Universitatea *Transilvania* din Braşov

HABILITATION THESIS

Challenges facing financial markets and entrepreneurship - crises, competition, financial integration, new technologies, sustainable business development

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REZUMATUL TEZEI DE ABILITARE

"Pieţele financiare sunt implicate esenţial in alocarea resurselor. Pot fi considerate "creierul" întregului sistem economic, un punct focal al deciziilor: eşecul lor duce nu doar la profituri suboptime pentru acest sector, ci si la posibile disfuncţii la nivelul întregului sistem economic."

Joseph Stiglitz, March 1999

Teza de abilitare reprezintă sinteza celor mai semnificative cercetări realizate ulterior obținerii titlului de doctor și este structurată în trei părți: prezentarea principalelor realizări științifice, planul de dezvoltare a carierei și referințele bibliografice care susțin cercetarea inclusă în teză.

Realizările științifice sunt prezentate în teza de abilitare în trei secțiuni: 1. cercetări privind piețele financiare cu focus pe piața de capital din Romania și a industriei bancare, 2. cercetări privind fluxurile de capital și consumul 3. cercetări privind provocările cu care se confruntă întreprinzătorii și managerii în procesul complex de dezvoltare sustenabilă a afacerilor.

Prima secțiune sintetizează cercetări privind piața financiară românească, bancară și non-bancară, în contextul provocator al ultimelor trei decenii, caracterizat de crize sistemice și conjuncturale. Cercetările întreprinse pleacă de la rolul fundamental pe care piața financiară îl joacă, sau ar trebui sa îl joace – finanțarea economiei reale. Atât piața de capital, dar mai ales industria bancară, se află în prezent în fața unor provocări pe care nu le pot ignora: apariția tehnologiilor care transforma economia într-una digitalizata, concurența intensificată de apariția companiilor fintech, a segmentului de shadow banking in creștere, precum și de procesul de integrare financiară europeană. Mai mult, în condițiile unei concurențe crescute și sub presiunea necesității transformării abordării de business pentru adaptarea la digitalizare, piața financiară se confruntă azi cu consumatori sofisticați care, în căutarea satisfacției privind consumul de servicii financiare, ridică prestatorilor de astfel de servicii noi provocări. Pe de altă parte, investitorii, în contextul unor piețe financiare integrate, adaugă presiunea nevoii de a obține performanțe economice comparabile cu piețele europene, oferind acestora randamente care să consolideze procesul de atragere a acestora, mai ales a celor străini, dar și retenția lor pe piața românească pe termen lung. Cercetările au arătat ca piața românească de capital a făcut pași timizi în direcția susținerii economiei reale, furnizând finanțare prin emisiuni de acțiuni, numărul acestora rămânând dezamăgitor de mic, dar prin comparație cu alte piețe din regiune(Bulgaria și Ungaria) a făcut față mai bine șocurilor provocate de crizele manifestate la nivel global în 2007-2008. De asemenea, industria bancară a fost abordată în cercetările realizate din două direcții. Una privește aspecte ale determinării poziționării ei în raport cu exigențele investitorilor, impactul pe care competiția în creștere a segmentului de shadow

banking îl are precum și penetrarea serviciilor de internet banking. Cealaltă pune accentul pe realitatea pe care crizele și competiția au accentuat-o după 2007 – nevoia de a pune în centrul strategiilor de dezvoltare pe termen lung satisfacția consumatorului(o armă fără de care niciun actor din piață nu va reuși să supraviețuiască, dar mai ales să obțină performanțele așteptate de investitori). Abordarea conceptului de satisfacție a consumatorului de servicii bancare s-a făcut aplicând diverse modele matematice și utilizând rețele neuronale artificiale cu scopul de a identifica factorii ce influențează satisfacția, dar și ierarhizarea lor, pentru a releva importanța pe care le-o alocă consumatorii.

A doua secțiune dezvoltă cercetări privind două concepte în vederea identificării modului în care influențează pe termen lung creșterea economică: fluxurile de capital și consumul. Literatura de specialitate arată influența pozitivă a fluxurilor de capital asupra creșterii economice, însă dimensiunea acestei influențe este condiționată de calitatea politicilor economice și a răspunsului instituțional a țărilor receptoare, mai ales în cazul celor în curs de dezvoltare. Cercetarea acestor influențe nu poate face abstracție de fenomenul de integrare financiară și de crizele care afectează economia la nivel global. Demersul realizat în lucrare privește evoluția fluxurilor de capital în economia românească, determinanții acestora, precum și relația cu creșterea economică. Analiza punctează, de asemenea, modul în care banca centrala a răspuns provocării reprezentate de fluxurile de capital in contextul crizei financiare internaționale și a procesului de integrare financiară. Ultima parte a acestei secțiuni prezintă existența fenomenului de histerezis la nivelul consumului. Acesta, prin cele două trăsături ale sale – remanență și memorie selectivă, aduce o viziune nouă în explicarea evoluției sistemelor economice. Cercetarea realizată la nivelul României asupra consumului au relevat prezența histerezis-ului, evidențiind faptul că influențe temporare asupra determinanților consumului au efecte de durată asupra acestuia. Concluziile arată că, pentru a reuși să obțină performanțe, agenții economici trebuie sa accepte această realitate și să își modifice în consecință comportamentul în ceea ce privește abordarea consumatorului și a strategiilor de vânzare.

A treia secțiune abordează provocările pe care le aduce demersul de a dezvolta afaceri sustenabile, care să conserve mediul din grija pentru generațiile viitoare. Cercetarea realizată investighează modul în care managerii și întreprinzătorii reacționează la eforturile necesare, mai ales cele financiare, pentru a dezvolta afaceri care sa contribuie la o dezvoltare economică durabilă, cu focus pe una din cele mai dinamice industrii – turismul.

Planul de dezvoltare a carierei sintetizează, pe de o parte realizările profesionale atât la nivelul activității de cercetare cat si a activității didactice, iar pe de alta parte intențiile privind dezvoltarea carierei didactice și direcțiile viitoare de cercetare ca o continuare firească a eforturilor depuse până în acest moment.

Rezultatele obținute(publicarea de articole, participarea la conferințe, desfășurarea de activități de cercetare in cadrul echipelor de implementare a unor proiecte naționale si internaționale) până în prezent vor reprezenta în continuare sursa de furnizare de act educațional de calitate, pentru a oferi studenților mei o pregătire profesională solidă.

Maturitatea atinsă în 20 de ani de carieră didactică și de cercetare se va canaliza către aprofundarea mai multor direcții de cercetare, dar și spre explorarea altora noi:

1. cercetări privind capacitatea piețelor financiare de a se adapta și de a se reforma pentru a face față crizelor cu care economia globală s-a confruntat din ce în ce mai des, chiar dacă acestea sunt de magnitudini diferite:

- continuarea investigației prin metode calitative și cantitative de cercetare a performanțelor piețelor de capital, în primul rând a celei românești dar într-un context internațional, în două direcții: pe de o parte cu privire la capacitatea de a asigura finanțarea economiei reale și pe de altă parte în ceea ce privește capacitatea de a atrage investitori.

- utilizarea de noi metode pentru a investiga capacitatea industriei bancare de a face față noilor provocări (concurență sporită, integrare financiară, digitalizarea accelerată a serviciilor financiare), precum și modul în care băncile își pot menține sau îmbunătăți performanțele.

- aprofundarea investigației privind satisfacția consumatorilor în ceea ce privește serviciile bancare, deoarece cercetările au arătat deja că noile condiții în care băncile sunt obligate să funcționeze (concurența crescândă din segmentul de shadow banking și companiile fintech a căror cifră de afaceri a crescut exponențial în ultimii ani) implica schimbări profunde în strategiile lor de dezvoltare.

2. Dezvoltarea analizei econometrice care sa permită investigarea factorilor determinanți ai fluxurilor de capital, precum și analiza fenomenului de histerezis privind investițiile străine plecând de la rezultatele obținute în cercetările realizate și în literatura internațională de specialitate. Fenomenul de histerezis, prin cele două caracteristici ale sale - remanența și memoria selectivă, poate arăta noi modalități de dezvoltare a strategiilor de atragere a investitorilor străini, având în vedere factorii care le influențează comportamentul.

3. A treia direcție principală de cercetare va continua cea mai recentă direcție de cercetare privind capacitatea managerilor și antreprenorilor de a se adapta la nevoia de dezvoltare a unor afaceri durabile: cum să se adapteze noilor direcții de dezvoltare în ceea ce privește gestionarea resurselor disponibile, cum să se schimbe strategii de afaceri și abordarea consumatorilor care au drept criteriu, atunci când aleg produse și servicii, nivelul de durabilitate al unei afaceri, raportul cost-beneficiu real pentru implementarea măsurilor și strategiilor pentru a face afacerea durabilă și prietenoasa cu mediul. Cercetările viitoare vor continua să investigheze industria turismului, dar o voi extinde la alte sectoare cu potențial ridicat de impact negativ asupra mediului.

SUMMARY

"Financial markets essentially involve the allocation of resources. They can e thought of as the "brain" of the entire economic system, the central focus of decision making: if they fail, not only will the sector's profits be lower than they would otherwise have been, but the performance of the entire economic system may be impaired."

Joseph Stiglitz, March 1999

The habilitation thesis represents the synthesis of the most significant research conducted after obtaining the doctoral degree, and is divided into three parts: the presentation of the scientific achievements, the career development plan and the references supporting the research included in this thesis.

The scientific achievements presented in the habilitation thesis are structured in three main sections: 1. research on financial markets, focused on the Romanian capital market and the banking industry, 2. research on capital flows and consumption 3. research on the challenges faced by entrepreneurs and managers in the complex process of sustainable business development.

The first section summarizes research on the Romanian banking and non-banking financial market, in the challenging context of the last three decades, characterized by systemic and conjunctural crises. The research undertaken starts from the fundamental role that the financial market plays or should play - the financing of the real economy. Both the capital market and especially the banking industry are currently facing challenges that they cannot ignore: the emergence of technologies that transform the economy into a digital one, the intensified competition by the emergence of the fintech companies, the growing segment of shadow banking, as well as the process of the European financial integration. Moreover, in the face of an increased competition and under pressure to transform the business approach to adapt to digitization, today the financial market faces sophisticated consumers who, in search for satisfaction with the consumption of the financial services, pose new challenges to providers of such services. On the other hand, investors, in the context of integrated financial markets, add the pressure to obtain economic performance comparable to the European markets, offering returns that strengthen the process of attracting them, especially foreign ones, but also their long-term retention on the Romanian market. Research has shown that the Romanian capital market has taken timid steps towards supporting the real economy by providing financing through equity issues, their number remaining disappointingly small, but compared to other markets in the region (Bulgaria and Hungary) it has better coped with the shocks caused by the crises manifested globally in 2007-2008. The banking industry has also been approached, with two research directions. One concerns aspects regarding the determination of its position in relation to the requirements of investors, the impact that the growing competition of the shadow

banking segment has, as well as the penetration of the internet banking services. The other emphasizes the reality that crises and competition have exacerbated, since 2007, - the need to place at the center of the long-term development strategies the satisfaction of the consumer of banking services(a weapon without which no market player will be able to survive, but especially to achieve the performance expected by investors). The concept of the consumer satisfaction with banking services was approached by applying various mathematical models and using artificial neural networks in order to identify the factors that influence satisfaction and their hierarchy, to reveal the importance given by the consumers.

The second section develops research on two concepts in order to identify how they influence long-term economic growth: capital flows and consumption. The literature shows the positive influence of the capital flows on economic growth, but the size of this influence is conditioned by the quality of economic policies and the institutional response of the recipient countries, especially in the case of the developing ones. The research of these influences cannot ignore the phenomenon of the financial integration and the crises affecting the global economy. The approach developed concerns the evolution of the capital flows in the Romanian economy, their determinants as well as the relationship with the economic growth. The analysis also points out how the central bank has responded to the challenge posed by the capital flows in the context of the international financial crisis and the process of financial integration. The last part of this section analyses the existence of the phenomenon of hysteresis in consumption. The hysteresis, through its two features - remanence and selective memory, brings a new vision of explaining the evolution of the economic systems. The research carried out in Romania regarding the consumption revealed the presence of the hysteresis phenomenon, highlighting the fact that temporary influences on the determinants of consumption have lasting effects on it. The findings show that, in order to obtain economic performance, the companies need to accept this reality and change their behavior in terms of consumer approach and sales strategies.

The third section addresses the challenges of developing sustainable businesses that protect the environment for future generations. The research investigates how managers and entrepreneurs react to the necessary efforts, especially the financial ones, to develop businesses that contribute to a sustainable economic development with a focus on one of the most dynamic industries - tourism.

The career development plan summarizes, on the one hand, the professional achievements of the research activity as well as the didactic activity, and on the other hand the intentions regarding the didactic career development and the future research directions as a natural continuation of the efforts made so far.

The results obtained (publication of articles, attending conferences, conducting research activities within the implementation teams of national and international projects) so far will continue to be the source of providing a qualitative educational activity for my students, for their solid professional training.

The maturity reached in 20 years of didactic and research career will be channeled into deepening several research directions but also towards the exploration of new ones:

1. the research regarding the capacity of the financial markets to adapt and to reform to face the crises that the global economy encountered more and more often even if they are of different magnitudes:

- continuing the investigation through qualitative and quantitative methods of researching the performances of the capital markets, first of all the Romanian one but in an international context, in two directions: on the one hand regarding the capacity to ensure the financing of the real economy and on the other hand in terms of the ability to attract investors.

- the use of new methods to investigate the capacity of the banking industry to face the new challenges(increased competition, financial integration, the accelerated digitization of financial services) as well as the way in which banks can maintain or improve their performances.

- further investigation of consumer satisfaction of banking services, because research has already shown that the new conditions in which banks are forced to operate (increasing competition from the shadow banking segment and the fintech companies whose turnover has grown exponentially in recent years) includes profound change in their development strategies.

2. The development of the econometric analysis that would allow the investigation of the factors of the capital flows, as well as the analysis of the hysteresis phenomenon regarding the foreign investments starting from the results obtained in the realized researches and in the international specialized literature. The hysteresis phenomenon, through its two characteristics – remanence and selective memory, can show new ways of developing strategies to attract foreign investors considering the factors influencing their behavior.

3. The third main research direction will continue the latest research direction on the capacity of managers and entrepreneurs to adapt to the need of developing sustainable businesses: how to adapt to new development directions in terms of managing the resources available to them, how to change business strategies and approaching consumers who have as a criterion, when choosing products and services, the level of sustainability of a business, the real cost-benefit ratio for the implementation of measures and strategies to make the business sustainable and environmentally friendly. Future research will continue to investigate the tourism industry, but I will extend it to other industries with high potential for negative environmental impact.

PART I. CONTRIBUTIONS

SECTION I THE ROMANIAN FINANCIAL MARKET – EVOLVING AND FACING CRISIS TAWORDS FINANCING THE REAL ECONOMY

The Romanian banking and non-banking financial market, evolved in the challenging context of the last three decades, characterized by systemic and conjunctural crises. One of the objectives of the research was to investigate how the Romanian financial market was able to recover from the turmoil of the 2007-2008 and if its fundamental role was or should have been fulfil - the financing of the real economy.

Both the capital market and especially the banking industry are currently facing challenges that they cannot ignore: the emergence of technologies that transform the economy into a digital one, the intensified competition by the emergence of the fintech companies, the growing segment of shadow banking as well as the process of the European financial integration. Moreover, in the face of an increased competition and under the pressure of the need to transform the business approach to adapt to digitization, today the financial market faces sophisticated consumers who, in search of the satisfaction with the consumption of the financial services, pose new challenges to providers of such services. On the other hand, investors, in the context of integrated financial markets, add the pressure of the need to obtain economic performance comparable to the European markets, offering them returns that strengthen the process of attracting them, especially foreign ones, but also their long-term retention on the Romanian market.

The banking industry has also been approached with two research directions. One concerns aspects regarding the determination of its position in relation to the requirements of investors, the impact that the growing competition of the shadow banking segment has as well as the penetration of the internet banking services. The other emphasizes the reality that crises and competition have exacerbated, since 2007, - the need to place in the centre of the long-term development strategies the satisfaction of the consumer of banking services(a weapon without which no market player will be able to survive but especially to achieve the performance expected by investors).

I.1 The Aftermath of the 2007 -2008 Financial Crisis – the Performance of the Eastern European Stock Exchanges (Romania, Bulgaria and Hungary)[1]

The 2007-2008 financial crisis has affected most of the national economies and has had a major impact on the evolution of the capital markets, especially in the case of the emerging economies. The Eastern European countries have not made an exception and have experienced negative developments in terms of both capital markets and other markets, with long-term effects on their performance and the evolution of the economy in terms of economic growth.

Considered to have similar profiles, the three capital markets were heavily affected by the general fall in financial instruments 'prices, the withdrawal of the foreign investors from the national markets since 2008 and the significant reduction in the transactions' volume. The impact of the crisis was even more significant because all three markets had failed to reach a certain level of maturity, having at the time, a small number of listed issuers, a small number of financial instruments traded, and were at the beginning of the road in what concerns the strengthening of the role of mobilizing funds for the real economy.

The goal of the analysis was to identify how the financial crisis affected the performance of these capital markets, and if, a decade later, the stock exchanges were able to recover from the crisis in terms of their performance.

1.1 The profiles of the stock exchanges in Romania, Bulgaria and Hungary

All three capital markets from the countries considered, as all the national economies in the Central and Eastern Europe share a common history and a rather similar path of development.

In the last two centuries, the economies of the Central and Eastern Europe have gone a long way in the face of major political events, armed conflicts, and especially the transformation of incipient but emerging market economies into economic systems under communist political regimes, a process characterized by the disappearance of the private property and with it the foundation of a market economy. The similarities continued to exist after 1990 when these economies started once again to build market economies (with functional market mechanisms) and, subsequently, trying to become developed economies and to eliminate the gaps between them and the Western European countries.

The capital markets in these countries also had a common history: set up at the end of the nineteenth century in most cases, showing positive developments and even upward

[1] Based on scientific contributions from **Duhnea Cristina** & Ghiță-Mitrescu Silvia (2017), *The Aftermath of the 2007-2008 Financial Crisis – the Performance of the Eastern European Stock Exchanges (Romania, Bulgaria and Hungary),* The International E-Conference "Enterprises in the Global Economy", 2nd Edition, 21st June 2017, published in FILODIRITTO INTERNATIONAL PROCEEDINGS, 2017, ISBN 978-88-95922-97-3, pp.28-36

trends in the interwar period but affected by the two world wars of the first half of the 20th century, disappearing in the period 1946-1949 as a result of the nationalization process that took place in all these economies.

The stock exchanges in the three countries considered are thus included in the incipient stock exchanges category with less than 30 years of existence since only after the 1990s we can talk of re-establishing or creating a stock exchange in these economies. Affected by the very unstable macroeconomic conditions of the period 1990-2000, the activity of the three stock exchanges was characterized by a small number of listed issuers, small trading volumes, and insignificant foreign investments in the vast majority of cases, and privatization processes carried out slowly and just fractionally through the capital market.

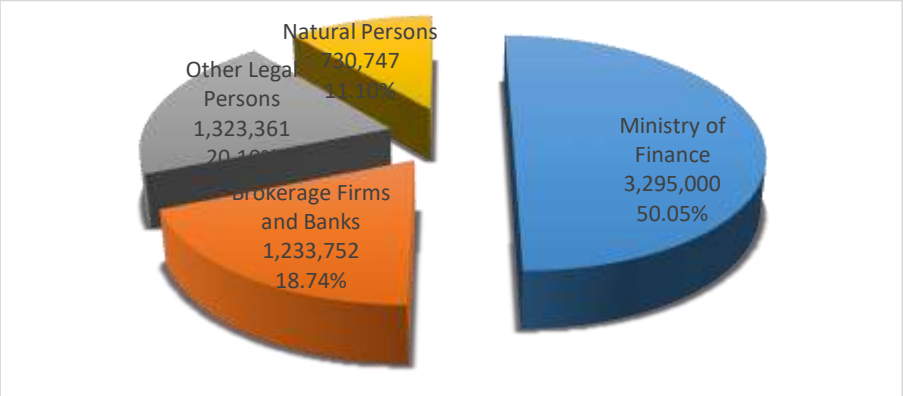
After 2000, however, as the effect of the domestic stabilization and the decision to join the European Union, the three national economies began to register an economic growth and became attractive for foreign investments. The stock exchanges had a similar evolution, as the stabilization of the business conditions encouraged the issuers and the investors to be more active on the capital market.

The downgraded financial crisis from 2007-2008 has significantly affected the evolution of the capital markets in the Eastern Europe and has led to a rapid deterioration of the performance indicators. The way that the stock exchanges managed to overcome the difficulties of reducing the economic activity and consequently the investors' interest in the capital market, but also the inability of the issuers to raise funds through these markets depended both on the recovery of the national economies and on their own managerial strategies.

The ownership ‘structure of the three stock exchanges analysed shows different situations and is, in our opinion, a possible explanation for how the three stock exchanges have evolved over the past 10 years.

Established in 1914 and started the trading activity in 1918, the Sofia Stock Exchange functioned until 1947. The Bulgarian Stock Exchange was reopened in 1995 and currently has as major investor the Ministry of Finance with 50,05% of total number of shares. The ownership of the stock exchange is divided as it is showed in the figure below.

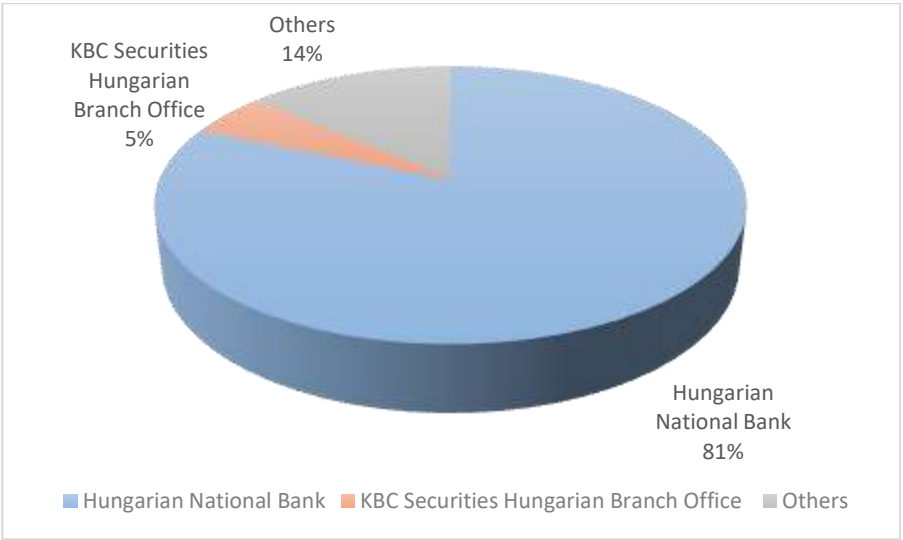
Figure 1 The ownership structure of the Bulgarian Stock Exchange – Sofia (2016)



Source: Annual management report BSE available www.bse-sofia.bg

Created in January 1864, the Budapest Stock and Commodity Exchange (BSCE) was a successful stock exchange before the First World War and during the interwar period but was closed in 1948. In June 1990, the Budapest Stock Exchange was re-established with just one company listed. The Budapest Stock Exchange is owned by three categories of shareholders: the Hungarian National Bank with a participation rate of 75,75% on 31.12.2015 that increased at 81% until 31.12.2016, the KBC Securities Hungarian Branch Office with 5,20% and other investors with participation rates under 5% totalling 13,45%.

Figure 2 The ownership of the Budapest Stock Exchange (2016)

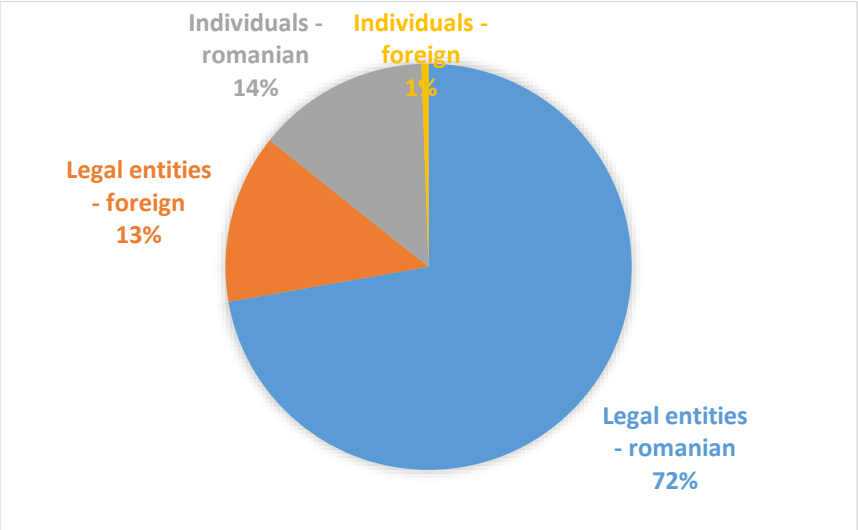


Source: Annual report of the Budapest Stock Exchange available www.bse.hu

The third stock exchange, the Bucharest Stock Exchange, was established in December 1882, and functioned until June 1948 when ceased to exist because of the nationalization process. In December 1995, the Bucharest Stock Exchange started as a state stock exchange with 10 listed companies. The institution remained a state stock exchange until 2005 when it became a private company so we can consider that the Bucharest Stock

Exchange had a differently evolution from this point of view. According to the Government Emergency Ordinance no. 90/2004 on amending and supplementing the Law no. 297/2004 regarding the capital market, a shareholder of a market operator shall not hold, either directly or indirectly, more than 20% of the voting shares therefore the participation rate of a shareholder in case of the Bucharest Stock Exchange does not exceed 20% of total voting rights.

Figure 3 The ownership of the Bucharest Stock Exchange



Source: Annual report of the Bucharest Stock Exchange available www.bvb.ro

1.2 The comparative analysis of the stock exchanges' performance

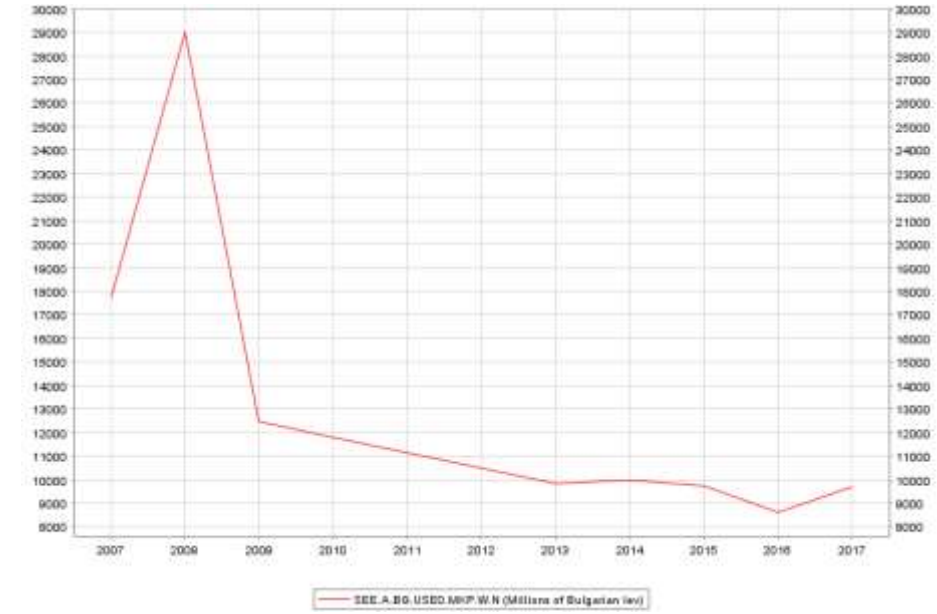
To assess the performance of the three capital markets selected, Romania, Bulgaria and Hungary we analysed the evolution of two indicators: the market capitalization and the benchmark stock exchange index of each stock exchange for the period 2007 – 2016 in order to determine the level of the financial crisis impact and the after crisis evolution of the markets performance.

We chose to compare the values of the market capitalization in US dollars as a result of the data available for the three stock exchanges.

With a timid performance before 2000 the Bulgarian Stock Exchange was able to exceed 1 billion US dollar in market capitalization only in 2003(1.76 billion) and had a relatively rapid grow until 2006 when a 10 billion US dollars capitalization was reached for the first time in the last 25 years. The first signs of the financial crisis shown in 2007 found the Bulgarian Stock Exchange in an accelerated ascend trend and, the next year, reaching a maximum historical value of the market capitalization exceeding 20 billion US dollars. The absolute maximum in terms of the stock market capitalization is 2008 when this indicator approached 22 billion US dollars (21.67). As we can see in figure below, the performance of the stock market in terms of market capitalization entered from 2009 in a descendent trend with a dramatic reduction of approximately 60%. In the next 7 years the performance of the stock market continued to deteriorate reaching new minimum. After the crisis period, 2008-

2011, the Bulgarian Stock Exchange has failed to return to its pre-crisis performance as all the capital markets in the region: if in 2009 the market capitalization was 7.8 billion US dollars the next years brought no improvements as in 2016 the value of this indicator was only 6 billion US dollars. The reduction of the trading activity, the inexistence of the initial public offerings activity to boost the interest of the investors for the capital market, the Bulgarian capital market was unable to recover from the crisis.

Figure 4 The evolution of Bulgarian Stock Exchange Capitalization (Bulgarian leva)

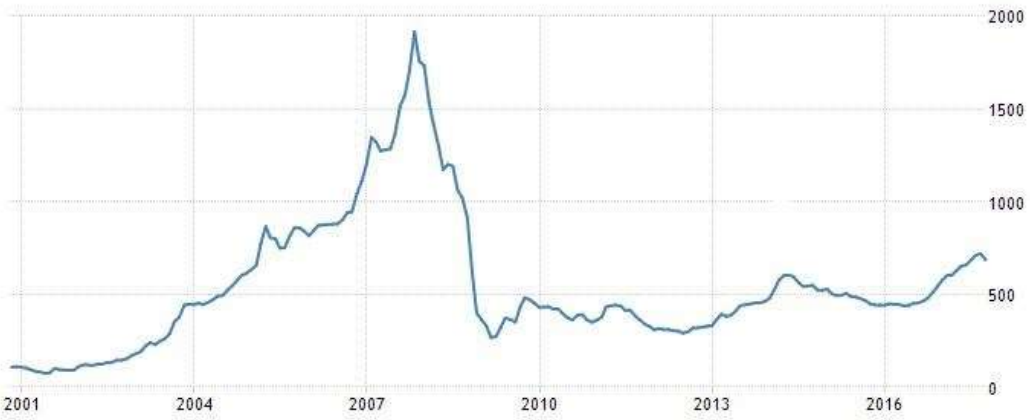


Source: www.ecb.europa.eu – Statistical Data Warehouse

For the period analysed, the stock market performance reached an absolute minimum in 2016 as can be seen in the figure above.

In the figure below we can see the evolution of the SOFIX index (a general stock index including the first 15 ranked issues) in the last 16 years. The index value exceeded 500 points for the first time in 2004 and continued the ascendant trend until 2008 when almost reached 2000 points, the highest level registered.

Figure 5 The evolution of SOFIX index – closing values



Source: www.bse-sofia.bg

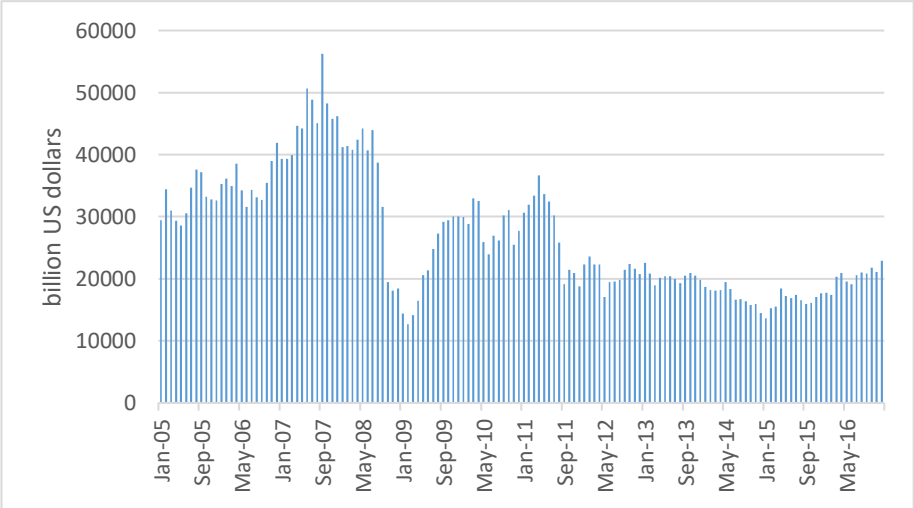
From 2009, because of the reduced trading activity, the value of the SOFIX index decreased significantly and the 500 points value was again reached only after 2014. Looking of the whole period analysed, the SOFIX index decreased with more than 70% with no sign of recovery until the end of the period.

The Budapest Stock Exchange has seen a much faster evolution since the 1990s, one reason being that, unlike in Romania and Bulgaria, the privatization process in Hungary has been largely driven by the market of capital, attracting foreign investors very early. Thus, since 2003, the increased investors' interest in the financial instruments traded on this stock exchange has led to an increase in the stock market capitalization to over 12 billion US dollars and a year later to more than 20 billion US dollars. The upward trend strengthened over the next period exceeding 50 billion US dollars in 2007, which was also the historical maximum recorded by this indicator after 1990. A factor that contributed to the high attractiveness of this exchange, especially for the foreign investors, was the increase in the IPO activity.

The downgrade of the financial crisis has shown that this advantage quickly turned into a vulnerability when the foreign investors withdrew massively from the Hungarian capital market. The effect was the collapse of the market by about 70%, at the start of 2009, bringing the stock market capitalization at the level reached in 2003 - 12 billion US dollars, as shown in the figure below.

Analysing the evolution of stock market capitalization as an indicator of the performances of the Hungarian capital market we found that, although the end of 2009 and the years 2010 and 2011 registered a recovery of the market, the capitalization increasing to 30 billion US dollars, in the long run this trend was not consolidated, but on the contrary, there was a continuous decline until 2016, bringing the stock market at the level of 2004.The recovery from the crisis was made slowly and without obtaining the performances of 2007 so at the end of 2016 this indicator did not exceed 23 billion US dollars (22.6).

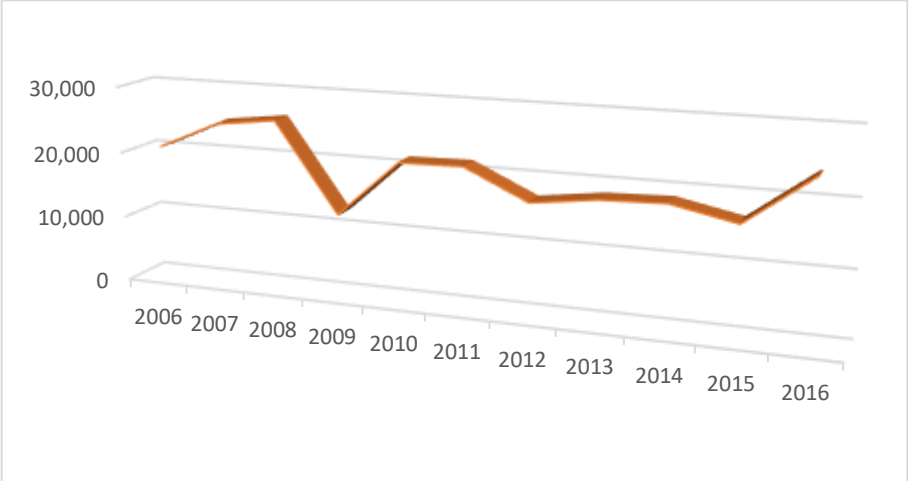
Figure 6 Stock market capitalization – Budapest Stock Exchange



Source: authors' compilation from data on www.bse.hu

The evolution of the BUX index showed the same evolution of the stock market, reaching a maximum value during 2007 and dropping by 60% in 2009. The general trend of the index evolution is attenuated compared to the evolution of the market capitalization because it is a general index that includes 12 to 25 companies with the highest trading volumes and the highest stock market capitalization. After 2010, the index value had a non-linear evolution remaining below 20,000 points until 2016, as shown in the figure below.

Figure 7 The BUX index evolution – closing values

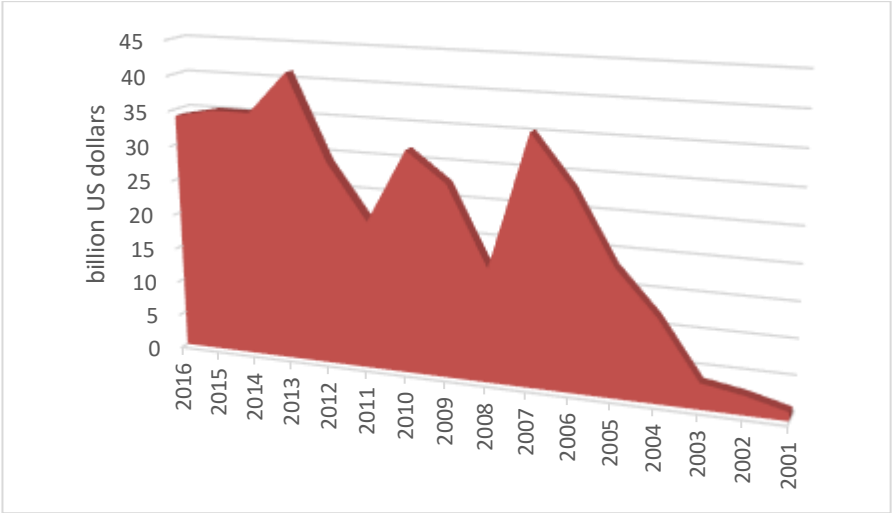


Source: authors' compilation from data on www.bse.hu

The Bucharest Stock Exchange evolved differently from the other two stock exchanges. The lack of knowledge regarding the mechanisms and instruments of the financial markets, the reduced performance of the Romanian companies, the lack of the foreign investors, and the macroeconomic situation that characterized the Romanian economy for the 1995-2000 period determined a low volume of the transactions, a small number of listed companies, and an insignificant stock market capitalization for the Bucharest Stock Exchange. Its development, by increasing the volume and the value of the transactions, but also by increasing the number of IPOs, started later than on the Hungarian capital market, after 2000. The stock market capitalization first exceeded one billion US dollars in 2001 but, from that moment, the stock market's performance has risen steadily, reaching 35 billion US dollars in 2007.

Since the second half of 2008, the markets administered by the Bucharest Stock Exchange have been strongly affected by the crisis (Pop et al., 2009), the stock price dropped by over 60% and the stock market capitalization diminished by about the same percentage (at the level of 2009), as can be seen in the figure below. Unlike the two stock exchanges presented above, in the next years, the Bucharest Stock Exchange managed to recover, registering an increasing trend, although not continuous, from 2010 until 2016. After 2013, the market returned to the level of the year 2007 and even surpassed it. Unfortunately, a minus of the Romanian capital market continues to be the small offer of the financial instruments and a very low IPO activity.

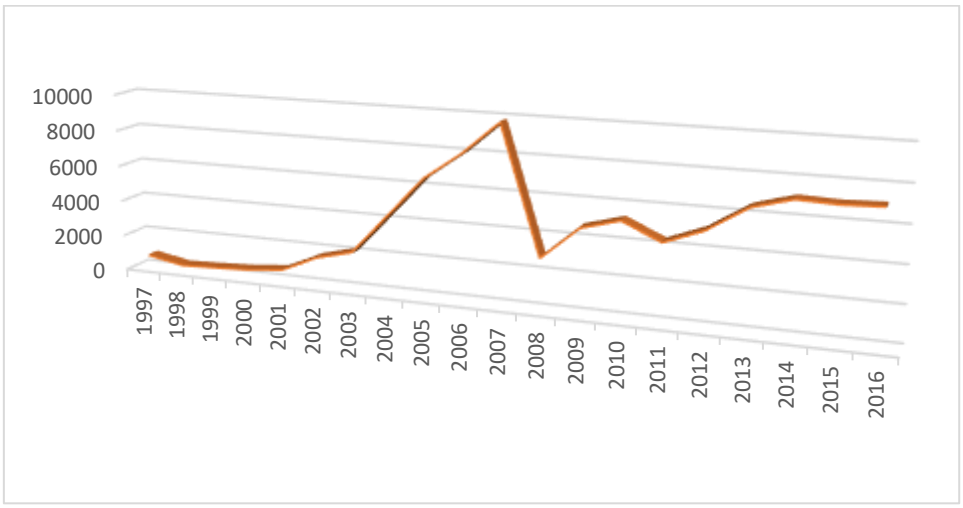
Figure 8 The evolution of the stock market capitalization - Bucharest Stock Exchange



Source: authors' compilation from data on www.bvb.ro

The evolution of the BET index as the benchmark index of the Bucharest Stock Exchange, taking into consideration the 10 most liquid shares listed, shows that 2008 was the period when the international financial crisis affected severely the Romanian capital market witnessing a decrease of 60% compared with the previous year.

Figure 9 The evolution of BET index



Source: authors' compilation from data on www.bvb.ro

As we already showed, starting with 2010 the Romanian capital market recovered from the crisis, and the value of BET index increased for the whole period, reaching a value of 7085 points in 2016.

1.3 Conclusions

The analysis looked at how three stock exchanges from Eastern Europe have evolved over the last ten years as performance, how the 2007-2008 international financial crisis affected these performances, and last but not least if the three capital markets were able to recover from the crisis period.

Not coincidentally, this analysis considered what the three exchanges have in common and their ownership situation because data showed very different developments whose possible explanation may be this aspect.

Analysing the evolution of one of the most important stock market performance indicators, the stock market capitalization, we found major differences in the evolution of the three institutions:

- The fastest development was registered by the Budapest Stock Exchange, which managed to reach, between 2000 and 2007, a level of stock market capitalization comparable to that of the Central European stock exchanges;
- The smallest progress was recorded by the Bulgarian Stock Exchange - Sofia, which, even at the historical maximum of the stock market capitalization, remained at half the value of the other stock exchanges;
- Comparing the performances of the three stock exchanges taken into consideration in order to determine the level of recovery for each of them after the 2007 -2008 financial crisis we concluded that the only market capable to fully recover is the Romanian capital market as is seen in the table below.

-

Table 1 Maximum level of the market capitalization

Stock Exchange	maximum value of the market capitalization 2007-2008 (billion US dollars)	market capitalization in 2016 (billion US dollars)	level of 2016 compared with maximum historical level
Bulgarian Stock Exchange - Sofia	21	6	29%
Budapest Stock Exchange	**56**	22	39%
Bucharest Stock Exchange	35	**34**	**97%**

Source: authors' compilation from the annual reports of the three stock exchanges

-Comparing the values of the benchmark indices of the three stock exchanges taken into consideration, in order to determine the level of recovery for each of them after the 2007 - 2008 financial crisis, we obtained different results than comparing the market capitalization, as is seen in the table below.

Table 2 Maximum value for the Benchmark index

Stock Exchange	Benchmark index	Level of 2016 compared with maximum historical level(2007-2008)
Bulgarian Stock Exchange - Sofia	SOFIX	26%
Budapest Stock Exchange	BUX	**92%**
Bucharest Stock Exchange	BET	72%

Source: authors' compilation from the annual reports of the three stock exchanges

Analysing the level reached by each index in 2016 compared with the highest level from 2007 – 2008 period we found that the indices performance were below the stock market performance (as in case of the Romanian stock market) or higher than the stock market performance (as in case of the Hungarian stock market), and in case of the Bulgarian stock market the value reached in 2016 was as lower as the value of the market capitalization reported at the highest value registered.

Looking at the ownership concentration in comparison with the evolution of stock market performance we observed that in the case of Bulgaria, where the state owns aver 50% of the capital and in case of Hungary where the National Bank of Hungary owns over 80% of the capital, the capacity to develop and recover from the 2007-2008 financial crisis was lower than the Bucharest Stock Exchange where ownership cannot exceed 20%.

In conclusion, the crisis affected all three stock markets under survey but, the level of decreases, and, subsequently, the way in which they evolved were very different and the factors determined such evolutions will be subject of future research.

I.2 Financing the real economy through the capital market – the IPO long – run underperformance and underpricing phenomena: a comparative study of Romania, Bulgaria and Hungary[2]

2.1 The underprincing phenomenon

Financing companies on the capital market by issuance of shares followed by the listing on a stock exchange represents the most important contribution of the capital market to the development of the real economy.

The influence of initial public offerings (IPOs) on the capital market developments, the future evolution of those shares listed on the stock exchange and on the performance obtained by the investors participating in those offerings shows that the offer price and the time of the offer are important elements as well as the subject of numerous studies and research papers in the last decades.

The focus of the literature on the practical conditions of financing companies through the capital market by issuing shares comes, on the one hand, from the need to verify if that capital market is able to provide financing to the real economy and, on the other hand, the desire to investigate what are the conditions in which these IPOs have the ability to attract domestic and foreign investors especially on the emerging capital markets.

Ritter (1998) considers that, once a company's shares are traded on the stock market, the increase of their liquidity allows the issuer to raise capital on more favourable terms than if it had to compensate investors for their low liquidity associated with a closed company. On the other hand, the costs of an initial public offering are significant, and the issuers are directly interested in creating all the conditions for the offer to be attractive to investors and to be successful (several comparative studies (Chen & Ritter (2000), Tortsila (2001 and 2003) showed that these costs are higher in the United States than in Europe).

2.1.1 The Research Objectives and Arguments

The research study investigates two important issues regarding the initial public offerings conducted on capital markets in Romania, Bulgaria and Hungary, namely: the degree of underestimation of the offer price used to obtain the financing through the capital market, the initial returns of the initial public offerings in the first day of trading on the stock exchange and in a short time horizon.

[2] Based on the scientific contributions from **Cristina Duhnea**, Diane Paula Corina Vancea & Loredana - Georgiana Frecea (2017), *IPO Underpricing in Emerging Capital Markets: A Comparative Study of Romania, Bulgaria and Hungary*, Transformations in Business & Economics, Vol. 16, No 2A (41A), Pages: 478-494, ISSN: 1648 – 4460 and **Duhnea Cristina**, Vancea Corina Paula Diane (2013), The long-run underperformance of initial public offerings in the emerging capital markets: evidence from Romania, Bulgaria and Hungary, Transformations in Business & Economics, Vol. 12, No 1A (28A), Pages: 343-353, ISSN: 1648 – 4460,

A study which examines the hypotheses existing in the literature regarding initial public offerings of shares for the three markets considered (Romania, Bulgaria and Hungary) has several reasons:

- The development of the capital markets able to provide to the real economy funds at lower cost in a short time depends on its ability to offer investors attractive opportunities in terms of future yields. Achieving this goal depends on the ability to attract issuers that wish to list their shares on the stock exchange and on the returns made by investors who have purchased the shares of the initial public offerings, since the investment decision is based in part on the income from dividends and other patrimonial transactions but is largely influenced by the share's liquidity and price increases on the secondary market.
- The confirmation of the two phenomena poses a dilemma for the process of financing the real economy through the capital market: who will be interested in buying shares from initial public offerings and consequently how will the issuers manage to mobilize funds through the capital market if they are not able to provide returns equal or higher than the market returns.
- The selection of the three markets is justified by the fact that the problems described above are particularly of interest for the emerging capital markets, which have made major efforts over the past 20 years to become functional and thus able to fulfil their basic functions in the economy. The small number of issuers listed on the three stock exchanges proves that a growth in initial public offerings of shares is a necessary condition to diversify the opportunities offered by the capital market and to attract more investors willing to finance economic activities. On the other hand, the former membership in the Communist bloc, the start of a long process of transition to a market economy in the early '90s, and later the accession to the European Union are features that make the development of the three markets similar and thus justify the comparison as previously illustrated.

2.1.2 The IPO Underpricing Phenomenon in the Literature

Underpricing describes the listing of newly issued securities at initial offer prices below their market value on the secondary market. The market value can refer to the prevailing price on the first day of trading, or at some other time elapsed since the securities were launched.

The underpricing phenomenon was constantly the subject of financial markets specialists' concern in recent decades, as many studies documented the verification of this theory on various capital markets.

The first studies that have provided evidence for the assertion that the price of the initial public offerings is underestimated were developed in the 70s (among the most important Logue, 1973; Ibbotson, 1975; Ibbotson et al. 1988).

The research on the underpricing phenomenon focused on two directions: on the one hand it has been verified on different markets and in different periods of time, if there is any

underpricing of primary initial public offerings and the level of the underpricing, and on the other hand searches were conducted for the explanation of this phenomenon and the influence on the initial public offer and the future evolution of share prices.

One of the first studies investigating underpricing was that of Loughran et al. (1994) who studied the phenomenon in 25 countries, practically synthesizing dozens of studies by many economists, for different markets. The authors concluded that the phenomenon is present in most markets investigated, but its level was very heterogeneous across different markets, from more than 10 percent to 200 percent, and that the level of underpricing is higher in emerging countries.

The study was repeated 12 years later when the authors added data for other capital markets, the investigation covering 39 countries.

Loughran & Ritter (2002) said, that underpricing changes over time: in the 80s it averaged 7%, increased to 15% between 1990 and 1998, and reached record levels in 1999-2000 (the period known in the literature as the dot com bubble).

In recent decades numerous studies have analysed the underpricing phenomenon as manifested on numerous capital markets.

The other important aspect is, as mentioned above, the motivation of underpricing. Among the authors who have investigated the reasons for issuers to accept and promote underpricing is the work of Jay Ritter (1998, 2003), who authored or co-authored numerous studies to test various theories, and Alexander Ljungqvist (2006) who, in his „IPO Underpricing", provides a breakdown of the possible explanations of the phenomenon of underpricing observed in the initial public offerings: models based on the asymmetric information, institutional determinations of the phenomenon, reasons related to ownership and control holding in companies, behavioural determinations.

Reviewing the literature, we believe that the most important theories on the existence of the underpricing phenomenon refer to: information asymmetry, shareholders or issuer behaviour prior to the offer, and the stimulation of liquidity in the secondary market.

Many studies have shown that the phenomenon of underpricing is due to asymmetric information on capital market on the one hand, and on the other hand viewed the underestimation of the offer price as a way of mitigating information asymmetry.

Authors such as Rock (1986) and Welch (1992) believed that IPO underpricing is a result of information asymmetry between investors. This is known in the literature as „winner's course": according to Rock's study, there are informed investors as ordinary market participants on the initial public offerings market, and uninformed investors. The informed investors will subscribe only those offers whose prices are attractive compared with the share prospects on the secondary market, while the second category will opt equally for the attractive and least attractive initial public offerings, so uninformed investors will ultimately get more equities with unfavourable outlooks on the secondary market, which will bring disappointment and sometimes result in exit from the market.

To prevent this phenomenon that would reduce the chance that the issuers sell the offered shares, companies agree to set an offer price lower than could be obtained on the market. In support of this theory, Welch shows that the uninformed investors tend to imitate the behaviour of the informed investors, causing a domino effect with dual finality on the capital market: initial public offerings with hundreds of percentages of oversubscription, or initial public offerings failed for lack of subscribers.

Another manifestation of asymmetric information that causes the phenomenon of underpricing is between the issuing company and the financial intermediary of the offer. When the issuing company is less informed about the investors' intentions to buy than the financial intermediary of the offer, the company management tends to allow the intermediary to set the offer price, and the intermediary lowers the offer price to ensure that the offer will be subscribed –the literature is not consistent regarding this theory, some studies confirm it, as that of Baron (1982) and others deny it, as that of Muscarella et al. (1989).

The models supporting signalling theory show that the companies underestimate the offer price to boost investor confidence that the company has good prospects on the secondary market - the term for this phenomenon is well-established as the „good taste" left to the investors. These models are based on the fact that investors consider that only strong companies can afford to underestimate the offer price and „leave money on the table" but "the owners of bad companies cannot recoup the initial loss from underpricing, and so cannot afford to signal"(Allen & Faulhaber,1989, p 304). The studies that have tested the validity of this theory have reached different results: while the Michaely & Shaw (1994) do not support this theory, showing, on a sample of 947 offerings in the U.S., that the companies less underestimated bring higher earnings on the secondary market and tend to do more issues after the listing of their shares Jegadeesh et. al (1993) demonstrated a positive relationship between the level of underpricing and earnings brought by the shares on the secondary market.

Authors such as Jegadeesh et. al. (1993) and van Bommel & Vermaelen (2003) confirm another theory, the so called „market feedback" hypothesis, according to which the underestimation of the offer price is not a decision of the issuer but appears as evidence that the investors have confidence in the growth potential of the company value on the secondary market and the consequence is that the issuer will have easier access to subsequent funding on the capital market.

Another possible motivation for the underestimation of the offer price is the interest of the existing shareholders, prior to the public offering, to retain control of the company. An underestimation of the price will attract many investors, leading to a dispersion of social capital of the old company which will allow the existing shareholders to retain control in the general meeting of shareholders. In addition, the underpricing allows both the intermediary and the issuer to preferentially allocate the shares issued, primarily to those investors who do not want to gain control of the company.

Among the possible explanations that the issuer, most often under the influence of the intermediary, decides to establish an offer price lower than they could get from investors interested in its shares, we must also remember the interest to boost shares liquidity on the secondary market. The intermediary interest is considered as directly related to the shares' liquidity on the secondary market, so that the number of transactions following the listing of the shares from a public offering will provide income that compensates losses related to lower fees caused by underestimation of the offer price, as shown by Boehmer & Fishe (2000).

2.1.3 Measuring the IPO Underpricing

Measuring the level of underestimation of the price offer on a capital market implies relating the closing price of the first day of trading and/or the following trading day, depending on the time horizon to be considered, to the initial public offer price, considered the final price at which the shareholders have acquired the new securities offered for sale.

This formula results in the initial raw return (U) of the share that has been the object of the initial public offering.

$$U = \frac{PI - PO}{PO} = \frac{PI}{PO} - 1 \quad U = \frac{PI - PO}{PO} = \frac{PI}{PO} - 1 \quad \text{or} \quad U = \ln\left(\frac{PI}{PO}\right) U = \ln\left(\frac{PI}{PO}\right)$$

(1)

where:

PI is the closing price on the first day of trading or any other time considered in the analysis

PO is the final price of the IPO.

Achieving results that are representative for the market conditions during which the IPO shares have been listed requires adjusting the results for each offer. The specialized literature summarizes three methods of adjusting the raw underpricing of a share which has been subject of an initial public offering:

a. Adjusting with the performance of a stock market index

$$Um = \frac{PI - PO}{PO} - \frac{I - Io}{Io} = \frac{PI}{PO} - \frac{I}{Io}$$

$$Um = \frac{PI - PO}{PO} - \frac{I - Io}{Io} = \frac{PI}{PO} - \frac{I}{Io} \text{ or}$$

$$Um = \ln\left(\frac{PI}{PO}\right) - \ln\left(\frac{I}{Io}\right) \quad Um = \ln\left(\frac{PI}{PO}\right) - \ln\left(\frac{I}{Io}\right)$$

(2)

where:

Um is the performance of the share compared to the offer price of the first day of trading or a subsequent date considered in the analysis, adjusted with the index performance;

I – is the closing value of the index, chosen for the adjustment, on the first trading day of the share or any subsequent date considered in the analysis;

Io is the closing value of the index chosen for adjustment, on the trading day preceding the first day of trading of the share.

b. Adjustment based on systemic risk assessment

$$Ur = \frac{PI - PO}{PO} - \beta \frac{I - Io}{Io} Ur = \frac{PI - PO}{PO} - \beta \frac{I - Io}{Io}$$

(3)

where β is a factor for systemic risk

c. Adjustment based on the performance of a portfolio benchmark for the respective market. This method was chosen by Affleck-Graves et. al (1993) and mentioned by Gajewski & Gresse (2006).

$$Up = \frac{PI - PO}{PO} - Rp \; Up = \frac{PI - PO}{PO} - Rp$$

(4)

Up - is the performance of the share compared to offer price of the first day of trading or a subsequent date considered in the analysis, adjusted with the performance of the benchmark portfolio;

Rp - the performance of the benchmark portfolio;

Most studies use for the analysis of the level of the IPO underpricing the Um model, which assumes that the systemic risk is equal to 1 (Gajewski & Gresse, 2006).

Choosing a measurement model adjusting the gross value of the offers in our sample, with the performance of a benchmark portfolio, raises in the our view two problems: on one hand the difficulty of establishing selection criteria for a representative portfolio , and on the other hand that for the emerging markets covered by this study, the number of listed companies is small enough that the market index reflects to a large extent the performance of a portfolio consisting of companies listed on that market, making virtually useless the selection of another portfolio of stocks on that market.

2.1.4 Research Methodology and Results

IPO Sample and Data Collection

For carrying out the study we have taken a sample selection of IPOs and collected data on the offer prices, listing data and closing prices for the three capital markets considered in the analysis: Romania, Bulgaria, and Hungary. The time frame selected for analysis is 2003-2008. The analysis ends at 2008, since from the last half of that year financing by share issuance diminished drastically or stopped altogether, as was the case in Romania, and because the capital markets crash in September 2008 makes IPO shares return analysis impossible.

The selection of the initial public offerings sample was made under the consideration that shares are financial instruments which allow the discussion of their further development after the public offer, important for those investors that have shown confidence in the business financed.

Thus, were took into consideration only the primary initial public offerings of shares, eliminating those offers that involved other financial instruments[3].

The second criterion used to create the sample was the market segment on which the initial public offerings were made - we considered those offers conducted on the regulated markets, eliminating offers made on market segments such as over the counter. For this reason, for the Romanian market no initial offer made on the RASDAQ was considered until 2005, when it merged with the Bucharest Stock Exchange.

Thirdly, those IPOs were considered, the shares of which registered a number of transactions as to ensure sufficient liquidity on the secondary market.

Applying these criteria, we obtained a representative sample for the three markets, in fact including in the analysis all initial public offerings that could be part of a sample for IPO underpricing of shares that have been issued from 2003-2008.

Applying these principles to the Romanian capital market we have created a sample that includes all initial public offerings successfully completed during 2003-2008, excepting the Contor Grup company, which was listed only in December 2008 and therefore had no data on closing price.

For the Bulgarian market we considered all initial public offerings of shares made during 2003-2008 at the Sofia Stock Exchange.

The sample considered in the study for the Hungarian market includes 12 initial public offerings of shares of a total of 16 completed, but the excluded 4 do not deduct from the 100% representation, because they were not included either because of delisting, which has occurred after a short period of trading with low liquidity, or because they were listed by the end of the analysed period (November 2008).

Removing all cases where data collection would have been impossible (due to late listing on the study's time horizon) it should be emphasized that the sample of IPOs is the same with the number of initial public offerings for the capital markets taken into consideration.

The data were collected from the official web sites of the three stock exchanges[4] - the sections for daily reports and initial public offerings. Information about the price of the offers were collected either from the official sites of the stock exchanges, the sites of the companies that have been the subject of initial public offerings and the www.kmarket.ro site (for IPOs on the Romanian capital market). Data collection and processing for both IPOs

[3] This criterion did not significantly change the number of offers considered, as on the markets included in the survey, such offers have been very few (for Romania we eliminated only the offer made in 2008 by the investment fund STK Emergent which however was listed very late for the time horizon considered for this study)

[4] www.bse.hu , www.bvb.ro , www.bse-sofia.bg

and the stock indices considered in the analysis was done with a software solution developed in Python.

Research Methodology

For the analysis of the IPO underpricing of shares from the capital markets in Romania, Bulgaria and Hungary, we chose from the methods described above the one that adjusts the performance of the shares from the initial public offerings with the performance of an index considered representative for the respective capital.

We made the measurement of the underpricing for the three markets under analysis using the equations (1) and (2) and calculating U and Um for each capital market.

To calculate the two indicators, we used as reference data the closing price from the first, fifth and tenth trading day, and the closing price at a month, two months, three months and four months from listing.

The Um indicator value is calculated by adjusting the gross initial return with the market index return considered in the analysis: for the capital market in Romania the BET index for Bulgaria the SOFIX index and the BUX index for Hungary.

For the three stock markets analysed we considered as the market index return the relevant index of each stock exchange:

- For the Budapest Stock Exchange, we chose the BUX index. The index was introduced in January 1995 as a general index of the market with an initial value of 1000 points (in January 2, 1991). The manual of the BUX index states that the „most important role of it is to give the most accurate reflection on the status of the securities market as a whole". The index includes from 12 up to 25 largest Hungarian companies considering the book order volume and the capitalization and it is a capitalization-weighted index[5].
- For the Bulgarian Stock Exchange – Sofia we considered the SOFIX index. It is a general index launched in 2000 with an initial value of 100 points. The SOFIX index includes the first 15 ranked issues, in ascending order by the four criteria that have equal weight: median value of the weekly turnover during the last 6 months; number of trades during the last 6 months; free-float market capitalization; average arithmetic value of the spread between „buy" and „sell" prices[6].
- For the Bucharest Stock Exchange, we selected BET index - a market capitalization weighted index of the individual index member companies. BET index was launched on September 19, 1997, with a start value of 1.000 points and includes 10 most

[5] "The BUX index manual" – www.bse.hu

[6] "Rules for calculating the indices of Bulgarian Stock Exchange – SOFIA- www.bse-sofia.bg

liquid companies listed on BSE except for the financial investment companies traded on the BSE regulated market and of the investment funds.[7]

The value of U and Um for each country was obtained by calculating the mean raw initial returns and adjusted initial returns for all initial public offerings made in that market in the period considered.

Also, for each of the three selected capital markets we calculated the sample median and standard deviation (table below).

2.1.5 The Results of IPO Underpricing Measurement on the Capital Markets in Romania, Bulgaria and Hungary

The calculation of the raw and adjusted initial returns for the three capital markets: Romania, Bulgaria and Hungary, led to different results for the level of underpricing of the initial public offerings for each market.

[7] The index management rules for BET" – www.bvb.ro

Table 3 Country raw and adjusted initial returns

Country	Sample		Raw initial returns									Adjusted initial returns						
			1 day	5 days	10 days	1 month	2months	3 months	4 months	Index		1 day	5 days	10 days	1 month	2months	3 months	4 months
România	8	Mean	0,28	0,26	0,23	0,20	0,17	-0,10	-0,22	BET	Mean	0,28	0,23	0,21	0,16	0,18	-0,09	-0,12
		Median	0,21	0,23	0,20	0,21	0,15	-0,08	-0,09		Median	0,22	0,19	0,18	0,16	0,11	0,02	0,03
		Std. Dev.	0,42	0,43	0,47	0,55	0,46	0,74	0,78		Std. Dev.	0,42	0,44	0,45	0,54	0,45	0,79	0,78
Bulgaria	22	Mean	-0,29	-0,31	-0,27	-0,25	-0,26	-0,23	-0,22	SOFIX	Mean	-0,29	-0,32	-0,29	-0,27	-0,23	-0,20	-0,15
		Median	0,02	0,01	0,01	0,01	-0,01	0,02	0,00		Median	0,02	0,03	0,01	-0,02	0,06	-0,01	-0,04
		Std. Dev.	0,89	0,85	0,84	0,87	0,85	0,81	0,80		Std. Dev.	0,88	0,85	0,83	0,86	0,86	0,81	0,83
Hungary	12	Mean	0,01	-0,02	-0,03	-0,06	-0,03	-0,05	-0,01	BUX	Mean	-0,02	-0,07	-0,08	-0,12	-0,11	-0,13	-0,07
		Median	0,03	0,01	0,01	-0,06	0,03	0,03	0,09		Median	0,01	-0,02	-0,01	-0,08	-0,04	-0,06	0,02
		Std. Dev.	0,09	0,13	0,12	0,13	0,16	0,19	0,35		Std. Dev.	0,11	0,18	0,18	0,18	0,22	0,23	0,37

Figure 10 Raw initial returns

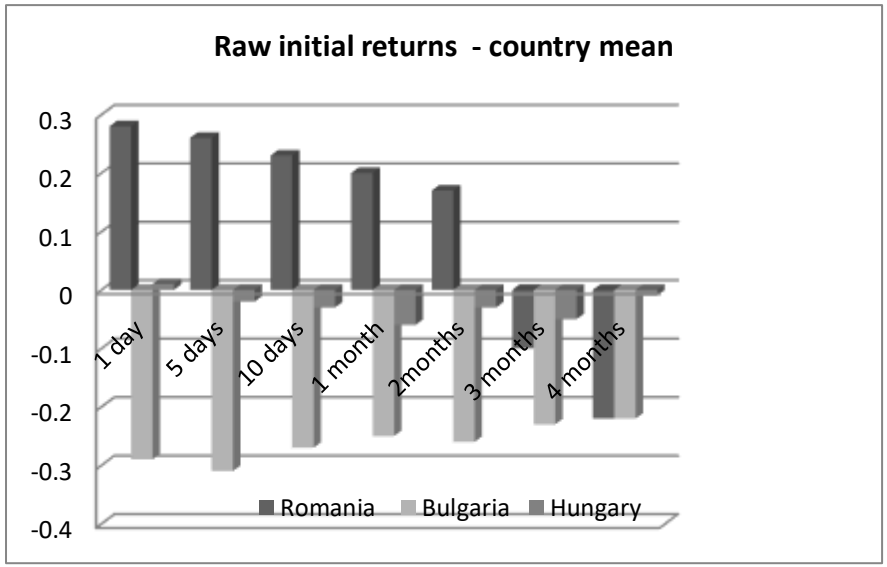
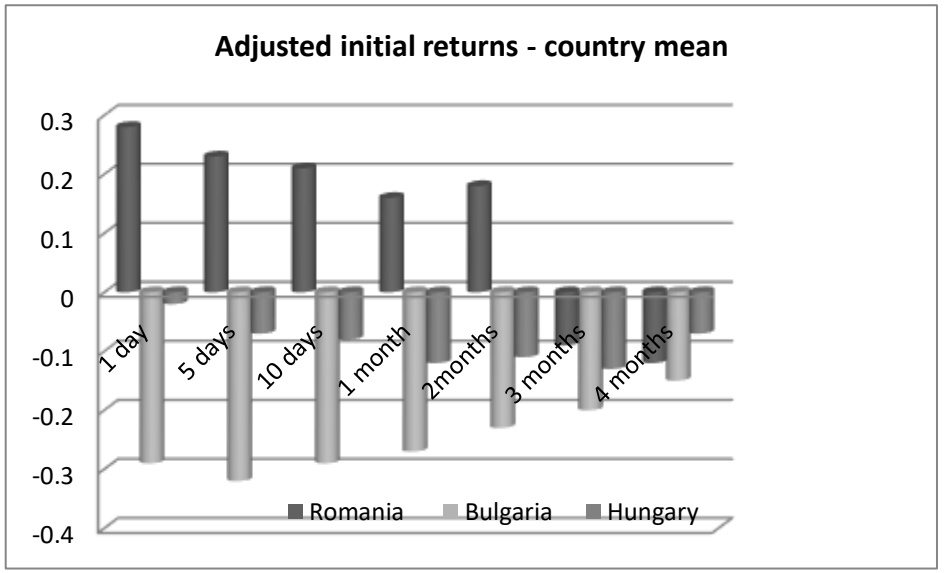


Figure 11 Adjusted initial returns



Source: author's calculation

The Romanian capital market results show that there is underestimation of the offer price in a two month horizon from the first day of trading.

On the first day of trading the raw initial return for the whole sample was 28%, equal to the initial yield adjusted with BET index - this value shows that investors who purchased shares during the initial public offerings could sell the shares on the first day of trading with a profit of 28%. Data for each distinct IPO shows that there are companies in the sample that in the first day of trading recorded a price lower than the offer price - it's the case of Casa de Bucovina Club de Munte and Teraplast. The two offerings were listed on the Bucharest Stock Exchange in 2008 and their price evolutions after the listing are part of the general downward trend of the market because of the current international financial crisis. The best returns were made on the first day of listing by Broker SA and Alumil Rom Industry SA, with values above 50%.

The underpricing manifested up to the two months horizon, ranging from 26% in the fifth trading day to 17% at the end of two months of trading. From the third month of trading the raw and adjusted initial returns became negative, indicating that investors who purchased shares during the initial public offerings could sell the securities with a loss of 9% in three months and 22% in four months, if taking into account raw initial returns.

The adjustment of raw initial return with the market returns did not bring corrections higher than two points in the first two months of trading but for the third and fourth month the negative raw initial returns are attenuated by the market returns, also declining. This development is driven by the fact that initial offerings made in 2007 were listed in 2008 when the market entered a downward trend.

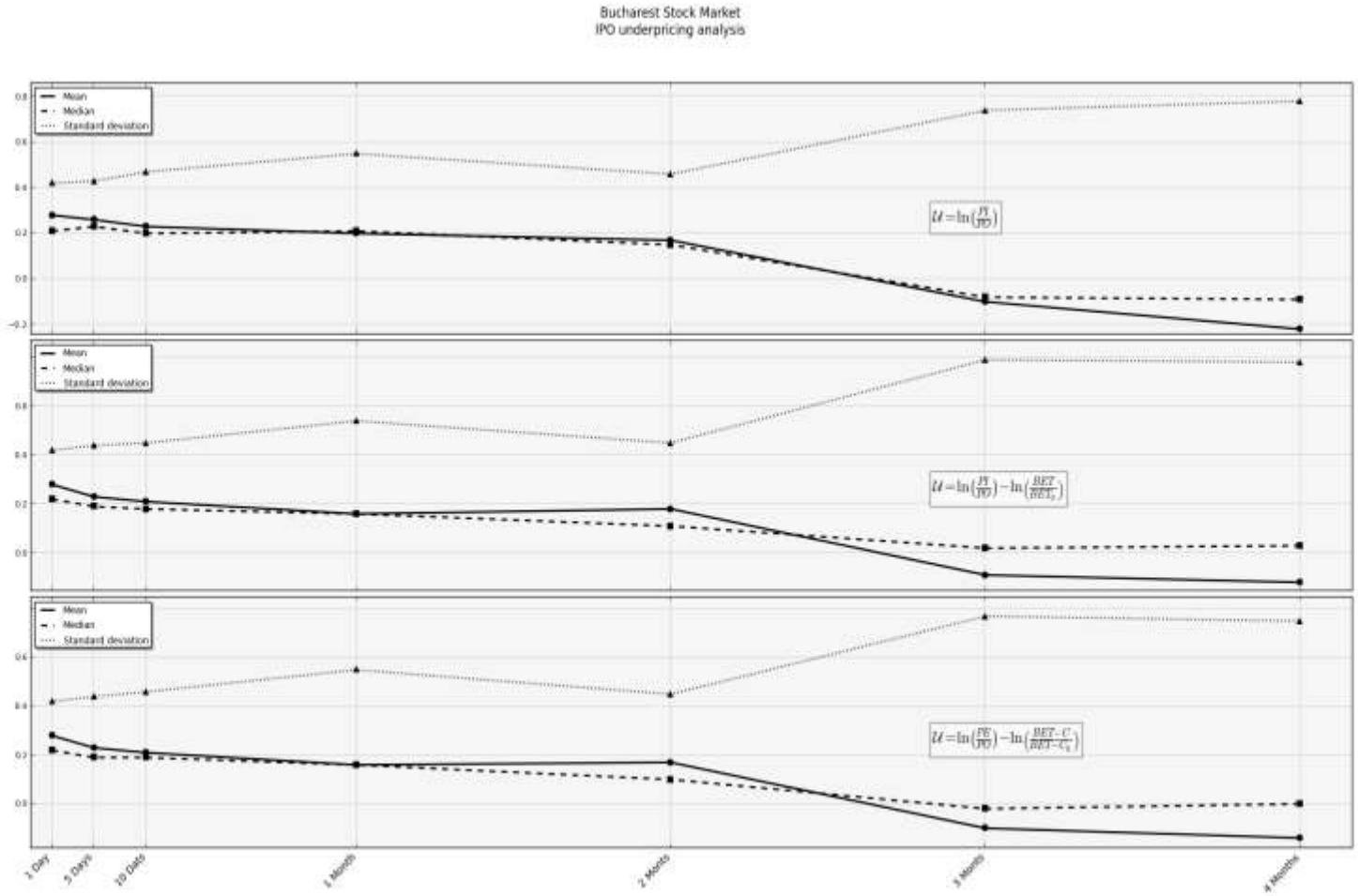
In conclusion, we can say that on the Romanian capital market the theory of underpricing of initial public offerings shares is confirmed.

On the Bulgarian capital market, the results on returns of IPOs show that from the first day of trading the prices of shares from initial public offerings were lower than the offer prices, which invalidates the theory of IPO underpricing on this market.

Raw initial returns for the first day of trading were 29%, with a slight attenuation after four months. The correction with the market return was made without any significant changes for this market. The invalidation of the underpricing theory on this market raises the question for Bulgaria: if investors who trusted issuers are not rewarded with increased prices on the secondary market, how will they be stimulated to invest in shares from initial public offerings?

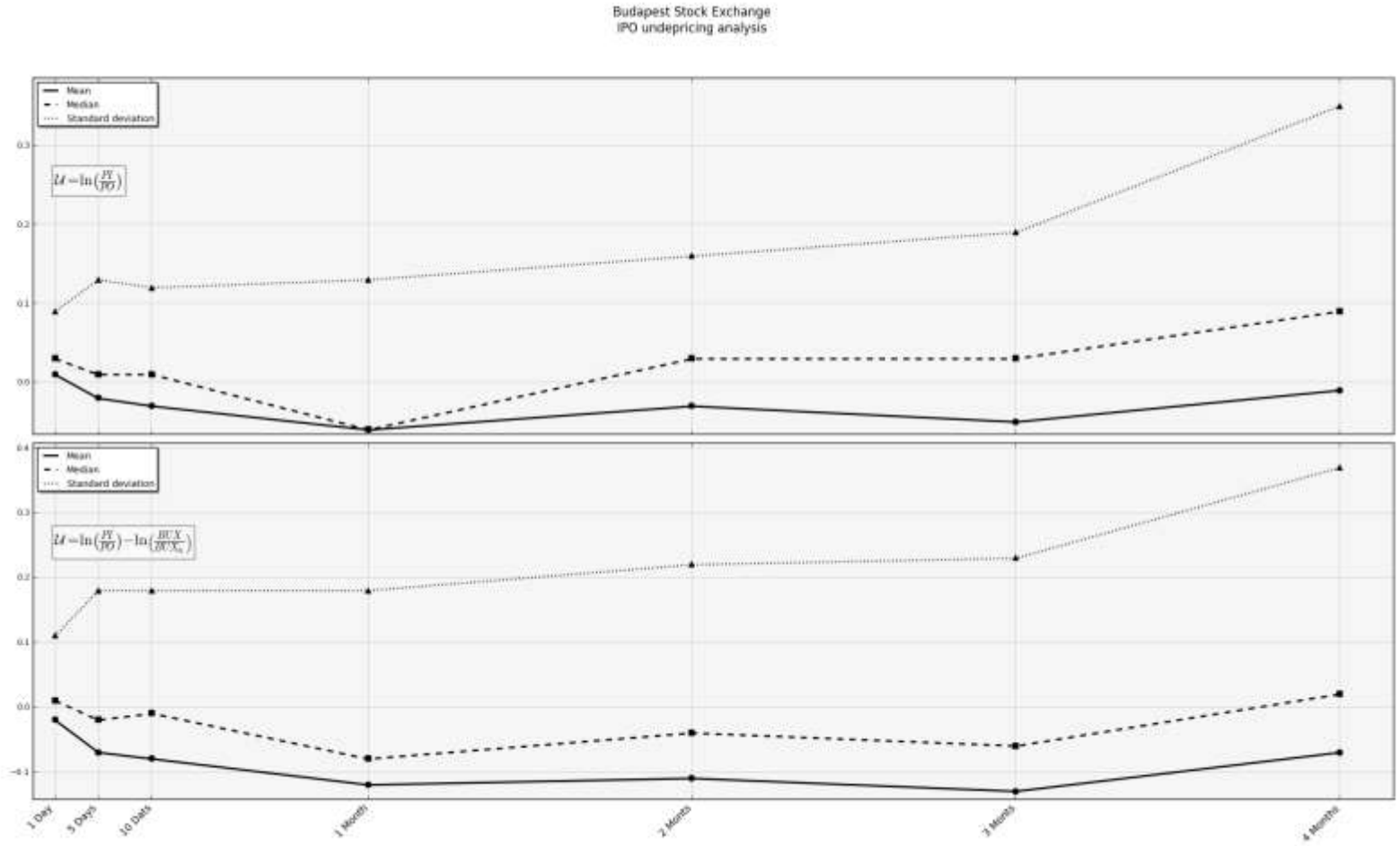
Underestimation of the offer price represents an important element of the attractiveness of companies on the initial public offerings market and, as noted previously, a successful IPO depends on the presence of those features to be able to convince investors to buy shares on this market. The lack of underpricing on the Bulgarian capital market is, in our opinion, the explanation for the weak performance of initial public offerings, which could not exceed the 100% subscription level, a part of them not having even reached this threshold.

Figure 12 IPO Underpricing Analysis –Bucharest Stock Exchange



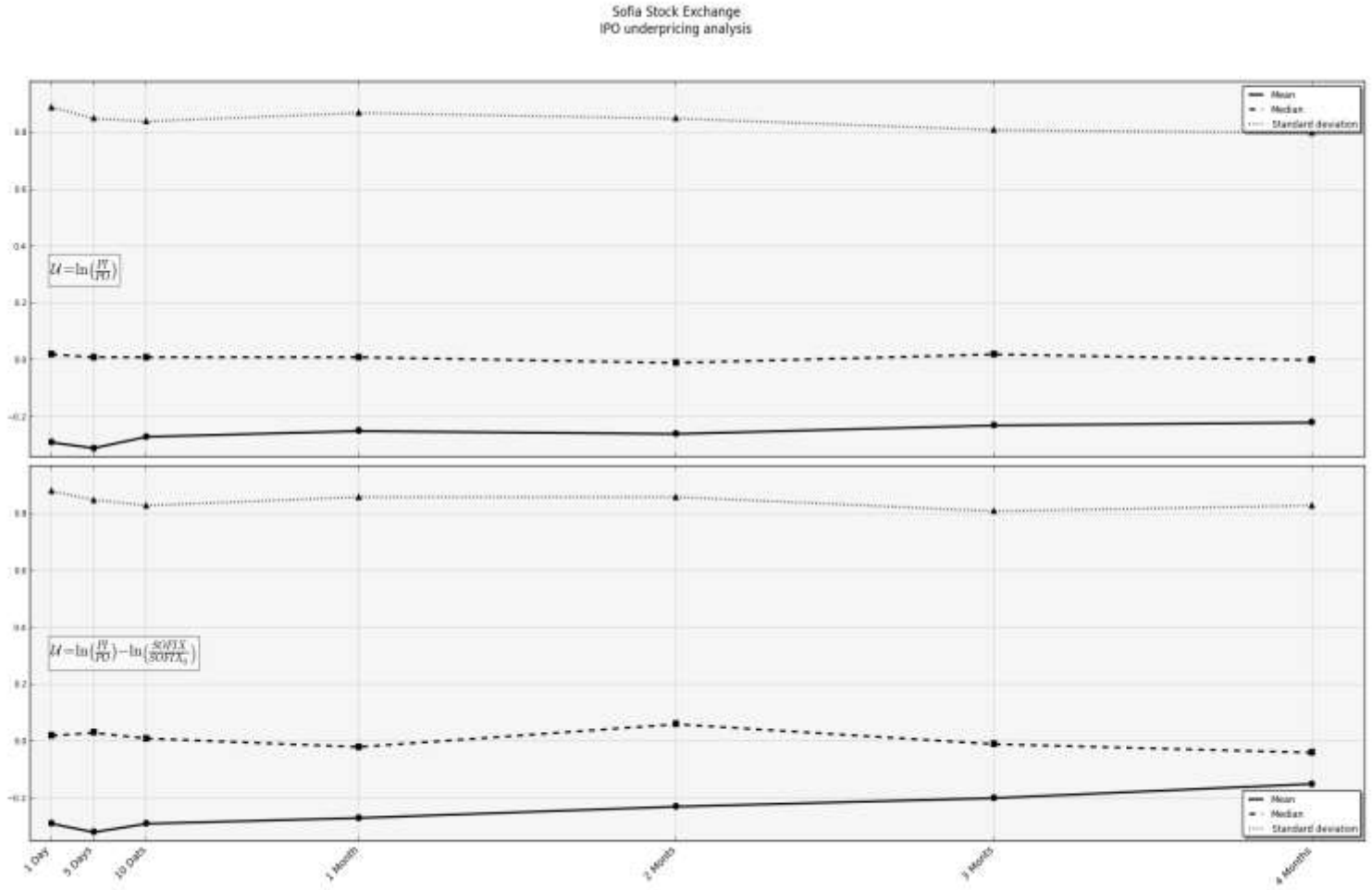
Source: authors‘own data processing

Figure 13 IPO Underpricing Analysis –Budapest Stock Exchange



Source: authors‘own data processing

Figure 14 IPO Underpricing Analysis –Bulgarian Stock Exchange - Sofia



Source: authors‘own data processing

The three graphs above show the means, medians and standard deviations of raw and adjusted initial returns for each market and each time horizon considered.

Regarding the degree at which the issuer considers the subscription level sufficient to declare an offer successfully closed, the Bulgarian and Romanian capital market have very different philosophies: if on the Bulgarian market underwriting levels of 40% are common and considered to result in a successful offer, on the Romanian public offerings market there have been offers with subscription levels over 2500%, and issuers declaring an offer a failure at an underwriting level of 62%.

On the capital market of Hungary, according to the results obtained, the IPO underpricing theory is not confirmed. The calculation of the raw initial returns shows that for the time horizons considered, only the first day of trading recorded a positive raw initial return of 1%, but corrected with market evolution it reached -2%, showing that the rate of 1% is below the general market return.

2.1.6 Conclusions

The research developed in this paper has as main goal to determine if, for the three markets selected for the IPO sample, the phenomenon of IPOs' underpricing is confirmed.

The selection of the markets to be analyzed and the period to use in the research was the most important issue to be solved because on all three markets considered the IPO activity was a discontinue one, with periods without such an activity as for Romanian market before 2000, the all three markets after the economic and financial crisis triggered in 2007-2008.

Even the three stock markets considered are relatively small stock markets and it would be difficult to include them in IPO samples along with more mature markets as Poland and Czech Republic and absolutely incomparable with Western European stock markets such as London Stock Exchange, Borsa Italiana or Borsa de Madrid, the analysis is consistent when the comparison refers only to these three markets. The identical historical background, the similar pattern of rebirth in the 1990's and the relatively similar implication in the privatization process for all sustain the authors' option to do a comparative study.

Although it had the smallest number of initial public offerings, the Romanian market was closest to the behaviour of the mature capital markets, showing a medium degree of underpricing that allows investors to obtain positive initial returns.

The calculation of IPO underpricing on the capital market in Hungary exhibits the same phenomenon as the Bulgarian capital market - lack of IPO underpricing.

This is a premiere among studies on this subject, which showed a very high underpricing phenomenon in most investigated markets. Browsing the literature revealed no such investigation targeting the markets targeted by our study - Bulgaria and Hungary.

Negative initial returns on the Bulgarian market had high absolute values, as shown in figure above. The sample for this market was heterogeneous, and contained extreme values, as the large standard deviation reveals.

On the Hungarian capital market, the situation was different: the negative initial returns are relatively low and the average values of individual returns are both positive and negative, but with small values, as shown by the low standard deviation on the first, fifth and tenth day of trading.

For the Romanian capital market, we calculated the level of underpricing when the initial return is adjusted with the BET C index, an index that takes in consideration the overall market return. The results are similar with those obtained by correcting with BET. This is explained by the fact that on the Romanian capital market only a small number of companies are listed, making the two indexes have similar evolutions.

The research made by several authors have shown that there is a cyclical phenomenon on the market of the initial public offerings: periods during which many firms decide to launch initial public offerings and list on a stock exchange (hot markets) and periods in which the number of these firms is shrinking (cold-market markets).

An explanation of this phenomenon is not unanimously accepted, but many authors believe that in the periods characterized by investment-friendly macroeconomic conditions, the firms with development potential take the decision to launch initial public offerings also encouraged by the prospect of obtaining favourable prices in those initial public offerings. Such initiatives attract the interest of less attractive firms to carry out initial public offerings. This behaviour leads to an increase in their number giving rise to a "hot" market.

Yung et. al. (2008) tested several assumptions about the cyclicality of the initial public offerings market, one conclusion being that a high percentage of the offers launched in a "hot" market do not survive the time horizon of three or five years after the listing.

The research literature in the field of IPOs such as the IPOs' underpricing or the IPOs' underperformance for the Eastern European stock markets revealed partial results for some of the markets studied in this research or included one or two of them (Hungary or Bulgaria) in comparative analysis with markets having very different profiles.

In conclusion we can appreciate that the study conducted obtained valuable comparative results for the research topic of IPOs activity on the Eastern European capital markets.

2.2 The long run underperformance phenomenon

2.2.1 Introduction

The most important contribution of the capital market to the development of the real economy represents the supply of financial capital to the real economy.

The influence of initial public offerings (IPOs) on capital market developments, future developments of those shares listed on the stock exchange and the performance obtained by investors who have subscribed to those offerings show that the offer price, the time of the offer and the long-run performance of those shares are important elements for issuers and investors and analysed in numerous studies and research papers.

The focus of the literature on the practical conditions of financing companies through the capital market by issuing shares comes, on the one hand, aims at verification if that capital market is able to provide financing to the real economy and, on the other hand, the desire to investigate what are the conditions in which these IPOs have the ability to attract foreign investors on emerging capital markets. The long-term performance of the shares delivered in the initial public offerings is regarded as one of the most important factors of this ability.

The development of the capital markets able to provide funds at lower cost in a short time to the real economy depends on its ability to offer investors attractive opportunities in terms of the future yields. The achievement of the goal depends on both, the ability to attract issuers that wish to list their shares on the stock exchange and the returns made by investors who have purchased the shares of the initial public offerings since the investment decision is based on the income from dividends and other patrimonial transactions, and is largely influenced by the long-run performance of these equities.

The hypothesis to be tested in this study is: *the shares from the initial public offerings show lower performance than the overall market performance considered as an abnormal return in the long-term.*

Many studies verify this hypothesis in various capital markets and the majority of them show that the hypothesis is true: the IPOs shares have an abnormal and usually much lower performance compared to the average market return.

The capital markets on the basis of which this hypothesis is verified face a challenge: if the vast majority of shares from initial public offerings registered a strongly negative abnormal return comparing with the average market returns then despite the buyer, how will the basic function of the capital market in an economy, namely, financing the real economy, be fulfilled? (Pagano et. al. 1998).

The analysis of the long-run performance of the shares from the initial public offering represent a particularly interesting aspect (both, for Investors and issuers) especially as the studies have shown that in most markets the analysed under-pricing of the IPO shares

allows for sometimes positive short-term yields, that are counted from the first day of trading to three months.

2.2.2 The Determinants of the Long-Run Performance of the Shares from the Initial Public Offerings

The studies conducted by the economists on various capital markets raise two important aspects, i.e., both, the choice of the calculation models for relevant results that might differ with regard to the used and the discussion related to the fact that the results of the different models respond to different questions should be mentioned.

Furthermore, the discussion related to the abnormality in comparison with the expected return of a compared element should be introduced. Many authors have observed that results are sensitive to the choice of this comparing element in the models applied (Brav&Gompers, 1997).

In many studies the return of IPO's shares is compared with an index return considered to be representative of the overall market developments but Ritter (1998 and 2000) showed that using indexes can alter the outcome if in their calculation shares from the investigated initial public offerings are taken into account, which is a common situation especially in the emerging markets with a small number of equities quoted. In their works Stehle et al. (2000), Brav (2000) argue that the performance portfolios formed on the basis of size or relationship between the book value and the market value used for the comparison mitigate the abnormality to the expected return from that share.

The long-term abnormal returns from IPOs shares have been analysed in a number of studies and very different results on the absence or presence of negative abnormal returns for different markets have been gained:

- In 1991 Ritter investigated the long-term performance of 1526 IPOs carried out on the U.S. market between 1975 and 1984 - showing that they obtained returns lower by 34.47% compared to the reference portfolio;
- In 1993 Levis calculated long-term returns for 712 IPOs in the UK capital market between 1980 and 1988 and found out that they are 8.31% lower than HGSC index;
- In 2008 Bildik&Yilmaz showed that the shares from the initial public offerings on the Turkish market have a return lower by 84.5% than the long-term market index return. A previous study (Kiymaz, 2000) on the same capital market shows that the shares from the initial public offerings registered a positive return being 44.1% higher than the market return, in a three-year horizon.

Besides the concern for long-term performance of the shares from the initial public offerings, many authors interested in this issue have sought an explanation that these returns are abnormal compared to the market return.

An explanation of the fact that in a three-year time perspective the return of these securities is in most cases lower than the market return refers to the aim that to prepare the

prospectus and to obtain the necessary permits from the market authority, managers show availability to present the financial statements in an "embellished" manner (for fear that otherwise offer will not be subscribed successfully). The proponents[8] of this theory assume that investors buy the shares during the subscription period because they have the ability to properly assess the financial situation of the company, but in a period of time longer than one year after listing they will realize the real situation of the issuer and will liquidate the holdings of shares in their portfolios.

The launch timing of initial public offerings after a very successful financial year may be another explanation for the fact that although, at the time of the offer, the shares of an issuer had good prospects, in many cases, these shares register low returns in a longer time horizon.

The market conditions are also of importance since when the market allows easy placement of shares, the prices are rising and the risk of the failure of the offers launched diminishes, the managers may consider appropriate to launch an initial public offering causing so called "hot market".

There are authors who believe that long-term underperformance of shares obtained from IPOs may be due to an exaggerated optimism expressed at the time of offer that allows the issuer to sell shares at a higher price than the real financial condition and the future prospects of development for the issuer would allow. Krigman (1999) and later Cornell (2000) found that, during the periods when the investors are optimistic about the future positive development of the issuer and overrate such offers, shares which have a poor long-term performance are issued.

Depending on the length of time the particularities of the capital market where the shares from the initial public offerings are listed are also considered, the factors determining the abnormal returns, most often more negative than that of the market, remain open to discussions.

2.2.3 Models for Determining the Long-Term Performance of Initial Public Offerings Shares

Several models are used to determine the long-term performance of those shares with regard to the market that the shares from IPOs are listed on, the sample size; the available information used both, on the market and the sample.

The analysis of the long-term performance of a share involves a period of at least one year but generally the time horizon taken into consideration is three to five years after listing on the market. The studies have shown that the results are not uniform and depend on the method chosen to obtain them (Teoh et. al. (1998), Ritter& Welch(2002) Ritter(2003)).

The main categories of models investigating the existence of abnormal returns of the shares from IPOs compared to the market return involve the calculation of Buy-and-Hold

[8] Teoh(1998), Roosenboom(2003), Pastor-Llorca şi Poveda-Fuentes(2006).

abnormal returns (BHAR); cumulative abnormal returns (CAR), and the abnormal returns using multifactor models.

Buy-and-Hold Abnormal Returns (BHAR)

The BHAR model to measure the abnormal return assumes the calculation of the return brought by a IPO's share compared with the expected return, for example, that of a representative index of the capital market.

This model assumes that an investor buys the shares of the sample of IPOs on the first trading day and keeps them for T periods.

$$BHAR_i = \prod_{t=1}^{T}(1 + r_{it}) - \prod_{t=1}^{T}(1 + I_t) BHAR_i = \prod_{t=1}^{T}(1 + r_{it}) - \prod_{t=1}^{T}(1 + I_t) \quad (1)$$

where:

$r_{it} = \frac{PI_t - PI_1}{PI_1} r_{it} = \frac{PI_t - PI_1}{PI_1}$, represents the return of the share at time t compared to the price on the first trading day (PI_t is closing price at time t,, PI_1 relates to closing price on the first trading day);T suggests total number of periods (days, weeks or months);I_t is the market return determined using the chosen index applying the formula: $I_t = \frac{VI_t - VI_1}{VI_1}$ $I_t = \frac{VI_t - VI_1}{VI_1}$, where VI_t refers to the value of the index at time t, VI_1 is the value of the index in the first day of trading of the share.

The abnormal return registered by the entire sample of IPOs compared to the market yield with regard to the expected return is calculated as the arithmetic means of the individual abnormal returns for all IPOs in the sample are considered.

$$BHAR = \frac{\Sigma_{i=1}^{n} BHAR_i}{n} BHAR = \frac{\Sigma_{i=1}^{n} BHAR_i}{n} \quad BHAR = \frac{\Sigma_{i=1}^{n} BHAR_i}{n} \quad (2)$$

where:

N is the total number of initial public offerings; BHAR is the abnormal return obtained by the sample of IPOs.

Wealth Relatives (WR)

The wealth relatives as well as the BHAR calculate the abnormal returns of a portfolio of IPOs purchased on the first day of trading compared with the expected return (typically considered a relevant market index).

The first economist who introduced this form of calculation of wealth relatives in 1993 was Levis. He considered the return of the share at the end of the period of time.

$$WR_i = \frac{1 + r_{iT}}{1 + I_T} WR_i = \frac{1 + r_{iT}}{1 + I_T} \quad (3)$$

where:

$$r_{it} = \frac{PI_T - PI_1}{PI_1} r_{it} = \frac{PI_T - PI_1}{PI_1} \quad (4)$$

r_{iT} pertains to the return of the share at the end of the period of time T; PI_T refers to the closing price at the end of the period of time T;

$$I_T = \frac{VI_T - VI_1}{VI_1} I_T = \frac{VI_T - VI_1}{VI_1} \quad (5)$$

VI_T is the index value at the end of the period of time; I_T is the index return of the end of the period of time.

Some authors such as Ritter (1991) and Loughran&Ritter (1995) calculate the wealth relatives as a product of the returns of IPO' s shares by sub-periods.

$$WR_i = \frac{\prod_{t=1}^{T}(1 + r_{it})}{\prod_{t=1}^{T}(1 + I_t)} WR_i = \frac{\prod_{t=1}^{T}(1 + r_{it})}{\prod_{t=1}^{T}(1 + I_t)} \quad WR_i = \frac{\prod_{t=1}^{T}(1 + r_{it})}{\prod_{t=1}^{T}(1 + I_t)} \quad (6)$$

The relative abnormal return for the entire sample is calculated as the arithmetic means of the individual returns:

$$WR = \frac{\sum_{i=1}^{n} WR_i}{n} WR = \frac{\sum_{i=1}^{n} WR_i}{n}$$

$$WR = \frac{\sum_{i=1}^{n} WR_i}{n} \quad (7)$$

Cumulative Abnormal Returns (CAR)

The cumulative abnormal returns of a share from an initial public offering over a number of months (T) is calculated as a sum of monthly abnormal returns of shares obtained due to the market index performance.

$$CAR_i = \sum_{t=1}^{T} AR_{it} \; CAR_i = \sum_{t=1}^{T} AR_{it} \quad (8)$$

where:

the monthly abnormal returns are calculated by the formula: $AR_{it} = r_{it} - I_t$ $AR_{it} = r_{it} - I_t$, r_{it} and I_t being calculated as was shown for the BHAR.

The cumulative abnormal return for the entire sample is calculated as the arithmetic mean of the individual returns:

$$CAR = \frac{\sum_{i=1}^{n} CAR_i}{n} CAR = \frac{\sum_{i=1}^{n} CAR_i}{n} \quad (9)$$

where:

n is the number of initial public offerings.

In the last two decades, several calculation models of the long-term abnormal returns brought by the IPO's shares taking into account a larger number of variables have appeared. The application of these models, however, is conditioned by the variables considered in the light of the particularities of the capital market taken into account for the analysis.

2.2.4 IPO Sample and Data Collection

To carry out the study a sample selection of IPOs was taken and data on the offer prices, listing data, closing prices and the index values for the three capital markets, namely, Romania, Bulgaria and Hungary were collected. The time frame selected for analysis is the years from 2003 to 2008. The analysis ends at 2008, since from the last half of that year financing by share issuance diminished drastically or stopped. Also the crash in September 2008 in capitals markets makes IPO shares return analysis impossible.

The global crisis that started in 2008 has affected the world economy. It also relates to the effects such as the rising unemployment, the increase of inflation, the decrease of purchase power that have determined an augmentation of the level of anxiety perceived by consumers, leading to a reconsideration of their priorities (Moraru, 2011).On a global level, the slowdown of all economic activities had an impact on the capital movements.

The financial and economic crisis had a direct and strong impact on the emerging capital markets in the East-Central Europe. In this respect, it must also be taken into account the fact that the fall of the capital market was very correlated and triggered by events which did not necessary had anything to do with their macroeconomic environment, these negative consequences being rather a spill over effect of the event that took place on the more advanced European and American capital markets (Roman&Sargu, 2011, p.32).

The first criterion used to create the sample refers to the selection of those IPOs which take companies shares as a subject, ignoring other financial instruments.

The second criterion used to create the sample was the market segment on which the initial public offerings were made. - Those offers conducted on the regulated markets, eliminating offers made on market segments such as over-the-counter were considered. For this reason, no initial offer made on the RASDAQ for the Romanian market was considered until 2005, when it merged with the Bucharest Stock Exchange.

Thirdly, only those IPOs were considered, the shares of which registered such a number of transactions as to ensure sufficient liquidity on the secondary market.

Applying these criteria, we obtained a representative sample, in fact, including in the analysis all initial public offerings that could be a part of a sample for long-run performance of shares from IPOs that have been issued from 2003 to 2006.

Removing all cases where data collection would have been impossible (due to late listing on the study's time horizon), it should be emphasized that the sample of IPOs shows itself coinciding with the number of initial public offerings for the capital market taken into consideration.

The data were collected from the sections for daily reports and initial public offerings of the official websites of the Bucharest Stock Exchanges, Sofia Stock Exchange and Budapest Stock Exchange. Information about the price of the offers were collected from the official sites of the stock exchanges, the sites of the companies that have been the subject of

initial public offerings and the www.kmarket.ro site. Python Software was used for data collection and processing for both, IPOs and the stock indices considered in the analysis.

2.2.5 The Methodology

The analysis of the long-term returns of the shares from the initial public offerings on the capital market in Romania, Bulgaria and Hungary were compared using previously presented three methods, namely BHAR, WR and CAR.

For the calculation of BHAR the relations (1) and (2) were used, for WR the relations (6) and (7) were taken and for CAR the relations (8) and (9) were employed, and a period of one and three years after the firms decided to go public was chosen as time horizon.

The individual results for each considered IPO are calculated using as a comparison item, such as the market index BET for the Romanian capital market, SOFIX for the Bulgarian capital market and BUX for the Hungarian capital market.

The choice of the methods for investigating the abnormal returns of shares from the initial public offerings compared to the market return was made taking into account that for the Romanian capital market choosing a portfolio of all listed shares to represent the market performance is irrelevant as the total number of listed companies is small enough for the chosen index to represent a realistic level of market efficiency.

A review of the studies conducted in various national markets showed that the three selected methods are the most commonly used both, on a developed capital market and an emerging market like in our case.

2.2.6 The Results of the Long-Term Performance Measurement for the IPO's Shares

The results obtained after the application of the three models to calculate the abnormal returns for shares from initial public offerings on the markets considered in the analysis showed different situations.

The calculation of long-term returns for the shares from the initial public offerings on the Romanian capital market (*Table 4*) leads to the following conclusions:

- The BHAR indicator is negative and greater in the time horizon of three years than the one year horizon. We observe that that the average return of our portfolio is lower than the average market return constituting 46.975% in the first year of trading and with 93.38% at the end of the third year of trading, showing long-term yield very low in comparison with the overall market efficiency which confirms the theory of the long-run underperformance.
- WR indicator value is 62.30% for the time horizon of one year, which shows that the returns of shares from IPOs were lower than the return offered by the market, and the IPOs sample return is only 29.37% for the time horizon of three years. This indicator also relates to long-term underperformance.

- The CAR indicator shows that the shares from the initial public offerings were less efficient with 50.19% of the overall market performance for a time horizon of one year and with 102.14% for a time horizon of three years from the listing.

Table 4. Abnormal returns for time horizon of one and three years from the initial public offerings on the Romanian capital market

Abnormal returns for a one year horizon of time					
BHAR	-0,469733808	WR	0,623031539	CAR	-0.501902205
Median	-0,261844256	Median	0,683957991	Median	-0,376770094
Standard deviation	0,782311049	Standard deviation	0,406802414	Standard deviation	0,617605953
Abnormal returns for three-year time horizon					
BHAR	-0,933752334	WR	0,293784255	CAR	-1,021449748
Median	-0,891605418	Median	0,347005125	Median	-0,668733936
Standard deviation	0,278519557	Standard deviation	0,209681866	Standard deviation	0,770242316

Source: author's calculations.

The calculation of long-term returns for shares from the initial public offerings on the Bulgarian capital market leads (*Table 5*) to the following conclusions:

- The calculation of the abnormal returns of shares from the initial public offerings using BHAR method show that in the time horizon of one year the performance of these shares slightly differ from the overall market performance, while the time horizon of three years shows that the shares from the initial public offerings recorded a level of performance 69% higher above the average level of the overall market. These results support the theory of low long-term performance of the shares from the initial public offerings on the Bulgarian capital market;
- The results obtained using the WR indicator are consistent with those obtained by applying the first method: the time horizon of one year shows a level of returns for the shares arising from the initial public offerings almost identical to the market and the time horizon of three years shows a yield which is 78% higher than the general market performance.
- Applying the CAR method the results in the sense of refutation of the theory of low long-term returns for the shares from the initial public offerings were confirmed, namely, the time horizon of one year shows that the performance of these shares is only 6% smaller than the overall market and the time horizon of three years shows a yield which is 83% higher than the overall market.

Table 5. Abnormal returns for time horizon of one and three years from the initial public offerings on the Bulgarian capital market

Abnormal returns for a one year horizon of time					
BHAR	-0,019694807	WR	0,934346546	CAR	-0,063873006
Median	-0,230867922	Median	0,735115914	Median	-0,270808021

Standard deviation	0,724108416	Standard deviation	0,514035015	Standard deviation	0,546703444
Abnormal returns for time horizon of three years					
BHAR	0,690051483	WR	1,782592503	CAR	0,830315178
Median	1,306569019	Median	1,489898114	Median	0,721301579
Standard deviation	1,917948784	Standard deviation	1,550450389	Standard deviation	0,734186474

Source: author's calculations.

The last capital market analysed in terms of the long-term returns of the shares from the initial public offerings compared with the Hungarian market performance shows a situation differs from the other two markets discussed above.

Table 6. Abnormal returns for one and three year's horizon of time form the initial public offerings on the Hungarian capital market

Abnormal returns for a one year horizon of time					
BHAR	0,049118364	WR	1,124579409	CAR	-0,079289494
Median	-0,297554417	Median	0,766648309	Median	-0,202990515
Standard deviation	0,888995141	Standard deviation	1,010417265	Standard deviation	0,743785876
Abnormal returns for three years horizon of time					
BHAR	-1,349434390	WR	0,33932885	CAR	-0,55592189
Median	-1,483875834	Median	0,365503189	Median	-0,712849634
Standard deviation	0,591069345	Standard deviation	0,147642558	Standard deviation	0,401685968

Source: author's calculations.

The results of applying the three methods on the Hungarian capital market, presented in *Table 3*, lead us to the following conclusions:

- Values of the BHAR indicator's for the horizons of considered two periods of time show that with regard to the time horizon of one year the returns of shares from the initial public offerings differ slightly (only 5%, from the overall market performance), but the time horizon of three years shows that the performance of the shares from initial public offerings is generally 134% lower than the overall market performance. This confirms the theory that the long-run performance of the shares from the initial public is lower in comparison with the general market performance.
- WR indicator shows that the performance of the shares from the initial public offerings for a time horizon of one year is 12.4% higher than the market performance, but after three years the market performance becomes equal to 34% showing a strong deterioration of the returns of these shares;
- The results gained using CAR method lead to similar results obtained applying the other two methods: after a year the performance of the shares from the initial public offerings were only 7% lower than the market performance, but after three years the returns of these shares became 55% lower than the market performance.

2.2.7 Conclusions

Testing of the theory that the long-run performance of the shares from the initial public offerings are generally lower than the market efficiency for the three markets considered in our analysis showed that the situation of each of them is similar, namely. While the Romanian capital market showed a poor performance during the time horizon of one year but it was even worse for the period of three years, the Bulgarian capital market in the time horizon of one year shows the performance of the shares from the initial public offerings differs slightly from the general market in the sense of smaller values and in the time horizon of three years the yield of these shares is higher than the general market performance. In Hungary the capital market's time horizon of one year was recorded after the market was closed. During a three-year period the performance of shares comparing to the initial public offerings deteriorated noticeably.

Although in the Hungarian capital market the time horizon of one year relate to the levels of the returns for shares from the initial public offerings close to the overall market performance, after three years the performance of these shares steeply declined.

The calculation of the long-term abnormal returns of shares from IPOs on the capital market in Romania, all three chosen methods prove that the tested hypothesis is true and the shares from the initial public offerings performed much lower yields than the general market performance.

Considering the one-year time horizon, the IPOs launched on the Romanian market obtained a very low performance which proves that the investments in such shares were counterproductive. The horizon of three years after listing the results of the calculation of the abnormal returns comparing with the general market return for shares from the initial public offerings shows that the performance of these titles reduces even more.

The hypothesis tested and verified on the Romanian capital market may be an explanation for the poor development of the capital market in Romania in terms of reduced liquidity, a low volume of transactions and a lack of interest of the foreign investors for portfolio investments made through the Romanian market capital.

From the three emerging capital markets taken into consideration on the long-run underperformance of shares from the IPO's the only capital market on which the theory of low long-term returns of shares from the initial public offerings is rejected is the Bulgarian market. After the results of the study have been given, we can say that at least the other two markets are not attractive for the foreign investors in terms of advantageous investments from the perspective of the long-term yield. This assumption is confirmed only the case of Romania as the Hungarian capital market was more attractive to these investors, e.g.in the analysed period the market recorded a strong infusion of foreign capital as opposed to the Romanian capital market which became attractive to foreign investors only after 2008.

I.3 Political uncertainty and volatility on the financial markets-the case of Romania[9]

For decades, specialists in the economy have developed studies on financial markets. However, the 2007-2009 financial crisis raised serious questions about the economists' ability to understand these phenomena and to explain, prevent and resolve them. Under these circumstances, the financial crisis "has also become a crisis of economics" (Bragues, 2010).

Did or did not the decision that every American, whether s/he had the necessary income, taken by politicians in the early 2000s, lead to the escalation of these sub-prime loans with the disastrous consequences that arose a few years later? Is not this a political decision? Clearly, markets are fundamentally driven by the rhetoric that defines politics. The main actors, i.e. investors and traders, are those who face daily uncertainty, formulating strategies to maximize earnings or to minimize losses, based on various probabilistic arguments.

As such, a more competitive market of ideas – focused on various subjects (besides orthodox economics) from social sciences and humanities – could contribute to a more complete analysis that would allow for a more consistent understanding of how financial markets behave and evolve (Bragues, 2010).

Political uncertainty is undoubtedly an issue that generates probability, and we must investigate it when it comes to risk and uncertainty, in general. Therefore, in order to understand the phenomenon correctly, we must open the door to interdisciplinary studies that allow broader, multidimensional approaches to market behaviour.

3.1 Literature Review

There are authors, such as Ferguson (2009) professing that even the French Revolution was caused by stock market bubbles. The way in which stock markets were affected by war or political crises was investigated by the literature (Berkman & Jacobsen, 2006; Schenider & Troeger, 2006). Analysts went even further by focusing on the Arab Spring's impact on the markets (Chau et al., 2014) or on the socio-political issues caused by the organized crime in Colombia (Laverde et al., 2009).

In both situations, i.e. the Arab crisis or the political and economic criminality in Colombia, there have been massive financial market disturbances. However, not only these extreme political events influence the markets. The literature also retains that ordinary and predictable political events, such as democratic elections, can cause abnormal situations on the financial market. In this respect, the study performed by Bernhard & Leblang (2006) is

[9] Based on the scientific contributions from Diane Paula Corina Vancea, Kamer Ainur Aivaz & **Cristina Duhnea** (2017), *Political Uncertainty and Volatility on the Financial Markets- the Case of Romania*, Transformations in Business & Economics, Vol. 16, No 2A (41A), Pages: 457-477, Document Type: Article, Web of Science Categories:Business; Economics , ISSN: 1648 – 4460

remarkable. By using several data on OECD countries, these two authors highlighted that the financial markets, the stock, bond, and currency markets respond to the political changes caused by elections, government formation and development.

Other authors like Jones & Olken (2005) found that the effects are even stronger in autocracies than in consolidated democracies.

The analysis of the effects entailed by the changes in political leadership is performed mainly by political scientists. In the literature, there are two distinct trends. The first one associates political and economic changes with the presence and activity of important leaders, personalizing any evolution, development. For instance, in this regard, Keegan (1998) is the one who believes that "the political history of the 20th century can be written as the biographies of six men"[10]. At the same time, there is the opposite trend in both economic and political sciences, where the accent is placed on the institutions that are considered fundamental to the study of economic performance. Some studies have even looked at the influence of political institutions on financial markets (Haber et al., 2008) defining political institutions as "the rules of the game". These studies argue that well-built institutions protect the market and provide adequate means of responding to extreme policies that can lead to the profound damage to property rights or even to expropriation.

Thus, control levers are built against the political forces that would turn the system upside-down. The independence of central banks, which shift the responsibility for monetary policy from the political area to an independent body, may be a good example in this regard. "Institutions might define the number of veto players in the political structure, creating checks and balances in the system" (Osa, 2014, p.11).

The idea of political leaders as explanatory variable has gained ground lately. Blais (2013), in the volume "Political Leaders and Democratic Elections" considers that the personalization of politics and the decline of partisan loyalties are factors that act in this regard. An essential contribution to the use of leaders as explanatory variable comes from Jones & Olken (2005). They claim that political leaders affect economic growth. An explanation for this causality would be that "leadership transitions are often non-random and may in fact be driven by underlying economic conditions" (Jones & Olken, 2005). Other studies led by various researchers (Besley et al., 2011) go even further and explore the hypothesis that the leaders' education can explain the leaders' effect on economic growth. Including 215 events in their analysis, they show results indicating that economic growth rates are higher under leaders that have higher education, indicating the importance of leader on economic issues.

Researchers such as Frot & Santiso (2013) and Rodríguez & Santiso (2007) have expanded their analyses in emerging countries, especially from Latin America. Their findings are even more challenging having in view the conclusion, i.e. in the "past decades nearly all the major financial crises in developing countries have occurred in synchronization

[10]Lenin, Stalin, Hitler, Mao, Roosevelt, and Churchill.

with electoral cycles" (Frot & Santiso, 2010). Faccio & Parsley (2009) also found that a politician's sudden death leads to, on average, a drop of 1.7% in value of companies from that politician's hometown. Thus, gradually, the interest in researching how political uncertainty affects financial markets has grown, both in the economists' world and in the world of other social science specialists. Andrea Mattozzi (2008) even proposed a way of hedging against political uncertainty in the US stock market.

In order to explain the incidence of political and regulatory activity in finance, the adherents of the "new political economy" adopted the vision of the political decision-makers who have the sole aim of raising votes and maintaining and increasing political power (Pagano & Volpin, 2001). At the same time, Strange (1996) and Forssbaeck & Oxelheim (2003) have questioned whether the political leaders, for their own interest, would regulate financial markets even risking damaging the democracy.

Based on this knowledge, we are no longer surprised by the fact that financial bodies, such as the IMF and the World Bank, are interested in the consequences of political uncertainty on financial markets, in order to provide credible solutions to the problems faced by different countries.

The new realities imposed by the economic crises bring to the present the need to change the economic and institutional framework where markets operate. This framework is a result of policy compromise at national, super-state or global level. This compromise is achieved through the interaction of policy actors. The connection between financial markets and the political world is far from being a new phenomenon. It is a phenomenon that has been analysed, as we have already said, also by the political science specialists and the economists. Under these circumstances, the exercise of studying the influence of the political events on the Romanian financial market, as a country still in transition, an interesting and complex process, makes sense.

3.2 Research Methodology and Data

Research Scope and Objectives

This research is an empirical, quantitative study on how Romanian financial markets react to different political events and to political uncertainty. We have in mind both current political events such as local, parliamentary and presidential elections, as well as accidental events, triggered by political crises, sudden political changes, such as censure motions voted in the parliament, the President's suspension, or political and economic decisions, such as the sudden cut by 25% of salaries ("salary cuts"). We chose to analyse two financial market segments, i.e. the foreign exchange market and the capital market. This is primarily because both segments show or should show high sensitivity to different economic, social and, last but not least, political events; secondly, our choice is motivated by methodological reasons, because both segments present daily quotations, resulting in long enough and comparable

series that allow the performance of a consistent analysis. Therefore, we focused on the two important indicators, relevant for the two markets, i.e. the exchange rate and the BET index.

The period analysed (July 2015 - March 2017) represents for Romania's political and economic history a period marked by several important events, with profound implications in relation to the economic and social transformation of the country. It is the period when Romania joined the EU (January 1, 2007), missed the entry into the Schengen area, went through a profound economic crisis, experienced extreme measures applied in order to exit the crisis (such as salary cuts by 25%), recorded two suspensions of the president in office (2007 and 2012), went through two censure motions that triggered the fall of the governments in office, went through many political crises; the political class was shaken from the ground by famous arrests, all alongside three rows of local and parliamentary elections (2008, 2012, 2016) and two rounds of presidential elections (2009, 2014), the first being contested at the Constitutional Court and placed under parliamentary investigation (2009).

Externally, we witnessed a major military conflict, the Crimean crisis and the strengthening of Russia as a military power, which is a real threat to Romania at the eastern border. In contrast, the location of the Deveselu missile shield represents for Romania a new affirmation of its position within the North Atlantic Alliance, with the natural consequences resulting from this positioning, both on the military level and as a strategic partner.

The turbulences that marked the investigated period influenced the evolution of Romanian financial markets. In order to exemplify these statements, we chose some of the listed events, considering them politically significant. In our research, we acted in a double sense. First, we looked at the selected events in order to see if they produced significant mutations in terms of volatility on the two markets. Second, we analysed the major turmoil recorded, trying to identify if the respective periods were marked by significant political events or by other causes that could lead to such behaviours.

The economic phenomena, especially in the context of the current economic crisis, presented and still present a high variability; in the sense of the analysis of this variability in time, appears the term volatility, which helps to quantify this variability. From the statistical point of view, the volatility is seen as a measure of the dispersion of the value of a variable in time and the volatility term is best associated with the risk; logically, an increased volatility, determinant for a high uncertainty, makes the associated risk to be higher. Modelling the volatility as efficient as it may be, based on previous information, makes the prognosis of the future values of the studied phenomena more robust. Statistically, an economic phenomenon studied in time, may be shaped with the help of a time series. Estimating an econometric model which can shape as precise as it may the respective time series is hit, most of the time, by the failure to comply with the homoscedasticity hypothesis – from the constant variance of the residue. The motives for which this thing happens come both from the nature of the analysed phenomena as well as the chosen period for analysis.

The volatility has always been considered a key-variable to evaluate the status of the financial markets and to take decisions by the investors, the speculators, the financial investment managers and the regulatory authorities. In this context, the empirical research undertaken by us between 2005 and 2017, a period which has been characterized by a continuous political, financial and economic crisis, had as objectives obtaining volatility estimators with the help of conditional heteroskedastic econometric models: ARCH, GARCH, TGARCH and EGARCH. The research hypothesis formulated is that between political events and the reactions the financial markets (through the exchange rate indicator and the BET index) exists a strong connection.

Research Model in the Literature

In the last decades, the specialists elaborated different techniques in order to obtain some estimators of the volatility, starting from the extremely simple models which utilise the so-called "naive" hypotheses (of the random type ("random walk")), to the complexes heteroskedastic conditioned models of the ARCH group and the stochastic volatility models. In developing the time series analysis models, an important moment is the introduction by Engle in 1982 of the ARCH model. In the specialised literature, the models used prior to this moment are part of the so-called "pre-ARCH" period or of the historical volatility (Historical volatility models). Between those models, we mention HISvol (Historical volatility) model, EWMA (exponential weighted moving average), TAR (threshold autoregressive). The most utilized univariate volatility models are the conditioned heteroskedastic autoregressive models proposed by Engle (1982) and those general ARCH (GARCH) proposed by Bollerslev (1986). Numerous extensions of these models, like "exponential GARCH" (EGARCH) proposed by Nelson (1991) or "conditional heteroskedastic autoregressive moving average" (CHARMA) elaborated by Tsay (1987), are highly utilized in the analysis of the volatility. Other models used in the prevision of the volatility were the "random coefficient autoregressive" (RCA) model developed by Nicholls & Quinn (1982) and the stochastic volatility models (SV) proposed by Taylor (1994) and Harvey et al. (1994).

Extensive reviews of the written literature in this area are offered in the papers referring to shaping the volatility, elaborated by Bollerslev et al. (1992).

One of these fundamental hypotheses of the classic model of linear regression is that of homoscedasticity, according to which the variance is constant. In the case of the financial time series, it is unlikely that the variance of the errors to be constant in time and that is why it is preferred to estimate a model which does not require the variance to be constant and which can describe the evolution of the error variance.

The financial time series, as the case of the exchange rate's series and the shares price's series presents very often the phenomena of "volatility clustering" which highlights the fact that the current level of the variance tends to be positively correlated with the level from the previous periods.

To shape the economic series which, present the above-mentioned characteristics, were elaborated ARCH and GARCH type models, taking into consideration the conditioned variance also (Engle, 1982). The ARCH type model, proposed by Engle (1982), starts from the analysis of the modelling errors. The residue dispersion at a *t* moment depends on the square of the error terms from the previous periods.

We consider the model:

$$Y_t = \alpha + \beta' X_t + u_t$$

Where: X_t is a vector of the independent variables (kx1 dimension)

β' is a vector of the coefficients (kx1 dimension)

u_t represents the error term, $u_t \sim N(0, \sigma^2)$

In a ARCH(1) process, the residue variation (σ_t^2) depends on the value of the immediately preceding value of the error square.

$$\sigma_t^2 = \gamma_0 + \gamma_1 u_{t-1}^2$$

Taking into consideration the two equations, the one for the conditioned average as well as the one for the conditioned variation, an ARCH(1) model may be expressed as followed:

$Y_t = \alpha + \beta' X_t + u_t$, where $u_t \sim N(0, \sigma^2)$ and
$h_t = \gamma_0 + \gamma_1 u_{t-1}^2$
where we note $h_t = \sigma_t^2$

When a significant shock happens in the t-1 period, the value of u_t will also be higher (when u_{t-1}^2 has a high value, the variation of the next u_t shock will have a higher value).

The value of the conditioned variation has to always be strictly positive (a negative variation at any time moment is meaningless).

GARCH type model, developed by Bollerslev (1986), represents a generalization of the model proposed by Engle and includes in its equation both the error terms (often named "shocks"), and the heteroskedasticity phenomena. The equation of the conditioned variance is as following:

$$h_t = \gamma_0 + \sum_{i=1}^{p} \delta_i h_{t-1} + \sum_{j=1}^{q} \gamma_j u_{t-1}^2$$

The conditioned variation, in this case, is a function with three terms:

- the constant term γ_0;
- the ARCH term given by the volatility from the previous period expressed by the square of the residues from the previous moment, u_{t-1}^2;
- the GARCH term expressed through the predicted variation for the previous moment, h_{t-1}.

The general expression of a GARCH(p,q) model is the following:

$Y_t = \alpha + \beta' X_t + u_t$, where $u_t \sim N(0, \sigma^2)$

$$h_t = \gamma_0 + \sum_{i=1}^{p} \delta_i h_{t-1} + \sum_{j=1}^{q} \gamma_j u_{t-1}^2$$

The GARCH model has been later extended to include the asymmetry of the impact from some external shocks. Through the developed models, having at base the GARCH model, also includes the following models: GARCH in Mean (GARCH-M), Threshold ARCH (TARCH), exponential GARCH (EGARCH).

The financial theory suggests that an asset with a risk perceived as high, in average, will have a superior yield. The investors with a risk' aversion, requests request a premium for taking the risk. The value of the premium it is determined by the risk level (the higher the risk of a financial instrument, the higher the requested profitability). If the risk is measured through the volatility or the conditioned variation, then this enters in the componence of the equation of the conditioned average.

Therefore, the GARCH in mean model (GARCH-M) is obtained by introducing in the equation of the conditioned average of the Y variable, of the variation or of the conditioned standard deviation (h_t or $\sqrt{h_t}$). The GARCH-M (p,q) model presents the following equation:

$$Y_t = \alpha + \beta' X_t + \theta h_t + u_t, \text{ where } u_t \sim N(0, \sigma^2) \text{ and}$$
$$h_t = \gamma_0 + \sum_{i=1}^{p} \delta_i h_{t-1} + \sum_{j=1}^{q} \gamma_j u_{t-1}^2$$

In the ARCH/GARCH type models a positive shock has the same effect upon the series volatility like a negative shock of the same or intensity. On the financial markets is observed that the negative news has a much higher impact upon the volatility than the positive shocks of the same magnitude.

The most used ARCH models which allow the analysis of the asymmetrical response to shocks are Treshold ARCH (TARCH) and exponential GARCH (EGARCH) models.

The EGARCH model has been introduced by Nelson in 1991. This model represents the conditioned variance under logarithmic form, which implies a constraint to obtain a positive variance. The equation of the variance is the following:

$$log\ log\ (h_t) = \gamma + \sum_{j=1}^{q} \zeta_j \left| \frac{u_{t-j}}{\sqrt{h_{t-j}}} \right| + \sum_{j=1}^{q} \xi_j \frac{u_{t-j}}{\sqrt{h_{t-j}}} + \sum_{i=1}^{p} \delta_i$$
$$log\ log\ (h_{t-1})$$

where γ, ζ, ξ and δ are parameters which needs to be estimated.

In this model, h_t depends both on the value and the sign of u_t. The EGARCH model allows testing the asymmetries like the TARCH model. This approach indicates the fact that a negative shock determines o higher value of the conditioned variance in the next period, than in the case of a positive shock. In the case in which $\xi_j < 0$, the positive shocks generate a reduced volatility than the negative shocks. If $\xi_1 = \xi_2 = \cdots = 0$, then the model is symmetric.

Zakoian (1994) and Glosten et al. (1993) introduced the TGARCH (p,q) model having the following equation for the conditioned variance:

$$h_t = \gamma_0 + \sum_{i=1}^{q} (\gamma_i + \theta_i d_{t-1}) + \sum_{j=1}^{q} \delta_j h_{t-j}$$

In this model it is introduced in the equation a dummy multiplicative variable (d_t) which receives the value 1 for $u_t < 0$ and the value 0 otherwise. Thus, the positive shocks have an impact equal with γ, while the negative shocks have an impact of $\gamma + \theta$. If $\theta > 0$ we can consider that there is asymmetry, and if $\theta = 0$, then the impact of the shocks upon the volatility is symmetrical.

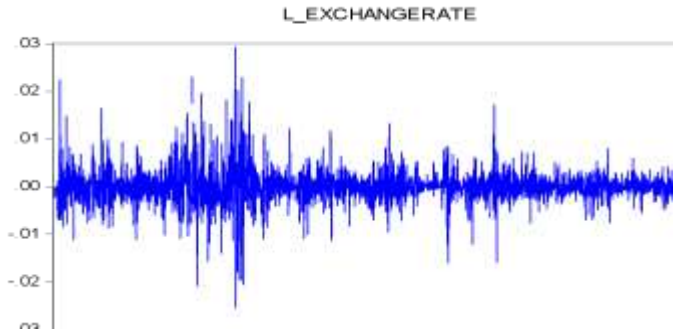
Data Processing and Models Testing

In this study, we will build four heteroskedastic models: ARCH (1), GARCH (1,1), EGARCH (1,1,1) and TARCH (1,1). All models will be estimated and tested, and the optimal model will be chosen based on the information criteria.

a. Presentation of the used data

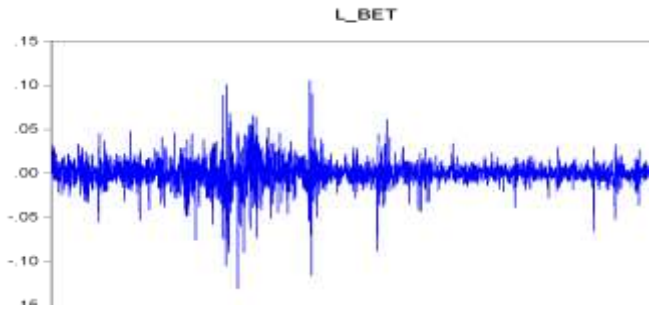
The variables used in this study are the leu / euro exchange rate and the BET index of the Bucharest Stock Exchange. The recorded data are daily and were selected for the period 04.07.2005 - 31.03.2017. The data series were converted into daily logarithmic yield series to alleviate the non-stationary character of the initial time series and for the results to be conclusive: Rt = ln (Pt / Pt-1), where Rt is the yield in period t; Pt = the value of the leu / euro exchange rate at the moment t, and the value of the BET index at the moment t.

Figure 15. The Daily Variation of leu/euro Exchange Rate



Source: E-Views data processing

Figure 16 The Daily Evolution of the BET Index Returns



Source: E-Views data processing

From the f*igures 15 and 16*, we can observe that both time series show a high volatility, the appearance of the volatility clusters (periods marked by significant fluctuations are followed by equally volatile periods) and have leptocurical distributions (kurtosis> 3), a characteristic of the financial time series. The logarithmic series of the exchange rate variation shows an asymmetry to the left, while the logarithmic series of the

BET index has a right asymmetry. We can also note that the series does not have the characteristics of normal distributions, results being confirmed by the Jarque-Bera test.

The first step in the proposed research is to test the integration order. We used the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests to test stationarity. If the tests do not reject the hypothesis that the time series presents the root unit, the stationarity of the first difference series is tested.

Before estimating ARCH models, it is important to verify the presence of ARCH effects in order to know which models require estimation using this method. Then, the results of the Akaike (AIC), Schwarz (SIC) and Hannan-Quinn (HQC) information criteria are used to choose the model that best explains the evolution of the analyzed phenomena. Finally, we verify the existence of the ARCH effects to continue to estimate ARCH-GARCH models.

b. Testing the stationarity of the time series

In the first part of the study, we test the time series stationarity using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The assumptions to be tested are as follows: H0: the series has a unit root and is non-stationary; H1: The series is stationary.

Synthetic results of the ADF and PP tests are outlined in *Table 7.*

Table 7 The Augmented Dickey-Fuller and Phillips-Perron tests values

Test	**t-statistic (exchange rate)**	**t-statistic (BET)**
ADF	-32.84	-50.63
PP	-45.41	-50.60

Notes: * critical value MacKinnon of the ADF şi PP tests for a 5% significance level is -2.86.

Source: E-Views data processing.

Table 7 shows that both series are stationary for a significance level of 5% because the test values are higher than the theoretical critical values.

The next step of the empirical study is to test the presence of the ARCH effects through correlograms.

Table 8 The variation of the exchange rate series correlogram

Sample: 7/04/2005 3/31/2017
Included observations: 2983

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.172	0.172	88.039	0.000
		2	-0.036	-0.067	91.864	0.000
		3	-0.076	-0.060	109.15	0.000
		4	-0.054	-0.033	117.81	0.000
		5	-0.003	0.006	117.84	0.000
		6	0.004	-0.005	117.89	0.000
		7	0.055	0.052	126.90	0.000
		8	0.031	0.011	129.75	0.000
		9	0.002	-0.001	129.76	0.000
		10	-0.028	-0.021	132.12	0.000
		11	-0.007	0.009	132.25	0.000
		12	-0.019	-0.021	133.29	0.000
		13	-0.023	-0.020	134.86	0.000
		14	0.019	0.022	135.96	0.000
		15	0.012	-0.000	136.42	0.000
		16	0.022	0.018	137.89	0.000
		17	0.024	0.023	139.69	0.000
		18	-0.026	-0.030	141.68	0.000
		19	-0.021	-0.005	142.95	0.000
		20	0.010	0.019	143.22	0.000
		21	-0.005	-0.014	143.29	0.000
		22	-0.003	-0.005	143.33	0.000
		23	-0.019	-0.020	144.39	0.000
		24	-0.001	0.004	144.39	0.000

Source: E-Views data processing.

Table 9 The BET index returns series correlogram

Sample: 7/04/2005 3/31/2017
Included observations: 2949

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.069	0.069	14.214	0.000
		2	-0.006	-0.011	14.316	0.001
		3	-0.024	-0.023	16.031	0.001
		4	-0.000	0.003	16.031	0.003
		5	0.043	0.042	21.416	0.001
		6	-0.029	-0.035	23.839	0.001
		7	-0.020	-0.015	25.030	0.001
		8	0.057	0.061	34.514	0.000
		9	0.032	0.022	37.513	0.000
		10	0.013	0.007	38.027	0.000
		11	0.061	0.067	49.147	0.000
		12	0.007	0.000	49.292	0.000
		13	0.019	0.013	50.352	0.000
		14	0.033	0.036	53.545	0.000
		15	0.049	0.048	60.528	0.000
		16	0.030	0.017	63.139	0.000
		17	0.030	0.031	65.797	0.000
		18	0.013	0.012	66.282	0.000
		19	0.048	0.039	73.056	0.000
		20	-0.030	-0.040	75.729	0.000
		21	-0.011	-0.005	76.110	0.000
		22	-0.030	-0.035	78.807	0.000
		23	0.020	0.016	79.958	0.000
		24	0.008	-0.005	80.165	0.000

Source: E-Views data processing.

From the *Tables 8 and 9* we concluded that the probability of accepting the null hypothesis (no ARCH effects) is rejected (the probability associated with the coefficients is less than the threshold of 0.05). The results obtained give the certainty that we can estimate the heteroscedastic models.

c. The estimation of the volatility through the conditional variance

In order to estimate the conditional variance as a measure of the volatility of the variables we considered in the analysis, we constructed four heteroskedastic models, namely: ARCH (1), GARCH (1,1), TGARCH (1,1), EGARCH (1,1,1).

c1. The estimation of the heteroskedastic models and the criteria for choosing the optimal model.

At this stage, comparing the values indicated by the Akaike (AIC), the Bayesian (BIC or Schwarz), and the Hannan-Quinn (HQ) criteria in the *Tables 10 and 11*, we choose the model whose values are minimal.

Table 10 The values of the information criteria for the models estimated in the case of the series of the daily exchange rate variation

	ARCH (1)	GARCH(1,1)	TGARCH (1,1)	EGARCH (1,1,1)
AIC	-8.688	**-8.908**	-8.908	-8.902
BIC	-8.680	**-8.898**	-8.896	-8.890
HQC	-8.685	**-8.905**	-8.903	-8.898

Source: E-Views data processing.

According to the information criteria, the most robust for estimating volatility is, as it can be seen in the table no. 4, the GARCH model (1,1).

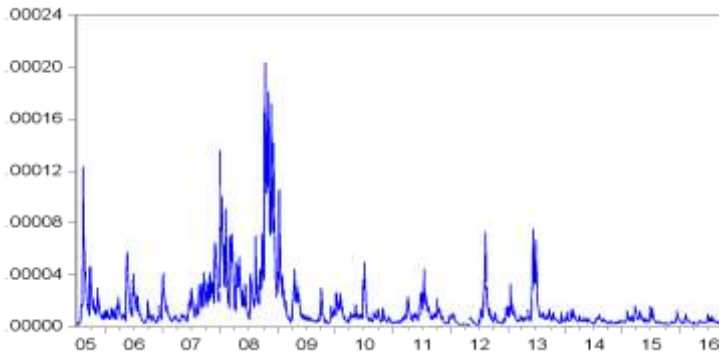
The variance equation is the following:

h_t= 1.98E-07+ 0.838 h_{t-1} + 0.156 u_{t-1}^2

Because the sum of the ARCH and GARCH coefficients is very close to 1, the volatility is persistent.

The *Figure 17* shows the volatility of the leu/euro exchange rate based on the estimated model.

Figure 17 The Volatility of leu/euro Exchange Rate Series



Source: E-Views data processing.

Table 11 The values of the information criteria for the models estimated in the case of the series of the daily BET Index returns

	ARCH (1)	GARCH(1,1)	TGARCH (1,1)	EGARCH (1,1,1)
AIC	-5.811	-6.042	**-6.045**	-6.040
BIC	-5.803	-6.032	**-6.033**	-6.028
HQC	-5.809	-6.038	**-6.041**	-6.036

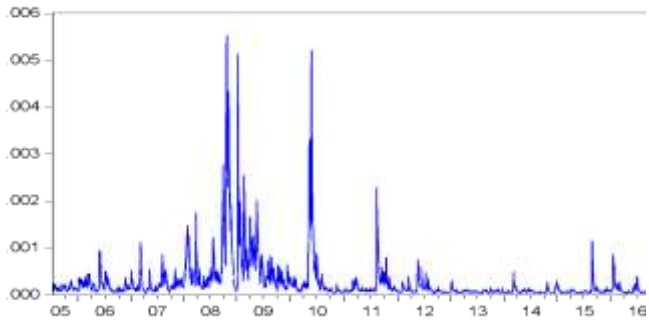
Source: E-Views data processing.

For the series of daily BET index returns, according to the Akaike, Schwarz, Hannan-Quinn criteria, the optimal model for the volatility estimation, as shown in the *Table 8*, is the T-GARCH (1,1) model. The variance equation is the following:

h_t= 4.88E-06 + 0.781 h_{t-1} + 0.170 u_{t-1}^2 +0.086 $u_{t-1}^2 D_{t-1}$

It is noted that the asymmetry term is equal to 0.086 (positive). Thus, we can conclude that the volatility increases more after negative shocks and the impact of the positive shocks is lower on the analysed variable. Based on the estimated model, the *Figure 18* shows the volatility of the daily BET index returns.

Figure 18 The Volatility of the BET Index Daily Returns



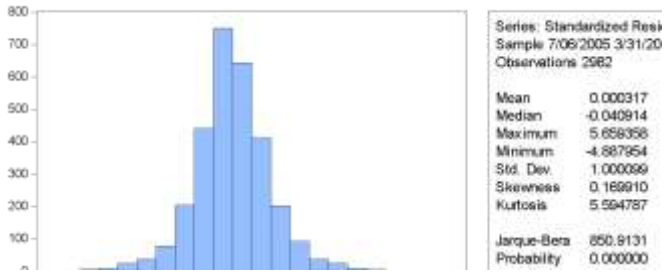
Source: E-Views data processing.

c.2. Testing the validity of the heteroskedastic models

The estimated statistical models are subject to the validation tests. At this stage, the assumptions for the error variable in the model are verified: the errors are normally distributed, the homoscedasticity of the errors, the error uncorrelation.

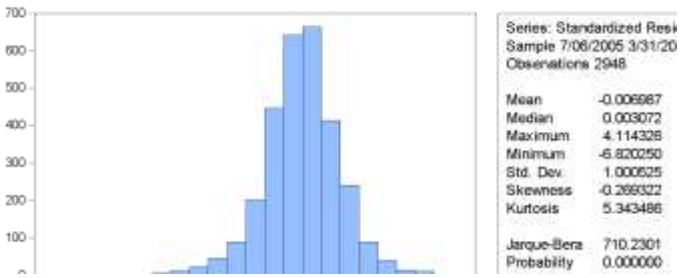
The residual variable normality testing is performed as shown in the *Figures 19,20* both graphically (the error histogram) and using the Jarque-Bera test.

Figure 19 The Histogram of the Distribution of the Series of Daily Exchange Rate Variation



Source: E-Views data processing.

Figure 20 The Histogram of the Distribution of the Series of the BET Index Daily Returns



Source: E-Views data processing.

The probability associated with the test is less than 0.05, indicating that the residual terms do not have a normal distribution. The null hypothesis is not accepted, the time series does not have a normal distribution.

Although this hypothesis is not verified for both analysed time series, we can assume that for large data sets the assumption that the error normality is asymptotically met.

Testing the homoscedasticity involves testing the following hypotheses:

H0: There are no ARCH effects

H1: There are ARCH effects

Table 12. The ARCH test the estimated GARCH (1,1) model

Heteroskedasticity Test: ARCH

F-statistic	1.652271	Prob. F(7,2967)	0.1162
Obs*R-squared	11.55205	Prob. Chi-Square(7)	0.1163

Source: E-Views data processing.

According to the ARCH test in the *Table 12*, the null hypothesis is accepted with a 95% probability. Therefore, there is no ARCH effect.

Table 13 The ARCH test the estimated TGARCH (1,1) model

Heteroskedasticity Test: ARCH

F-statistic	1.962486	Prob. F(1,2945)	0.1614
Obs*R-squared	1.962511	Prob. Chi-Square(1)	0.1612

Source: E-Views data processing.

As can be seen from the *Table 13*, the probability of the test is greater than the significance threshold, resulting in the acceptance of the null hypothesis, according to which there are no ARCH effects.

To test autocorrelation, we used the Q-statistic test. The Q-statistic test and the associated probability is a statistical test that has as null hypothesis - no autocorrelation up to lag k. If the probability associated with the Q-statistic test is superior to the level of the relevance, the null hypothesis is accepted (the absence of the errors'autocorrection).

Table 14 The errors correlogram

Sample: 7/06/2005 3/31/2017
Included observations: 2982

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.034	0.034	3.5157	0.061
		2	-0.008	-0.009	3.7196	0.156
		3	-0.011	-0.010	4.0544	0.256
		4	-0.008	-0.007	4.2318	0.376
		5	0.015	0.015	4.8640	0.433
		6	-0.011	-0.012	5.2105	0.517
		7	0.024	0.025	6.9856	0.430
		8	-0.002	-0.004	7.0001	0.537
		9	0.005	0.006	7.0826	0.629
		10	0.023	0.023	8.7342	0.558
		11	0.029	0.028	11.184	0.428
		12	0.006	0.004	11.287	0.505
		13	-0.005	-0.003	11.355	0.581
		14	-0.001	-0.001	11.358	0.658
		15	0.004	0.004	11.405	0.723
		16	0.025	0.024	13.234	0.656
		17	0.019	0.017	14.371	0.641
		18	-0.004	-0.005	14.411	0.702
		19	-0.008	-0.007	14.607	0.747
		20	0.010	0.011	14.910	0.782
		21	0.004	0.001	14.956	0.825
		22	0.008	0.006	15.136	0.856
		23	-0.002	-0.003	15.146	0.889
		24	-0.001	-0.001	15.148	0.916

Sample: 7/06/2005 3/31/2017
Included observations: 2948

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.027	0.027	2.1220	0.145
		2	0.018	0.017	3.0907	0.213
		3	0.006	0.005	3.1860	0.364
		4	0.010	0.010	3.5091	0.476
		5	0.029	0.029	6.0488	0.301
		6	-0.012	-0.014	6.4812	0.371
		7	0.006	0.006	6.6044	0.471
		8	0.029	0.029	9.1231	0.332
		9	0.011	0.008	9.4575	0.396
		10	0.022	0.019	10.830	0.371
		11	0.018	0.017	11.808	0.378
		12	0.008	0.005	11.992	0.446
		13	0.009	0.006	12.236	0.508
		14	0.013	0.012	12.728	0.548
		15	0.027	0.024	14.847	0.462
		16	-0.009	-0.012	15.071	0.519
		17	0.017	0.016	15.898	0.531
		18	0.008	0.005	16.075	0.587
		19	0.017	0.013	16.892	0.597
		20	-0.017	-0.021	17.784	0.602
		21	-0.009	-0.009	18.024	0.648
		22	0.002	0.000	18.037	0.704
		23	0.012	0.010	18.431	0.734
		24	0.004	0.002	18.471	0.780

Source: E-Views data processing.

As the *Table14* shows, there is no serial autocorrelation of errors until lag 24.

3.4 Research Results and Discussions

In order to analyze accurately the impact of political events on market developments, we briefly presented the analyzed policy period and interpreted the results obtained by processing the data from the empirical study.

Political background

2005-2017 represents almost half of Romania's recent history, after the 1989 events that led to the fall of communism.

Even though it had been 15 years since the so-called anti-communist revolution, "the communist past decided the outcome of the 2004 presidential election" (Stan & Zaharia, 2007, p.1091).

Both Traian Basescu and Adrian Nastase, the two presidential candidates in 2004, were members of the former communist party, Basescu admitting in a television confrontation "that the country 'could not share the mentality of the communist regime fifteen years after its collapse' (Stan, 2005, p.10)".

The result of the 2004 elections brought Traian Basescu to power, with the Justice and Truth Alliance (DA, right-wing alliance); however, the entire 2004-2008 parliamentary term was marked "by dissensions between the President and the Premier, and the legislative majority was increasingly fragmented by disputes between main alliance partners, the PD and the PNL" (Stan & Zaharia, 2007, p.1092). This almost constant war between Basescu and Tariceanu, which started in 2005, led to the president's suspension in April 2007, a new event in Romanian politics, with strong negative internal and external consequences. The

May 2007 Referendum returned Traian Basescu to Cotroceni*, but the consequences of his suspension would hang hard on Romania's image at international level.

Although they brought a premiere in the Romanian election system through the introduction of the uninominal vote, the 2008 elections did not produce a clarification in Romanian politics. By extending the president's mandate to 5 years, the parliamentary elections were decoupled from the presidential ones, which made the 2008 Cotroceni winners also face the will of President Basescu, who, under the Constitution, had the right to nominate the Prime Minister. Under these conditions, Basescu raised his closest collaborator, Emil Boc, to power; at that time, Boc was the mayor of Cluj-Napoca. This Prime Minister, who once ruled a right-left wing alliance, resisted, with multiple cabinet amendments (Boc Government 1, Boc Government 2, Boc Government 3 - Interim, Boc Government 4 and Boc Government 5) until February 2012. He surmounted the 2009 presidential elections with Basescu's help and overcame (with truly disastrous consequences for his image) even the terrible year 2010, marked by the 25% salary cuts, also set at Cotroceni.

The fall of the Boc Government occurred due to the street demonstrations from February 2012. Boc was replaced at Victoria Palace[11] by Mihai Razvan Ungureanu, who was promoted as prime minister from the position of SIE (Foreign Intelligence Service) Director. Ungureanu's government had days numbered, i.e. just over 70. Without any roots in the party that formed the majority of the government, i.e. PDL (Democratic Liberal Party), Ungureanu was shaken up relatively quickly, following a censure motion introduced by PSD (Social Democratic Party) in May 2012.

There followed the nomination of Victor Ponta (the PSD leader) by Traian Basescu, and the rapid alignment of the parties forming the government (USL (Social Liberal Union) formed by PSD - left wing and PNL - right wing), behind the idea of suspending the president in office for the second time. Although, this time, Basescu faced an overwhelming number of citizens who voted in favour of his suspension (about 7.6 million Romanians, i.e. 87.52% of those who voted), according to the legislation, the number of voters did not exceed 50% + 1 of the population with voting rights on the electoral rolls and the referendum was invalidated. Consequently, Basescu remained at Cotroceni with Ponta at Victoria Palace.

The tense atmosphere between the two palaces was maintained throughout the two years until the 2014 presidential elections. President Basescu's strength began to gradually decline; at the beginning of 2014, he left PDL definitively and contributed to the formation of a new party. Klaus Iohannis (right wing) clearly won the 2014 elections, following the extraordinary mobilization of voters, both in the country and abroad. However, despite his sweeping victory, Iohannis was forced to co-operate with the PSD Government led by Victor Ponta until November 2015, when, following a very sad event, i.e. a fire at a popular club

[11] The Romanian Gouvernment headquarters

from Bucharest, "Colectiv", which caused the death of 64 young people, the government faced extensive street movements and Victor Ponta resigned.

The new cabinet formed this time by President Klaus Iohannis's will around the former European Commissioner for Agriculture, Dacian Ciolos, was made up of technocrats, little known to the public, formerly employed in the country administration or abroad. This cabinet resisted until the winter of 2016 when, after the parliamentary elections, PSD returned to power, in alliance with ALDE (Alliance of Liberals and Democrats), the party headed by Calin Popescu Tariceanu.

Taking into account this path, the political events selected for the analysis were the following: the summer of 2005 – the consistent circulation of the anticipated/ snap elections; the rupture between President Basescu and Prime Minister Calin Popescu Tariceanu; the beginning of the war between the two; President Basescu's suspension in April 2007, followed by a referendum; the economic crisis started in autumn 2008 and unfolded in 2009 (economic event with political consequences for the Government in office); the 2008 parliamentary elections; the censure motion that led to the fall of the Boc Government in October 2009; the resignation of Boc Government caused by street demonstrations in February 2012; the censure motion that triggered the fall of the Ungureanu Government in May 2012; President Basescu's suspension in July 2012; parliamentary elections in the winter of 2012 and the installation of a new Ponta Government; the 2014 presidential elections; the 2016 parliamentary elections.

Interpretation of the results

The parliamentary and presidential elections of November 2004 brought to power the right-wing Justice and Truth alliance; at Controceni, they propelled Traian Basescu and Prime Minister Calin Popescu Tariceanu.

The fragility of the majority that supported the government brought to the fore in the early 2005 the idea of anticipated/snap elections, strongly promoted by Traian Basescu and by the PDL leader Emil Boc. Under these circumstances, a few months after winning the elections, the situation got tense and the political class entered the crisis, being divided into two categories, i.e. those who were for and those who were against anticipated/ snap elections. The anticipated/ snap elections were supported by PDL and by the president, against PNL, headed by the Prime Minister. This political instability raised concerns about government stability, which sparked reactions on the financial markets. The exchange rate generally had a downward trend, the national currency becoming more powerful; this positive phenomenon was influenced by the denomination, which took place in mid-2005. On the other hand, the BET index, which had increased in the first months after the elections, started to decline immediately after the discussions about the anticipated/snap elections had begun, showing moderate volatility throughout the period dominated by political instability. The clear announcement made by the prime minister in mid-summer on the renunciation to the anticipated/snap elections and on the maintenance in office of the government triggered

the reinstatement of political and governmental stability, which led to a steady and consistent upward trend in the BET index over the next period, which continued throughout 2006, with slight volatility periods. The maximum value of the BET index was reached in 2007 (the year of Romania's accession to the EU), i.e. 10,813.59 points, practically more than double compared to January 2005 (i.e. 4,622.73 points). It is also noteworthy that throughout this period Romania registered economic growth.

Nevertheless, the dysfunctions and tensions manifested from the very beginning in the government alliance, rather than diminishing, continued to increase in the first part of 2007, culminating with the withdrawal of the PDL from the government and with President Basescu's suspension. This time, the reactions of the markets were weak. The exchange rate registered a slight volatility; however, immediately after the situation had calmed down and Traian Basescu had returned to Cotroceni, the exchange rate increased, while the capital market seemed to evolve independently of the respective political events, being thus unaffected by them.

We must bear in mind that, from an economic perspective, in 2006, Romania registered an economic growth of 7.7%, and 2007 ended with an economic growth of 6.3% and with very good prospects for 2008. As already mentioned, 2007 was the year of Romania's EU accession, and, from a political perspective, Basescu's suspension was not perceived as a real danger to political and governmental stability, but as a whim of the famous 322 politicians who voted his suspension in the Parliament. In fact, the people's predictable vote brought the president back to Cotroceni, restoring calmness. The historical maximum of the BET index – recorded on July 24, 2007, after the political crisis – confirms that the capital market is mainly focused on economic trends. However, the influence of political instability is felt not so directly and quickly as in the case of the exchange rate, which is more sensitive in the short term to the political and economic conjuncture. The Romanian capital market is delayed in terms of response, and it is affected if the political instability persists for a longer period and if it threatens government stability.

The 2008 parliamentary elections overlapped the beginning of the 2008 financial crisis. As such, we witnessed a fall in the BET index since the summer of 2008 with over 4,000 points, reaching 2,800-2,900 points at the end of 2008. The same trend was registered in the currency exchange rate, the national currency depreciating in a dramatic way.

2009 started poorly in terms of financial markets, the fall in the BET index continuing to the historic minimum of 1,887.14 points in February 2009, while the RON continued to depreciate. However, the establishment of a new government, with a large majority, brought some hope in the market, which was felt both in the capital market and in the exchange rate market. The BET index started to grow, and, at the end of the year, it was almost three times higher. Moreover, there were also periods when the national currency got stronger. Under these circumstances, the presidential elections that took place at the end of 2009 did not cause great turbulence on the market. This also happened because both candidates were seen as promoters of European values, Traian Basescu (PDL) competing

with Mircea Geoana (PSD), former ambassador to the US, a career diplomat perceived more as a technocrat than as a politician. Although the competition was tight and the outcome was challenged, the markets did not suffer as none of the candidates was seen as a threat to economic stability and democracy. This result confirms the results of other studies (Frot & Santiso, 2010) that show that elections affect "portfolio flows only when they create some policy uncertainty". "In the absence of this uncertainty, portfolio managers do not significantly respond to elections".

This also applies to the 2014 presidential elections, when the market was virtually unresponsive, as both candidates were perceived as political stability factors, not threatening the democracy and the country's general orientation.

The end of 2011 highlights some turmoil in the capital market. The last months of the last Boc government, until its fall in February 2012, were marked by a fall in the BET index. The political crisis was also felt on the market, the government's resignation being triggered by a wave of popular dissatisfaction. The appointment of a new government, i.e. the Ungureanu government, brought a wave of hope on the markets. However, it lasted only a little, the government's fall by a censure motion in May 2012 causing high volatility, with the BET index dropping by about 1,000 points. Again, we notice that prolonged government instability is felt strongly on the capital market, which reacts more slowly, but in the longer term than the foreign exchange market. 2012 remains a year of political instability, determined by both ordinary political events, local and parliamentary elections, as well as unforeseen political events, such as the resignation of the Boc Government, the censorship motion against the Ungureanu Government and president Basescu's suspension for the second time. The latter produced the highest volatility of the RON-EURO exchange rate. The exchange rate seemed to be extremely sensitive to this event, President Basescu's suspension, followed by a referendum where the population overwhelmingly voted against the president, leading to a consistent depreciation and to a historic maximum of the RON-EURO exchange rate of 4.6481 on August 3, 2012, immediately after the announcement of vote results. President Basescu's suspension caused great irritation and concern both in the foreign markets and in the European administrative structures, among the heads of state and government in the EU. This was reflected clearly in the evolution of the exchange rate. The president's return to Cotroceni and the restoration of calmness were translated by the consolidation of the RON, on August 21, 2012, when the invalidation of the referendum was announced officially, the RON-EURO exchange rate being 4,4987.

This is, in fact, the last major turbulence recorded on the foreign exchange market until the end of the analysed period.

The 2012 parliamentary elections and the establishment of a government based on a strong majority brought a certain optimism to the market, which was manifested by slight but constant increases of the BET index from one year to another, and by the stability of the exchange rate, also influenced by Romania's participation in the ERM (European Exchange Rate Mechanism).

Neither the 2014 presidential elections nor the 2016 parliamentary elections caused major turmoil. This also confirms the results of the studies conducted in the literature, showing that when politicians clearly present their intentions during elections, political instability diminishes, and markets react calmly to the recorded results (Frot & Santiso, 2010).

The results of our study, which target the financial markets from Romania, do not confirm the aspects regarding the market adversity over the possible victories in the election of left wing leaders (Campello, 2009). The markets from Romania seem particularly focused on government stability, no matter if it is provided by the left or by the right wing.

3.5 Conclusions

The first conclusion of our study is that in Romania, as in other countries analyzed in the literature, there is a clear influence of the political events on financial markets. They are sensitive and react to the agitation and anxiety caused by political uncertainty.

Two. The two markets, i.e. the foreign exchange market and the capital market, react differently to the political situation. While on the foreign exchange market the incidence of events is much faster, on the capital market the reaction is slower but deeper. The capital market is marked by political instability, especially by the governmental one, for a longer time, with a slower recovery pace. Volatility is lower when it is related directly to political events, but it lasts longer, even after the respective events end.

Three. Endangering democracy and democratic rules and norms deeply affect markets. Foreign partners perceived President Basescu's suspension in 2012 and the way this suspension was thought and implemented as a direct attack on democracy, the effect on the markets being direct and strong.

Four. The results of this study confirm the conclusions of other studies conducted in the literature, professing that the clear expression of the politicians' intentions, the transparency of governance programs, and of their future initiatives generate trust, which translates into calm transitions from one electoral cycle to another. In this case, markets do not register major turbulence.

Five. The RON's future accession to the European Monetary Space and Romania's entry into the ERM, used as anchors, have positive effects, the Romanian currency market being more stable and less exposed to various influences, including political ones.

Six. Government stability is beneficial and more important in Romania than the political preferences of its left or right-wing leaders.

I.4 Recent Developments and challenges for the Romanian banking industry

4.1 Is the Romanian banking industry worth investing in? A Romania - UE comparative approach[12]

The global financial crisis that began in 2007 proved to be one of the most difficult milestones in the recent history of the international banking system and led to major changes in the way banks conduct their day-to-day business and, more important, in terms of banking regulations. If prior to the crisis banks benefited from a more relaxed supervision that led to extensive profits and sky-high stock market valuations, once the crisis settled in regulators began tightening legislation imposing capital requirements and stress testing on banks. The consequences for investors were quick to occur. Worldwide, investors in the banking system faced decreasing investments profitability, major losses of stock market value and with limited prospects for growth.

The banking system in Romania has felt the financial crisis with some delay, its channels of spreading being different from the international ones due, on one hand, to the underdevelopment of the system and, on the other hand to the relatively small number of foreign investors and the relatively low levels of foreign investment compared to other countries in the region.

The goal of the analysis is to identify the level of attractiveness of the Romanian banking system compared with the European level for the investors who are taking into consideration a long-term investment in this industry.

4.1.1 The performance of the banks in the European Union

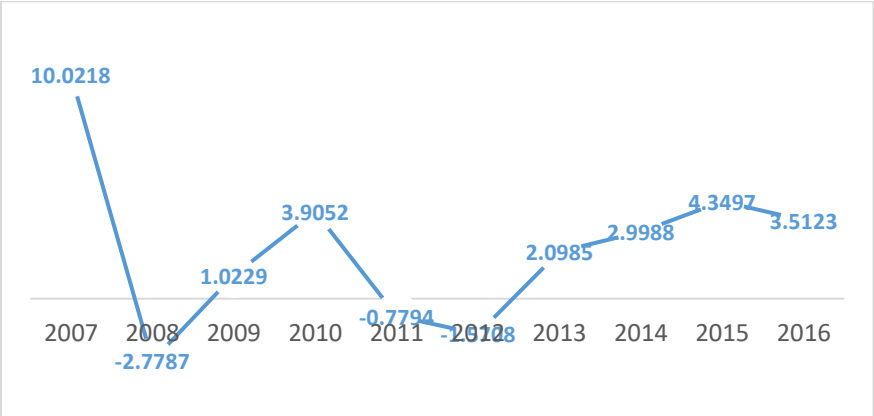
To assess the profitability of investing in banking system, the first indicator taken under consideration is Return on equity (ROE). ROE represents the amount of net income returned as a percentage of shareholders' equity, revealing the amount of profit generated with the funds that shareholders have invested. It is wide recognized the fact that a certain level of ROE indicator of a bank is of particular importance to equity analysts and equally for its shareholders and the future management strategy and can be a tool to investigate why a bank is able to generate return for investors so much better than its rivals (Golin J. & Delhaise P., 2013).

[12] Based on the scientific contributions from Ghiță-Mitrescu Silvia & **Duhnea Cristina** (2017), *Is the Romanian Banking Industry Worth Investing in? A Romania – UE Comparative Approach*, The International E-Conference "Enterprises in the Global Economy", 2nd Edition, 21st June 2017, published in FILODIRITTO INTERNATIONAL PROCEEDINGS, 2017, ISBN 978-88-95922-97-3, pp.59-65;

In some authors' opinion (Admati A. & Hellwig M., 2013, p. 115-128) the bankers search for a high ROE contributed to the financial crisis. They also believe that ROE doesn't really measure a bank's performance because it doesn't comprehend the amount of risk involved in creating the return. Therefore, bankers, in their search for a high ROE, were encouraged into increasing the level of debt and risk.

Before the financial crisis, European banks reported high values of ROE, the aggregated level for the EU member states banks being of 10.02 percent in 2007 (Figure 21).

Figure 21 Aggregated level of ROE for EU member states domestic banking groups and stand-alone banks between 2007 and 2016

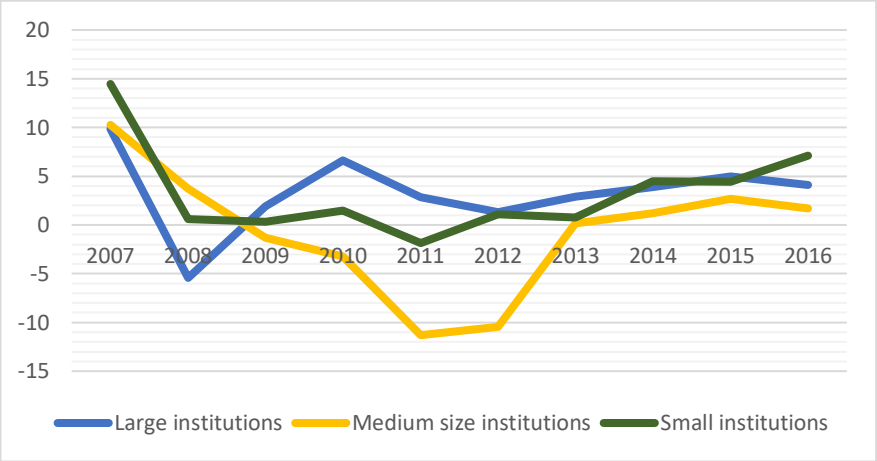


Source: European Central Banks statistics www.ecb.org

After the start of the financial crisis the level of ROE plummeted to a historical low of minus 2.77 percent in 2008, then entered an uptrend for the next two years. In 2011 and 2012, the aggregated level of ROE for the banks in EU member states was once again negative. From 2013 until 2015, the statistics show a year-to-year improvement of ROE value, thus implying an uprising in banks performances, or, if we consider the opinion of Admati and the other critics of ROE's relevance, a new dangerous territory for banks which are once again searching for high investment profitability rates. The provisional value of ROE for 2016 is lower than the previous year pointing to the beginning of a new unprofitable period for investors.

If we take the analysis one step further and divide the EU domestic banks intro three size-based categories, we can notice that the evolution of ROE throughout the period varies from one group to another. Large institutions form a sample of 9 EU member states registered the biggest fallout of ROE in 2008 and afterwards managed to recover and keep a positive level of returns on equity for the rest of the period, while medium size institutions from 24 EU states recorded negative values of ROE between 2009 and 2013. Small size institutions form 24 EU countries only reached a negative level of ROE in 2011, but their ROE value stayed between 0 and 1 from 2009 to 2013. In 2016 provisional data show an average one-point decrease of ROE for large and medium size institutions and a 2.6838 increase form small banks.

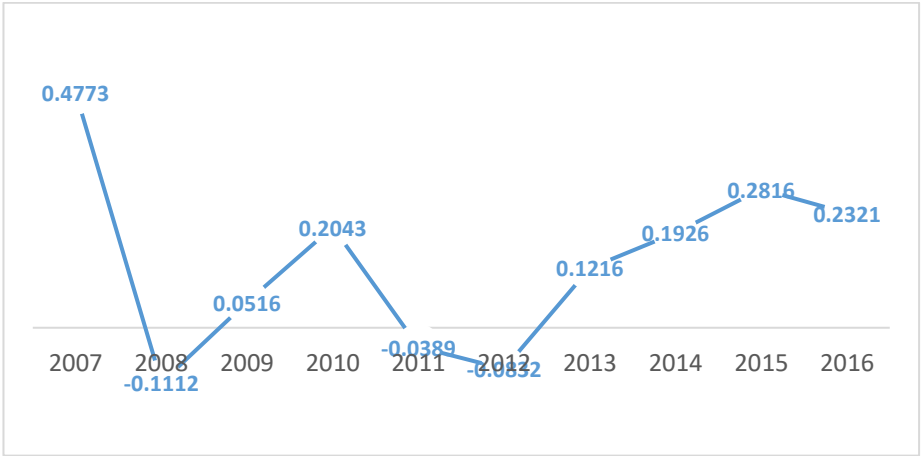
Figure 22 Aggregated level of ROE for EU member states domestic banking groups and stand-alone banks by size between 2007 and 2016



Source: European Central Banks statistics www.ecb.org

A second indicator of banks' profitability that we consider is Return on Assets (ROA). ROA indicates how efficiently the management is using a company's assets in order to generate profit, therefore we believe it is a relevant indicator for investors, being also called "return on investment". ROA is calculated by dividing the company's annual earnings by its total assets.

Figure 23 Aggregated level of ROA for EU member states domestic banking groups and stand-alone banks by size between 2007 and 2016



Source: European Central Banks statistics www.ecb.org

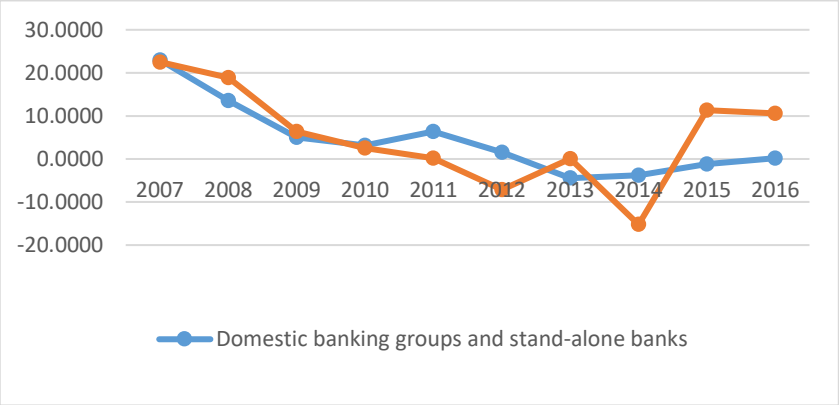
The ROA indicator showing the return on investment had, at European level, a nonlinear evolution dropping to a negative value in 2008 as the financial crisis deepened, with a slightly unconsolidated recovery in 2009 and 2010 as between 2011 and 2012 returned to negative values. The capacity of the European banking system to grow the yearly earnings reported to the total assets augmented after 2013 but at the end of the period registered a value with 50% lower than the 2007 level.

Looking at both ROE and ROA indicators at European level we can conclude that, from the investors' point of view, the banking system showed a lack of consistency regarding the capacity to obtain performance by using the assets raising questions regarding the attractiveness of the investments made in the system.

4.1.2 The Romanian banking system' performance

In Romania's case, the evolution of ROE throughout the past nine years was different from the EU average (Figure 24).

Figure 24 Aggregated level of ROE for the Romanian banking system between 2007 and 2016



Source: European Central Banks statistics www.ecb.org

The value of ROE for the entire Romanian banking system at the beginning of 2007 was 22.5176%, double compared to the European average. Starting in 2008, ROE set on a downward trend, reaching a negative 7.1488 percent in 2012, but still standing above the EU average. From 2012 until 2014, the situation has reversed, with the Romanian banking system showing returns on equity well below the European average, culminating in a minus 15.2378 percent of ROE in 2014. From 2015, ROE has returned to positive values and exceeded EU values.

If we take into account only domestic banking groups and stand-alone banks, we can say that from the investors' point of view, the financial crisis began with a certain delay in Romania compared to the European situation, ROE recording downward but positive values until 2012, followed by a negative values period between 2013 and 2015 and a shady return above zero in 2016.

In order to determine the factors that influenced the evolution of ROE in the analyzed period, we will use the DuPont analysis tools. Used since 1920 by the DuPont Company, the homonymous analysis identifies three factors that influence ROE: operating efficiency, asset use efficiency and financial leverage. The operational efficiency is measured through profit margin, asset use efficiency through total asset turnover and financial leverage through the equity multiplier, the ROE calculation formula becoming:

ROE = profit margin x total asset turnover x equity multiplier

Profit margin for banks is determined by dividing net income to total operating income and shows the percentage of operating income that the bank retains as a profit, also being an indicator of the banks' capacity to manage its expenses.

The assets utilization or assets turnover ratio is the value of a bank's operating income relative to the value of its assets, indicating the efficiency with which the bank is using its assets in order to generate revenue.

The equity multiplier is calculated by dividing the value of the bank's total assets by its total equity and it measures financial leverage, indicating the portion of assets financed through debt.

Table 15 Evolution of the Romanian banking system' performance indicators

	Profit margin	Total assets turnover	Leverage ratio	ROE
2007	0.3055	5.897	12.4987	22.5176
2008	0.2710	6.3366	11.0028	18.8955
2009	0.0900	6.2006	11.3303	6.3263
2010	0.0504	5.8604	8.7227	2.5771
2011	0.0203	5.2955	2.1716	0.2334
2012	-0.1234	5.2279	11.0838	-7.1488
2013	0.0151	5.3212	0.1058	0.0085
2014	-0.2445	5.2528	11.8654	-15.2378
2015	0.2398	4.8764	9.6619	11.2984
2016	0.2232	4.9813	9.5358	10.6009

Source: Authors' calculation based on NBR statistical database

As we can see in the table above, the three components influenced differently the ROE indicator over the period under review.

Since 2009, there has been a dramatic reduction in the profit margin, more than 60% over the previous year, a trend that remained until 2014. The decline in the lending activity that followed the 2007-2008 crisis period strongly marked the banks' capacity in the Romanian banking system to make profit.

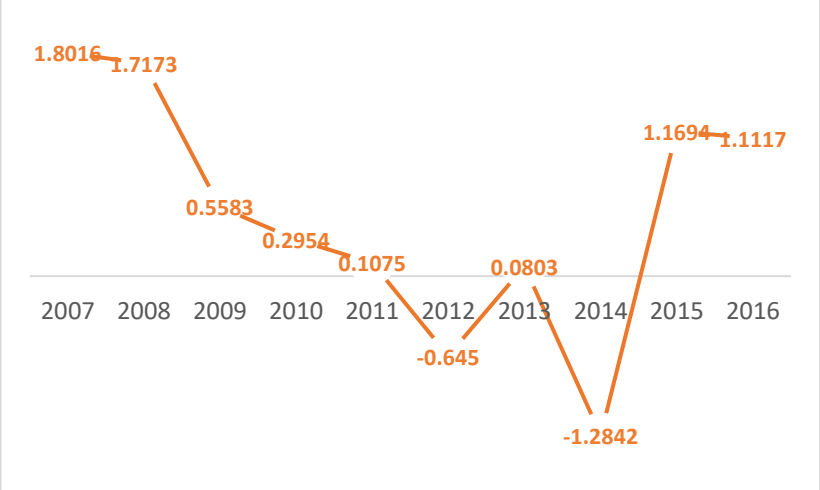
The second component of the analysed indicator, the total assets turnover, had a different pattern. Although it recorded decreases over the whole period, the beginning of the period registered, on the contrary, an increase: in 2008 and 2009 this indicator increased compared to 2007 because in Romania the effects of the international financial crisis were felt especially in the last quarter of 2008 on the one hand, and, on the other hand, due to the delayed reaction of the Romanian market to the tightening of the conditions on the international credit market. In 2010, the total assets turnover returns to the 2007 value and entered on a downward trend until 2016.

The third influencing factor of the ROE indicator, the leverage ratio, had a very fluctuant evolution: with a slightly reduction in 2008 and 2009 started to reduce in 2010 reaching a low level of 2.1716 in 2011. The next year grew at a value comparable with 2008

level and the next year registered a historical minimum of 0.1058. In 2014 the leverage ratio reached almost the highest level in the analysed period and reduced with about 20% in the next two years.

The ROE indicator for the whole Romanian banking system showed no consistency over the entire period taken into consideration in the analysis. From a value of 22.5176 in 2007 downs to near zero points in 2011 and 2013 and register negative values in 2012 and 2014 due to negative profit margins. Until the end of the period the value of the ROE indicator fails to reach the level of the 2007-2008 period.

Figure 25 Aggregated level of ROA for the Romanian banking system between 2007 and 2016



Source: European Central Banks statistics www.ecb.org

In 2007, due to the investments made by banks for the expansion of their networks and to the increased competition within the Romanian banking industry, the share of operating income in net profit the profit decreased compared to the previous year, but the capacity of the assets to generate revenues was not affected, so ROA, although set on a downward trend, did not drop significantly over the previous year. The same trend continued in 2008, as the Romanian banking system began to absorb the shock of the international financial crisis. Since 2009, both ROA components, profit margins and assets utilization have begun to decrease, with the fall being more pronounced in the case of profit margins, with banks significantly reducing the share of operating income in net profits as a result of tighter borrowing conditions. However, banks continued to maintain their assets' capacity to generate income within acceptable limits, which kept ROA within positive limits until 2011. Starting from 2012, the profitability of the banking system assets entered a negative territory, reaching the lowest value in the analysed period in 2014.

Starting form 2015, the profitability of the banking sector in Romania has improved, amid the resumption of the increase of operating incomes share in net profit, but also the existence of a stable internal macroeconomic climate. It should be remembered here that an important role in the diminishing of the operational expenditures was the passage of banks in the calculation of provisions according to IFRS starting 2012.

4.1.3 Conclusions

The analysis made had the goal to determine if, from the investor point of view, the banking industry in Romania worth investing in comparing with the European level through the level of two performance indicators well known and widely used ROE and ROA.

Several authors (Andries A.M. & Cocris V., 2010; Iuga I. & Cioca I., 2013; Socol A. & Danuletiu A.E., 2013) analysed and discuss the performance of the banks in Romania and, in several cases, in comparison with other countries and obtained valuable results in terms of determine the factors that influenced a certain level of ROE and ROA indicators.

After comparing the level of ROE and ROA indicators for Romanian banking system and the European level of them we can draw several conclusions regarding the attractiveness of this industry for investors:

- Looking at both ROE and ROA indicators at European level we found that the banking system showed a lack of consistency regarding the capacity to obtain performance by using its assets, strongly affected by the international financial crisis between 2008 and 2011, raising questions regarding the attractiveness of the investments made in the system.
- Less developed than the European banking system, in Romania, the banking system showed a certain inertia to the effects of the crisis registering the lowest level between 2011 and 2014, including negative values.
- From the ROA indicator point of view, both European and Romanian banking system registered a strong descendent trend, but as for ROE indicator, at the European level the crisis affected earlier the performance of the banks.
- In both cases, until the end of the period analyzed, the level of performance obtained in 2007 was not reached again.
- For the period taken into consideration in the analysis the Romanian banking system was not able to obtain the same level of performance as the European banking system.

The overall conclusion of the study is that, both European banking system and the Romanian banking system, lost their attractiveness for the investors comparing with the period before the international financial crisis in terms of the level of performance. The factors that determined such situation will be the subject of future detailed and deeper research.

4.2 Shadow banking in Romania. Does 'it count? [13]

The concern for the development of the financial intermediation activities that ensure a proper functioning of the national financial systems is not new but the financial crisis triggered in 2007 - 2008 put in a new light the need to build a balanced structure of these systems. The banking system and the credit institutions were, since the 19th century, subject to ongoing preoccupations to provide a proper regulation in order to limit the risks entailed by the credit intermediation activity but other components of the financial system were given too little attention, especially in terms of supervision and regulation.

This study aims to analyse the importance it has in the Romanian financial system a segment poorly considered by literature – the shadow banking system, using quantitative and qualitative indicators in a comparative approach to the financial system components.

The financial crisis has brought to the attention of the monetary authorities, international organizations and specialists the shadow banking activity. On one side were highlighted the risks brought forward by the functioning of this system with minimal regulation, and on the other hand the benefits it can provide to investors and borrowers when the traditional banking system faces a contraction as it was the case during the recent international financial crisis.

The study is divided into several chapters: an approach to the concept of the shadow banking, an analysis of the Romanian financial system components aiming at identify the place occupied by the shadow banking system, a brief analysis of risks and benefits that shadow banking activities brings to the Romanian financial system and conclusions.

4.2.1 Defining the shadows

With the increasing attention paid to credit intermediation activities outside the traditional banking system appeared in the literature the preoccupation to identify methodologies allowing a correctly estimation of the size and dynamics of this sector. The first step in this direction implied a clear definition of the activities circumscribed to the shadow banking concept on the one hand and identify those entities which, by virtue of the nature of the financial market activities, can be considered part of this system on the other hand.

Among the economists who used the term "shadow banking" was Paul McCulley trying to find answers regarding the triggers of the global financial crisis developed since 2007 and pointing out that due to a strict regulation and supervision of the banking system

[13] Based on scientific contribution from Ghiță-Mitrescu Silvia & **Duhnea Cristina** (2015), *Shadow banking in Romania. Does'it count?* Euro and the European banking system: evolutions and challenges, Publishing House of the „Alexandru Ioan Cuza" University, Iaşi, 2015, ISBN: 978-606-714-142-9, p. 170-180

a more creative financing process rose outside banks "flying below the radar of traditional bank regulation"(McCulley, 2009).

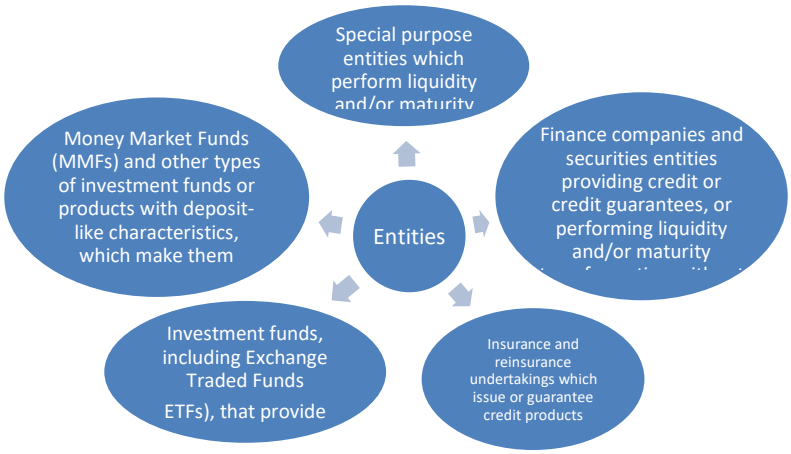
The promoter of the efforts to conceptualize this segment of the financial system is the Financial Stability Board that initiated since 2011, a periodical monitoring activity of this sector and an effort to crystallize tighter regulatory directions of the activity carried out by the shadow banking entities.

According to the FSB (2011b, p1) the "shadow banking system" can broadly be described as "credit intermediation involving entities and activities outside the regular banking system". The name of shadow banking is sustained by the FSB with the fact that after 2007(the starting point of the global financial turmoil) can be identified a "increased recognition of the importance of entities and activities structured outside the regular banking system that perform bank-like functions ("banking")"(FSB, 2011b, p1). Even the content of the activity carried out by these entities is commonly accepted by the economic literature and the institutions as European Commission, Federal Reserve and Financial Stability Board the sector was named differently in several occasions as "market-based financing system", "non-bank credit activity", "parallel banking system" or "shadow banking system" as we will continue to refer to.

Following the increased interest regarding the conceptualization and the evaluation of the shadow banking system activity the European Commission in its Green Paper from March 2012 (p2) point out two important functions of shadow banking in the financial system (it creates additional sources of funding and offers investors alternatives to bank deposits) but draws attention to the need of intensifying prudential regulation and supervision.

According to European Commission there are several entities that can be consider part of shadow banking system (figure 26) and in some cases activities developed by entities outside the shadow system that can be take into consideration as shadow banking activity such as securitisation and securities lending and repo.

Figure 26 Shadow banking entities from European Commission point of view



Source – EC – Green Paper March 2012 – p4

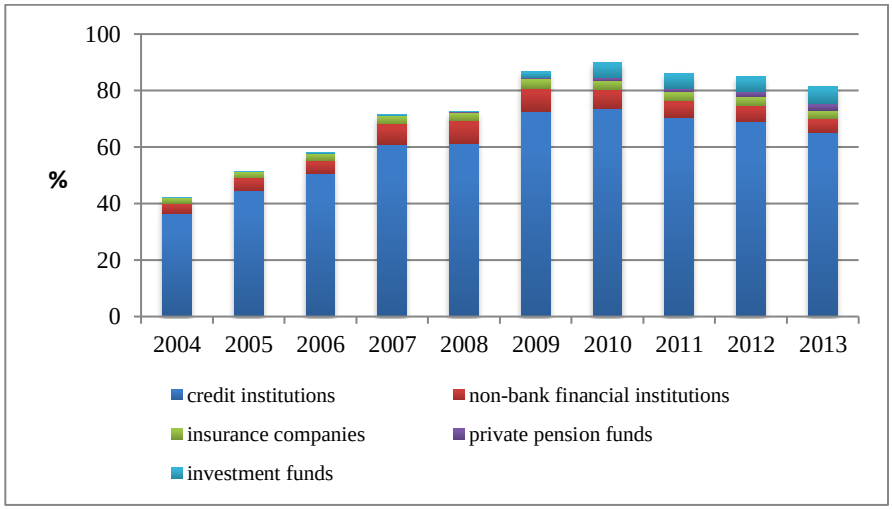
Willem Buiter (2008) synthetize the concept of shadow banking entities "they are functionally very similar to banks but are barely supervised or regulated; they hold very little capital, are not subject to any meaningful prudential requirements as regards liquidity, leverage or any other feature of their assets and liabilities".

4.2.2 Shadow banking in the Romanian banking system

The Romania's financial system has evolved in recent decades under the influence of both the internal economic factors and because of the trends of financial systems in the EU countries. The restructuring of the financial system in Romania was aimed at integration into the European financial system.

Seen in the light of its structure, the financial system is dominated by the Romanian credit institutions, the share of assets in GDP of the banking system is predominant over the past 10 years (figure 27).

Figure 27 The structure of the Romanian financial system (assets as a share of GDP)



Source: NBR – Data sets, Financial Stability Report

In terms of the financial system assets to GDP ratio, the period 2004-2013 can be divided into two phases: first, between 2004 and 2010, when the financial system has doubled the value of assets in GDP from 42.3% to 90.07%, and after 2010 when a decrease in asset values up to 81.5% in 2013 was registered.

At the start of the analysed period, the share of assets of credit institutions in GDP was 36.6%, increasing its value until 2010 to 73.56%. Subsequently, during the financial crisis, the assets of credit institutions decreased as a percentage of GDP to 65.1% in 2013, the same trend being recorded for the whole financial system.

The non- bank financial institutions accounted for the entire period analysed a share between 3.6% and 8.26% of assets in GDP and followed the same trends as credit institutions, except that they reached a maximum of the percentage of assets GDP in 2008, falling by 2010 to 6.89%, while credit institutions recorded in the same years the maximum

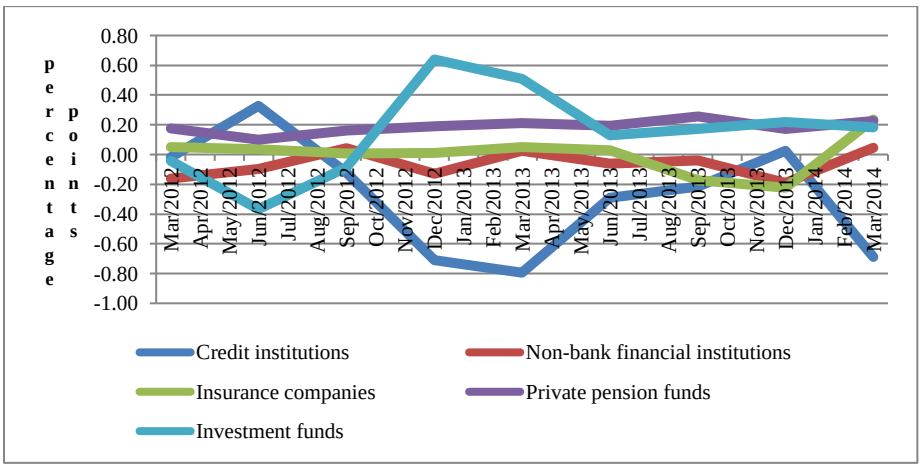
level of assets in GDP. This demonstrates that the NBFIs are more exposed to a restriction of activity during a financial crisis. At the end of 2013, the NBFIs assets represented 5.19% of GDP, the evolutionary tendency being one downward.

The assets of the insurance companies represented in the last 10 years a percentage from 1.9 to 3.27% of GDP, reaching the highest value in 2009 and subsequently enter a descendent trend, with a slight recovery in 2012.

A different situation in terms of evolution registered the private pension funds and the investment funds. Although insignificant compared to other components of the financial system, the share of their assets to GDP increased in the period under review reaching maximum levels in 2013, which may be due to investors shifting to alternative forms of investment, given that intermediation of credit institutions decreased.

In terms of the share of each component in the system structure in the recent three years we can notice a decrease in the importance of credit institutions and an increase in the role of other components (Figure 28).

Figure 28 Quarterly changes in sectoral share of the financial system components

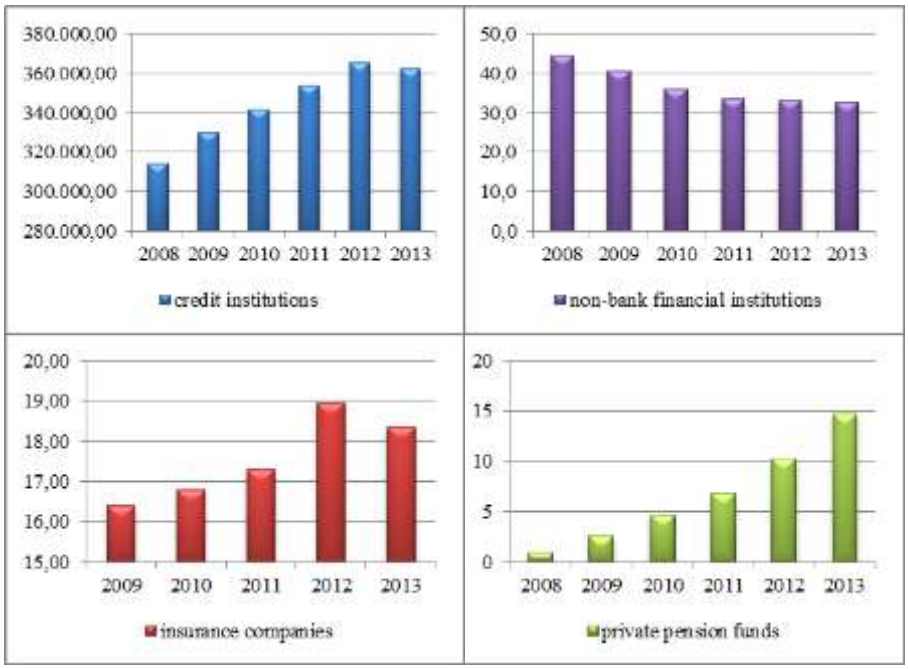


Source: NBR – Data sets, Financial Stability Report

These trends are, in our opinion, enough reason to consider an analysis of the shadow banking activity and its impact on the Romanian financial system.

One aspect to take into consideration in order to determine the importance of shadow banking activity in Romania is the value of assets of each component of the financial system (figure 29).

Figure 29 Total assets of credit institutions and shadow banking in Romania (Lei bill.)



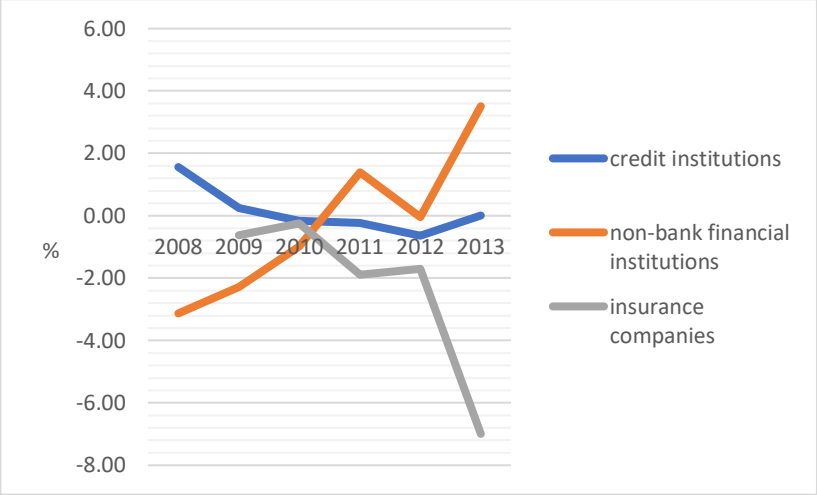
Source: NBR – Data sets, Financial Stability Report

The credit institutions have experienced an upward trend of the value of assets between 2008 and 2012, followed by a slight decrease in 2013, while the assets of NBFIs have evolved contrarily. The insurance companies have registered an increasing trend of their assets value until 2012, and subsequently entered a downward trend, the value of assets in 2013 decreasing by 3.2%. The only sector of the financial system showed a steady upward trend in the period under review is that of the private pension funds, whose assets have increased by an average annual rate of 1.8% every year amid the collection of new contributions and an increase of the participants number, both in privately-managed pension funds (Pillar II) and the optional pension funds (Pillar III).

Amid this development of the assets value, the profitability of the components of the Romanian financial system, assessed by considering ROA had divergent dynamics (figure 30).

While the credit institutions have registered negative values of ROA between 2010 and 2012 and a slight recovery in 2013 to a value of only 0.01% and the insurance companies reached a value of -6.99% in 2013 , the NBFIs started in 2008 with a ROA of -3.13% and ended the period under review with a value of 3.51%.

Figure 30 The evolution of ROA for credit institutions, NBFIs and insurance companies



Source: NBR – Data sets, Financial Stability Report

Following this brief analysis, we can conclude that shadow banking, despite the low weight that it has in the structure of the financial system in Romania, presents relevance to the system evolution, manifesting as a counterbalance to the evolution of credit institutions.

4.2.3 The shadow banking – benefits for the financial system

The increased interest in recent years for the shadow banking activity is due, on one hand, to the potential advantages that could bring to the proper functioning of the financial system and on the other hand to the risks related to the developing of this sector.

Both international bodies and experts have expressed concerns about the rapid growth of this activity without a strict regulation but also highlighted the benefits that shadow banking brings to the financial system with the condition of a careful supervision and an intensified regulation.

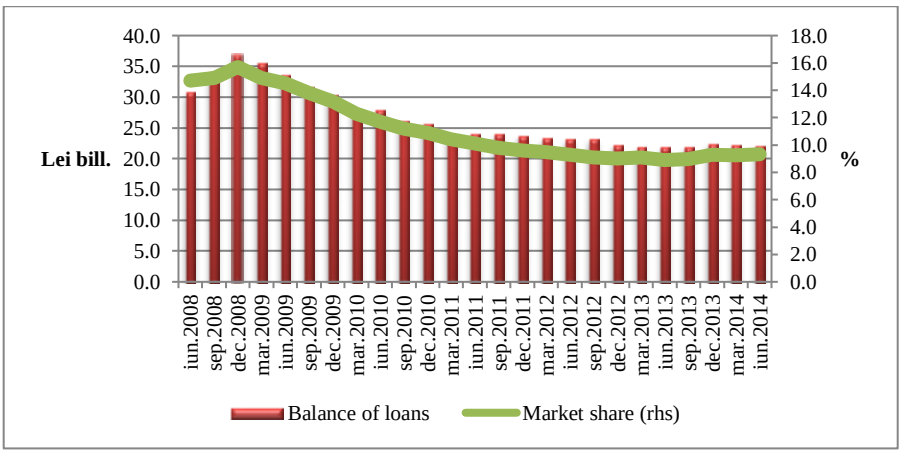
Among the benefits of shadow banking activity in an economy we can identify ((Institute of International Finance, 2012), (EU Green Paper, 2012)):

1. Efficiency, innovation, and specialization (they channel resources towards specific needs more efficiently due to increased specialization)
2. Diversification and mitigation of risk (alternatives for investors to bank deposits)
3. Greater flexibility and investment opportunities
4. Increased liquidity and funding (they constitute alternative funding for the real economy, which is particularly useful when traditional banking or market channels become temporarily impaired);

Due to all these potential benefits the entities subject to shadow banking activities can have a real contribution to a healthy financial system.

In Romania the NBFIs help increase financial intermediation both by lending in sectors where credit institutions are reluctant and by offering different crediting conditions than those offered by the traditional banking system, which may lead to increased competition in the financial system.

Figure 31 Balance of loans and market share of NBFIs between 2008 and 2014

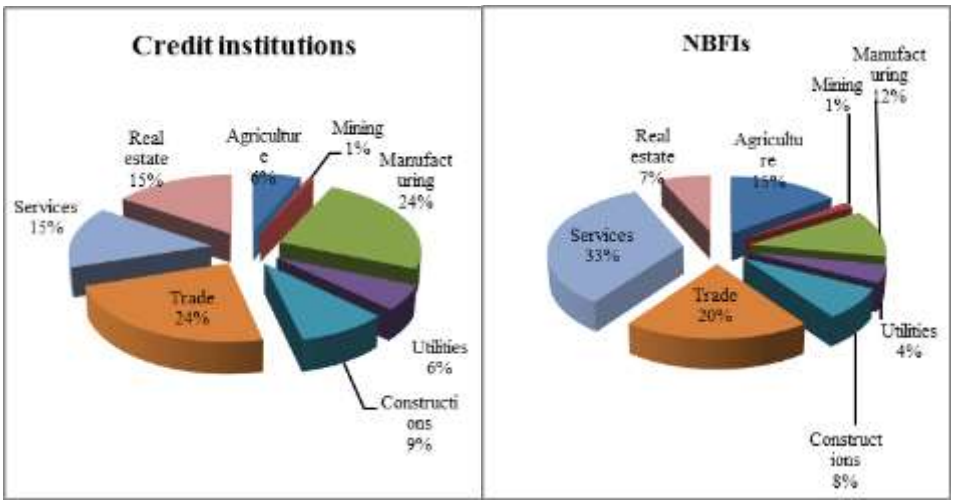


Source: NBR – Data sets, Financial Stability Report

The NBFIs lending activity intensified in the period immediately preceding the financial crisis, the volume of loans granted in December 2008 was the biggest in the whole period analysed, but after this moment the lending activity shrank amid the deepening of the financial crisis and due to the delay of economic recovery. In this context, the market share of NBFIs reached in June 2013 a minimum of 8.9%, a figure which increased slightly to 9.3% in June 2014.

The most important benefit to having NBFIs in the Romanian financial system, in our opinion, is the increasing access to credit for certain categories of individuals and businesses that do not fit the criteria of credit institutions. An analysis of the structure of loans granted by the two categories institutions reveals the following sectorial distribution of debtors (figure 32):

Figure 32 Structure of credits granted by credit institutions and NBFIs by borrowers in 2013



Source: NBR – Data sets, Financial Stability Report

In 2013 the credit institutions granted loans mainly to the trade and manufacturing sectors while NBFIs loans were directed towards the services, trade and agriculture. The real estate sector preferred to borrow from credit institutions, while the share of loans granted to constructions sector was approximately the same for credit institutions and NBFIs.

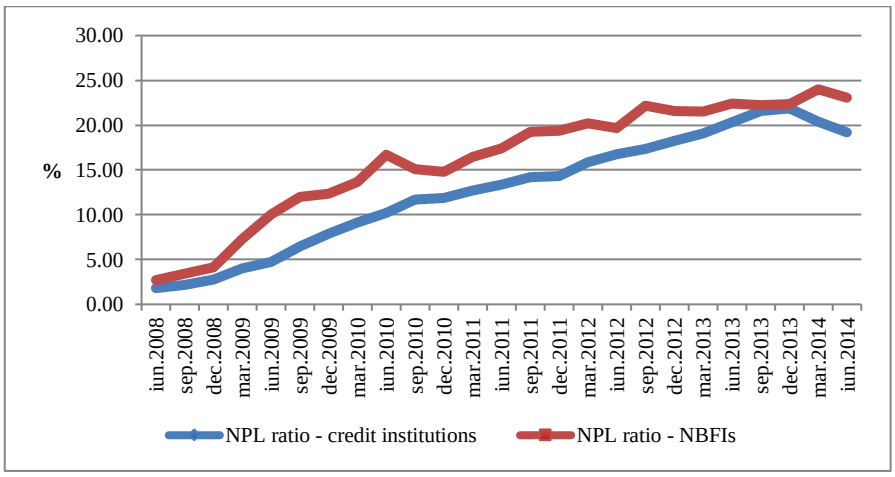
4.2.4 The shadow banking system - risks

Considering the rapid development of the shadow banking system, the Financial Stability Board draw attention that these activities raise "systemic risk concerns, in particular by maturity/liquidity transformation, leverage and flawed credit risk transfer, and/or regulatory arbitrage concerns" (FSB, 2011a, p3).

European Commission synthetized in its Green Paper the main directions in which the shadow banking system can affect the stability of the financial system (EC, 2012, p5): Deposit-like funding structures may lead to "runs"; Build-up of high, hidden leverage; Circumvention of rules and regulatory arbitrage; Disorderly failures affecting the banking system through direct borrowing from the banking system and banking contingent liabilities (credit enhancements and liquidity lines); and, massive sales of assets with repercussions on prices of financial and real assets.

If in the previous section we mentioned that the biggest advantage of NBFIs activity in the Romanian economy is the increase of the financial intermediation by expanding the lending opportunities, we equally believe that easier access to loans can also be a potential risk to the financial system stability. The evolution of non-performing loans (NPLs) of the credit institutions and NBFIs it is an indication in this regard (figure 33).

Figure 33 Non-performing loans granted by credit institutions and NBFIs



Source: NBR – Data sets, Financial Stability Report

The NPLs ratio was growing both for the banking system and the NBFIs for most of the period under review, but the level of non-performing loans granted by NBFIs was greater than the credit institutions percentage of NPLs. The smallest difference between the NPLs ratio for the two sectors was achieved in December 2013 after this moment the difference increasing at the expense of the NBFIs.

At the end of the period, the credit institutions registered a decreased value of NPLs ratio of 19.2% while NBFIs faced an increase of the NPLs ratio to 23.09%. The NPL situation, although it represents a risk to the financial system stability is not alarming, given the fact that both the traditional banking system and the shadow banking system set up enough provisions to cover the risk of non-payment.

4.2.5 Conclusions

Following the analysis conducted in this paper we can conclude that for the Romanian financial system the shadow banking sector is underdeveloped compared to the traditional banking system but ranks second ahead of the private pension funds and the insurance companies considering the value of total assets.

In Romania we cannot speak about a notable influence of the shadow banking entities in the financial intermediation activity. In addition, we can say that the presence of the shadow banking system in the Romanian financial system does not affect its stability because the activity is extremely narrowed and in early stages of development if we consider the complexity of credit intermediation activity.

However, an analysis of the percentage of non-performing loans show that the shadow banking system closely follows the trend of credit institutions but reported to a much lower level of assets which show a potential source of financial internal market imbalances.

For a better understanding of the advantages but also the risks of the shadow banking sector growth in Romania as part of the financial system that has proven it could still perform

(as shown by the analysis of the ROA indicator) issues regarding shadow banking activities as structure, volume and regulation framework will be subject for futures research developments.

4.3 Internet Banking in Romania at a Glance[14]

The banking industry, as well as all financial services, was found since the 90's in front of one of the biggest challenges: the introduction of information and communication technologies in the service providing process especially the internet banking services. The classical model of business used by banks regarding the clients approach, based on face to face interaction, has become a constraint for the development strategies and the possibilities to increase their market share in the context of the rapid growth of the internet usage in all sectors of the national economy and especially on the international markets.

The increasing competition in the banking services market has forced the market' players to find solutions to adapt to the new consumer behaviours that consider eliminating direct interaction with service provider or goods supplier in favour of using the internet for purchases. Another reason banks have developed internet banking services is represented by the reduction of costs and the profits enhance, while enriching customer convenience through the ease and rapidity with which transactions is executed (Stoica et. al, 2015).

Over the past 20 years the literature has crystallized several research directions regarding the internet banking services: comparison, in terms of profitability, of the business models of banks from the classical "click and mortar" model to the mixed models to those based solely on online services (Sullivan (2000), DeYoung (2005) Arnaboldi & Claeys (2008)), analysis of the degree of penetration of the internet banking services at national economy level (Black et al. (2001), Gerrard & Barton Cunningham (2003)), the integration of internet banking services in the development strategies of the banks.

Hanafizadeh et al. (2014) made a taxonomy of the scientific articles regarding the internet banking taking onto account three main topics: descriptive studies(presenting the concept, identifying characteristics and attitudes of internet banking consumers, barriers to development of such services) studies based on primary and secondary data; relational studies(trying to identify and explain factors influencing the implementation of internet banking services, to explain the penetration of online banking) using models and theories ; comparative studies(analysing the internet banking services through comparisons based on several variables (population, distribution channels, methods)).

This research addresses one of the issues regarding the internet banking services - the use and the penetration of them in Romania compared to the European Union. The paper is organized as follows: the analysis of the use of internet banking services in the European Union, the analysis of the use of internet banking services in Romania by types of users based on several criteria (age, residence, occupational status) as well as the level and trends of the transactions made through internet banking (number and value) in Romania.

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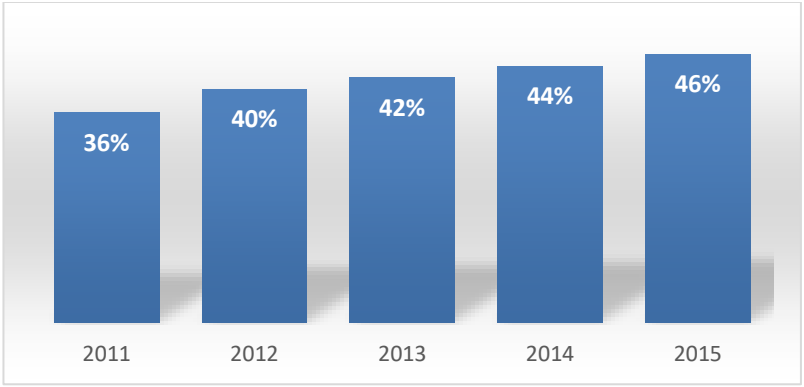
[14] Based on scientific contributions from Ghiță-Mitrescu Silvia & **Duhnea Cristina** (2016), *Internet Banking in Romania at a Glance, Annals of Ovidius University Series – Economic Sciences*, vol. 16, part II, 2016, ISSN 2392-3127, p.508-514,

4.3.1 Internet banking in EU

A short overview of the internet banking services usage level in the European Union shows that the penetration of these services had a rapid grow jumping from 16% in 2004 (Driga, 2014, p 89) to 46% in 2015. The internet banking services have seen an increase in use among the EU population in the last 5 years. In 2011 36% of all population used Internet banking services, while in 2015 the share of users in total population grew to 46%. The numbers are even higher for those who used the Internet banking in the last three months, increasing from 52% in 2011 to 57% in 2015. (figure 34)

Figure 34 Online banking penetration in the European Union between 2011 and 2015

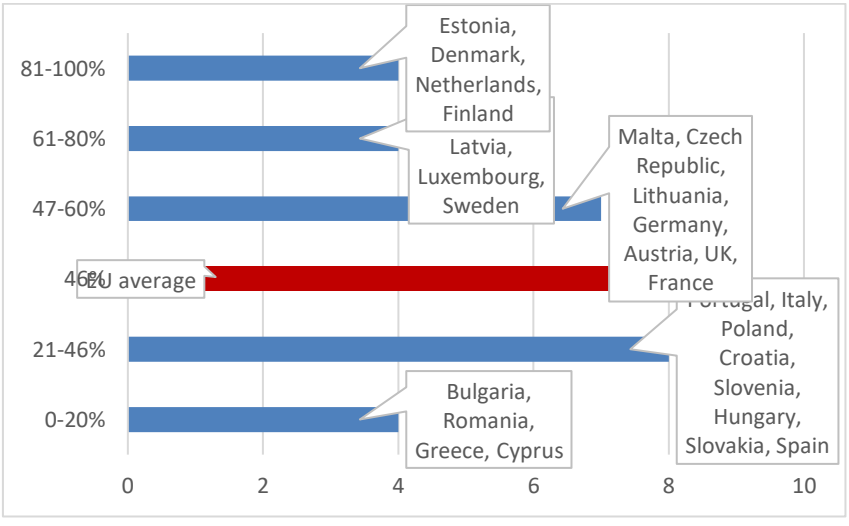


Source: authors' compilation based on data from www.statista.com

According to the data presented, almost half of the EU population used, at the end of 2015, Internet banking services. However, the same study shows that the country with the higher penetration of Internet banking is Norway, which is not a member of EU and has a 90% level of online banking users (www.statista.com).

Country-level data show that there is a greater reliance on the use of Internet banking in the countries of Northern and Western Europe, while the South-East area is below the EU average (figure 35).

Figure 35 Online banking penetration in the European Union countries in 2015



Source: authors' compilation based on data from www.statista.com

The same conclusions were reached in a 2006 study carried out by Deutsche Bank that revealed that online banking adoption is higher in northern countries and it also increases alongside GDP, latitude and GDP statistically explaining around 80% of the variation in Europe, according to the authors of the above mentioned study (Deutsche Bank Research, 2006).

The question that arises from this upper trend of online banking is whether it will replace traditional banking and lead to smaller, less staffed banks. The evolution of the number of local units and employees of credit institutions in the last five years, seem to confirm this theory.

Seven years after the beginning of the financial crisis, the banking systems of EU countries continue to transform, trying to cope with a new way of running their daily activities. The development of online services makes fewer and fewer customers require direct interaction with the staff of banks. If we add to those stated above the need for credit institutions to reduce their operating costs, we conclude that the banking systems in the EU are in a process of restructuring designed to transform the credit institutions into more flexible entities, able to adapt to a financial markets in which information technology plays a decisive role. It is difficult to argue at this point that the banking business will become fully automatic in the near future, suppressing the direct interaction between customers and bank employees, but it is obvious that online banking operations are on an ascending trend.

4.3.2 Internet banking in Romania

The recent literature shows a raising preoccupation for the internet banking services in Romania. Starting with 2008-2009 studies conducted analysed different angles regarding internet banking in Romania: from the attitude, the behaviour and the tendencies of the Romanian consumer of such services and the penetration of these services in the Romanian market (Buhociu et al, 2009) to the technical aspects with the analysis of internet banking services platforms from the Cloud computing services perspective (Frăţilă et al., 2013) and if and how the internet banking services contribute to the enhancement of the overall efficiency of Romanian banks (Stoica et al., 2015).

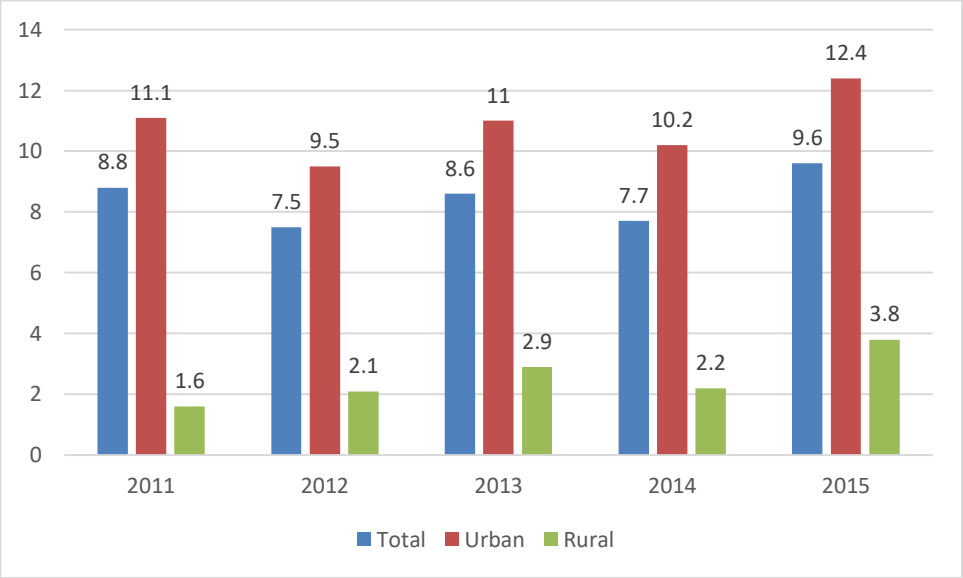
4.3.3 The internet banking services by types of users

In the past five years, the number of households with Internet access in Romania increased from 43.3% to 61%. The growth is greater in urban areas, where statistics show that 71.9% of households had Internet access in 2015 compared to 59.3% in 2011. In rural areas, the share of households with Internet access in total households doubled during the analyzed period, from 21.8% to 46.6%.

According to the National Institute of Statistics research, the share of persons aged 16-74 years who accessed the Internet in the last 3 months prior to the survey in order to use Internet banking services in the total number of persons who accessed the Internet increased

from 8.8% to 9.6%. In the urban area 12.4% of users in the above mention group used the Internet for on-line banking services, while in the rural area 3.8% accessed the Internet banking services in 2015 (figure 36).

Figure 36 The share of persons aged 16-74 years who have accessed the Internet in the last 3 months for Internet banking by the residence area

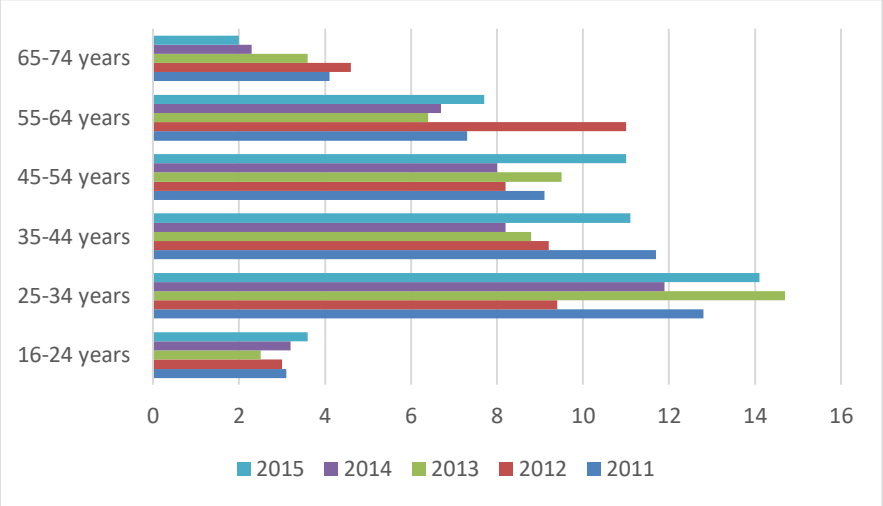


Source: processed based on data released by NIS

Compared to other Internet access purposes, Internet banking has one of the lowest percentage rates. In 2015, 78.3% of inquired users utilized the Internet for participating in social networks, 76.3% for sending or receiving e-mails, 67.2% for reading or downloading online newspapers, 47.6% for seeking health-related information, 42.2% for telephoning over the Internet.

The distribution of Internet banking users by age group shows that the largest share in the segment is comprised between 25 and 34 years. In 2015 from the total number of respondents in this category, 14.1% accessed the Internet banking services, the percentage increasing over the previous year by 2.2% and by 1.3% compared to the beginning of the period. The highest percentage of users in this group was reached in 2013 when 14.7% of respondents used Internet banking services. In the category ranged between 35 and 44 years, 11.1% of respondents accessed the Internet banking services in 2015, compared to 8.2% in 2014. An increase in the number of users was recorded in 2015 compared to 2014 in the 45-54 years segment, from 8% to 11% (figure 37).

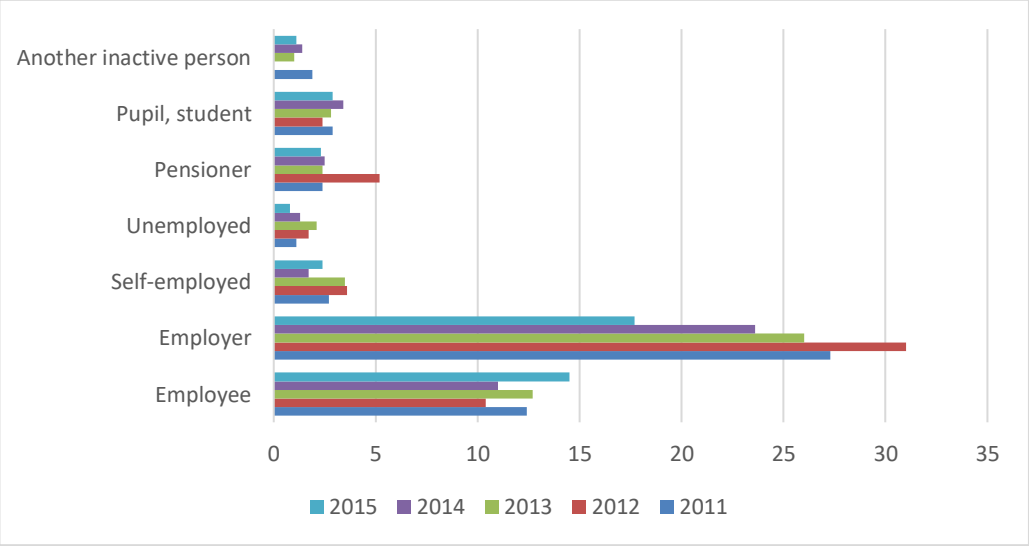
Figure 37 The share of persons who used Internet banking services in the last 3 months by age group



Source: processed based on data released by NIS

In the same period, the distribution of respondents by occupational status shows that most users of Internet banking are among employers. However, in 2015 only 17.7% of surveyed employers were using Internet banking, compared to 27.3% in 2011, 31% in 2012, 26% in 2013 and 23.6% in 2014. The second highest number of users are in the category of employees. The share of users in this category increased to 14.5% at the period end, compared to 12.4% at the beginning of the period (figure 38).

Figure 38 The share of persons who used Internet banking services in the last 3 months by occupational status



Source: processed based on data released by NIS

If we add to the foregoing that in 2015 10.3% of men participating in the NIS study

have used in the last 3 months Internet services to 8.8% of women, their number being increased from the previous period, we conclude that user Internet banking is male, aged between 25 and 34 years old, lives in the urban area and is an employer.

4.3.4 The internet banking transactions

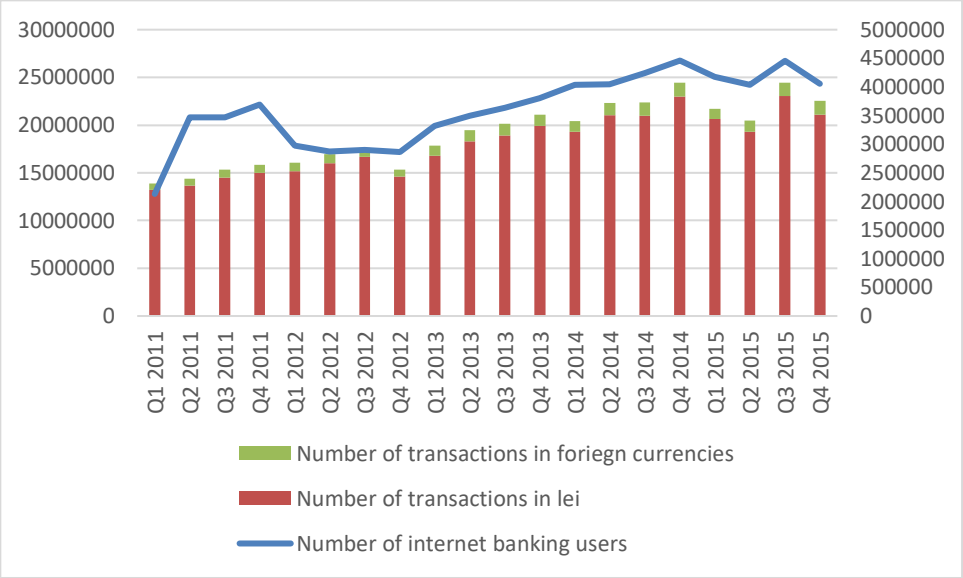
An even more comprehensive outlook on the size of the Internet banking sector in Romania can be obtained by analysing the data that credit institutions are required to report under the provisions of the Ministry of Communications and Information Technology Order no. 389 from 2007.

In the last quarter of 2015, banks reported to the Ministry of Communications and Information Society a total of 4,051,640 users of Internet banking services, doubled than the number of users in the first quarter of 2011. The maximum number of users, 4,460,437 was reported in the fourth quarter of 2014. The evolution of the number of users fluctuated throughout the period, registering both upward and downward trends, but remaining higher than the number reported for the first quarter of 2011 (figure 39). Comparing the internet banking users' number with the Romania' total population (about 20 million at the national census in 2012) the share is only 20% and 25% if we consider only the adult population over 18(about 16 million at the national census in 2012).

In terms of transactions number, the internet banking in Romania developed and grow between 2011 and 2015(as we can see in the figure no. 39) showing that the individuals accessed more often the possibility of doing payments, shopping and transfers online.

The users of Internet banking conducted their transactions mainly in the national currency, the maximum number of their transactions, 23.025 million being reached in the third quarter of 2015 and representing a total value of 459,710,240,844 lei. Throughout 2015, 1.647 billion lei were traded via Internet banking operations in 84.053 million transactions. The number of transactions in foreign currency averaged around 1.08 million transactions each quarter, with a maximum of 1.43 million transactions in Q3 2015. The value of foreign currency transactions in 2015 reached 62.4 billion in euro equivalent.

Figure 39 The quarterly evolution of the number of Internet banking users and number of transactions between 2011 and 2015



Source: processed based on data released by MCIS

Considering the number of internet banking transactions, we found that the evolution is different depending on the currency used. The number of internet banking transactions in the national currency registered, each quarter in the analysed period, an ascendant trend growing from about 14 million in the beginning of 2011 to over 20 million at the end of 2015. On the other hand, the internet banking transactions in foreign currencies remained for the entire period under 2 million with an important grow after 2013. Even if the number of internet banking transactions are incomparable, the grow ratio is significant in both cases: the transactions in national currency augmented by 60% and those in foreign currency had more than doubled in each quarter of 2015 comparing with 2011.

4.3.5 Conclusions

After conducting this analysis we can state that Internet banking in Romania is set on an upward trend and this raises two problems for banks: the need to adapt their operations to the new requirements of clients, providing secure and fast Internet transactions, on one hand, and the need to reduce their personal and on-field presence and replace it will a more active on-line presence. At macroeconomic level, if we add to those trends stated above, the tendency of reducing the number of ATMs and the increase of POS payments, we may be looking, on long term, at the substitution of the physical currency with the electronic one.

I.5 Crises challenging the banking industry development strategies – giving its rightful place to customer satisfaction[15]

One of the Romanian industries with a long-lasting upward trend since the 90's is the banking services industry. For fifteen years, this economic sector has seen rapid growth due to the high demand especially for low complexity services. The 2007-2008 financial crisis brought about a significant change in the banks' interest in relation to the consumer' satisfaction issue and the customer' retention techniques, in the context of a strong contraction of the banking system and a significant reduction in bank performance indicators.

The proof of this situation are the data on three important indicators for the financial stability of a banking institution and the ability to obtain profit, presented for the period 2006 -2010 in the table below. Until 2008, the non-governmental credit rose on a yearly basis and the two non-performing loans indicators showed low values, but the situation changed in the next five years.

Table 16 Selected performance indicators of the Romanian banking system

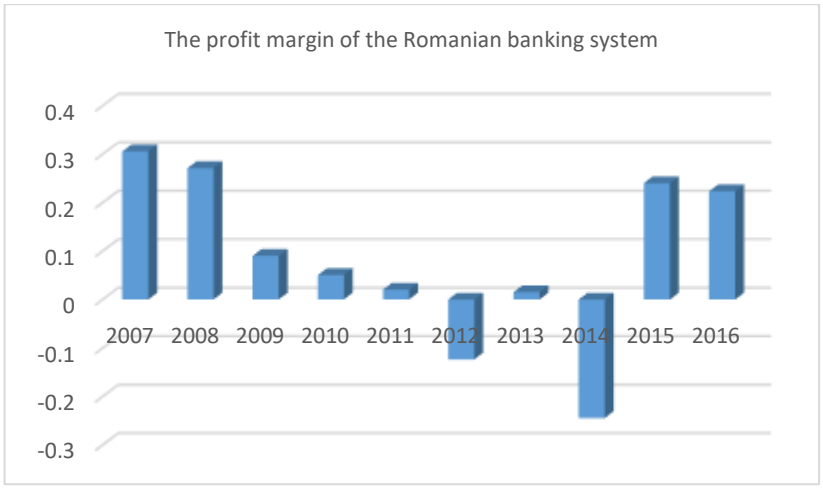
Year/Indicators	Growth ratio of non-governmental loans - in real terms	Overdue receivables/total assets	Overdue receivables / total equity
2006	47%	0,1	1,5
2007	50,5%	0,17	1,6
2008	25,8%	0,29	3,19
2009	-3,6%	1,01	11,78
2010	3%	1,47	16,59

Source: Authors' compilation using data from the National Bank of Romania reports – years 2006-2010

Since 2009, because of the financial crisis, there has been a significant drop in the profit margin, more than 60% compared with the previous year, a trend maintained until 2014. As the lending activity was the main source of profits for the Romanian banks prior to the 2007-2008 crisis period, the massive reduction of this sector as one of the crisis' effect, resulted in a dramatic fall in the profit margin of the Romanian banking system.

[15] Based on the scientific contributions from **1.** Moraru Andreea-Daniela & **Duhnea Cristina** (2018), Assessing Customer Satisfaction with Banking Services Using 3D Mathematical Representations, pp.19-37, published in Strengthening the Competitiveness of Enterprises and National Economies – Thematic collection of papers of international significance, editor Bojan Krstic, University of Nis, Serbia, 2018, ISBN 978-86-6139-154-5. 2, **2.**Moraru Andreea-Daniela & **Duhnea Cristina** (2018), *E-banking and Customer Satisfaction with Banking Services*, Strategic Management, Vol. 23, Issue 3, pp.3-9, Publisher: University of Novi Sad, Faculty of Economics in Subotica, Serbia, ISSN: 1821-3448, eISSN: 2334-6191.

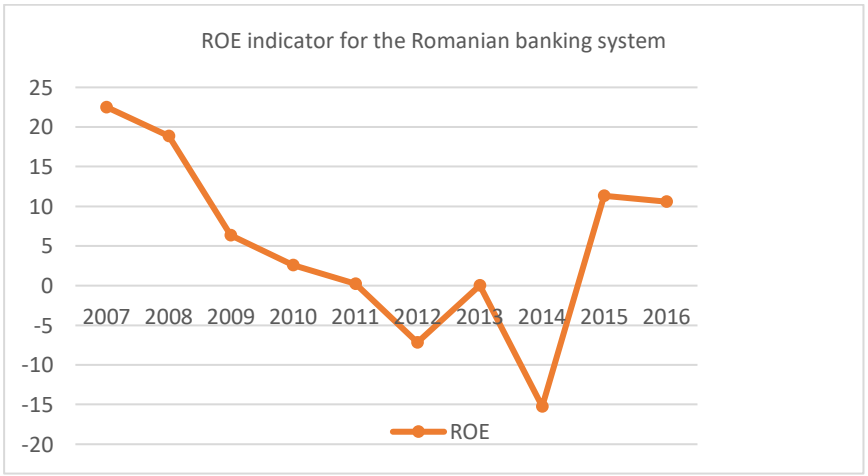
Figure 40 The profit margin of the Romanian banking system



Source: Authors' compilation based on the data from the National Bank of Romania

The shift between the "golden era" and the crisis period is also shown by the evolution of the Return on Equity (ROE) indicator for the whole Romanian banking system with no consistency over a ten-year period. It reached a high value of 22.5176 in 2007, zero points in 2011 and 2013, and negative values in 2012 and 2014. In 2016, the value of the ROE indicator could not reach the 2007-2008 level, raising concerns for the investors and putting pressure on the banking institutions management.

Figure 41 ROE indicator for the Romanian banking system



Source: Authors' compilation based on the data from the National Bank of Romania

The Romanian banking system has undergone two distinct stages over the past 17 years in terms of how credit institutions have levelled on customer satisfaction and infrastructure modernization in order to offer e-banking and mobile banking services as an integral of the banking products offer. Until 2007, the range of the banking services offered to customers was part of the traditional lending and saving products and in relation with the clients, the most important aspect was the product. Starting with 2008, with the manifestation of the effects of

the international financial crisis, the banking system entered another stage - the refining of the banking products and services offered in order to maintain customer satisfaction and to achieve their retention in the conditions of a drastic reduction of the consumption of such products and services.

The deterioration of the banking institutions' capacity to make profit while reducing the demand for the traditional banking services (loans and savings products) as a result of the crisis period, the changes in the profile of the consumer of banking services (from the consumer that unconditionally accepts the offer of the banks to the consumer involved in making the acquisition decision) and the increasing competition(from shadow banking system and the fin-tech companies) are factors that have led to the need to change banks' development strategies. Diversifying the offer with the introduction of innovative services as mobile banking, e-banking, customer assistance 24/7, complex products with multiple services included, and the development of measures to investigate consumer satisfaction and active retention plans have become key points in the operational plans and in the day-to-day management of these financial institutions.

5.1 A conceptual approach to customer satisfaction. Customer satisfaction in a general context

Given its place at the centre of marketing theory and practice, it is not surprising that plenty of attention has been paid to customer satisfaction, especially after 1970. At the base of the literature on customer satisfaction there are mainly the pioneer works of Cardozo (1965) and Anderson (1973), focused on consumer satisfaction regarding the assessment of performance or even of acquisition experience. Some authors view satisfaction as a process (Tse & Wilton, 1988), while others regard it as an outcome (Howard & Sheth, 1969). As the complexity of the economic activity augmented the study on satisfaction has grown rapidly in the 1970's, as more than 500 studies were carried out regarding customer satisfaction (Hunt, 1982, cited by Clinton & Wellington (2013)). Subsequently, the antecedents of consumer satisfaction as well as its consequences on purchase intentions, company performance, and customer loyalty became subject to ample research.

In the literature there have been recorded numerous approaches to defining satisfaction. Satisfaction has been viewed as "the buyer's cognitive state of being adequately or inadequately rewarded for the sacrifice he has undergone" (Howard & Sheth, 1969, p.145), or as "an emotional response to the experiences provided by, or associated with particular products or services purchased […]" (Westbrook & Reilly, 1983, p. 256). In another approach it was viewed as a "pleasurable level of consumption-related fulfilment" (Oliver, 2010, p.8), while it is worth mentioning that in other cases a definition of satisfaction was attempted by clarifying the concept of dissatisfaction as "the degree of disparity between expectations and perceived product performance" (Anderson, 1973, p.38).

Although a vast plethora of research works on the topic has focused on testing models of consumer satisfaction, the literature has still to shed light on defining the concept. The definitions given to satisfaction viewed it either as an outcome or as a process, and the majority inclined to qualify consumer satisfaction as a response to an evaluation process (Giese & Cote, 2000).

Clinton & Wellington (2013) reviewing the theories of satisfaction from literature concluded that the most documented and confirmed by different research studies are: assimilation theory, contrast theory, assimilation-contrast theory, and negativity theory. Isac & Rusu (2014), citing Peyton et al. (2003) and on the synthesis achieved by Vavra (1997) consider five categories of such theories, adding to those previously mentioned the theory of hypothesis testing.

Thus, the most widely accepted conceptualization of satisfaction seems to be the expectation disconfirmation theory, substantiated first by Oliver (1980), as well as Churchill & Surprenant (1982) or Tse & Wilton (1988). Under this paradigm, customer satisfaction is the result of a comparison between customer expectations and product/service performance; satisfaction derives from a performance exceeding expectation (positive disconfirmation), while dissatisfaction is naturally determined by a performance falling behind expectations (negative disconfirmation). Churchill & Surprenant (1982, p.493) follow this line of thinking, viewing satisfaction as "an outcome of purchase and use resulting from the buyer's comparison of the rewards and costs of the purchase in relation to the anticipated consequences". Later on, Kotler (2000, p.51) agrees with the approach by defining satisfaction as a "person's feeling of pleasure or disappointment which resulted from comparing a product's perceived performance or outcome against his/ her expectations".

Extensive research has supported this paradigm, while it is necessary to mention that numerous guises of the theory have also been considered (Yi, 1993), and that the approach does not offer an exhaustive explanation of the satisfaction construct (McQuitty et al., 2000).

As it is, in the absence of a generally accepted definition for customer satisfaction, the research struggles in developing valid measures of satisfaction, which eventually leads to the impossibility of achieving comparability of empirical results (Giese & Cote, 2000, pp.1-2). Another aspect that the literature highlighted was the need to support this multitude of theories with empirical evidence. Johnson & Fornell (1991, p.23) emphasized "it is important that future research adopts an empirical approach that recognizes both the nature of the satisfaction construct and the measurement problems associated with satisfaction research [...] As a latent construct, satisfaction can be measured proximally (though not equated) with observable indicators".

Perceived performance and expectations in the consumer satisfaction model were subject to studies with varied results. Perceived performance was found to have both direct and indirect effects (through its effect on disconfirmation) on satisfaction, while in other studies had no significant direct effect. Expectations had a direct effect on consumer satisfaction in

some studies, while in others had only little effect, with perceived performance having a significant effect on consumer satisfaction (Yi, 1993, p.502).

Extensive research has been dedicated to the antecedents of satisfaction and the findings were mixed. Perceived performance and customer's expectations regarding performance were found to be the main antecedents of satisfaction (Churchill & Surprenant, 1982; Oliver 1980; Westbrook & Oliver 1981; Yi 1990).

To grasp the full dimension of customer satisfaction, it has to be projected against several other concepts, such as: customer loyalty, product/service quality, value, purchase intention, etc.

Satisfaction has several behavioural consequences, including customer complaints, product repurchase, and brand switching (Fornell & Wernerfelt 1987, 1988 in Johnson & Fornell 1991, p. 23).

As customer satisfaction issues gained ground in the scientific studies, researchers have looked for the most appropriate investigative methods and created various systems of indicators in search of the most appropriate combination for the product/service considered. Several authors such as Isac & Rusu (2014) or Spreng & Page (2003) have synthesized the most used methods to investigate consumer satisfaction. These include difference score, direct effects model, better than / worse than, standard percept disparity, additive differential model, etc. They are all used and each has its own advantages and disadvantages, but the choice must be made taking into account the particularities of the product/service on the one hand and the category of consumers targeted, on the other hand.

5.3 Approaches on customers' satisfaction with banking services. A literature review

If we refer to the satisfaction of the banking services consumers, the specialized literature shows that, on the one hand, the generally developed consumer satisfaction theories have been applied in various studies at different levels (of a single bank, of a region or of a national economy). On the other hand, it was necessary to customize the methods used and the selection of the determinants in accordance with the specificity of the services and the banking industry. Belas & Gabcova (2016) synthetized the visions expressed by different authors. Some viewed a certain characteristic as being essential in determining the level of customer satisfaction while others, on the contrary, stated that highlighting only one determinant can be irrelevant, and that the relations between customer satisfaction and its determinants tend to be nonlinear, to influence each other or to be found only in some segments.

In order to determine the best approach regarding the consumers of the financial services, in the context of a challenging economic environment, the financial institutions need to identify correctly the types of consumers they are dealing with.

Starting with the 50's, several authors investigated and subsequently created profiles and types of financial services' consumers. Beckett et al. (2000, p.16) developed a consumer behaviour matrix based on previous studies and having as a starting point "the ideal type"

methodology developed by Max Weber and identifying two principal factors that motivate and determine individual contracting choices, namely involvement and uncertainty. Their model considered four types of consumer behaviour. Repeat-Passive consumers are characterized by low levels of involvement and limited perception of uncertainty. In the case of Rational-Active consumers the consumer's involvement in terms of control, participation and contact is high as well as the confidence in terms of product complexity and certainty of outcome. The No purchase category includes consumers who make no purchase other than traditional deposits and services regarding their current accounts because they are characterised by a very low or no involvement with the financial product and they do not make transactions decisions due to the lack of ability or confidence. Relational-Dependent consumers are highly involved but with a low confidence due to the complexity of the services offered by the financial institutions and in order to make a choice they constantly seek advice and help.

A second aspect regarding the customer satisfaction with banking services to be investigated concerns the determination of those factors that essentially influence their satisfaction.

During the last three decades, the scientific literature on customer satisfaction with banking services has developed in several distinct directions. One direction refers to studies that have applied, in the field of banking services, the theories of consumer' satisfaction, focused on different levels of depth: on a single bank, on a group of banks or on the entire banking system either at regional or even national level. Another direction is represented by studies that have highlighted the particularities of the banking services and have brought to the attention specific survey methods suitable for these types of services. Whatever the theory / model used to investigate consumer satisfaction, research in this area has shown that, in order to be of some relevance for the academia or for the banking system' practitioners, it is necessary to correctly determine and use in such research those factors specific to the banking services not only those applying to all types of services.

The third issue under discussion refers to the importance of identifying the most relevant determinant factors of customer satisfaction with banking services and to the number of factors considered. On one hand, there are the studies that investigated the level of satisfaction considering only the most relevant factor. On the other hand, there are studies that consider customer satisfaction in this industry to be influenced by more than one determinant factor. Moreover, it is important to accept that, depending on the specific target group of customers and the extent of the research, the matrix of the customer's satisfaction may vary. The literature has not reached a consensus as shown by the synthesis of the studies on the satisfaction of the banking services' consumers of Belas & Gabcova (2016).

In Romania, as we have previously shown, the banking industry has gone through significant changes in the relationship with the consumers of banking services. It had to adapt from a state in which the client seeks the bank (when offering a certain product/ service was the only effort required to retain the customer and even to gain new ones) to the one in which,

in an intense competition, the bank is forced to adopt an active strategy and find new ways for keeping existing customers by maintaining and/ or increasing their satisfaction.

The research of the banking services' customer satisfaction in the Romanian banks started to take shape after 2005 and until nowadays, only a small number of studies have been conducted. All of these studies have as a target the customers of a single bank (usually focused on the operations developed in a city, not at national level) or, if it includes a group of banks, it is limited to a city or a region.

In the first category of research are included:

- Bena (2010): the author conducted a survey to determine the level of satisfaction for the customers of a Romanian bank from Bucharest,
- Bente (2013): the study has as objective, using the SERVQUAL method, to identify the level of customer's satisfaction for Volksbank Oradea.

From the second category of studies we can mention the research of Micuda & Cruceru (2010) focusing on the customer' satisfaction for the banking services offered by financial institutions in Pitesti, through the SERVQUAL method.

5.4 Assessing customer satisfaction with banking services using 3d mathematical representations

The research developed aims at identifying the influence of five categories of customer satisfaction determinants with banking services in the South East of Romania region.

In our study, we decided to consider several main categories and subcategories of factors that determine customer satisfaction with banking services:

- Convenience, with the subcategories: 1. bank location, 2. distance to the bank, 3. availability of parking spaces, 4.ATM availability;
- Quality, with the subcategories: 1. trust, 2. prompt reaction of personnel, 3. safety of operations, 4. solicitude;
- Environment, with the subcategories: 1. furniture, 2. equipment, 3. cleanness, 4. personnel's physical appearance, 5. bank atmosphere;
- Tariffs;
- E-banking, with the subcategories: 1. availability of e-banking services, 2.e-banking services performance.

5.4.1 The research methodology

The research tools

The study employed as a research tool a questionnaire, which comprised several sections:

- a socio-demographic section;

- a section focusing on assessing the general level of satisfaction with banking services and the satisfaction with several service categories, such as current account operations, bank deposits, credits, and e-banking services, measured using a five-point semantic differential (from 1 – very unsatisfied to 5 – very satisfied);
- a section focused on assessing the perceived influence of each of the five categories of determinants on the general level of satisfaction (using a constant sum scale), as well as assessing the five categories of customer satisfaction determinants in terms of bank services (measured using a five-point semantic differential (from 1 – very unsatisfied to 5 – very satisfied);
- a final section focused on the assessment of the tolerance respondents exhibit towards the deterioration of the five categories of customer satisfaction determinants, measured using a five-point semantic differential (from 1 very little to 5 very high).

The research type, sampling method, and period

A descriptive quantitative analysis was conducted in Constanta County, during November and December 2016. The questionnaires were randomly distributed, and out of 750, 667 were returned filled in. After eliminating the ones that were incomplete, the research was finally conducted on 643 questionnaires.

The software programs

The software programs used were Mathcad 14, Microsoft Office Excel, and IBM SPSS Statistics 23.

The method

For the levels of tolerance respondents indicated for the 16 subcategories of satisfaction determinants a weighted arithmetic mean was calculated, according to the importance awarded by the respondents, thus yielding a new variable, the average level of tolerance (ALT). For each of the five categories of determinants there was calculated the average level of satisfaction, thus yielding a new set of variables – convenience average, quality average, environment average, tariffs average, e-banking average.

The method uses 3D graphical representation in order to compare the evolution of the ALT under the influence of the categories of determinants taken two by two. For the graphical representation, the authors used Mathcad software for the calculation of the function that governs the trend evolution of ALT under the influence of the positive rise of the values of each category of determinants (Ilie C. et al., 2016, p.183).

The calculation of each of the five functions was made considering the grade 3 function. Several types and grades of functions were considered, but the small variations of trends and the results calculated with higher grade or different functions determined higher errors.

In the early stages for the calculation of function each of the category of determinants, with the corresponding values of the average level of tolerance, was sorted from smallest to

largest, in order to determine the trend of average level of tolerance under the influence of the each of the category of determinants.

5.4.2 The research results

The structure of the sample

Most of the respondents are women (59.1%).

22.1% of the respondents are between 18 and 24 years old, 16% between 25 and 34, 18.5% between 35-44, 13.5% are between 45 and 54, 18% are between 55-64, while 11.8% are over 65 years old.

49.6% of the respondents indicated they graduated secondary education, 36.7 % are bachelor graduates, while 13.7% are post university studies graduates.

Most of the respondents live in the urban environment (80.6%). 51.3% are married, 37.9% are single, while 10.7% are divorced or widowers.

Regarding the professional status, the sample structure is as follows: 55.8% are employees, 19.6% are students, and 16.5% are pensioners, while 3.7% are entrepreneurs, 3.4% are self-employed, 0.3% are family workers, and 0.6% are unemployed.

The vast majority indicated an average income level per family member of less than 4,000 Lei (92.4%).

Data analysis

The duration of the collaboration with the bank is as follows: between 5-10 years (39.2%), less than 5 (35.8%), between 11-15 years (13.2%), more than 15 (11.8%).

Descriptive statistics regarding the general level of satisfaction and levels of satisfaction with different categories of banking services are presented in table 17.

Table 17 Descriptive statistics of the sample

	General level of satisfaction	Current account operations	Bank deposits	Credits	E-banking
Mean	4.09	4.11	3.7	3.67	4.08
Std. Deviation	.649	.690	.835	.809	.874
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Skewness	-.874	-1.314	-1.186	-.770	-1.127
Std. Error of Skewness	.096	.096	.123	.145	.116
Kurtosis	3.083	4.413	2.366	.877	1.784
Std. Error of Kurtosis	.192	.192	.245	.288	.232

Source: Authors' calculations

For a simple and easier way to track the evolution of category of determinants and the Average Level of Tolerance, the graphical representations use the following notations:

- Convenience Average: A_C;

- Quality Average: A_Q;
- Environment Average: A_E;
- Tariffs Average: A_T;
- E-banking Average: A_EB;
- Average Level of Tolerance: ALT.

As one may observe from figure 3, the authors used Mathcad software and at first, defined the functions as six degrees polynomial, but considering the results, as simulated trends, an overestimation of the functions was acknowledged and therefore three degrees functions were chosen instead. In figure 3 one may observe an example of calculus using Minerr Mathcad function for the calculation of A_E (Average of Environment) free terms.

Figure 42 Function calculation of Average Level of Tolerance (ALT) evolution vs the variation of A_E using Mathcad

Given

$$d \cdot m^3 + e \cdot m^2 + f \cdot m + g = q$$

$$\text{Minerr}(a,b,c,d,e,f,g) = \begin{pmatrix} 0 \\ 0 \\ 0 \\ -0.044 \\ 0.374 \\ -0.818 \\ 4.008 \end{pmatrix}$$

$m := 1..5$

$$M(m) := -0.044 \cdot m^3 + 0.374 \cdot m^2 - 0.818 \cdot m + 4.008$$

Source: Author`s calculation using Mathcad

In the table below the calculated functions are presented.

Table 18 Functions calculated with Mathcad

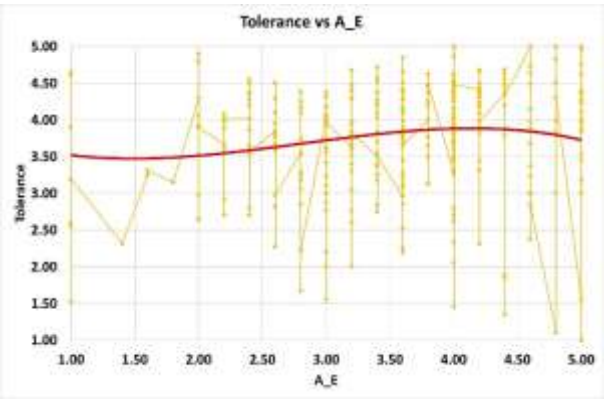
Category of determinants	Function
Convenience Average (A_C)	$f(x) = -0.014 \cdot x^3 + 0.17 \cdot x^2 - 0.481 \cdot x + 3.899$
Quality Average (A_Q)	$f(x) = -0.032 \cdot x^4 + 0.323 \cdot x^3 - 1.05 \cdot x^2 + 1.56 \cdot x + 2.082$
Environment Average (A_E)	$f(x) = -0.044 \cdot x^3 + 0.374 \cdot x^2 - 0.818 \cdot x + 4.008$
Tariffs Average (A_T)	$f(x) = 0.011 \cdot x^3 - 0.18 \cdot x^2 + 0.988 \cdot x + 2.086$
E-banking Average (A_EB)	$f(x) = -0.006276 \cdot x^3 + 0.131 \cdot x^2 - 0.577 \cdot x + 4.334$

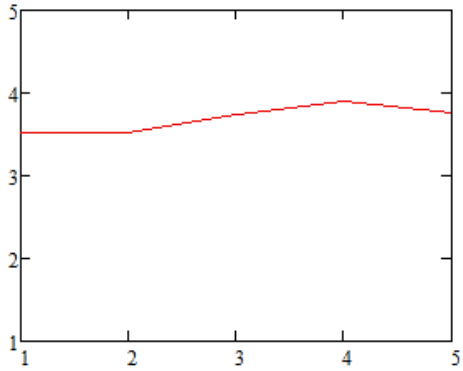
Source: Authors' calculations

For testing the calculated functions, a simple representation of data and their trends were made in Office excel (figure 43.a) and the trend was compared with the calculated function graphical representation (figure 43.b).

Figure 43 Graphical representation of Tolerance evolution vs the variation of A_E:
a) Microsoft Office excel; b) Mathcad.

b)





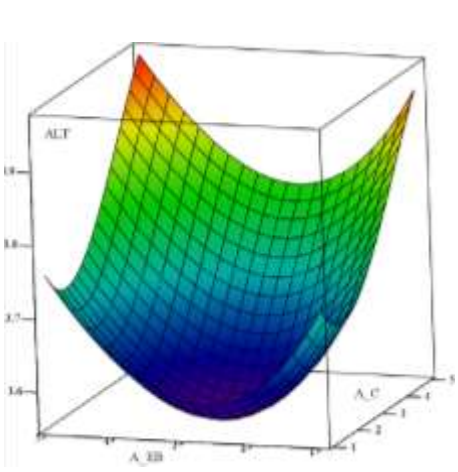
Source: Authors' representation using Microsoft Office Excel and Mathcad

As we can see, the 2D graphical representation is very similar with the simple representation of data that proves the method and function's availability and viability.

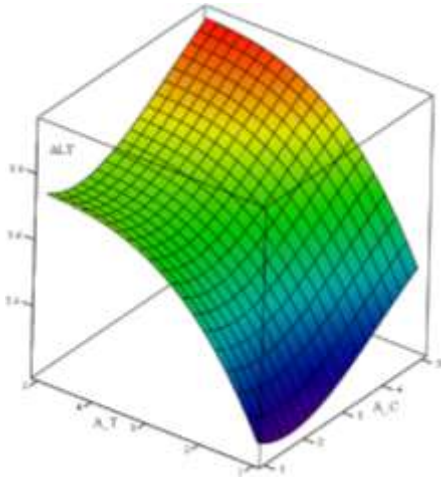
After the calculation of all the 5 functions for all the categories of determinants we used each of the function in combination with each other for the determination of a 3D representation that reveals the mathematical modelled response surfaces, see figure 44 (Ilie C. et al., 2016, p.293).

Observing the surfaces one can notice which of the two category of determinants has a more powerful influence over the evolution of ALT.

Figure 44 The 3D evolution of the ALT under the influence of the 5 satisfaction categories, considered 2 by 2.



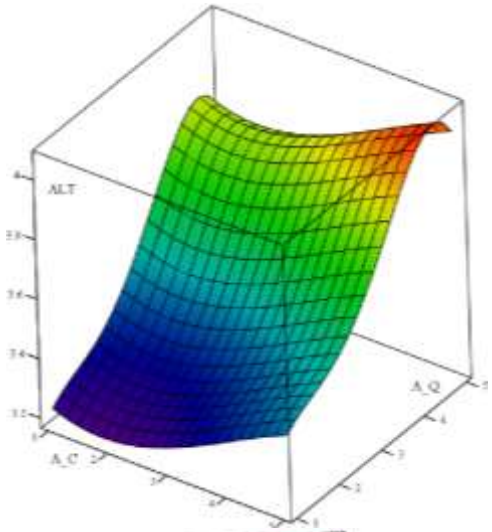
a)

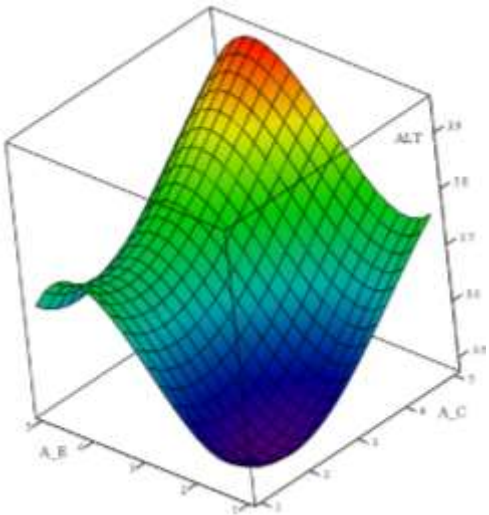


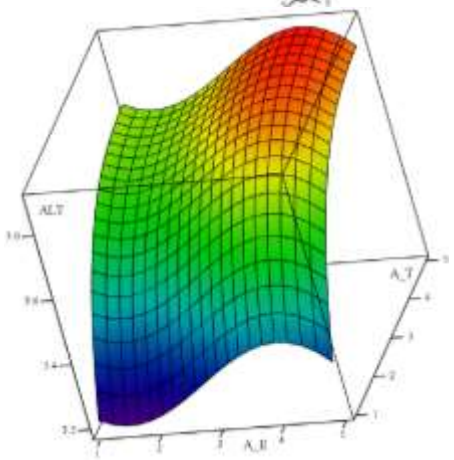
b)

c)

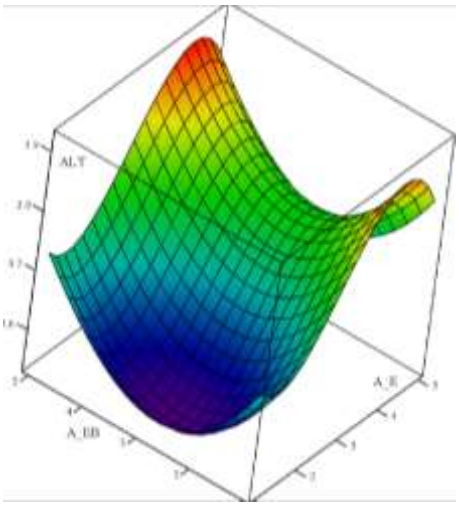
d)



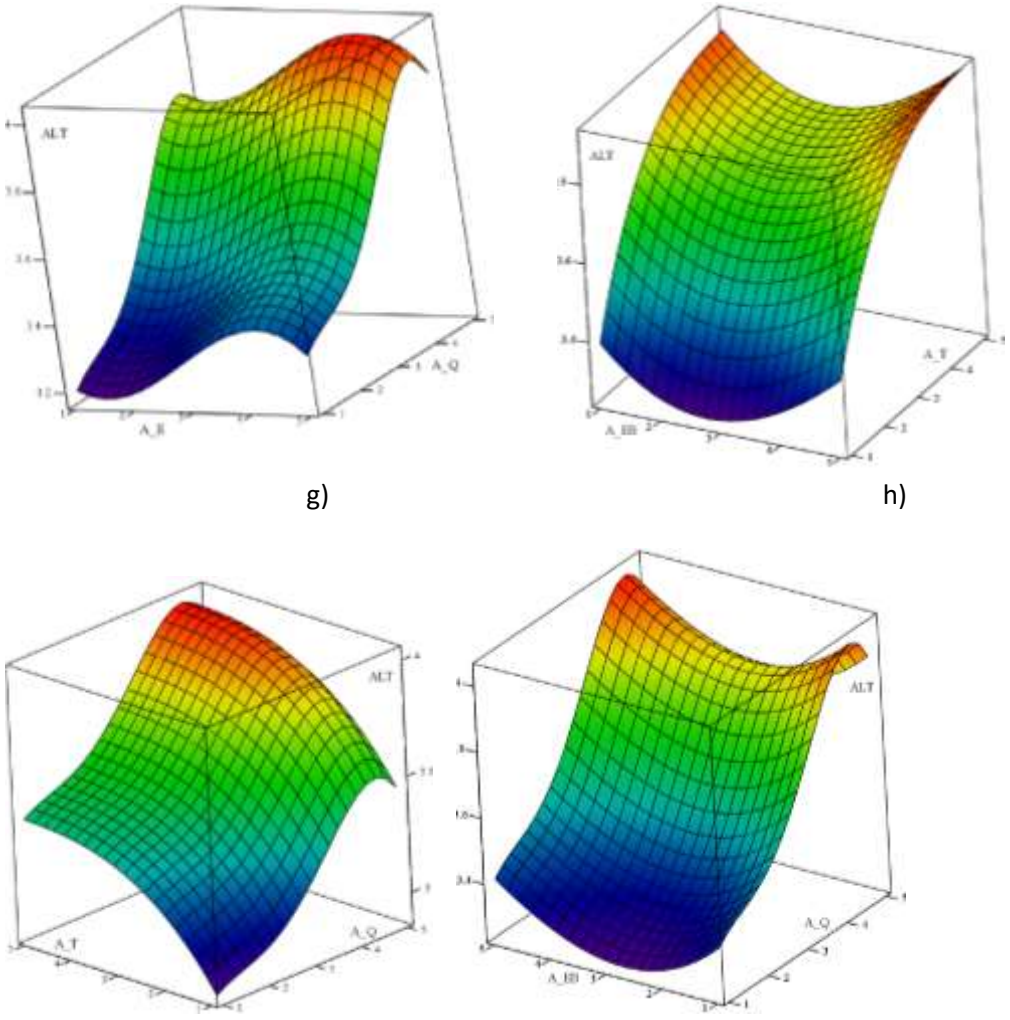




e)



f)



Source: Authors' calculation and graphical representation using Mathcad

Based on the representation from figure 44.h (for example), it is obvious that ALT will be more sensitive to changing the value of A_T than to the modification of A_EB. The comparison between the influences of the category of determinants over the ALT is presented in table 19.

We must emphasize that the comparison does not consider the increase or decrease of the ALT under the influence of the categories of determinants, but the magnitude (slope) of the evolution of the ALT.

Table 19 The comparison of the influence of the categories of determinants over the evolution of the ALT

The category of determinants	A_C	A_E	A_T	A_EB	A_Q	Level of influence
	Comparison of the above to the first column:					
A_C			<<		<<	3

A_E	=<		<<		<<	4
A_T					=<	2
A_EB	=<	<	<<		<	5
A_Q						1
No. of category of determinants that are less influential than the one presented in the first row of the table	2	1	3	0	4	
Legend: =< almost equal, but with a small advantage than < more influential than << much more influential than						

Source: Authors' calculations

In table 19, each category of determinants from the first row is compared to each category of determinants from the first column and for an easier presentation and in order to be read more easily, only "more influential than" type conclusions were written in the table. An example of comparison is that A_C (always from the first row) is almost equal, but with a small advantage than (=<) A_E or A_EB (always from the first column).

One may observe that the A_Q has 4 cells in which appears the conclusion "highly influential", which shows that it is more influential than all the other categories of determinants, and, thus it was assigned the level 1. Further, A_F is more influential than three other categories of determinants (naturally, not more influential than A_Q) and was assigned the level 2. And so on, a hierarchical list of influence factors over the evolution of the average level of tolerance was determined. This list is presented as a result of the hierarchy obtained:

1. A_Q (Quality);
2. A_T (Tariffs);
3. A_C (Convenience);
4. A_E (Environment);
5. A_EB (E-banking);

5.4.3 Conclusions

The banking industry, and, particularly, the banking services, have seen a very rapid development in the last three decades, which has led to an increased competition between credit institutions and made them acknowledge the importance of the research in the field of customer satisfaction. One of the directions in which so many scientific studies, as well as the research and the reports of the practitioners, have developed is to determine the factors that influence customer satisfaction. After conducting a thorough research on the existing literature, we decided upon five categories of customer satisfaction determinants with banking services: quality, tariffs, convenience, environment, and e-banking. In this study, the focus was on the assessment of the tolerance respondents exhibited towards the deterioration of the five categories of customer satisfaction determinants. The method employed used 3D graphical representation in order to compare the evolution of the average level of tolerance under the influence of the categories of determinants taken two by two. A series of mathematical functions was determined in order to model the evolution of the average level of tolerance

under the influence of each of the five categories of determinants. A hierarchical list of influence factors over the evolution of the average level of tolerance was determined, and the hierarchy obtained is as follows: quality, tariffs, convenience, environment, and e-banking.

5.5 E-banking and Customer Satisfaction with Banking Services

The focus of this research is to grasp the importance of e-banking within the general satisfaction of customers regarding banking services.

Following an ample literature review, we selected five categories of customer satisfaction determinants with bank services: convenience, environment, quality, tariffs, and e-banking, each comprising several sub-criteria. We then employed a descriptive quantitative research, in Constanta County (South-East of Romania), during November – December 2016. The research tool was a questionnaire comprising three main sections: a general socio-demographic section, a section dedicated to the assessment of the general customer satisfaction level with bank services, and a third section focused on assessing the five categories of customer satisfaction determinants in terms of bank services. Five-point semantic differentials (from 1 –very unsatisfied to 5 – very satisfied) were used in order to assess the general satisfaction level with banking services as well the satisfaction level with each of the 16 criteria.

5.5.1 Research methodology

The Data

Following a close review of the literature on customer satisfaction in general and specifically on customer satisfaction with banking services, as well as the related concepts of service quality and customer loyalty, we decided upon five main categories of determinants that impact customer satisfaction with banking services: convenience, environment, quality, tariffs, and e-banking, and in the case of four categories of determinants there were identified subcategories (Table 20).

Table 20 Customer satisfaction with services - determinants

Determinant	*Convenience*	*Quality*	*Environment*	*Tariffs*	*E-banking*
Subcategories	1.bank location 2.distance to the bank 3.availability of parking spaces 4.ATM availability	1.trust 2.prompt reaction of personnel 3.safety of operations 4.solicitude	1.furniture 2.equipment 3.cleanness 4.personnel physical appearance 5.bank atmosphere		1.availability of e-banking services 2.e-banking services performance

Source: Authors' contribution

A descriptive quantitative analysis was conducted in Constanta County, during November – December 2016. The data were collected using as a research tool a questionnaire. The questionnaires were randomly distributed, and out of 750, 667 were returned filled in.

After eliminating the ones that were incomplete, the research was finally conducted on 643 questionnaires, using IBM SPSS Statistics 23.

The research instrument, the questionnaire comprised several sections: a socio-demographic section, a section focusing on assessing the general level of satisfaction with banking services as well as the satisfaction with several service categories, and a section focused on assessing the five categories of customer satisfaction determinants in terms of bank services. The general level of satisfaction, as well as the customer satisfaction with different categories of services and the satisfaction with each of the 16 criteria listed in table 1 were assessed using a five-point semantic differential (from 1 –very unsatisfied to 5 – very satisfied).

The research presented in this paper is part of a more ample research focused on assessing customer satisfaction with banking services. The collected data made the object of a large study aimed at simulating customer satisfaction in banking services using an artificial neural network and was already published in 2017. In this study the focus is on e-banking services and the impact e-banking services have on the general level of customer satisfaction.

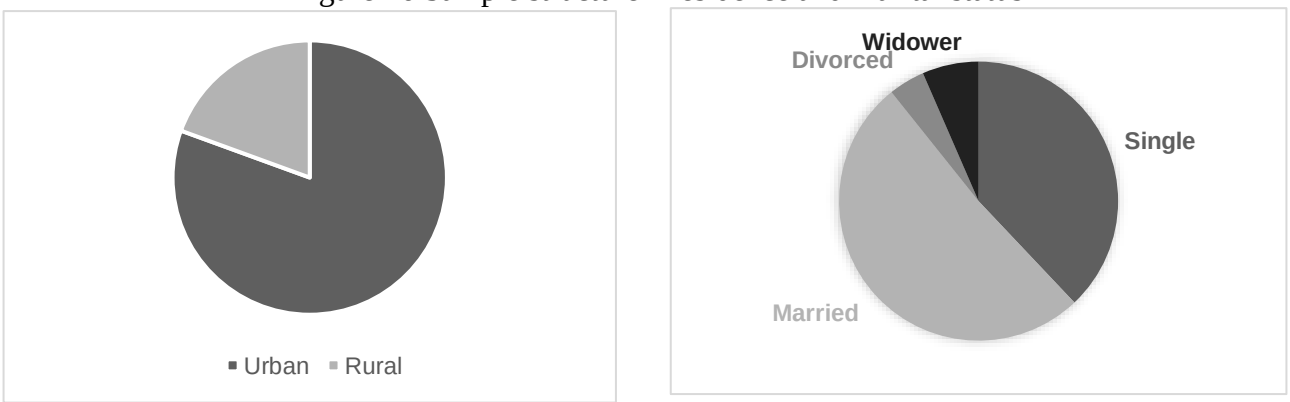
The structure of the sample

The structure of the sample is presented in the figures below.

Figure 45 Sample structure - Gender and age

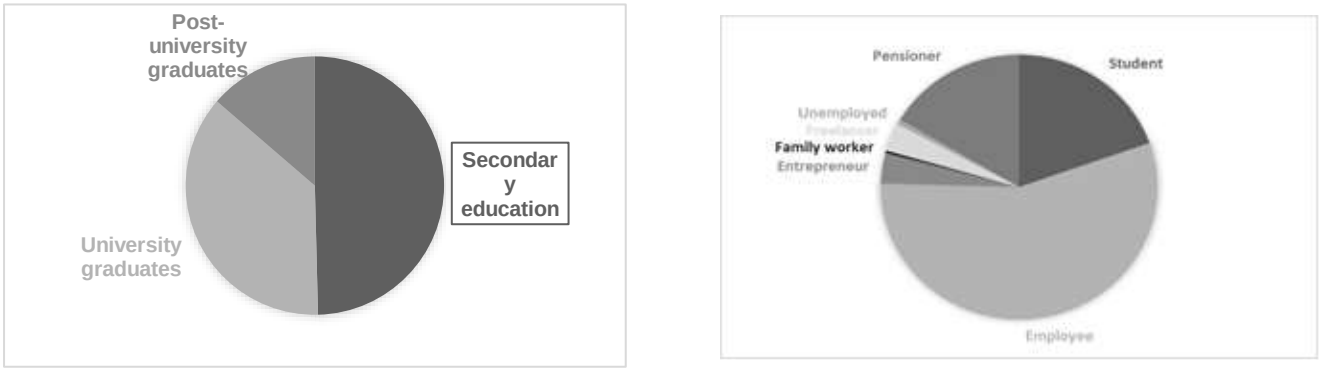
Source: authors' processing

Figure 46 Sample structure -Residence and marital status



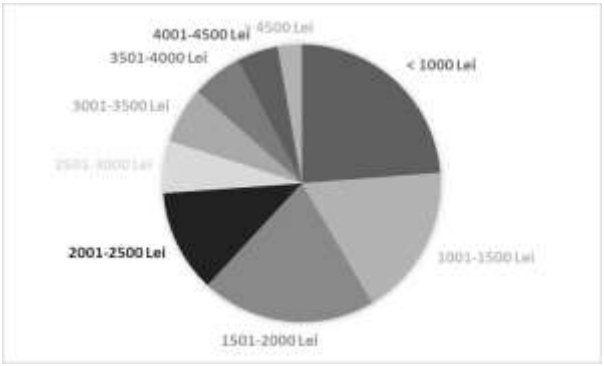
Source: authors' processing

Figure 47 Sample structure – Education and professional status



Source: authors' processing

Figure 48 Sample structure - Average monthly income



Source: authors' processing

Data analysis

The duration of the collaboration with the bank is as follows: between 5-10 years (39.2%), less than 5 (35.8%), between 11-15 years (13.2%), more than 15 (11.8%).

Descriptive statistics regarding the general level of satisfaction and levels of satisfaction with different categories of banking services are presented in table 21.

Table 21 Descriptive statistics

	General level of satisfaction	Current account operations	Bank deposits	Credits	E-banking
Mean	4.09	4.11	3.7	3.67	4.08
Std. Deviation	.649	.690	.835	.809	.874
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Skewness	-.874	-1.314	-1.186	-.770	-1.127
Std. Error of Skewness	.096	.096	.123	.145	.116
Kurtosis	3.083	4.413	2.366	.877	1.784
Std. Error of Kurtosis	.192	.192	.245	.288	.232

Source: authors' processing

Testing the research hypotheses

Several research hypotheses were formulated and subsequently tested.

H_1. There is a strong correlation between the satisfaction with e-banking and the general level of satisfaction.

We tested the correlation between the two variables and the results indicate that they are strongly correlated, r (641) =.357, $p < .01$.

H_2. The assessment of the satisfaction with e-banking services differs based on gender.

All assumptions have been met (normality of the dependent variable, homogeneity of variances), so an independent sample t test can be performed.

The test results, t (438) = -.436, p= .663, lead to the acceptance of the null hypothesis.

H_3. There are statistically significant differences in the satisfaction with e-banking services between age groups.

All assumptions have been met (normality of the dependent variable, homogeneity of variances, and independence of observations) and one-way ANOVA can be performed.

There is a statistically significant difference between groups as determined by the one-way ANOVA (F (5,434) = 3.34, p =.006).

A Tukey post hoc test revealed that the level of satisfaction with e-banking services is significantly lower for the age group over 65 years old (3,60+/-.503, p=0.28) compared to the age group 18-24 (4.24+/- .945).

H_4. The assessment of the satisfaction with e-banking services differs based on residence environment (rural/urban).

All assumptions have been met (normality of the dependent variable, homogeneity of variances), so an independent sample t test can be performed.

The test results are t (438) = .854, p= .393; therefore, we accept the null hypothesis.

H_5. There are statistically significant differences in the satisfaction with e-banking services between professional groups.

All assumptions have been met (normality of the dependant variable, homogeneity of variances, and independence of observations) and one-way ANOVA can be performed.

There is a statistically significant difference between groups as determined by one-way ANOVA (F (6,433) = 4.71, p =.000).

H_6. There are statistically significant differences in the satisfaction with e-banking services between income groups.

All assumptions have been met (normality of the dependant variable, homogeneity of variances, and independence of observations) and one-way ANOVA can be performed.

There is a statistically significant difference between groups as determined by one-way ANOVA (F (8,431) = 1.99, p =.046).

5.5.2 Conclusions

The importance of the customer satisfaction in banking services is the result on the one hand, of the stronger dynamics of the industry. On the other hand, as stated by Belas & Gabcova (2016), in this business sector, characterized by an increased competition, an efficient management of selling additional products and services to existing satisfied customers represents a significant opportunity to improve the financial performance of a bank.

The research conducted revealed that overall customer satisfaction with banking services and customer satisfaction with e-banking services are strongly correlated, thus pointing out the importance of e-banking services. The research results also indicated that the assessment of the satisfaction with e-banking services does not differ based on gender, nor based on residence environment (rural/urban). However, the level of satisfaction with e-banking services is significantly lower for the age group over 65 years old compared to other age groups. Our findings are in line with previously conducted studies such as Gikandi & Bloor (2010) or Mukhtar (2015). In addition, it was revealed that there are statistically significant differences in the satisfaction with e-banking services between professional groups, as well as between income groups.

Considering the importance of e-banking services in the overall assessment of satisfaction with banking services and given the impact of customer satisfaction in the increasingly competitive banking sector, the conducted research may represent a starting point for future studies regarding customer satisfaction with banking services both at national and international level.

SECTION II CAPITAL FLOWS AND CONSUMPTION – MACROECONOMIC DRIVERS OF THE ECONOMIC GROWTH

The literature shows the positive influence of the capital flows on economic growth, but the size of this influence is conditioned by the quality of economic policies and the institutional response of the recipient countries, especially in the case of the developing ones. The research of these influences cannot ignore the phenomenon of the financial integration and the crises affecting the global economy. The evolution of the capital flows in the Romanian economy, their determinants as well as the relationship with the economic growth represent a research objective. The analysis points out how the central bank has responded to the challenge posed by the capital flows in the context of the international financial crisis and the process of financial integration.

As consumption is a vital factor of the gross domestic product, the factors that influence its evolution are a main concern of the scientific literature. One of the recent approaches of this issue regards the existence of the phenomenon of hysteresis in consumption. The hysteresis, through its two features - remanence and selective memory, brings a new vision of explaining the evolution of the economic systems. The research carried out in Romania regarding the consumption revealed the presence of the hysteresis phenomenon, highlighting the fact that temporary influences on the determinants of consumption have lasting effects on it. The findings show that, in order to obtain economic performance, the companies need to accept this reality and change their behavior in terms of consumer approach and sales strategies.

II.1 CAPITAL FLOWS IN ROMANIA: EVOLUTIONS, DETERMINANTS, CONSEQUENCES AND CHALLENGES ADRESSING THE CENTRAL BANK POLICY[16]

The last global financial crisis demonstrated clearly that liberalization of capital flows and globalization also present side effects. The 90's were mostly dedicated to the financial deregulation and the globalization of financial markets. Everyone agreed that capital inflows benefit the recipient countries, contributing effectively to economic growth. At the same time, it was observed that the import of capital relates to an import of risk.

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[16] Based on the scientific contributions from: **1**. **Duhnea Cristina** (2013), *Studii Post-Doctorale în Economie. Disertaţii Post-Doctorale. Vol.3. Studii si cercetari fiscal bugetare, Scetiunea Studii si cercetari privind modelarea politicilor de ajustare macroeconomica*, Capitolul *Fluxurile de capital, integrarea financiara si criza economiei romanesti*. (pp. 720-760, 41 pg.), Romanian Academy Publishing House, Bucureşti, 2013, ISBN 978-973-27-2290-9, ISBN 978-973-27-93-0.; **2.** Vancea Corina Paula Diane & **Duhnea Cristina** (2013), *Capital flows in Romania: evolutions, consequences and challenges adressing the Central Bank policy*, Transformations in Business & Economics, Vol. 12, No 1A (28A), Pages: 318-331, ISSN: 1648 – 4460, WOS:000319713200004

The dramatic increase in capital inflows, especially the short-term, volatile ones, will exert high future pressures on the capital outflows. In these conditions, a major concern for any economic policy decision-makers of a country is the effective management of the capital flows. Understanding the factors underlying these contradictory flows represents the key to select the correct solutions for an optimal legal framework.

This research analyses Romania's experience in attracting and managing financial flows and the challenges that have emerged following the increase in the level of financial integration.

1.1 What Drives the Capital Flows?

There is extensive literature dealing with the issue of capital flows to and from emerging countries.

Some known authors believe that the capital flows are determined by external factors, also known as "push" factors, business cycles in the developed countries having an important role (Calvo et al., 1993; Fernandez-Arias, 1994). The idea of the important role of the developed countries' business cycles among the push factors influencing the capital flows reappears after 2000 (Kim, 2000; Ying & Kim, 2001). Other authors advocate in favour of the internal factors, also known as "pull" factors, considered essential in attracting capital flows (Dasgupta & Ratha, 2000; Hernandez *et al*., 2001; Culha 2006); There are also studies that analyse the role of trade liberalization and financial liberalization of capital movements. Also, a considerable number of authors focus on institutional quality in emerging countries, which along with trade liberalization would represent important drivers of capital flows (Broto *et al*., 2008; International Monetary Fund, 2007; Wei, 2011).

Undoubtedly, it can be stated that both, internal and external factors matter when talking about capital flows entering and leaving a country.

Interestingly, while FDI is the least volatile segment of private capital flows as a whole, the so-called "cold money" (there are also empirical studies in this regard: Carlson & Hernandez, 2002; Cavali & Rajan, 2009), the portfolio investments are often pro-cyclical.

Furthermore, the literature highlights the stability of capital flows due to investments in shares compared to those arising from investments in debt instruments. These latter have a tendency of reversal of movement direction, although, after a sudden stop, they can reappear.

However, recent studies (Claessens S. *et al*., 1995) have shown that more unstable capital flows are determined by the debt capitals, which, in moments of crisis, stop suddenly. Those capital flows are also known as "hot money".

The last financial crisis, as well as those of the 90's, has raised questions about the effects of financial integration. Krugman (2000), Kose *et al*. (2006) investigated whether the emerging countries that have, sometimes prematurely, opened their markets, benefit from financial integration or, on the contrary, are more exposed, exhibiting very important disadvantages.

The key features identified in the literature as determinants of a successful financial integration are macroeconomic policies, development of financial markets, institutional quality and corporate governance (Obstfeld & Taylor, 2003; Nakagawa & Psalidi, 2007; Kose et al. 2006).

In the emerging markets crises manifested mainly in the areas where authorities have focused less or had a small influence.

Classens *et al*. (1995) demonstrates that there are types of financial flows more volatile and more destabilizing than others, and the areas where "hot money" act, like the banking and money market, which should be monitored carefully by the authorities.

Both, the Asian crisis and the global crisis have shown that, while FDIs have remained relatively stable in a country, being determined by the fundamental characteristics of that country, the areas of banking market, money market and capital market have recorded a significant volatility.

1.2 Evolutions and Changes in the Capital Flows to and from Romania

In order to realise the analysis of the evolution and changes in capital flows, the influence of these flows on the Romanian financial market, the effects of the National Bank of Romania policy of stimulating the investments, we collected data from several institutions: state bodies or institutions that play a role of financial market authority:

- National Institute of Statistics - data on Gross Domestic Product, balance of payments;
- National Bank of Romania - data on balance of payments and banking assets structure of the Romanian banking system;
- Bucharest Stock Exchange – data on BET index daily values for the period 1997-2011, data on non-residents activity on capital market in Romania (trading volume, purchases, sales).

Romania is a country with 21.4 million inhabitants, with a gross domestic product in the past five years ranging between €120 and 140 billion, and a present gross domestic product per capita around €7000. Unemployment in Romania also varies, with the current level at 5.5 to 6%.

In these conditions, Romania has managed to attract, in a 10 years period (2002-2011), an investment flow of 99.65 billion euro and to export investments of 53.74 billion euros, recording a positive difference of 45.92 billion euro of direct foreign investment. In terms of portfolio investment Romania registered inflows of over 27 billion euro, while the outflows were approximately 23 billion euro, with a plus of over 4 billion euro.

Most of these capital flows were in the other investment category, with inflows over 346 billion euro, while the outflows enclose 294 billion euro in total and with a difference of 52 billion euros.

Taking all capital flows into account, 473,521 billion euro entered Romania, and 370.574 billion euro came out, the net difference attracted being 102,967 billion euro.

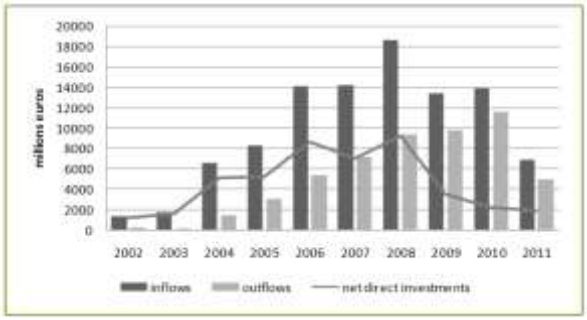
This was the case after 2000 since Romania started to be attractive to investors, with the economic situation stabilized after 2000, and a real and consistent improvement of economic indicators of the country. In addition, from the economic and political point of view, Romania has become attractive in terms of its accession to NATO (2004) and EU (2007).

Historically, the direct foreign investment in Romania was the main concern of the authorities, their growth being permanently lauded by the governors, viewing a higher level of foreign direct investment as an element of pride for any prime minister (Duhnea, 2012).

At the same time, portfolio investments have started to grow in importance, especially after Romania joined NATO, a fact registered by investors as a safety element. Despite the increasingly intense worldwide competition, by 2008 there was a growing net flow of investments, as Romanian investors increased their activities as exporters of capital on the international markets.

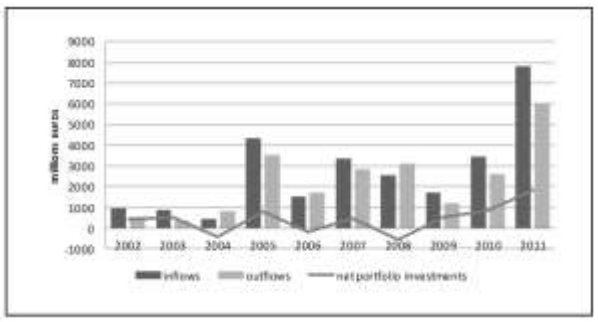
The changes shown in *the figures* below highlight the increasingly intense presence of Romanian companies as investors on international markets, which demonstrates their ability to diversify their operations, and is in line with the government's policy to promote Romanian players, both, regionally and globally. Processes like the progressive liberalization of the capital account, the gradual elimination of any barriers to capital flows into and out of Romania, with relatively equal inflows and outflows in recent years, especially in the area of other capital investments made their presence felt.

Figure 49 The Evolution of Direct Investments Flows, 2002-2011



Source: created by the authors

Figure 50 Annual Evolution of the Portfolio Investments Flows, 2002-2011

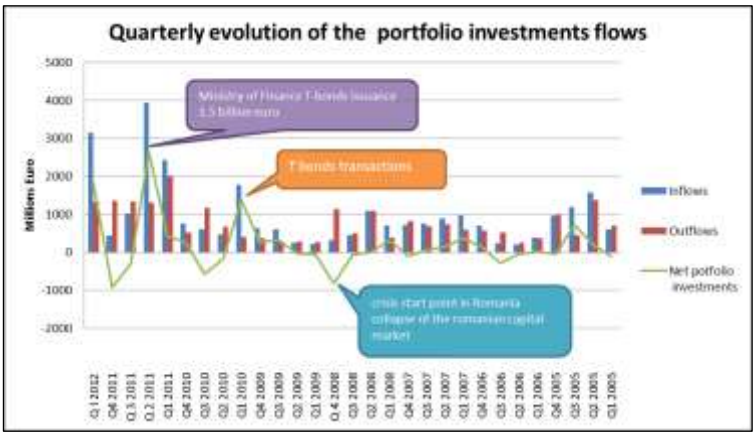


Source: created by the authors

In 2002, the first year of the period analysed, the world economy experienced a moderate revival, amid the growing U.S. private consumption, the economic expansion of the Asian countries and the European Union candidates.

Romania managed to catch this wave of widespread economic growth, as the private consumption in Central and Eastern European countries was driven by the foreign direct investments, the real wage growth and the prospects of accession to the EU.

Figure 51 Quarterly Evolution of Portfolio Investment Flows



Source: created by the authors

With an annual GDP growth of 6%, Romania managed to take the second place in the area, after Slovakia. Along with other countries in the region, Romania derives advantages from improving conditions to access the international capital markets and the increasing interest of non-residents for the domestic capital markets, leading to increased net inflows of investment, both, direct and portfolio investments.

For the first time, Romania, with a low level of indebtedness, benefited from the greatest opening up in terms of economic access to foreign loans and credits to date, that could be used mainly to strengthen the official reserves, considering the fact that the current account deficit was fully financed by both, foreign direct and portfolio investments. From this moment forward, the direct investments began to rise to significant amounts over 1 billion euro, with a similar situation in other capital investments, which was close to 6 billion euro, and an important value recorded at long-term loans and credits, of almost 4 billion euro. It can be said that it was the historical moment from which the foreign direct investments, the portfolio investments and the other capital investments have started to matter to the Romanian economic balance and recovery (see *Figure 49* (FDI), *Figure 50*(portfolio investments), *Figure 52* (others investments))

If in general the investment volumes registered an upward trend with some short-term adjustments, the evolutions of each of the three components: direct investments, portfolio and other investments, were very different.

Both, the magnitude and the volatility of the investment flows to and from Romania have grown together with the intensification of integration process into the global financial

system. Nonetheless, each component presented particular features, different maximum and minimum points and different inflection points, depending on various internal and external factors.

Thus, foreign direct investments grew almost explosively during 2002-2008 due to a continued process of privatization, with short intermittent episodes of decline, the most pronounced of which was in 2007, having resulted due to the reduction on shareholdings, caused by the absence of large privatizations and reinvested profits.

2008 was the year in which Romania registered a premiere: the direct investment recorded net inflows of almost 9.5 billion euro, compared with 7.5 billion euro in 2007, the increase reflecting the growth of the net debt inflows due to increasing global aversion to high risk financial instruments, the liquidity needs and the short-term interest differentials, and the efforts made by the global investors trying to modify their investment portfolio in favour of countries of residence. At the end of 2008 FDIs in Romania recorded the value of 48.798 billion euro, up 14% from the balance at the end of 2007. 2008 was the peak year in terms of volume of the FDI in Romania, which was called "the Balkans dragon ", representing the only EU country in which the foreign direct investments increased as a share of GDP.

Unfortunately, lower private capital expenditures and a tightening of the international trade resulted in the dramatic economic decline of 4.1% in the euro area in 2009. The foreign direct inflows declined significantly compared to 2008 in eight states that joined the European Union after 2004, including Romania.

In 2009, the net direct investments in Romania amounted to only 3.5 billion euro, lower by 61.9% compared to the previous year, a compression trend which persisted in 2010 and 2011. Showing high volatility, the foreign direct investments in Romania contradict the general principle according to which the flow of direct investments is less dependent on the economic crisis situations. In the case of Romania as well as other countries in the region it demonstrates that the emerging Central and Eastern countries are still considered high risk regions. In addition, Romania has not benefited from substantial privatization processes over the last five years, which caused a significant reduction of attractiveness of the Romanian economy to foreign investors.

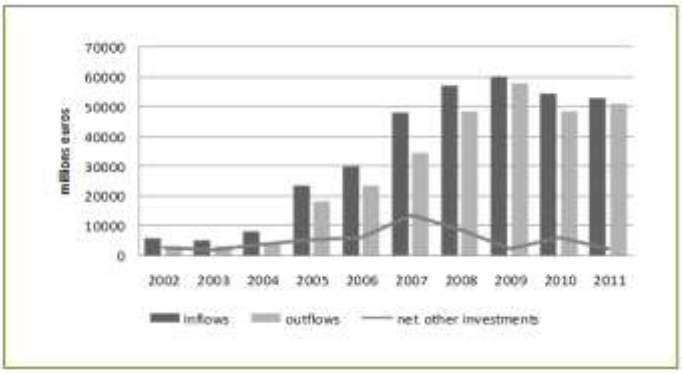
If, in terms of direct foreign investments the developments in recent years are trending down, portfolio investments do not show the same (*Figure 50*, *Figure 51*).

Showing a considerable magnitude and volatility, the portfolio investments exhibited significant growth in 2005 and, paradoxically, during the economic crisis in 2010-2011. Moreover, the historical maximum for this type of investments is recorded in 2011, at nearly 8 billion euro. If in 2004 a significant increase in portfolio investments was due to bond issues made by the City Hall of Bucharest (500 billion euro on the Luxembourg market) and the Romanian Commercial Bank (500 billion euro on the London market), the portfolio investments in 2011 of about 1.9 billion euro, 2.1 times higher than in 2010, came mainly from the bonds issues of 1.5 billion euro made by the Ministry of Finance on foreign markets. The difference is attributed to the transactions in government securities made by the banking sector

on the secondary market. It is important to note that the investor interest for government securities has maintained level, supported by the slight improvement of the BBB country rating – corresponding to a category of reduced investment risk as recognition of the continuing efforts for economic stabilization, resulting in lower inflation, reduction of the budget deficit and keeping the current account deficit at a moderate level.

Regarding other foreign investments, a historic maximum value of inflows (60 billion euro) and outflows (57 billion euro) in 2009 is found as a result of the movement of "hot money" in the economy, as high levels of credit for the bank subsidiaries by parent banks were maintained in accordance to the Vienna Agreement (*Figure 52*).

Figure 52. Evolution of the Other Investments Flows, 2002-2011

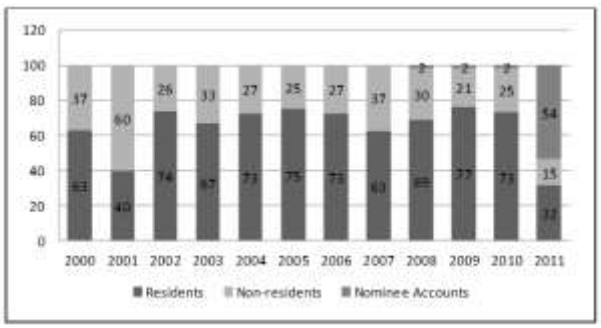


Source: created by the authors.

The increased non-residents involvement had a positive impact on the Romanian financial markets, contributing to the growth in size and liquidity of the financial assets.

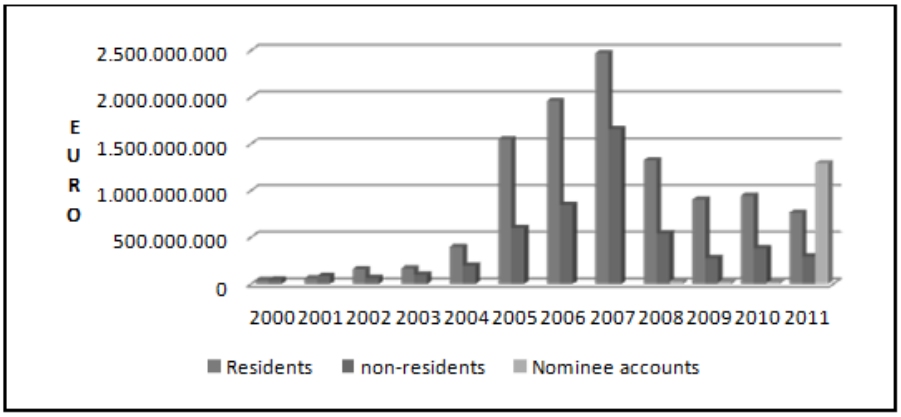
Figures 53 to 57 highlight the impact of capital inflows in bonds and stock market in Romania. As the percentage of non-residents in the total number of capital market participants increased, both the market liquidity and the trading volume have augmented, the maximum having been reached in 2007.

Figure 53. Resident and Non-Residents participation in the BSE Trading Volume, 2000-2011



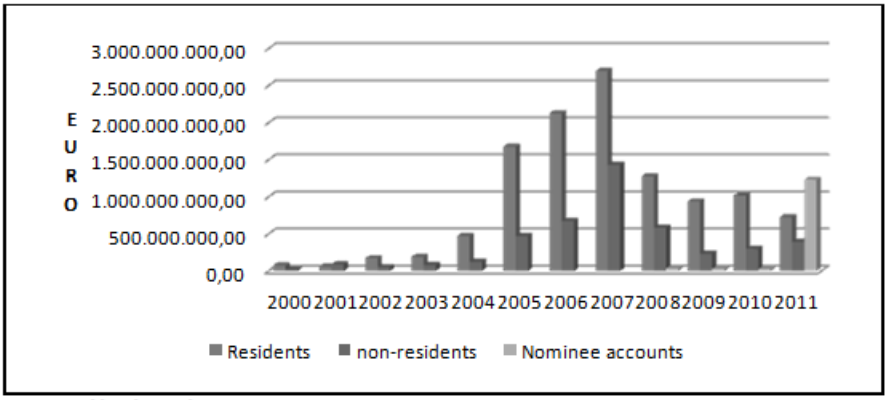
Source: created by the authors.

Figure 54 Buying Volume Participation by Residence, 2000-2011



Source: created by the authors.

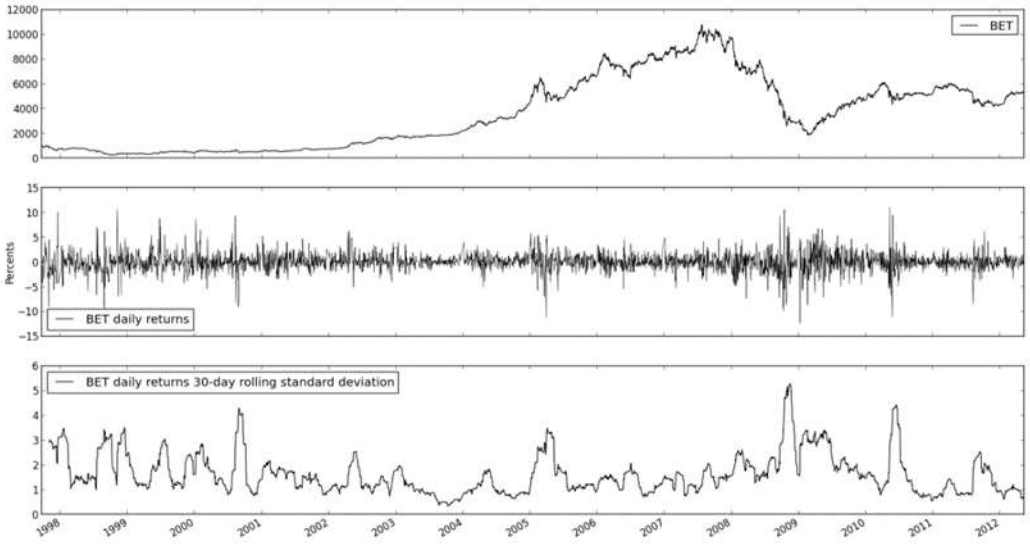
Figure 55 Selling Volume Participation by Residence, 2000-2011



Source: created by the authors.

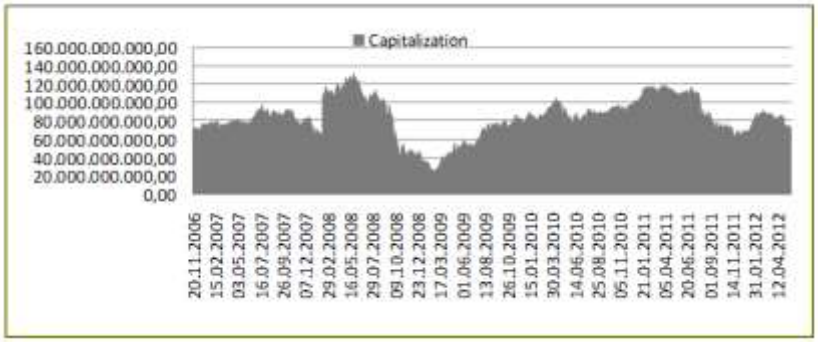
Since 2008, the market participants were able to use a new technical tool, namely, the nominee accounts. These accounts allow many individual clients the trading of financial instruments on the same account on the Bucharest Stock Exchange. The number of the nominee accounts increased significantly in 2011, making difficult to identify the level of non-resident activity on the stock exchange, which meant that, from 2012 forward, BSE decided to stop collecting data regarding non-residents. This new tool was introduced due to external market pressure, since as the European integration of Romania approached the foreign investors have shown growing interest in these accounts (Romania being among the few European markets where they could not work with such accounts). The introduction of nominee accounts was a measure to stimulate the access of foreign investors to the Romanian capital market, but its effects will be visible at a time when the market will record a positive trend.

Figure 56 BET index 30 days returns- rolling standard deviation



Source: created by the authors

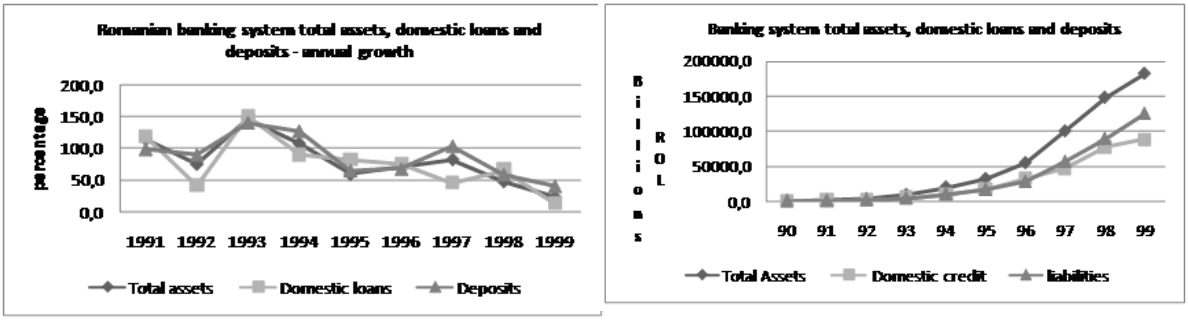
Figure 57 BSE Capitalization, 2006-2012



Source: created by the authors.

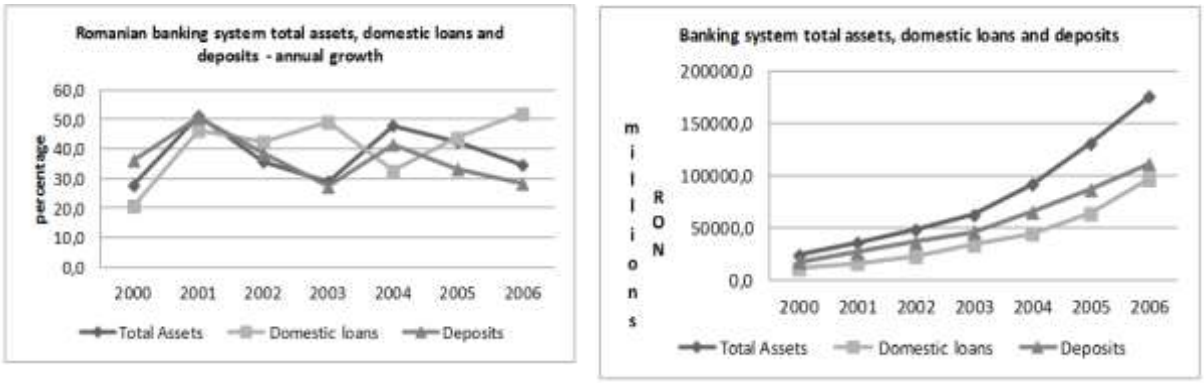
Generally, the active presence of non-residents increased the market competition, resulting in price increases of high-quality local asset and significantly increased value-added financial services, with more and more focus on the client. The offerings of financial products have exploded; the market developed financial innovations able to attract the attention and loyalty of the customers (investors and issuers). This remark applies equally to the capital market and the banking system. With a volume of bank assets continuously growing in the past fifteen years (*Figures 58 to 60)* the banking market has been developing continuously and outlining new investment opportunities for banking institutions and financial market participants.

Figure 58 Banking system total assets, domestic loans and deposits – volume and annual growth 1991-1999



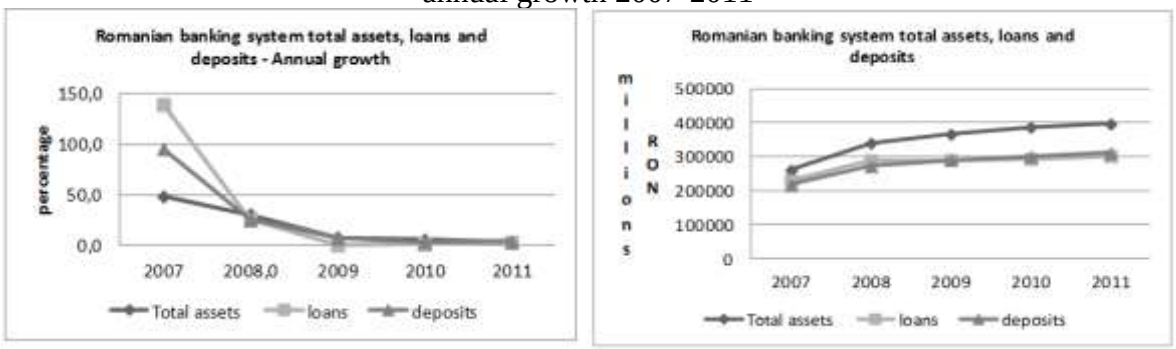
Source: created by the authors.

Figure 59 Banking system total assets, domestic loans and deposits – volume and annual growth 2000-2006



Source: created by the authors.

Figure 60 Banking system total assets, domestic loans and deposits – volume and annual growth 2007-2011



Source: created by the authors.

During the analysed period, the foreign players on the financial market have facilitated the transfer of technology and expertise to the local institutions, including best practices and standards in risk management, new innovative financial products, new market strategies, new development models, access to new financial instruments and access to financial innovation in general.

1.3 The Capital Flows Challenges to Financial Stability of Romania and Reactions of the Central Bank and Other Supervisory and Control Bodies of the Financial Markets

Amid the mutations in the Romanian financial inflows and outflows during the 2001 – 2011 period, to monitor these flows and the risks manifested both, internally and externally, as well as the paths of contagion to Romania's real and financial sectors was a permanent concern for the Central Bank.

In this context, the central bank acted intensively in the field of prudential regulation, banking supervision and risk management, insofar as the banking sector has shown vulnerabilities, especially after 2008, after the global financial crisis ignited.

The measures adopted by the Central Bank ensured the stability of the banking system, which was characterized by an adequate level of capitalization and the gradual strengthening of the solvency, forecasting and liquidity indicators. The credit institutions from countries affected by the sovereign debt crisis have also aligned to this prudent policy, thus, averting serious market turbulences.

The main activities of the NBR in terms of the prudential regulation focused on *the increase of the capitalization of the banking sector*, especially in the case of credit institutions with high exposure to foreign currency loans, and *on improving capital adequacy*. The National Bank of Romania has focused on maintaining a high solvency rate, insisting on levelling the system liquidity in accordance to prudential requirements.

One of the most important measures in terms of maintaining the stability of the banking sector was the Vienna Agreement signed between the NBR and the parent banks of the nine major credit institutions with foreign shareholders, present in Romania in mid-2009. This was an agreement which was supported by the International Monetary Fund. One request was to maintain the exposure of these banks at the March 2009 level, which was respected, as in practice banks maintained an aggregate exposure of 96-97% of the benchmark, demonstrating confidence in the system.

Regarding the regulation field, the Central Bank elaborated normative acts in order to extend the level of insurance of the deposits per depositor and per credit institution (100,000 euro in 2010). Also, an appropriate legislative framework allowed the Central Bank to provide a superior capacity of intervention in case of the emergency situations, by increasing the powers granted to the special administrator to resolve the situation of the credit institutions facing financial problems.

Romania has aligned itself with the Basel II accord, as the Central Bank and National Securities Commission issued normative acts concerning the management of large exposures, risk management of the securitized financial products, management of liquidity risk, transposing the EU Directives into the national legal framework.

When the capital flows to and from Romania intensified in 2001-2002, the NBR adopted measures, aimed at slowing down the high foreign currency credit growth rate, using a variety of tools, i.e. prudential instruments, monetary policy instruments and administrative

ones. As we could observe in the case of other countries, the effectiveness of these measures proved limited in time, especially after the capital account liberalization.

Under these conditions a unitary approach at European level became necessary, through simultaneous involvement of both, countries of origin and host countries of the credit institutions. The European Systemic Risk Board (ESRB) was founded, through which more effective action could be taken in preventing the resumption of the growth of foreign currency credit to the private sector, especially for borrowers unprotected from foreign exchange risk.

The global crisis has drawn serious alarm signals in the direction of proper management of mortgage loans. In this respect, the central bank used a proactive management of the risks of mortgage crediting, by taking measures aimed at widening the action space for managing the effects of any diminished value of real estate collateral, in the case of newly granted loans.

In this respect, NBR has acted together with the National Association of Romanian Evaluators to build a framework for assessing the guarantees in the banking sector.

In Romania, the National Committee for Financial Stability (CNSF), which brings together in its structure representatives of the Ministry of Finance, of the NBR, of the National Securities Commission, of the Romanian Insurance Supervisory Commission and the Private Pension System Supervision Commission plays an essential role in terms of the systemic risk management in the financial sector. The CNSF meetings, and the analyses carried out by the committee have provided a common action platform for managing financial sector crises.

The permanent training for managing the potential financial crisis was an important part of NBR activity. Since 2004, the central bank together with other financial market authorities has created a cooperative framework in order to keep up with the accelerated integration of markets and financial infrastructures in the European Union and the emergence of an increasingly large number of financial institutions carrying out cross-border activities.

The authorities of the Romanian financial market regularly organized financial crisis simulation exercises and tests of the banking system resistance to extreme shocks were taken yearly. In addition, the set of measures designed to strengthen the capacity of the Romanian banking system included the development of semi-annual stress testing exercises. These tests allowed the quantification of capital requirements that credit institutions need to accumulate to maintain an adequate level of solvency during difficult economic conditions.

1.4 Determinants of international capital flows in Romania

The analysis of capital inflows should start with the determinants that influence the dynamics and structure of these capital inflows in order to then analyse the reaction of decision makers materialized in macroeconomic policies to ensure a healthy financial system by limiting vulnerability to shocks. Moreover, the choice of the right instruments, the determination of the efficiency of macroeconomic policy decisions and the ability to predict these capital inflows depend on the ability to correctly determine their causes, the factors that determine the movement of capital to and from a national economy.

1.4 1 Research' objectives and data description

The research aims at identifying the existence of links between capital inflows and the factors that the literature considers to be determinants of these flows, for capital inflows in Romania for 1990 – 2011 period.

According to the specialized studies mentioned we chose as internal factors of influence the gross domestic product, the reference interest rate of the National Bank of Romania, the balance of payments, the budget balance consolidated state. As an external factor, we considered the US Industrial Production Index. The analysis has the following objectives:

- Verification of the existence of a balanced relationship between capital inflows and the determinants considered;

- Checking the intensity and meaning of the link between capital inflows and gross domestic product, the state budget deficit, the balance of payments balance, the monetary policy interest rate as internal factors and the industrial production index in the USA as an external factor.

In the analysis performed at the level of the determinants of capital inflows in Romania, we used annual statistical data for the variables chosen for the 1990 – 2011 period, collected from several sources:

- Capital inflows (ICAP) value of the credit of the capital and financial account: for the period 1990-2002 the data were collected from the Statistical Yearbook 2010 (NIS) edition, table 21.4, expressed in millions of USD, for the period 2003-2008 from the Statistical Yearbook 2010 edition, table 21.4, expressed in millions of EURO, 2009 - 2011 periodical publication of the NBR - Balance of Payments;

- Gross Domestic Product (GDP) for the period 1990 - 2002 data were collected from the Statistical Yearbook 2010 edition, table 11.1, expressed in billion ROL, for the period 2003 - 2009 from the Statistical Yearbook edition 2010, table 21.4, expressed in millions RON, 2010 - 2011 from the budget execution summaries of the Ministry of Finance;

- Execution of the state budget - deficit (SBC) value of the credit of the capital and financial account: for the period 1990 - 1999 the data were collected from the Statistical Yearbook 2010 edition, table 21.1, expressed in billions ROL, for the period 2000 - 2009 from the Statistical Yearbook 2010 edition, table 21.4, expressed in RON million, 2010 - 2011 summary of the state budget execution;

- NBR (RD) monetary policy interest rate;

- Current Balance of Payments Balance (CCS) for the period 1990 - 2002 data were collected from the Statistical Yearbook 2010 edition, table 21.4, expressed in millions of USD, for the period 2003 - 2008 from the Statistical Yearbook 2010 edition, table 21.4, expressed in millions EURO, 2009 - 2011 periodical publication of the NBR - Balance of Payments;

- US industrial production index

In order to ensure the comparability of the data used and to ensure the consistency of the results obtained, several processing activities were necessary: converting the amounts

expressed from old lei to new lei, transforming the amounts from lei into US dollars, euro in US dollars by using the cross rate method on the Romanian market.

The testing of the built econometric models was performed using the E-views Enterprise Edition 7.1 software.

1.4.2 Methodology and results

In this analysis capital inputs can be modelled in the form of a function in which these inputs represent the dependent variable and is a function of the form:

ICAP = f {GDP, RD, SBC, SCC, IPUS}

Table 22 Matrix of the Pearson's coefficients

	ICAP	PIB	RD	SBC	SCC	IPUS
ICAP	1,00	0,99	-0,65	-0,93	-0,80	0,58
PIB		1,00	-0,69	-0,89	-0,83	0,64
RD			1,00	0,52	0,57	-0,54
SBC				1,00	0,59	-0,44
SCC					1,00	-0,61
IPUS						1,00

In several existing studies (Kim (2000) and Culha (2006)) one of the variables that represents an interest rate on the domestic market in question can be seen that there is a positive correlation between this rate and capital inflows. For Romania, this correlation works atypically: the results obtained using Pearson's coefficient matrix to identify the type of correlation and its intensity show that there is a negative correlation of medium intensity between the interest rate and capital inflows.

. Capital inflows are positively influenced by gross domestic product as evidenced in the literature because a country with performing macroeconomic indicators is able to attract investment.

A growing state budget deficit and significant current account deficits usually show an unfavourable overall situation of the analysed economy which makes it no longer attractive to investors the two indicators being a good indication for the internal vulnerability of the economy but also its external fragility. In the case of Romania, the analysed data prove a strongly negative relationship between the state budget deficit and the current account deficit and the volume of capital inflows.

The stationarity of the data used in this analysis was verified using the Augmented Dickey-Fuller (ADF) unit root test. The optimal lag length was selected based on the Schwarz Information Criterion (SIC). The results presented in table 23 clearly shows that all data used are non-seasonal. They become stationary after achieving the first difference for a critical level of 1% and 5%, as can be seen in the table.

Table 23 the stationarity check results with Augmented Dickey – Fuller test

Variables		Initial series	Series transformed after first difference
		with trend	without trend
ICAP		-1,84	-2,32**
PIB		-1,71	-2,73***
RD		-4,09	-4,08***
SBC		-3,59	-2,5***
SCC		-3,74	-2,95***
IPUS		-1,02	-3,05***
Critical values	1%	-4,47	-2,69
	5%	-3,65	-1,96
	10%	-3,28	-1,61

Notes:. (***) the results are significant at 1% level and (**) at a 5% level .
Source: authors' compilation

After verifying the stationarity of the data from the analysed time series, we applied the Johansen cointegration test to justify the initial assumption that there is a long-term equilibrium relationship between the selected variables. The null hypothesis is rejected at a critical level of 5%, which shows that there is a long-term relationship between capital inflows as a dependent variable and the 5 proposed independent variables: gross domestic product, consolidated state budget deficit, current account deficit, the monetary policy interest rate and the industrial production index for the USA.

After applying the Johansen test, considering the presence of a constant and the trend, the results obtained, show us that the working hypothesis we started from - that between the dependent variable and the 5 independent variables selected as factors influences the size and dynamics of capital inflows in the Romanian economy there is a long-term equilibrium relationship, is confirmed for 6 possible cointegration equations for a critical level of 5% in the case of the trend and constant test. The application of the Johansen test without constant and without trend shows us that the equilibrium relation between the considered variables is maintained and 4 cointegration relations are possible.

The regression models

In order to verify the existence of a connection, presumed by us in a linear form, highlighted in the specialized literature between capital inflows and the 5 determinants considered relevant for the Romanian economy, we considered two regression models: one that considers capital inflows as dependent variable and one that verifies our connection (also highlighted by the neoclassical models of economic growth) in between the gross domestic product and capital inflows.

Model 1:

$$ICAP = a_0 + a_1 PIB + a_2 RD + a_3 SBC + a_4 SCC + a_5 IPUS + u$$

Model 2:

$$PIB = a_0 + a_1 ICAP + u$$

In order to estimate the parameters of the two proposed regression models, we first proceeded to stationary the data series used with the first difference method because we showed in the previous stages that all the data series considered were non-stationary.

The results obtained for model 1 following the application of the least squares method refer to the parameters of the regression function and the results of statistical tests showing whether the assumed links are statistically significant.

Estimates of the model's parameters indicate that although the Johansen cointegration test demonstrated the existence of no less than 6 cointegration equations confirming the initial assumption that there is a long-term relationship between our dependent variable and the five determinants of capital inflows, the only ones factors influencing capital inflows are the level of gross domestic product (with a p <0.01) and the consolidated state budget deficit (with a p <0.05), while the influence of the balance of payments balance, the interest rate and the industrial production index aren't statistically significant. The adjusted indicator R2 has a value that shows us that the link between the variables considered is strong.

The equation will have the following form:

DICAP = 0.60DPIB + 64.15DRD - 2.16DSBC + 0.04DSCC - 336.09DIPUS + 294.91

For the second regression equation considered to see the dependence of the change of the gross domestic product based on the change of the capital inflows, the estimates of the parameters of the regression function and of the statistical tests have the values from the table.

Table 24 The estimation of Model 2 parameters using the least squares method

Dependent Variable: DPIB
Method: Least Squares
Date: 01/09/13 Time: 13:52
Sample (adjusted): 1991 2011
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DICAP	1.357430	0.183318	7.404764	0.0000
C	518.4596	2205.369	0.235090	0.8167

R-squared	0.742654	Mean dependent var	7104.762
Adjusted R-squared	0.729109	S.D. dependent var	17768.19
S.E. of regression	9247.836	Akaike info criterion	21.19256
Sum squared resid	1.62E+09	Schwarz criterion	21.29204
Log likelihood	-220.5219	Hannan-Quinn criter.	21.21415
F-statistic	54.83053	Durbin-Watson stat	2.056900
Prob(F-statistic)	0.000001		

Source: authors' compilation

The estimates for the parameters of the regression equation show us that between the dependent variable gross domestic product and the capital inflows as an independent variable (with a $p < 0.01$) is a strong connection.

The equation can be written DPIB = 1.35DICAP + 518.46

The results obtained for the first model considered show us that for Romania, in the period 1990-2011, capital inflows were positively influenced by the increase of gross domestic product and negatively by the state budget deficit, for the other influencing factors considered not being a proven link.

For the second model, the result confirms the assumption from the literature that an increase in capital inflows has a positive influence on the growth of the gross domestic product.

1.5 Conclusions

The analysis considering the capital flows in Romania showed not only the opportunities they brought, but also their volatile nature. In these circumstances, the authorities have been subjected to various challenges, primarily making attempts to decouple the benefits of these new investment flows to the potential dangers of triggering speculative bubbles.

In a globally integrated economy, this process of decoupling a country from the financial stress and the risks emerging from other economies is extremely complex. The benefits arising from the liberalization of markets can turn quickly in disadvantages, but we must admit that, at least during certain periods, the existence of these investment flows has proven beneficial.

For this reason, the need for a coordination and cooperation between authorities in both, emerging market countries of origin and host countries seems imperative. We need a global accumulation of information that would allow those responsible to respond in time and effectively in order to ensure the global macro-stabilization.

There are no major differences between the experience of Romania and that of other countries. Romania tried to attract, on a background of increasingly intense competition, foreign direct investments and other types of investments, and to maintain and develop these investment flows, hoping they will provide the necessary funds to reduce the existing gaps.

At the same time, Romania had to face the default risks that came with the entry and exit of these capital flows, many of which were highly risky. Along with other emerging economies, Romania has faced a real challenge in managing these increasingly larger and volatile flows.

Like other countries Romania faced a dilemma: the more opened the economy becomes, and allows more integration and a deepening of the financial markets, the quicker the turbulences recorded on other markets have been propagated, and new solutions are to be found to absorb the negative impact of the capital flows on the national currency and financial stability.

At the same time, it was found out that the efforts to bring depth and structure to financial markets, to enable faster absorption of capital flows, could not be done as quickly as the authorities wish. It has been shown that the efforts to deepen financial markets of Romania represent a long process, requiring a long period of preparation and construction in order to achieve an adequate level of maturity.

While the measures to monitor capital flows and obtain financial stability have intensified and became more sophisticated, the crisis has shown that they were not sufficiently effective, failing to protect the economy from the adverse effects of the disturbances arising worldwide.

Romania lost substantial flows of foreign direct investment, failing to remain an attractive destination for these types of capital flows. Under these conditions, in the absence of investments, Romania was forced to find new solutions to finance the deficits, which led to the need to adopt radical solutions: cutting spending and foreign loans, resulting in increased population poverty, reducing consumption, increasing the indebtedness of a country and deepening the recession.

The exogenous capital flows and the strong contagion effects induced by them forced the authorities, both, at national and international level, to a more intense cooperation to help the national economies to achieve stability. Romania has actively participated in all the structures designed specifically for crisis management, being aware of the need for serious cooperation to penetrate the opacity of capital flows. Greater transparency will ensure a better future management of these capital flows and will make their activity less onerous in times of crisis.

The prudential and supervision policy and the control practiced by Romania have shown their positive effects, as the Romanian financial system proved relatively stable. Romania experienced neither resounding bank failures, nor dramatic percentages of non-performing loans.

Regarding monetary policy, the central bank has always aimed to use a mix of instruments and policies to reduce the shocks induced by capital movements on inflation and the exchange rate. Based on a growing international currency reserve, the central bank has plenty of room to operate in mitigating the effects of the speculative attacks on the national currency due to the action of the risk capital.

Unfortunately, too preoccupied with the objectives of macro-stabilization and targeting inflation, the central bank has not practiced a sustained policy to stimulate the economy by reducing the interest rate of monetary policy. The National Bank of Romania acted very prudently, failing to boost the real economy, which, lacking outside support due to the deepening crisis and low investor appetite for investments in the area, still struggles in a region marked by high uncertainty.

The literature has tried to identify, especially in the context of 2007-2008 developments in the world economy affected by perhaps the deepest economic and financial crisis or at least the most widespread, which are the determinants of capital flows.

The research conducted in order to determine the existence of a connection and the nature of this connection between capital inflows and some variables considered to be factors of these inflows for Romania showed that the results obtained for Romania are similar to those obtained by most studies conducted internationally.

II.2 Consumption and hysteresis - the new, the old, and the challenge

The history of hysteresis started in the 19th Century with the research of the physicist James Alfred Ewing who introduced the new term to define irreversibility. Being a visionary, he rejected the successive attempts made by his peers to drop the new notion of hysteresis arguing that they were dealing with a generic phenomenon and that it would enter other domains as well. Indeed, shortly afterwards, hysteresis crossed the borders of ferromagnetism and came into prominence in conductivity, ferroelectricity, biology, chemistry, and finally, social sciences.

Its implantation in the fertile soil of economic science is not at all surprising since the neoclassical economists enthusiastically adopted concepts, metaphors, and equations from physics in their endeavour to set economics as a science. Hysteresis, as an enlarged concept and subsequently as terminology, entered therefore the field of economics, and starting with the 1980's became even a favourite research topic.

Its importance in the economic research represents a natural consequence of the development of economic sciences and of the raising concern to understand the economic systems' evolution considering their 'memory', their conscience of the past. Hysteresis represents one of the most important path dependency forms in economics (Lang, 2009). The inclusion of hysteresis in economic models is a complex activity, and although a plethora of approaches already exists, hysteresis has not yet been formally incorporated in orthodox economic models. Nonetheless, its relevance cannot be denied, since history and expectations play a most important role in determining economic outcomes (Dutt, 1997).

The research represents an attempt to review some of the most relevant approaches to hysteresis in economics and to emphasize the impact of the phenomenon on the macroeconomic consumption in Romania. The results revealed that past economic events affect the consumption in Romania, with significant implications for economic policy.

1.1 Hysteresis and Economics – Significant Landmarks

The term comes from the Greek 'hysterein' translated as '*that which comes later*'. The physicist James Alfred Ewing used it for the first time to describe the persistent effects of the temporary exposure of ferric metals to magnetic fields. The subsequent states of the material were better understood by reference to their past states. Ewing (1881, pp. 122-123) mentioned in his work: '*The same tendency towards persistence of previous state is exhibited whenever we change the magnetisation of a piece of iron or steel by the alternate application and removal of any kind of stress* [...] *and accordingly I have called it Hysteresis'*.

Although the term *per se* was only introduced in 1881, the concept has a history that precedes the 19th Century. Leibniz enunciated the antithesis hysteresis – equations of state as early as the 17th Century, arguing Descartes and Newton, and assessing that due to ontological

reasons the past in itself cannot have a greater influence on the present than that determined by the traces left by the past in the present (Elster, 1976).

Considering that ontological hysteresis is impossible, one cannot implicitly argue the existence of epistemological hysteresis. Even admitting that the past can only influence the present by the persistent effects of the past in the present, the characterization of present phenomena exclusively with current variables values may prove incomplete compared to that which can be achieved by evoking hysteresis. Therefore, hysteresis is used for explaining the functioning of systems for which no unhistorical explanation may be thought as viable. According to Franz (1990, p.110), these systems have a long run memory and may be considered as 'historical' systems.

Strong epistemological hysteresis is characteristic of systems whose functioning cannot be explained by any possible set of equations of state. Weak epistemological hysteresis is typical of those systems whose working may be described by a set of equations that contain past values of some of the variables, but by no known set of equations containing exclusively present values of all variables (Elster, 1976). The interest for the study of hysteresis may be therefore assimilated to the one for the past up to the extent to which it potentiates the proper ways to understand the present.

Subsequently to its introduction to magnetism, the easiness of perceiving intuitively the hysteresis effect facilitated its entering to various domains: conductivity, ferroelectricity, biology, chemistry, and social sciences.

As in other such domains, also in economics the phenomenon was observed and used to describe the persistent influence of past economic events. Moreover, it was considered as a significant progress in economic theory and credited with the potential to reduce the distance between economic modelling and reality (Cross *et al.*, 2009).

The term may be considered as a new addition to the economic vocabulary, with only rare occurrence before 1970. The notion was, however, present especially in the study of consumption, starting with the late 1940's. Duesenberry (1948) in his relative consumption theory and Modigliani (1949) proved that households have the tendency to maintain consumption when faced with an income reduction, consumption behaviour being influenced by customs. Brown (1952) also observed, in both cases of income growth and decrease, the lack of promptitude in consumer reactions attributed to a kind of inertia he called *hysteresis*. The idea of the influence of previous events on the present was explored by Georgescu-Roegen (1950) by raising the question regarding the dependence of indifference varieties on the economic experience of an individual, and emphasizing that they were not invariant because the temporary experiences of a person were visible even after the initial conditions had been restored. The notion although not the term itself, was also used in the works of Haavelmo (1970) and Von Weizsäcker (1971), focused on consumer behaviour. The establishment of the term hysteresis in the consumer behaviour was completed in Georgescu-Roegen's work from 1971, *The Entropy Law and the Economic Process*, in which although he did not offer a consistent definition of hysteresis, he described a general framework for its application to social

sciences and especially to consumer behaviour theory. He signalled the difficulties in assessing hysteresis in human behaviour, due to the impossibility to evaluate the effect of the latest experience on consumer behaviour until it actually took place, that is until one observed exactly what was intended to be predicted (Georgescu-Roegen, 1996).

After 1970, hysteresis has become the usual practice especially in the fields of unemployment and international trade. Edmund Phelps (1972) found new opportunities to use the term for describing the dependence from the past in unemployment, while Murray Kemp & Henry Wan (1974) consecrated hysteresis in international trade. In international trade, hysteresis denotes the persistent influence of temporary factors such as exchange rate variations and their impact on prices and quantities, with the most illustrative example being that of sunk costs. In the 1980's there were brought pieces of empirical evidence demonstrating that unemployment did not return to the natural or equilibrium levels following the implementation of disinflation strategies but remained at a high level or even increased. These proofs marked the moment when economists started developing alternative explanations for the persistence of unemployment based on the accumulation of consequences of the most significant previous shocks experimented by the economy, thus introducing hysteresis (Lang, 2009).

Later, hysteresis has also been used in explaining several phenomena in foreign investments, capital formation or marketing. But although its relevance to economic systems has been acknowledged it has not yet been incorporated in formal economic models (Cross *et al.*, 2010). The current economic conditions do however create an excellent framework for empirical testing as well as for a deeper theoretical development of hysteresis in economic science.

1. Consumption and Hysteresis. The Research Methodology

Methodological considerations – the models

In economics, hysteresis was incorporated in formal models in two approaches – the first one based on the existence of zero/unit roots of differential equations, while the second one describes *'true'* hysteresis.

In the first case, hysteresis is illustrated as a natural consequence of the Cauchy-Lipschitz theorem on the existence of solutions of systems of linear differential equations.

Let us consider the equation:

$$x_t = \alpha x_{t-1} + \beta + \varepsilon_t \quad (1)$$

where β is a constant and ε is a stochastic variable.

Equation (1) may be written as:

$$x_t = \alpha^t x_0 + \sum_{i=1}^{t} \alpha^{i-1}(\beta + \varepsilon_i) \quad . \quad (2)$$

If the equation has a unit root ($\alpha = 1$) then the solution of (2) is:

$$x_t = x_0 + t\beta + \sum_{i=1}^{t} \varepsilon_i. \quad (3)$$

This solution points out that the current value of x depends on past values, thus signalling hysteresis. If $\alpha < 1$ and $\varepsilon = 0$ the solution of (2) becomes:

$$x = \frac{\beta}{1-\alpha} \quad (4)$$

so x depends exclusively on α and β.

For small values of *t*, the past influences present values of x; to the limit, however, x tends to the values which do not indicate a dependence on the past (4), confirming the presence of hysteresis only as a particular case.

Criticism was brought to this approach, the most important referring to the over-simplification of the concept and the impossibility to characterize the structural changes of hysteresis effects since it only takes into account the application to linear systems (Setterfield, 2009; Cross, 1993). This alienation from its usages in physics and mathematics determined the approach to hysteresis through unit/zero roots in linear differential equations to be labelled as *'bastard'* usage (Piscitelli *et al.*, 2000).

The contributions of Vito Volterra, especially the predator-prey model (Volterra, 1927), demonstrate that hysteresis was a major preoccupation for mathematicians as early as the beginning of the 1900's. An important temporal lag between physical hysteresis and mathematical hysteresis is however noticed. Moreover, although applicative studies used mathematical approaches of hysteresis, these were mere calculations and not functional analyses. Only in 1966 hysteresis became the object of the functional analysis when R. Bouc modelled a series of hysteretic phenomena, regarding hysteresis as a map between function spaces (Visintin, 2006).

Between 1970 and 1980, M.A. Krasnosel'skii, A.V. Pokrovskii, and their colleagues elaborated a formal model with hysteresis operators starting from the magnetic hysteresis model of Franz Preisach (Preisach, 1935), and conducted a systematic analysis of the mathematical properties of these operators. Their efforts were concretized in a monography published in 1983 and translated into English in 1989. This model elaborated by Krasnosel'skii and his collaborators represented the conceptual basis for the introduction of '*true*' hysteresis in economics by Cross (1993) and Amable *et al.* (1993, 1994, 1995).

In the following paragraphs, there will be presented the analysis elaborated by Krasnosel'skii, using the explanations offered by Mayergoyz (1986, pp. 604 - 605) and Cross (1993, pp. 59 - 66).

The system is considered to be affected by pairs of expansionary and contractionary shocks such as that a value *a* of the shock will raise the output, while a value *b* of the shock will determine the output's decrease. The combinations of critical values of *a* and *b* are denoted by *Hab*, which defines a set of hysteresis operators (hysterons).

The economic agent is affected by a shock σ_t. When the shock reaches the critical value *a*, then the agent's output will raise by 1. When σ_t drops to the critical value *b* then the agent's output will decrease by 1.

The hysteron *Hab* describes how the aggregate shock σ_t determines the increase or the decrease of the output for a certain agent, and this output is denoted as *Hab* σ_t.

The shocks' intensity required to determine the output increase or decrease, respectively, differs between agents and also, in the case of the same agent, over time, which imposes the necessity to define a function g (a,b) specifying the relative weight of the output of each agent in the aggregate output y_t. Then, the total output may be written as:

$$y_t = \iint_{a \geq b} g(a,b) Hab\ \sigma_t\ dadb.$$

The hysteresis effect may be illustrated by the following situation: a first expansionary shock determines the augmentation of the output for those agents whose values of a are less than the aggregate shock. A subsequent contractionary shock will not surpass the b values of all agents which previously increased output, so the initial shock continues to influence their current output. The initial condition is that the first shock σ_0 is less than b_0 so that the entire system is affected, determining the decrease of the output of all agents, all *Hab* carrying the value -1. A second shock, σ_1 then affects the system. The outputs of the agents with values of a less than or equal to σ_1 will increase while the other agents will continue to reduce output, which will lead to the subdivision of agents in two categories: the category of agents increasing output (S+) and the category of agents decreasing output (S-). A subsequent contractionary shock σ_2 will determine the agents with values of b greater than or equal to σ_2 to decrease output, while the rest will continue to increase output, thus modifying the subdivision of agents in the two categories. For some of the agents, the effects of the initial expansionary shock have been annulled by the effects of the subsequent contractionary shock. One may, therefore, assert that the memory of the system is selective, and only the non-dominated maximum and minimum values of previous shocks are remembered thus affecting current output.

A second expansionary shock σ_3 will determine the output to increase for agents with values of a less than or equal to σ_3. A second contractionary shock σ_4 will determine the output to decrease for those agents with values of b greater or equal to σ_4. The new conditions create the opportunity for a new subdivision of agents in the two categories. Continuing the process and allocating decreasing values for input maxima and increasing values for input minima will lead to a new division between categories.

Aggregate output is determined by the subdivision of agents which is in turn determined by the extreme values of the experimented shocks. In other words, the system's memory records only the non-dominated maxima and minima experienced. The aggregate output can be written as:

$$y_t = \iint_{S_{t+}} g(a,b) Hab\ \sigma_t dadb\ + \iint_{S_{t-}} g(a,b) Hab\ \sigma_t dadb.$$

Given that $Hab\ \sigma_t$ = +1 for agents in the category of increasing output (S+) and $Hab\ \sigma_t$ = -1 for agents in the category of decreasing output (S-), then the aggregate output can be written as:

$$y_t = \iint_{S_{t+}} g(a,b)dadb - \iint_{S_{t-}} g(a,b)dadb.$$

According to the compelling mathematical definition of hysteresis given by Krasnosel'skii & Pokrovskii (1989) and supported by Mayergoyz (1991), a system with memory is considered to be a hysteresis system if it has two properties: remanence and selective memory. Remanence is best illustrated by the first example of magnetic hysteresis given by Ewing – after successively applying to a probe two opposite magnetic fields of the same intensity the probe would not return to the initial state. Similarly, one may interpret the remanence in economic systems: if the system experiences successively two equal but opposite shocks it will not return to the initial state. The selective memory refers to the system's property to retain only the non-dominated maxima and minima that is the most significant previous shocks experienced.

Piscitelli *et al.* (2000, pp. 63-71) took a step further in the arguments exposed by Krasnosel'skii (1983, 1989), Mayergoyz (1986, 1991), and Cross (1993) and developed an algorithm for computing hysteresis variables for time series.

Methodological considerations – the economic background

The importance of consumption within the national economies sustains its continuous study. Romania makes no exception with the final consumption accounting for approximately 70% of the GDP. The recent evolution of consumption is consistent with the general evolution of both the Romanian economy and of the international economic context. The most important turning points in the evolution of Romanian consumption offer an accurate reflection of the social, political, and economic state of the country.

Following the dismissal of the Communist party at the end of 1989, the new political factors opted for the orientation toward a market economy, but as in the case of other former socialist countries, this alternative generated serious negative consequences for the population. During the 1990's, Romania faced significant gaps compared to the Western European countries as far as the economic development was concerned. The accumulation of disequilibria caused by the slow rhythm of the reforms rather frequently doubled by the inconsistent public policies reflected upon the evolution of economic phenomena and processes. A significant problem faced by the Romanian economy after 1990 was the inflation. The phenomenon was present6 before the year 1990 but the specific mechanisms of the socialist economy kept it under control. Once released from this artificial restraint the inflation rate reached high levels during the 1990's, with a peak of 256.1% in 1993.

Although in the late 1990's the GDP level continued to drop, and the inflation rate was on a rather ascending path, year 1999 embedded the premises for the economic growth at the beginning of the 21st century. Year 2000 marked a growth of 1.6% of the GDP, after three years of involution. In addition, the inflation rate, the budget deficit, and the unemployment rate

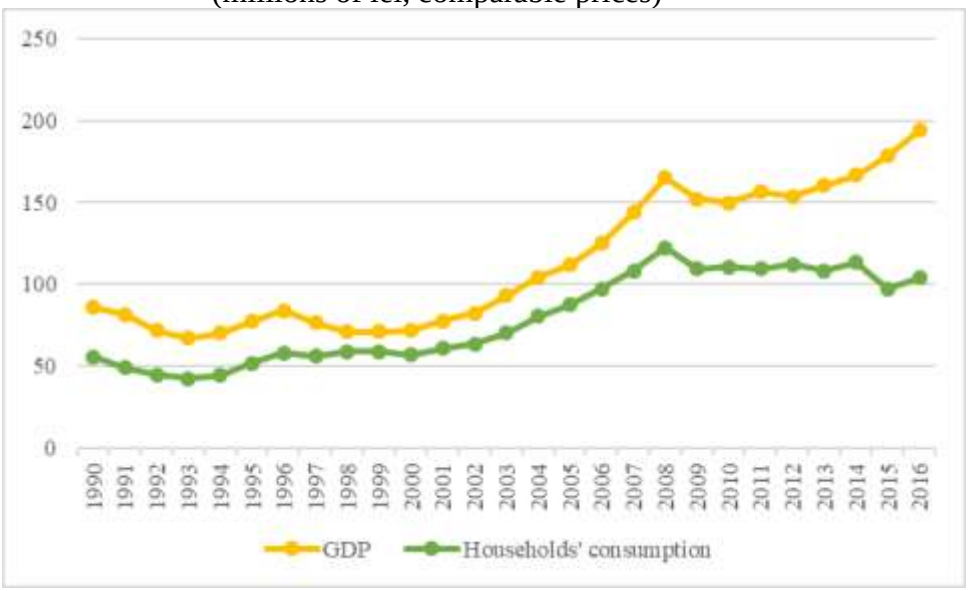
dropped. The priorities of the new government formed following the elections organized in 2000 targeted the economic growth and the reduction of the inflation rate, as preliminary objectives for the EU accession.

Positive economic results generated by the EU accession objective characterised the period 2000 – 2006. The major economic indicators grew and consolidated the positive trend initiated at the beginning of the new century.

Following the EU accession on January 1st, 2007 the positive trend continued up to and including 2008. Although starting with the second half of 2007 the effects of the global crisis became apparent, the Romanian economy experienced the first signs of the crisis only in 2009 when the GDP dropped, the budget deficit increased, and the national currency faced depreciation. According to Duhnea (2012), the net direct investments, which recorded unprecedented growth between 2006 and 2008, amounted to only 3.5 billion euros in 2009, lower by 61.9% compared to the previous year, signalling a compression trend that persisted throughout 2010 and 2011.

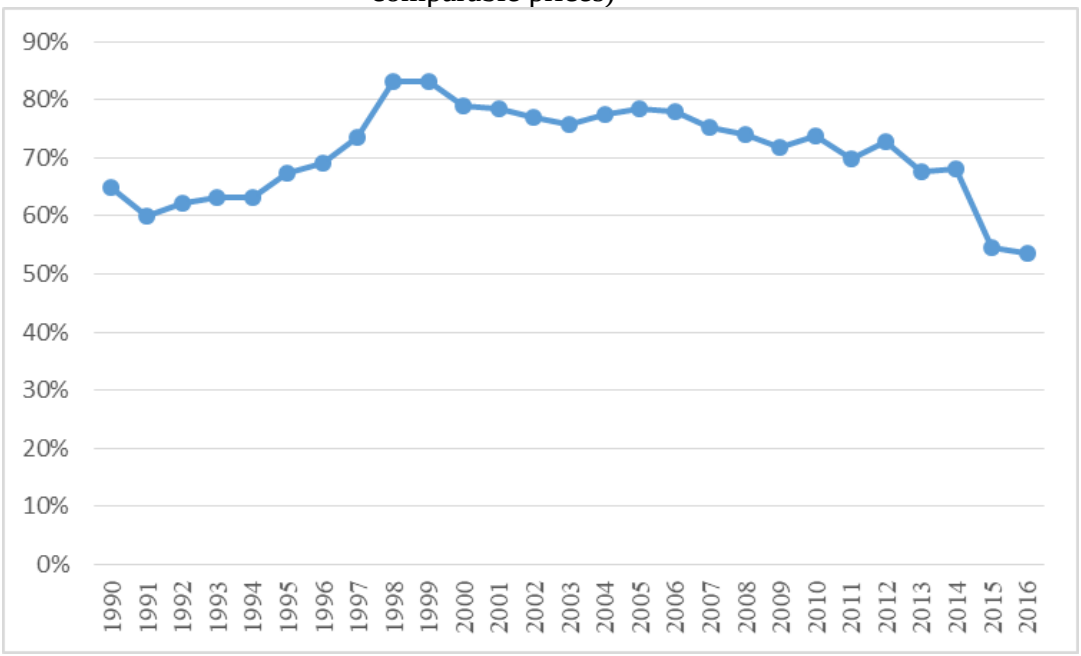
As for the evolution of consumption in Romania, one may notice a close interdependence with the overall development of the national economy. In the early 2000's the proliferation of credit opportunities and the growth of real salary determined an increase in consumption, the annual growth rate attenuated during 2005-2006 and dropped in 2009 (by 5.4%), when the economic crisis effects became obvious. The growth rate of households' consumption, which surpassed the growth rate of GDP, illustrated the accentuated dynamism of consumption during 2000-2008. In 2010, the households' consumption in constant prices increased slightly, only to return in 2011 to the level from 2009. The period 2009-2016 shows an oscillatory evolution of the households' consumption, with levels below those registered in 2008, although the GDP has been on an obvious ascendant path following 2012 (figure61). Figure 62 shows the households' consumption share in the GDP, for the period 1990-2016.

Figure 61 The evolution of households' consumption and GDP (1990 – 2016) (millions of lei, comparable prices)



Source: Designed by authors based on data available in Statistical Yearbooks of Romania

Figure 62 Household consumption share in GDP (1990 – 2016) (millions of lei, comparable prices)



Source: Designed by authors based on data available in Statistical Yearbooks of Romania

1.2 Methodological considerations – the data

For the research there were used official annual data for the period 1990 – 2016 on households' actual individual final consumption (*C*), on disposable income of households (*Y*), and on the monetary aggregate M_1, used to approximate wealth (*W*).

According to the methodology of the National Institute for Statistics, the actual final consumption 'comprises the households' actual individual final consumption and the government's actual collective final consumption. The households' actual individual final consumption includes households' expenditure for purchasing goods and services to meet their members' needs, expenditure for individual consumption of general government (education, health, social security and social activities, culture, sport, recreation, waste collection) and expenditure for individual consumption of non-profit institutions serving households (religious organizations, trade unions, political parties, unions, foundations, cultural and sport associations)' (National Institute of Statistics, Monthly Statistical Bulletin, No 2/2012, p.140). The households' actual individual final consumption accounts for more than 90% of the actual final consumption, which justifies our choice to use this variable in the study.

According to the definition provided by the Central European Bank (www.ecb.int), M_1 (narrow money) 'includes currency such as banknotes and coins, as well as balances which can immediately be converted into currency or used for cashless payments, i.e. overnight deposits. The choice for the latter indicator is justified by the fact that 'money (M_1) is no doubt a dominant asset: the store of value' (Dwivedi, 2005, p. 248). Moreover, the 'monetary theory has emphasized two different, but not mutually exclusive, functions of money: a medium of exchange and a store of wealth' (Batten & Thornton, 1985, p. 30) and is simultaneously related to the current households' consumption. Therefore, it represents the most suitable option given the particularities of the Romanian economy in which case the aggregate M_1 is best represented compared to the additional elements of the M_3 aggregate, considered by other authors as a representation of wealth. According to the most recent Annual Report of the National Bank of Romania (2016, p.67), the weight of M_1 in M_3 has continued its ascendant path of the past five years, reaching, at the end of the period, the record of the last 22 years (57,3%).

The sources for the data were the Statistical Yearbooks of Romania (1995-2014), the Monthly Statistical Bulletins (2012-2016), and the Monthly Bulletins of the National Bank of Romania (1998-2016). All the data were deflated and the series were stationarized by taking the first order differences.

The research was conducted on the time series for households' consumption, disposable income of households, and the monetary aggregate M_1, used to approximate wealth, containing 27 observations. The number of observations is suitable for a reliable analysis (Tiron, 1976).

1.3 Methodological considerations – the research goal and hypotheses

The goal of our research was to reveal the presence of the hysteresis phenomenon in Romanian households' final consumption. To this end, we employed an integrated unit root – '*true'* hysteresis approach, where the unit root theory was partially applied to evaluate the time series used for research. Both the unit root and the '*true*' hysteresis approaches were presented earlier.

Initially, a statistical analysis was performed for testing the following hypotheses about the study series: the autocorrelation (using the autocorrelation function and the Durbin-Watson test for the first order autocorrelation), the existence of a unit root against the stationarity (by the Augmented Dickey – Fuller and KPSS tests), and the series' homogeneity (by the Pettitt, Buishand and Standard Normal Homogeneity Test -SHNT tests). The latter tests were performed since hysteresis is associated with structural changes determined by the historical experience (Setterfield, 2009).

All tests were performed at a significance level of 0.05. Emphasis will not be placed on these tests since they are well-known in statistics. The reader may refer to Pfaff (2008).

The research was conducted in two phases.

In the first phase, we aimed at testing the relationship between the dependent variable households' actual individual final consumption (*C*) and both the current and previous values of two independent variables: disposable income of households (*Y*), and wealth (*W*).

The following hypotheses were formulated:

Hypothesis 1. *Consumption is influenced by the current income.*

Hypothesis 2. *Consumption is influenced by both current and previous income.*

Hypothesis 3. *Consumption is influenced by current income and previous consumption.*

Hypothesis 4. *Consumption is influenced by current income and current wealth.*

Hypothesis 5. *Consumption is influenced by current income and current wealth and previous income and previous wealth.*

XLStat and E-views Enterprise software, Edition 7.0 were used for performing the statistical analysis and the modelling.

In the second research phase, we took the '*true*' hysteresis approach to test for the presence of hysteresis in Romanian households' final consumption. To this end, we applied the algorithm elaborated by Piscitelli *et al*. (2000, pp. 63-71) (Reprinted by permission from Springer Nature: Springer Nature COMPUTATIONAL ECONOMICS, A test for Strong Hysteresis, Piscitelli, L., Cross, R., Grinfeld, M., Lamba, H., COPYRIGHT © Kluwer Academic Publishers (2000)).

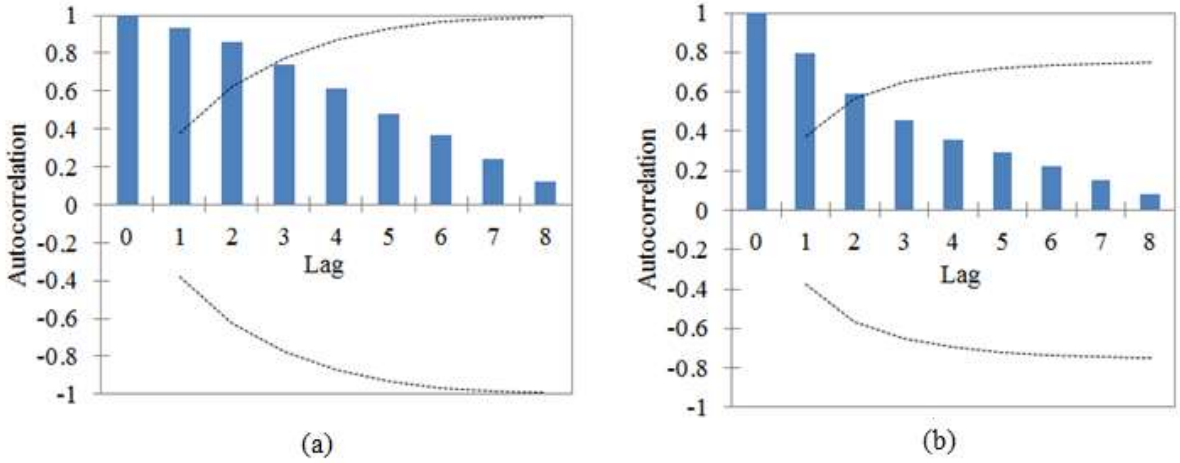
Finally, the cointegration test of Johansen was performed.

1.4 The research results

The results of the statistical analysis for the initial series of income, consumption, and wealth were the following.

All the series were autocorrelated. In Figure 63 we present the autocorrelograms of the consumption and wealth series. The dashed lines represent the limits of the confidence interval at the confidence level of 0.95.

Figure 63 Autocorrelograms of the (a) consumption and (b) wealth series



Source: Authors compilation, software generated

The Durbin - Watson test confirmed the existence of the first order autocorrelation.

The ADF and KPSS tests rejected the stationarity hypothesis for all the series. The non-stationarity was also confirmed by the slowly damping of the autocorrelogram. Therefore, the series were stationarized by taking the first order difference.

After testing the hypothesis H_0: *the series is homogenous* (there is no change point in the time series) against the alternative H_0: *the series is not homogenous* (there is at least a change point in the series), the null hypothesis was rejected for all the series. The results of the Pettitt, Buishand, and SNHT tests are presented in Table 25, together with the change points.

Table 25 Results of the homogeneity tests for income (Y), wealth (W), and consumption (C)

	Pettitt		Buishand		SNHT	
Series	Reject H_0	Change point	Reject H_0	Change point	Reject H_0	Change point
Y	yes	2003	yes	2005	yes	2006
W	yes	2004	yes	2005	yes	2006
C	yes	2002	yes	2003	yes	2004

Source: Authors' computations, software generated data

In the following we denote the series of independent variables, respectively by the income – current and previous levels (Y_t, Y_{t-1}), the previous consumption (C_{t-1}) and wealth (W) – current and previous levels (W_t, W_{t-1}).

In the first research phase a series of econometric models having the households' consumption as a dependent variable were tested. Considering the series of dependent variable to be the consumption (C_t), the following models were created:

Model 1 $C_t = a_0 + a_1 Y_t + u_t$

Model 2 $C_t = a_0 + a_1 Y_t + a_2 Y_{t-1} + u_t$

Model 3 $C_t = a_0 + a_1 Y_t + a_2 C_{t-1} + u_t$

Model 4 $C_t = a_0 + a_1 Y_t + a_2 W_t + u_t$

Model 5 $C_t = a_0 + a_1 Y_t + a_2 W_t + a_3 Y_{t-1} + a_4 W_{t-1} + u_t,$

where u_t is the residual random variable.

For each model, the significance of the coefficients was tested, using the Student t-test and the significance of the model, using the F-test. The results of these tests are shown in Table 26.

Table 26 Consumption function models – results

	Estimated coefficients:				
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Y_t	1.082***	0.967***	0.111	1.190***	0.992***
Y_{t-1}		0.005			-0.145
C_{t-1}			0.876***		
W_t				-0.436**	0.126
W_{t-1}					-0.211
Constant (a_0)	0	9.148	3.380	0	4.444
R^2	0.977	0.788	0.935	0.979	0.835
F-statistic	1148.006***	42.820***	166.007***	591.815***	20.139***

***p<0.01, **p<0.05, *p<0.10

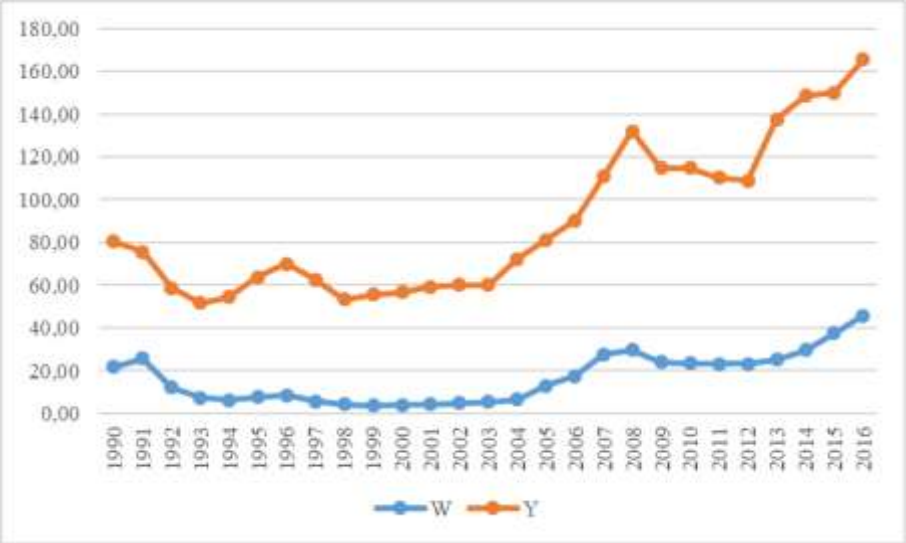
Source: Authors' computations, software generated data

From Table 26, it results that only in Models 1 and 4 the variables are significant. Therefore, the consumption is influenced by the current income and wealth, while the previous consumption, previous income, previous wealth does not have a significant influence. The relationship between consumption and income is obvious and unquestioned. The relationship between consumption and wealth (with M_1 used as a proxy for wealth) is consistent with previous studies conducted in Romania (Moraru & Moise-Titei, 2012).

In the second research phase, for the '*true'* hysteresis approach, only the variables found significant at the previous stage were considered as independent variables. These are income and wealth. During this phase, the stationarized series of income and wealth were transformed in hysteresis time series (HY and HW) using the algorithm suggested by Piscitelli et al. (2000), as presented in the previous sections of this paper.

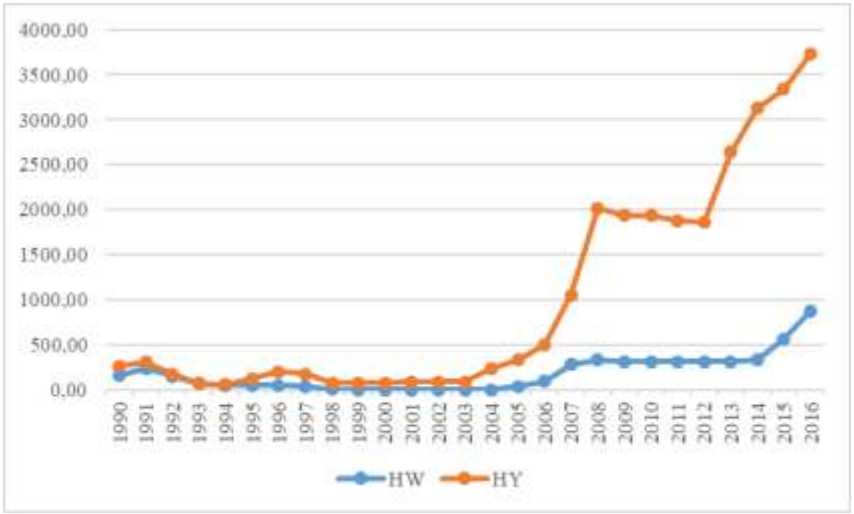
Figures 64 and 65 show the evolutions of income and wealth between 1990 and 2016, before and after the hysteresis transformation, respectively.

Figure 64 The evolution of households' income and wealth (1990 – 2016) (millions of lei, comparable prices)



Source: Designed by authors based on data available in Statistical Yearbooks of Romania

Figure 65 The evolution of income and wealth transformed in hysteresis time series during 1990 - 2016



Source: Designed by authors based on data available in Statistical Yearbooks of Romania

The Augmented Dickey-Fuller (ADF) was applied to the hysteresis transformations of income (HY) and wealth (HW) and the stationarity hypothesis was not rejected.

Subsequently, the existence of cointegration relationships between the studied series was tested using Johansen cointegration test, and the results showed that the existence of cointegration relationships was not rejected at the significance level of 0.05.

1.5 Conclusions

We may therefore conclude that hysteresis in the case of consumption in Romania cannot be overruled, or in other words, temporary influences on consumption determinants seem to have reman

ent effects on consumption. Our study revealed that income and wealth strongly influence consumption in Romania and that the presence of hysteresis cannot be denied. Therefore, the non-dominated shocks affect the equilibrium of the system. In other words, severe changes occurring in one or both of the independent variables determine a lasting impact on consumption.

It is our strong belief that the decision factors should be aware of this reality and act in accordance; up to the present moment however, this seems not to be the case. The economic crisis effects determined the government to adopt a series of austerity measures and among those, some of the most controversial measures adopted in 2009 and especially 2010 had a strong, unfortunate and one may add, lasting impact on consumption. These include, but are not limited to, the increase of VAT from 19% to 24%, the extensively debated and contested measure of cutting budgetary salaries by 25%, a 16% tax on deposit interests, capital market and monetary market operations income, and notable increases of local taxes as well. To sum up, the economic recovery policy focused on cutting salaries, pensions, subventions, social allowances, and unemployment benefits and at the same time on increasing numerous taxes. Even though some of the measures have been reversed since then, their effects are most likely to last for a significant length of time. Up to 2016, the level of households' consumption has maintained below the peak level registered in 2008, before the economic crisis.

Considering that the current economic context represents a favourable framework for empirical testing of hysteresis and may not only herald new opportunities for study but also set new directions for economic policy orientation, the present paper aimed at following up the inclusion of the phenomenon at macroeconomic consumption level in Romania. The research results admitted the presence of hysteresis thus revealing implications inaccessible by a different approach and pointing out several concerns regarding the effects of recently adopted economic measures on consumption in Romania.

SECTION III THE FINANCIAL BURDEN AND THE ENTREPRENORIAL CHALLENGES OF THE ECONOMIC SUSTAINABLE DEVELOPMENT

Sustainable business development should not be a parallel direction to the strategy for achieving economic and financial performance. The need to ensure the sustainable development of the economy in order to conserve resources for future generations puts pressure on how to do business. In order to ensure a sustainable business development, efforts are needed, first financially, at least in the first part of the process. That is why it will become more and more important for entrepreneurs and managers to find solutions to achieve this goal and to change, in some cases, their business strategies. An industry that is acute need for sustainable development is tourism which is perhaps the most dynamic economic sector but also one of the most pollutant.

III.1 Ecolabelling in the Romanian Seaside Hotel Industry – marketing considerations, financial constraints, perspectives[17]

Tourism proved to be a robust industry after its spectacular recovery from the world economic crisis of 2007-2008. The latest data provided by the World Tourism Organization (UNWTO, 2016), confirm the resilience and boost of the industry, a sector accounting for 10% of world's GDP, 7% of global trade and one in ten jobs. Due to its continuous and constant expansion, tourism gained a vital role in the global and social development, with an obvious and significant environmental impact.

Since the 80's, specialists have emphasized the potential negative impact of the tourism industry on the environment, particularly because of the extensive use of the natural and anthropic resources (Cohen, 1978; Obua, 1997; Wen, 1998; Christensen & Beckmann, 1998; Gössling, 2001), of the pollution caused by the intensive tourism flows, and of the rapid development of tourism facilities (Liu & Var, 1986, pp. 193-214; Ahn et al., 2002, pp. 1-15).

Starting with the works of Ceballos-Lascurain (Ceballos-Lascurain, 1987, pp. 13-14) and Romeril (Romeril, 1985), the concepts of ecotourism, sustainable tourism, and responsible tourism have received broad attention from researchers, governmental bodies, international tourism organizations, consumers, and tourism enterprises. The emergence and implementation of various environmental tools and certification schemes, aimed at reducing tourism impact and promoting green practices in general tourism management, have come therefore as a natural consequence. The tourism industry has witnessed a great proliferation of these certification schemes and programs – if more than 70 were identified at the beginning of the

[17] This section is based on the article *Barbulescu, A., Moraru, A.D. &* ***Duhnea, C.*** *(2019)*. Ecollabeling in the Romanian Seaside Hotel Industry – Marketing considerations, Financial constraints and Persepctives., *Sustainability, Vol. 11, Issue 1, Article number 265*

21st century (Font et al., 2003), at present, there are more than 150 such schemes and programs (Plüss et al., 2012). It led to an increased interest of the academics who developed studies addressing different tourist subindustries (accommodation, transport, food services, etc.) and several issues related to environmental measures – the certification process (steps to be taken, difficulties in implementation, financial concerns, duration, ethical considerations), general tourism businesses management, and consumer perceptions (Bagur-Femenias et al., 2016; Bhaskaran et al., 2006; Tzschentke et al., 2004; Butler, 2008; Zhang et al., 2014). One of these areas of interest targets the EU Ecolabel, the unique official environmental label of the European Union, certified by an independent organisation and valid throughout Europe. Therefore, the present article focuses on the hotel managers' opinions about the EU Ecolabel, the challenges they face as far as environmental issues are concerned, and the prospects for a more environmentally responsible tourism in the area.

The objectives of the present research are:

- To classify the most common environmental measures implemented in the accommodation units on the Romanian seaside;
- To reveal the measures pending implementation in the next years;
- To observe the level of the managers' awareness regarding the EU Ecolabel;
- To gain knowledge on the reasons wherefore the EU Ecolabel was not applied for by the Romanian hotel managers, the criteria considered the most difficult to implement given the particularities of the seaside tourism, and the managers' perceptions on the impact that the EU Ecolabel has on activity efficiency;
- To investigate the factors influencing the intention to meet the criteria and to obtain the EU Ecolabel by the hotels on the Romanian seaside, and to this end, a model will be proposed.

The paper is organized as follows: section 2 is devoted to the conceptual framework, section 3 presents the methodology adopted in this study, section 4 contains the results and discussions, and the last section concludes the work.

1.1 Conceptual framework

The scientific research has detailed multiple facets of the implementation of environmental protection measures. Investigations regarding the voluntary or mandatory nature of such measures suggested that hotels voluntarily embracing green policies obtained better results (Bagur-Femenias et al., 2016). Several works (Bhaskaran et al., 2006; Tzschentke et al., 2004; Butler, 2008; Zhang et al., 2014; Segarra-Oña et al., 2012; Bonilla – Priego et al., 2011) analysed the economic advantages that such measures bring to tourism businesses and revealed mixed results. In some cases, the empirical studies unveiled advantages, such as the reduction of water and energy consumption or even the positive relationship between the implementation of a certification scheme and tourism firm efficiency (Bhaskaran et al., 2006; Tzschentke et al., 2004; Butler, 2008; Zhang et al., 2014). Other studies provided evidence that there were registered significant differences in the economic performance of certified hotels compared to

those not certified (Segarra-Oña et al., 2012) and that the environmental responsibility is strongly and positively related to firm performance (Rodrıguez & del Mar Armas Cruz, 2007). However, the findings revealed that tourism managers are not convinced that holding a certification would automatically yield financial benefits (Jarvis et al., 2010), or market advantage (Bonilla – Priego et al., 2011).

Numerous empirical studies (Han et al., 2011; Lee & Moscardo, 2005; Millar & Baloglu, 2011; Bohdanowicz, 2005; Kasim, 2004; Volsky et al., 1999; Blamey et al., 1999) conducted on the tourist accommodation industry showed that in the case of eco-friendly hotels (whether the respective hotels had an environmental certification or just implemented environmental protection measures) a positive influence on consumer decision was frequently recorded; however, depending on the country/region where the study had been conducted, different results were revealed. Certain investigations regarding the effects of the eco-friendly measures taken by the hotels' management concluded that their presence influenced the intention to choose the hotel, to have a longer stay, and even to pay more (Han et al., 2011; Lee & Moscardo, 2005). Millar and Baloglu (Millar & Baloglu, 2011), in a study conducted in the USA, observe that consumers appreciate eco-friendly functionalities such as the re-use policies for towels and linens and the electronic efficiency control of the power use when they chose accommodation. On the other hand, several studies identified different consumer behaviour. In a study about the Polish customers, Bohdanowicz (Bohdanowicz, 2005) concludes that the environmental certification or the eco-friendly measures for an accommodation facility are less important than the price and the location of the holiday destination. Kasim (Kasim, 2004) and Volsky, Ozanne, and Fontenot (Volsky et al., 1999) show that even though customers are aware of the concern and necessity of environmental protection, they consider other criteria as more important when choosing their holiday accommodation. The study conducted by Blamey, Bennett, Louviere, and Morrison (Blamey et al., 1999) revealed the same contradiction between the fact that most consumers are concerned about the necessity to protect the environment and that the purchase decision seems to take no account of the eco-friendly facilities or ecolabels.

The scientific studies deal in most cases with the plethora of certification schemes and programs as an ensemble covering the environmental perspective related to the tourism industry, without singling out one or another of these schemes and programs and without elaborating on them as individual certification schemes. In this paper, we focus on ecolabelling, with a particular interest in the EU Ecolabel in tourist accommodation, which is the voluntary European initiative implemented after 2003 in order to attest the responsible attitude towards the environment (European Commission, 2016).

As with the other certification schemes, ecolabelling initiatives have grown since the mid-70s, when the first ecolabelling scheme was implemented. The authors preoccupied with studying the ecolabel implementation process (Grodsky, 1993; Davis, 1997; Kusz, 1997; Shimp & Rettray, 1997; Sasidharan et al., 2002) emphasize that the main motivation of tourism enterprises to obtain such a certification is the image delivered to customers – an

environmentally friendly business. Studies on the impact of ecolabelling focused on several directions: the advantages of ecolabelling for tourism companies, tourism industry, and tourists (Dziuba, 2016), the difficulties that companies face when trying to obtain such a certification, and the impact of holding an ecolabel on the consumers' decision (Zhang et al., 2014; Lupu et al., 2013). There are also less investigated aspects, such as those regarding the real advantages that an ecolabel brings to tourism businesses, although the theoretical advantages are listed in several research works (Font, 2002). Other aspects that are even less studied are represented by the opinions of the managers from the hospitality industry regarding the necessity to obtain an ecolabel. Covering this research area are the works of Dziuba (Dziuba, 2016), Ryglova (Ryglová, 2007), or Duglio (Duglio et al., 2017).

Therefore, we investigated the hotel managers' opinions concerning the balance between marketing considerations, competitive advantage, and technical or/and financial constraints, focusing on the hotel industry from the Romanian seaside.

The research on the topic in Romania reveals a situation that is similar to that identified in international research – several general aspects regarding certifications were investigated, while the particular case of the EU Ecolabel received less attention. The challenges related to ecolabel implementation, the consumer behaviour regarding ecolabeled tourism accommodation units or the hotel managers' perspective towards the advantages and the challenges of having an ecolabel certification are, at present, insufficiently researched at the Romanian tourism industry level. In their study conducted in Brasov on the customer's interest in eco-certified accommodation, Constantin, Ispas, and Candrea (Constantin et al., 2013) found that 47% of the tourists from the investigated sample were interested in choosing an eco-certified hotel. Candrea and Bratucu (Candrea & Bratucu, 2012) investigated the Romanian tourism managers' opinion about the implementation of environmental protection measures, and the results showed that most of the interviewed managers lacked knowledge on the existence of environmental management systems and certification schemes, but were interested in energy saving measures, for example. The authors considered that the low response rate of the accommodation unit managers invited to participate in the survey showed little interest in environmental protection measures. One of the few articles focusing on the EU Ecolabel in the Romanian hotel industry (Lupu et al., 2013) tested several hypotheses regarding customer perception. The research investigated customer awareness regarding the Ecolabel, the opinion about the presence of the Ecolabel as related to the quality of the services provided by the hotel, the willingness to pay more for the services offered by an ecolabeled hotel. Over 75% of the respondents had no knowledge about the Ecolabel. Moreover, customers tended to associate the presence of the Ecolabel primarily to the image of the hotel and not to the quality of the services. Only 15% of the respondents stated that they were willing to pay more due to the existence of the EU Ecolabel. Another study (Ban et al., 2016) investigated the managers' willingness to comply with the criteria and apply for obtaining the EU Ecolabel in Natura 2000 Crişul Repede Gorge-Pădurea Craiului Pass site and revealed positive attitudes among operators to meet the requirements for EU Ecolabel awarding. The study also reported that

managers viewed the Ecolabel as a promotion vector that differentiated a tourism business from its competitors.

1.2 Materials and Methods

Research hypotheses

Two research hypotheses were formulated and tested using the Chi-square test.

Hypothesis 1. The efficiency of the hotel's activity significantly influences the decision to implement additional environmental protection measures in the next three to five years.

Jarvis et al. (Jarvis et al., 2010) cited Medina (2005), Mycoo (2006), and Vertinsky & Zhou (2000) in order to emphasize that the implementation of environmental protection measures and applying for a certification scheme were usually associated with high costs for the tourism business, which could hinder this endeavour. Therefore, our assumption was that the efficiency of the economic activity affected the decision to implement environmental measures.

Hypothesis 2. The hotel classification category significantly influences the decision to implement additional environmental protection measures in the next three to five years.

The only two hotels in Romania holding the EU Ecolabel are a five-star and a four-star hotel, respectively. The other five-star hotels generally hold some sort of environmental certification. On the other hand, one or two-star hotels with environmental certifications are rather exceptions. Our interest was, therefore, to find out if the managers are influenced by the classification category of their hotel when they consider implementing additional environmental protection measures.

To reveal natural groupings within the sample of hotel managers, a cluster analysis was performed in IBM SPSS Statistics 23, using the Two Step algorithm. This algorithm was preferred due to its ability to generate clusters using both categorical and continuous variables. Two predictors were used: a. the reasons for not applying for the EU Ecolabel, and b. the presumed impact of ecolabelling on the efficiency of the hotel's activity. The economic efficiency of the hotel's activity represented the assessment field. For further reference on the Two Step cluster analysis in SPSS please see (Bacher et al., 2004).

Sample selection

To achieve the objectives, the research targeted hotel managers and was conducted between November and December 2018. The research was aimed at the managers of the hotels established in the tourist resorts from the Northern Romanian seaside and in Constanta city. The choice of the seaside tourism region for the research was sustained by the importance of the seaside within the national tourism of Romania.

The sample was compiled using proportionate stratification sampling, based on the statistical information regarding the number and classification of the hotels from the seaside

tourist resorts, provided by the County Statistics Directorate. Proportionate stratification is a type of stratified sampling where each stratum has the same sampling fraction. The population is divided into separate groups and a sample is drawn from each group. Therefore, the hotels were grouped function of their classification and proportional subsamples were extracted from each classification category. Subsequently, hotel managers of hotels in each classification category were approached by telephone and e-mail, until the sample was compiled. Once a hotel manager answered positively to the invitation to participate in the research, a meeting was scheduled with one of the authors of the article.

The sample size, *n*, was computed using Yamane's formula (Yamane, 1967):

$$n = \frac{Nz_{\alpha}^{2}p(1-p)}{z_{\alpha}^{2}p(1-p)+Ne^{2}},$$

where *N* is the population size, z_{α} is the z-score, *e* is the margin error, and *p* is the probability to obtain an affirmative answer to the question addressed.

In this study, *N*=107 (according to the official statistics provided by the County Statistics Directorate for the year 2017), $z_{\alpha} = 1.96$, corresponding to a confidence level of 95%, *e*=0.089, *p*=0.5.

The questionnaire

The research instrument was a questionnaire, and in order to ensure the proper understanding of the research scope and the completeness of the information provided, the respondents filled in the questionnaires during a scheduled meeting with one of the authors of this article.

The questionnaire integrated four sections. The first section focused on obtaining information on the environmental measures that had been already implemented by the accommodation unit, the ones pending implementation in the near future, and the existence of any kind of ecological certification. The respondents' degree of familiarity with the EU Ecolabel was subsequently targeted, using a five-point semantic differential, from 1 (very little familiarized) to 5 (very familiarized). Since none of the respondents indicated a high degree of familiarity with the EU Ecolabel, the authors delivered a short presentation of the mandatory and optional criteria for ecolabel awarding.

The second section focused on obtaining information on whether applying for the EU Ecolabel was considered, and if not, which were the reasons wherefore the management did not take it into consideration; questions were also asked about the criteria that would be the most difficult to meet.

The third section of the questionnaire focused on the managers' views and opinions on customer cognition of the matter and on the perceived impact of the ecolabel on the economic activity of the accommodation unit. The managers gave their opinion on the customers' perception of ecolabeled accommodation units. Subsequently, three-point semantic differentials from 1 (very unlikely to be a criterion) to 3 (very likely to be a criterion) were

used to assess the managers' opinion on whether the environmental protection measures represent a criterion for choosing hotel accommodation, by Romanian and foreign tourists, respectively. Next, a five-point Likert- type scale was used to assess the managers' opinions whether during the next three-five years the EU Ecolabel would become a major criterion for customers when choosing their accommodation. Also, a five-point Likert- type scale was used to assess whether the managers considered that holding the EU Ecolabel would have a positive impact on the economic efficiency of the hotel's activity. Finally, the managers' intention to meet the criteria and obtain the EU Ecolabel was investigated, using a scale from 1 (little interested) to 5 (very interested).

The last section was directed toward obtaining general information about the respondents, such as their age, gender, education, and work experience in tourism.

Modelling

Based on the collected data, a multiple linear regression model was determined for the dependence between the declared intention to meet the criteria and obtain the EU ecolabel (Y) and the managers' level of knowledge about the EU Ecolabel (Z_1), their opinion on whether ecolabelling represents a competitive advantage (Z_2), and the current efficiency level of the hotel's economic activity (Z_3):

$$Y = \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \xi, \quad (1)$$

where ξ is the residual variable.

Data summary is available as Supplementary material.

The model was tested for accuracy using the following tests: (1) the Student t- test, for the significance of coefficients, (2) the F - test for the model's significance, (3) the Kolmogorov – Smirnov test for the residual's normality, (4) the F-test and the Levene test for the residual's homoscedasticity. The correlogram was also built to study the residuals' autocorrelation (Bărbulescu & Koncsag, 2007; Bărbulescu, 2016a; Bărbulescu, 2016b). The determination coefficient was also provided.

1.3 Results and discussions

Table 28 contains the characteristics of the sample targeted in our study. Most of the respondents were women, i.e. 61.7%. As far as the age was concerned, the majority of the respondents (46.7%) were 36-45 years old. One may easily notice that more than 70% of the respondents were less than 45 years old.

35.0% of the respondents had between 11 and 15 years of work experience in tourism, 31.7% had between six and ten years, 13.3% had between 16 and 20 years, while 10.0% had more than 20 years of experience in tourism.

Most respondents (51.6%) stated they were post-university studies graduates (master's or doctorate degree), followed by university (BA) graduates (41.7 %).

Table 27 Characteristics of the sample

	Gender		Studies		
	Female	Male	Elementary education	Bachelor	Post-university
(%)	61.7	38.3	6.7	41.7	51.6
Age (years)					
	18-25	26-35	36-45	46-55	56-65
(%)	8.3	20	46.7	20.0	5.0
Experience in tourism (years)					
	0-5	6-10	11-15	16-20	>20
(%)	10.0	31.7	35.0	13.3	10.0

Source: authors' calculation

In this study, we relied on the perceived efficiency of the economic activity of the hotels. The managers were invited to assess the efficiency of the economic activity of the hotel, based on the results from the previous two years, in terms of income and expenditure. Considering the efficiency of the economic activity of the hotels included in the sample, the hotels were grouped into three categories – low efficiency (group 1), medium efficiency (group 2), and high efficiency (group 3). This yielded the following structure of the sample: group 1 – 8.3%; group 2 – 53.3%; group 3 – 38.3%.

One of the pursuits of our research was to classify the most common environmental measures already implemented by hotels and to discover whether the hotel management had other environmental measures planned for the next three to five years. The results revealed that in most hotels the environmental measures implemented targeted the reduction of energy consumption, with 58.3% of the hotels having taken such measures. Secondly, 36.7% of the hotels targeted water consumption, followed by waste (26.7%).

The research revealed that most of the hotels (73.3%) were planning to implement other environmental measures during the next three to five years. These measures targeted energy saving (43.3%), water consumption (40.0%), waste reduction (26.7%), and hazardous chemical products (11.7%).

At the time of the research, only four hotels had an ecological certification well established in the field of tourism, other than the EU Ecolabel. However, in two cases although well established, the certification was not related to the accommodation services provided.

When asked how familiar they were with the EU Ecolabel, most managers (48.3%) indicated that they were little familiarized; 23.3% had no previous knowledge of the issue, and 28.3% were moderately familiarized with the EU Ecolabel. None of the managers asserted that they had solid knowledge of the EU Ecolabel. The results confirmed other findings identified in the literature (Ryglová, 2007; Candrea & Bratucu, 2012; Ban et al., 2016). It is worth mentioning that the necessity to raise awareness on the EU Ecolabel is a current concern of the European responsible bodies (European Commission, 2016).

Then, the research aimed at finding whether the hotel had previously considered applying for the ecolabel; if it did not, we aimed at identifying the reasons behind this decision. Only five managers claimed that the hotel had previously considered applying for the EU Ecolabel, and eight said that they did not have information on whether applying for the ecolabel was considered or not. Most respondents, i.e. 47 (78.3%), stated that applying for the ecolabel was not previously taken into consideration. The most cited reasons for not considering applying for the ecolabel were the lack of information on the EU Ecolabel (38.3%), the difficulty in meeting the criteria (33.3%), and the customers' lack of awareness regarding the Ecolabel (20.0%). Other reasons included the costs of the certification and holding other types of ecological certification. Focusing on the Ecolabel criteria, the managers considered that the most difficult to comply with was the energy criterion (41.7%), followed by waste reduction (28.3), water consumption (18.3%), as well as the general management (15.0%).

88.3% of the managers were convinced that holding the EU Ecolabel would represent a competitive advantage for the hotel. This finding is in line with previous studies, which revealed that generally, the environmental protection measures were considered a source of competitive advantage (Jarvis et al., 2010).

The research focused next on the managers' opinion regarding the tourists' perceptions of the Ecolabel. Most of the respondents (26.7%) singled out the role of the Ecolabel in building company reputation, while 23.3% considered that the Ecolabel might endorse service quality. 21.7% of the respondents viewed it as a marketing element, while the rest considered that the clients were not interested in the matter and they perceived the EU Ecolabel more as expense rather than advantage.

The next two research questions focused on whether managers considered that the environmental measures implemented by hotels and advertised to customers represented a criterion for choosing accommodation for Romanian and foreign tourists, respectively. A three-point semantic differential was used in order to assess the managers' opinions, from 1 (very unlikely to be a criterion) to 3 (very likely to be a criterion). The results indicated that managers considered foreign tourists to be slightly more inclined to choose accommodation based on hotel environmental measures than the Romanian ones, with a mean score of 1.97 for foreign tourists, and 1.35 for Romanian tourists. However, managers did not foresee a dramatic change in the consumers' attitude in the next years. On a five-point Likert-type scale (from -2 completely disagree to +2 completely agree) the opinion regarding whether the EU Ecolabel would become an important criterion for choosing hotel accommodation during the next three to five years was assessed. The mean score of 0.11 indicated that managers were rather sceptical about the prospective role of the Ecolabel in tourist behaviour. This is consistent with the previous research conducted both in Romania (Lupu et al., 2013), and worldwide (Budeanu, 2007).

Next, there was assessed the managers' opinion on whether fulfilling the environmental criteria and receiving the EU Ecolabel would have a positive impact on the economic efficiency of the activity. A five-point Likert-type scale (from -2 completely disagree to +2 completely

agree) was used. The mean score of 1.00 indicated that managers presumed that the Ecolabel would have a positive impact on the efficiency of the hotel's activity. Previous results on economic efficiency related issues revealed mixed results – in some cases the managers considered that the environmental protection measures had a positive impact (Bhaskaran et al., 2006; Tzschentke et al., 2004; Segarra-Oña et al, 2012.; Rodrıguez & del Mar Armas Cruz, 2007), while others expressed their doubts regarding a positive impact (Jarvis et al., 2010).

The results of the tested hypothesis are the following:

For Hypothesis 1, χ^2 (2) = 11.403, p = 0.003, indicating that the efficiency of the hotel's activity significantly influences the decision to implement additional environmental measures in the next three to five years.

For Hypothesis 2, χ^2 (4) = 2.852, p = 0.583, revealing that the hotel classification category does not significantly influence the decision to implement additional environment protection measures in the next three to five years.

Using the Two-Step algorithm and based on the two predictors - the reasons for not applying for the EU Ecolabel and the presumed impact of ecolabelling on the efficiency of the hotel's activity, and choosing – as assessment field – the economic efficiency of the hotel's activity, three clusters resulted, covering 39.7%, 34.5%, and 25.9% of the study data.

The cluster quality was good, based on a silhouette coefficient of cohesion and separation of 0.6. The size of the smallest cluster was 15 (25.9%) and the size of the largest one was 23 (39.7%). The ratio of sizes was satisfactory (1.53).

The first cluster includes the managers who considered that the most important reason for not applying for the EU Ecolabel was their lack of information and knowledge regarding the certification and found that holding the EU Ecolabel would have a low to moderate impact on the efficiency of the economic activity. The second cluster includes the managers who considered the difficulty of meeting the criteria as reason for not applying for the EU Ecolabel and found that holding the EU Ecolabel would have a moderate impact on the efficiency of the economic activity. The third cluster includes the managers who considered that the customers' lack of awareness was the main reason for not considering applying for the EU Ecolabel, and that holding the EU Ecolabel would have a strong impact on the efficiency of the economic activity.

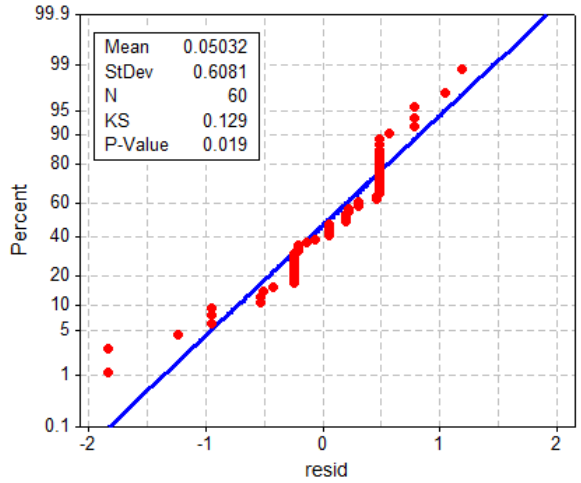
The modelling results are provided in Table 28 and Figures below.

Table 28 Coefficients of the variables in the regression model

	Coefficients	**Standard error**	**t Stat**	**p-value**
X_1	0.70649	0.10925	6.46628	2.45×10^{-08}
X_2	-0.37611	0.16943	7.865639	0.03042
X_3	0.73392	0.10549	2.502161	3.743×10^{-09}

Source: authors' calculation

Figure 66 Normal probability plot for the residuals in the model. The line represents the theoretical distribution and the dots represent the actual data



The coefficients of the variables are in the second column of Table 29, the values of the Student t – statistics are presented in the fourth column, and the corresponding p-values - in the fifth column. Since the p-values are all less than 0.05, it results that all the coefficients of the model are significant.

The F-test did not reject the hypothesis regarding the significance of the model because the p-value corresponding to the F statistics is $2.94\times10^{-38} < 0.05$.

The analysis of residuals was also performed.

The Kolmogorov – Smirnov test did not reject the hypothesis that the residuals are normally distributed at the significance level of 0.01 since the p - value associated is 0.019 > 0.01 (Figure 66).

Figure. 67 The correlogram of the residuals (with 5% significance limits for the autocorrelations)

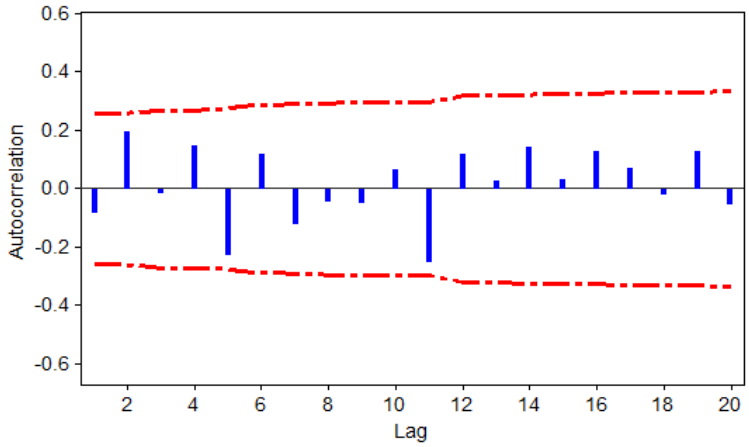
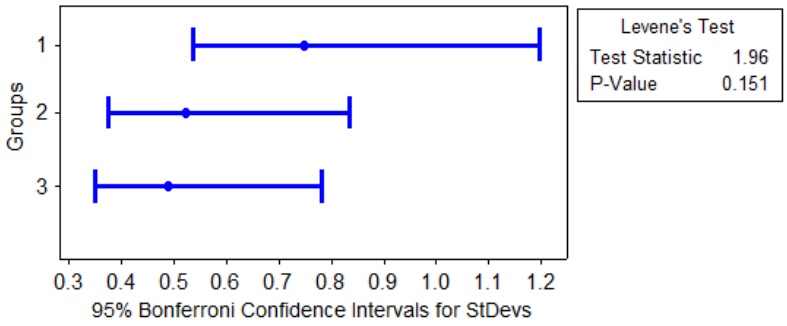


Figure 68 Results of the Levene test for the residual in the model



The correlogram analysis does not emphasize the existence of the residuals autocorrelation, as one may observe in Figure 66, where the vertical bars represent the values of autocorrelation functions at different lags and the dotted line represents the limits of the empirical confidence interval at 95% confidence level.

As the residuals are Gaussian and not correlated, they are independent. They are also homoscedastic since the p-value corresponding to the Levene tests are greater than 0.05 (Figure 67).

The value of the determination coefficient ($R^2 = 0.9564$) confirms the existence of a strong relationship between the dependent and independent variables. Therefore, the model:

$$Y = 0.706\, Z_1 - 0.376\, Z_2 + 0.734\, Z_3 + \xi, \qquad (2)$$

is statistically correct, describing the intention to meet the criteria and obtain the EU Ecolabel (Y), the function of the managers' level of knowledge about the EU Ecolabel (Z_1), their opinion on whether ecolabelling represents a competitive advantage (Z_2), and the current efficiency level of the hotel's economic activity (Z_3).

1.4 Conclusions

Tourism is one of the most dynamic economic sectors and is extremely environmentally challenging. The scientific literature on the tourism accommodation industry and environmental related issues is abundant in studies concerned with the way tourism businesses should implement environmental protection measures and obtain a certification. At the same time, a similar scientific interest is paid to the customers' appreciation of the accommodation units awarded with such a certification. Less studied perspectives are those related to whether these eco-certifications bring real benefits to tourism businesses and the hotel managers' opinion on obtaining a certification in terms of the opportunities to increase their income and maintain profitability. Our research investigates precisely one of these less studied perspectives, that is, the managers' opinion regarding environmental protection measures and their appreciation of the impact a certification would have on the hotel economic activity, with

an emphasis on the EU Ecolabel. The situation of Romania where there are only two hotels holding the EU Ecolabel is consistent with that of other countries in Central and Eastern Europe (Poland, Hungary, Greece, Bulgaria) and in contrast with several Western and Southern European countries (Italy, France, Spain, Austria). Therefore, the aim of the research was to investigate the tourism managers' perspective, who are, in the end, the decision-making factors in adopting environmentally friendly measures and obtaining certifications.

The research proposed five objectives, which were attained. The research results revealed that the most common environmental measures implemented in the Romanian seaside hotel industry targeted the reduction of energy consumption, followed by water consumption, and waste. The research also showed that most hotels are planning to implement other environmental measures during the next three to five years, especially targeted at energy saving, water consumption, waste reduction, and hazardous chemical products.

A significant conclusion of our research is that most managers are convinced that the EU Ecolabel represents a competitive advantage for the hotel, which is in line with previous findings (Jarvis et al., 2010). However, most managers had never considered applying for the EU Ecolabel. The most cited reasons for not applying are the lack of information about the EU Ecolabel, the difficulty of the criteria (especially the energy, waste, and water criteria), the customers' lack of awareness and interest regarding the ecolabel. These findings confirm the results of the previous studies on the managers' lack of information about the EU Ecolabel (Ryglová, 2007; Candrea & Bratucu, 2012), the customers' attitude (Kasim, 2004; Blamey et al., 1999; Lupu et al., 2013; Budeanu, 2007), and the high implementation costs (Medina, 2005; Mycoo, 2006; Vertinsky & Zhou, 2000), cited in Jarvis et al. (2010). Bearing in mind the research findings, it is our strong belief that the entire hotel industry should benefit from coherent and sustained information campaigns on the EU Ecolabel.

In accordance with the results of previous studies on the consumers' perception of the accommodation units with an environmental certification (Bohdanowicz, 2005; Kasim, 2004; Volsky et al., 1999; Blamey et al., 1999, Lupu et al., 2013) , the managers were rather sceptical about the prospective role of the EU Ecolabel in tourist behaviour. Moreover, they considered foreign tourists to be slightly more inclined to choose accommodation based on the existence of environmental protection measures than the Romanian ones.

The novelty of our research resides in investigating the factors that influence the managers' decision to implement additional environmental measures during the next years, meet the criteria, and apply for obtaining the EU Ecolabel. The results indicated that the efficiency of the hotel's activity significantly influences the decision to implement additional environmental measures during the next years, while the hotel classification category does not. Finally, yet importantly, the constructed and tested model confirmed that the decision to meet the criteria and obtain the EU Ecolabel depends significantly on the managers' knowledge of the EU Ecolabel, their opinion on whether ecolabelling represents a competitive advantage, and the current efficiency level of the hotel's economic activity.

Given the obtained results, a future research direction would be to investigate the opinions of the Bulgarian seaside tourism managers, bearing in mind the similarities between Bulgaria and Romania concerning seaside tourism.

PART II- CAREER DEVELOPMENT PLAN

The development of the academic career in the perspective of obtaining the habilitation certificate and later the promotion to the didactic degree of university professor, represents for me a natural continuation of a road started 20 years ago when, in the autumn of 2000, I stepped for the first time in a classroom as a teacher.

Because, in my opinion, to be a researcher and a good teacher means to have equally the necessary professional skills, vocation, perseverance and last, but not least, the desire to work with the student, I structured my career development plan on three directions:

- Presentation of the professional competences acquired as a result of the studies completed, the professional experience gained, and the research activity carried out so far;
- Medium and long-term objectives of the teaching activity.
- Medium and long-term objectives of the research activity.

The 20 years dedicated to the study and continuous perfection in the knowledge of economic science, both as a subject of teaching and as a preoccupation for research, had as a starting point the moment of graduating the bachelor studies in 2000. From that moment until now, my entire teaching and research activity has been channeled in two main directions: finance (financial markets, international finance) and international business.

In 2000 I graduated the bachelor studies in economics, at Ovidius University of Constanța, Faculty of Economic Sciences, International Transactions Study program, with the obtained grade of the bachelor's thesis 10 (ten) and the general grade of 9.36 (nine and 36%).

One year later, I graduated a master program, Intra-European Transactions, at Ovidius University of Constanța, Faculty of Economic Sciences, with the grade of the dissertation exam 10 (ten) and the general grade 9.87 (nine and 87%).

During 2002-2009 I was enrolled in a doctoral studies program at Al. I. Cuza University Iași, Faculty of Economics and Business Administration in the field of Finance, publicly presenting my doctoral thesis in June 2009 and receiving the scientific in November 2009.

A step forward to develop my professional career was realized with my acceptance at the Academic Post-Doctoral School in Economics (SpDAE) organized by the Romanian Academy. My postdoctoral studies in the economic field, between October 2010 and January 2013, ended with the presentation of the postdoctoral dissertation in January 2013, appreciated by the evaluation committee with the grade 9 (nine).

The desire for continuity in the study of international business environment made me follow, between 2011 and 2013, the courses of a master program with the specialization Risk Management in International Business at Ovidius University of Constanta, Faculty of Economic Sciences, completed with final grade for the dissertation thesis 10 (ten) and the general grade 10 (ten).

In order to improve my professional competences, throughout my career, I followed several training/professional development programs: psycho-pedagogical module, training

programs for Project Manager, Trainer for trainees, Project Evaluator, as well as professional development programs for Internal Managerial Control System, Process Improvement Manager, which allowed me to acquire skills that gave me the possibility to access new opportunities: teaching courses in projects for adult education and the participation in various national and international educational and research projects.

I have 20 years of teaching and research experience.

In 2001 I started teaching at "Ovidius" University of Constanta, first as a collaborator, and from February 2001, as a full-time teaching assistant until 2007. Between 2007 and 2014 I was an university lecturer and from February 2014 I am associate professor. During these years I have taught courses and seminars in the field of finance and international business: capital markets, financial markets, international finance, international monetary financial relations, regulations and institutions in capital markets, payment and financing techniques, international investments.

In addition to my teaching activity, as a full-time associate professor of the Faculty of Economic Sciences from Ovidius University of Constanta, I was permanently involved in all activities carried out within the faculty in the service of an educational process that recognizes and promotes value, ensuring optimal conditions for its development:

- I coordinated over 100 bachelor and dissertation thesis of students, especially to study programs in the fields of finance and accounting;
- I carried out tutoring activity for students from undergraduate study programs;
- I coordinated the specialized practice.
- I participated in the organization of olympics and competitions for students;
- I was part of the committees for organizing national and international conferences, as well as workshops organized by the Faculty of Economic Sciences;
- I participated in the realization of the authorization/accreditation/re-accreditation files for bachelor and master study programs within the Faculty of Economic Sciences;
- I was a member or president in the commissions for finalizing the master's or bachelor's degree programs, as well as in the admission commission within the faculty;
- I was permanently involved in organizing events with employers to facilitate the process of adapting the university curriculum to the requirements of the labor market.

Opened to opportunities and willing to accept new challenges, I have permanently carried out teaching activities in educational projects and mobility programs for teachers funded by European funds.

My teaching experience was enriched by teaching in French and English, as a visiting professor, in the frame of the ERASMUS program and in a Tempus project, the courses international finance and financial management, for 6 teaching missions.

Starting with October 2013, my teaching activity was completed with a management activity by occupying the position of Head of Office for the Erasmus Plus Program, a position that allowed me to improve my managerial skills and also to actively contribute to the implementation of the internationalization strategy of Ovidius University of Constanta,

becoming a constant promoter of the opening of international collaborations both for teaching activities and for research.

Research activity

The doctoral study program carried out between 2002 and 2009 at Al. I. Cuza University Iași was the basis and, at the same time, the starting point of my preoccupations in the field of research, the doctoral thesis representing the first notable scientific product. The complex topic developed in the doctoral thesis entitled "Financing the economy through the capital market" is one of the directions on which my research focused both during the doctoral studies and after their completion.

Very important for consolidating my research activity was the admission to the Postdoctoral Academic School in Economics - SpDAE, developed by the Romanian Academy, starting with October 2010. The attendance of the knowledge development component, as well as the individual research stage started in March 2011 and completed in January 2013, is an essential pillar in the development of my university career. The individual research provided by the post-doctoral program materialized in the participation to a series of international conferences, in the elaboration of several articles and their publication in journals indexed in international databases and in ISI-listed journals, and all these preoccupations and efforts led to the realization of a post-doctoral dissertation on "Capital flows, financial integration and the crisis of the Romanian economy".

The research activity was materialized in specialized articles published in journals indexed in Web of Knowledge with influence score and nonzero factor (6), indexed in Web of Knowledge without influence score and factor (1), indexed in international databases (29), national journals (10), as well as papers presented at prestigious international conferences in Romania and abroad (40) of which 10 are published in ISI Proceedings indexed volumes.

In order to develop the teaching activity, I published three books as a co-author: Payments and financing in international affairs - studies and applications, International financial-foreign exchange relations - seminar book, Payments and financing in foreign trade - seminar book.

In the last 15 years I have been part, as a member or project coordinator, of the research/implementation teams for several national and international projects won through competition:

- 2 national research projects (PNII)
- 4 international research projects, of which one as project coordinator.
- 7 national projects financed from operational programs
- One international INTERREG V project as project coordinator
- 4 institutional development projects, of which 3 as project director.

Medium and long-term objectives in terms of teaching activity

An important objective that any teacher must constantly keep in mind is to improve teaching methods in order to achieve two equally important goals: to pass on to students the information that will help them build a solid foundation as economists and at the same time, arousing interest and concern for individual study and for developing the acquired knowledge. The approach of modern, interactive teaching methods has proved to be particularly effective, both for stimulating attendance at courses and for setting study guidelines for students. In addition, I want to intensify and perpetuate a system of study visits to the fundamental institutions for the Romanian financial market (the National Bank of Romania, the Financial Supervisory Authority, the Bucharest Stock Exchange) that I initiated three years ago with very good results.

The increase of the quality of the teaching activity is achieved, in my opinion, combining the adequate teaching methods with the quality of the transmitted information, an objective that I set out to achieve by constantly updating the informational contents of the courses and seminars. The field of finance, especially the financial markets, characterized by the permanent increase of the complexity of structures, transactions, instruments used and the relations that are developed between the actors on these markets and the dynamism of institutional architectures under the rule of a permanent change of regulations, makes necessary the continuous connection to the latest theoretical approaches in the field, but also to the practical realities, both at national and international level, in order to offer students a thorough training that will give them the opportunity to face the challenges of the real economy.

In order to facilitate the individual study of the students, I propose myself to publish the course and seminar supports related to the disciplines I teach.

For a better collaboration between the teacher and the student and to stimulate their involvement in research activities, I propose myself to develop working groups and student research teams to include students interested in developing the study topics in the field of financial markets. Such extracurricular activities will certainly lead both to a better assimilation of the informational content and to the development of students' economic thinking. This double effort, both teacher and of the student, can be appreciated by the participation of students in Olympics and student competitions held at national and international level.

From the perspective of enrolling in the direction of a student-centered teaching process, I propose myself to intensify the relationship with students in the coming years through an e-learning platform. This will allow me a better student teacher interactivity, will stimulate the involvement of students in collaborative projects, will provide a quick and direct feedback of the quality of the teaching activity and will allow me to make a permanent assessment throughout the academic year of the progress made by the students in the study of the proposed topics.

Another objective of my future teaching activity is to continue guiding students from undergraduate and master study programs in completing their bachelor's and dissertation thesis.

Last but not least, I propose my continuous improvement as a teacher by participating in various training/documentation/teaching internships in educational institutions in Romania and abroad, in order for me to be permanently connected to the newest and most modern teaching methods and techniques.

Medium and long-term objectives for research

The experience gained and the development of several fields of interest, having as starting point the doctoral program and the postdoctoral studies, have drawn me the research directions that I want to develop:

1. As the 2007-2008 financial crisis showed, when markets go wrong, they can cause a lot of harm. During a crisis even strong markets proved fragile and their fragility spread to the wider economy.

That is why I consider a constant interest the researches regarding the capacity of the financial markets to adapt and to reform in order to face the crises that the global economy encountered more and more often even if they are of different magnitudes:

- continuing the investigation through qualitative and quantitative methods of researching the performances of the capital markets, first of all the Romanian one but in an international context, in two directions: on the one hand regarding the capacity to ensure the financing of the real economy and on the other hand in terms of the ability to attract investors.

- the use of new methods to investigate the capacity of the banking industry to face the new challenges - the accelerated digitization of financial services as well as the way in which banks can maintain their performances.

- further investigation of consumer satisfaction of banking services, because research has already shown that the new conditions in which banks are forced to operate (increasing competition from the shadow banking segment and the fintech companies whose turnover has grown exponentially in recent years) includes profound change in their development strategies. In this context, the developed knowledge of the factors influencing the consumer satisfaction and the consumer behavior will become a weapon that the academic environment can provide to managers in the banking industry. Without understanding these factors, banks will no longer be able to make the right decisions to ensure customer loyalty and retention.

2. The development of the econometric analysis that would allow the investigation of the factors of the capital flows, as well as the analysis of the hysteresis phenomenon regarding the foreign investments starting from the results obtained in the realized researches and in the international specialized literature. The hysteresis phenomenon, through its two characteristics – remanence and selective memory, can show new ways of developing strategies to attract foreign investors considering the factors influencing their behavior.

3. The third main research direction will continue the latest research direction on the capacity of managers and entrepreneurs to adapt to the need of developing sustainable businesses: how to adapt to new development directions in terms of managing the resources

available to them, how to change business strategies and approaching consumers who have as a criterion, when choosing products and services, the level of sustainability of a business, the real cost-benefit ratio for the implementation of measures and strategies to make the business sustainable and environmentally friendly. Future research will continue to investigate the tourism industry, but I will extend it to other industries with high potential for negative environmental impact.

4. The forth direction of research regards the residents of touristic cities perception of tourists visiting and living in the city using different econometric models and aggregate indicators of support and tolerance, especially from the point of view of the binomen economic benefits – negative effects on environment, historical attractions and the standard of living of the residents.

In accordance with the previously approached topics circumscribed to the field of finance and international business, but also with the assimilation of new fields of interest, I will continue documenting, researching and publishing articles in specialized journals (publishing scientific papers in extenso in ISI listed journals in Romania and abroad), publishing scientific papers in extenso in journals indexed in prestigious international databases.

Another way to highlight the results of the scientific research, especially those carried out on research directions initiated during the doctoral and postdoctoral programs, I propose to be the publication of books in international publishing houses.

I will continue to participate in national and international scientific conferences and seminars because it is an opportunity to present the results of my own research, to obtain useful feedback from other participants and the opportunity to know directly the results of current research. The interaction, the suggestions received, the initiation of the collaborations lead to a superior quality of the scientific research. So far, I have participated in over 40 national and international conferences, held both in Romania and abroad, and I intend to continue with this approach.

For the individual research activity to produce notable and useful results for the business environment, I consider it essential for a researcher to get involved in scientific research projects, both national and international. My involvement as a member in research projects, gave me the opportunity to be part of the research teams with a wide range of areas of expertise which allowed me to broaden my horizons in the direction of multi and interdisciplinary research. The experience gained will be extremely useful in continuing my research activity by initiating project proposals, but also by collaborating in partnerships for the implementation of projects both nationally and internationally.

Convinced of the importance of the participation of each researcher in scientific events that allow the connection to the latest research in the economic field, I was the initiator, together with colleagues, of the first scientific event organized by the Faculty of Economic Sciences of Ovidius University of Constanța. Since 2004 I have been involved and I will continue to be involved in organizing the scientific events of the Faculty of Economic Sciences.

I believe that being a member in scientific and professional societies (CEDIMES, 2008, Economic History Society, 2017) has contributed to broadening my professional horizon and continuing to participate in research activities started within these professional organizations remains a priority.

Being already a member of scientific committees of international events whose volumes are indexed in the ISI Thomson database, I believe that, with access to a higher teaching degree, it becomes a priority to increase national and international recognition and visibility as a researcher, which will certainly contribute to increasing the visibility of the institution in which I am a full-time associate professor.

All my efforts will be channeled towards achieving the proposed objectives so that my future activity, both based on the skills acquired and the experience gained, as well as the possibilities of collaboration within the faculty, but also with other university centers, will rise to the standards of the international academic environment and will truly contribute to the training of the future generations of economists preparing them to meet and overcome professional challenges.

In my opinion, the dichotomy didactic activity - scientific research activity is apparent, the development of a solid university career not being possible without the interpenetration of didactic and scientific research preoccupations. I believe that all the above can be summarized in a single goal that I tried, through all the activities carried out, to achieve from the first day I entered a classroom as a teacher – qualitative professional training of my students to face the challenges of the economic reality and to be able to integrate in the labor market in the shortest time.

LIST OF FIGURES

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