Is BET-FI a domestic index leader for Bucharest Stock Exchange?

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Abstract:
One area of strength of a frontier market, in general, it is represented by the diversification potential it might offer to the portfolios of international investors.
We concentrated our attention on Bucharest Stock Exchange due to its leading position by size among the EU frontier markets. It also reports seven indices for the main equity market. In our study, by using the Granger causality, we will tried to establish if Bucharest Stock Exchange has a domestic market index leader, and if that leading index gives an indication regarding the internal diversification potential of Bucharest Stock Exchange.
The general hypothesis tested was: *BET-FI does Granger cause all the other 6 BVB indexes and it is not Granger caused by any of them*. The corollary of this hypothesis would have been: if BET-FI is a market index leader, the BVB internal power of diversification is limited to the components of the respective index portfolio. The question regarding BET-FI potential as a market index leader was raised by the position of its constituents within BVB equity sector, which were considered 'an engine' for BVB trading activity.
The results implied the hypothesis to be rejected. BET-FI can not be considered an index leader for the whole market. However, the results also pointed out that BET-FI can be considered an index leader for the four blue chip indices calculated at BVB, and by extension for the 1st category equities. By exhibiting the features of a frontier market, the BVB transactions are concentrated around a small number of (five) shares. In this situation, the diversification alternatives are much reduced, an investor being able to choose either among a handful of liquid shares or to choose the SIFs.
While BVB internal diversification power is not as reduced as we expected, ***it remains at low levels***.
The findings of this paper imply that BVB has a relatively fragile position within financial markets pan European developments, represent impairment on the main Romanian exchange future development and on BVB potential to accede the emerging market status, and represents also an important weakness in the competition it has to face against the other EU frontier exchanges.

Key words: frontier market, diversification, Granger causality, Romania

JEL Classification: G10, G19

1. Introduction and literature review

1.1. Introduction

In order to describe a subset of small, illiquid markets, considered to be at an early stage of economic and financial development compared with established emerging markets, the term of 'frontier markets' was introduced in 1992 by International Financial Corporation's Farida Khambata (Fowler, 2010). The use of this term ('frontier market(s)') was scarce until the second half of the 2000s. The increase in popularity and use of 'frontier markets' was triggered by the successive launches of dedicated frontier market indices by Standard & Poor's (in August 2007), MSCI Barra (in December 2007) and FTSE (in July

2008)[1]. The launching of the dedicated indices was accompanied by the announcement of the general criteria used to include a country and its respective security exchange(s) in the index portfolios. A core subgroup of countries, labeled 'frontier markets' became available to all those interested: investors, professionals and researchers alike. The growing importance of frontier security/ equity markets for the international investors was recently pointed out by De Groot et al. (2012) mentioning the increase in listing of new mutual funds and exchange traded funds on frontier markets.

Quisenberry & Griffit (2010) consider 'frontier markets' to represent a loosely defined class of countries. Within the existing academic literature, the term 'frontier market' is used in a dual way, representing either developing economies or the security exchanges established within the respective economies.

Within this paper, we will use the term frontier markets to designate frontier security/ equity markets (exchanges).

The frontier exchanges included in the dedicated frontier indices by Standard & Poor's, MSCI Barra and FTSE belong to a vast variety of countries from development level viewpoint, considered to be frontier economies (Annex 1a). According to Speidell (2011), frontier countries account for 21.6% of the world population, 6% of the world nominal GDP and only for 3.1% of world market capitalization. This situation indicates the fact that frontier markets are often overlooked or only marginally considered by international investors. The main reason for this avoidance might be the relative low level of transparency and the limited amount of data available on frontier markets.

The current paper tries to fill the gap in information to some extent by focusing on a European Union frontier market, namely Bucharest Stock Exchange.

Within the European Union (EU) a number of eight (8) security exchanges are considered to belong to the frontier market category, while Latvia is included in this category only by Standard & Poor's (Annex 1b). The position and development potential of EU frontier markets must be considered cautiously since these markets have to face a faster process of integration with the developed and emerging markets of EU, a process highlighted by Bergof & Boltan (2002). Also Haas (2007) pointed out that the advent of Market in Financial Investment Directive (MiFID) under the Financial Services Action Plan (FSAP) of European Commission is likely to raise the critical size needed for exchanges to attract and to retain liquidity and to generate revenues necessary to invest in the needed technology. MiFID has been enforced starting with November 1st 2007 and is expected to generate an increased competition pressure mainly through the development of alternative trading venues as Skinner (2007) shows. Considering just these several ideas, a small, less liquid security market might not be relevant in EU context as Iorgova & Ong (2008) pointed out. In such an environment, if the EU frontier markets will not find the way for further development and consolidation, their independent status becomes questionable. In a best case scenario, they might be integrated in regional alliances or they might disappear as entities by being took over by their competitors; in the worse case, they will be closed because the competitors will provide better and less costly trading platforms. One main strength of any frontier market is represented by the diversification potential they might offer to international investors for their portfolios.

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[1] Standard & Poor's launched the first index dedicated to frontier markets, S&P/IFCG Extended Frontier 150, August 8th 2007. October 22nd 2007 S&P Selected Frontier was also launched, consisting of 40 of the largest and most liquid stocks from the S&P Extended Frontier 150. November 1st 2008 a new index on frontier markets was launched: S&P Frontier BMI (Broad Market Index) 500 with a large portfolio of over 500 stocks from 36 frontier markets. (The information above is based on: www.spindices.com/indices/equity/sp-extended-frontier-150, www.spindices.com/indices/equity/sp-selected-frontier-index, www.spindices.com/indices/equity/sp-frontier-bmi-us-dollar)

MSCI Barra Frontier Market 100 Index was launched December 18th 2007. Currently its portfolio includes 185 constituents of 30 frontier markets (according to: www.msci.com/resources/factsheets/index_fact_sheet-/msci_frontier_emerging_market_index.pdf).

FTSE launched FTSE Frontier 50 Index July 29th 2008. The 50 stocks were chosen from 23 to 26 frontier markets (according to: www.ftse.com/Indices/FTSE_Frontier_Indices/Downloads/FF50.pdf).

We concentrate our attention on Bucharest Stock Exchange due to its leading position among EU frontier markets, from the size point of view. With 78 domestic companies and 2 foreign companies listed on its main equity market segment, Bucharest Stock Exchange seems to be attractive. On the other hand, Bucharest Stock Exchange reports seven equity indices related to its main equity market, which might create confusion among investors less familiar with the exchange. In our study, by using the Granger causality, we will try to establish if Bucharest Stock Exchange has a domestic market index leader, and if that leading index gives an indication regarding the internal diversification potential of the Bucharest Stock Exchange, an important factor for the exchange development. The result will also have further value for academic researchers and practitioners: only the leading index can be taken into consideration for various cointegration, correlation and contagion processes when Bucharest Stock Exchange is considered for various researches.

1.2. Literature review

The academic literature covering the topic of frontier (security/ equity) markets is relatively scarce compared to the amount of studies dedicated to emerging markets. The turning point in the academic literature focused on frontier markets can be considered the launching of frontier indices during the second half of 2007. The lists of countries included in the indices' portfolios became available for those interested and generated a general framework for the research in this area.

Dvorak & Podpiera (2006) focus their attention on a mix of 8 emerging and frontier EU accession markets and suggest that the integration of these markets into world markets manifested itself through the dramatic rise in the respective stock prices following the EU enlargement announcement.

Miles (2005) and Maneschioeld (2006) test the integration of a subset of emerging and frontier markets, respective of Baltic exchanges with the world markets. Both studies suggest that international investors can obtain potential diversification benefits through investing in the markets under analysis. These two studies preced the series of studies with the similar topics published during and after 2007.

Speidell & Krohne (2007) study is probably the first published around the launch of dedicated frontier market indexes. It is focus only on frontier markets and documents their promising diversification potential, while highlighting the low correlation of frontier markets with S&P 500 index compared with emerging markets. Speidell (2008) continues the previous study by investigating the diversification benefits in frontier markets under the influences of financial crisis. The paper argues that frontier markets superior performances (during the first 16 months of the financial crisis) were generated by the dominance of local investors more concerned with local factors than with global credit problems.

The idea of potential diversification benefits generated by investing in frontier markets was investigated and received further support through the findings of Girard & Sihna (2008), Quisenberry & Griffith (2010), Berger et al. (2011, 2012), and Nikkinen et al. (2011). These studies investigate different subsets of frontier markets over different periods. De Groot et al. (2012), while using a large sample of over 1,400 stocks from 24 of the most liquid frontier markets, also argue that the inclusion of frontier market strategies generate more efficient portfolios, and show that the findings hold during the first period of the recent financial crisis. All the studies mentioned above also document the low correlation and the low integration of frontier markets with world markets. Marshall et al. (2012a) complete the picture of diversification potential in frontier markets by showing that while the transaction costs in these markets are considerable larger than those registered in US markets, the low correlation of frontier markets allow for diversification benefits that, on average, overweight transaction costs from 2002 to 2010.

Kohlert (2011) using MSCI Frontier Index concludes that frontier markets in general provide useful diversification benefits, nevertheless these benefits tend to disappear during periods of crisis. This viewpoint is different compared with those expressed by the group of studies mentioned above, and the results might be influenced by the length of the period under analysis.

A very small group of papers is concerned with the liquidity in frontier markets: Mincovic & Zivcovic (2010) perform the analysis for the Serbian equity market, while Marshall et al. (2012b) considers 19 frontier markets for the study of liquidity measurements.

Other studies, like those previous 2007, analyze different subsets of equity markets that include a mix of emerging and frontier countries. All the studies in this group are concentrated on the diversification potential of the emerging and frontier equity markets taken into consideration. Jayasuriya & Shambora (2009), Cheng el al. (2010), Chan Lau (2011), and Bley & Saad (2012) support the idea of the diversification benefits.

Meanwhile the studies of Middleton et al. (2008) and Samarakoon (2011) express slightly different viewpoints by showing that diversification benefits should be considered with care. Middleton et al. (2008) suggest that the diversification benefits exist for the 8 emerging and frontier markets from Central and Eastern Europe under analysis, however they derive mainly from geographical spread rather than from the industry mix of the equity included in the portfolio. Middleton et al. (2008) also warns against the risk of dramatic variations of returns earned by CEE equities and point toward the drawbacks of such swings over the respective markets diversification potential. Samarakoon (2011) shows evidence of small magnitude interdependence and contagion in frontier markets with respect to US shocks during normal times. Further the paper shows that the frontier markets are influenced by US shocks more during the crisis and finds that the US financial crisis had a higher contagion effect on frontier markets than on emerging markets and concludes that portfolio diversification in frontier markets does not provide an effective hedge against US shocks in crisis times.

Niemczak (2010) is the only study that investigating the diversification benefits for US investor in the region of Eastern Europe (using a mix of emerging and frontier markets). The results reveal that Eastern Europe does not provide much diversification from the point of view of US investors. The different results of Niemczak (2010) compared with previous studies might be generated by the subset of countries under analysis which include Russia and Ukraine, two markets that were not taken into consideration by the previous mentioned studies.

The Romanian capital market drew little attention from international academic community. Harrison & Paton (2004) document the level of inefficiency at BVB during its first years of operations and highlight the diminution of this inefficiency starting with January 2000. Skully & Brown (2006) present a detailed analysis of Romanian financial market before the country's accession to European Union.

The domestic academic literature regarding Bucharest Stock Exchange is growing. However, only a limited number of studies focused on the problems and challenges BVB has to face in the pan-European exchanges environment. Anghelache (2007) tries to outline a potential evolution for BVB after Romania's accession to EU. Sargu (2010) discuss some aspects of European integration process' impact on Romanian stock market. Stoica (2010) discuss the Romanian capital market position within the developments undergone by the European capital markets, while Pop (2011) assesses the position of BVB among the exchanges of Central and Eastern Europe. Both studies (Pop, 2011 and Stoica, 2010) are stressing the relative weak position of Bucharest Stock Exchange within the pan-European developments.

The academic studies dedicated to BET-FI, the index under investigation within this paper, are few. Dima et al. (2007) investigate the BET-FI static properties, while Socaciu & Danubianu (2009) investigate the universality hypothesis for BET-FI. More recently Pop et al. (2012) showed that BET-FI is an index leader for Romanian blue chips shares.

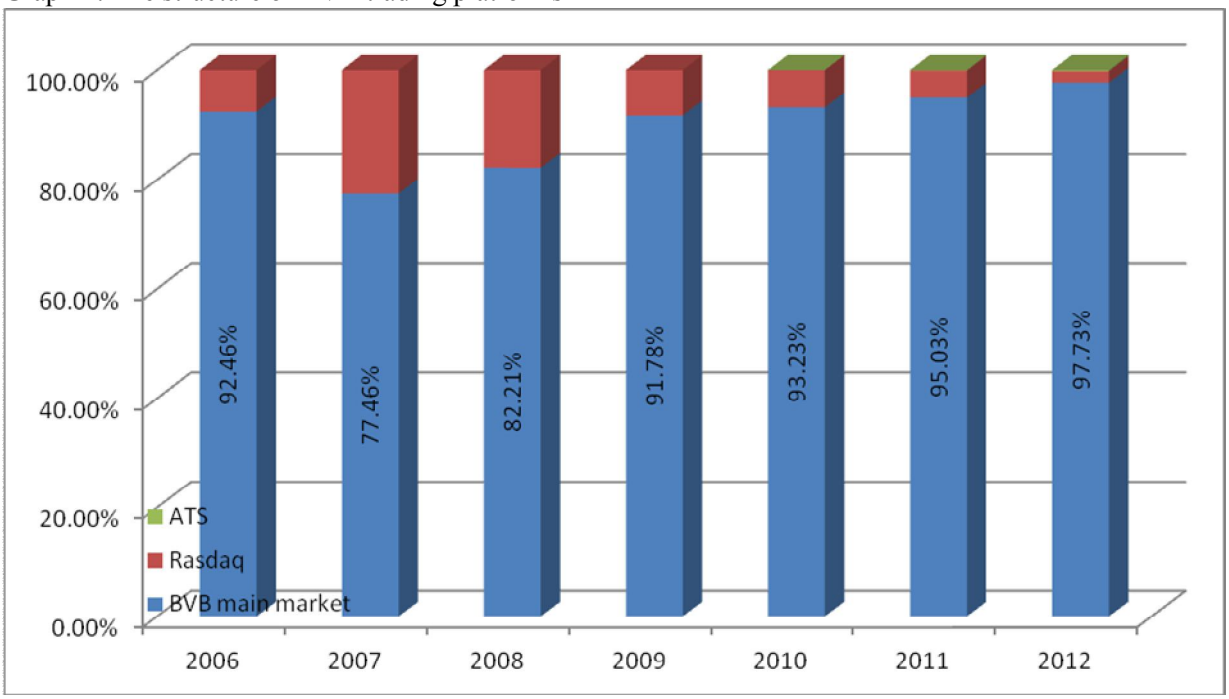
The present paper continues and extends the research of Pop et al. (2012) by applying the Granger causality to all stock indices calculated for Bucharest Stock Exchange main market, and extending the period under scrutiny until the end of 2012. The paper is based on the idea formulated by Canegrati (2008) regarding the index leaders at world level. By applying the Canegrati's idea at the level of BVB, where no less than seven indices are reported, the authors consider that the position of BET-FI as an index leader can also reveal the limited diversification potential of the frontier Bucharest Stock Exchange.

Further, our paper is structured as follow. Section 2 presents briefly Bucharest Stock Exchange, while section 3 documents the position of BET-FI portfolio constituents within Bucharest main equity market. Section 4 presents the hypothesis, methodology, data, and discussions; section 5 concludes.

2. Bucharest Stock Exchange: a brief presentation

Bucharest Stock Exchange (BVB[2] henceforth) opened for transaction with 8 listed companies in November 1995. Currently, it operates three trading platforms: the main market, the Rasdaq market, and the ATS (Alternative Trading System). The Rasdaq market was included in 2006 through the absorption of the Electronic Exchange Rasdaq at the end of 2005. It trades mainly shares. The ATS was introduced in 2010 as an alternative to the Rasdaq platform. However, until December 2012 only one Romanian company is listed on ATS, while the core of this system trading is represented by the parallel trading of listed foreign companies' shares from United States, Germany and France. Based on their contribution to the total turnover, the importance of the three platforms within BVB is presented in Graph 1 below.

Graph 1: The structure of BVB trading platforms



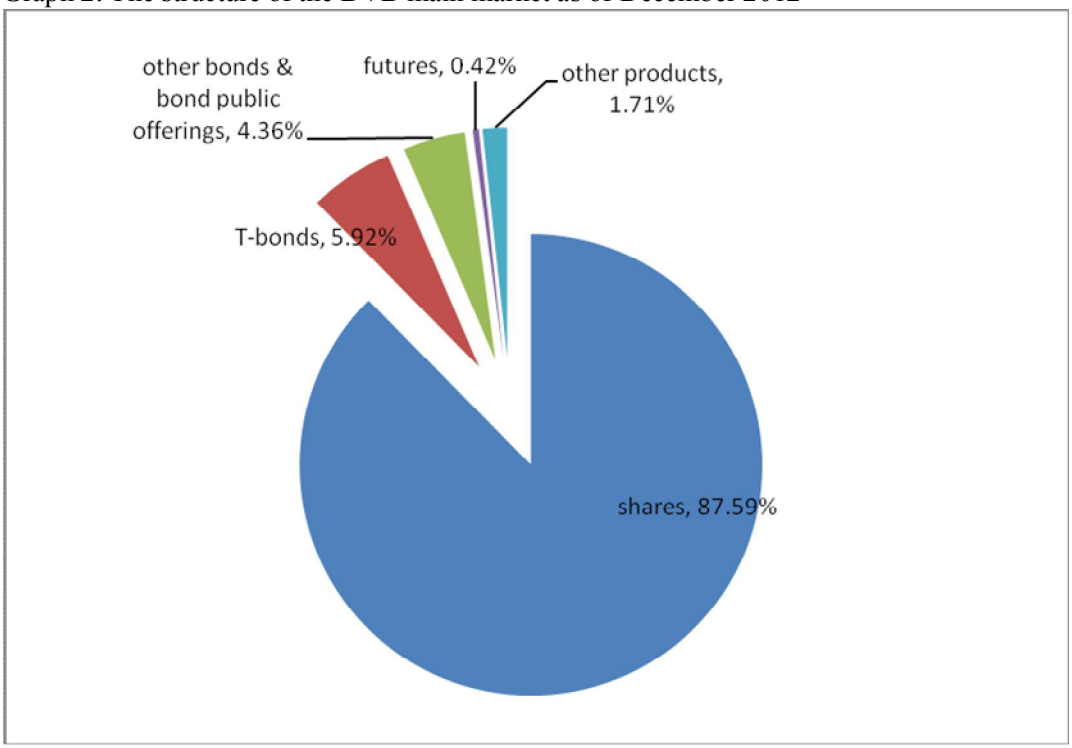
Source: authors' calculations based on BVB data

As it can be seen, the main market is the most important trading platform within BVB. From this point forward the attention will be concentrated on BVB main market developments. Until 2001 only equities were traded at BVB. November 2001 witnessed the introduction of municipal bond sector, followed in May 2003 by the domestic corporate bond sector, and in September 2006 by the international corporate bond sector. While the request was made by investors since 1998, only in August 2008 the Romanian government bond sector was launched. In order to diversify the available financial instruments and to provide hedging alternatives, in September 2007 the futures contracts were introduced, thus with limited

[2] The abbreviation BVB was chosen in order to avoid any confusion with other stock exchanges in the Central and Eastern European region. BSE abbreviation can stand for: Budapest Stock Exchange, Bratislava Stock Exchange, Belgrade Stock Exchange, Bulgarian Stock Exchange and, of course, for Bucharest Stock Exchange.

success. In September 2008 the sector for ETFs (Exchange Traded Funds) was launched, followed in July 2010 by the introduction of structured products sector (until December 2012 only structured notes/ certificates were listed). The cumulate structure of these sectors is presented in Graph 2. It clearly shows the dominance of equity market within BVB main market. The importance of equity market segment is also highlighted by the seven (7) indices reported. Details regarding these equity indices are presented in Annex 2a.

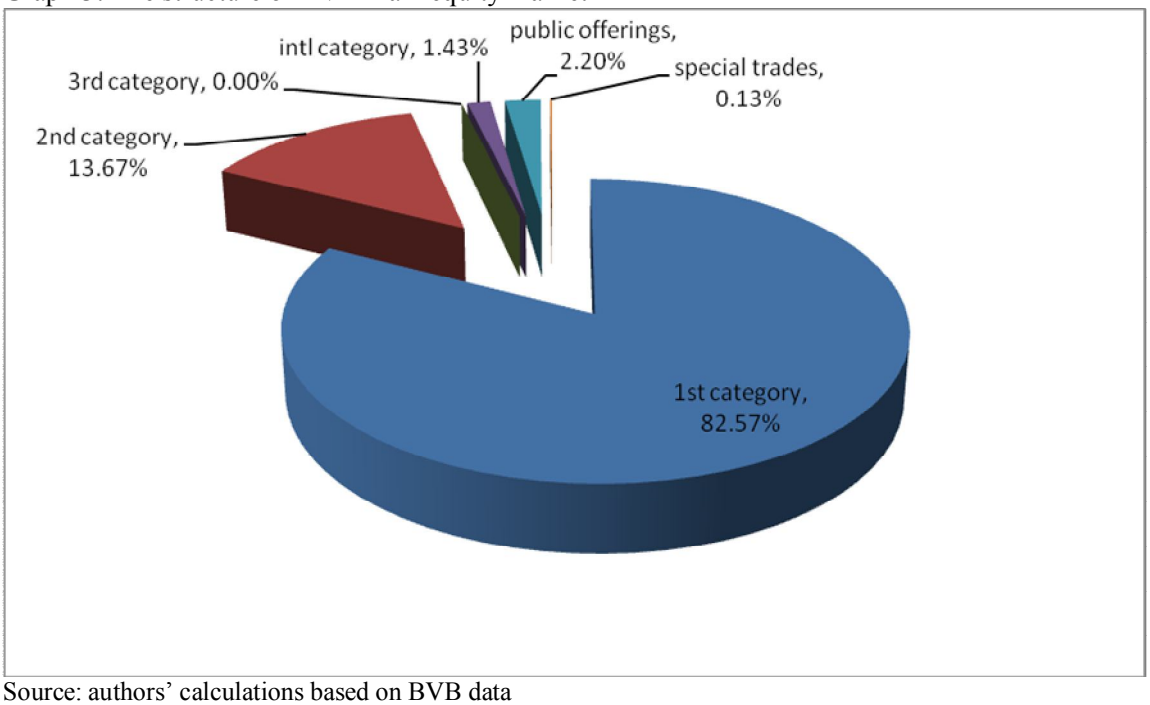
Graph 2: The structure of the BVB main market as of December 2012



Note: Other products category includes: rights, other investment funds, ETFs, and structured certificates
Source: authors' calculations based on BVB data

The equity segment of BVB main market is divided in three (3) categories (or tiers). The base, respectively the second category, is the oldest. The first category was introduced in January 1997 for the Romanian blue chip companies. The third category was created in November 2007 in order to improve the listed shares' ranking by quality. However, as of December 2012 only one company is registered within this third category. The position of these 3 categories within BVB turnover is presented in graph 3. As the graph shows, the first category attracts the highest level of transactions.

Graph 3: The structure of BVB main equity market



Source: authors' calculations based on BVB data

The main equity market at BVB has all the features of a frontier market. The low equity market capitalization is presented in Annex 1b and shows that compared with the emerging markets in the region, BVB capitalization is about half the size of Budapest Stock Exchange capitalization and it rises barely slightly over 10% of Warsaw Stock Exchange capitalization. The same Annex 1b also presents the limited liquidity of BVB measured through turnover ratio which is barely 10.5%; only two EU frontier exchanges rank lower: the Slovak and the Latvian stock exchanges. More detailed data regarding the liquidity at BVB can be found in Annex 2d. While the current paper does not investigate the level of volatility at BVB, a glimpse of this aspect can be seen in Annex 2c where the annual returns of BVB main market indices are presented. The high level of BVB volatility was also documented by Panait (2011) for the period 2007-2009. The low level of integration of BVB with the world markets is documented by the papers presented in the literature review, where Romania is included in the groups of frontier markets considered for analysis. Another feature of a frontier market can be considered the low number of outstanding shares: at the end of 2012, for the all 78 Romanian listed companies, the average number of outstanding shares was of 1.8 billion, with an average free float of about 37%. Further, the concentration of trading around a small number of stocks is reflected in Annex 2a where the main companies of BVB indices' portfolios are presented. For five of the seven BVB indices a number of 5 companies[3] (three of the financial sector, one utility company, and one in petroleum extraction sector) are dominant within the respective index portfolios, covering a cumulate weight between 32.11% and 87.89%. In the case of BET-NG (sector index dedicated to energy) SNP and TGN symbols represent over 60% of the portfolio. These five companies while being the companies with the highest capitalization, they are also the most traded. The importance of the financial sector at BVB is presented in Annex 2e. This sector represents, in average for the period 2001-2012, 45.77% of BVB capitalization and 63.75% of BVB turnover. This position is correlated with the fact that the companies of the financial sector had, at the end of 2012, an average free

[3] It also must be mentioned that these 5 companies are all listed within the first category at BVB and are considered blue chips.

float of about 86%, while the average outstanding number of shares is only slightly higher (2.1 billion) than the general average (1.8 billion).

For an equity market that seems to gravitate around a relative small number of stocks and being dominated by the financial sector, the number of seven indices calculated for it is high and puzzling for any investor. Compared with the indices reported by the frontier stock exchanges of EU27, only other two exchanges display more than 2 indices: the Bulgarian Stock Exchange with 4 indices, and the Cyprus Stock Exchange with 8 indices. The reasons behind such a high number of indices calculated at BVB can be discussed at length, thus a brief explanation might be provided that the newly launched indices tried to provide a better portfolio combinations in order to overcome the minuses of the older BVB indices.
Any investor and researcher that have an interest in BVB would ask the same question: which index to consider? The next natural question that arises: are any of these indices a leading index? In order to answer to these questions we chose to focus on BET-FI index, the index dedicated to the financial sector, which includes in its portfolio only the six closed-end funds listed within the first category on BVB main equity market. The choice was triggered by the special position five of these investment funds[4] had at BVB since they were listed in November 1999.

3. The position of SIFs within the equity main market at BVB

3.1. SIFs before listing at BVB

The SIFs precursors were the five Private Property Funds or PPFs created under the Law no.58/ 1991. These funds were part of the Romanian privatization process during the first half of the 1990s. According to the aforementioned law, to each PPF a number of companies were allocated. The allocation process was based on the regional concentration of the assigned companies. The name[5] of each PPF reflected the region where the respective allotted companies had their headquarters. From the State Ownership Fund a maximum of 30% of the assigned companies' shares were transferred toward the five PPFs.
November 1st 1996 marks the birth of SIFs under the Law no.133/ 1996 that decided the transformation of PPFs trough incorporation in the newly created investment companies. SIFs were incorporated as public limited companies and their main activity became the management of the allotted financial assets (domestic shares). Under this organization format, SIFs can be considered closed-end funds, sub-type: equity funds. However, under the current Romanian regulations[6], SIFs are defined as 'other undertakings for collective investment in transferable securities' (other UCITSs). For any domestic investor they are simply investment funds, since the term 'closed-end' funds is rarely used in Romania.
Since the beginning of their existence, SIFs situation was unusual (Apostu, 1998): (i) they inherited the portfolios of the former PPFs which had no possibility of choosing the allotted companies; (ii) the inherited portfolio structures were strongly influenced by the Romanian complicated privatization process; at the time of their creation, November 1996, SIFs portfolio structures were still under discussions and negotiations with the State Ownership Fund; (iii) SIFs had a large number of shareholders (over 5 million each) divided in two broad categories: those who subscribed to PPFs during 1996 within

[4] The general name if these five closed end funds is in Romanian: Societate de Investitii Financiare (Financial Investment Company) from where the SIF(s) abbreviation that will be use henceforth.
[5] Until October 1996, the names of PPFs were: PPF Banat-Crisana or PPF1, PPF Moldova or PPF2, PPF Transilvania of PPF3, PPF Muntenia or PPF4 and PPF Oltenia or PPF5. In November 1996 the five PPFs became SIFs and their names were respectively transformed in SIF Banat-Crisana or SIF1, SIF Moldova or SIF2, SIF Transilvania or SIF3, SIF Muntenia or SIF4 and SIF Oltenia or SIF5.
[6] The Law no. 297/ 2004 and the Regulation no. 15/ 2004, issued by Romanian National Securities Commission, regarding SIFs.

the announced subscription period, and those who became SIFs' shareholders latter (during 1997 and 1998) as a result of countless alterations to the law and regulations concerning Romanian privatization process. Many of the investors in the last category were not even aware of the fact they were actually shareholders to a SIF; (iv) there were also many changes to the shareholders' database (e.g. changes of names, addresses, deaths etc.) which were not tracked properly.
During 1997 and 1998, SIFs administrators had the difficult task of identifying the entire number of their respective shareholders. Also between 1997 and 1998 the discussions and negotiations of SIFs representatives with the State Ownership Fund continued on the topic of SIFs portfolio structure. At the end of 1998, through the Government Emergency Ordinance no.54/ 1998 this topic was considered settled and the situation of SIFs' portfolios was clarified. Starting with 1999, SIFs administrators were able to manage their portfolios by changing their structure and selling those companies they considerate bad stakes.
Due to their large number of shareholders and interested investors there was a constant pressure on SIFs representatives to list the investment companies at BVB. SIFs listing at BVB first category/ tier started November 1, 1999.

3.2. SIFs position at BVB

Despite the initial ownership limit established to 0.1% of any SIF shares, the large number of SIFs shareholders and the interested investors created the critical mass for frequent trading of SIFs. Immediate after their listing they increased the total turnover at BVB, November 1999 turnover being 5.4 times higher than the October 1999 turnover. The daily averages of 2000, in comparison with 1999, increased as follow: the number of transactions with 22%, share trading volume with 74%, and the turnover with 75%.
Table 1 presents the evolution of SIFs capitalization and how much it represents of BVB main equity market capitalization. The decrease of SIFs capitalization ratio in 2004 to less than 7% was due to the wave of foreign investors that entered Romania along with the investments made in the Central and Eastern European countries that became EU members that year. Since Romanian shares were considered undervalued, those investors spread their attention toward all sectors, SIFs not being favored due to the low ownership threshold of 0.1%. In 2005 SIFs regained the attention of all investors amid of discussion regarding the increasing of ownership limit to 1%, finally introduced in November 2006. The second and more severe decrease in SIFs capitalization ratio came in 2008 under the influence of the world financial crisis. The period that followed, 2009 to 2012 was marked by the influence of successive burst of crisis periods[7]. Another factor that impaired the SIFs position was the listing, starting with the end of January 2011, of a similar closed-end fund: Fondul Proprietatea[8] (FP). As it can be observed, this new company alone concentrates around 8% of BVB main equity market capitalization. SIFs and FP combined capitalization ratios indicate a level of around 11%, similar to that reached by SIFs during 2005-2007 period.

[7] In order to boost investors' interest toward SIFs, after three years of discussions, the ownership threshold was increased again to 5% per person or group of persons for any SIFs. This new ownership limit became effective at the beginning of 2012 under the Law no.11/ 2012. However, the too long postponed decision seems to came too late; it did not generated an increased interest in SIFs.
[8] Fondul Proprietatea (FP) was created in order to compensate those persons who were not able to receive back their nationalized properties, either due to destruction, or due to current state ownership for strategic reasons. As in the case of PPFs, Romanian government decided that a percentage owned by the state in various companies will be allocated to FP. After years of discussions, negotiations and administrative problems, during 2010 all the conditions to lists FP were fulfilled, a foreign fund manager was appointed and at the beginning of 2011 this sixth investment fund start trading at BVB. Within this paper we will not try to translate FP name in English since no such translation exists on the fund's website: http://www.fondulproprietatea.ro/index.php/pages/en/1/Homepage.html

TABLE 1
SIFs' AND FP's CAPITALIZATION AS OF END OF PERIOD (mil. EUR)
AND % OF BVB's CAPITALIZATION

Year	SIFs' capitalization (mil. EUR)	FP capitalization	SIFs' % of BVB capitalization	FP' % of BVB capitalization
1999	65.9	-	17.41	-
2000	68.1	-	14.18	-
2001	125.5	-	9.22	-
2002	236.9	-	8.95	-
2003	268.1	-	8.96	-
2004	612.7	-	6.96	-
2005	1,783.4	-	11.65	-
2006	2,524.8	-	11.79	-
2007	3,076.9	-	12.51	-
2008	436.5	-	3.75	-
2009	776.7	-	4.08	-
2010	700.6	-	2.93	-
2011	636.5	1,351.3	3.88	8.25
2012	819.9	1,709.6	3.72	7.75
Average	**866.6**	**1530.5**	**8.57**	**8.00**

Source: authors' calculations based on BVB data, www.bvb.ro

Tables 2 and 3 reflect the importance of SIFs for BVB equity trading activity. For the period November 1999 – December 2012, SIFs concentrated about 47% of BVB transactions and almost 59% of 1st category transactions, 28% of BVB traded share volume, respective 42% of 1st category volume, and 38% of BVB equity turnover, respectively 46% of the 1st category turnover. The important position of SIFs is also confirmed by their contributions to the daily transactions, covering about 52% of the daily transactions and 41% of the daily turnover between November 1999 and December 2012.

TABLE 2
SIFs' POSITION IN TOTAL BVB AND 1st CATEGORY TRANSACTIONS (AVERAGE FIGURES FOR NOV.1999-DEC.2012)

	% of total BVB	% of 1st category
Number of trades	46.99%	58.71%
Volume	28.07%	41.53%
Value	38.44%	45.81%
Source: authors' calculations based on BVB data		

TABLE 3
SIFs DAILY ACTIVITY COMPARED WITH BVB (NOV.1999-DEC.2012)

	BVB total	SIFs
Average number of trades per day	3,473	1,825
Average volume per day (mil. shares)	39.72	6.72
Average value per day (mil. EUR)	5.38	2.18
Source: authors' calculations based on BVB data		

The main reasons for SIFs' strong position within BVB might be considered the following: (i) their free float is 100%, being among the most liquid shares traded in Romania; (ii) for more than a decade SIFs constantly paid cash dividends to their shareholders; (iii) their annual price returns were most of the time above the performances registered by BVB blue chips (BET index in Table 4) and BVB entire main

equity market (BET-C index in Table 4); before the financial crisis SIFs also offered good investment alternatives compared with bank deposits and covering completely the inflation rate, as Table 4 shows. Further details regarding SIFs returns, PER (P/E ratio) and dividend yield (DIVY) can be found in Annexes 3a, 3b, and 3c.

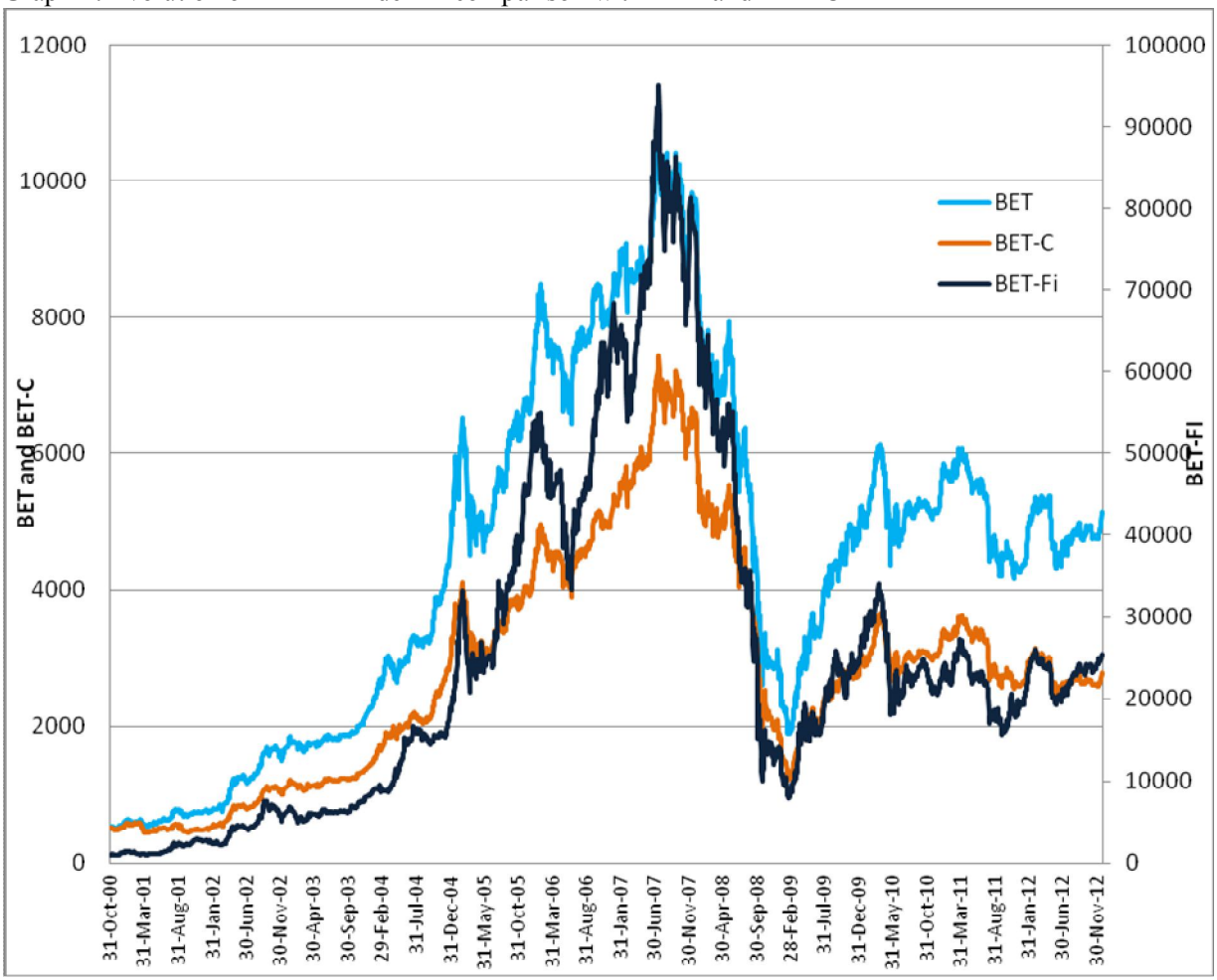
TABLE 4
SIFs ANNUAL RETURNS
(average percentage for the two sub periods)

	2000-2007	**2008-2012**
Inflation rate (%)	18.79	5.73
Interest rate for bank deposits (%)	15.08	8.10
BET annual return (%)	46.08	-0.44
BET-C annual return (%)	41.10	-6.40
BET-XT annual return (%)	-	-2.64
BET-NG annual return (%)	-	0.25
BET-BK annual return (%)	-	0.81
ROTX annual return (%)	-	-2.85
SIF1 annual return (%)	74.72	3.66
SIF2 annual return (%)	83.12	9.41
SIF3 annual return (%)	61.56	10.54
SIF4 annual return (%)	63.97	-9.89
SIF5 annual return (%)	80.51	5.82

Source: authors' calculation based on BVB data and Romanian National Bank data

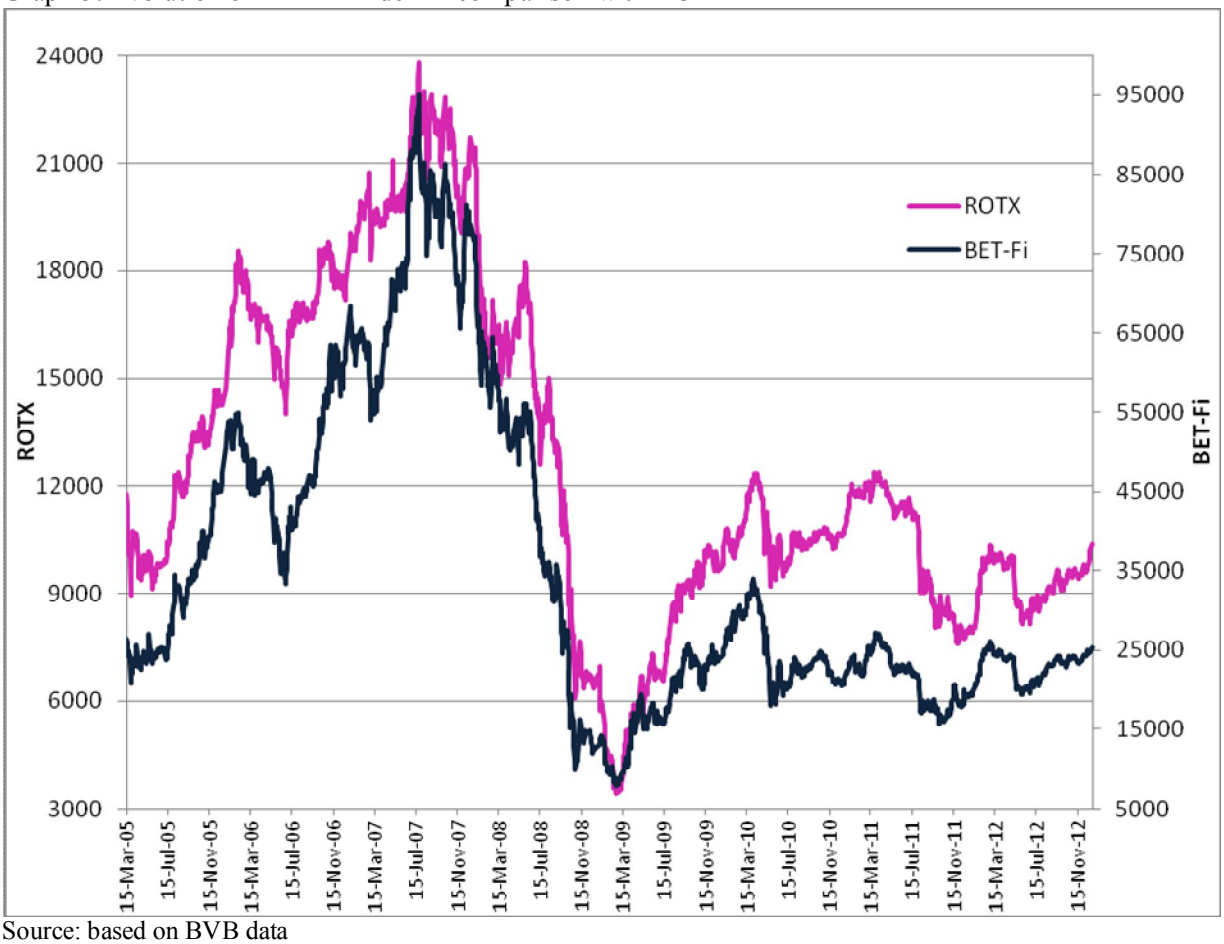
As data presented above show, SIFs position within BVB main equity market is important and strong and support the general opinion expressed by Romanian media which consider SIFs 'an engine that stimulated BVB transactions' for more than a decade.
The importance of SIFs for BVB was also recognized in November 2000 when the dedicated index BET-FI was launched. The evolution of BET-FI index in comparison with the other BVB indices (presented in Graphs 4, 5, and 6), along with the important position SIFs have within BVB main equity market raised the obvious question if the BET-FI is a domestic market index leader.

Graph 4: Evolution of BET-FI index in comparison with BET and BET-C



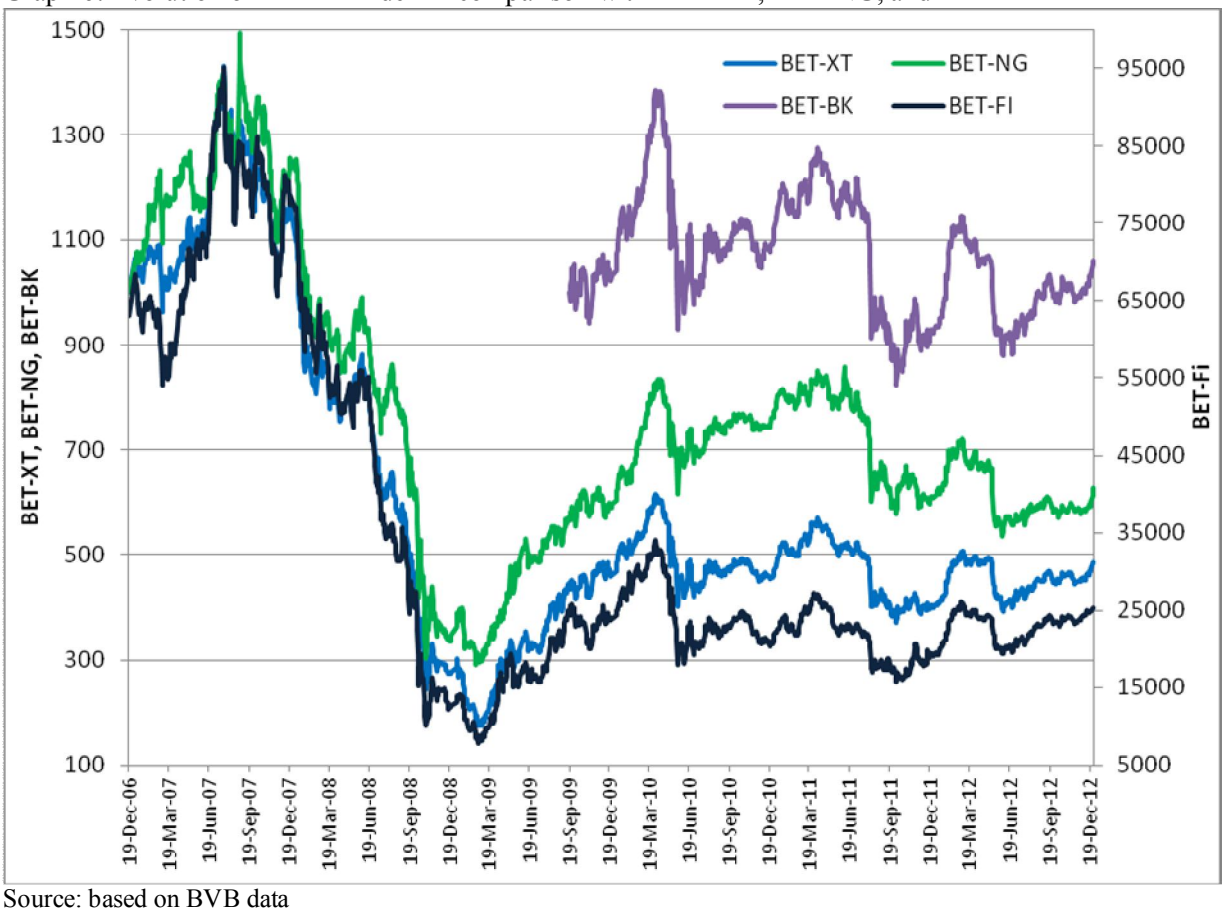
Source: based on BVB data

Graph 5: Evolution of BET-FI index in comparison with ROTX



Source: based on BVB data

Graph 6: Evolution of BET-FI index in comparison with BET-XT, BET-NG, and BET-BK



Source: based on BVB data

4. Hypotheses, methodology, data, and discussions

4.1. Hypotheses, methodology, data

The ***general hypothesis*** in order to verify if BET-FI is an index leader for BVB equity market is the following: *BET-FI does Granger cause all the other 6 BVB indices and it is not Granger caused by any of them*.

The corollary of this hypothesis would be: if BET-FI is a market index leader, the BVB internal power of diversification is limited to the components of the respective index portfolio.

In order to test the general hypothesis, a subset of six hypotheses was formulated, as presented in Table 5 below. All the six hypotheses must be confirmed in order to confirm the general hypothesis.

TABLE 5
SUBSET HYPOTHESES

H1: BET-FI Granger causes BET	H1a: BET does not Granger cause BET-FI
H2: BET-FI Granger causes BET-C	H2a: BET-C does not Granger cause BET-FI
H3: BET-FI Granger causes ROTX	H3a: ROTX does not Granger cause BET-FI
H4: BET-FI Granger causes BET-XT	H4a: BET-XT does not Granger cause BET-FI
H5: BET-FI Granger causes BET-NG	H5a: BET-NG does not Granger cause BET-FI
H6: BET-FI Granger causes BET-BK	H6a: BET-BK does not Granger cause BET-FI

The present investigation is based on the research idea of by Canegrati (2008) regarding the international market index leaders. However, we choose to apply the idea at BVB level in a trial to determine if one index (respectively BET-FI) of the seven indices reported for the main equity market is the index leader.

We started our investigation by calculating the simple correlation between BET-FI and the other indices. Further, the simple regression was applied, with BET-FI as independent variable to confirm the relationships between this index and the other six indices. The general equation for the simple regression is:

$$R_{INDEX} = a + b \cdot R_{BET-FI}$$

In order to confirm the subset of hypotheses formulated above, a Granger-causality test was also performed. The bivariate Granger causality test for any of the six indices and BET-FI evaluates whether the past values of BET-FI are useful for predicting the respective index, once the respective index evolution has been modeled. The test is implemented by regressing the respective index on *m-lag* values of the index and *m-lag* values of BET-FI.

$$R_{INDEX}(t) = a_0 + a_1 R_{INDEX}(t-1) + \cdots + a_m R_{INDEX}(t-m) + \varepsilon_t$$

$$R_{INDEX}(t) = a_0 + a_1 R_{INDEX}(t-1) + \cdots + a_m R_{INDEX}(t-m) + b_1 R_{BET-FI}(t-1) + \cdots + b_m R_{BET-FI}(t-m) + \varepsilon_t$$

The null hypothesis that BET-FI does not Grange-cause the respective is accepted if and only if no lagged values of BET-FI are retained in the regression. An F-test is then used to determine whether the coefficients of *m-lag* values of BET-FI are jointly equal zero. We report the p-values for each F- test in annexes 5a to 5c in graphical format.

For the present paper, we chose not to indentify the structural breaks in the series. The simple reason is given by the visual analysis of the graphs 4, 5 and 6 which indicate similar (almost superimposed) evolutions for all the indices. Also, the seven indices describe the same market and a structural change in any of them, at the daily level, is reproduced immediately by the others. Moreover, within the discussions we will present the split we made on the data series for four sub periods for BET, BET-C and BET-FI, suggested by the correlation results and by the manifestations of financial crisis at the mid 2007 when the ascendant trend was broken.

The data used is represented by the daily returns calculated using the daily closing values reported by BVB of the seven indices. Annex 2b presents general information for the seven indices, including the availability of data.
Since the indices were introduced successively and the data are not available for the same period, the analysis was split in two groups of indices. The first group includes two indices, BET and BET-C, the oldest BVB indices that preceded BET-FI. For these two indices, the period under analysis is equal with

the period since BET-FI was launched: November 2000 to December 2012, including 3,030 observations. Further details are revealed by descriptive statistics of these data series in Annex 4a. The analysis for these two indexes also was split in sub-periods. The first split was generated by the information offered by the simple correlation coefficient (Table 6) that show low correlation coefficients between 2000 and 2004, and a higher level of correlation starting with 2005. The second split was induced by the financial crisis of 2007-2011. In this case, the following two sub-periods were considered: the stagnation and growth period, between November 2000 and July 2007, and the period under the influence of financial and economic crisis, between August 2007 and December 2012. By using this second split, we try to determine if BET-FI had a different behavior during normal and growing times and during the crisis.
The second group of indices is formed by the four indices launched after BET-FI, as Annex 2b shows. The periods under analysis for each of these indexes are shorter, depending on respective data availability. In the case of ROTX we worked with 1,953 observations, for BET-XT and BET-NG 1,510 observations were available, while for BET-BK, the last index launched, the number of observations is 828. Further characteristics of the respective indices return series are presented in Annexes 4b and 4c. For three of the indices in this group we did not split the period due to the low number of observations available before July 2007, when the decrease of all indices began under the rumor of crisis signs. The fourth index has available data only since September 2009, which means there was no necessity to consider a period split.

4.2. Discussions

The correlation coefficients (Table 6) and regression results (Table 7) suggest a strong relationship between BET-FI and the other six BVB indices. The correlation coefficients range between 0.676 (with BET) and 0.918 (with BET-XT). Considering BET-FI the independent variable, the regression results support the information provided by correlation coefficients indicating in all six cases a statistically significant relationship at a confidence level of 99% with p values less than 0.01. The adjusted R-squared shows that BET-FI variability explains about 46% of BET and BET-C variability, over 55% of ROTX and BET-NG variability and about 84% of BET-XT and BET-BK variability. In the case of the last two indices the very strong relationships is explained by the fact that the respective portfolios include also SIFs.
The findings are supported by Dima et al. (2007) which confirms the strong relationship between BET-FI, BET, and BET-C, however for a shorter period than the period we consider for the present paper and using a different statistical methodology.
In the case of the sub-periods considered for BET and BET-C, while the relationship is statistically significant in all the cases, R-squared explains a higher that 60% of BET and BET-C variability only during the second sub-periods in both cases. These results are supported by the correlation coefficients which point toward a stronger correlation between these indices and BET-FI after 2005. The results also point out that during the financial crisis, BET-FI might have had a stronger influence over BET and BET-C.

TABLE 6
CORRELATION COEFFICIENTS OF BET-FI WITH THE OTHER SIX BVB INDEXES

BET													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.673	0.196	0.281	0.414	0.535	0.218	0.645	0.580	0.675	0.874	0.769	0.846	0.637	0.777
BET-C													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.676	0.186	0.210	0.472	0.548	0.265	0.637	0.626	0.682	0.874	0.777	0.845	0.612	0.774

ROTX													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.740	-	-	-	-	-	0.585	0.540	0.619	0.849	0.727	0.857	0.701	0.769
BET-XT													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.918	-	-	-	-	-	-	-	0.833	0.944	0.911	0.939	0.888	0.900
BET-NG													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.751	-	-	-	-	-	-	-	0.566	0.867	0.716	0.790	0.640	0.619
BET-XT													
Entire period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0.740	-	-	-	-	-	0.585	0.540	0.619	0.849	0.727	0.857	0.701	0.769

Source: authors' calculation based on BVB data

TABLE 7
REGRESSION RESULTS FOR BET-FI AS INDEPENDENT VARIABLE

	DEPENDENT VARIABLES – Entire period					
	BET	BET-C	ROTX	BET-XT	BET-NG	BET-BK
Adjusted R squared (p-value)	0.4574 (0)	0.4609 (0)	0.5487 (0)	0.8416 (0)	0.5695 (0)	0.8377 (0)
	DEPENDENT VARIABLES – Sub-period Nov.2000-Dec.2004					
	BET	BET-C				
Adjusted R squared (p-value)	0.1270 (0)	0.1255 (0)				
	DEPENDENT VARIABLES – Sub-period Jan.2005-Dec.2012					
	BET	BET-C				
Adjusted R squared (p-value)	0.5961 (0)	0.6041 (0)				
	DEPENDENT VARIABLES – Sub-period Nov.2000-July.2007					
	BET	BET-C				
Adjusted R squared (p-value)	0. 2457 (0)	0.2443 (0)				
	DEPENDENT VARIABLES – Sub-period Aug.2007-Dec.2012					
	BET	BET-C				
Adjusted R squared (p-value)	0.6484 (0)	0.6558 (0)				

The Granger causality results are presented in Annex 5a while the status of the subset of tested hypotheses is presented in Table 8.

TABLE 8
SUBSET HYPOTHESES

Hypothesis	Status	Hypothesis	Status
H1: BET-FI Granger causes BET	confirmed (up to 10 lags)	H1a: BET does not Granger cause BET-FI	confirmed
H2: BET-FI Granger causes BET-C	rejected	H2a: BET-C does not Granger cause BET-FI	rejected
H3: BET-FI Granger causes ROTX	confirmed (for almost all lags)	H3a: ROTX does not Granger cause BET-FI	confirmed
H4: BET-FI Granger causes BET-XT	confirmed (for almost all lags)	H4a: BET-XT does not Granger cause BET-FI	confirmed
H5: BET-FI Granger causes BET-NG	confirmed (from 30 to 60 lags)	H5a: BET-NG does not Granger cause BET-FI	rejected (up to 30 lags)
H6: BET-FI Granger causes BET-BK	confirmed (only from 32 to 60 lags)	H6a: BET-BK does not Granger cause BET-FI	confirmed

The general hypothesis considering BET-FI as an index leader for BVB is therefore **rejected**.
The fact that BET-C Granger causes BET-FI, and BET-FI does not Granger cause BET-C was partly confirmed by the previous studies of Pop, Vamos, Craciun (2010), and Pop, Bozdog, Calugaru (2012). However, it raised some question marks since BET-C index portfolio is dominated by the same companies included in BET index. The only explanation we could find for this reverse causality might be given by SIFs portfolio structure which included, over the past 14 years, over 30 companies of BET-C index, representing in average over 40% of the index portfolio. SIFs position as shareholders[9] in these companies is reflected by a combined average figure of about 25% of outstanding shares owned per company. In this situation is only logic/ natural to deduce that BET-C might have an influence over BET-FI, confirmed by the Granger causality.
The fact that BET-NG Granger causes BET-FI was also an unexpected result. Trying to find an explanation we looked at SIFs portfolios but those include only one company of BET-NG index. The 'culprit' in this case can be considered Fondul Proprietatea (FP) which has controlling interest of over 12% in three companies of BET-NG index, while these companies represent 79% of the respective index portfolio. The Granger causality might have been generated by the FP position as a shareholder in these companies.

However, ***the results allow us to reformulate the hypothesis in the following form: BET-FI is BVB index leader for the four blue chip indices***.
This result is supported by the fact that BET-FI Granger causes all the four blue chip indices reported for BVB, and it is not Granger caused by any of them. One can argue that the Granger causality for BET-BK occurs only at lags of over 30. However, BET-BK is the youngest BVB index and the relative low number of observation might be a problem. It remains for BET-FI to confirm its leadership position over the next years. Nevertheless, we chose not to ignore this Granger causality at long lags due to our knowledge regarding the way Romanian investors behave, even there is no research to document this behavior. The information come from informal discussions with Romanian brokers and investors. Thus, we consider that the information is also supported by the fact that the Hofstede index[10] for Romania is 30,

[9] While SIFs are shareholders also for 7 companies of BET portfolio, their ownership in those companies is in average of only 8% per company, with one exception for symbol BIO where the combined ownership reaches 45.5%. Thus, BIO is not an important company in BET portfolio.
[10] http://geert-hofstede.com/romania.html

considered low and showing a collectivistic society[11]. For Romanian investors this collectivism can be seen as their permanent desire to based their investment decision by following the decisions of other investors, collective investors (like investment funds) if possible. SIFs and FP represent the best 'models', mainly when after a period of time, the market has the tendency to stagnate and the domestic individual investors tend to look back at these investment fund evolution for inspiration. Speidell (2009) also reports a similar behavior for local investors in Bangladesh frontier market, where retail investors try to copy other investors' speculative decisions.

The Granger causality was investigated by sub-periods for the two oldest BVB indices: BET and BET-C. The results for these sub-periods are briefly presented in Table 9 and can be viewed in Annex 5b and Annex 5c

TABLE 9
GRANGER CAUSALITY RESULTS FOR THE SUB-PERIODS CONSIDERED FOR BET AND BET-C

Sub-period I	*BET-FI causality on BET*	*BET causality on BET-FI*
Nov.2000 – Dec.2004	BET-FI Granger causes BET for all the lags	BET Granger causes BET-FI for lags from 4 to 10
Jan.2005 – Dec.2012	BET-FI Granger causes BET for the lags lags 35 to 60	BET does not Granger cause BET-FI
Sub-period II	*BET-FI causality on BET*	*BET causality on BET-FI*
Nov.2000 – July 2007	BET-FI Granger causes BET for all the lags up to 40	BET Granger causes BET-FI for lags from 1 to 10
August 2007 – Dec.2012	BET-FI Granger causes BET for the lags 1 to 6 and from lag 32 to lag 60	BET does not Granger cause BET-FI
Sub-period I	*BET-FI causality on BET-C*	*BET-C causality on BET-FI*
Nov.2000 – Dec.2004	BET-FI Granger causes BET-C from lag 4 up to lag 60	BET Granger causes BET-FI for lag 1 and from lag 21 to 30
Jan.2005 – Dec.2012	BET-FI Granger causes BET-C from lag 40 to lag 60	BET-C occasionally Granger causes BET-FI for lags for 18 to 20 and from lag 48 to lag 58
Sub-period II	*BET-FI causality on BET-C*	*BET-C causality on BET-FI*
Nov.2000 – July 2007	BET-FI Granger causes BET-C for all the lags up to 46	BET-C Granger causes BET-FI for all lags from up to 30
August 2007 – Dec.2012	BET-FI Granger causes BET-C for the lag 1 and from lag 32 to lag 60	BET-C does not Granger cause BET-FI

From these results it can be observed that by sub-periods BET also Granger causes BET-FI for small lags for the time intervals when the correlation coefficients and the statistical relationship between the indices indicated to be relatively weak. For the crisis period of August 2007 to December 2012, BET-FI Granger causes BET for large lags while BET does not Granger causes BET-FI, suggesting that BET-FI could be considered an index leader for BET during the respective period, taking into consideration the explanation regarding the 'collectivistic' inspiration proposed above.

[11] A low Hofstede index was considered by Chui et al. (2010) as a factor that can explain weaker medium-term momentum effects, while de Groot et al. (2012) investigating a sub-sample of frontier markets with low Hofstede index did not find such evidence for the respective frontier markets.

Contrary to the sub-hypothesis 2, by sub-periods BET-FI also Granger causes BET-C. However, these results do not change the general conclusion. For the crisis period, the results are similar with those of BET.
This indicate that BET-FI can be considered as a market index leader during the crisis period, for large lags, for both the oldest BVB indices: BET and BET-C. It can be considered an important finding for a next crisis period when BET-FI can be watched and followed more closely than the other indices.
By extension, since BET-XT and BET-BK were launched during the crisis period, and ROTX only two years before, and due to the fact that BET-FI Granger causes all the three indices and is not Granger caused by them, it can be considered that BET-FI was an index leader for five of six BVB indices during the crisis.

With the original hypothesis rejected, the corollary for the respective hypothesis does not apply. This indicates at a first shallow look that BVB host a good diversification potential through its composite index BET-C and partly through the energy sector index BET-NG, both influencing the index under investigation BET-FI. However, there are nuances to be considered.
First, as shown in paragraph 2, BVB main equity market is dominated by the 1st category transactions, which concentrate about 83% of equity total turnover and hosts the best and most liquid companies.
Second, being a frontier market, BVB exhibit the feature of concentrating the trading around a small number of companies (in fact 5), all listed within the 1st category, one of which being FP also part of BET-FI index, two are banks (financial sector) and two are from the energy sector, with an important weight in BET-NG index portfolio.
Third, BET-FI, while not an index leader for the whole market, can be considered a blue chip index leader. This situation has a direct impact on share buying decision at BVB. Since, on average, 78% of the four blue chip indices' portfolio consists of 1st category shares, this indicate that within the 1st category an investor either choose from among 15 to 20 shares listed there, or choose to invest in SIFs.
Fourth, while within the 2nd category there is a small group of interesting shares, considered similar to blue chips; their liquidity is impaired either by the small number of outstanding shares and/ or by a low free float.
Taking into consideration these nuances, the fact that BET-FI can be considered an index leader for blue chip shares, by extension an index leader for the 1st category shares, reduce much of BVB diversification potential to about a handful of shares, including FP, or to SIFs.
As such, ***BVB diversification potential can be considered low.***
However, SIFs might prove to be a better choice than FP since their portfolio is better diversified across all equity categories at BVB than in the case of FP. The superior returns generated by BET-FI base-portfolios[12] compared with BET based-portfolios are documented in the paper of Stancu & Radu (2010).

5. Conclusions

The current paper tried to establish if the financial sector index at BVB, BET-FI, can be considered a market index leader among a total of seven indexes reported for the main Romanian equity market. The question regarding BET-FI potential as a market index leader was raised by the fact that its portfolio includes six closed-end funds, of which the five SIFs, and the respective investment funds were considered, over time, 'an engine' for BVB trading activity. Within the paper we documented SIFs position at BVB, along with the features of BVB as a frontier market.
The general hypothesis tested was: *BET-FI does Granger cause all the other 6 BVB indexes and it is not Granger caused by any of them*. The corollary of this hypothesis would have been: if BET-FI is a market

[12] At the time when the research was done, BET-FI portfolio consisted only of SIFs. FP was added only during the second half of 2011 as BET-FI portfolio constituent.

index leader, the BVB internal power of diversification is limited to the components of the respective index portfolio.
The results implied the hypothesis to be rejected. BET-FI can not be considered an index leader for the whole market since it is Granger caused by the BVB composite index BET-C, without Granger causing this index. Also reciprocal Granger causality was found between BET-FI and the other sector index, the energy index BET-NG.
However, the results also pointed out that BET-FI can be considered an index leader for the four blue chip indices calculated at BVB, and by extension for the 1st category equities. These results are supported by the correlation coefficient between BET-FI and the respective indices as well as by the regression results that indicate a strong and significant relationship with BET-FI as an independent variable.
While at a first glance these results seems to suggest a good internal diversification potential for BVB, the reality is different. BVB main equity market is dominated by the 1st category and most of the blue chips are listed here. Also, by exhibiting the features of a frontier market, the BVB transactions are concentrated around a small number of (five) shares. In this situation, the diversification alternatives are much reduced, an investor being able to choose either among a handful of liquid shares or to choose the SIFs. The superiority of BET-FI based-portfolios (at the date of the study having as sole components the five SIFs) in comparison with BET based-portfolio (blue chips) was shown by Stancu & Radu (2010).
While BVB internal diversification power is not as reduced as we expected, ***it remains at low levels***.
This indirect finding regarding the low internal diversification potential of BVB is in concordance with the results reported by Middleton et al. (2008) which suggest that the diversification benefits of the emerging and frontier markets under scrutiny came rather from the geographical spread than from the industry mix of the equity included in the portfolio. Also Niemczak (2010) study reveals that Eastern Europe equity markets do not provide much diversification from the point of view of a US investor.
By revealing BET-FI leader index position for Romanian blue chip stocks, the current paper helps any investor and researcher to focus only on a smaller number of indices, three in fact (BET-FI, BET-C, and BET-NG), instead of all seven reported for BVB main equity market. Likewise, it helps focus the attention only on BET-FI when the 1st category shares are concerned. By highlighting the low diversification power of BVB, the current paper address some of international investor questions when considering the Romanian frontier market as an investment alternative (BVB frontier equity market features were presented briefly in paragraph 2).
The findings of this paper imply that BVB has a relative fragile position within financial markets pan European developments, adding new evidences to the findings of Pop (2011) and Stoica (2010). The low diversification potential BVB currently offers for international portfolios is impairment on the main Romanian exchange future development and on BVB potential to accede the emerging market status. This low internal diversification potential of BVB represents also an important weakness in the competition race the main Romanian stock exchange have to face against the other EU frontier exchanges, mainly against those closed from geographical point of view: Bulgarian Stock Exchange, Ljubljana Stock Exchange, and to some extent Bratislava Stock Exchange.

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Annexes

Annex 1a
FRONTIER MARKETS COUNTRY COVERAGE AS OF DECEMBER 2012

Country	FTSE	MSCI Barra	Standard & Poor's
Argentina	X	X	X
Bahrain	X	X	X
Bangladesh	X	X	X
Botswana	X	-	X
Bulgaria	X	X	X
Cote d'Ivoire	X	-	X
Croatia	X	X	X
Cyprus	X	-	X
Ecuador	-	-	X
Estonia	X	X	X
Ghana	X	stand-alone index	X
Jamaica	-	stand-alone index	X
Jordan	X	X	X
Kazakhstan	-	X	X
Kenya	X	X	X
Kuwait	-	X	X
Latvia	-	-	X
Lebanon	-	X	X
Lithuania	X	X	X
Macedonia	X	-	-
Malta	X	-	-
Mauritius	X	X	X
Namibia	-	-	X
Nigeria	X	X	X
Oman	X	X	X
Pakistan	-	X	X
Panama	-	-	X
Qatar	X	X	X
Romania	X	X	X
Serbia	X	X	-
Slovakia	X	-	X
Slovenia	X	X	X
Sri Lanka	X	X	X
Trinidad-Tobago	-	stand-alone index	X
Ukraine	-	X	X
United Arab Emirates	-	X	X
Tunisia	X	X	X
Vietnam	X	X	X
Zambia	-	-	X

Note: X signifies the country coverage by the respective frontier index
Sources:
http://www.ftse.com/Indices/FTSE_Frontier_Indices/index.jsp
http://www.msci.com/products/indices/country_and_regional/fm/

Annex 1b

STOCK EXCHANGES OF THE EU12 RANKED BASED ON MARKET CAPITALIZATION

	Data for equity sector Average annual figures for the period 2006-2012 (Dec.)						
Stock Exchange	Market capitalization (EUR m)	Turnover (EUR m)	Trades (thou)	Listed companies	Mkt.cap. in GDP (%)	Turnover ratio (%)	Classification according to FTSE
Warsaw Stock Exchange	115,999	53,778	12,719	545	34.91	48.55	Advanced emerging
Prague Stock Exchange – CEESEG[2)]	33,268	22,693	1,092	29	23.62	67.11	Advanced emerging
Budapest Stock Exchange - CEESEG	21,233	20,234	2,130	47	22.13	97.24	Advanced emerging
Bucharest Stock Exchange	**12,563**	**1,511**	**712**	**66**	**10.51**	**12.44**	**Frontier**
Ljubljana Stock Exchange - CEESEG	9,285	1,241	142	78	26.82	11.77	Frontier
Cyprus Stock Exchange	7,730	1,552	366	116	48.02	19.20	Frontier
Bulgarian Stock Exchange	7,419	1,281	216	383	22.49	13.98	Frontier
Vilnius Stock Exchange – NASDAQ OMX	4,400	491	176	39	15.82	9.48	Frontier
Bratislava Stock Exchange	3,980	133	9	165	6.62	3.45	Frontier
Malta Stock Exchange	3,194	64	11	19	53.77	1.97	Frontier
Tallinn Stock Exchange - NASDAQ OMX	2,368	535	86	16	15.92	21.40	Frontier
Riga Stock Exchange – NASDAQ OMX	1,262	42	23	32	6.51	3.04	Not classified

Source: authors' calculations based on data provided by FESE (Federation of European Stock Exchanges), NASDAQ OMX Baltic, EUROSTAT and FTSE Index Company

Note: 1): EU12 represents the abbreviation for the twelve countries that accessed the European Union in 2004 (10 countries) and 2007 (two countries)

Note 2): CEESEG comes from Central and Eastern European Stock Exchange Group created in September 2009 and includes the following stock exchanges: Budapest, Ljubljana, Prague and Vienna.

Annex 1c
EQUITY INDICES REPORTED BY EU12 SECURITY MARKETS

Exchange	All share indices	Blue chip indices	Indices based on capitalization	Other indices	Sector indices
Warsaw Stock Exchange	WIG	WIG20	mWIG40 (medium size) sWIG80 (small size)	WIG Plus WIG Div RESPECT	11 sector indices One index dedicate to bank sector WIG BANKI
Prague Stock Exchange - CEESEG	PX-Glob	PX (former PX50)			
Budapest Stock Exchange - CEESEG		BUX	BUMIX (medium and small capitalization)		
Bucharest Stock Exchange (main market)	BET-C (except the 5 closed-end funds)	BET BET-XT BET-BK		ROTX	BET-FI (dedicated to closed-end funds) BET-NG (energy)
Ljubljana Stock Exchange		SBI Top			
Cyprus Stock Exchange	General	Main Market FTSE/CySE20	Parallel Market (medium) Alternative Market (small)		Banks Investment companies Hotels
Bulgarian Stock Exchange		SOFIX		BG 40 (most traded) BG TR 30 (total return)	BG REIT (dedicated to 7 special Purpose REITs)
Vilnius Stock Exchange – NASDAQ OMX * (Lithuania)	OMC Vilnius GI (gross index)				
Bratislava Stock Exchange		SAX			
Malta Stock Exchange	MSE				
Tallinn Stock Exchange - NASDAQ OMX * (Estonia)	OMC Tallinn GI (gross index)				
Riga Stock Exchange – NASDAQ OMX * (Latvia)	OMC Riga GI (gross index)				

Source: based on information available on FESE (Federation of European Stock Exchanges), NASDAQ OMX Baltic
Note *: NASDAQ-OMX calculate and publish a complex set of indices for the Baltic exchanges, including 3 indices dedicate to the financial sector. Thus, since these indices have their portfolios selected from all the 3 exchanges, they are rather regional indices and not domestic indices. Further details regarding these regional indices can be found at: http://www.nasdaqomxbaltic.com/en/indexes/about-indexes/index/

Annex 2a

SELECTED PORTFOLIO COMPONENTS FOR BVB INDICES AS OF DECEMBER 2012

Symbol	BET	BET-C	BET-FI	ROTX	BET-XT	BET-NG	BET-BK
FP (%)	22.32	22.08	37.30	21.95	17.48	0	7.51
SNP (%)	21.38	21.10	0	19.26	16.72	32.11	7.51
TLV (%)	18.94	7.83	0	14.86	14.79	0	4.94
BRD (%)	18.19	16.82	0	15.97	14.23	0	7.16
TGN (%)	7.06	7.22	0	3.43	3.41	29.54	4.99
SIFs (total %)	0	0	62.70	0	22.89	0	21.66

Source: based on data available at http://www.bvb.ro/IndicesAndIndicators/indices.aspx

Annex 2b

GENERAL INFORMATION REGARDING THE SEVEN INDICES OF THE MAIN EQUITY MARKET

Index	Type	Launching date	Data available since	Observations
BET	10 blue chips	Sept.19, 1997	Sept.19, 1997	free float weighted capitalization does not include SIFs
BET-C	Composite	April 16, 1998	April 16, 1998	market capitalization weighted does not include SIFs
BET-FI	Sector - finance	Oct.31, 2000	Oct.31, 2000	free float weighted capitalization includes only the 5 SIFs and FP
ROTX	Blue chips (variable)	March 15, 2005	March 15, 2005	free float weighted capitalization never considered SIFs is calculated and reported at Vienna Stock Exchange
BET-XT (extended)	25 blue chips	July 1, 2008	Jan.2, 2007	n/a information regarding the weightening includes SIFs
BET-NG	Sector – energy	July 1, 2008	Jan.2, 2007	n/a information regarding the weightening
BET-BK (benchmark)	25 blue chips	July 3, 2012	Sept.18, 2009	free float weighted capitalization includes SIFs

Source: based on data available at http://www.bvb.ro/IndicesAndIndicators/indices.aspx

Note: BET comes from Bucharest Exchange Trading; ROTX comes from Romanian Traded Index

Annex 2c

BVB EQUITY MARKET PERFORMANCES

	Inflation rate (%)	Average interest rate for bank deposits (%)	BET annual return (%)	BET-C annual return (%)	BET-FI annual return (%)	BET-XT annual return (%)	BET-NG annual return (%)	BET-BK annual return (%)	ROTX annual return (%)
1999	45.8	45.40	15.21	-4.90	n/a	n/a	n/a	n/a	n/a
2000	45.7	32.44	18.25	7.39	n/a	n/a	n/a	n/a	n/a
2001	34.5	26.16	35.71	-6.47	109.92	n/a	n/a	n/a	n/a
2002	22.5	18.39	117.52	124.02	113.14	n/a	n/a	n/a	n/a
2003	15.3	10.78	27.13	22.62	24.72	n/a	n/a	n/a	n/a
2004	11.9	11.34	93.15	98.29	106.94	n/a	n/a	n/a	n/a
2005	9.00	8.34	42.47	31.63	151.32	n/a	n/a	n/a	n/a
2006	6.56	6.51	18.09	25.07	24.66	n/a	n/a	n/a	20.16
2007	4.84	6.70	16.29	26.27	14.95	9.63	18.99	n/a	15.73
2008	7.85	9.55	-69.68	-69.68	-83.62	-79.23	-71.71	n/a	-68.70
2009	5.59	11.89	57.20	34.62	83.33	61.54	63.98	n/a	42.22
2010	6.09	7.29	10.89	13.49	-10.09	0.30	27.96	7.60	10.85
2011	5.79	6.29	-19.18	-16.73	-13.52	-15.25	-21.51	-18.21	-27.09

2012	3.33	5.50	18.57	6.29	29.63	19.45	2.51	13.03	28.46

Source: authors' calculations based on BVB data and Romanian National Bank data

Annex 2d

THE LIQUIDITY (calculated with the turnover ratio (%) at the end of period)

	BVB	Financial sector	All 5 SIFs
1999	33.89	-	8.03
2000	16.67	-	23.97
2001	9.80	7.63	12.99
2002	7.46	7.67	24.95
2003	7.80	10.05	21.20
2004	5.87	12.34	25.55
2005	13.80	25.97	51.59
2006	13.26	26.35	58.84
2007	15.72	24.78	64.85
2008	14.95	16.77	176.46
2009	6.35	6.94	71.98
2010	5.46	5.59	84.58
2011	14.03	21.60	67.52
2012	7.60	9.92	48.07
Average	**12.33**	**14.63**	**52.89**

Source: authors' calculations based on BVB data

Annex 2e

THE IMPORTANCE OF FINANCIAL SECTOR IN TOTAL BVB

	% of BVB capitalization	% of BVB turnover
2001	33.18	25.80
2002	51.02	50.86
2003	35.46	45.65
2004	27.15	47.86
2005	35.17	66.19
2006	35.92	71.36
2007	43.12	67.97
2008	63.88	68.72
2009	70.39	76.97
2010	69.72	71.35
2011	57.59	88.66
2012	62.56	83.61
Average	**45.77**	**63.75**

Source: authors' calculations based on BVB data

Annex 3a

PER[13] for BVB and SIFs (AS OF DECEMBER OF EVERY YEAR)

	BVB	SIF1	SIF2	SIF3	SIF4	SIF5
1999	**8.8**	2.2	1.9	3.2	2.9	2.2
2000	**3.9**	3.3	3.4	2.9	2.6	3.2
2001	**4.9**	3.5	4.5	4.8	4.1	4.0
2002	**9.1**	6.8	4.6	8.3	8.8	6.3
2003	**13.1**	7.9	6.8	9.8	8.7	6.9
2004	**35.2**	13.2	9.6	16.1	12.5	17.5
2005	**24.1**	33.4	25.5	14.9	32.2	21.5
2006	**18.0**	20.4	47.4	30.4	16.9	21.5
2007	**19.2**	27.6	28.0	24.2	35.8	27.0
2008	**4.1**	2.3	3.3	3.8	3.7	4.2
2009	**14.4**	5.2	4.7	5.1	9.8	3.6
2010	**10.7**	12.7	6.8	24.2	18.8	11.7
2011	**8.4**	12.6	7.6	4.0	8.2	8.2
2012	**7.6**	4.7	2.9	2.7	5.2	11.6

Source: BVB monthly reports

Annex 3b

DIVY[14] (%) at BVB level and SIFs (AS OF DECEMBER OF EVERY YEAR)

	BVB	SIF1	SIF2	SIF3	SIF4	SIF5
1999	**7.84**	n/a	n/a	n/a	n/a	n/a
2000	**7.48**	20.97	25.81	22.15	35.90	17.86
2001	**6.70**	19.05	19.46	17.39	17.89	18.10
2002	**4.97**	10.82	12.94	9.14	10.68	11.76
2003	**2.00**	9.30	14.10	8.68	10.67	10.00
2004	**1.45**	5.78	6.81	4.04	7.26	4.25
2005	**0.94**	2.04	2.67	3.10	2.92	2.53
2006	**1.72**	1.53	2.05	1.68	1.03	1.70
2007	**2.18**	1.69	1.81	0	2.90	1.61
2008	**8.57**	12.84	9.43	13.79	11.20	13.33
2009	**2.81**	2.65	3.95	4.41	5.63	4.72
2010	**1.87**	4.93	5.16	5.52	6.21	12.70
2011	**5.46**	11.41	8.33	5.29	14.19	7.10
2012	**6.94**	8.24	15.17	24.06	10.52	9.27

Source: BVB monthly reports

[13] For the calculations above it was used the price of the last trade recorded in the Regular market segment. The net income used to calculate PER is as the last 4 quarters.

[14] For the calculations above it was used the price of the last trade recorded in the Regular market segment. The net income used to calculate DIVY is as the last 4 quarters.

Annex 3 c

BVB EQUITY MARKET AND SIFs PERFORMANCES

	Inflation rate (%)	Average interest rate for bank deposits (%)	BET annual return (%)	BET-C annual return (%)	BET-FI annual return (%)	BET-XT annual return (%)	BET-NG annual return (%)	BET-BK annual return (%)	ROTX annual return (%)
1999	45.8	45.40	15.21	-4.90	n/a	n/a	n/a	n/a	n/a
2000	45.7	32.44	18.25	7.39	n/a	n/a	n/a	n/a	n/a
2001	34.5	26.16	35.71	-6.47	109.92	n/a	n/a	n/a	n/a
2002	22.5	18.39	117.52	124.02	113.14	n/a	n/a	n/a	n/a
2003	15.3	10.78	27.13	22.62	24.72	n/a	n/a	n/a	n/a
2004	11.9	11.34	93.15	98.29	106.94	n/a	n/a	n/a	n/a
2005	9.00	8.34	42.47	31.63	151.32	n/a	n/a	n/a	n/a
2006	6.56	6.51	18.09	25.07	24.66	n/a	n/a	n/a	20.16
2007	4.84	6.70	16.29	26.27	14.95	9.63	18.99	n/a	15.73
2008	7.85	9.55	-69.68	-69.68	-83.62	-79.23	-71.71	n/a	-68.70
2009	5.59	11.89	57.20	34.62	83.33	61.54	63.98	n/a	42.22
2010	6.09	7.29	10.89	13.49	-10.09	0.30	27.96	7.60	10.85
2011	5.79	6.29	-19.18	-16.73	-13.52	-15.25	-21.51	-18.21	-27.09
2012	3.33	5.50	18.57	6.29	29.63	19.45	2.51	13.03	28.46

Source: BVB data and Romanian National Bank data

Annex 3c cont.

BVB EQUITY MARKET AND SIFs PERFORMANCES

	SIF1 annual return (%)	SIF2 annual return (%)	SIF3 annual return (%)	SIF4 annual return (%)	SIF5 annual return (%)
1999	n/a	n/a	n/a	n/a	n/a
2000	57.11	48.83	20.00	-7.27	34.94
2001	90.91	133.33	100.00	132.08	107.14
2002	129.32	114.29	107.14	108.66	105.65
2003	32.31	10.91	40.32	26.79	9.09
2004	84.44	137.71	139.08	58.90	176.19
2005	173.74	183.02	82.61	169.29	169.11
2006	29.90	37.98	33.04	1.66	28.83
2007	0	-1.14	-29.70	21.72	13.16
2008	-84.20	-84.18	-88.07	-73.29	-86.20
2009	94.83	107.27	135.29	13.60	106.50
2010	-12.58	0.17	-21.79	-11.78	-3.07
2011	-12.33	-9.24	3.09	-12.15	-18.06
2012	32.57	33.03	24.17	34.16	29.91

Source: BVB data and Romanian National Bank data

Annex 4a

DESCRIPTIVE STATISTICS FOR BET, BET-C, BET-Fi DAILY RETURNS (Nov.2000 – Dec.2012)

	BET	BET-C	BET-Fi
Number of observations	3,030	3,030	3,030
Mean	0.090	0.068	0.140
Std. Dev.	1.734	1.586	2.588
Skewness	-0.060	-0.362	0.196
Kurtosis	7.985	7.329	5.201
Largest (1) (%)	15.692	11.506	14.827
Smallest (1) (%)	-12.293	-11.413	-14.850

Annex 4b

DESCRIPTIVE STATISTICS FOR BET-XT, BET-NG, BET-Fi DAILY RETURNS (Jan.2007 – Dec.2012)

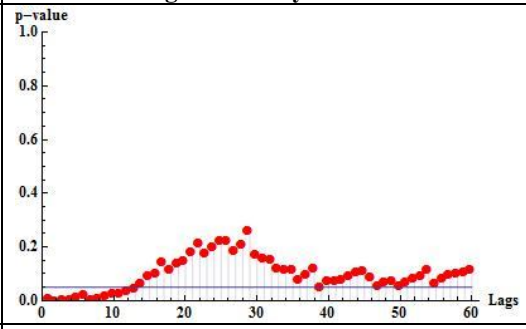
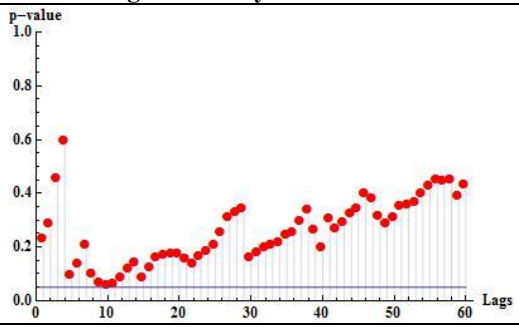
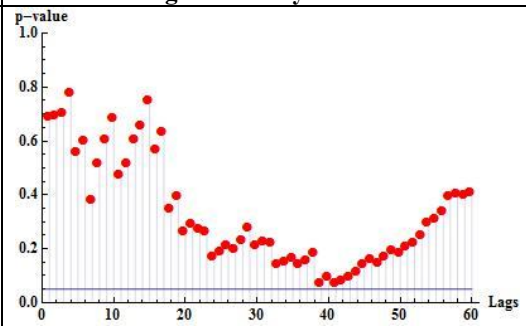
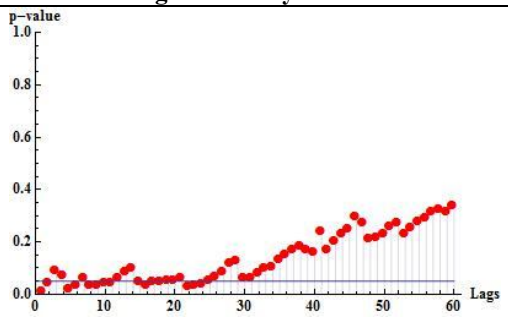
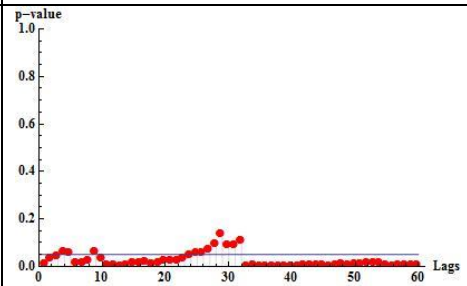
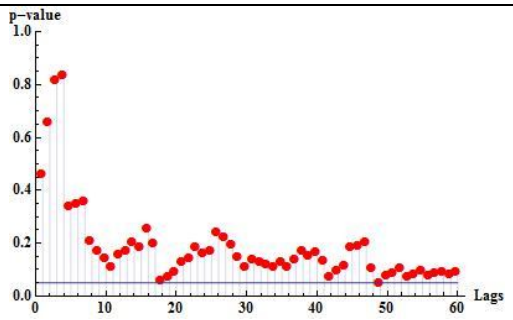
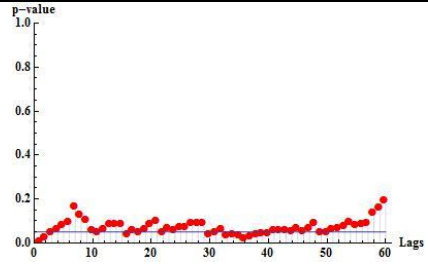
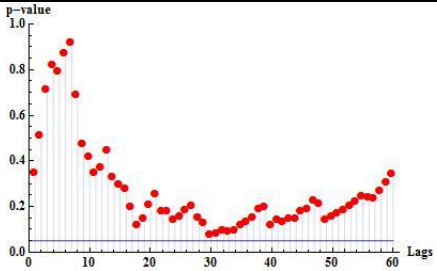
	BET-XT	BET-NG	BET-Fi
Number of observations	1,510	1,510	1,510
Mean	-0.026	-0.010	-0.021
Std. Dev.	2.093	2.037	2.809
Skewness	-0.236	-0.048	0.127
Kurtosis	5.371	8.376	5.560
Largest (1) (%)	11.655	14.402	14.827
Smallest (1) (%)	-11.916	-14.150	-14.850

Annex 4c

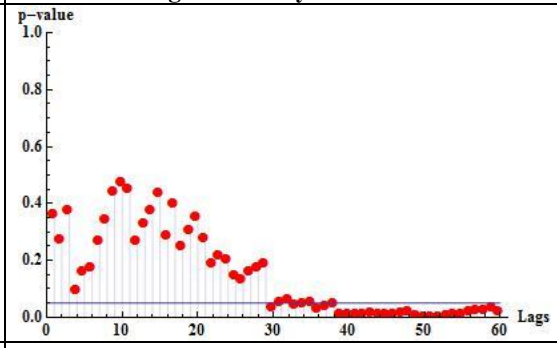
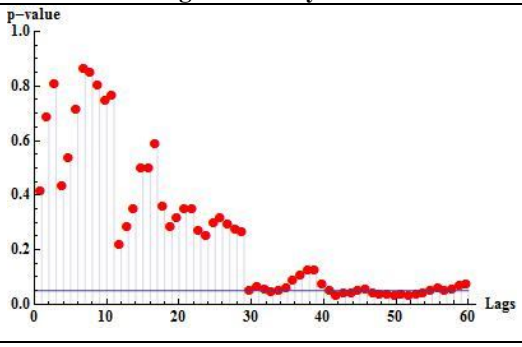
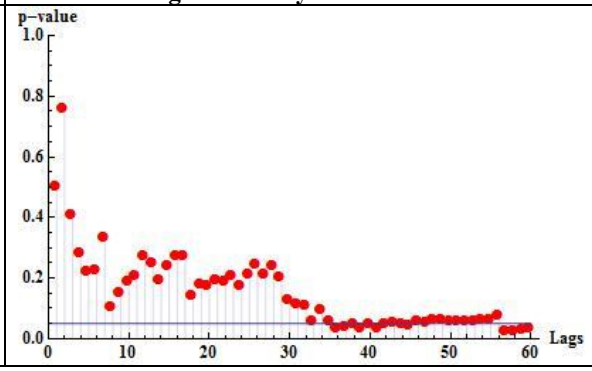
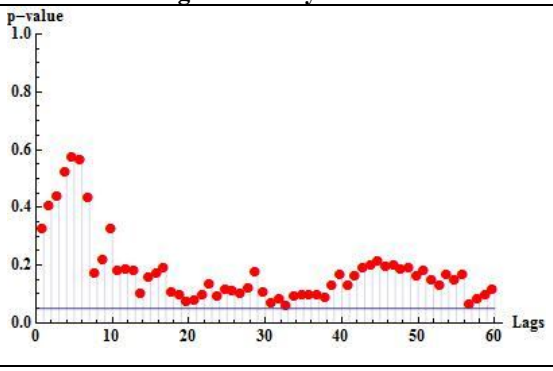
DESCRIPTIVE STATISTICS FOR ROTX, BET-BK, BET-Fi DAILY RETURNS
(March 2005- Dec.2012 respectively Sept.2009 – Dec.2012)

	ROTX	BET-Fi	BET-BK	BET-Fi
Number of observations	1,953	1,953	828	828
Mean	0.013	0.035	0.020	0.025
Std. Dev.	1.965	2.708	1.584	2.134
Skewness	-0.650	0.073	-0.212	-0.119
Kurtosis	8.099	5.403	9.141	5.822
Largest (1) (%)	10.992	14.827	11.971	13.575
Smallest (1) (%)	-17.843	-14.850	-10.316	-13.907

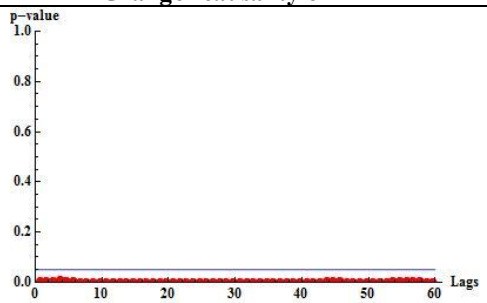
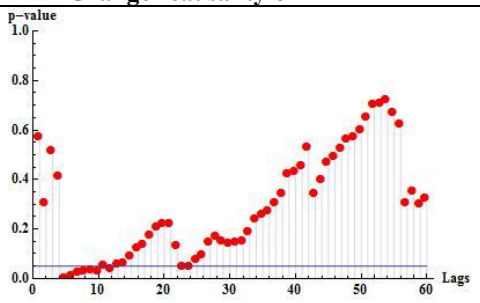
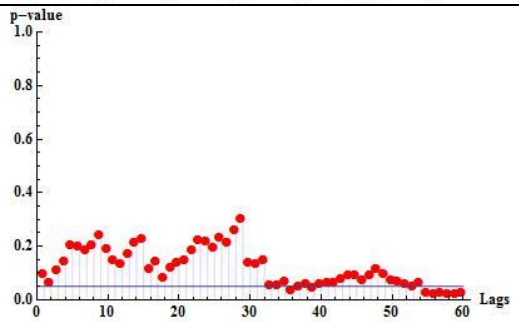
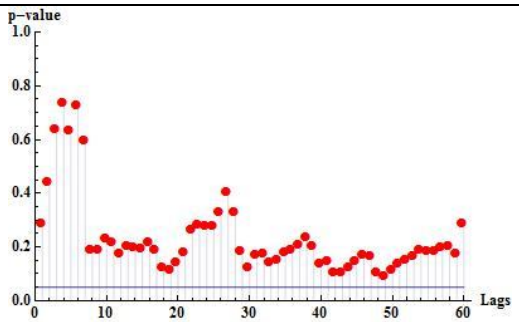
Annex 5a

Period	BET-Fi Granger causality on BET	BET Granger causality on BET-Fi
Nov.2000-Dec.2012		
Period	**BET-Fi Granger causality on BET-C**	**BET-C Granger causality on BET-Fi**
Nov.2000-Dec.2012		
Period	**BET-Fi Granger causality on ROTX**	**ROTX Granger causality on BET-Fi**
March.2005-Dec.2012		
Period	**BET-Fi Granger causality on BET-XT**	**BET-XT Granger causality on BET-Fi**
Jan.2007-Dec.2012		

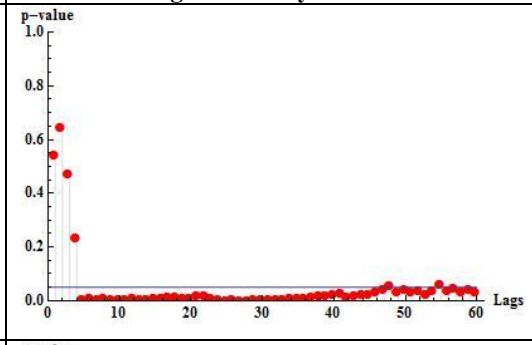
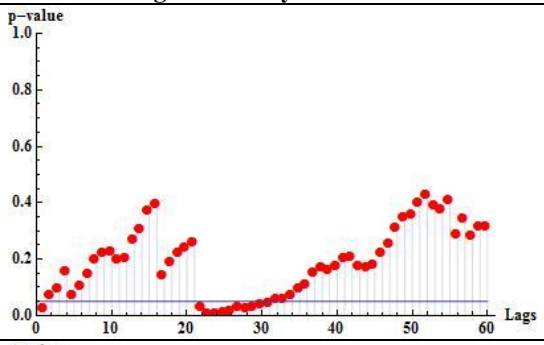
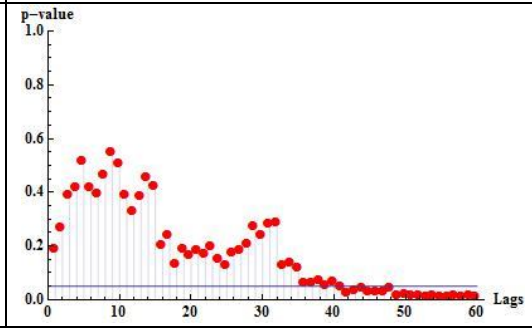
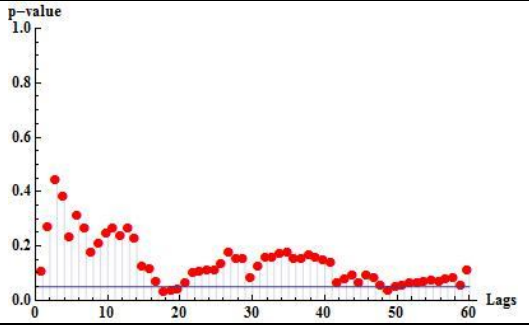
Annex 5a cont.

Period	BET-Fi Granger causality on BET- NG	BET- NG Granger causality on BET-Fi
Jan.2007-Dec.2012		
Period	**BET-Fi Granger causality on BET- BK**	**BET- BK Granger causality on BET-Fi**
Sept.2009-Dec.2012		

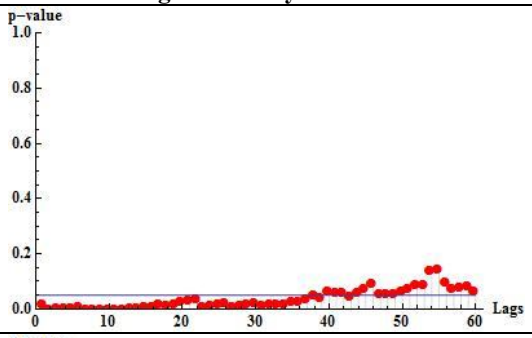
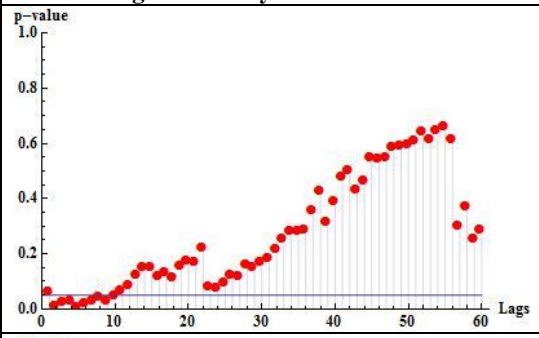
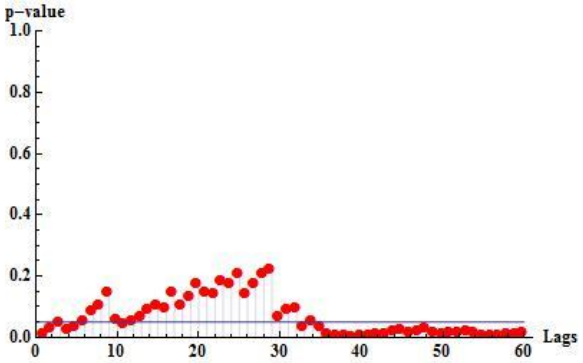
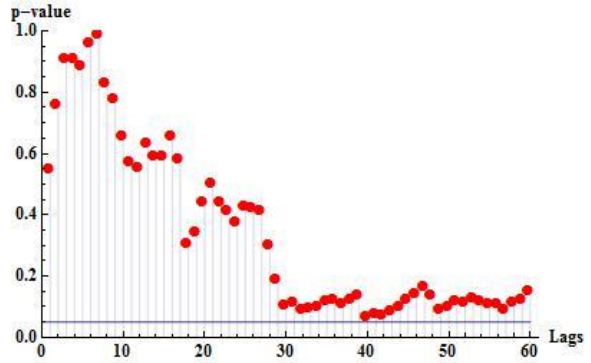
Annex 5b

Period	BET-Fi Granger causality on BET	BET Granger causality on BET-Fi
Nov.2000-Dec.2004		
Jan.2005-Dec.2012		

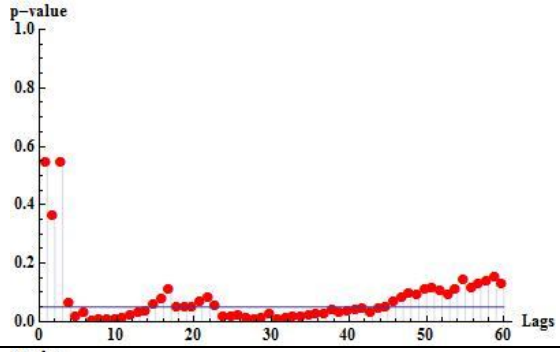
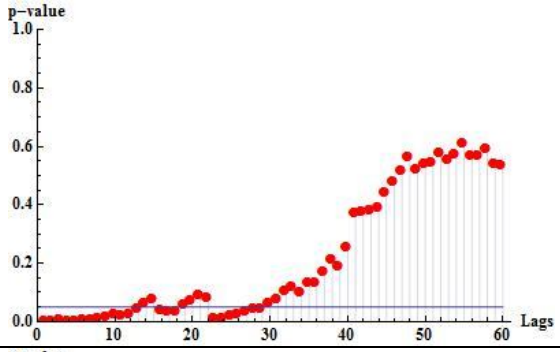
Annex 5b cont.

Period	BET-Fi Granger causality on BET-C	BET-C Granger causality on BET-Fi
Nov.2000-Dec.2004		
Jan.2005-Dec.2012		

Annex 5c

Period	BET-Fi Granger causality on BET	BET Granger causality on BET-Fi
Nov.2000-July.2007		
Aug.2007-May.2012		

Annex 5c cont.

Period	BET-Fi Granger causality on BET-C	BET-C Granger causality on BET-Fi
Nov.2000-July.2007		
Aug.2007-May.2012