefficient is concerned and in terms of the business cycle estimated with Hodrick-Prescott and Band-Pass filters. The Pearson coefficient assesses Romania as being among countries least correlated with the euro area in terms of the business cycle, together with Poland and Croatia (the results being slightly dependent of the detrending method employed). As far as the common direction in terms of the business cycle evolution with the euro area is concerned, this being assessed using the Spearman correlation coefficient, Romania has a more favourable position, taking the fourth place, before Poland and Hungary, when using as filtering methods Hodrick-Prescott and a quadratic time trend.

A very interesting analysis is the assessment of the business cycle synchronization before and after the onset of the crisis. For this purpose, the Pearson correlation coefficient is computed over two sub-samples, according to the beginning of the crisis in the euro area, namely the third quarter of the 2008. Table 2 shows a high correlation of the Czech Republic's business cycle with the Euro Zone cyclical position both before and after the crisis. Bulgaria seems to be the second country in terms of correlation before the crisis, while after the onset of the

turbulent developments, Hungary seems to be the next country after Czech Republic in terms of correlation (depending on the detrending method). As far as Romania is concerned, our country seems to have experienced a higher degree of correlation before the crisis, while after 2008Q3, the correlation seems to have somewhat decreased. An interesting aspect is the fact that although before the crisis, Poland had a relatively high degree of synchronization with the euro area, after 2008, according to the Hodrick-Prescott and quadratic analysis, the correlation has decreased a lot (becoming even negative for the latter).

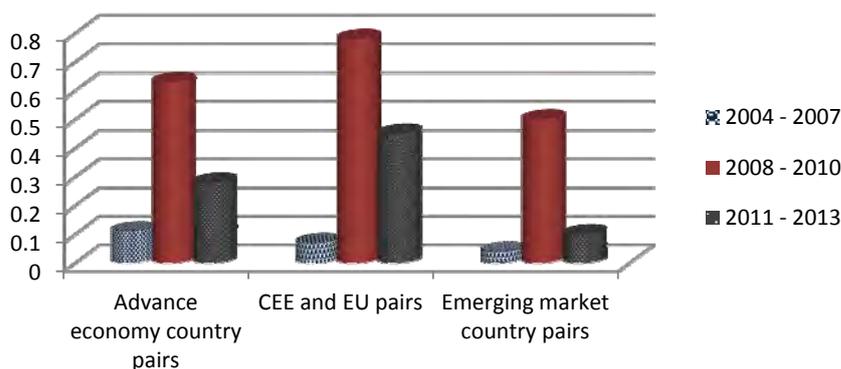
**Table 2.** *The degree of correlation of business cycles between CEE countries and the euro area before and after the onset of the crisis*

Pearson correlation coefficient (2000Q1-2008Q2)						
Filter/Country	RO	BG	CZ	HR	PL	HU
<b>Hodrick-Prescott</b>	82.8	88.5	90.5	83.8	75.2	73.7
Rank	4	2	1	3	5	6
<b>Quadratic</b>	90.3	91.6	92.8	89.4	82.3	57.3
Rank	3	2	1	4	5	6
<b>Band-Pass</b>	65.3	70.6	92.7	55.0	37.8	57.2
Rank	3	2	1	5	6	4
Pearson correlation coefficient (2008Q3-2014Q3)						
Filter/Country	RO	BG	CZ	HR	PL	HU
<b>Hodrick-Prescott</b>	39.7	59.1	90.4	67.5	55.4	84.2
Rank	6	4	1	3	5	2
<b>Quadratic</b>	45.1	57.9	80.0	63.7	-2.4	71.9
Rank	5	4	1	3	6	2
<b>Band-Pass</b>	43.4	71.7	94.5	76.3	81.7	95.0
Rank	6	5	2	4	3	1

## 5. Output comovement between CEE countries and EU

An interesting aspect that a lot of studies focused on is the comovement between CEE economies and the EU, in terms of their real GDP, this being mostly important in the context of the economic and global crisis and how economic growth in these countries synchronised or not during turbulent periods.

In order to measure comovements three different methods based on quarterly real GDP were chosen. To start with, the most common measure of output comovements is represented by the correlation of real GDP growth between every analysed economy and EU. Figure 3 shows a comparison of output comovements measured this way, as in Muraruşu and Bobaşu (2014). Moreover, fixed spans, rolling window of two or five years long time period and an instantaneous measures of simple correlations were used. The correlations in terms of economic growth have been reduced as magnitude in the years before the crisis but increased significantly during the crisis period. The phenomenon was observed in case of all regions, including emerging and developing economies. Starting with 2010 the correlations between different countries have fallen back significantly which suggest that the global economic evolution, including CEE countries, have returned to a normal state of nature. Still an important question is what has driven the large correlation between the economic growth of different countries and regions. One explanation would be the fact that it might be possible that the increase in output growth correlations was determined by shocks which affected simultaneously many economies. For example, such common shocks could be a sudden rise of financial uncertainty or a change in the investors' perceptions regarding their placements (Fratzcher, 2009, 2012; Acharya and Schnabl, 2010; and Bekaert et al., 2011).

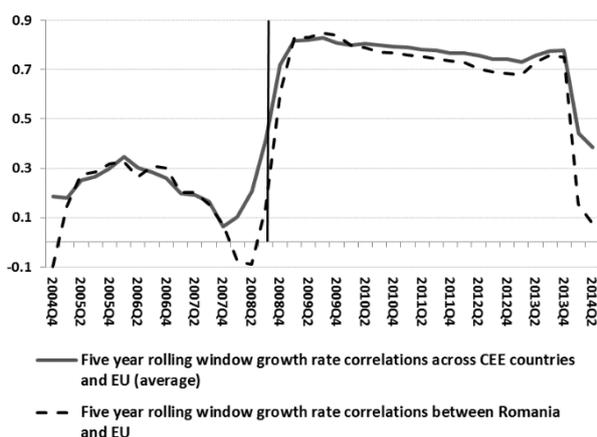
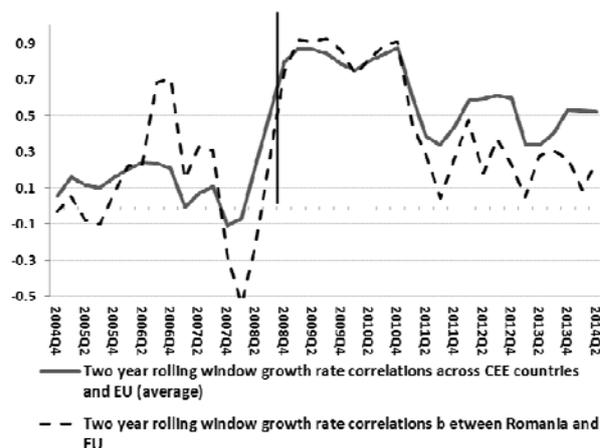
**Figure 3.** Growth rate correlations

**Sources:** Eurostat Database; IMF, World Economic Outlook; Organization for Economic Cooperation and Development; author calculations.

Another way of analysing the output comovement between countries is the methodology proposed by Giannone, Lenza, and Reichlin (2008), who measure business cycle synchronization with the negative of divergence, computed as the absolute value of real GDP growth differences between each CEE country and EU in every year included in the sample:

$$SYNCH_{i,ea,t} = -|(lnY_{i,t} - lnY_{i,t-1}) - (lnY_{ea,t} - lnY_{ea,t-1})|$$

This indicator is very easy to compute and in contrast to the correlation measures analysed previously, it does not contain estimation errors being insensitive to various filtering methods that have been criticized by Canova (1998) or to the time length of the rolling window used in the computation. Moreover, this index of synchronization doesn't directly reflect the volatility of output growth and, therefore, it allows the identification of the impact of trade and financial integration on the covariation of output growth as in Kalemli-Ozcan, Papaioannou and Peydro (2009).

**Figure 4.** The five-year moving average growth rate correlations**Figure 5.** The two-year moving average growth rate correlations

**Sources:** Eurostat Database and author calculations.

The averages of five-year rolling window growth correlations across each EEC and rest of the EU country pair remained below 0.7 from the 2000 Q1 until 2008 Q2. The five-year moving average growth correlations spiked sharply during the global financial crisis, starting with 2008 Q3 (Figure 4). The high correlation depicted during the crisis can be ascribed to the sharp and synchronized collapse in output in 2008 Q4 and 2009 Q1. The highest correlations are among pairs including Czech Republic, Hungary, and Romania on one side and the rest of EU on the other one. The correlations based on output gap measures show even higher

increase during the economic crisis, which accounts for a high synchronisation of the business cycle during the turbulent times.

The five-year rolling window correlations suggest that output synchronization remains high. Nevertheless, if the output comovement is assessed using a shorter window or instantaneous correlations it can be observed that they have already been fallen. For instance, in case of two-year rolling window, where growth correlations are used, there is a significant decrease in output comovements in 2011 Q1 (Figure 5), this drop being ascribed to the fact that the first quarter of 2009 exits the two-year tolling window.

In order to test that average output comovements sharply decreased compared to the peak of the global financial crisis an instantaneous measure of correlation was used.

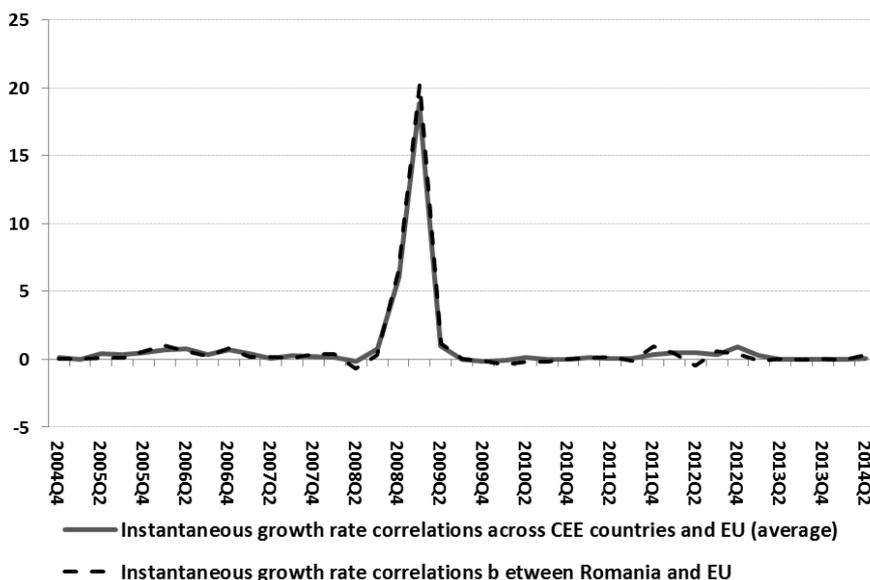
The instantaneous measure of correlation is computed as follows:

$$\frac{(\Delta y_{i,t} - \overline{\Delta y_i}) \cdot (\Delta y_{j,t} - \overline{\Delta y_j})}{\sigma_i \cdot \sigma_j}$$

This correlation measure is not bounded between -1 and 1 because, if growth rates in the two countries/regions included in the pair are both far away from their respective means, this being a very common trend during the peak of the financial global crises, this correlation measure can significantly exceed 1.

Figure 6 shows that the output growth correlations after 2011 have fallen close to pre-crisis levels, in spite of the intensification of the sovereign debt crisis in Europe during this period.

**Figure 6.** *The instantaneous growth rate correlations*



**Sources:** Eurostat Database and author calculations.

## 6. Conclusions

The analysis of the similarities between the economies who aim joining the euro area and the monetary union itself has been of much controversy during the last years. According the Optimum Currency Area theory, the benefits of joining a monetary union must be higher than the costs, this being similar to the fact that the candidate country is not in a different phase of its economic cycle than the union and does not experience asymmetric shocks as compared to the union. Business cycle synchronisation among the union is very important from the perspective of the monetary policy conduct. If the members of a monetary union are not synchronised in terms of their business cycles, a common monetary policy may have different

results on the countries' economies. Business cycle synchronisation is also highly influenced both by common external shocks and idiosyncratic shocks and impacted through similar country-specific transition mechanisms as international trade and financial assets.

Considering all these aspects, this paper focuses on assessing the degree of correlation between the business cycles of some countries from Central and East Europe and the euro area. For this purpose, different methods of assessing the cyclical component of GDP were employed and various correlation coefficients were computed. The results point towards a high correlation with the euro area in terms of the business cycle for some CEE countries, like the Czech Republic and Hungary, while Romania seems to have a lower degree of synchronisation with the monetary union, although a little bit higher before the onset of the financial crisis. A straight-forward analysis based on the dispersion of the output gaps of the countries included in the analysis shows that the dispersion index of the cyclical components of the countries increased sharply when the economic and financial crisis reached its peak and all the economic experienced a decline in their GDP. This analysis is further expanded by computing different correlation measures of the output of different countries and the UE. The same conclusions are drawn. The correlation in terms of the economic growth increased a lot during the crisis, whereas, in the last period, it has fallen back significantly to figures very similar to the ones of the pre-crisis period, pointing that these economies have somehow returned to a normal state of nature.

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## Note

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<sup>(1)</sup> For more information regarding the filter techniques please consult Appendix 1.

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## Appendix 1

**The Hodrick-Prescott filter** is a smoothing method which has become one of the most common used filters in decomposing a data series ( $y_t$ ) in two unobservable components, its trend ( $\dot{y}_t$ ) and cyclical component ( $\hat{y}_t$ ), respectively.

In order to obtain these two components the following loss function is minimized:

$$\sum_{t=1}^T (y_t - \dot{y}_t)^2 + \lambda \cdot \sum_{t=1}^T ((\dot{y}_{t+1} - \dot{y}_t) - (\dot{y}_t - \dot{y}_{t-1}))^2.$$

The first term denotes the sum of the squared deviation of the variable from its trend and is also referred to as a measurement of the “goodness of the fit”, while the second term penalizes the changes in the trend’s growth rate. The higher the values of the penalty parameter  $\lambda$ , the smoother the trend of the series. The recommended value for  $\lambda$  in case of quarterly data is 1600.

**The quadratic trend filter** assumes the same decompositions of variable in its trend and cyclical component like stated below:

$$y_t = \dot{y}_t + \hat{y}_t.$$

The dynamics of the trend assumes a polynomial function of the second order:

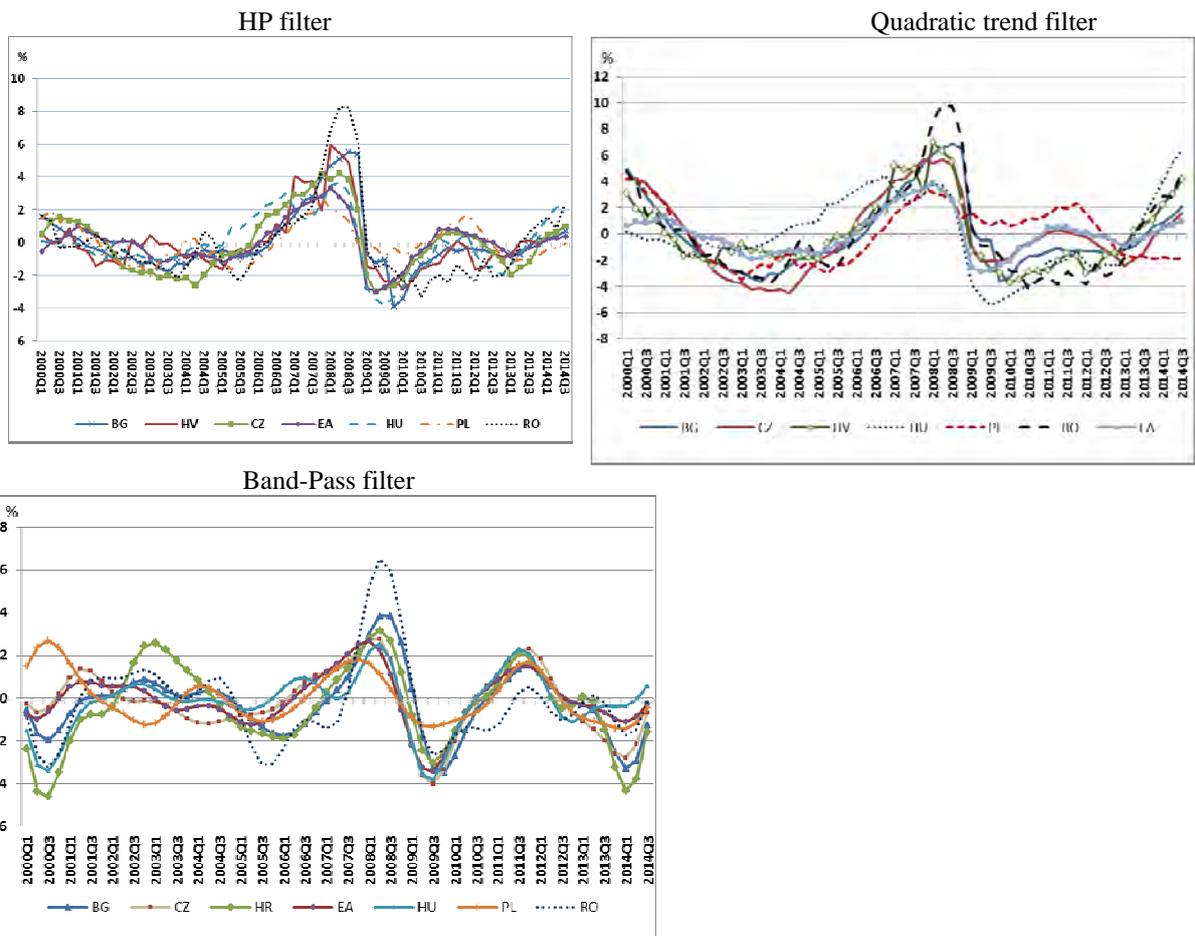
$$\dot{y}_t = a + b \cdot t + c \cdot t^2.$$

And therefore, the cyclical component can be obtained as the residual of the following equation:

$$y_t = a + b \cdot t + c \cdot t^2 + \hat{y}_t.$$

**The Band-Pass filter** (Christiano and Fitzgerald) specifies the business cycle as fluctuations within specific range. The filter adopts the hypothesis of Burns and Mitchel (1946) stating that a business cycle lasts no less than 6 quarters and no longer than 32 quarters. In other words, taking into account that data series can be decomposed into various frequency components, the band-pass filter extracts the frequencies within some predetermined ranges and eliminates all others.

Appendix 2



# Assessing the impact of financial disturbances on the Romanian business cycle fluctuations

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**Abstract.** *In this paper we estimate a large Dynamic Stochastic General Equilibrium model with financial frictions and external sector for the Romanian economy. The main objective is to shed some light on the adjustment mechanism that takes place after the economy has been perturbed by a shock originated from the financial sector. As for some key findings, apart from the risk premium shock, the rest of the financial shocks seem to have a small impact on the real economy; the Loan-To-Value shocks and the interest rate spread shocks affect the output only marginally.*

**Keywords:** DSGE, banking sector, collateral constraints, open-economy, Bayesian estimation.

**JEL Classification:** E21, E22, E32, E44.

## 1. Introduction

Since the latest financial crisis, important progress has been made in the field of dynamic macroeconomic modelling. The specifications used in the early 2000s abstracted the role of financial markets for business cycle dynamics, therefore, prior to the 2008-2009 financial crisis, the operational macro models were unable to foresee the impact of financial disturbances on the main macroeconomic variables. The literature covering these aspects is growing at rapid pace, but there are only a handful of papers which tackle this issue for emerging economies.

An emerging small open economy (like Romania) is particularly vulnerable to external developments, such as foreign demand drops, commodity price volatility or increases in risk aversion of foreign investors. Also, in particular countries other vulnerabilities can arise from the fact that a consistent part of the financial sector is foreign owned. Given the facts stated above, we consider that studying the transmission mechanism of financial shocks on the Romanian business cycle fluctuations can be relevant for policymakers. To this end, we estimate a large Dynamic Stochastic General Equilibrium (hereafter DSGE) model, where the economy can be disturbed exogenously by external and financial shocks.

Apart from the financial sector, the model incorporates standard New-Keynesian features<sup>(1)</sup> like monopolistically competitive markets and nominal rigidities. The financial block is written in the spirit of Iacoviello (2005) and Gerali et al. (2010) and is composed of lending and saving banks, as well as lending and saving intermediaries. There are two types of financial market frictions specified in the model, a time-varying spread between the interest rate on deposits or credits and the interbank market and borrowers need collateral to take loans, either in form of housing or capital. Also there is an incomplete pass-through of the monetary policy impulse, because the lending and saving intermediaries are using a Calvo-scheme to readjust the retail interest rates.

## 2. Related literature

The DSGE framework is a natural extension of the Real Business Cycle (RBC) models that were one of the main toolboxes for macroeconomic research in the '80s. At the genesis of the RBC theory is the seminal paper of Kydland and Prescott (1982), who proposed a new type of models, where private agents had an optimizing behaviour, benefiting from rational expectation and acting in a general equilibrium framework. Although standard RBC models provided a fundamental methodological contribution, these models were unable to provide a rigorous policy analysis mainly due to the fact that the economy was perfectly competitive and frictionless, with prices and quantities immediately adjusting to their long-run equilibrium. In this framework, monetary policy was neutral regarding the real economy, a contradiction with empirical economics. Later, due to the works of Christiano and Eichenbaum (1990), Erceg et al. (2000), Smets and Wouters (2002), Christiano et al. (2005), Gali et al. (2005) and many others, the standard DSGE framework caught the attention of academia and policymakers. The development of a better econometric framework for the estimation of DSGE models has considerably enlarged their scope of application. As a result, many central banks have are using Bayesian DSGE models for a large number of purposes such as: policy analysis, identification of shocks, forecast exercises and welfare measurement.

One possible weakness<sup>(2)</sup> of the benchmark DSGE models is the fact that the channels through which financial market frictions affect the real economy are poorly modelled. The influence of financial sector on the real economy is well known; an example is the latest economic recession triggered by US subprime mortgage market. Therefore, a DSGE model without financial frictions may not be able to explain some of the regularities seen in the business cycle fluctuations and, also, can exclude many other possible analyses which are of interest

for policymakers, such as financial vulnerabilities, illiquidity or the effects of financial sector pro-cyclicality. The most common approach to incorporate financial frictions into DSGEs is through the financial accelerator approach which was introduced by Bernanke, Gertler and Gilchrist (1999). In their model, endogenous developments in credit markets amplify and propagate shocks to the economy. The mechanism is based on the inverse link between the external finance premium and the net worth of potential borrowers. This setup allows for endogenous determination of external finance premium above the risk free interest rate. Christiano et al. (2011) found for the US and the Euro Area that the financial accelerator plays a relevant role in amplifying a shock that moves the prices and output in the same direction as well as explaining the business cycle fluctuations. One limitation of the financial accelerator is that it addresses only credit market frictions and leaves untouched many other possibilities of financial frictions. Later, Gertler, Gilchrist and Natalucci (2007) used the financial accelerator in an open economy framework. Their goal was to explore the connections between the exchange rate regime and financial distress. Their model was applied on the Korean economy and they found that the financial accelerator, in the context of open economy, is significant, accounting for about 50% of total reduction in economic activity and the fixed exchange rate regime leads to substantially higher welfare losses after a financial crisis that would be obtained under inflation targeting regime. Also, Faia (2010) has used a two-country DSGE model with sticky prices and financial frictions to compare different exchange rate regimes. She found that the flexible exchange rate has the property of stabilization in presence of credit frictions, but if the shocks are symmetric and correlated, fixed exchange regime can perform better.

However, in models with financial accelerator, financial frictions arise because monitoring a loan is costly, which determines an external finance premium above the risk free interest rate. Another way of incorporating financial frictions into DSGE models is through collateral constraints. Iacoviello (2005) has developed a model with nominal loans and collateral constraints tied to housing values on both firms and households and he found that collateral effects allow the model to match the positive response to a real spending to a housing price shock and secondly, nominal debt allows the model to replicate the sluggish dynamics of real spending to an inflation surprise. Later, Iacoviello and Neri (2008) have used a slightly modified framework to study the consequences of fluctuations in the housing market and the amount of spillovers from the housing market to the wider economy and they found that fluctuations in housing investment directly affect the output. Calza et al. (2009) have built a two sector DSGE model with price stickiness and collateral constraints to analyse how the response of consumption and residential investment to a monetary policy shock is affected by alternative values of two institutional features: (i) down payment rate and (ii) mortgage interest rate structure – variable vs. fixed. They showed that the response of consumption and residential investment to a monetary policy shock is affected by alternative values of the two institutional features that were taken in consideration. Also, they showed that residential investment and housing prices are usually more responsive to a monetary policy shock in countries where the mortgage markets are more developed. Gerali et al. (2010) study the role of credit supply factors for the business cycle fluctuations and they show that the banking sector may contribute to the stabilization of the business cycle fluctuations by reducing the negative effects of the nonfinancial shocks, but banks can also induce volatility in the business cycle if these shocks are originating from the credit market.

### 3. Structure of the model<sup>(3)</sup>

The economy is populated by patient households, impatient households and entrepreneurs. Patient households consume, accumulate housing stock, save and work. Impatient households consume, accumulate housing stock, borrow and work. Entrepreneurs produce homogeneous

intermediate goods using capital purchased from capital goods producers and labour supplied by the households. Furthermore, entrepreneurs can borrow to finance their activity. Both patient and impatient households supply differentiated labour services to labour unions which set their wages in order to maximise the members' utility. Labour is then sold to a competitive intermediary who supplies undifferentiated labour to entrepreneurs.

There are three stages of production, first entrepreneurs produce homogeneous intermediate goods which are sold in perfectly competitive markets to retailers who brand them at no cost and then sell differentiated intermediate goods in monopolistic competitive markets to aggregators. Finally, aggregators combine domestic intermediated differentiated goods and foreign differentiated goods into one final domestic good. There are also capital good and housing producers who are using final consumption goods to produce capital or housing with a technology which is subject to investment adjustment cost. The adjustment cost allows for the price of capital and housing to differ from the prices of the consumption goods.

In the financial sector there are lending and savings banks as well as lending and savings intermediaries. A saving financial intermediary purchases differentiated deposits from savings banks and sell undifferentiated deposits to households. The lending financial intermediary purchases differentiated loans from landings banks and sells undifferentiated loans to households or firms. In order to produce a deposit or a loan, a bank needs to purchase a deposit or a loan from the interbank market at the interbank interest rate. There is also a central bank that controls the interbank market using open market operations and sets the interest rate according to a standard Taylor rule.

In the model there are two types of financial frictions, first the interest rate on loans and deposits is different from the interbank interest rate. This difference is subject to external shocks; this is convenient way of modelling changes in the interest rate spreads and secondly, borrowers need collateral to take a loan, either in form of housing or capital. This constrain is perturbed stochastically in the form of a shock to the required LTV ratios. The specification of the LTV shock allows the introduction of changes in loan granting policies of commercial banks. Both types of financial frictions enter in the model exogenously and we consider this framework to be an attractive way of modelling financial frictions in a small open economy due to their vulnerability to external developments.

#### 4. Bayesian estimation

This section provides all the empirical aspects concerning the estimation process, namely the estimation procedure, issues related to the data, calibration, choosing of priors and simulation results. Throughout the estimation process it is assumed that all parameters and all shock are independent and, therefore no correlation between them is considered.

##### 4.1. Methodology

The Bayesian technique allows for the use of prior information from early studies in the estimation of the parameters of DSGE model. The model is composed by a parameter set  $\theta$  that defines the admissible value of the parameters that indexes the functions of the model, a likelihood function  $p(y|\theta)$  that tells us the probability that the model assigns to each observation given the parameters values and a prior distribution  $p(\theta)$  that captures pre-sample beliefs about the value of the parameters.

Accordingly to Bayes' theorem the posteriori distribution is given by:

$$p(\theta|y) = \frac{p(y|\theta)p(\theta)}{p(y)} \quad (1)$$

The likelihood corresponds to the joint density of all variables in the data sample conditional on the structural parameters of the model. Before evaluating the likelihood function, the DSGE model must be solved, in order to derive the likelihood function. Then the posteriori distribution can be estimated.  $p(y)$  does not depend on the parameters and therefore it can be treated as a constant.

$$p(\theta|y) \propto p(y|\theta)p(\theta) = K(\theta|y) \quad (2)$$

Where:  $K(\theta|y)$  is the posteriori kernel, which is proportional to the posteriori distribution by the factor of  $p(y)$ . Equation (2) in logs is:

$$\ln K(\theta|y) = \ln p(y|\theta) + \ln p(\theta) = L(y|\theta) + \sum_{x=1}^n \ln p(\theta_x) \quad (3)$$

Where:  $L(y|\theta)$  is the log likelihood function,  $n$  is the number of the parameters that are being estimated. When deriving equation (3), the priors were assumed to be independently distributed. With this equation, the posteriori distribution can be estimated. However, equation (3) is complicated and solving it analytically it is almost impossible, therefore the analysis will be performed with numerical methods.

The first step is to maximise (3) with respect to  $\theta$  and to obtain an estimate for the mode of the posteriori distribution  $\theta^m$ , and the Hessian matrix evaluated at the mode  $H(\theta^m)$ . This is performed with an optimization routine. Next, the posteriori distribution is simulated with Random Walk Metropolis (RWM) sampling method. The general idea of the algorithm is to generate a Markov-Chain that represents a sequence of possible parameter estimates in way that the whole domain of the parameter space is explored.

The Random Walk Metropolis sampling method has the following steps: (An and Schorfheide, 2007):

1. Use a numerical optimization routine to maximize  $L(y|\theta) + \ln p(\theta)$ , the posteriori mode is denoted by  $\tilde{\theta}$ .
2. Let  $\tilde{\Sigma}$  be the inverse of the Hessian computed at the posterior mode  $\tilde{\theta}$ .
3. Draw  $\theta^{(0)}$  from  $N(\tilde{\theta}, c_0^2 \tilde{\Sigma})$  or directly specify a starting value.
4. For  $s = 1, \dots, n_{sim}$ , draw  $\vartheta$  from the proposal distribution  $N(\theta^{(s-1)}, c^2 \tilde{\Sigma})$ . The jump from  $\theta^{(s-1)}$  is accepted ( $\theta^{(s)} = \vartheta$ ) with the probability  $\min\{1, r(\theta^{(s-1)}, \vartheta|Y)\}$  and reject ( $\theta^{(s)} = \theta^{(s-1)}$ ) otherwise. Here

$$r(\theta^{(s-1)}, \vartheta|Y) = \frac{L(\vartheta|Y)p(\vartheta)}{L(\theta^{(s-1)}|Y)p(\theta^{(s-1)})}$$

5. Approximate the posterior expected value of a function  $h(\theta)$  by  $\frac{1}{n_{sim}} \sum_{s=1}^{n_{sim}} h(\theta^{(s)})$ .

Steps 1 and 2 are not necessary for the implementation of the RWM algorithm, but they are often helpful. The RWM algorithm generates a sequence of dependent draws from the posterior distribution of  $\theta$  that can be averaged to approximate posterior moments.

For the estimation of this DSGE model we have used Dynare<sup>(4)</sup> which estimates the model using the methodology described above. The posterior maximization was performed with Sims algorithm (csminwel) and the posteriori distribution was approximated with the Metropolis-Hastings sampling method.

#### 4.2. Data and shocks

The model was estimated using thirteen macroeconomic variables, ten of them covering the Romanian economy, namely: *real GDP, private consumption, real exchange rate, consumer*

price index (HIPC), money market interest rate (ROBOR 3M), interest rate on households deposits, interest rates on households and firm loans and loans to households and firms. Three series cover the Euro Area (EU18): real GDP, consumer price index (HIPC) and money market interest rate (EURIBOR 3M).

All national accounts were seasonally adjusted, taken in logs and detrended using *one-sided* Hodrick-Prescott (HP) filter ( $\lambda=1600$ ). The time series covering the interest rates were just taken in first difference and detrended with HP filter. Interest rates and the inflation rate were detrended because of the disinflation process that characterized the Romanian economy during the period taken in consideration. The macroeconomic time series cover the period from 2003 Q1 to 2014Q2 a total number of 46 observations. The data for the Romanian GDP and private consumption came from the Romanian National Institute of Statistics (ESA95 methodology), the exchange rate and all the interest rates from the National Bank of Romania. Euro Area GDP and inflation (HIPC) are taken from the Eurostat, the money market interest rate (3 months) from the EURIBOR web site.

Also, in the model there are 16 structural shocks, namely:

○ Government consumption shock	○ Transitory technology shock
○ LTV households shock	○ LTV firms shock
○ Spread to households deposits shock	○ Spread to households loans
○ Spread to firm loans	○ External risk premium shock
○ Consumption preference shock	○ Labour preference shock
○ Housing preference shock	○ Inflation objective shock
○ Interest rate shock	○ External demand shock
○ External interest rate shock	○ External inflation shock

From the total of 16 structural shocks, three of them enter in the model exogenously through the SVAR model for the foreign economy – these shocks are assumed to be serial uncorrelated. Apart from the interest rate shock, all others shock are assumed to be first order autoregressive processes with normal innovations.

#### 4.3. Calibration and priors

The calibration strategy follows the common practice in the literature and assigns values<sup>(5)</sup> to those parameters that are known to be weakly identified in the data and to those that affect the model steady state. The discount factor for the patient households was calibrated to  $\beta_p = 0.995$  to match 2% annual real interest rate on deposits, for the impatient households and entrepreneurs the discount factor was set to  $\beta_l = \beta_p = 0.965$  to make sure that the lending constrain is binding<sup>(6)</sup> in the steady state. In line with the literature, the depreciation rate of capital and of housing was set to  $\delta_k = 0.025$  respectively  $\delta_\chi = 0.0125$  and the capital share in production  $\alpha$  was set to 0.3. Wage mark-up was set to 1.1 meaning that labour unions in Romania have the negotiation power to obtain a 10% increase in the wages above the marginal rate of substitution between wages and hours worked. The elasticity of substitution between home and foreign goods was set to 2. The home bias parameter  $\eta$  was set to 0.5825 consistent with the level of domestic production which remains at home with respect to imports. The sensitivity of the external intermediation premium was set to 0.001 meaning that the evolution of the foreign debt has a small impact on the exchange rate in the short run.

The steady state Loan-to-Value ratio (LTV) for the households was set to 0.85 and for firms to 0.6 accordingly to Annual Report of 2013 made by National Bank of Romania. The share of loans to households and firms was set to 4.1% respectively 8.9%, in line with long term nominal sample averages. Consumption share in GDP was set to 0.65, capital investment share was set to 0.18, housing investment was set to 0.076, export and import share in GDP was set to 0.34, respectively 0.41 matching nominal average ratios from the data. External debt to GDP ratio was set to 2.7 accordingly to the data from the National Bank of Romania. The annual value of the inflation objective of the National Bank of Romania was set to 2.5%

and the monetary policy interest rate was set to an annual value of 7.2 % - sample mean from the past two years. Interest rate on loans for households and firms was set to 12.8% and 11.4%, respectively matching sample mean from 2009 to 2014. The rest of the parameters are calibrated from the steady state relations of the model. The most important calibrated parameters are summarised in Table 1.

**Table 1.** *Calibrated parameters*

Parameters	Values
Discount factor for patient households	0.9952
Discount factor for impatient households	0.9650
Depreciation rate of capital	0.0250
Depreciation rate of housing	0.0125
Elasticity of substitution between domestic and foreign goods	2.0000
Wage mark-up	1.1000
Exporters price mark-up	1.1000
Home bias	0.5825
The elasticity of production with respect to capital	0.3000
The elasticity of external debt to financial premium	0.0010
Selected steady state ratios of the model	Values (%)
Consumption share in GDP	65.49
Capital investment share in GDP	18.33
Housing investment in GDP	7.85
Export Share in GDP	34.55
Import Share in GDP	41.75
Loan to Value for loans to households	85.00
Loan to Value for loans to firms	60.00
New loans to households	4.13
New loans to firms	8.97
External Debt to GDP ratio	270.52
Inflation	0.62
Policy interest rate	1.77
Interest rate for loans to households	3.06
Interest rate for loans to firms	2.74

\*Interest rates, inflation and depreciation rates are expressed in quarterly terms.

\*\*GDP is considered to be 100%.

Regarding prior distributions, they were set mainly in line with the original paper (Brzezina and Makarsky, 2011). The prior distributions for the parameters were chosen in conformity with constraints on the parameter space implied by the economic theory. That is, for the parameters bounded between 0 and 1, we've chosen the Beta distribution - this group is formed by habit formation with the mean 0.5 and standard deviation of 0.1, the Calvo parameters with the mean set to 0.6 and the standard deviations to 0.05, the indexation parameters with the mean 0.5 and the same standard deviation. Also, for the autoregressive coefficients of the shocks we have used beta distribution with the prior mean set uniformly to 0.7 and standard deviation to 0.1.

For the parameters bounded to be positively the inverse gamma distribution or gamma distribution was used. The inverse gamma distribution was chosen for the standard deviation of the structural shocks; the standard deviations of the LTV shocks was set to 0.05, for the preference shocks, the government consumption shock, the risk premium shock, and for the transitory technology shock the mean was also set to 0.05. For the rest of the standard deviations the prior mean was uniformly set to 0.01. Gamma distribution was chosen for the capital utilization cost, with the mean 0.2 and standard deviation of 0.02. Because the adjustment costs are expressed as inverse, the beta distribution was used, so, for the capital investment adjustment cost the prior mean was set to 0.2 and the standard deviation of 0.02 and for the housing investment adjustment cost the prior was set to 0.02 with the standard deviation of 0.002. The reason for higher housing investment adjustment cost, 50 comparatively to 5, is that housing brings only utility to households and aren't used for

production process like capital, therefore is straightforward to consider that housing investment is returning more slowly to the equilibrium after a shock.

The priors for the monetary policy rule were set in line with the Taylor principle, the prior for the response to inflation was set to 1.8, for output gap at 0.4 with the standard deviation of 0.1 respectively 0.05. For the interest rate smoothing, we have used Beta distribution, with the mean 0.7 and standard deviation of 0.05. Due to the importance of the exchange rate for a small open economy we have introduced the real exchange rate as a tertiary objective for the monetary policy; the prior was chosen as normal distribution with mean 0 and standard deviation 0.05. The full list of the priors is presented in the first three columns of Tables 2 and 3.

#### 4.4. Estimation results

In the right columns of Tables 2 and 3 are reported the estimation results of the model. The estimation was performed with Dynare, using Metropolis-Hastings sampling method with 5 Markov chains and 100.000 replications for each chain; the average acceptance rate was around 25%.

Some of the results are worth mentioning, starting with the preference parameters, the estimated value for the habit in consumption is relatively low, around 0.52, which can be interpreted as a relative quick response of households' consumption habit with respect to shocks hitting the economy. The intertemporal elasticity of substitution is estimated around 0.48, the Frisch elasticity of labour supply is estimated at 0.32 and the elasticity of housing stock is estimated even lower, at 0.19. Also the model features investment adjustment costs, which have the role of inducing inertia in the level of new investments after the economy has been perturbed by a shock. Therefore, investment adjustment cost for the capital is estimated at 4.7 and for housing investment at 49. The larger value of housing adjustment cost indicates that housing investment is returning more slowly to the steady state after a shock, in comparison with the level of new capital investments.

Turning to the Calvo parameters concerning price and wage setting, the estimates are relatively low (exception is the parameter for importers), fact which is in line with the particularities of the Romanian economy – periods of large inflation. The degree of wage stickiness is around 0.4 implying that the duration of the wage contract is around one quarter and a half. Larger degree stickiness is observed at the importers price, a value of 0.7, which is in line with the estimates for Euro Area (Christoffel et al., 2008; Adolfson et al., 2007). However, the estimates for the sticky price parameters for the other sectors (aggregators and exporters) are considerably lower than the Calvo parameter for importers price, suggesting almost two quarters stickiness in these sectors. Regarding indexation parameters, the estimation results suggest the weight of the past inflation to be around 0.4 (exception is the exporter price, where the level of indexation with past inflation is higher, at 0.48). The Calvo parameter for the interest rate stickiness is estimated around 0.5, which means that interest rates for deposits and loans are adjusting in two quarters after a modification in the money market interest rate.

**Table 2.** Prior and Posterior Distributions for Structural Parameters

Parameters	Prior Distribution			Posterior Distribution		
	type	mean	std.	mean	5%	95%
<i>Preferences</i>						
Habit formation	beta	0.5	0.1	0.5230	0.3906	0.6484
Inter-temporal elasticity of consumption	normal	2	0.1	2.0576	1.8978	2.2232
Inverse elasticity of labour supply	normal	4	0.5	3.0563	2.3896	3.7259
Inverse elasticity of housing	normal	4	0.5	5.2309	4.4210	6.0367
<i>Adjustment costs</i>						
Capital utilization cost	gamma	0.2	0.02	0.1957	0.1639	0.2271
Inverse capital adjustment costs	beta	0.2	0.02	0.1984	0.1655	0.2306
Inverse housing adjustment costs	beta	0.02	0.002	0.0204	0.0169	0.0236

Parameters	Prior Distribution			Posterior Distribution		
	type	mean	std.	mean	5%	95%
<b>Wages and price setting</b>						
Calvo - wages	beta	0.6	0.05	0.4108	0.3446	0.4734
Indexation wages	beta	0.5	0.05	0.4997	0.4192	0.5804
Calvo - domestic prices	beta	0.6	0.05	0.5679	0.4853	0.6472
Indexation domestic prices	beta	0.5	0.05	0.3964	0.3356	0.4571
Calvo - import prices	beta	0.6	0.05	0.7935	0.7604	0.8264
Indexation import prices	beta	0.5	0.05	0.4181	0.3639	0.4701
Calvo - export prices	beta	0.6	0.05	0.6802	0.6380	0.7219
Indexation export prices	beta	0.5	0.05	0.4880	0.4063	0.5668
Calvo - interest rate for deposits	beta	0.6	0.05	0.5331	0.4712	0.5921
Calvo - interest rate for loans	beta	0.6	0.05	0.4696	0.4179	0.5216
<b>Monetary Policy</b>						
Interest rate smoothing	beta	0.7	0.05	0.7850	0.7352	0.8345
Response to inflation	normal	1.8	0.1	1.8090	1.6495	1.9647
Response to GDP	normal	0.4	0.05	0.3834	0.3007	0.4598
Response to real exchange rate	normal	0	0.05	0.0065	-0.0714	0.0804

Regarding the Taylor rule, the estimates shows a fairly high degree of interest rate smoothing, around 0.78; the remaining parameters regarding the inflation response and output gap response are very closely to prior information, mostly because of the changes in the monetary policy regime, inflation targeting was officially adopted in 2005. Also the reason that we have introduced a tertiary monetary policy objective, the real exchange rate, is that, prior to 2005 the National Bank of Romania had regular interventions on the exchange rate.

The posteriori modes for the persistence parameters are very small in comparison with the estimates for the Euro Area. The persistence parameter of the technology shock is estimated at 0.66, in line with those reported<sup>(7)</sup> for Poland economy, Kolasa (2009) reports a value of 0.64. The autoregressive coefficient for labour and housing preference is estimated around 0.7 in line with the values reported by Brzezina and Makarsky (2011) for Poland economy, but the persistence parameter for consumption preference is estimated at 0.65, a smaller value than the reports for Poland economy. The persistence of the inflation objective shock is estimated at 0.3, which is in line with changes in the inflation objective reported by the National Bank of Romania. Now, turning to the estimates for the financial shocks, we observe a small degree of persistence of these shocks, around 0.4 for the interest rate spreads and risk premium shock. An increase in persistence can be observed to Loan-to-Value shocks, 0.5 for firms and 0.7 for households. This low value for the autoregressive parameters indicate a frequent change in the financial sector, regarding the interest rate spreads and loans granting policies. The analysis of the implications of the financial shocks for the Romanian business cycle fluctuations is an important objective of this paper, thus a more detailed discussion about the effect of these shocks will be provided in the next sections.

**Table 3.** Prior and Posterior Distributions for Structural Shocks

Parameters	Prior Distribution			Posterior Distribution		
	type	mean	std.	mean	5%	95%
<b>Autoregressive coefficients</b>						
Transitory technology shock	beta	0.7	0.1	0.6636	0.5199	0.8005
LTV households shock	beta	0.7	0.1	0.4995	0.3183	0.6737
LTV firms shock	beta	0.7	0.1	0.6056	0.4749	0.7355
Spread to households deposits shock	beta	0.7	0.1	0.4148	0.2619	0.5657
Spread to households loans shock	beta	0.7	0.1	0.4148	0.2619	0.5657
Spread to firms loans shock	beta	0.7	0.1	0.3843	0.2311	0.5444
Consumption preference shock	beta	0.7	0.1	0.6536	0.4794	0.8313
Labour preference shock	beta	0.7	0.1	0.6792	0.5182	0.8352
External premium shock	beta	0.7	0.1	0.4120	0.2993	0.5205
Government consumption shock	beta	0.7	0.1	0.6964	0.5825	0.8143
Housing preference shock	beta	0.7	0.1	0.6988	0.5464	0.8584
Inflation objective shock	beta	0.7	0.1	0.2920	0.1896	0.3937
<b>Standard Deviations</b>						
Transitory technology shock	inv. gamma	0.05	inf.	0.0127	0.0094	0.0161

Parameters	Prior Distribution			Posterior Distribution		
	type	mean	std.	mean	5%	95%
<i>Autoregressive coefficients</i>						
LTV households shock	inv. gamma	0.05	inf.	0.1120	0.0883	0.1427
LTV firms shock	inv. gamma	0.05	inf.	0.1636	0.1345	0.1899
Spread to households deposits shock	inv. gamma	0.01	inf.	0.0062	0.0043	0.0080
Spread to households loans shock	inv. gamma	0.01	inf.	0.0056	0.0043	0.0068
Spread to firms loans shock	inv. gamma	0.01	inf.	0.0050	0.0035	0.0063
Consumption preference shock	inv. gamma	0.05	inf.	0.0531	0.0105	0.0980
Labour preference shock	inv. gamma	0.05	inf.	0.0403	0.0119	0.0726
External premium shock	inv. gamma	0.01	inf.	0.0174	0.0137	0.0209
Government consumption shock	inv. gamma	0.05	inf.	0.1183	0.0959	0.1409
Housing preference shock	inv. gamma	0.05	inf.	0.0489	0.0106	0.0999
Interest rate shock	inv. gamma	0.01	inf.	0.0049	0.0039	0.0058
Inflation objective shock	inv. gamma	0.01	inf.	0.0122	0.0098	0.0145

#### 4.5. Variance decomposition and conditional variance decomposition

In Table 4 we report the variance decomposition of the main macroeconomic variables. We observe that from the total variance of the GDP growth, almost 33% can be explained by the variance of the risk premium and 33% by the variance of external shocks. The fact that these two types of shocks explain the most part of the GDP variation isn't uncommon for an emerging market. As is the case of the Romanian economy, which is integrated in the European financial and trade markets, a slightly variation of finance premium and foreign demand can severely disrupt the economic activity, a fact which was at its play in the latest financial crisis, when the deleveraging process had cut the flow of funds for the real sector. Moreover, we find that preference shocks, like the consumption preferences and labour supply shocks have a non-negligible impact on the business cycle. As for the financial shocks, we can see from Table 4 that their variances explain only by a small fraction from total variance of the GDP growth. In the case of investment and consumption, we observe that the variance decomposition mimics the one for the GDP.

**Table 4.** Variance decomposition of selected variables

	Technology shock	Financial shocks	Monetary policy shocks	Preference Shocks	External shocks	Risk premium
GDP	8.11	0.30	7.96	19.47	30.39	33.78
Investment	3.24	2.87	8.37	19.38	35.38	30.76
Consumption	9.97	0.18	0.79	15.59	34.80	38.68
Policy Interest Rate	2.44	0.20	8.67	10.82	40.11	37.76
Inflation	1.91	0.18	21.04	9.35	34.36	33.16
New Loans	5.68	76.85	7.75	1.07	5.24	3.41

**Note:** Financial shocks: LTV and interest rate spreads shocks; Monetary policy shocks: interest rate shock, time-varying inflation objective; Preference shocks: consumption, government consumption, housing and labour shocks; External shocks: inflation, interest rate and supply shocks.

In Table 5 we present the conditional variance decomposition of the GDP for eight quarters ahead. An important difference between these two types of decomposition is that the latter one takes in consideration only the last available observation, in contrast with the variance decomposition which is based on the entire sample. As we can see, the conditional variance decomposition for the next quarter reveals an entirely different story, assigning an import contribution to the government consumption shock. This result probably has its foundations in the constant reduction of public spending in Romanian after the burst of the financial crises. Also, the model suggests that the technology shock<sup>(8)</sup> is important for the future path of the GDP growth, a fact which is also sustained by the macroeconomic developments after the crisis, when the reduction in investments was one of the main important factors that contributed to the drop of the GDP growth. As in the case of variance decomposition, the conditional variance decomposition reveals a small influence of the financial shocks for the future path of the GDP growth.

**Table 5.** *Conditional variance decomposition – GDP*

GDP	Technology shock	Financial shocks	Monetary policy shocks	Preference Shocks	External shocks	Risk premium	Government consumption
Period $T_{+1}$	35.42	0.46	4.03	0.49	6.76	1.19	51.65
Period $T_{+2}$	28.11	0.33	13.23	0.64	5.34	7.16	45.19
Period $T_{+3}$	24.55	0.37	19.49	0.71	5.20	8.73	40.95
Period $T_{+4}$	23.17	0.42	23.05	0.73	5.22	8.57	38.84
Period $T_{+5}$	22.58	0.45	24.82	0.72	5.31	8.41	37.70
Period $T_{+6}$	22.19	0.46	25.49	0.71	5.60	8.66	36.89
Period $T_{+7}$	21.81	0.46	25.52	0.70	6.15	9.19	36.17
Period $T_{+8}$	21.41	0.45	25.24	0.69	6.89	9.83	35.50

**Note:** Financial shocks: LTV and interest rate spreads shocks; Monetary policy shocks: interest rate shock, time-varying inflation objective; Preference shocks: consumption, housing and labour shocks; External shocks: inflation, interest rate and supply shocks.

#### 4.6. Impulse response analysis

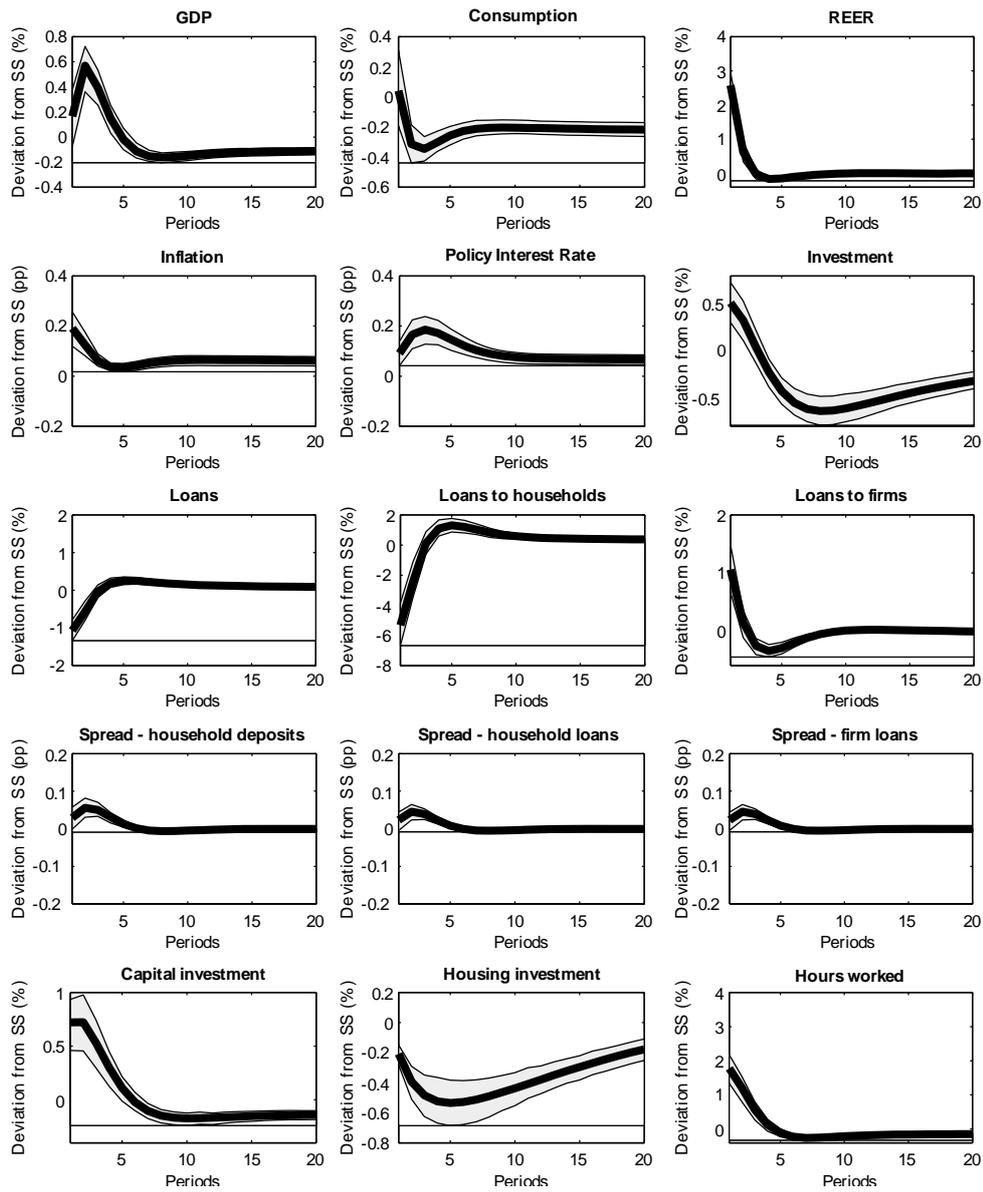
Figure 1 to Figure 3 show the model's impulse-response functions to five structural shocks: a risk premium shock, a firm LTV shock and three shocks regarding interest rate spreads for firms and households loans and households deposits. The responses to the remaining structural shocks are in line with the New Keynesian literature and thus we have decided to concentrate only on the ones regarding the banking sector. The figures show the mean and the confidence interval for the impulse responses to shocks equal to one estimated standard deviation. The uncertainty bands reflect the uncertainty about the model structural parameters, as described by the posteriori distribution. All the impulse responses are reported as deviation from the model steady state.

The adjustment mechanism after a positive risk premium shock is plotted in Figure 1. At impact, the real exchange rate depreciates boosting exports. Therefore, entrepreneurs have additional funds to invest, which translates into a higher investment rate for the next few quarters, determining an increase of the collateral. Because of the new additional collateral, entrepreneurs borrow more, but the newly borrowed funds aren't enough to compensate the reduction of new loans for households. Due to a higher export rate, the GDP rises and the inflation shortly follows, but, then the Taylor rule kicks-in bringing down inflation and GDP growth. Although, the exchange rate depreciation seems to affect the GDP in a positive way, the model doesn't take into account the loans in another currency. The exchange rate depreciation will cause a larger fall in consumption because agents will need more national currency in order to repay their loans in foreign currency.

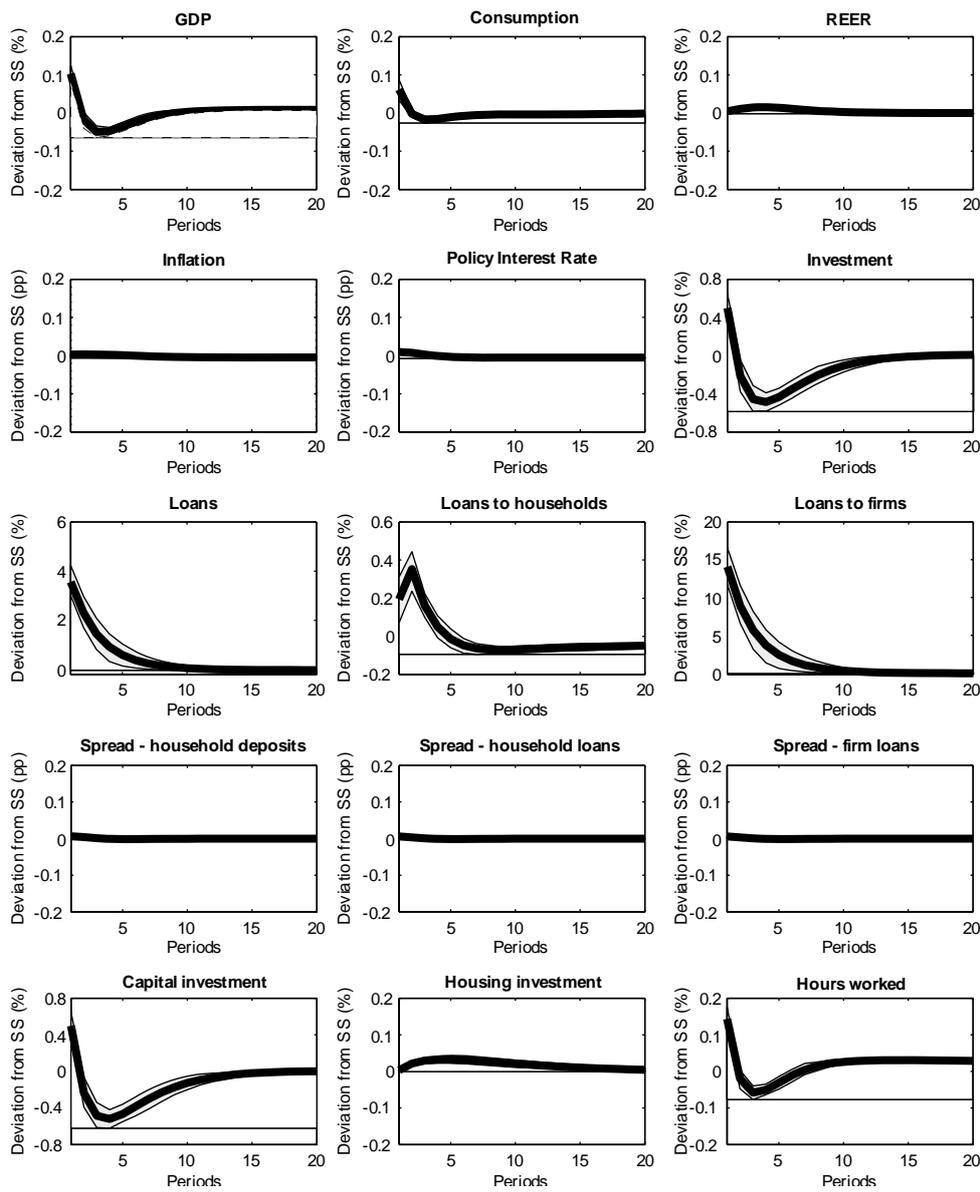
Figure 2 presents the adjustments that take place after a positive shock to firms LTV ratio - equivalent with a reduction of the down payment. Because of the loosening of the credit constraint, the level of loans for entrepreneurs are raising but, because they know that this is only a temporary shock and won't be able to sustain a high level of investment in the long run, they divert a considerable part towards consumption and only slightly to the level of investment. There is also a small effect on households, due to an increase in hours worked.

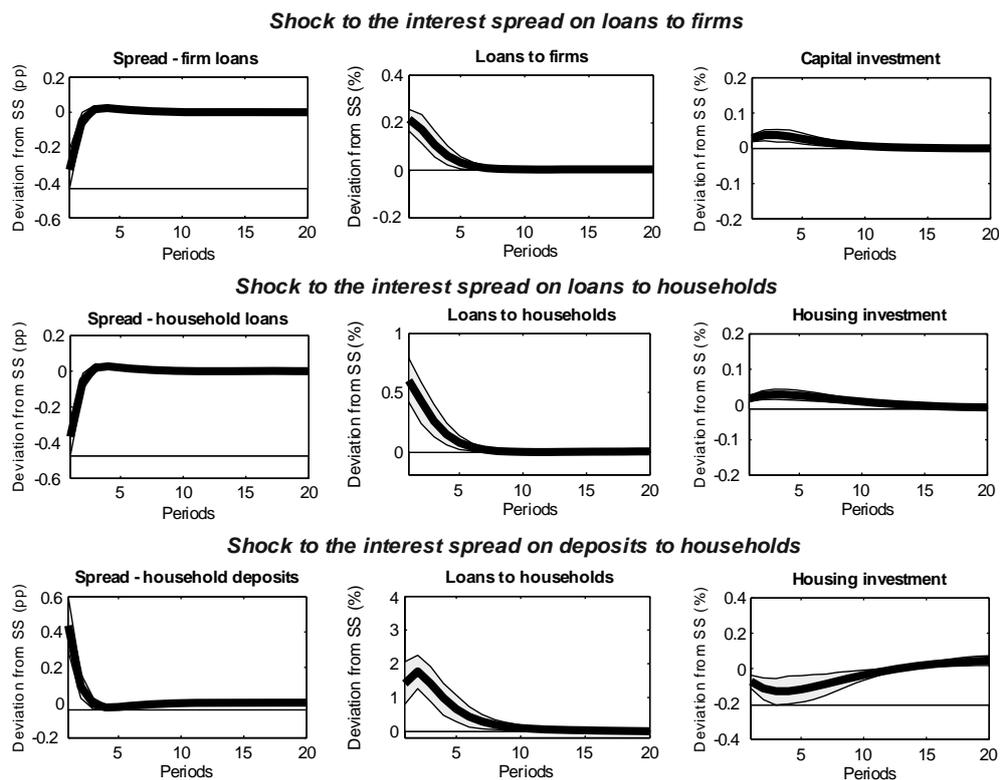
In Figure 3 are plotted the response impulse functions for the interest rate spreads. As we can see, a reduction in the interest rate spreads has a limited impact on the economy. This result may be explained by the high calibrated value for the interest rate spreads corroborated with a fairly small estimated standard deviation for these shocks. The intuition of this result resides in the fact that due to large historical values for the interest rates on loans, a small reduction after an external shock merely affects the decision of the agents to borrow more.

**Figure 1.** Risk premium shock



**Figure 2.** *Loan-to-Value shock to firms*



**Figure 3.** Impulse response to spread shocks

## 5. Conclusions and directions for further work

In this paper we analysed the impact of several financial shocks on the Romanian business cycle fluctuations using a small open-economy DSGE model with financial frictions. The model was estimated with Bayesian, the estimation revealing a small degree of price and wage stickiness, almost two quarter stickiness in domestic prices and one quarter and a half for a wage contract. The habit in consumption parameter was estimated at a fairly low value, around 0.5, suggesting a quick response of consumption patterns when the economy is affected by shock.

From the analysis of impulse response functions we observe that an increase in the risk premium determines an increase in domestic interest rates accompanied by a reduction of loans to households. Because the exchange rate depreciates, exports are rising, leading to an increase in GDP. The higher level of funds determines the entrepreneurs to demand more capital – capital investment is also rising. Moreover, an increase in the Loan-to-Value ratio for producers (equivalent with a reduction in down payment) is perceived as a temporary shock, because entrepreneurs are reducing their capital investment and divert funds towards consumption. Apart from the risk premium and LTV ratio shocks for entrepreneurs, the other financial shocks seem to have a small impact on the real economy – especially on the GDP. We also noticed that because housing prices are fully flexible in the model and basically there isn't a multiplication mechanism for housing investments, changes in the LTV ratio for households' loans barely influence the economy.

Even if the model seems to replicate the data well, there are a few caveats, such as the fact that exchange rate depreciation has a positive impact on the GDP due to the rise in exports. Because the model does not take into account loans in foreign currency, the level of consumption does not fall low enough in order to compensate for the increased level in exports. Moreover, the specification of perfectly competitive housing market and weak

representation of labour market frictions tend to create puzzles in model dynamics. This happens primarily because impatient households can enter and exit the labour market unrestricted and, due to a high income effect, they stop working when the economy is running smooth and start again immediately after a negative shock. Also due to these fluctuations in the labour market, the price of housing adjusts very quickly according to competitive market laws, affecting the level of collateral and implicitly the level of new loans. Bottom-line, under certain conditions the model predicts an increase of new loans when the monetary policy tightens.

## Acknowledgements

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## Notes

- (1) For a detailed overview, see Smets and Wouters (2002), Adolfson et al. (2007) and Christoffel et al. (2008).
- (2) See Tovar (2009) for a more thorough analysis.
- (3) For a detailed overview of the model, see Brzezina and Makarsky (2011).
- (4) For more information visit <http://www.dynare.org/>
- (5) The values are expressed in quarters if another timeline is not specified.
- (6) Which means that the multiplier assigned to the borrowing constraint is positive.
- (7) Due to the inexistence of DSGE models estimated for Romanian economy, we decided to compare some of the results with the estimates for the Poland economy.
- (8) In this model, an important part of the realization of the technology shock is due to investments, because this framework does not feature an investment specific shock.

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# Microeconomic complexity: trading policy in conditions of crises – an empirical study from Romania

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**Abstract.** *Worldwide trading policies has been modified to keep up with the world commercial development movement in the last decade, taking in consideration the evolving Economic complexity which can be found in several factor such as the acts of commerce in terms of constraints, from the producer market and also consummation level in the EU. Romania as a EU member taken as model in our paper is facing a number of challenges, which needs to be removed, in order to increase welfare and sustainable development to its economy, with the scope of measuring the economic complexity on the Romanian Economy, data input represents two quarters in a row fourth 2013 and the first of 2014, explaining imports and exports implications to the Romanian economic complexity rate ,and trying to simulate reformulation suggestions for a new trading behavior in the context of last financial Crises, The Analysis was made in collaboration with Ontonx Economic complexity analysis EU-28 Zone samples. Our paper scope is to find key factors to develop international trading with Romania.*

**Keywords:** Commercial trade regulations, Policies, Economic, Complexity, Index.

**JEL Classification:** O24.

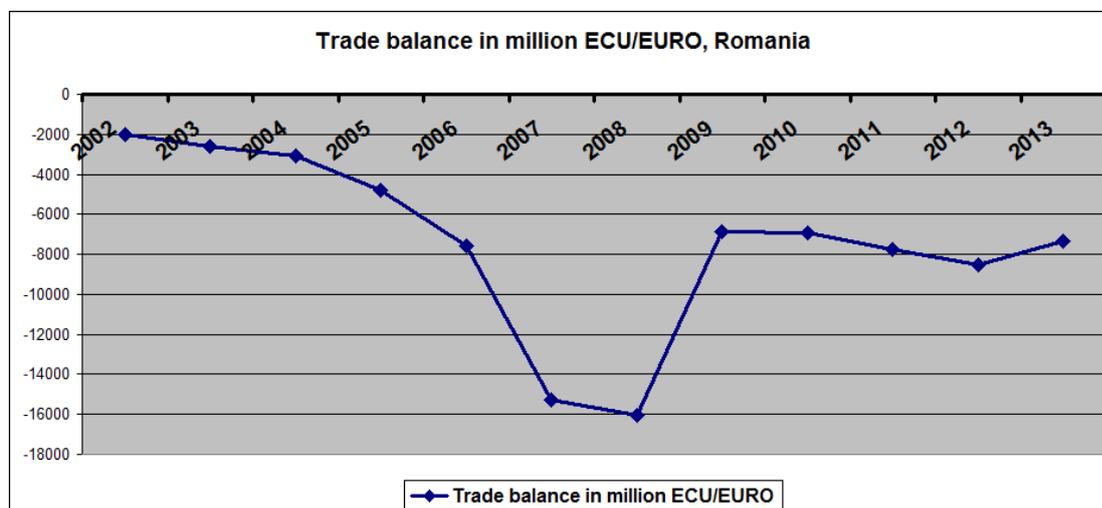
## 1. Introduction

Main challenges of trading policies between the countries after the world global financial crises are based on a fair relation trade between them, avoiding or simplifying factors of economic complexity, such as protectionist practices in some cases, implementing and complying to international regulations related to goods trading. Also challenges which influence and increase the Economic complexity can be excessive competition an EC paradigms resulting from increase in exchanges in the EU single market, constraints on accessing new players for a market under divided forces such as regional or local costs associated within the single currency, the costs of reducing employment or employment generated by underground economy. Such paradigms simplifying are fundamental elements to influence future trade policies in the context of current or future economic upheavals.

Contemporary Financial instability the major EC paradigm represented on the last starting 2007 financial crises, may require a global multilateral trading system based on rules, revitalized, based on ensuring a robustness and comprehensive framework to restore the sense of confidence globally and restore economic complexity to its regular levels. Restoring economic confidence requires a number of courage measurements from central banks and governments focused more on fluid intake system. Present measures till now have resulted a limited success in reviving global financial markets.

International trade has been a major source of income within economies and a jobs creator especially in the euro zone. The current financial crisis the major paradigm of EC resulted an economic recession in several EU members, creating a negative impact on trade and serious economic growth diminishes, due to decrease in liquidity and consumer confidence mostly in foreign investments and entrepreneurship and bank systems.

**Figure 1.** Trade balance



**Source:** Eurostat, 2013.

Austerity programs as a proposed implemented model in the European Union, were designed to mitigate the negative effects of the mismanagement of previous economic policies, using complex instruments in which fattening the virtual economic on the account of trade policy and real production, a fast contagious economic disease to the entire European economies. The return to real economy requires a systemic state market approach, as deepening deficits stands to the most structuring policies of the EU Member States these days. Side effects are clear, delocalization of production to countries outside the community in term of policy making, encouragement of consummation lending without return, encouraging protectionist measures to support economic growth in the short term.

With a proper management for financial deficits to solve the core of economic crises the major paradigm of EC, the effective solution implementation will help focusing on decreasing other economic complexities paradigms and eliminating business complexity to the lowest level to an economy, strengthen regulation of a commercial system, starting by redefining the status of whole national and international role trading policies specially managing monetary and financial flows, better coordination between banking and commercial systems to encourage real economic for the delineation of solutions for the recession.

From the data presented in our study, we can highlight the weak link of the trade balance and the real GDP growth rate, caused in particular by the EU countries' economies and the decline of the commercial activity under the conditions and the emergence of international financial crisis.

## 2. Hypothesis and research methodology

### 2.1. Literature review

Free movement of capital creates what some economists have called "virtual" a Parliament of investors and creditors, which monitors government programs carefully and vote against their "If" are considered irrational: for the benefit of the people rather than of private power concentrates.

Investors and lenders can "vote" on a capital transfer abroad, to insure protection from currency attacks and any other negative effects by financial liberalization, following the Bretton Woods system, it set up to regulate currency variations and allow capital control. Keynes believed that the most important achievement of the Breton Woods was the government's duty imposition to restrict the movement of capital. In the contrary, the new liberal phase, after the collapse of the Bretton Woods system in the 1970s, US Treasury believes that the free movement of capital is a "fundamental right", as opposed to the so-called rights guaranteed by the Universal Declaration of human rights: health, education, decent conditions of work. The obvious corollary is that after removing the post-war system, in the 1970s, democracy has been restricted. Thus, it has become necessary to control and marginalize audiences, particularly visible processes in companies run by business environments, the USA economic model.

During crisis, bold actions are needed to prevent global trading system from collapsing under the burden of an unstable world. A temptation to take quick protectionist actions measures can bring disastrous results and in-depth the problem rather solve. Stiglitz, a promoter of the Chinese doctrine, argues that economic systems need a balance between the role of the markets, the role of the State and the common law, from his opinion these are basic principles to exit or enter in economic decline. According to Stiglitz, the biggest danger is that failure of a dysfunctional market generates an inexorably unique corruption affects the very institution of democracy and the free market model.

John Eatwell and Lance Taylor anticipated extreme hazards of financial liberalization, stressing the extent of the financial process, costs related to the externalities. "Financial markets sub evaluate risk and is chronically inefficient way to measure the risk effect, while ignoring systemic risk results taking a greater risk even if the economy is effective, which can be influenced by any smallest action.

The task of financial institutions is to assume the risks and, if they are well managed, to ensure that potential losses for themselves will be covered. The exacerbation problem in the last decade in the financial markets, made trade policy gains new dimensions and perspectives, becoming an attribute for developing economies to grow.

Prior to the commencement of the 2007 financial crisis, unprecedented development of the global market, welfare and unsustainable economic growth, were some of the reasons that in the last two decades, policymakers have expressed interest in the complex mechanism of trade negotiations, the process of creating commercial policies stand in the shadow of the financial markets. Based largely on letters of credit whose functionality in the period marked by the global financial crisis was slowing down, international trade is currently facing a new dilemma: lack of international liquidity and low flexibility of the international financial system. Thus, there is a breakdown in international trade in goods deliveries economic slowdown caused by the collapse in global aggregate demand.

As a result of increasingly distorted effects they have on trade business practices, it becomes very necessary international adoption by countries of effective competition rules and their harmonization at the international level. There are many doubts about the ability of the WTO to efficiently manage the process of legislative harmonization in the conditions under which international law is considered imperfect WTO rules, being derived from the negotiations, including the negotiations between rich and poor countries, success or triumph of the negotiations goes to the rich and powerful, in the absence of concerned legislation in casting raw power (Stiglitz, 2008).

The EU is a strong supporter of GATT, but not always is appreciated in a manner by other partners of the GATT for instance the US and Japan. It would seem that the EU gives a great importance to the following two elements of the GATT multilateral trade liberalization and international trade law. In the same time anyone can observe a certain ambivalence about a third key element, a keystone of the GATT initially agreement: non-discrimination., an effective practice, the EU was the most frequent user of the concept "pyramid of preferences", and initiating a wide range of bilateral preferential agreements (or interregional) in which different groups of countries benefiting from preferential access to the EU market with a free access for a wide range of goods, primarily manufactured goods.

## 2.2. Research hypothesis

In this paper were trying to find if new reforms in international trade polices specially Euro zone, and suggests developing them between the lines in a scope to simplify economic complexity to boost the real GDP of Romania.

**H1:** Measuring Economic complexity will make us understands implications to the right methods to boost the real GDP of Romania.

**H2:** Identifying how Romanians current trading system is making apart in reducing or increasing the Business complexity.

## 3. Current trade policies and influence on the economic complexity

The many reforms carried out in developing countries in the latter part of the 20th century resulted in the emergence of multiple players, big or small, engaged in global trade. The trade is no longer the exclusive domain of the OECD countries. In recent years the involvement of new member states in the development of trade policy. Along with savings with very strong growth in China and India, other countries-Turkey, will increasingly more to have a say in the process of policy-making since their interest in terms of the trade has grown considerably.

The WTO, along with the World Bank and the IMF, has served the interests of the developed countries over those of developing countries. The problem is not globalization, but how they were managed processes and phenomena related to global trade (Stiglitz, 2010). Part of the problem is within international economic institutions, starting with the IMF, World Bank,

WTO, contributing to establishing the General rules of the game. They, too, have often served the interests of industrialized countries more advanced than those of developing countries.

Rich countries have arguments to serve their own needs: "developed countries' negotiators have become adept at hiding their own interests in language development. Rich countries argue that what they call "developing countries advanced" such as China, India, Brazil and South Africa, no longer in need of preferential measures to promote development. These countries have achieved a certain level of development because it addresses certain markets where consumers belong to the middle class, with high economic potential. Many of these countries still face social problems related to poverty, broad sectors uncompetitive that could be deleted from the liberalization of markets, with premature serious consequences on the population, caused by stagnation or slowdown the pace of the negotiations of trade policy to the regulatory authorities.

The consequences of this musical stagnation have resulted in putting into question the role and direction of the negotiations within the framework of international trade-related bodies. Also, the diversity and increasing the number of players in the market have led to the increasing complexity of the process. The repeated failures of the negotiations in the Doha round from its launch in 2001 can be attributed to two strengths: lack of interest and enduring public support, including from the business community, the inability of negotiators to settle differences and cultural of economies.

Starting from the premises before, commercial policies promotion proposes the eliminating the gaps inherent in the approaches whose objective is more limited, commercial policies to become more flexible by nature, giving up goals specific and strict compliance with deadlines, in favor of measures considered essential and logical in an order which is expected to be implemented, leaving up to the associated countries choosing priorities and define the timing of the action. In the same context, these policies take into account the degree of harmonization or breaking of rules and norms already placed on a common basis.

"The package in Bali," an agreement on a number of issues related to the multilateral trading system, contains a number of decisions concerning measures 10 relevant to all WTO members, structured around three main pillars, which cover three important areas of the agenda of multilateral trade negotiations within the Doha round, namely:

- 1) *Trade facilitation*: the initiation of a new multilateral agreement concluded within the framework of the WTO, which will improve the customs procedures and will enhance their transparency, aimed at speeding up the movement of goods across national borders;
- 2) *Agriculture*, with the consideration of the items relating to food security, export competition, the administration of tariff quotas;
- 3) *Developing*, with highlighting those provisions come in support of the least developed countries, in areas such as rules of origin, services etc.

This package of measures of commercial policy opens up new export opportunities for all WTO member countries, and provides an important stimulus for the world economy, particularly in the current economic conjuncture characterized by the fragility of the global economic growth. The economic impact of the package in Bali is reflected in the measures accompanying the economic recovery efforts of countries in crisis in the direction of growth and stimulation of economic development through:

- encouraging reductions in subsidies in agriculture;
- encouraging reductions in customs duties on industrial products;
- encouraging reductions in barriers to trade in services;
- improving multilateral rules and adapt them to the new realities of the twenty-first century.

The new rules of trade policy must take account of recent changes in international trade: putting the fragmentation of production under the impact of dynamic expansion of global

production networks, the growth of trade in parts and components, the expansion of electronic commerce, the expansion of trade in services and increasing integration of markets for goods and services.

Global solution for the current financial crisis could consist in a commercial multilaterally system based on solid and appropriate regulations, which reflect the new realities of a new global era with an exciting and dynamic potential. The financial crisis calls unprecedented coordinated action at the global level, to intensify efforts to prevent the transformation of the financial crisis, trade protectionism, to establish a mechanism to facilitate multilateral trade and cooperation. Efforts to liberalize trade and the elaboration of new rules of the game were far more than the WTO, many countries opting for the conclusion of preferential trade agreements, bilateral and/or regional authorities. Lack of confidence in international trade related rules has an impact on the real economy, and as a consequence, international trade is beginning to show signs of blockage. From this perspective, it seems that the multilateral trade liberalization era draws to a close, as the low level of expectations of developing countries in relation to facilitating trade is associated with increasing protectionist sentiments in the developed countries (Stiglitz, 2008).

Currently, the real danger lies not in whether or not the adoption of measures to produce negative consequences on developing countries for development, but in the absence of developed countries' awareness of the danger that involves promoting a unfair trade in relation to developing countries, with consequences in the long term sustainable development plan and of the welfare of the population of the world in General, private.

International players agree that the global economic revival and sustainable, it requires a strengthening of the multilateral trading system. The reality shows that the overall economic well-being of Nations is inextricably linked to the convergence of exogenous variables, used in international trade, such as goodwill, honesty, equality and freedom. Toward off the danger of us protectionism, the world needs a global multilateral trading system, based on regulations, revitalized, which provide the overall frame work and to restore vigorous sense of confidence globally.

Restriction of international trade could worsen the crisis. The solution to overcoming the global economic crisis is international cooperation. Decisions based on the correct principles will influence how the world economy will develop.

In the new conditions in the world economy, we are witnessing a crisis of confidence in the international trading system. In a world in which mathematical models of calculation of risk, the ratings given by specialized agencies, insurance policies and similar tools, no longer poses any real guarantee against bankruptcy caused in particular by a lack of liquidity in the economy, financial institutions and investors to assess risk, preferring not to lend/invest.

#### 4. Research methodology

Our paper uses two type of scientific analysis comparative and descriptive. The comparative part presents current condition of the international trade policies, combined with economic complexity influence. the second part is concerned with descriptive Economic complexity analysis , with the scope of measuring the economic complexity for the Romanian Economy for period fourth quarter of 2013 and the first quarter of 2014, and the correlation role of imports exports in the Economic complexity , and trying to simulate our proposed reformulation new policy suggestions of a new trading behavior ,Economic Complexity test is an innovative method used to measure complexity influence for macroeconomic data and financial results for a country. The Analysis was made in collaboration with Ontonx Economic complexity analysis EU-28 Zone samples.

### 5. The Observatory of Economic Complexity (OEC)

The economic complexity index (ECI) observe the rate of connection between countries together by the goods each country produce the ECI interpret ate the whole economic system production characteristics based on the country’s population involvement in production and the level of product sophistication exports to the other countries for instance Germany exports diversified sophisticated products to a large scale of countries in the same time. Most countries does not produce these same products, and this determines the high rank of Germany in the Economic complexity index (ECI).

**Figure 2.** Exports and Imports destinations in percentage maps for Romania with destinations



**Source:** The Observatory of Economic Complexity, 2012.

Romania’s top export products are Cars by 6.2%, Vehicle Parts by 5.6%, Insulated Wire by 5.4%, by Refined Petroleum, 4.1%, and Rubber Tires by 2.5% and these go to Germany18%, Italy11%,France7.3%,Turkey5.6%, andHungary4.2%.

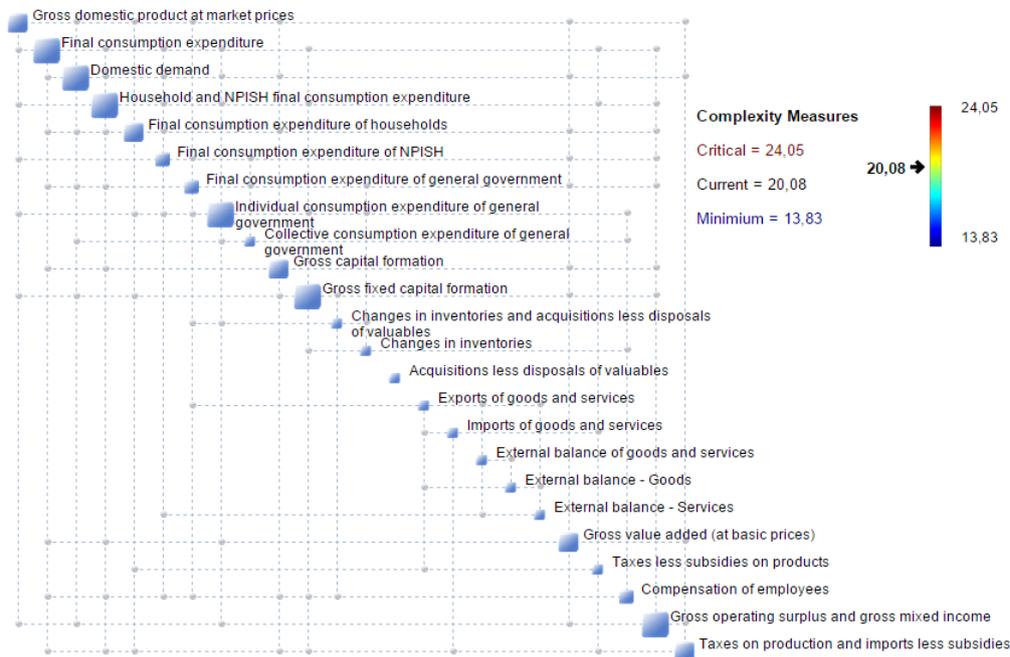
On the other hands top Imported products are Crude Petroleum by 5.8%, Packaged Medicaments by 3.7%, Vehicle Parts by3.2%, Refined Petroleum by 2.9%, and Insulated Wire by 2.0% and they are brought from Germany 17%, Italy 11%, Hungary 8.7%, France 5.6%, and Kazakhstan4.3% as The Observatory of Economic Complexity shows in 2012, giving Romania rate of 0.907668 and a rank of 31.

### 6. Descriptive statistic analysis and results

Otnospace software provides a complexity measuring scale and factors linking robustness analysis. Ontospace transform financial input data to a risk map which shows the relationships between the various economic parameters as shown in Figure 3 these are displayed on the diagonal up the map. The parameters which interact are connected by links the parameters with the most interactions are called hubs, and are critical to economy; it also can show relationships between two parameters on their link in a separate risk map. Ontospace computes the complexity of an economy based on the number of connections and the nature of interactions, the critical level of complexity for this economy is also calculated as the complexity the limit level approach economy is more likely to become harder to manage,

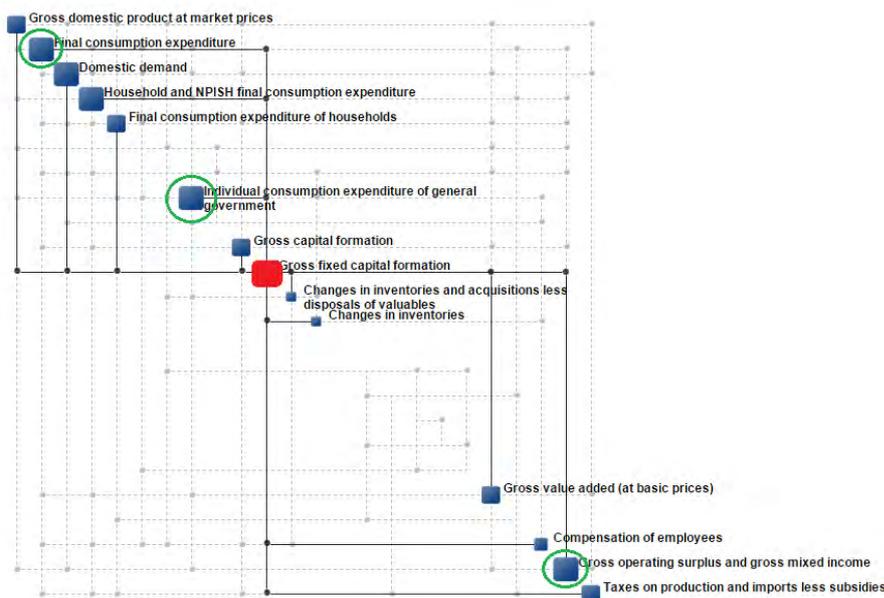
based on the difference between current and critical complexity the overall robustness of the business is also computed

**Figure 3.** *The Risk Map shoeing Hub and nods within Romanian economy associated with complexity rate scales*



On one of the hubs External balance of good in services in our case, it can identifies which factors contribute most to the Economic complexity (EC), the contribution from each parameter to the overall complexity can be checked in this case variations in Gross fixed capital formation, Final consumption expenditure, Household and NPISH final consumption expenditure and Domestic demand make them a top contributors to complexity

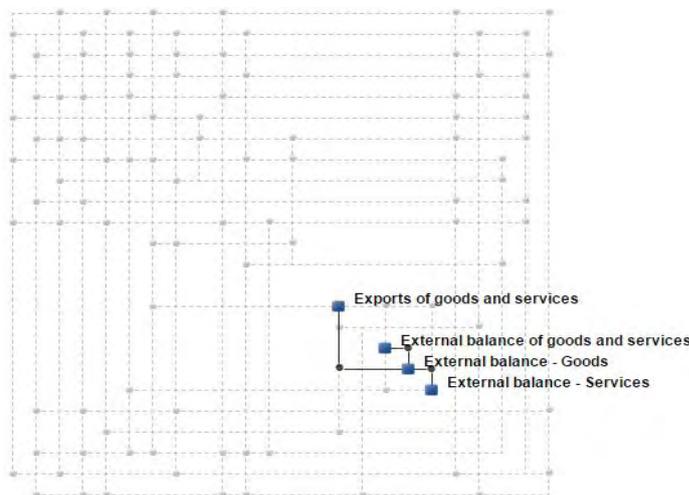
**Figure 4.** *That Gross fixed capital formation interaction risk map with other hubs increasing complexity to high levels complexity*



The four factors have increased rapidly in the last several months and also have a high number interactions with other parameters, it can be seen that Gross fixed capital formation is effecting Individual consumption expenditure of general government ,by increasing with Gross operating surplus and gross mixed income are related to the increase in Taxes on

production and imports higher taxes affect economy to higher risk exposure any of the other relationships between economy parameters can be studied in the same way.

**Figure 5.** External balance of goods and services risk map with other interaction parameters hubs



The same thing can apply to External balance of goods and services which not effecting Romanian economic Complexity rate as Ontospace calculations shows, because the low interactions between the different parameters (External balance of goods and services and external balance of goods and services)

**Figure 6.** Exports of goods and services risk map and hubs interactions

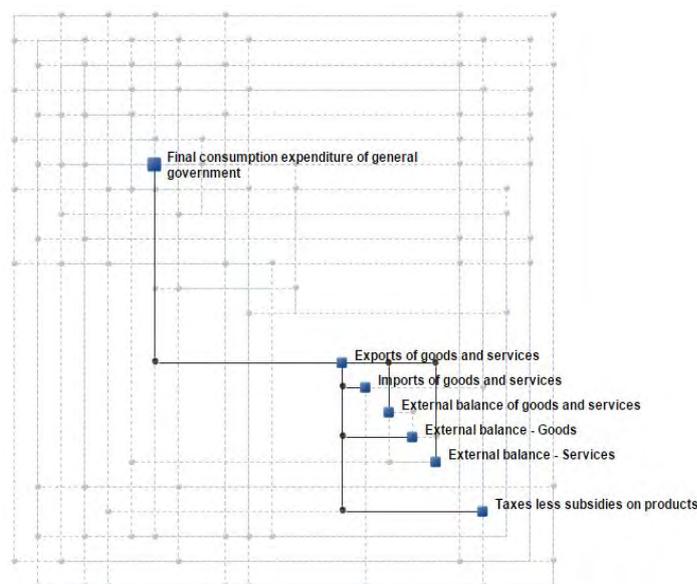


Figure 6 and External balance – Services are contributing with 0.19% of the whole complexity to Romanian economy, an excessive complexity can reduce efficiency produce profits war generally make a business less competitive can you

**Conclusions**

Global solution for the current financial crisis could consist in a commercial multilaterally system based on solid and appropriate regulations, which reflect the new realities of a new global era with an exciting and dynamic potential

Restriction of international trade could worsen the crisis. The solution to overcoming the global economic crisis is international cooperation. Decisions based on the correct principles will influence how the world economy will develop.

The international trading system. In a world in which mathematical models of calculation of risk, the ratings given by specialized agencies, insurance policies and similar tools, no longer poses any real guarantee against bankruptcy caused in particular by a lack of liquidity in the economy, financial institutions and investors to assess risk, preferring not to lend/invest.

International players agree that the global economic revival and sustainable, it requires a strengthening of the multilateral trading system. The reality shows that the overall economic well-being of Nations is inextricably linked to the convergence of exogenous variables, used in international trade, such as goodwill, honesty, equality and freedom. Toward off the danger of us protectionism, the world needs a global multilateral trading system, based on regulations, revitalized, which provide the overall frame work and to restore vigorous sense of confidence globally.

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# A comparative performance analysis of The Credit Bureau of Romania & Schufa Holding AG in Germany

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**Abstract.** *The present article illustrates the context in which the credit ratings agencies emerged, their roles and modus operandi. To exemplify, we proceeded to a comparative, quantitative analysis of two companies of profile, the Credit Bureau JSC of Romania and Schufa Holding AG in Germany between 2009 and 2013. It was presented the establishment and the evolution of the two agencies, being also tackled aspects related to some relevant macroeconomic indicators to the retail credit market in both countries such as the income per capita, total population, gross domestic product, the declared unemployment rate as a percentage of the total labor force, the number of domestic loans and the percentage of the adult population coverage by the rating agencies. There are also analyzed comparatively the financial performances, respectively the revenues, the financial results, the relevant synthetic data, the stored credit data, the credit reports, and the two scores, FicoScore and SchufaBaseScore.*

**Keywords:** rating agencies, credit report, credit data, financial performances, Schufa, the Credit Bureau, FICOscore, SchufaBaseScore.

**JEL Classification:** G29.

## Introduction

The unprecedented development of the world economy and implicitly of the financial markets imposed at the internal level of many countries, the emergence of some new actors on the stage of consumer loans, respectively the providing credit ratings agencies. The World Bank is signaling on its website (World Bank, 2014a) the presence of such a profile institutions on all continents. The data provided shows that their role is important in the credit accessing, having a positive impact in reducing the number and the value of debts in the banking and financial sector (World Bank, 2014b). More precisely, these information are intended to support the credit decision makers, respectively the banks and the leasing companies in adopting the best decisions both in granting and during the unfold of the credits, leading to an improvement of the quality of the credit portfolios, reducing the volume of the unpaid credits at maturity and hence a reduction in the borrowing costs (National Bank of Romania, 2014). From the perspective of the customer of the granting banks, they will help avoid situations of over-indebtedness, which could affect both the credit history (Foca, 2012) as well as their personal life (Bancherul.ro, 2014).

These actors have already a considerable age in countries with advanced democracies or they are very young in the case of new democracies. The first agency in the world providing credit ratings is reported in the United States in 1841 (Cantor, Packer, 1994), and in Europe, in Germany, in 1879. Among the youngest European agencies, there are the credit bureaus in Romania and Moldova, established in 2004, respectively in 2008 (Platon, 2014).

For a better understanding of the role and the working system of the agencies providing credit ratings, in this article we shall approach a pertinent comparison, over a 5 year period, between 2009 and 2013, of two companies which are in very different situations, regarding the age, history, features as well as the economic development of the country in which they operate.

For exemplification, we shall deal with the Romanian rating agency, the Credit Bureau JSC, which has started to operate in 2004, and a longtime giant, being in the top of the profile German companies, the Schufa Holding AG agency, founded in 1927, in Berlin (Helfrich, 2010).

For Romania, along with the financial and the economic context, which required the emergence of a monitoring agency of the individual credit users, will be also presented the legal framework harmonized with the one of the EU, applicable to the banking and financial sector.

There will be also approached aspects regarding the establishment and development of the Credit Bureau. These items will be also illustrated for Germany, respectively Schufa Holding AG agency.

Further, the article analyzes, for a period of five years, between 2009 and 2013, several macroeconomic indicators relevant to the retail credit market in the two countries, such as the income per capita, the total population, the gross domestic product (GDP), the unemployment rate declared expressed in percentage of the total labor force, the volume of loans granted to the individual customers and the percentage of the adult population coverage by the rating agencies (National Bank of Romania, 2014). There are also analyzed comparatively the performances of the two companies, the Credit Bureau and Schufa, respectively the revenues, the financial results, and the relevant synthetic data.

## 2. The establishment and development of the Credit Bureau JSC and Schufa Holding AG, and a synthetic presentation of the markets in which they operate

### 2.1. The Presentation of the Credit Bureau JSC

The development of the credit market in Romania after 1989, but also the efforts to join the European Union have imposed the harmonization of the national legislation with the European one. Thus, based on the Banking Law no. 58/1998, in 2004, at the initiative of the Romanian banking sector and following the recommendation of the IMF (International Monetary Fund, 2009) it was established the Credit Bureau JSC. This is a joint stock company, providing credit ratings, with an initial share capital of EUR 1 million subscribed by the 24 initial shareholders.

The activity of the Credit Bureau is to collect and process data on the individual customers' portfolio, participants in the Credit Bureau system, to offer information, analyses, and financial and banking assistance when requested by the participants; to establish uniform criteria in assessing the customers, through scorings development.

The Credit Bureau is driven by four important principles that ensure the role of the key player in the Romanian credit system. These principles are: the reciprocity of the type of information provided and accessed, of confidentiality, of impartiality and fairness, and, of course, of the efficiency in activity.

In the development of the Credit Bureau, depending on the type and complexity of the data provided, there can be distinguished three phases.

The first phase, which lasted about 11 months, began with its establishment, on 16 August 2004 and it was characterized by an exchange of "negative" information. Thus, during this period, the participants conveyed electronically on a daily basis to the Credit Bureau, information on the debtors experiencing arrears exceeding 30 days, on fraudulent customers, people who have committed a delict or an offense in direct relationship with a participant, for which it has been issued a final or an irrevocable judgment decision, accordingly, or through uncontested administrative papers and inaccurate statements, related to inaccurate data provided by individuals when applying for a loan.

The second phase of development of the Credit Bureau is between July 2005 and March 2009. During this period, it was issued Ordinance no. 99/2006, which abolished the banking law 58 of 1998, regulating the legal framework applicable to the financial institutions, consequently to the Credit Bureau, in the perspective of Romania's EU accession in 2007.

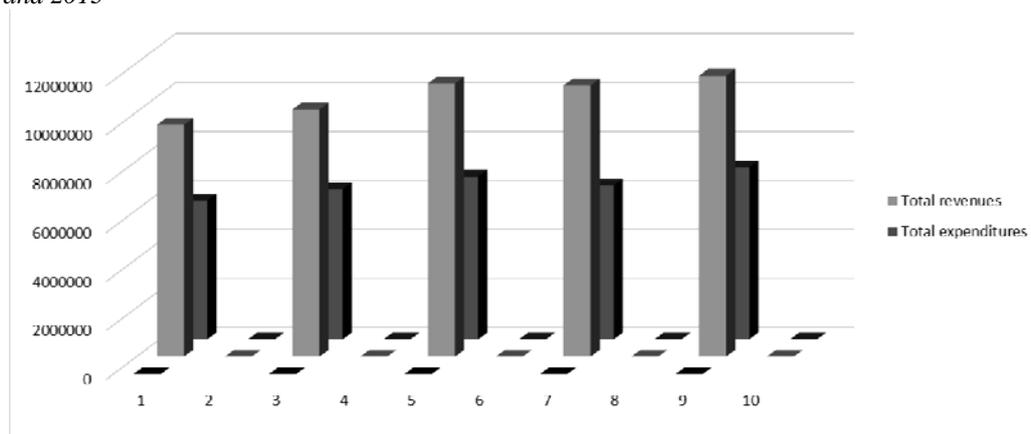
In this phase, called also "the positive phase", in the services provided by the Credit Bureau, it appears an element of novelty. It consists in the processing and including both negative and positive information on all types of the credit products, similar, or of insurance granted to the individuals, information taken from banks and non-banking institutions (consumer credit, leasing and insurance companies), participants in the Credit Bureau, and also information about fraudulent customers and inaccurate statements. The document containing this information is "the credit report", a name preserved even today.

In the third phase of development, which began in March 2009 and continues today, the Credit Bureau is working with 12 employees and it has 25 financial institutions (Biroul de credit, 2014) as shareholders.

It is improving the quality of services provided by making available, in addition, to the participants an American statistical indicator, the FICO score, also known as the «FICO® Score». Details of it will be presented in Chapter 3.3.

In 2013, the Credit Bureau issued a large number of credit reports, respectively 9 million.

**Figure 1.** *The evolution of the revenues and expenditures recorded by the Credit Bureau Company between 2009 and 2013*



Regarding the evolution of the Credit Bureau company's revenues, according to Figure 1, it can be noticed an upward trend beginning with 2009, simultaneous with the increase of the volume of services. The highest revenues were obtained in 2013, representing an increase of 3.61%. The expenditures of the Credit Bureau JSC grew also, again until 2011, then decreased by 5.51% in 2012 and increased by 24.2%, in 2013. Balancing the revenues and the expenditures it can be seen that the Credit Bureau expenditures rise faster than the revenues, at least in the analyzed period (2009-2013), which indicates the need for measures destined to increase the business efficiency (Toader, 2013).

## 2.2. The Presentation of the Schufa Holding AG

SCHUFA - Schutzgemeinschaft für allgemeine Kreditsicherung, translated as the General Credit Protection Association, was established in 1927 in Berlin, in addition to the newly formed power company, BEWAG. It generated and distributed electricity for private consumption as well as vacuum cleaners, refrigerators and electric stoves on hire purchase. The original idea consists in the fact that those who paid their electricity bills on time, could benefit of installments when buying electrical appliances. BEWAG designed an enquiry system based on a positive list of payers who regularly make the payments. Thus, before concluding a contract, the sales department consulted this list, which contained information on the payment behavior of a potential buyer of their electrical appliances. The idea proved to be successful, so in only two years after its launch, the Berliner Zeitung newspaper announced that SCHUFA card index held 1.5 million records. Soon after, the business idea spread throughout entire Germany, consequently a second SCHUFA office was opened in Dortmund in 1930. Three years later, SCHUFA had on its record credit customer data for no less than 3,000 retail businesses in Berlin and within a radius of 100 km (Wiemeler, 2008).

In 1952, the 13 Schufa companies, together with their 34 branches, launched FEDERAL SCHUFA eV, an organization with national coverage. In 1957 the organization moved its headquarters to Wiesbaden, where it operates even at present.

In 1954, a number of 2.2 million credit reports issued annually is reached. During the era of the economic miracle, the accelerated growth of consumer credit gave rise to a growing need for systematic creditworthiness checks, and in 1965 the annual number of credit reports reached 10 million.

In 2000, SCHUFA is restructured and realigned the conditions imposed by the complexity of the global economy, and it also assumes social responsibilities. The company becomes very flexible and oriented towards offering personalized services tailored to the needs of the customers. It offered a broad spectrum of products in the areas of the information management, decision management, scoring services and of the customized solutions (Schufa,

2014c). The types of products available to customers are diversified. They will be presented in section 2.3 compared with those of the Credit Bureau of Romania.

Currently, the company consists in the headquarters, 5 branches and 2 regional offices, where almost 700 employees are operating. Their number decreased between 2009 and 2013 with 100 employees, respectively 14% (Schufa, 2014a, b).

The SCHUFA Holding AG agency operates in the credit market in Germany in a competitive system alongside with Infoscore Consumer Data GmbH, Deltavista GmbH, Bürgel Wirtschaftsinformationen GmbH & Co. KG, and Creditreform AG considered to be the most important player in the market (Wielandt, 2010), compared with the Credit Bureau of Romania, which is unique in the market as a rating agency.

### 2.3. The presentation of some relevant indicators for the retail credit market in Romania and Germany

For a more accurate understanding of the context in which the two agencies providing credit ratings operate, the Credit Bureau and Schufa, we shall analyze for a period of 5 years, some relevant macroeconomic indicators for the retail credit market in Romania and Germany (World Bank, 2014b).

Table 1 presents the income per capita, total population, gross domestic product (GDP) as value and variation, respectively its increases or decreases, the declared unemployment rate expressed as percent of the total labor force, the number of loans granted to population, expressed as a percentage of GDP, the percent of the nonperforming loans in the total loans and the percentage of adult population coverage by the rating agencies between 2009-2013.

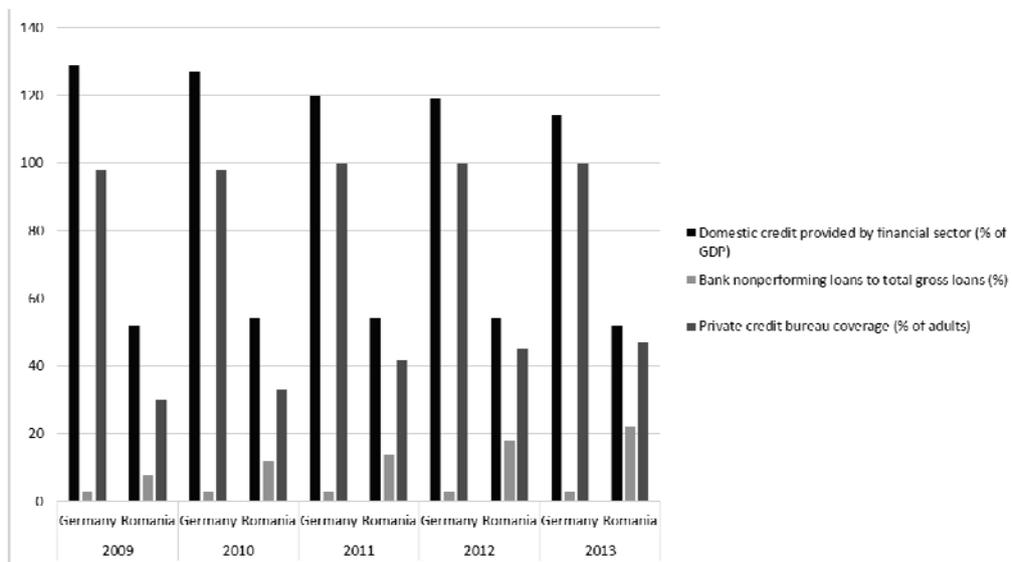
**Table 1.** *The Presentation of some relevant indicators for the retail credit market in Romania and Germany*

Indicators	2009		2010		2011		2012		2013	
	Germany	Romania								
GNI per capita, PPP (current international \$)	38,1	15,28	40,39	16	43,47	17,07	44,31	17,7	45,62	18,41
Population, total	81,902,307	20,367,487	81,776,930	20,246,871	81,797,673	20,147,528	80,425,823	20,076,727	80,621,788	19,963,581
GDP (current Mio. US\$)	3,412,770	164,344	3,412,008	164,792	3,752,109	182,610	3,533,242	169,396	3,730,260	189,638
GDP growth (annual %)	-6	-7	4	-1	4	2	0	0	0	3
Unemployment, total (% of total labor force) (national estimate)	8	7	7	7	6	7	5	7	..	..
Domestic credit provided by financial sector (% of GDP)	129	52	127	54	120	54	119	54	114	52
Bank nonperforming loans to total gross loans (%)	3	8	3	12	3	14	3	18	3	22
Private credit bureau coverage (% of adults)	98	30	98	33	100	42	100	45	100	47

It can be noticed that the loans granted to the population, expressed as a percentage of GDP are 2.2 times higher in Germany than in Romania, the nonperforming loans expressed as a percentage of the total loans are 7 times lower, and while in Germany the adult population is covered 100% by the credit bureaus, in Romania the coverage is stagnating to 47% for 2 years.

It should be highlighted that for a population 4 times greater, Germany is achieving a GDP 20 times higher than Romania, the reasons for this discrepancy being not subject of our study.

**Figure 2.** The evolution of the indicators relevant to the credit market in Romania and Germany between 2009 and 2013, respectively the domestic loans, non-performing loans and the coverage of the adult population by the rating agencies



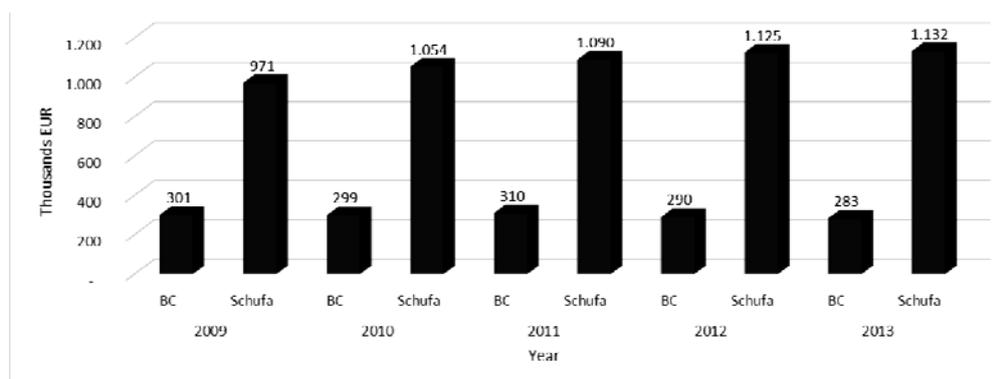
From Figure 2, that shows the evolution of the relevant indicators for the credit market in Romania and Germany between 2009-2013, the existence of huge discrepancies between the two countries can be observed, and the idea that we expressed in the introduction, regarding the existence of a strong correlation among the adult population coverage degree of the rating agency, the volume and the quality of the loans granted expressed as a rate of the arrears, is obvious.

### 3. The comparative analysis of the performance recorded by the Credit Bureau JSC and Schufa Holding AG

In order to achieve this comparative analysis of the performances of the two companies, we shall consider the revenues, financial results and the relevant synthetic data. We expect the analysis to reveal commonalities and differences and also the strengths and the potential development points of the Credit Bureau, respectively Schufa. The data underlying the analysis and the drawing of the charts have been taken from the websites of the Credit Bureau JSC and Schufa Holding AG.

#### 3.1. The comparative analysis of the revenues

**Figure 3.** The evolution of the Credit Bureau and Schufa's revenues based on 1 million credit reports, between 2009 and 2013



As shown in the chart above (Figure 3), the revenues of the Credit Bureau are almost 4 times less per unit of product than the Schufa's, aspect justified by the characteristics of the markets that they serve. In terms of the evolution of this indicator in the period under review, it appears that Schufa's revenues were steadily increasing, which means that the products

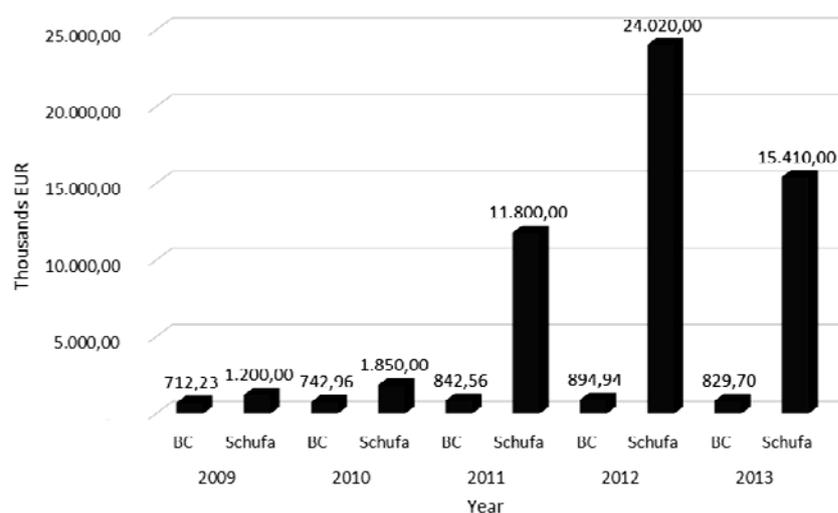
supplied have been increasingly better paid, in 2013 compared to 2009 the revenues per unit of product increasing by 16%. Regarding the Credit Bureau, there is a relative lessening of the price of the products supplied, in 2013 being cashed by 6% less than in 2009, and the reduction in the collected revenues we explain it by the depreciation of the RON/EUR exchange rate, the Credit Bureau's revenues and charges being expressed in RON.

The turnover of the Credit Bureau JSC has been growing since 2009 until 2011, the year 2012 recorded a decrease of 1.37% compared to 2011, in 2013 a return to the previous trend of growth being noticed, with a rate of 3.6%, below the 2011 peak of 10.5% vs. 2010, but positive. Consequently, the company recorded revenues had a similar evolution.

Comparing the two performances of the turnover recorded by Schufa Holding AG and the Credit Bureau, we can observe a similar situation, since both companies have an increasing trend in turnover until 2011. In 2012, Schufa retains its positive development, while the Credit Bureau registers a slight decrease, which was recovered in 2013.

### 3.2. The comparative analysis of the financial result (profit/loss)

**Figure 4.** The evolution of the Credit Bureau and Schufa's gross profit between 2009 and 2013



The Credit Bureau JSC registered profit in all the years when it issued declared annual balances, including the period we submitted to our analysis, the company recording no losses in any year. During the analyzed period, the profit increased with margins between 4.31% in 2010 and 13.41% in 2011, registering a decrease of 7.29% compared to 2012, while the annual revenues have increased of 3.61% the same year.

Regarding the Schufa Company, the situation is similar to the Credit Bureau in terms of fluctuations, which, however, are more extensive, with a variation range between a decrease of 36% in 2013 and a maximum profit increase of 537% in 2011. The major difference between the two companies is related precisely to this profit evolution, so spectacular for Schufa, and with a more linear development for the Credit Bureau. While the Credit Bureau registered a maximum increase in profit of 13.41%, Schufa registered significant increases of it, between 54% and 537%, so almost 6 times higher, reaching EUR 1.2 million in 2009, to over 24 million in 2012, as it can be seen in Figure 4.

### 3.3. The comparative analysis of the relevant synthetic data specific of the two companies

Through the comparative analysis of the relevant synthetic data specific of the two companies, there are revealed characteristic features and differences. Next, there will be analyzed the relevant data provided publicly on 2013, for the other years they being not accurate. Thus, in

Table 2 there are presented the types of customers, the services offered and the number of documents issued.

**Table 2.** Synthetic presentation of the customers, services, and the number of the documents issued by the analyzed companies in 2013

The types of customers and the services provided		The Credit Bureau	Schufa
<b>Customers</b>	Corporate Customers - number-	55	8.500
	Individual Customers - number -	-	1.700.000
<b>Services provided</b>	Negative Information	x	x
	Positive Information	x	x
	Scoring	x	x
	Creditworthiness checking	x	x
	Identity Verifications	-	x
	Adress Verifications and Updates	-	x
	Verifications regarding the Accuracy of the Banking	-	x
	Market Analysis, Target Groups	x	x
	Bussiness' Recording Products	-	x
Development of Predictive Scorings	-	x	
<b>Issued documents - million units-</b>	Credit Report	9	109
	Registration in the Credit Bureau's databases	unreported	1,7
	Compact Reports for Companies	-	x
	Assessment Reports	-	x
	Reports Containing The Results of The Verification	-	x
	Tailored Rating Systems	-	x
	Number of Employees	12	700

Already from the customer data it is observed that Schufa is a gigantic agency, the number of customers of the Credit Bureau representing only 0.0032% of the Schufa's number of customers. Another important difference between the two companies is given by the segment of customers they serve. Thus the Credit Bureau does not work with individuals, while for Schufa this category represents 99.7% of all customers and 1.5% of the entire activity, the remaining 98.5% of the activity being generated by the corporate sector. Regarding the types of services, it appears that in addition to the positive and negative information, the scoring, the creditworthiness checking and the market analyses, common to both agencies, Schufa offers a much richer range of services such as identity verification, the verification and updates of the addresses, checking of the banking accounts, records of the companies and the development of predictive scores (Seefelder, 2007). This difference comes from both the peculiarities of the German market, which is very complex and more developed than the Romanian market, and the rigor and responsibility, typical for the German working style.

**Table 3.** Synthetic presentation of the scoring features used by the Credit Bureau, respectively by Schufa

		The FICO Score	The Schufa Base Score
<b>Scoring</b>	The Minimum (Value)	300	0
	The Maximum (Value)	850	1.000
	The Assigned Rating (from A to L)	-	DA
<b>Information</b>	The Payment History	DA	DA
	The Ongoing Credits	DA	DA
	The Length of the History	DA	DA
	The Newly Obtained Loans	DA	DA
	The Types of the Utilised Credits	DA	DA
	The Demographic Data	-	DA
<b>The Origin</b>	Purchased	DA	-
	In House Product	-	DA
	Updates	daily	quarterly

Regarding the documents generated by the Credit Bureau and Schufa, we shall present peculiarities of the risk score, an important element of the credit report. As we already mentioned, the Credit Bureau uses "FICO® Score» designed by the American company Fair Isaac Corporation. It is calculated based on an international statistical model that is applied to the Credit Bureau's database. Thus, as illustrated in Table 3, the Credit Bureau's scoring is a number between 300 and 850, which estimates the risk level of the future credits, respectively indicates the probability that, in the future, an individual to pay the installments on time. The higher the score, the lower the risk. But no score cannot predict whether a person is a "good" or "bad" customer (myFICO, 2014).

The FICO scores include all the information related to payments made to the credit, insurance, and the leasing products, in order to determine the risk in granting the credit. It is calculated based on 5 major categories of information. This information are the payment history (which accounts for 35% of the final score), the loans in progress (30%), the length of history (15%), the new obtained loans (10%), the types of used credits (10%).

The FICO Score can be used to fulfill the requirements stipulated in the Basel II Agreement, which requires the calculating of a bank's capital so as this to respond to a set of three major components of risk, the credit risk, the operational risk and the market risk.

Compared with the "FICO® Score" features, it can noticed that Schufa's basic score, a creation of the German company, that folds perfectly to the needs of the local credit market, is calculated based on proprietary algorithms statistically validated. It has a value range of 1,000 units, larger than the FICO score, which is 550 units. It can take discrete values between 0, as a minimum, with an imminent default risk of the amounts granted, to 1000, as a maximum, with a very low default risk. There are defined 12 intervals validated statistically, on which an alphabetical rating, A being the most favorable value, and L the lowest (Schufa, 2014d), is assigned to each customer, whose data are stored.

FICO score does not provide such a rating, so the Schufa score allows a more accurate image of the stored data.

FICO score does not provide such a rating, so Schufa score allows a more accurate reflection of the stored data.

The data to be considered in the calculation of the scoring by the two companies are the same, the difference being that Schufa, at the request of its contractual partners and when there are no relevant credit information about individuals is using the demographic data to calculate the base score.

The databases of the two credit data providers are updated at different time intervals, daily for the FICO Score, or quarterly for Schufa base score, which indicates that the information from FICO Score are current, while Schufa base score information may be slightly out of date (Schufa, 2014d).

**Table 4.** *The Schufa base score*

Ratings	Scorewerte	Anteil an der Gesamtbevölkerung in Deutschland	Ausfallwahrscheinlichkeit
A	1000 – 662	ca. 20 %	1,38 %
B	661 – 564	ca. 20 %	2,46 %
C	563 – 517	ca. 10 %	3,56 %
D	516 – 467	ca. 10 %	4,41 %
E	466 – 410	ca. 10 %	5,57 %
F	409 – 341	ca. 10 %	7,16 %
G	340 – 247	ca. 10 %	10,72 %
H	246 – 177	ca. 5 %	15,02 %
I	176 – 137	ca. 2 %	20,95 %
J	136 – 111	ca. 1 %	22,26 %
K	110 – 77	ca. 1 %	27,01 %
L	76 – 0	ca. 1 %	42,40 %

For information, we present Table 4, in which it is noticed that 80% of the German population has a degree of default risk less than 10%, value which is also validated by the non-performing loans rate (NPL) of 3% of the total loans granted.

It is noticed that the Schufa base score is used both for their own purposes, and for the customers who request information about themselves; for the business customers, banks, insurance companies and others, it is provided another score specially tailored for them.

According to Schufa in order to calculate the score, there are used possible types of data, such as late payments or defaults (interruptions or faults), the lending activity of the last calendar year, the number of debts owed, the type, duration and the volume of the credit contracts concluded and the length of the credit history. To these, there may be added other types of data stored by Schufa, as the personal and the demographic data.

Therefore, the flexibility of the solution developed in-house by Schufa, allowing adaptation to the individual customer requirements, is evident, unlike the FICO Score, which is rigid in this regard.

## Conclusions

As a result of the analysis in the previous chapters, there can draw several conclusions, which we shall present below.

Even if they operate in countries with different economic development levels, the Credit Bureau of Romania and Schufa Holding AG in Germany base their functioning on the European Community law. This led to an overlap of some types of services offered, documents issued and of the "corporate customers" category. Although, the German giant demonstrates its superiority by addressing to the "individual customers" category, which is missing to the Credit Bureau. To this is added the volume and the multitude of the services as the number of the types of reports offered. If in Romania it is issued just one type of credit report, the German agency offers a range of five different types of documents of major importance in determining the credit risk.

Regarding the revenues per unit of product in the analyzed period, they are almost 4 times lower for the Credit Bureau than those of Schufa's, aspect justified by the characteristics and the economic strength of the markets in which they operate. In terms of financial results, both have had profit, but its variations are very different. Thus, for Schufa they are large, registering for example a decrease of 36% in 2013 and an increase of 537% in 2011. For the Credit Bureau the magnitude of these oscillations is much smaller, respectively a maximum increase of 13.41% in 2011 and a 7.29% decrease in 2013.

In terms of the scoring used by the two agencies, this is based on the same type of information that are the payment history and its duration, the ongoing and the newly obtained loans and the types of credits used, but the risk score calculation, an important part of the Report credit, differs. Thus Schufa uses the Schufa base score, the German company's own creation, and the Credit Bureau uses "FICO® Score» designed by the American company Fair Isaac Corporation. Significant differences in the design of the two scores are given by the wider range of values of the Schufa score, which translates into a superior nicety of prediction, and by the 12 intervals denoted by letters, on which each customer is assigned an alphabetical rating, rating which is missing to the FICO score used by the Credit Bureau.

A new computational perspective could be given by combining of the scores with the credit application data and the internal scoring of the banks. This would improve the credit risk assessment associated with the individuals through an increased degree of accuracy, the banks can adjust their credit offers to the risk profile of the consumers and thus to increase their market penetration in a controlled, informed, and flexible manner.

Of course this comparative analysis can be considered a first step in the investigation of the quantitative data provided by the two rating agencies. A possible future direction of development of the research could be represented by a qualitative analysis, based on the assumption that this concept of data quality can be judged only in terms of the purpose of their use, namely, the data quality determines the outcome of their use. Thus, there may be questions about the degree of achievement of the purpose for which they were created or even on the satisfaction of the customers, beneficiaries of these information.

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# Economic Value Added (EVA). A structural and dynamic analysis, during 2006-2013, of the companies having the business line in industry and construction, listed and traded on The Bucharest Stock Exchange

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**Abstract.** *The specialized literature provides modern analytical indicators of the listed companies' performance, in their construction starting from the concept of value creation. Crossing from the financial decision making criteria based on accounting income to their foundation based on criteria that envisage the value created for shareholders is a process that many companies operating in the European Community area go through.*

*The assessment of financial performance in terms of modern indicators, built under the optics of value added, was based on empirical research of Economic Value Added (EVA) for the companies listed on BSE, acting in industry and construction domains.*

**Keywords:** Economic Value Added, Value Creation, Bucharest Stock Exchange, listed companies.

**JEL Classification:** G01, G30, G32.

## 1. Introduction

The pressure of financial markets requires to the companies to reward own equity, shareholders no longer being satisfied with just compensation through a residual income, sometimes of doubtful nature. In this context, creating constant value for shareholders became a must.

If past performance evaluation involves the analysis of several criteria such as industry, management strategy, competition, human and material available resources, through the use of performance indicators systems, the new concepts involves now a systemic approach to enterprise performance.

Delivering satisfactory results for all stakeholders in an economic entity, it is materialized by creating value, which is market validation of company's strategic objectives, quantifying its financial performance in relation with owners, as residual value generated by company activity (Petcu, 2009: p. 403).

In this respect, creation of value for listed companies became the main criteria by which shareholders evaluate performance, based on the strategic objective of maximizing the present and future earnings.

## 2. Literature review

Far from being a paradigm in nowadays, the concept of value management was found its roots in papers of Nobel Prize laureates Franco Modigliani and Merton economy H. Miller (1961), later being taken over by other economists developed and continuous refined (Vâlceanu et al., 2015: p. 310), (Vasilescu and Popa, 2011: pp. 60-65).

Initially, the concept was introduced in corporate environment context by General Motors in 1920, and then abandoned till 80's, when it was reborn by the consulting firm Stern Stewart & Co., in New York (Sulger, 2008: p. 153).

In the same logic, the words of Alfred Marshall stay eloquent: *"which remains a company in its earnings after deducting the cost of capital at an appropriate rate, can be considered a benefit of the entrepreneur"*.

**The creation of value for an economic entity is done at the moment when this succeed to obtain a superior efficiency of its invested capital compared with founding associated with used resources (Petrescu, 2008: p. 280).**

Compensation of own equity should be attractive to investors at a superior rate then available for lower risk investments, avoiding capital flight to more "tempting" (Niculescu, 2005: pp. 95-98) entities and justifying the assumption of risk compared to other investment opportunities (Petcu, 2009: p. 403).

As Silvia Petrescu remarked, the concept of value creation approach changes of the traditional performance concept analyze through net accounting profit concept, where equity is not considered as a resource that require a cost to the company, the only expense being the cost of debt considered .

Consequently, the rationale of building Economic Value Added (EVA) indicator is based on the specific cost of own equity which, unlike the cost of borrowed capital - which unambiguously appears in the profit and loss account - has a different accounting treatment. In this context, the enterprise must consider not only the accounted expenses sum but also the cost of equity (Niculescu, 2005: pp. 95-98).

The concept of Economic Value Added (EVA) - is a registered trademark of Stern Stewart & Co Consultancy Company and economic measure of profit, determined as the difference

between net operating profit after tax and the opportunity cost of invested capital. The opportunity cost of capital is a weighted average cost of cost of financing sources used ( Weighted Average Cost of Capital - WACC), determined as weighted arithmetic average ( CAPM ) of equity cost and the cost of borrowed capital, connected with the weight of each categories and corresponding pay rate (Petrescu, 2008: p. 283)

The computation formula proposed by Stern Stewart's for Economic Value Added is the deduction of capital cost from operational net profit, according to the next model:

$$EVA = \text{Operational Net Profit} - (\text{Invested Capital} \times \text{Cost of capital})$$

Considering the determination of operational net profit, the cost of capital (Niculescu, 2005: pp. 95-98), Economic Value Added calculation relationship (EVA) becomes:

$$EVA = [\text{Operating result} - \text{tax profit}] - \left[ \frac{Cp}{CI} \times Rf + \frac{Dt}{CI} \times d \times (1 - i) \right]$$

Where:

Cp – own equity;

Dt – total debt;

CI – invested capital,  $CI = Cp + Dt$ ;

d – interest rate;

i – income tax.

**In this case, the economic value added is the real economic profit obtained by the company based on the entire capital used and determined according to the relation (Petrescu, 2008, pp 284), ( Tabără, Dicu, 2007):**

$$EVA = \frac{\text{Operating Net Profitul}}{CI} * Ci - Ci * CMPC = Ri * Ci - Ci * CMPC = (Ri - CMPC) \times CI$$

Where:

Ri – return on total invested capital;

$$Ri = \frac{\text{Operating Net Profit}}{\text{Invested Capital}}$$

Operating net profit after tax (NOPAT) = Net result – Income tax

CMPC – weighted average cost of capital

CI-invested capital,  $CI = Cp + Dt$ .

The positive economic value added ( EVA) indicates wealth creation for shareholders over compensation of capital and the negative value indicates that the company does not cover the capital cost of operating result, losing money even when has a positive accounting result.

According to Professor Niculescu (Niculescu, 2005: pp. 95-98) determining the economic value added (EVA) as per above mentioned methodology is tributary to same accounting distortions and classical limits in assessing financial performance profit. Getting a true picture of the economic value added (EVA) involves elimination of accounting distortions, which means an estimated 160 accounting adjustments, given that most companies practice between 10 and 15 adjustments. The most significant adjustments relate to R&D costs, marketing costs, strategic investments, acquisitions accounting firm, impairments, restructuring costs, taxes, and cost of equipment held for lease operations, intellectual capital (Mărza, 2013: p. 124).

Quoting Joel Stern, Professor Nicolescu (Niculescu, 2005: pp. 95-98) considers that, since there is no standard methodology for applying the adjustments, each company practice their own methods, even consulting company customizing adjustments are been applied according to entities specific, while maintaining comparability in time and space is the driver. So, depending on the number of adjustments it can be obtained different values of Economic Value Added (EVA) for same entity.

The translation from operation result to Economic Value Added (EVA) requires deducting of the cost of capital by going through the following steps: removal of distortions of conventional accounting; taking into account the cost of all resources used to finance operating activities and that has a contribute to the production of income; integrating operational cost of operating and capital into a single monetary indicator of performance evaluation. Economic Value Added (EVA) is a net operating profit deducted with the opportunity cost of capital, as a measure of real economic profit obtained by the enterprise (Mârza, 2013: pp. 120-123).

Unlike accounting (classic) profit and operating cash flow, which does not take into account the risk related to invested capital, economic value added is a more realistic indicator of the value created. Using of conventional rates of return is insufficient to analyze a comprehensive company performance, because their high values not necessarily involve increasing of owners earnings.

Economic Value Added (EVA) is used in assessing investment opportunities as a means of allocating capital and also to avoid the erosion of invested capital and if the company does not make a return at least equal to the average rate of return on the market – its investors are to be attracted by other tempting investments, subject of limited financial resources and globalization.

Economic Value Added (EVA) raises awareness among managers in overall business assets management, funding policy and strategic decisions regarding capital structure. The indicator is an effective strategic performance measurement management tool, which can be used in the process of its incentives to increase economic performance (Petrescu, 2008: pp. 196-198).

The indicator disadvantage is connected with focus on only one category of company stakeholders - certain shareholders. Or, modern financial theories follow a holistic approach both the company and the people involved in his life, performance being overall rated and being subscribed to satisfy the interests of all social partners.

A major disadvantage in this context is the lack of a standardized methodology for calculating the relevance of accounting adjustments and their high number.

### 3. Case Study

#### **The research hypothesis**

Research hypothesis in the analysis of economic value added (EVA) envisages that companies listed on capital market do not get a proper economic value added. Not being able to cover the capital cost from operating result, consumes shareholders capital, even when post a positive accounting result.

#### **Research Objectives**

The research follows the reaching of following objectives:

- Determining the Economic Value Added for each company analyzed and dynamic analysis of Economic Value Added for the period 2006-2013;
- Identify the causes of Economic Value Added developments;
- Analysis of financial performance in terms of: Net Profit - economic value added;
- Building a rating model for assessing the performance score in terms of economic value added.

#### **Research Methodology**

The analysis of the evolution of the Economic Value Added is performed for the companies listed and traded on the BSE, which are operating in industry and construction, in a total

number of 51, hereinafter „*industry and construction companies, listed and traded on BSE in the period 2006-2013*”. According to the NACE classification Revision 2, the industry includes mining and quarrying, manufacturing, production and supply of electricity, gas, steam and air conditioning (sections B, C, and D).

Economic Value Added is calculated by the author, according to the methodologies presented by the specialized literature and practice, based on the information provided by the individual financial statements of these types of companies, developed for the years 2006-2013, published on [www.bvb.ro](http://www.bvb.ro) and on the website of each of the listed companies in the special sections dedicated to investors. To the extent necessary, additional information was obtained from the statutory audit reports, reports of the Board of administration and other publications devoted to investors, available on the website of each listed company.

For capital market specific indicators the existing data on the site [www.bvb.ro](http://www.bvb.ro) and [www.tradeville.eu](http://www.tradeville.eu) were used, accessed from October 2011 to November 2014.

Calculations, graphs, tables and annexes are the processing performed by the author.

Starting with the financial statements of year 2012, companies listed on a regulated market were required to apply IFRS in preparing separate financial statements, according to Minister of Finance Order no. 1286/2012. In applying these regulations, companies restated financial statements for 2011, according to the law, which led to the recording of value differences between the information provided by the initial and restated financial statements. The financial statements for 2011 are extracted from the reports for the year 2012 made in accordance with IFRS and presented in the following as „the year 2011r”. Since the analysis of influences due to restatement is one of our future concerns, there were presented both the values for 2011 to better highlight the differences that may arise, and the impact on comparability.

This analysis is a part of a larger work, the doctoral thesis concerning the financial performance of listed companies.

Since the values obtained by each company for Economic Value Added (EVA) are not consistent one to another, the assessment of annual progress indicator, based on annual averages would not be representative. As a result, we built two score models to assess the evolution of financial performance in relation to Economic Value Added (EVA).

The first model refers to the ability of companies to obtain economic value added (EVA) and positive net profit. Considering the four situations that may arise in relation Net result - Economic Value Added ( EVA ) was given to every company, every year, scores against positive values, respectively negative of pair “Net- economic value added (EVA)”, as presented in Table 1.

**Table 1.** Given score four situations that may arise in relation Net result - Economic Value Added

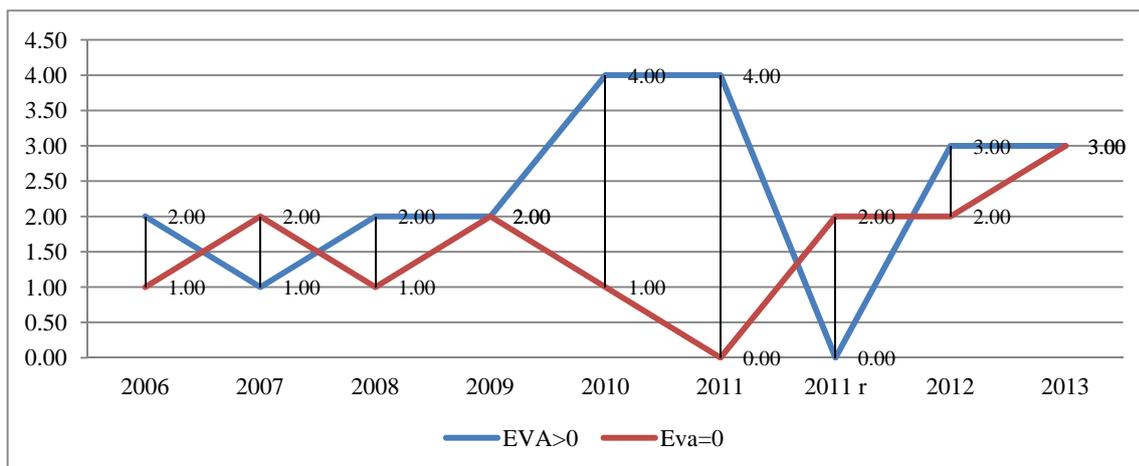
Position	Given score
Net Profit, Negative EVA	1
Net Profit, EVA positive	5
Loss , positive EVA	3
Loss, negative EVA	0

Based on yearly values of the scores for each company, was calculated as an average annually score to the companies listed and traded on the BVB (Bucharest Stock Exchange) acting in production and constructions.

### **Data analysis and results awarding**

Evolution of the companies number that have been null and positive EVA Economic Value Added (Vasiu et al., 2013, pp. 172-178) are shown in Figure 1.

**Figure 1.** Evolution of the number of companies that have registered zero and positive Economic Value Added between 2006 and 2013

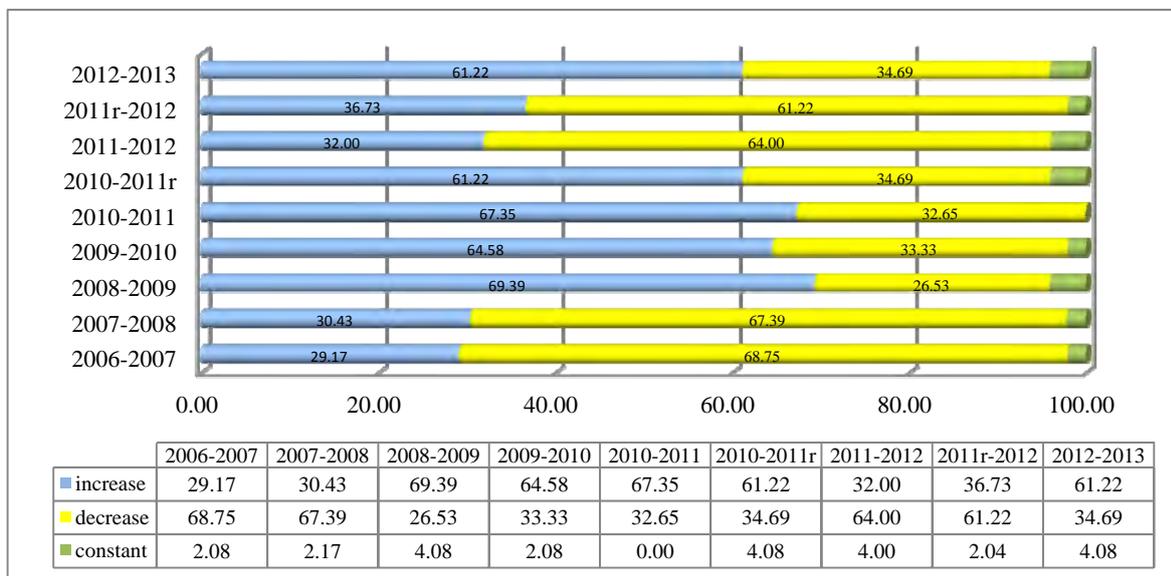


**Source:** Authors computing, based on the annual financial statements in the period 2006-2013, the companies listed and traded on BVB, which operates in industry and construction, available [www.bvb.ro](http://www.bvb.ro)

Since the majority of values of indicator are negative, it is very important to analyze trends in economic value added between 2006 and 2013. EVA evolution of period 2006-2013 was analyzed on chain based indices calculated for each company, for each pair  $t_0-t_1$  consecutive years, where  $t_0$  and  $t_1$  are two consecutive years from 2006-2013. Based on these indices was determined for each period  $t_0-t_1$ , EVA evolution, regarding increase, decrease or maintain it at a constant level (in most cases was the constant level 0).

Figure 2 shows the evolution of the economic value added (EVA) from one year to another, in the period 2006-2013.

**Figure 2.** 2006-2013 Evolution of Economic Value Added, for companies listed and traded on the Bucharest Stock Exchange, operating in industry and constructions



**Source:** Authors, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and construction available [www.bvb.ro](http://www.bvb.ro)

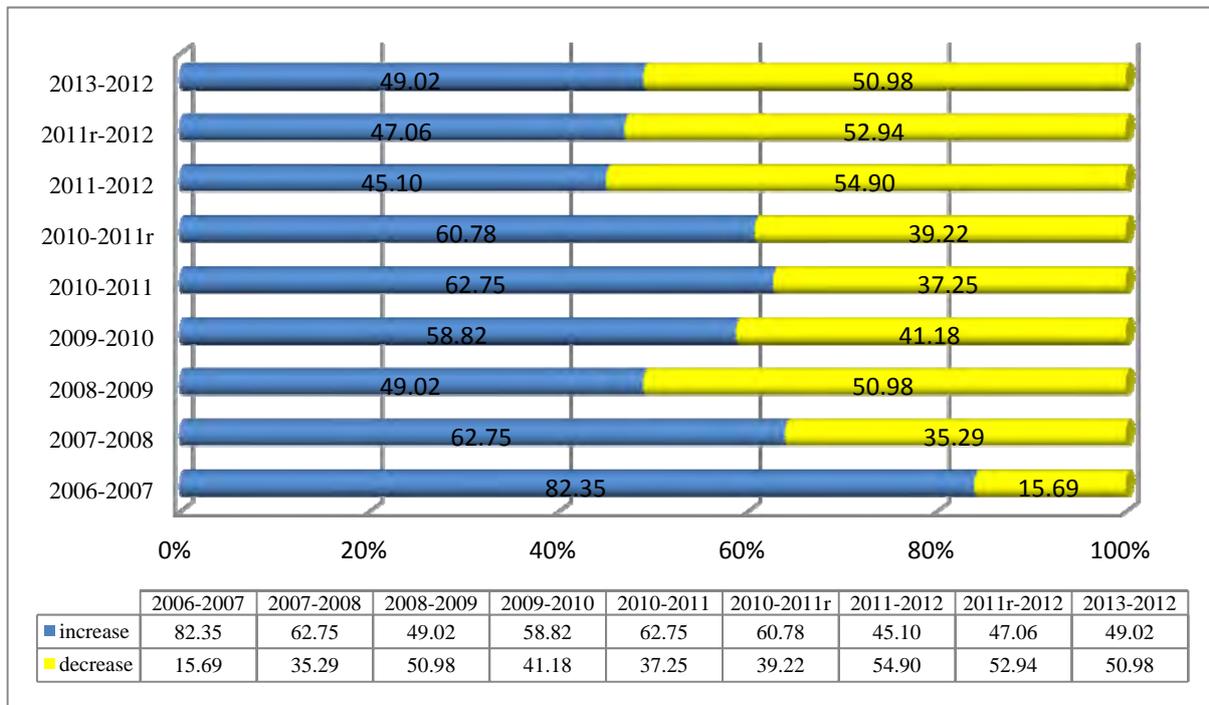
Looking at Figure 2, it can be noted that during 2006-2007, 2007-2008 and 2011-2012 the weight of companies that have registered increases of EVA is lower to weight of companies that have EVA declining. The situation is reversed in the periods 2008-2009, 2009-2010, 2010-2011 and 2012-2013, when the weight of companies that have registered EVA increases exceeds the weight of companies that have a declined EVA.

Determining the Economic Value Added (EVA) as per model:

$$EVA = (R_i - CMPC) \times CI,$$

EVA evolution and its values are depending on the evolution and values of invested capital (CI) and result of difference  $R_i - CMPC$ . Evolution invested capital (CI) is shown in Figure 3.

**Figure 3.** Evolution of invested capital (CI) in 2006-2013



**Source:** Authors, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and constructions, available [www.bvb.ro](http://www.bvb.ro)

If during 2006-2007, 82% of the companies analyzed show growth of invested capital (CI), in 2012-2013, only 49% of companies have done it the same. The companies that recorded from year to year increases in invested capital recorded a downward trend, decreasing by an average annual rate of 7%, while the share of companies that invested capital decreased from one year to another increased by an average annual rate of 18%, from 15.69% in 2006-2007 to 50.98% in 2012-2013.

Regarding the comparison  $R_i - CMPC$  (Return on total invested capital - WACC (Weighted Average Cost of Capital)), the results are shown in Figure 4.

**Figure 4.** Assessment of Return on total invested capital and Weighted average cost of capital in 2006-2013



**Source:** Author, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and constructions, available [www.bvb.ro](http://www.bvb.ro)

Throughout the period, most companies (over 86%) fail to achieve a return on invested capital higher than weighted average cost of capital, thus recording a negative EVA. One can notice a slight performance gain to achieve a higher Ri to CMPC, share of companies that have obtained  $Ri < WACC$  decreasing by an average annual rate of 0.57%, but not for companies that have made  $Ri > WACC$ , which decreased, in turn, with an average annual rate of 0.88% but to those who obtained  $Ri = WACC$ , which increased by an average annual rate of 13.34%.

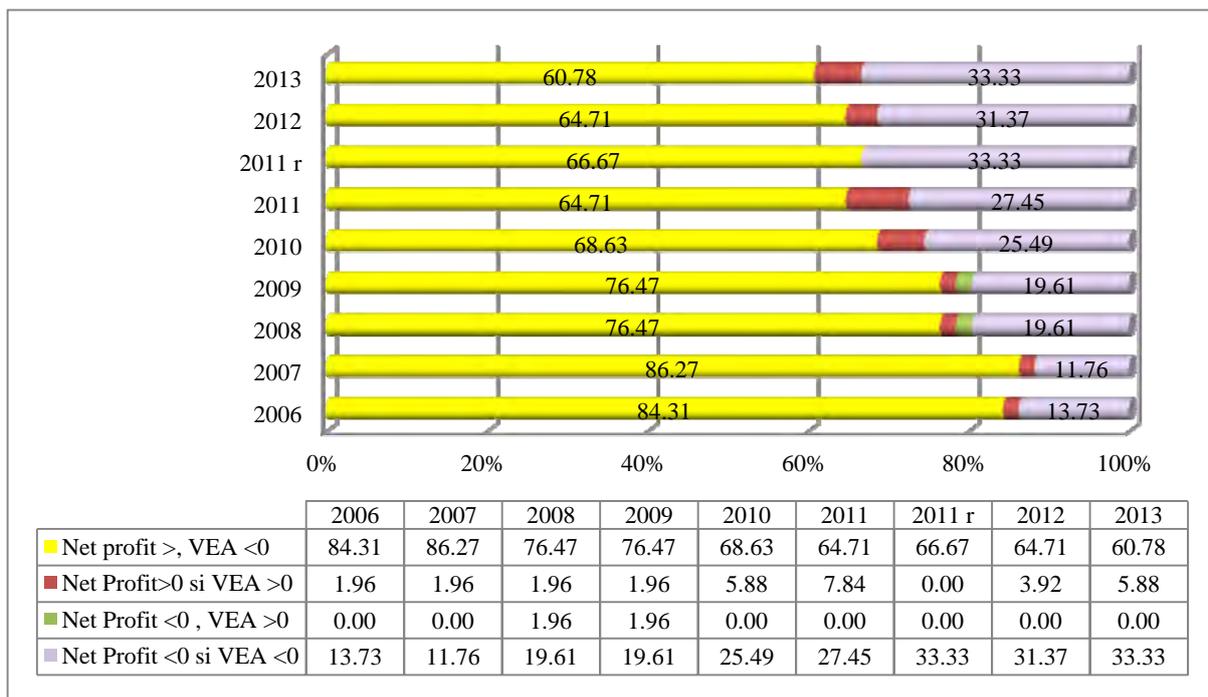
So, only 2% of companies succeed to give their shareholders a higher return on invested capital, but in 2011-2012 this performance is not achieved by any company.

In 2006, 4.08% of the companies recorded an identical value of Ri and CMPC, their share increased to 13.73% in 2012, as in 2013 to drop to 9.8%. For the entire reviewed period, the share of companies that have registered Ri equal to CMPC increased by an average annual rate of 12%. For these companies, the development of Economic Value Added (EVA) depends only on the development of CI.

Starting from the assumption that the positive value of Economic Value Added (EVA) indicates wealth creation for shareholders over remuneration and the negative capital shows that the company does not cover the capital cost of operating result, losing money even when a positive accounting result is shown.

In Figure 5, we analyzed the relationship VEA - Net profit for the companies listed and traded on the BVB.

**Figure 5.** Relation EVA- Net Profit for companies listed and traded on BVB in the period 2006-2013



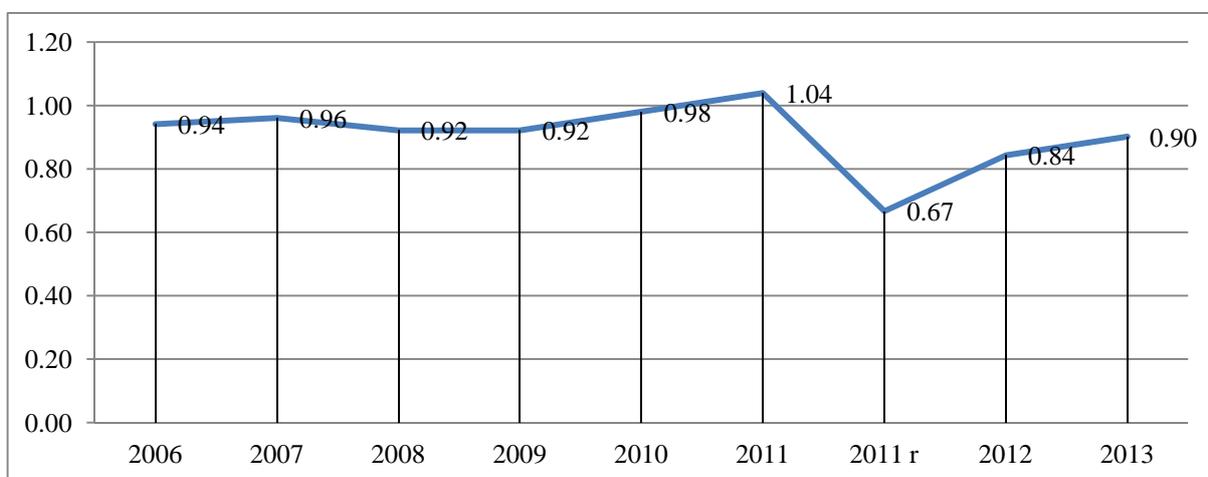
**Source:** Authors, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and constructions, available [www.bvb.ro](http://www.bvb.ro)

Although in a slight decrease during the study period, the proportion of companies that recorded net profit in the context of Economic Value Added (EVA) negative is high. Only a small percentage of companies registered net profit in the period analyzed both positive and EVA.

Considering the four situations that may arise in relation to the Net result – EVA, we are proposing a scoring model, giving to each company, every year, scores against positive values or negative of the pair Net result – VEA, as presented in Table 1.

Based on annual values of the scores for each company, we calculated an annual average score, which allowed the assessment of progress in terms of financial performance of relation Net profit - EVA (Figure 6).

**Figure 6.** Relation EVA-Net Profit for companies listed and traded on BVB in the period 2006-2013

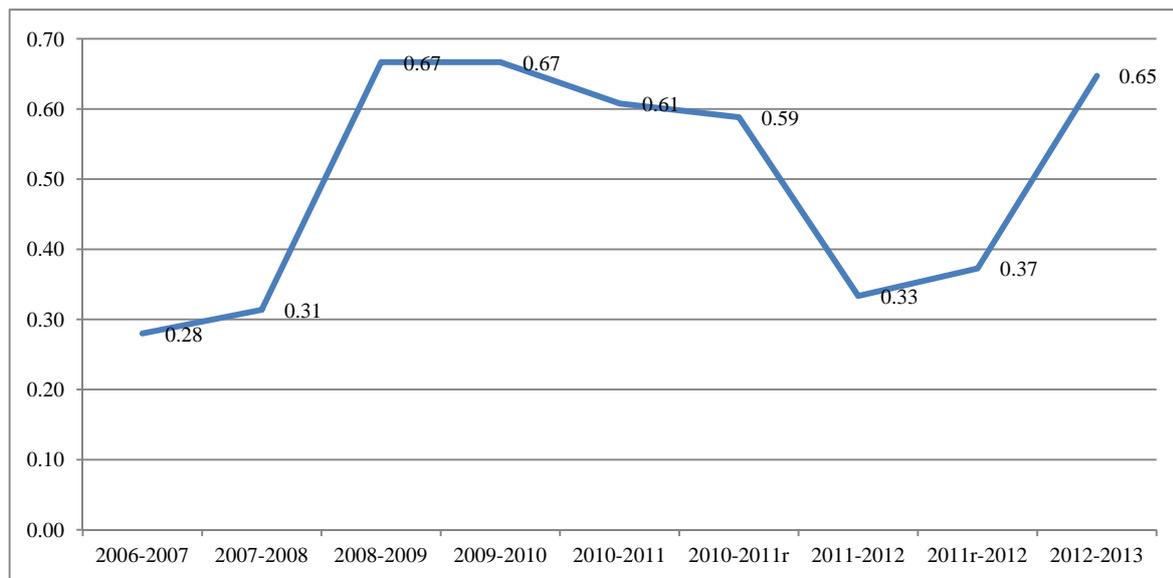


**Source:** Authors, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and construction available [www.bvb.ro](http://www.bvb.ro) and marks awarded

In the period 2006-2013, the annual average score values are at around 0.9. The wide variation recorded between 2011 and 2011r levels, highlighting once again the importance of using a uniform system of financial reporting.

Since, in most cases, EVA values are negative, we created a scoring model, giving companies 1 point if economic value added increased from one year to another, for each period of 2 consecutive years ( $t_1-t_0$ ) in the range 2006-2013. Based on annual values of the scores for each company, we calculated an annual average score, on which we appreciated the evolution of financial performance in terms of EVA growth (Figure 7).

**Figure 7.** Evolution of financial performance in terms of EVA growth in 2006-2013



**Source:** Authors, based on the annual financial statements in the period 2006-2013, the companies listed and traded on the BSE, which operates in industry and constructions, available [www.bvb.ro](http://www.bvb.ro) and awarded ratings

Between 2008-2010, although difficult economically, companies analyzed showed an improvement of Economic Value Added. In the period 2011-2012, there is a decrease in the number of cases in which companies manage increasing economic value added, followed by a significant recovery in 2012-2013. However, given the negative values of Economic Value Added, one cannot speak of a performance, but rather a reduction of inefficiency in terms of performance, expressed by this indicator.

#### 4. Conclusions

Economic Value Added Analysis evolution leads us towards the following conclusions:

- In most companies analyzed Economic Value Added values are negative, which means that they do not cover the cost of capital by operating result, losing money even when a positive accounting result;
- Return on invested capital ( $R_i$ ) is equal to WACC - weighted average cost of capital, when shareholders are solely financing the equity and without long-term debt attached, which consequently leads to a null value of Economic Value Added;
- Most companies (over 86%) fail to achieve a higher return on invested capital ( $R_i$ ) than weighted average cost of capital (WACC), consequently conducting to a negative Economic Value Added;
- The preponderance (over 60.78%) of the companies recorded a net profit in a combination with a negative Economic Value Added. The most favorable situation, when the financial performance is reflected as well in a positive a positive Economic Value Added was

recorded by 1.96% of the companies in 2006-2009, their share increasing by an average annual rate of growth of 17%;

- Despite the difficult economy momentum, during 2007-2010 analyzed companies registered a significant improvement of Economic Value Added. Between 2011 and 2012, there is a decrease in the number of cases in which companies manage to raise its EVA, followed by a significant recovery in 2012-2013. However, considering the negative values of Economic Value Added, it's clear that we cannot speak of a performance, but rather a inefficiency decline - in terms of performance, expressed by this indicator;
- The score for assessing performance in terms of Economic Value Added suggests that despite the difficult times of economy crossed; the companies between 2007 and 2010 showed an improvement of EVA. During 2011-2012, there is a decrease in the number of cases where companies recorded growth in EVA, followed by a significant recovery in 2012-2013.

The objectives of the research allowed us to validate the research hypothesis. We can conclude that analyzed companies listed and traded on BVB, doesn't provide shareholders an appropriate Economic Value Added. In almost all cases, this indicator has negative values, capital allocated by shareholders being consumed, even when recording a positive accounting result.

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# Determinants of non-performing loans ratio. Evidence from firm-level data<sup>(\*)</sup>

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**Abstract.** *The scope of this paper is analyzing the main evolutions of credit risk in Romanian banking sector since the outbreak of the crisis and identifying Non-performing loans (NPL) determinants using firm-level information. The results indicate that larger, more profitable and more productive firms were able to weather better the negative shocks. Labor productivity is one of the most important explanatory variables for firms' ability of repayment their debt, even after controlling for the evolution of market share and value added or other firm specific characteristics.*

**Keywords:** NPL, credit risk, firm-level data, fixed effects, labor productivity.

**JEL Classification:** D20, G21, C33.

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\* All views are of the author and do not involve in any way affiliated institutions.

## Introduction

An important area of research in the recent times is linked to credit risk analysis. Non-performing loans (NPL) and loan loss provisions have become one of the most pressing problems banking sectors confronted since the outbreak of the economic and financial crisis. The literature focusing on determinants of troubled loans is related to macroeconomic developments, bank-specific determinants of firm-level variables or a combination of these factors (Bonfim, 2009; Louzis et al., 2012 etc.). Analyzing the triggers of NPL is of particular importance for predicting banking crisis (Kaminsky and Reinhart, 1999), while understanding the drivers of firms' difficulties in repayment the debt, as well as identifying the riskiest categories of loans are of vital importance for financial stability. Against the backdrop of macroeconomic events, the firm specificities ultimately determine the ability of surviving and are the drivers of credit risk.

This paper is linked to the stream of the literature focusing on the impact of firm level characteristics on credit risk, which can have an important impact on their resilience in the downturn phases of economic cycles and influence the probability of default.

The scope of this paper is analyzing the main evolution of credit risk in Romanian banking sector since the outbreak of the crisis as well as testing NPL ratio<sup>(1)</sup> sensitivity linking to firms' characteristics. The results indicate that larger, more profitable and more productive firms were able to weather better the negative shocks, translating into an inferior NPL ratio generated by these companies to their loan commitments.

## Literature review

Benito et al. (2004) and Bunn and Redwood (2003) argue that the use of micro-level information could provide valuable improvement to the accuracy of empirical models explaining credit risk. The main advantage of using this kind of data stems from being able to capture the entire distribution of firm level characteristics, rather than making conclusion based on the mean indicators.

Bernhardsen (2001), Eklund et al. (2001) or Bonfim (2009) identify size, asset growth, leverage, profitability indicators, financial structure, liquidity, investment and age among the determinants of companies' performance in honoring their debt. A significant contribution to credit risk models was offered by Altman (1968), who developed a scoring known as Z-score. This is obtained by discriminant analysis, the main variables explaining firms' probability of default being working capital to total assets, retained earnings to total assets, earnings before interest and taxes over total assets, the ratio between the market value of equity and the book value of debt and sales over total assets.

Belaid (2014) show that firms having a good capacity of honoring bank debt service are different from firms with severe problems, the former being more profitable, with higher liquidity ratios, sales and investment growth and displaying a smaller dependence on external funding.

## Database used in the analysis

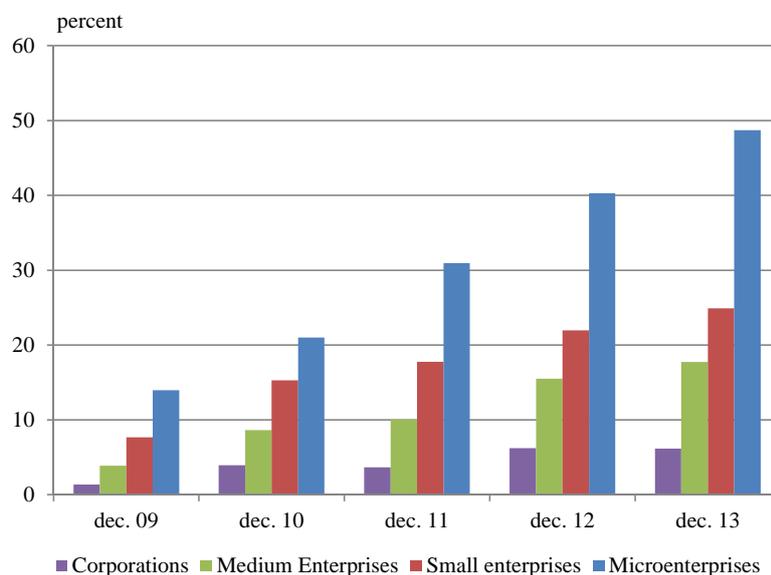
The firm level datasets used in this work are provided by Central Credit Register and Ministry of Public Finance. Central Credit Register offers data on all credit exposures above 20,000 lei (approximately 4,500 euro) for non-financial companies in Romania. This database also provides information on the current loan status. Using end-of-year data for the period 2004-2013, the debtors from Central Credit Register are matched to balance sheet and profit and loss account information from Ministry of Public Finance. The sample used in the estimations consists over 30,000 companies.

Based on this rich dataset, we construct micro-level indicators related to profitability (measured as return on assets, ROA), size (measured by total number of employees), growth in turnover and value added<sup>(2)</sup> and economic efficiency. For the former indicator, we use two measures: labor based revenue productivity computed as the ratio between firm turnover and number of employees and labor productivity, as value added divided by number of employees. These two measures are seen as among the most important competitiveness indicators (CompNet, 2014). Throughout the paper, the results are based on the first measure of productivity, although these are robust to using the second efficiency indicator.

## Results

The NPL ratio for non-financial companies was affected by the recent economic events: the bank lending maintained subdued, while firms confronted with difficulties related to the capacity of honoring bank debt service. Against this backdrop, the NPL ratio, which stood at 6.4 percent at end 2009, reached 23.6 percent in 2013.

**Figure 1.** NPL ratio by size of the enterprise



**Source:** Central Credit Register, Ministry of Public Finance, own calculations.

The foreign denominated loans proved to be riskier than lei loans. Since 2011, National Bank of Romania adopted a series of measures aimed at reducing the cost of national currency lending and at protecting unhedged borrowers.

According to debtors' size, the riskiest categories for banks' asset quality are represented by Small and Medium Sized enterprises (in particular firms at the lower bound of the size category), as reflected both by NPL developments (Figure 1) and banks' risk appetite. According to Bank Lending Survey, credit institutions consider microenterprises and small companies as the main source of credit risk.

There is a high heterogeneity of firms' ability of repaying their loans according to business sectors and their involvement in foreign trade activities: a high potential of increasing these companies role in banks' portfolio is displayed, as indicated by their relatively low role in banks' total asset and their superior payment discipline (the NPL ratio for these firms is significantly below economy-wide average, with an advantage for net importers).

Taking into account these findings, a series of regression were run in order to identify characteristics that enabled firms to better honor their service debt (Table 1). The estimations were done through panel fixed effects techniques, as indicated by the Hausman test.

**Table 1.** *NPL and firm characteristics*

VARIABLES	(1) NPL ratio	(2) NPL ratio	(3) NPL ratio	(4) NPL ratio	(5) NPL ratio	(6) NPL ratio
l prod rev	-0.185*** (0.00571)	-0.0819*** (0.00529)	-0.101*** (0.00503)			
ROA	-0.133*** (0.00287)	-0.0815*** (0.00290)	-0.0546*** (0.00292)			
size	-0.0139*** (0.00300)					
turnover growth		-0.0451*** (0.000950)				
value added growth			-0.0293*** (0.000774)			
l prod rev lag(1)				-0.116*** (0.00573)	-0.0420*** (0.00558)	-0.0677*** (0.00538)
ROA lag(1)				-0.122*** (0.00264)	-0.0718*** (0.00261)	-0.0549*** (0.00267)
size lag(1)				-0.0112*** (0.00247)		
turnover growth lag(1)					-0.0466*** (0.000992)	
value added growth lag(1)						-0.0337*** (0.000833)

**Note:** Panel fixed effects regressions. Robust standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Source:** Central Credit Register, Ministry of Public Finance, own calculations.

The results indicate that NPL ratios are fundamentally related to micro-level variation in productivity, profitability and dynamics in market shares and value added. One of the most important independent variable is productivity: even after controlling for size or other firm fixed effects (idiosyncratic characteristics), the NPL ratio is very sensitive to differences in efficiency. The effect of productivity on NPL levels is significant and negative, regardless the measure of productivity used. Most profitable and expanding firms whether negative shocks better, the identified relationships holding when using both contemporaneous and lagged independent variables.

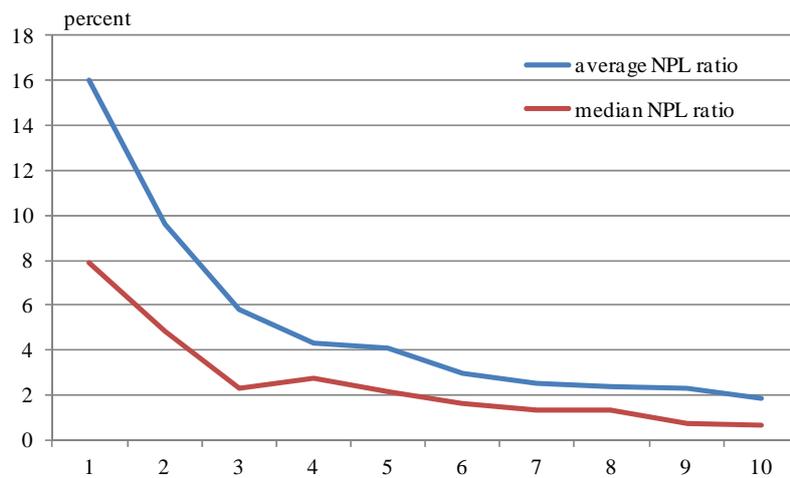
The robustness of the negative link between NPL and productivity is confirmed by regressions' results in which NPL values (both average levels and median values by productivity class) are explained by productivity deciles, controlling for specific sector and year effects (Table 2). The higher the productivity, the lower the NPL. Companies in superior productivity classes have significantly lower NPL ratios (Figure 2).

**Table 2.** *The link between firm productivity and NPL*

VARIABLES	(1) average NPL ratio	(2) median NPL ratio
lprod rev decile 2	-6.765*** (1.225)	-8.272*** (1.401)
lprod rev decile 3	-10.54*** (1.140)	-9.439*** (1.338)
lprod rev decile 4	-12.05*** (1.124)	-9.669*** (1.329)
lprod rev decile 5	-12.28*** (1.127)	-9.740*** (1.323)
lprod rev decile 6	-13.40*** (1.108)	-9.940*** (1.310)
lprod rev decile 7	-13.82*** (1.105)	-9.994*** (1.309)
lprod rev decile 8	-13.98*** (1.105)	-10.02*** (1.309)
lprod rev decile 9	-14.10*** (1.112)	-9.844*** (1.316)
lprod rev decile 10	-14.49*** (1.103)	-10.02*** (1.309)

**Note:** relative to first revenue based labor productivity decile. OLS estimations, including dummies for sectors and years. Robust standard errors in parentheses. Significance level: \*significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

**Source:** Central Credit Register, Ministry of Public Finance, own calculations.

**Figure 2.** NPL ratio by labor revenue based productivity decile

**Source:** Central Credit Register, Ministry of Public Finance, own calculations.

## Conclusions

In this paper, we investigate the micro-level determinants of NPL ratios registered by Romanian credit institutions during 2004-2013. By means of panel fixed effects models, we find a significant link between firms' performance in terms of productivity, profitability and growth rates of sales/value added and repayment discipline. One of the most important conclusion is that, even after controlling for firm size and other characteristics, labor productivity is of the essence in explaining payment discipline.

## Notes

- (1) The non-performing loan ratio is the share of corporate loans past due by more than 90 days and/or for which legal proceedings have been initiated (with firm-level contamination) in total corporate loans.
- (2) Value added is computed as turnover + capitalised production - intermediate inputs for each firm.

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# Behavioral influences in Romanian banks lending process

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**Abstract.** *Romania witnessed a sharp increase in non-performing private loans (firms and households) - from 6.46% in September 2009 to 22.46% in March 2014. Besides financial difficulties of the customers, error in loans analysis or fraud, the behavioral factors affected both the clients and the bank clerks. Emotions, misperception of risk, the level of financial literacy, social norms, have significant influence in lending process. The present paper makes an analysis of the behavior factors influence over the lending process and propose solutions to limit or highlight it. The findings may be used by banks in improving the loan portfolio quality but also can help individuals to increase their awareness over behavioral influences when contracting a loan. Regulatory bodies in the area can also use the findings in developing programs aimed to increase financial literacy of the banking consumers.*

**Keywords:** bank loans, behavioral sciences, credit analysis, Romania.

**JEL Classification:** D03, D10, G02, G21.

## Introduction

In Romania, banks were involved in clients' financial education beginning with the launch of the first banking products (cards, savings products other than deposits, personal loans or as authorized overdraft account). These simple banking products were hard to understand for a population with a low financial literacy.

Regarding lending process, although banks had developed complex processes of loan applications analysis and monitoring, the volume of bad private loans (firms and households) experienced a sharp increase from 6.46% in September 2009 to 22.46% in March 2014 (according to National Bank of Romania). The emergence of unexpected financial crisis has led to changes in individual income levels, financial and economic difficulties, with consequences in loan repayment capacity.

From the banks point of view, a loan applications analysis for private legal entities requires two approaches: one based on quantitative financial analysis and the other based on qualitative analyzes mainly regarding the quality and experience of the management and shareholders, the risks of the business.

In case of individuals, analysis is focused mainly on the ability to maintain income over time, affordability of loan rates and historical financial behavior.

In spite of these regulated analysis, banks loan portfolios contain non-performing loans which are due to high indebtedness assumed, foreign currencies loans with highly currency risk, incorrect choice or lack the ability to choose the right loan.

According to Minsky (Minsky, 2011: pp. 458-468), banks can be "engines of capitalism", stimulating development or can be only "traders of loans". Starting from this idea, and taking into account the increase of bad loans, banks should change their approach and treat credit holders as business partners. This approach requires an increased professionalism of the bank staff involved in the process of granting and managing loans.

Analyzing reports of National Agency for Consumer Protection in Romania, from 2012 to 2013 this institution received a total of 6084 complaints about banks and financial non-banking institutions, claimed the following main aspects: non-contractual clauses, missing fees in the credit agreement, drafting contracts in an inadequate form, the existence of unfair terms, the perception of the risk fee, incomplete and/or incorrect information. Some of these complaints may be due to errors or breaches of contract clauses, but most of them are based on ineffective communication, a lack of understanding the terms or the loan functioning.

Emotions, misperception of risk, the level of financial literacy, social norms, have significant influence in the lending process.

According to some researchers (Forbes, 2010: p. 285), companies are subject to the same behavior influences, driven by human beings who manage them. Even they are placed in various structures and action according to certain rules, they could take heuristic, biased or emotional decisions.

This paper mainly analyzes the connections and behavioral influences that arise in the process of lending over all the parties involved, and propose solutions from the same behavioral spectrum. In this respect I believe that from this research can benefit both sides: the banks and the customers and throw their actions they can restore the confidence in the banking system.

## Literature

According to studies developed by Fehr, Falk and Zehnder (2005), confirmed by Brown and Zehnder (2006), implicit contracts between lender and borrower and lasting relationships

between banks and their customers can be powerful tools of the financial discipline. The building of these long term relationship is based on trust, honesty and communication.

In order to strengthen these relationships behavioral researchers (Behavioral Insights Team, 2012) identified several ways that complement traditional coercive methods: increasing honesty, using customized financial language, easing the action that needs to be followed, highlighting key messages in correspondence, showing positive examples of community, rewarding positive behavior, highlighting the risk and consequences of false statements.

In general, people believe they are honest and want to behave in this respect. Regarding this idea it is possible to obtain a higher degree of honesty reminding people their willingness to be honest while they are filling out a form or a statement.

One study (Shu et al., 2011), showed that moving the signature from the end of a statement earlier in its body, significantly increases the level of honesty of the person. The study was based on a random process of individual statements in auto insurance contracts about the number of miles driven (the higher the number of miles reported, the higher the premium). Completed forms were related to a number of 3488 policies covering a total of 20741 cars. The results showed that people who signed early on the form reported by 10% more miles of their cars than those who signed at the end, thus showing a higher degree of honesty.

Earlier request to sign a form can be perceived like the common procedure in courts when before giving a statement the witness swore to say 'Nothing but the Truth'.

Another topic of study is how much the honesty reminder will last from an early signature on the form to the entire process of filling the form. For example, for a form of 40-50 pages is unlikely that an early signature to have effect until its final pages. In these cases the signature should be placed before the paragraph requiring the greatest honesty in statements or placing these important statements at the beginning of the form. Another solution would be to use the forms printed on paper with a cut box so that the signature to be visible regardless of which page is completed.

Researchers examined other ways to increase honesty (Ariely, 2010) - in two laboratory experiments they eliminated false statements by asking participants to sign the honor code or reminding them many of the "10 Commandments". This growth of honesty can be achieved by signing honesty statements, or handwriting the statements before signature (e.g. "I declare that the information filled in, completely correspond the truth").

Mazar et al., (2008) show that there is a much higher probability of lying by omission than by declaring deliberately false information. This occurs because providing false information implies a much more obvious dishonesty which makes difficult to keep an honest man interior image.

One of the easiest methods to increase attention in writing communication is that letters to be specifically targeted to certain people. Also, when the message came from a certain person and not from an institution, it became more personal. Highlighting contact details of a representative can determine a response from the recipient more likely than if it is directed to a help-line.

An experiment conducted in the US (Garner, 2005) has analyzed the impact of post-its and handwriting on the probability of response in a survey. The survey which was accompanied by a handwritten post-it had a response rate of 76% compared to 48% for the survey handwritten message appear on the first page and 36% for the survey that this message does not appear. In addition, responds to letters with handwritten post-it attached, responded more promptly and more detailed. When the researcher added his initials and a message of gratitude response rate was even higher.

One person can be conducted to act in a certain way providing the easiest way to do this action. A study conducted in 2009 on fees paying in 13 countries (Dohrmann and Pinshaw, 2009), showed that the most performing administrations were those which pre-fill a large number of form fields with already known information. Pre-filling will ease the process and will ensure accuracy of the data entered in the form.

Another US study (Bettinger et al., 2011) on completing a form for obtaining federal aid for students showed that a form with pre-filled data already owned and providing support for completing other supplementary information, substantially increase the number of students enrolled. College enrollment rates have increased in the experiment next year from 34% to 42% for the groups that facilitated the application process, while for the group that offered only information there has not been a significant change.

Given recent and increasing interest in using smart phones mobile applications become new ways for tax or loan rates payment. Such mobile applications can allow taxpayers to obtain information about the recovery of taxes or tax bills scanning for keeping the personal budget.

Another way to simplify a process is to make it automatic, desired action to be implicit, without further efforts, only the inverse action, also possible, suppose filling out forms. In support of this idea we have classic examples of behavioral economics, according to which once the option of joining to a pension fund became automatic, the number of persons registered rise critically.

Another way to increase attention to specific information is to highlight messages contained in letters, brochures or other written communication. A study conducted in 2010 by Eyetracker, mentioned by Behavioral Insights Team (2012), emphasized that people focus primarily on the top of page (Headings), boxes and images, while the body of the letter is often ignored. The same study shows that the front page of the letter has a 2.5 times higher attention than the back page, and people tend to consider actions required in the right - top of the page especially if the letters have a different color.

Daniel Kahneman, (Kahneman, 2011) introduces the term "cognitive ease" which includes other actions in order to help people to be better understood. He demonstrates that there are some ways to make messages more persuasive:

- using simple language;
- highlighting key information;
- using colors: red or dark blue have a higher percentage of persuasion and retention than green, yellow or pale blue; while using too many colors can create confusion among readers.

Glenberg and Langton (1992) have shown that the use of images in written communication contributes not only to attract the attention of readers, if the images are relevant, but can also help to understanding and memorizing the text.

Images can be used also outside of the envelope in order to stimulate the interest for opening it.

People are living in communities and are strongly influenced in their actions by their peers behavior and values representing social norms. This idea can be used to emphasize a particular behavior using a simple description of the actions of other people in the community. This type of influencing behavior was demonstrated by a series of studies on encouraging recycling, rational use of energy and water, reduce household waste (Schultz et al., 2007).

Using descriptive rules had proved to be effective in increasing fiscal conformism. In an experiment conducted in Minnesota (Coleman, 2007) where taxpayers were informed about the low level of tax evasion in that state led to the correction of erroneous perception that a large number of the population does not pay taxes, increasing the tax rate conformism.

Scientific literature shows that descriptive norms are even more effective if they can be associated with a given population or group, for example referring to a regional or local area instead of a national one.

Reward positive behavior can be cost-efficient in some cases where it is aimed to motivate people to act in a certain way.

The easiest way of rewarding positive behavior is to thank the person for his behavior with a thank you letter for payment the fees before the deadline, for full payment of rates on bank loans, or purchase more products from the same supplier, etc. The research on this subject is at the beginning, but I considered a response of gratitude to positive behavior can bring significant effects at a very low cost.

More explicit methods to stimulate positive behavior are to offer financial prizes in lotteries organized for a higher number of participants to a particular action. For example, the Chinese tax authorities printed the lottery numbers on the tax receipts to encourage conformity and determine a large number of consumers to ask for tax receipts. In 2015 Romanian Fiscal Authority organized first fiscal lottery based on date and sum of the bills.

Researchers (Ayres, 2010) have shown the lottery prizes are effective in terms of cost, with a small number of awards can influence the behavior of large mass of people, but using them repeatedly these incentives could remove the individual from his main motivation.

According to Brown and Zehnder (2006), when between clients and their banks occur repeated transactions, the relationship born cause a much better customer discipline. Therefore the bank must show determination in maintaining long-term customer relationship, even by granting incentives.

The classic way to divert someone from a bad intent is to increase the punishment or the efforts to catch these people in the act. There are several studies showing that there is a greater likelihood that people do not behave honestly if there is a low or ambiguous perception of the consequences or the possibility to be caught.

A study of Gneezy (2005) shows that people are reluctant to lie in favor of personal financial benefits if this has a great impact on other participants. Because people believe that fraud is committed against public entities, a greater awareness of the consequences of their actions on other peers can have significant influence on reducing negative actions. Local public entities can reveal the tax-payers the effect of not paying taxes on services financed from the local budget (clean public spaces, certain social services, etc.)

Another result of the study shows that the probability of committing fraud increases if people who commit such acts think to have a certain degree of anonymity. This can be countered by publishing online or in written publications the persons who committed repeated frauds, frauds with significant value or bad payers. The publication of negative information must be done with caution, to avoid the idea that such behaviors are widespread in society. This can have adverse effects by developing negative social norms. A solution is publishing this information on specific sites where those interested can check. Since 2004 in Romania operates the Credit Bureau, member of the European Association of Credit Bureaus that provide information in order to identify and quantify credit risk, to growth credit quality and reduce the risk of fraud.

### **Behavioral factors in the lending process**

Communication errors can occur in all phases of the lending process, which can cause payment delays and ultimately transforming the loan into a bad one. The causes of these errors are diverse: from the emotions expressed by the bank client to the bank advisor expertise.

To better identify these influences we split the loan process in two phases: the publicity and signing credit contract and the phase of implementation, monitoring and recovery.

In both phases communication errors related to poor customer information, and its ability in understanding the terms used, the course of the loan and the risks assumed.

#### a) Loan advertising and contract signing phase

Making an inventory of misunderstandings that can show up in this phase we identify errors made by bank officer, and also by customer (Table 1).

**Table 1.** *Causes of poor client-bank communication in advertising and contract signing phase*

Causes due to bank officer	Causes due to client
<ul style="list-style-type: none"> <li>- Incomplete information on the characteristics, operation costs and credit process;</li> <li>- Use of inappropriate financial language, according to client financial knowledge;</li> <li>- Incomplete explanation of the contractual clauses;</li> <li>- Lack of knowledge or experience;</li> <li>- Pressure boosting from commercial and quantitative results asked by the bank;</li> <li>- Behavior that is contrary to professional ethics</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of basic financial knowledge;</li> <li>- Misunderstanding of risks assumed;</li> <li>- Inaction in comparing offers on the market;</li> <li>- Incomplete or false statements;</li> <li>- Shame to recognize misunderstanding of contract terms in front of the bank advisor;</li> <li>- Excessive politeness or intimidation from bank advisor;</li> <li>- The hurry to get the money as soon as possible.</li> </ul>

**Source:** author.

One influencing factor over bank advisors honesty in this phase is the commercial pressure. Financial rewards based only on achieving quantitative commercial targets can influence the information communicated to the customer. As we have seen, the research showed that the lie of omission is more likely than providing false information.

#### b) Loan implementation, monitoring and recovery phase

Also in this phase we identify communication errors with consequences in number of complains registered, delayed payment rates increasing the bad loans. The causes identified in this phase are listed in Table 2.

**Table 2.** *Causes of poor client-bank communication in monitoring and credit recovery phase*

Causes due to bank officer	Causes due to client
<ul style="list-style-type: none"> <li>- Initiating communication with clients only related with negative events (non-payment of rates, non-renewal of insurance policies, etc.);</li> <li>- A reduced communication frequency;</li> <li>- Use of a standardized language, hardly understood by the client;</li> <li>- Presentation of drastic, radical recovery solutions, beginning with the first notification of delay;</li> <li>- Changing the banking advisors during the loan, leading to loose the connections born at the loan granting;</li> <li>- Lack of experience or lack of communication skills of the bank advisor (especially in the recovery process)</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of basic financial knowledge;</li> <li>- Misunderstanding of the risks assumed;</li> <li>- Inaction to the bank communication;</li> <li>- Shame to recognize financial problems to friends, family;</li> <li>- Non-recognition of financial difficulties</li> </ul>

**Source:** author.

Note that many of these cases are related to the experience and attitude of the bank advisor and also to the customer financial knowledge.

## Solutions

One of the obvious solutions would be improving bank staff training in terms of technical knowledge but also in relational, communication capabilities. In Romania, even if major banks have integrated, specialized training programs the higher rate of staff turnover makes these programs not very effective.

Another important remedy is increasing financial literacy of the population. This is a long process that requires special attention especially from regulatory or education authorities.

In the following we present the issues identified by behavioral sciences that would facilitate understanding, communication, would strengthen the commitment to pay on a loan, would reduce the number of complaints after signing the contract and ultimately lead to a lower NPL ratio. Doing this would eventually lead to a strong relation between bank and the client.

#### a) Advertising and signing contract phase

*Increasing honesty.* This concerns both sides so the bank or its representative and the customer.

From the bank's point of view, this can be done since the time of printing leaflets and posters with commercial messages that must not show incomplete or distorted information.

Bank staff may be tempted to provide incomplete information. These omissions could be avoided by providing a summary list of characteristics of the type of credit including costs of the related products (current account, card, etc.). This should include the most common operations performed by the client, expressed in plain language, with the possibility of completing this information either on the bank's website or through a subsequent visit to the bank adviser. As a proper time of presenting this list I consider it to be appropriate at the end of the first meeting, when the bank adviser is aware about customer profile and the customer can study the characteristics of product and costs until a next meeting.

Regarding customer honesty, as we have seen, moving the signature at the beginning of the forms and contracts, including the introduction of such statements like "Nothing but the Truth" may have important influences on the accuracy of statements.

#### *Using a custom language*

To provide personalized products and services tailored to customer typology, and a personalized treatment, banks perform customer segmentation by certain criteria (legal form of organization, income, turnover, exposure, etc.). Based on this segmentation banks can create specialized counselors to advise each customer segment, using a specific language accepted and understood by this type of client.

Thus bank can train counselors to treat regular customers, who need simple banking products (current account, card, credit, deposit) or to provide information on sophisticated banking products (investment products, portfolio management shares, derivatives). Also banks that hold units in rural areas can prepare counselors with information related to specific income in this area, specific products, etc.

In the case of legal persons (small businesses/corporations) on these segments were already several concerns.

#### *Make things easy*

To facilitate filling in forms, banks can use software to pre-fill forms with data from their database system thus making also a verification of the existing data. In this way banks will shorten the client time spent filling in the forms and reduce the likelihood of errors.

#### *Showing risk and consequences of false statements*

In order to prevent false or incomplete statements and also to determine a sound financial future behavior related to repayments of the loan, the bank advisor must highlight the risks of such behavior. The presentation of the financial consequences of recording an inappropriate behavior in the Central Credit Bureau database and the duration of records may influence future behavior of the client.

*Providing positive examples from community*

Using descriptive rules, exemplifying sound financial behavior of other people from the loan applicant community can influence its future behavior.

Banks with a large number of branches can be very effective in applying this idea because treating customers in their proximity.

## b) Implementation, monitoring and recovery phase

*Make things easy*

To determine customers to pay the loan rates in time, banks must provide ways for making this action very easy. The development of internet and the increased use of mobile devices have led to alternative channels that replace bank teller. Such payments can be made independent of existing banking unit and its hourly restrictions by internet banking or mobile banking.

Another way of paying loan rates offered by most banks is direct debit on the current account. Receiving regular income in the current account will absolve the holder from other actions in order to pay the loan rates.

*Using a custom language and underlying messages*

These solutions can be used in written communications between bank and customer after credit approval.

Following the evolution of written messages we can say that their form has improved in recent years: the messages come from a representative of the bank, indicate more channels to contact: sales advisor, a call center, or institution's website.

However banks still use an official, sometimes uninspired language in written communication. We also have to mention the moment when most banks begin to write their clients is linked about negative events: outstanding debts, increases in interest rates and fees, recovery solutions, etc.

Thus, to determine a positive response or action as a result of written communication banks should act on the following:

- use a simple and more familiar language;
- highlighting important messages and use the colors (red/blue) in the text body;
- insert handwriting as well as post-it with gratitude for the action required;
- use of different tones when send repeated messages regarding the payment of arrears;
- regular messages on the loan status and thanks for the timely payment of installments.

*Reward positive behavior*

A correct financial behavior of the client during the loan life must be rewarded and made known in the community.

As we have seen one of the easiest ways is a simple thank-you letter. If this involves also a participation in a lottery organized to reward "the most correct client" it will have a greater impact on the customer and the community.

Recognition and appreciation of customer behavior has a positive effect on long-term relationship between the bank and the client.

*Providing positive examples from community*

As shown in phase advertising and credit granting, exemplifying sound financial behavior of other people from the nearest community of the loan applicant can influence its future behavior.

## Conclusions

As we have seen, behavioral influences may occur both in case of individual consumer banking products and bank representative. In this paper we identify remedies to these influences, remedies from the same field of behavioral sciences.

In order to reduce or even eliminate these influences, the proposed solutions have to be applied in the same time with a process of increasing education and financial capacity. This can be achieved by granting easy access to information and providing easy comparison of financial proposals.

Thus, supervisors and market regulators can act in the following ways:

- developing an official educational site, regularly updated, explaining banking products in an easy language and enable the comparison between bank offers;
- introducing financial education programs throughout the educational cycle;
- developing exhibitions, interactive museums to help visitors become aware of the influence of these factors.

Limitations of the present work can be represented by impossibility to capture these influences in an econometric form and to measure the intensity of their manifestation.

Further research can observe the influence of these factors in the selling process of other banking products (investment products, savings, bankassurance, etc.), and also can analyze and effectiveness of other ways to remove these influences.

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# Global Competitiveness Index and economic growth<sup>(\*)</sup>

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**Abstract.** *In this paper, we examine the linkage between economic growth and competitiveness on a panel of 28 European countries, during 2006-2013. We use Global Competitiveness Index (GCI) as a measure of national competitive capacities and find that a shock in competitiveness has a positive impact on GDP developments. Nevertheless, the results show that fast economic growth has a small positive effect on competitiveness, as increasing the competitive capacity of a nation is linked to many other factors such as efficiency gains, better quality of general business environment etc.*

**Keywords:** Global Competitiveness Index, economic growth, panel VAR, impulse response, EU countries.

**JEL Classification:** C33, F43, O11, O47.

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\* All views are of the author and do not involve in any way affiliated institutions.

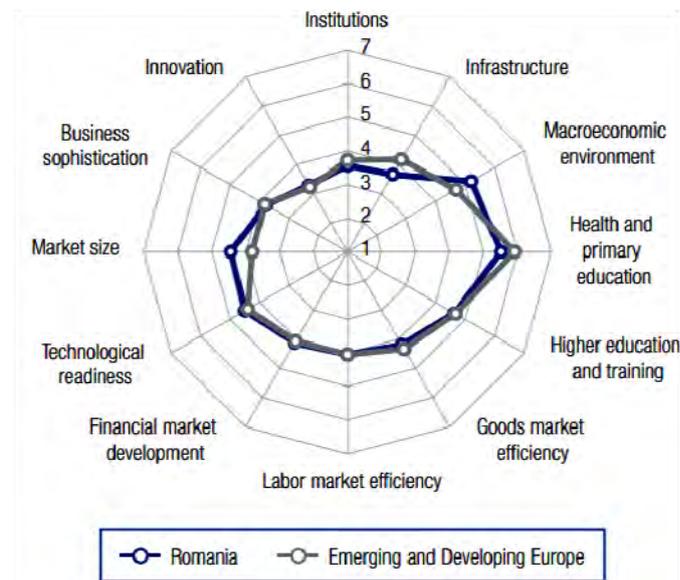
## Introduction

Competitiveness is a multidimensional concept, capturing aspects related to macroeconomic indicators (both price and non-price factors, related to institutions, infrastructure, political, social and legal framework etc.), firm-level performances and cross-border aspects, on the ground of emerging global value chains. As such, the ability of being competitive influences directly and indirectly the welfare of a nation and the proper functioning of an economy.

World Economic Forum defines competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The institution developed Global Competitiveness Index in 2004, which ranks 144 economies worldwide according to twelve pillars.

The first pillar of competitiveness is related to country's institutions, namely the legal and administrative framework. The second pillar refers to infrastructure, which is vital for a proper functioning of the economic activities. Macroeconomic environment represents the third pillar, influencing the ease of doing business and thus the competitiveness, while health and primary education are seen as the fourth pillar, with direct impact on productivity. Fifth pillar focuses on higher education and training (important for progressing into the global value chain), sixth pillar is goods market efficiency and seventh pillar refers to labor market efficiency. Financial market development, in light of the recent financial turmoil, is the eighth pillar of competitiveness. An efficient financial system, which efficiently channels funds to viable projects, is vital for enhancing competitiveness. Ninth pillar is related to technological readiness of economics, as technology determines the ability of firms and nations to compete on international markets.

**Figure 1.** *The GCI for Romania (2014-2015)*



**Note:** closeness to the centre reflects an unfavourable position.

**Source:** World Economic Forum (2014).

Market size has implications for economic efficiency since one might assume that in larger markets, companies can benefit from economies of scale. Thus, size of the market is the tenth pillar, while business sophistication (related to the quality of a country's overall business networks and the quality of individual firms' operations and strategies) represents the eleventh pillar. The last pillar of competitiveness is innovation, especially technological innovation.

The countries are grouped in three stages of development: i) factor-driven – the countries that compete based on factor endowments (unskilled labour and natural resources), for which maintaining competitiveness refers to pillars 1 to 4, ii) efficiency-driven – economies start developing more efficient production processes and increase product quality, competitiveness

being driven by pillars 5 to 10 and iii) innovation-driven – countries and companies compete by producing new and different goods using the most sophisticated production processes (pillar 11) and by innovating new ones (pillar 12).

According to this classification, Romania is situated in Stage 2 of development (efficiency-driven economies, Figure 1). For 2014-2015, the top of the most competitive countries consist of Switzerland, Singapore, United States, Finland and Germany, while Angola, Mauritania, Yemen, Chad and Guinea are at the bottom of world ranking.

### The link between competitiveness and growth. Literature review

The competitiveness of a nation is of vital importance for its current living standard, but also for its growth prospects. The link between economic growth and competitiveness has been highly debated. Ezeala-Harrison (1999) states that international trade is the engine of economic growth, while international competitiveness is considered the fuel that empowers the engine.

Hatsopoulos et al. (1990) claim economic competitiveness is reflected by trade balance and rising living standards or income. Nevertheless, the authors argue that export success can also be achieved at the cost of diminished real income, this situation not reflecting competitiveness.

Nkusu (2013) investigates the interlinkages among competitiveness, exports, economic growth, and fiscal performance. The author concludes that declines in price competitiveness, reflected by real effective exchange rate appreciation, hinder exports and economic growth. At the same time, gains in exports improve output and fiscal performance.

Dimitris (2012), using VAR models for Greece, Ireland, Italy and Spain, shows that economic development is influenced by different GCI pillars, mainly related to fiscal balance, health expenditures, FDI and unemployment rate.

### Methodological framework and results

In this paper, we seek to identify the relationship between competitiveness and economic growth evolution, using a panel Vector Autoregression framework. The estimations were done in Stata, using annual data for 28 EU countries during 2006-2013. The panel used in estimation is balanced, for each European country both GCI and GDP levels being observed for the entire period. The source for the country-level information is World Economic Forum, which offers information about GDP levels (expressed in USD billions) and GCI (expressed in units; it ranges from 1 to 7, 7 representing the highest score).

The general form of a PVAR analysis is exemplified by Canova and Ciccarelli (2004):

$$y_{it} = D_{it}(L)Y_{t-1} + c_{it} + e_{it} \quad (1)$$

Where:  $y_{it}$  is a  $(G \times 1)$  vector for each country  $i$  ( $i = \overline{1:N}$ ),  $Y_t = (y_{1t}', y_{2t}' \dots y_{Nt}')$  and  $t = \overline{1:T}$  denotes time.  $D_{itj}$  are  $G \times N \times G$  matrices for each lag  $j$ ,  $c_{it}$  is a  $G \times 1$  vector of intercepts and  $e_{it}$  the vector of disturbances.  $G$  represents the number of endogenous variables. In our case, the VAR model is estimated with two variables: GDP level (or GDP per capita level for robustness check) and GCI respectively.

Like in standard VAR models (introduced by Sims, 1980), all variables depend on the past of all variables in the system, the principal difference being related to the individual country-specific terms. The estimated matrices are interpreted as average dynamics in response to shocks (Gravier-Rymaszewska, 2012).

For estimating the model, we proceed to data transformation: the variables are time demeaned. At the same time, the panel data imposes that the underlying structure is the same for each cross-sectional unit. This however, might not hold in reality and thus, country fixed effects have to be introduced. These effects are correlated with the regressors, these being the lags of the dependent variables (Arellano and Bond, 1991; Blundell and Bond, 1998). For these fixed effects to be removed, Arellano and Bover (1995) introduced the so-called Helmert transformation, by which the variables are forward mean-differentiated (this assures the orthogonality condition between variables and their lags). The estimation of the coefficients is done by means of just-identified GMM (the number of regressors equal the number of instruments).

The stationarity of the data series was also evaluated and the unit-root tests indicated that the variables are stationary, so one might properly estimate the VAR.

Figure 2 presents the impulse response functions to one positive standard deviation shock for GDP and GCI respectively across all countries in the sample, as well as shocks' trajectory in in time.

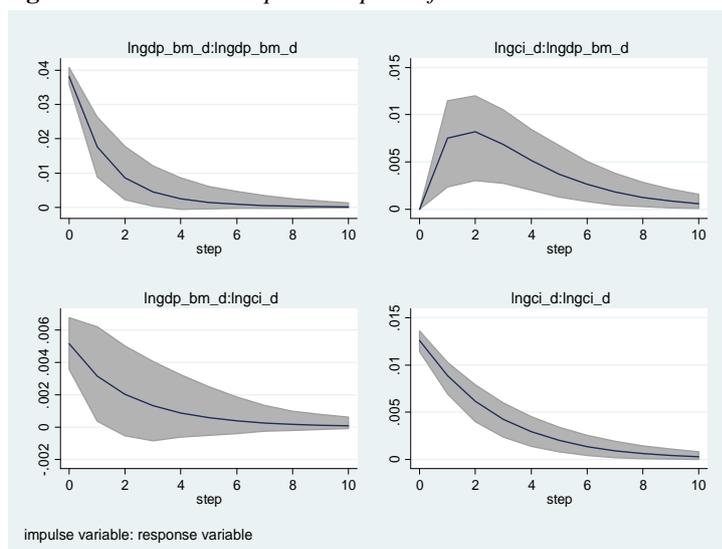
On the first row, the response of GDP to a demand shock ( $\varepsilon_t^{GDP}$ ) and to a shock in competitiveness, respectively, is analysed ( $\varepsilon_t^{GCI}$ ). The output gap increases following a positive shock in GDP, with the highest amplitude after the first year. As a result of gaining competitive advantages (a positive shock in GCI), the GDP increases, the impact reaching its maximum after three periods (i.e. three years). This suggests that improvement in competitiveness have beneficial effects for the economy especially on medium and long term horizon.

On the second row, we analyse GCI responses to shocks intervened in the GDP level ( $\varepsilon_t^{GDP}$ ), as well as in itself ( $\varepsilon_t^{GCI}$ ). The GDP shock positively influences the GCI level on short run, although the effect becomes statistically insignificant after 2 periods. This suggests that economic growth might not necessarily translate into significantly higher country-level competitiveness. Increases of GDP level are not enough for assuring higher competitiveness, as it also assumes supplementary improvements: efficiency gains, better quality of general business environment etc.

The shocks' impact in the system diminishes with increasing time horizon, which indicates the model is not explosive.

The above-mentioned relationships hold also when using GDP per capita instead of GDP.

**Figure 2.** Panel VAR Impulse response functions



**Note:** variables are expressed in logs, demeaned and modified by Helmert Transformation.

**Source:** World Economic Forum, own calculations using Stata MP 12.1.

## Conclusions

This paper showed that economic growth is linked to both price and non-price competitiveness factors, captured by GCI index developed by World Economic Forum.

Competitiveness gains have significant impact on improving living standards by enhancing growth, being a main goal for medium and long run. However, estimations' results highlight that in recent years, the fast growing countries were not necessary the most competitive, as a shock in GDP levels have small positive impact on GCI.

The analysis could further be extended by using other measures of competitiveness (for example export market shares), as well as by a disentangling the effects of different GCI pillars (infrastructure, institutions etc.) on economic development in EU countries.

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# Clustering patterns of socially responsible banks

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**Abstract.** *Economic literature devoted to banking social responsibility outlines the twofold dimensions of this concept: an internal one, which exerts a direct impact on different stakeholders and local community, and an external one that provides an indirect impact of bank's social behavior on its own financial operations, products and services. Although it is argued that the indirect impact has to be at the core of any sound social responsibility strategy, it is very difficult to be accurately assessed. Consequently, the paper aims at depicting whether there are similarities in terms of the economic and social indirect impact provided by the 28 socially responsible banks in EU countries, by relying on several proxy indicators. It will be employed a data mining exploratory approach, named Cluster Analysis, to reveal if there is a pattern of similitude or, on the contrary, high heterogeneity between different intrinsic financial characteristics of sustainable banks. The outcome of the analysis will consist in identifying and grouping in the same cluster the most resembling entities, at two different moments in time: 2008 year-end and 2013 year-end.*

**Keywords:** sustainable banks, social responsible behavior, financial indicators, cluster analysis.

**JEL Classification:** C38, G21.

## 1. Introduction

Moure (2012) appreciates that sustainable banks are only a dimension of the general acceptance of socially responsible banks, sharing common roots with ethical banks. When committing to a sustainability framework, a commercial bank accepts to voluntarily incorporate sustainability principles in its current activity, business lines and products and also in its internal functioning process.

Polychronidou et al. (2014) argue that, by adopting practices of social responsibility, banks commit to respect several principles, related not only to environmental impact of projects financed but also to human rights such as lifelong learning, better diffusion and transparency of information throughout the bank, a better balance between work and leisure.

However, academic literature is questioning whether commercial banks that claim adopting different types of sustainability principles do behave in a responsible manner and have really implemented them in all business lines. Also, the debates are still open in respect of the potential causality between adopting a socially responsible behavior and improving financial performance, reputation or increasing the balance sheet rate of growth, especially in terms of deposits attracted from customers.

The novelty of the paper consists in the interdisciplinary approach, that lies a financial markets' segment (mainstream banks that voluntarily joined an international sustainability framework) with the sustainability stream and statistical tools, but also in the comprehensive sample of banks considered, comprising all the 28 sustainable banks that have adhered to the United Nations Environment Program Financial Initiative sustainability standard. The aim of the present paper is not to perform comparisons between signatory and non-signatory banks, but to take an in depth look into sustainability focused banks' core financial ratios in order to identify similar business models. The paper is structured in two sections: the first one briefly reviews the existing literature devoted to sustainable banks' features or to comparative analyses between signatory versus non-signatory banks. The second section outlines the methodology employed, the choice of variables and discusses the results obtained.

## 2. Literature review

Scholtens and Dam (2007) have investigated whether the performance and the financial behavior in terms of societal, ethical and environment policies of banks that adopted the Equator Principles sustainability framework are significantly different than those of non-signatory banks. They found that balance sheet composition, risks and performance do not differ significantly between signatory and non-signatory banks. By analyzing shareholders' reaction after bank's announcement of adherence to Equator Principles, the conclusion is that they are passive, meaning that they expect no change in shareholder value. The main differences arise in terms of internal policies developed related to social and environmental issues. Also, large banks are more prone to implement sustainability principles in their current business, mainly for reasons related to reputation improvements brought by the responsible conduct.

The role that increased reputation might play from both a performance and risk management perspective determines banks to adopt different codes of conduct in the sustainability field (Sethi, 2002; Florini, 2003; Saunders and Allen, 2002).

Wu, Shen (2013) tried to investigate whether there is a link between banks' corporate social responsibility and financial performance. They identified three main reasons for a bank's engagement in social responsibility, namely, strategic choices, altruism, and greenwashing, and claim that their relation with financial performance is positive, non-negative and non-existent, respectively. Their study covered 162 banks in 22 countries, across 2003–2009 and

found out that a socially responsible behavior is positively related with financial performance, represented by return on assets, return on equity, net interest income, and non-interest income, and negatively related with non-performing loans. Authors' conclusion is that the reason for which banks engage in social responsibility is strategic choice.

A different approach has been followed by Kim et al. (2014), starting from a well known fact that loan rates are determined not only by hard, quantitative information on the applicant's financial soundness, but also by soft or qualitative attributes. In this respect, they argue that financial institutions increasingly screen their borrowers' social, ethical and environmental practices to establish the financing costs. By analyzing over 12,000 loans from 19 countries across 2003-2007, they found out that the ethical similarity of both lenders and borrowers influences loan rates, in terms of lowering the financing costs.

In a previous study, Goss and Roberts (2011) have investigated whether lenders discriminate between borrowers with low levels of CSR and those with higher levels. Also, they made a step further and examined whether lenders perceive the CSR initiatives of low-quality borrowers (borrowers without any guarantee or collateral) differently than those of high-quality borrowers (good collateral). Their findings show that CSR is a second-order determinant of spreads as it exerts modest economic impact on spreads. When judging in terms of collateral, low-quality borrowers face higher loan spread and shorter maturities, while lenders are indifferent to high-quality borrowers with CSR behavior.

According to the latest report issued by Global Alliance for Banking on Values (2014), which compares sustainability focused banks with large banks that haven't committed to a social responsible behavior, the sustainable banking business models are a reliable alternative to mainstream banking due to strong capital positions, better connection with the real economy and steady financial returns. In terms of the ability to finance real economy, computed as the share of loans in total assets, sustainability focused banks record a nearly double level than GSIFIs (global systemic financial institutions). In respect of reliance on customer deposits to finance the asset side of the balance sheet, the former account at end 2013 for a deposit to total assets ratio of 80%, while the GSIFIs recorded 48.8%. In terms of capitalization, both sustainable banks and GSIFIs show strong capital ratios. Financial returns recorded during 2003-2013 exhibit lower levels than those reported by GSIFIs, but are characterized by lower volatility and increased resilience.

### 3. Cluster analysis methodology, variables selection and results

A socially responsible bank still follows profits, but financial performance has to be treated in a sustainable manner. It has to ensure the going concern of the banking business and to be the result of a prudent behavior, so as not to expose the bank to the liquidity, credit or insolvability risks. In addition, banking regular activities have to show increased awareness on societal and environmental challenges. The purpose of this research is to investigate whether sustainable banks have aligned their business practices and balance sheets structure, or on the contrary, there is evidence of heterogeneity across financial positions and financial indicators. The presence of heterogeneity might indicate that these banks still perform a strong commercial financial behavior, the commitment to a sustainability international framework being mainly for strengthening reputation and gaining competitive advantages.

Cluster analysis is best suited for the purpose of our research as it performs a classification of banks into distinct groups or clusters, based on a set of attributes or variables. The outcome is that the banks within a group are the most similar while the others are not. It is an exploratory data analysis technique, whose results are strongly influenced by the amount of random noise in data, the presence of outlier data, the variables included in the analysis, the proximity measures used and the linkage methods employed (Timm, 2002).

To measure the proximity between individual banks it might be employed either a similarity or degree of association measure or a distance or dissimilarity measure. In this study it has been used the squared Euclidean distance, which is a dissimilarity coefficient. The lower its value, the most resembling the two banks considered.

To perform the cluster analysis it has been chosen the agglomerative hierarchical clustering algorithm. This method creates a sequence of cluster solutions, the starting point being the inclusion of each bank in its own cluster. Then the banks that have the least dissimilarity are joined in the same group and so on until all banks have been merged into a single, big cluster.

To compare two clusters and decide whether they should merge or not, it has to be used a measure called linkage method. The most employed ones are the average linkage and Ward's linkage. For comparative purposes, our study employs both. The average linkage doesn't rely on a maximum or minimum dissimilarity between two clusters, but it computes the proximity between them as an average of dissimilarities. Ward's method maximizes between-group differences and minimizes within-group distances. It defines the distance between two clusters through a variance approach, to find the cluster with the best configuration (the least increase in the sum of squares).

The sum of squares by combining clusters A and B =  $\frac{nA \times nB}{nA + nB} (cA - cB)^2$

Where:  $nA$  and  $nB$  represent the number of countries in clusters A and B respectively.  $cA$  and  $cB$  are the centers of the two clusters

For conducting the analysis it has been chosen four key financial indicators. The liquidity position is proxy by the loan/deposit ratio. A value close to one suggests that loans are funded mainly by customer deposits, which is a safe balance sheet structure. Operational efficiency is proxy by cost to income ratio. In practice, most banks target an operational efficiency level of around 50% or less, claiming that profitability cannot be achieved without monitoring and controlling the operational expenses. Capital adequacy is depicted by Tier 1 ratio, computed as the share of tier 1 capital in risk weighted assets. A high capital ratio increases bank resilience to unexpected shocks. In respect of profitability it has been used return on assets (ROA), computed as the ratio of bank's after tax profit in total assets. The choice for this profitability indicator is justified by the findings of several researchers (Hassan and Bashir, 2003; Flamini et al., 2009; Dietrich and Wanzenried, 2011; Sufian and Zulkhibri, 2011), which argue that ROA is a better and stable proxy for profitability than ROE.

The raw values cover a large range, some depicting extreme values, which might bias the final results. Therefore, to remove them and flatten their variation it has been applied z-score standardization. The analysis will be performed so as to identify and group the most resembling banks, at two different moments in time: 2008, the year that witnessed the onset of the financial crisis and 2013, for a current perspective.

**Table 1.** *Clustering solutions*

Number of clusters	Ward linkage		Average (between groups) linkage	
	2008	2013	2008	2013
1	Banco Espirito Santo, Intesa Sanpaolo, Nordea, EFG Eurobank, Barclays, BNP Paribas, Rabobank	BNP Paribas, ING, Intesa Sanpaolo, BBVA, Raiffeisen, Banco Espirito Santo, Unicredit, Societe Generale, EFG Eurobank	Banco Espirito Santo, Intesa Sanpaolo, Nordea, EFG Eurobank, Barclays, BNP Paribas, Rabobank, HSH, KfW, Bayern, Societe Generale, Piraeus, Alpha Bank, BBVA, Standard Charter, Danske Bank, LBBW, Raiffeisen, Unicredit, HSBC, Swedbank	BNP Paribas, ING, Intesa Sanpaolo, BBVA, Raiffeisen, Banco Espirito Santo, Unicredit, Societe Generale, EFG Eurobank, Danske Bank, LBBW, Triodos, Rabobank, ABN Amro, Bayern, Nordea, BCR, HSBC, Standard Charter, Barclays, Royal Bank of Scotland, Deutsche Bank
2	HSH, KfW, Bayern, Societe Generale, Piraeus	Barclays, Royal Bank of Scotland, Deutsche Bank	ING, Royal Bank of Scotland, Deutsche Bank	HSH, Swedbank, KfW
3	Alpha Bank, BBVA, Standard Charter, Danske Bank, LBBW, Raiffeisen, Unicredit, HSBC, Swedbank	HSH, KfW, Swedbank	Triodos	Alpha Bank
4	ABN Amro, BCR	Danske Bank, LBBW, Rabobank, Triodos, ABN Amro, BCR, Bayern, HSBC, Nordea, Standard Charter	ABN Amro, BCR	Piraeus
5	ING, Royal Bank of Scotland, Deutsche Bank	Alpha Bank, Piraeus	HBOR	HBOR
6	Triodos	HBOR		
7	HBOR			

**Source:** author, based on SPSS outputs

According to the results obtained by means of Ward linkage method, we have observed the following clustering patterns:

- Banco Espirito Santo, Intesa Sanpaolo, EFG Eurobank and BNP Paribas have been placed in the first cluster in both years considered. It means that they are the most similar in terms of the key financial ratios considered and that the similitude pattern persisted over time.
- HSH and KfW have been always positioned in the same cluster.
- Standard Charter, Danske Bank, LBBW and HSBC form another stable cluster.
- ABN Amro and BCR have been grouped together in both years.
- Royal Bank of Scotland and Deutsche Bank proves to be another persistent cluster.
- HBOR is the most dissimilar bank in the sample, and this feature persisted both at the onset of the financial crisis and several years after. By analyzing its balance sheet raw data it can be noticed striking features of its financial position. Its business model doesn't focus on customers' deposits as a core liability, but rather on long-term borrowings and issuance of bonds. As deposits held a low share in bank's total liabilities, this could explain the high value recorded by the liquidity ratio, largely exceeding the prudential level.

When changing the previous linkage method with the average linkage one, we have obtained the following clusters' configuration, common for both years:

- a big group, comprising most banks: Banco Espirito Santo, Intesa Sanpaolo, Nordea, EFG Eurobank, Barclays, BNP Paribas, Rabobank, Bayern, Societe Generale, BBVA, Standard Charter, Danske Bank, LBBW, Raiffeisen, Unicredit and HSBC.
- HBOR is still an outlier bank, in both years considered.
- the remaining banks do not prove a resemblance pattern that lasts over time.

If we analyse comparatively the clustering identified by the two linkage methods for the year 2008 we notice some similarities, which confirm the results obtained and act as a robustness check:

- Banco Espirito Santo, Intesa Sanpaolo, Nordea, EFG Eurobank, Barclays, BNP Paribas and Rabobank have been placed by each linkage method in the same cluster. They record operational efficiency around the average (56%), ROA levels around the average of 0.53%, below average (8.55%) values for tier 1 and close to average values for the liquidity indicator.
- ING, Royal Bank of Scotland and Deutsche Bank recorded a ROA equal to zero, the highest operational expenses in the sample (over 90%), above the average values for tier 1 and below average values for the liquidity indicator. Consequently, they have a good capitalisation, a relatively balanced liquidity position, but profitability is negligible and high operational expenses eroded much of the income generated across 2008.
- ABN Amro and BCR have recorded the highest profitability levels, of over 2%, one of the highest tier 1 level, operating efficiency above the average and a moderate liquidity position (130-138%).
- Triodos depicts the highest level of capitalisation (15%), the lowest liquidity ratio and implicitly the lowest exposure to liquidity risk as the loans provided to customers account for only 61% in total deposits collected, above the average values for operating efficiency and below average values for ROA.
- HBOR records above average levels for ROA, tier 1 and operating efficiency but the highest level for the liquidity indicator.
- Focusing on the common patterns identified for the year 2013, through both linkage approaches, it has been remarked the following clustering:
  - BNP Paribas, ING, Intesa Sanpaolo, BBVA, Raiffeisen, Banco Espirito Santo, Unicredit, Societe Generale and EFG Eurobank share the same group, with below average ROA and tier 1, close to average operational efficiency and close to one liquidity ratio.
  - HSH, Swedbank and KfW depict small, below average operational efficiency, the highest capitalisation levels, relatively high liquidity ratios and moderate profitability.
  - Alpha Bank and Piraeus have been signalled by both methods as depicting particular features. They record the highest levels of ROA, below average tier 1 ratios, close to one liquidity ratios. In terms of operational efficiency, Piraeus holds the minimum level, of 22.45% while Alpha Bank has a below average level.
  - HBOR maintains its strong dissimilarity with the banks in the sample, mainly driven by its highest liquidity ratio. It improved its capitalisation, while ROA and operational efficiency lie above the average.

To sum up, socially responsible banks show a relative heterogeneity of their business model, in terms of the financial ratios considered. Although they all voluntarily committed to follow and implement in current activities several responsible criteria, they haven't forgotten their commercial nature. Banks' involvement in social responsibility brings valuable reputation improvements, but cannot be easily quantified through financial ratios.

## Conclusions

One of the consequences of the global financial crisis has been the increased awareness on the lack of morality, transparency and ethics which characterized the financial institutions' behavior. There is more and more emphasis put on the social responsible orientation that financial industry has to acquire and strengthen, in order to better serve the regular customers, stakeholders and local communities.

Against this background, a still small but increasing body of literature attempts to investigate whether banks claiming a socially responsible, sustainable or CSR orientation do implement in their regular activity these responsible principles. The research in this paper focused on a comprehensive sample of 28 commercial banks that voluntarily joined a sustainability framework (the UNEP FI), the purpose being the aggregation of these banks into homogenous

clusters and the identification of the features depicted by each cluster. The findings show that although these banks share the same ethical values, in terms of core financial ratios there is great heterogeneity. Consequently, the present study aligns to the ones suggesting that banks' social responsibility is in an incipient stage, being perceived rather as a marketing tool that is beneficial to banking reputation.

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# Formation of an effective mechanism of financial and credit support reproduction a company's fixed assets

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**Abstract.** *The paper proposes an approach to the assessment of the economic efficiency of financial and credit support reproduction a company's fixed assets for sea transport sectors of the regional economy of the Russian Federation on the basis of an economic-mathematical models describing the process of cash flow development and including sensitivity analysis. The article examines the process of forming an effective mechanism of financial and credit support when reproducing fixed assets of the economic entity; offers forfeiting as the finance vehicle element; introduces comparative analysis of loan financing, leasing and forfeiting and proves the economic viability of the last described. The results of the study to determine the most effective methods of financial and credit support of the reproduction process in the economy may be based on the need to develop a financial mechanism for the Russian financial system in order to ensure sustainable economic development.*

**Keywords:** finance methods, financial relations, finance and credit support, leasing (finance lease), forfeiting, loan, fixed assets reproduction.

**JEL Classification:** G19.

## 1. Introduction

The investigation and development of methodology of forming an effective financial and credit support when reproducing a company's fixed assets is particularly pertinent in view of today's economic climate in Russia. Financial vehicle is a system of financial relations management with the use of capital gearing and finance methods (Raizberg et al., 2004). It consists of various elements complying with financial relations. It is the multiplicity of financial interlinkages that prejudices the implementation of many types, forms and methods of organization of financial vehicle elements. The need for developing the elements of financial vehicle with a focus on forfeiting is a priority topic (Miroshnikova, 2009).

The need for enhancing the scope of implementation of technical reconstruction as one of the main types of fixed assets reproduction has caused changes in the structure of sources of funds. That gives place to modern, unconventional methods of financial and credit support of reproduction process.

The recent increase in investment activities aiming technical modernization and reproduction of fixed assets in the economy is plagued by underdeveloped financial markets, basic concepts of stimulation of investment activity and consideration of the specific characteristics of the investment potential realization (Sheremet and Ionova, 2004).

The introduction of the term «forfeiting» as a financial instrument advances the theoretical and methodological basis for further development of the financial vehicle. It is appropriate to examine the relevance of this instrument justifying the economic efficiency and compare it with other funding models (Miroshnikova, 2013).

## 2. Data and methodology

### 2.1. Data sources and the model

The purpose of this study is to evaluate the economic impact of different financing methods for the reproduction of the Russian economy. Further theoretical and practical developments in the field of financing the reproduction process is demanded for the development of regional economy. The calculation is based on the principle of comparing the effect of alternative methods of fixed assets financing.

Economic-mathematical models consist of mathematical expressions that describe the process of formation of streams of payments and relationships, which allow calculating the desired performance characteristics. The main advantage of using the model, as is known, is the ability to simultaneously integrate all the necessary requirements, conditions and proposals. The important factor is some option in the review these facilities during the work with the model, the consistency of all the calculated parameters, finally, the possibility of obtaining behaviors of the studied phenomenon (in our case, the method of financing) for various combinations of monetary market, inflation, demand. A feature of the model developed for investment in production, is that it is the basic block in which costs and return on investment (flow of charges) are calculated for each time interval with a specific distribution within it. In the analytical model block defines the required performance indicators. The model allows sensitivity analysis, i.e. the identification of the most important model input parameters and receiving system of evaluation of investment efficiency for a wide range of values of such parameters. We obtain not only point estimates, but also a detailed picture in the form of tables and graphs efficiency values for a variety of possible and expected situations. Evaluation of the effect of the forecast period is made in accordance with the methodology for determining net present value (NPV) based on the discount rate.

Key assumptions and limitations taken into account are as follows: the economic impact is calculated using those industries in which there has been a practical use and application of these coatings. In accordance with the method used to determine net present value (NPV) of economic benefit, the results were given to the current value based on the discount rate by the formula (Soldatova, 2013):

$$NPV = \sum D_i / (1+K)^i, \quad (1)$$

where:

NPV- present value;

$D_i$  - the amount of economic benefit obtained in the  $i^{\text{th}}$  period of the discrete projection period;

$K$  - the discount rate;

$i$  - period.

## 2. Prediction accuracy and performance evaluation

To justify the efficiency calculations it is necessary to carry out the planning of revenue and costs. These indices are calculated on the assumption of a fully loaded vessel during the year. Revenue was calculated based on the average of tariffs for transportation of cargoes by sea transport on the territory of Kamchatskiy Krai (data were taken from the website of the company the «Trance-the leader of the DV») and the average number of use of the vessel per year. The ship takes on Board four 20 foot containers or four trucks of 20 tons. The cost of freight per ton is 20-25 rubles per kg, when fully loaded the vessel can work 2-3 days a week. Thus in the first year the amount of revenue was 27 540 000. The rate of revenue growth was 5% (the average growth of prices for this service).

To calculate the costs that the company will incur during the operating activities were calculated following elements: fuel costs; the salary Fund; depreciation; insurance of the vessel; the costs of preventive repairs and maintenance of vessels. In this article cost includes the painting of the vessel, the partial replacement of equipment, etc. This cost in the first year is 150 thousand rubles. Based on the data of the ship, it uses diesel fuel; average consumption for the vessel under such conditions is 500 litres per day (provided that the ship is working 18-20 hours a day). According to the characteristics, the ship has 2 diesel generators. On average the ship uses 1 ton per day. The cost of 1 liter of diesel fuel is 33 rubles. Total fuel costs for a year will be 3.432.000 rubles. The growth rate of the cost of fuel is 5% per year. For calculation of insurance the standard package of the company «Ingosstrakh» - 8% of the value of the vessel - was taken. It includes the insurance of risks associated with the wreck of a vessel due to natural disasters. Justification of the investment amount is 1.150.000 dollars or 39 100 000 rubles that corresponds to the cost of the vessel. For the considered schemes discount rate was 14.9% (Investment asset renewal (7%), inflation risk (4%), industry risk (1.9%), dependence on external sources of funding (2%)).

For finding the net present value and other indicators it is necessary to calculate the discount rate. In the process of discounting is usually done the conversion of future costs and outcomes to date. The discount factor is calculated by the formula of compound interest:

$$\alpha = \frac{1}{(1+r)^t}, \quad (2)$$

Where:

$\alpha$  is the discount factor;

$r$  – discount rate;

$t$  – time (year).

### 3.1. Stages of the research

The logic of the research involves the implementation of the following basic steps.

First point. Introduction of the «forfeiting» as an innovative financial instrument for Russian economy.

Forfeiting is a specific form of medium-term foreign trade lending. It is a sale transaction on credit terms, which represents the operation of purchasing loan-subscriber's debentures on non-recourse basis. Non-recourse basis stands for the risks and responsibilities that a fund receiver takes on. Usually documents of indebtedness consist of ordinary bills and bills of exchange.

That type of financing is used by discounting a series of consecutive ordinary bills that serve as the buy-side payment obligations in exchange for goods or services under a contract with the exporter.

Compared to traditional bill discounting, forfeiting:

- Is usually used when supplying equipment of high value.
- Is used with long-term delay of payment (from 6 to 10 months beyond traditional 90 or 180 days).
- Includes guarantees or aval of the first rate bank that is necessary for rediscounting (Adamova, 2005).

The participants of a traditional forfeiting transaction are merchant (loaner), buy-side and lending bank (the taker of the creditor's debt). Both a loaner and a buy-side can initiate a transaction. A forfeiter there is a bank or any institutional lender that mediates the lender and the promisors. In international trade a supplier's bank acts as a forfeiter, accepting and clearing bills on non-recourse basis. A bill should be drawn either in one of the freely convertible currencies or in one that is popular at the global market. The principle should be negotiated in every case. Sometimes acquirer's guarantor bank can serve as the fourth participant of transactions that ensures the recovery of debt on a bill. It is a great opportunity for a company to acquire fixed assets at lower cost.

In Russia a traditional forfeiting transaction looks as follows: if a Russian importer after making a contract with a foreign party has proved its creditworthiness, he can pay with a bill instead of cash avoiding advance payment. Yet, this bill must be avalized by Russian bank that is of good reputation at the financial global market. Providing clearer, Russian bank becomes a payment guarantor.

After getting avalized bill a foreign exporter presents it to foreign bank that endorsed an agreement with Russian bank for discounting. Upon aval receipt foreign bank pays to the exporter a nominal bill amount, net of discounts. On the expiration of the bill foreign bank tables a bill to the Russian bank and receives money. Russian bank submits the bill to the Russian importer who meets the bill.

This scheme describes a loan taken out by a foreign bank to Russian importer mediated through Russian bank. In addition, a loan period concurs with the currency of a bill. As you can see, forfeiting allows not only avoid advance payment, but, with luck, pay for goods after releasing them on the Russian market, which makes it attractive for Russian importers.

One of other advantages is the price factor as the cost of lending resources in foreign banks is much lower than in Russian banks. Moreover, forfeiting assumes the operating risks.

Forfeiting is a flexible instrument of international finances. Most transactions are based on export deliveries, which can be inside the country as well. At the moment forfeiting is not a traditional financial instrument, but it supplements traditional ones, thus requiring further development.

For calculation the following conditions of the Bank of Jiangsu (China) were used:

- five promissory notes with an annual repayment;
- interest accrues on the portion of debt that is covered by the bill;
- interest rate of 8.5%.

In the calculations the terms of this Bank will be used.

For the first option envisaged that the repayment of principal shall be made in equal amounts, respectively, in each promissory note the amount of  $R/n$  is recorded. The interest for the loan form number:

$$Pi, Pi \left(1 - \frac{1}{n}\right), \dots, Pi \left(1 - \frac{i-1}{n}\right), \dots, \frac{P}{n}i \quad t = 1, 2, \dots, n, \tag{3}$$

Where: P is the price of the goods;  
 i – rate of simple interest for the period;  
 n – the number of bills.

The amount of the promissory notes, redeemable at time t, will be

$$V_t = \frac{P}{n} + Pi \left(1 - \frac{i-1}{n}\right) = \frac{P}{n} [1 + (n - i + 1)i] \tag{4}$$

The total amount of accrued interest equal

$$Pi \sum_i^n \left(1 - \frac{i-1}{n}\right) = \frac{n+1}{2} Pi \tag{5}$$

The amount of bill portfolio will be

$$\sum V_t = P \left(1 + \frac{n+1}{2} i\right) \tag{6}$$

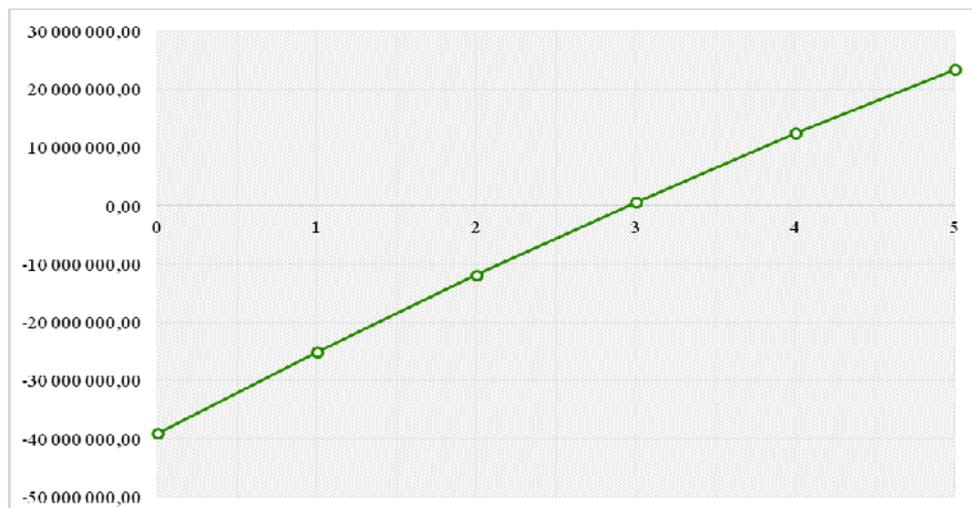
From these calculations we can draw the following conclusions:

- The annual amount for redemption: 7 820 000 roubles;
- The total amount of interest: 9 384 000 roubles;
- The total sum amounted: 48 484 000 rubles.

Cash flows upon acquisition of a vessel according to the scheme of forfeiting shows that the NPV is positive (27,788,780.2). IR (profitability index) was 1.71, which is higher than the unit and reflects a return on invested capital. Internal rate of return was 21.78%. Since IRR is more than 16.9%, the project provides a positive value of NPV.

Investment profile of the project using forfeiting financing scheme shows that the payback period is about 3 years.

**Figure 1.** The financial profile of the project using forfeiting financing scheme



The sensitivity of the cash flows of the lessee with the increase in fuel costs by 10% and the reduction of revenue by 5% reflects the reduction in NPV, profitability index and internal rate of return. In this scheme, the funding factor for decrease in profit is also more powerful than the increase in the cost of fuel.

Second point.

Loan is one of the most popular ways of getting money for a certain period of time. Most Russian companies prefer it as a source of funding. Leasing and forfeiting are more complicated, but at the same time have greater advantages.

As a subject of research, loan consists of elements that are closely related. These elements are entities, i.e. loan supplier and loan debtor. Loan supplier grants money. In fact, any entity can become a loan supplier if it lends money.

When a company purchases properties worth more than \$1mln, bank can require larger collateral and guarantees. Collateral is demanded by virtue of law or the contract and it can be provided in the form of company's assets, securities and property rights. The exceptions are assets which have been withdrawn from circulation, statement requiring associated with the loan debtor, particularly, claim for health compensation and other rights, assignment of which is statute-banned.

Guarantees are not less important. As for legal entities, guarantees are given by the head of a company, all the founders (entities with participating interest of more than 20%) or the spouse, if the head is the only founder. In Russia this term is applied by «Rosselhozbank, LTd».

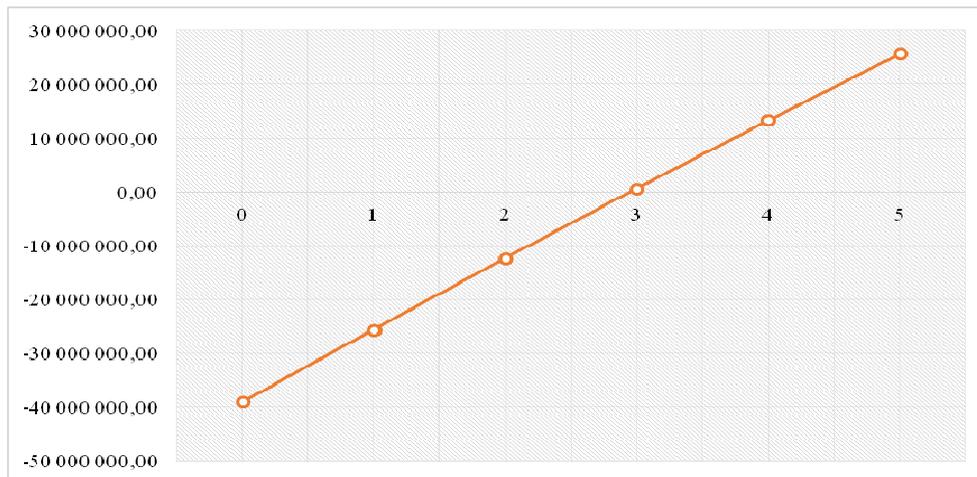
One of a bank loan features is the targeted use. When a company purchases high-value assets, bank lends large sum of money and starts to control the company's activity. For instance, the bank has the right to demand, at any time, balance sheet, finance statement and its definition. The breach of credit terms causes long-term withdrawal of the credit or implementation of default interest.

Substantial lending can be applied, if a company has existed for a certain period of time and got a fixed income. Also attention is given to goodwill of the company, criminal records, relations with debtors and creditors and accounts payable.

To estimate creditworthiness of a lender, quantitative and qualitative analyses of the risks are implemented. The aim is to determine the opportunities, amount and conditions of credit granting. The assessment of financial condition of the company covers the latest 3 years and it is based on methods, produced by the Ministries and investment banks. The most popular methods are offered by «Sberbank of RF».

#### 4. Empirical results and analysis

For calculations there were used the credit conditions of the Bank «Intesa». Loans are granted for five years. Loan interest rate is a 12.75% per annum. Repayment terms provide for repayment of principal and interest monthly over 5 years. For calculations we use the differential method of calculating payments. A criterion of efficiency is considered the net present value of cash flows. Cash flows upon acquisition of a vessel according to the scheme Bank loan shows that the NPV is equal to the value of 25 654 930 rbl.; IR is 1.66; IRR takes the value of 20.2%.

**Figure 2.** *The financial profile of the project using loan financing*

The payback period is about 3 years old that we can see from the figure.

A sensitivity analysis of this project revealed that the most significant factor affecting efficiency is the reduction of revenue by 5%, which can be noted a strong deterioration of performance indicators

The third point. Rental of equipment known since the middle ages, for example, the rental of a ship anchors in Venice XI. Leasing is a transaction with the participation of three people (legal and natural entities). In real terms one party buys some assets from another party and then lends it to the third party with a purchase option. The assets of the lessor may be provided in the form of equipment, transport, construction for production needs and so on. The terms are specified in the agreement of the parties (Weber, 2007).

The main feature of leasing is the absolute power of a user to choose the kind of property and its producer (in accordance with the lessor's abilities). That financial instrument is beneficial to small and medium-sized enterprises, as the procedure of concluding a contract is easier than getting a loan. If the contract conditions are violated, the lessor confiscates property.

The regulatory and legal framework of leasing is based on such regulatory acts as:

Federal Leasing Act No. 164 of 29 October 1998;

Civil Code of RF and the Russian Tax Code;

Federal Act No. 16 of 8 February 1998 «About Russia's joining to UNIDROIT Convention»;

UNIDROIT Convention on International Financial Leasing, Ottawa of 25 March 1988.

Now let us examine the characteristics of leasing, forfeiting and loan as financial instruments and check their viability in terms of purchasing a sea vessel. According to «Expert RA» agency, sea vehicles leasing makes the lowest share of leasing market, though it has increased by 0,5% for the last two years. Leasing characteristics depend on vessels high value, greater construction and pay-off periods.

According to the effective legal framework, sea vessels are defined as real estate property. That means that ownership rights must be registered, which makes the transaction more complicated. Leased asset cannot be pledged until the ownership right is registered by the lessor. Sometimes it can cause problems with bank financing.

In practice, vessels leasing goes through a number of stages: choosing the vessel with a certain range of functions, choosing either Russian or foreign supplier, negotiating the terms and signing the agreement, supplying the vessel to the lessee (arranging import customs formalities and registration in the name of either lessor or lessee), insuring the item.

When using the scheme of acquisition of a vessel through lease agreement, credit terms of the company «TransFin-M» were used, where loans are granted for four years with annual repayment. Interest rate is 10.5% per annum.

For the calculation of the lease payments it was proposed to use a formula with coefficient calculation for regular rents. Under such scheme, the lease payment is included in cash flow from financial activity that differs from the calculation of cash flows when determining the lease payments under the scheme recommended by the Ministry of Finance. For accuracy comparisons were calculated in both methods.

At first, lease payment under the scheme recommended by the Ministry of Finance was calculated.

$$PL=AO+PC+IN \quad (7)$$

Where:

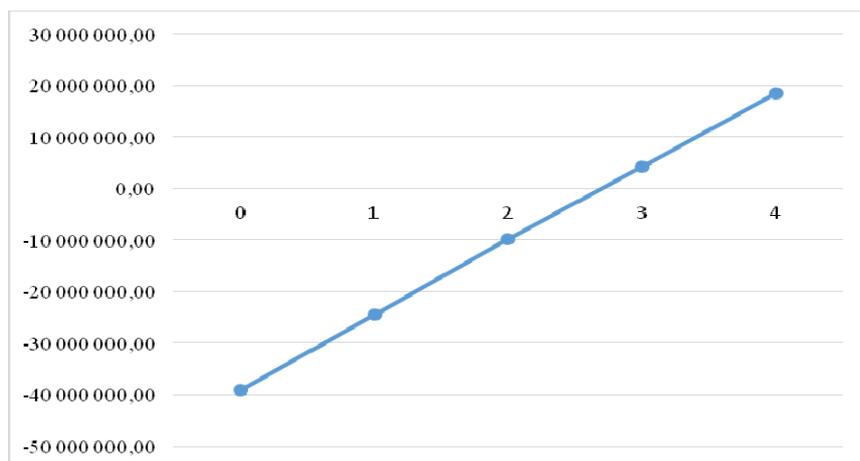
PL is the total amount of lease payments, RUR;

AO depreciation and amortization or maturity value cost, rbl.;

PC - fee loans, RUB;

IN - reward of the lessor for the provision of property, rbl.

**Figure 3.** The financial profile of the project using lease financing



The payback period is 2.6 years; discount rate of 14.9%; NPV takes the value 18,447,075.54 rubles; IR is 1.46; IRR takes the value 18.62%.

These values of efficiency indicators are change in the accrual of lease payments by a factor for regular rents.

To calculate the coefficient for permanent rent the following formula is to be used:

$$a = \frac{i}{1 - (1 + i)^{-n}} \quad (8)$$

a – coefficient ghosts of permanent rent;

i – interest rate per year;

n – the lease term in years.

The payback period is 2.4 years; discount rate of 14.9%; NPV takes the value 21 818 626 rubles; IR is 1.56; IRR takes the value 21.37%.

The following investigation introduces comparative analysis of loan financing, leasing and forfeiting on indicators, such as transaction object, time limits, finance methods, maximum term, risks and guarantees. The result of investigations is determining the economic viability.

#### 4.1. Comparative analysis

**Table 1.** *Comparative analysis of loan financing, leasing and forfeiting*

Comparison base	Loan financing	leasing	forfeiting
Transaction object	funds	Equipment or property	ordinary bills and bills of exchange
Loan term	Long-term loaning (up to 10 years)	Long-term loaning (up to 10 years)	Long-term loaning (up to 10 years)
Amount of loan	Up to \$4,000,000	The amount is limited by lessor's abilities	The amount can be enlarged depending on the ability of buyers to create syndicates
Financing method	Bank lends money and starts to control the company's activity (targeted use)	Lessor pays for transaction, lessee makes lease payments during loan period	Forfeiter meets a debt less the discount
Risks	Bank risks to lose own money, but assumes all the buyer's risks	risks depending on the agreement terms, either a lessor or a lessee can bear the risks	Forfeiter can resell the assets on the secondary market
Resale	One bank can resell the loan to another bank	Rented equipment can be transferred to another lessee	Forfeiting assets can be resold on the secondary market
Guarantees	Guarantee is required	Guarantee from a third party is required	Guarantee or aval is required from a third party
Pledge type	The assets themselves	Credit by rented assets	Possible transfer of finance bill which aim is to accumulate value for other allowed goals achievement

All the financial vehicles are unique and required by the economies of different countries. Economic viability of each of them depends on the goals of the promises, but all of them are appropriate for large companies that have the overall aim of accumulating funds for different-term projects implementation.

The difference of the financial instruments is based on several indicators:

- Transaction object.
- Loan term.

Not all the banks are ready to provide high-value loans

- Amount of loan.

For instance, commercial banks give credits with a maximum term of \$4,000,000. The amount of leasing depends on the company's size and turnover. As for forfeiting instrument, the amount is also limited as buyers can create syndicates. The process of unification is based on the mutual deal of the forfeiters on the share acquired.

- Risks.

Commercial banks do not assume risks connected with purchasing while forfeiter bears a risk of debt non-payment (including policy risk and exchange risk).

- Guarantee.

Bank loan demands additional guarantee in the form of stocks. Sometimes leasing does not demand guarantee, but it depends.

If using forfeiting model, aval or guarantee of a bill or note is required. Besides payer, everybody can act as a guarantor of a bill, whose guarantee is valid never mind, the reasons. In such case aval is equal to guarantee, which is complementary in relation to the primary obligation.

Also it is important to mention, that leasing companies specializing in leasing certain kinds of equipment and thus having long-term relations with suppliers, sometimes can purchase necessary equipment for lower price (or get sale for lot-size orders). That causes the decrease of the deal price (Grabovoy and Yaskova, 2004).

On the basis of the above, we can see that leasing and forfeiting funding models are more beneficial, as they include favorable terms, like risks allocation, finance methods and terms.

Let us examine the ways of ship financing in terms of bank loan, leasing and forfeiting.

The efficiency of practical implementation of the investigated financing tool was implemented for transport vessel in fishing industry. We calculated the amount of necessary financial and credit support of the fleet reproduction in fish industry of the Far -East region with the use of forfeiting, leasing and loan. To select efficient financing schemes the criteria of efficiency of investment projects (net present value, profitability index of discounted investment, internal rate of return, payback period) were considered and final amount of the purchase was calculated (Chetyrkin, 2008).

Calculations were performed for the transport vessel valued \$1150000 for the period of 5 years with the use of various financing methods. Also sensitivity analysis was performed to identify the impact of two factors - the reduction of revenues and the increase of fuel cost (Miroshnikova, 2014).

**Table 2.** *Efficient criteria for the different funding schemes*

Indicators	Credit	Leasing	Forfeiting
Vessel cost, rubles	1150000\$		
Basic version			
The final vessel cost (with interest)	1524142,46	1466903	1426000
The period of providing	5	4	5
The ratio of the final cost to the cost of the vessel	132,5%	127,9%	124,3%
NPV <sub>0</sub>	754556,76	641724,29	817317,06
IRR	20,2%	21,37%	21,71%
IR	1,66	1,56	1,7
Payback period	3,1	2,4	3
With the increase of fuel prices of 10%			
NPV <sub>1</sub>	723734,64	616163,15	786494,91
The ratio of the growth rate of NPV <sub>0</sub> к NPV <sub>1</sub> )	104,5%	104%	103,9%
IRR	19,1%	20,57%	19,8%
IR	1,63	1,54	1,68
Payback period	3,2	2,4	3
With the reduction of proceeds by 5%			
NPV <sub>2</sub>	614456,1	525537,27	677216,38
The ratio of the growth rate of NPV <sub>0</sub> к NPV <sub>2</sub> )	122%	122,6%	120%
IRR	16,42%	17,71%	18,27%
IR	1,53	1,46	1,59
Payback period	3,5	2,7	3

The net present value of each of the funding scheme is positive which indicates their effectiveness. However, not all criteria confirm the effectiveness of the financing schemes.

It is important to notice that the final cost of a loan is the biggest and it exceeds the initial 32.5%, while in the forfeiting scheme cost is the smallest, exceeding the initial 24.3%. This indicator, together with IRR and profitability index, shows that it is the most effective financial instrument.

Special attention should be paid to the leasing scheme, as this scheme has the lowest NPV. Still, the term of granting credit resources is 4 years, unlike 5 as in other two schemes. At the same time the payback period is 2.4 years instead of 3 years.

The sensitivity analysis was held with changing two main factors: revenue decline and rising fuel prices. The change of fuel prices has contributed insignificantly for all three funding schemes. The revenue decline was the most important factor in these calculations. In forfeiting scheme the net present value (NPV) reached 20% and the payback period has not changed.

## Conclusions

After consideration of the selected finance methods, conclusions were drawn on the most effective scheme. Forfeiting is the most effective scheme of the fleet financing as the final price is the smallest as well as payback period. Forfeiting operations have not yet become traditional, and the potential market is quite large. Under these conditions further theoretical development of forfeiting is required.

We covered the following research areas:

- giving the notion of the financial vehicle by introducing forfeiting as a financial instrument;
- specification of bank loaning, leasing accept and forfeiting when purchasing a vehicle;
- a comparative graph was made to compare 3 financial instruments;
- conclusion was made taking into account the effectiveness of every instrument and its features.

Fixed assets provide an ongoing stream of net operating income, along with a residual value. Fixed capital is often held directly rather than through a financial derivative, and it has other economic characteristics that in the minds of many make it a class of asset that is distinct from other capital assets. For instance, the cost of fixed assets is typically high, compared to operating cost, and the cost tends to be fixed rather than variable. The cost of construction across many types and locations of real estate also tends to be correlated. The value of fixed capital will influence the operating leverage. Capital assets can be valued at their net present value, which discounts an expected stream of value (Eugene et al., 1999). Results of the assessment of the economic efficiency of financing fixed assets for the economy of the Russian Federation was based on methodology for determining the present value (NPV) and estimating the economic benefit results based on the discount rate. Development of a financial mechanism is the main issue of providing the reproduction process in the Russian economy. The results of the study to determine the most effective methods of financial and credit support of the reproduction process in the economy may be based on the need to develop a financial mechanism for the Russian financial system in order to ensure sustainable economic development.

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