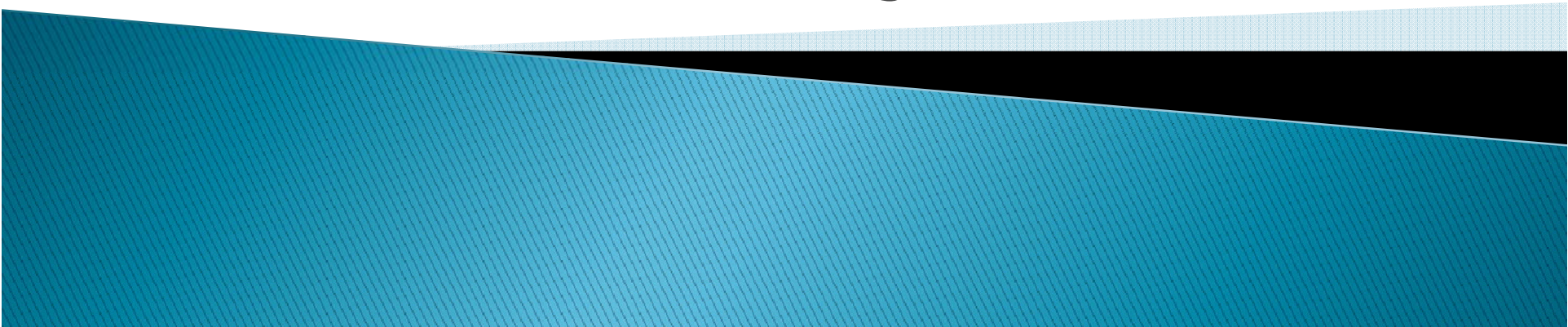


Can BET-Fi be considered a leading index for Bucharest Stock Exchange?

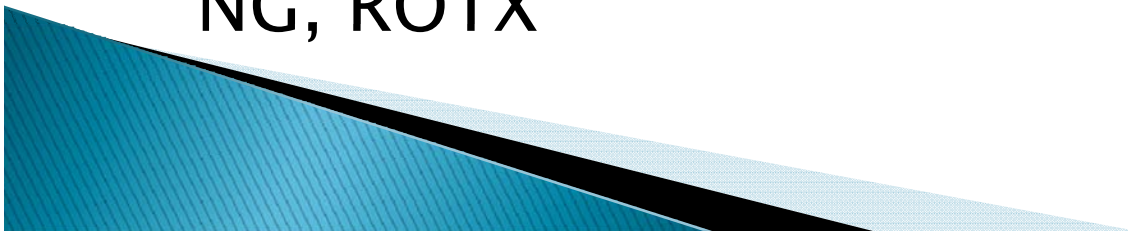
Cornelia Pop
Dragos Bozdog
Adina Calugaru





Bucharest Stock Exchange

- ▶ Opened up for trading in November 1995
- ▶ For almost 2 years, reduced number of trading days/week
- ▶ 4th place by market capitalization among eastern European exchanges
- ▶ 6 indices: BET, BET-C, BET-Fi, BET-XT, BET-NG, ROTX





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SPO of OMV Petrom, rolled by Ministry of Economy through the Office of State Ownership and Privatization in Industry

Market Capitalization

| Exchange segment: BSE | Exchange segment: RASDAQ | Exchange Rates |
|-----------------------|--------------------------|--------------------|
| 113,377,800,188 LEI | 10,862,097,444 LEI | 1 USD = 2.9953 LEI |
| 26,706,034,811 EUR | 2,558,556,896 EUR | 1 EUR = 4.2454 LEI |
| 37,851,901,375 USD | 3,626,380,477 USD | |

[\[more info\]](#)

Exchange Statistics

| Exchange Total | BSE Statistics | | RASDAQ Statistics | | ATS Statistics |
|---------------------|----------------|-------------------|----------------------|---------------------|----------------|
| | Trades | Volume | Value (LEI) | Value (EUR) | Value (EUR) |
| Shares | 3,232 | 53,205,851 | 27,882,580.83 | 6,567,715.84 | |
| Bonds | 1 | 283 | 2,897,337.02 | 682,465.03 | |
| Rights | 0 | 0 | 0.00 | 0.00 | |
| Fund Units | 2 | 6 | 411.00 | 96.81 | |
| Structured Products | 524 | 78,948 | 3,391,306.59 | 798,819.10 | |
| Futures | 14 | 227 | 358,133.40 | 84,357.99 | |
| Total | 3,773 | 53,285,315 | 34,529,768.84 | 8,133,454.77 | |

Last Update 7/21/2011 4:48:21 PM [\[more info\]](#)

TOP 5 Companies BSE

| by volume | | | | by value | | | |
|-----------|--------|------------|---------------|----------|---------|---------------|-------|
| Symbol | Price | Volume | Value | Symbol | Price | Value | Value |
| FP | 0.5160 | 36,037,100 | 18,619,670.45 | FP | 0.5160 | 18,619,670.45 | |
| AMO | 0.0147 | 4,340,500 | 1,596,883.95 | SIF3 | 0.4960 | 1,596,883.95 | |
| SIF3 | 0.4960 | 3,207,000 | 1,417,390.40 | BRD | 13.9500 | 1,417,390.40 | |
| SNP | 0.3835 | 1,253,000 | 1,222,598.00 | SIF5 | 1.3400 | 1,222,598.00 | |
| SIF5 | 1.3400 | 919,500 | 555,936.00 | SIF1 | 1.0170 | 555,936.00 | |

| by price - Gainers | | | | by price - Decliners | | | |
|--------------------|---------|---------|--------|----------------------|----------|--------|--------|
| Symbol | Price | Var (%) | Symbol | Price | Var (%) | Symbol | Price |
| EFO | 0.1096 | 7.77 ▲ | ELJ | 0.1372 | -14.25 ▼ | ELJ | 0.1372 |
| TUFE | 0.1960 | 5.15 ▲ | CBC | 4.4000 | -4.97 ▼ | CBC | 4.4000 |
| IBM | 0.0734 | 2.95 ▲ | ELGS | 0.3600 | -2.73 ▼ | ELGS | 0.3600 |
| SOCF | 0.3600 | 2.80 ▲ | RRC | 0.0650 | -2.26 ▼ | RRC | 0.0650 |
| PEI | 22.4500 | 2.05 ▲ | CMCM | 0.1551 | -1.84 ▼ | CMCM | 0.1551 |

Last Update 7/21/2011 4:48:21 PM [\[more info\]](#)
Trading data 15 min delay

News

Indices



| | | | |
|--------|-----------|--------|----------|
| BET | 5,356.50 | 5.24 | 0.10% ▲ |
| BET-C | 3,256.41 | 1.86 | 0.06% ▲ |
| BET-FI | 21,841.54 | 103.77 | 0.48% ▲ |
| ROTX | 11,179.04 | 36.84 | 0.33% ▲ |
| BET-XT | 494.97 | 0.62 | 0.13% ▲ |
| BET-NG | 764.85 | -1.18 | -0.15% ▼ |

Values as of: 7/21/2011 [\[Details\]](#)

Announcements

6/24/2011: BVB shareholders and potential investors can subscribe as of today at no charge for news regarding General Shareholders' Meetings, financial statements, dividends and corporate actions of the issuer Bucharest Stock Exchange. BVB symbol. [\[more info\]](#)

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- Financial Instruments
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Investor relations
Symbol: BVB



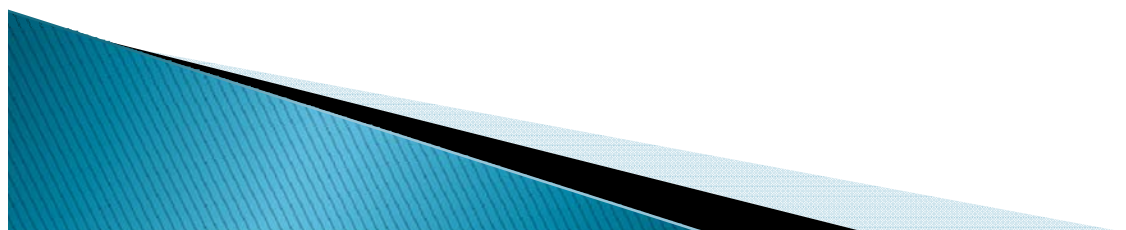
The New BVB Newsletter
Monthly Issue

Derivatives market
New products
More Market Makers

Derivatives market available through
sarena
From May 25, 2011

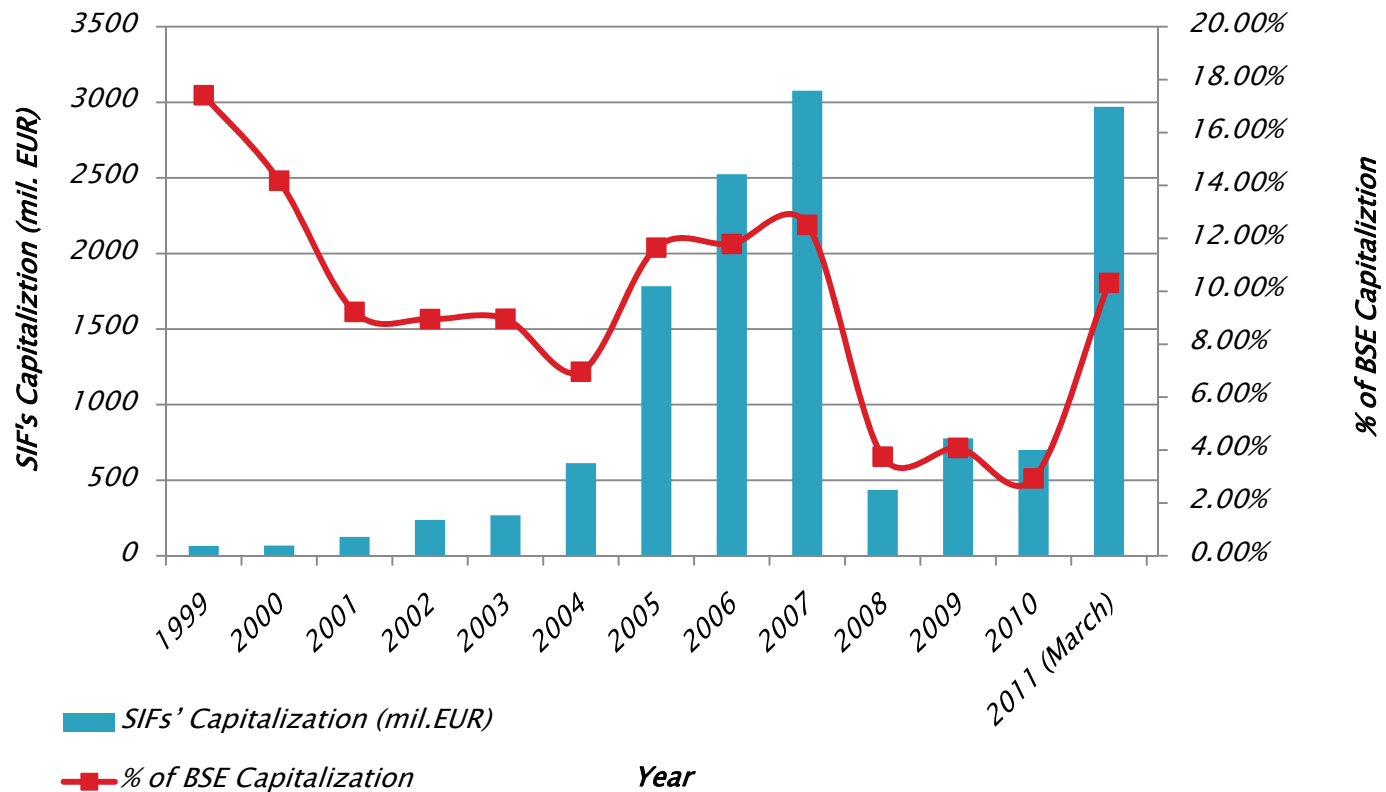
SIFs

- ▶ 5 Romanian Financial Investment Companies
 - ▶ Created on November 1st 1996
 - ▶ Former 5 Private Property Funds– part of the privatization process in Romania, in the '90s
 - ▶ Largest Romanian Closed–end funds (equity funds)
 - ▶ Listed on BVB since November 1st 1999
- 



SIFs position at BSE

SIF's capitalization

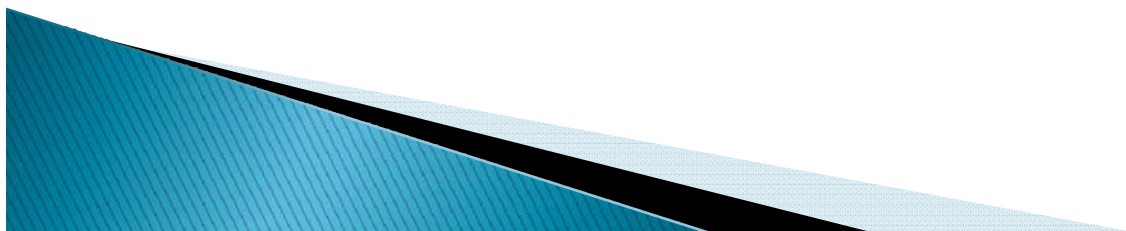
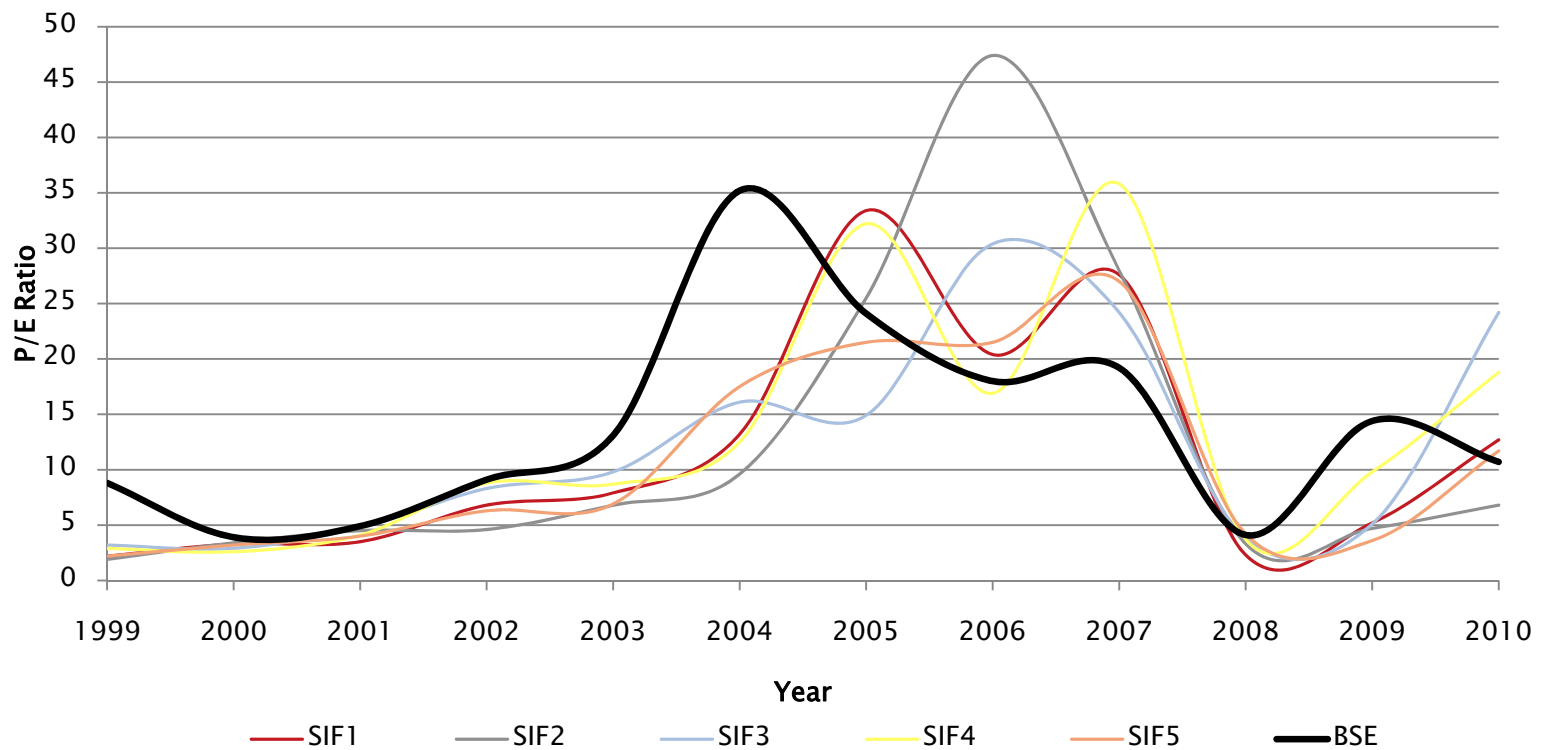


SIFs position at BSE (contd.)

| SIFs' POSITION IN TOTAL BSE AND 1 st CATEGORY TRANSACTIONS (AVERAGE FIGURES FOR NOV.1999-DEC.2010) | | | SIFs DAILY ACTIVITY COMPARED WITH BSE (NOV.1999-DEC.2010) | | |
|--|-------------------|----------------------------------|--|--------------|-------------|
| | % of total BSE | % of 1 st category | | BSE total | SIFs |
| Number of trades | 49.04% | 61.45% | Average number of trades per day | 3005 | 1944 |
| Volume | 29.75% | 45.23% | Average volume per day (mil. shares) | 28.02 | 6.49 |
| Value | 40.88% | 49.18% | Average value per day (mil. EUR) | 4.96 | 2.27 |

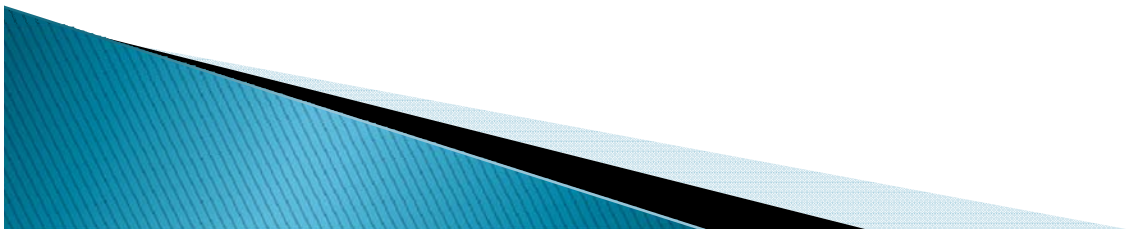
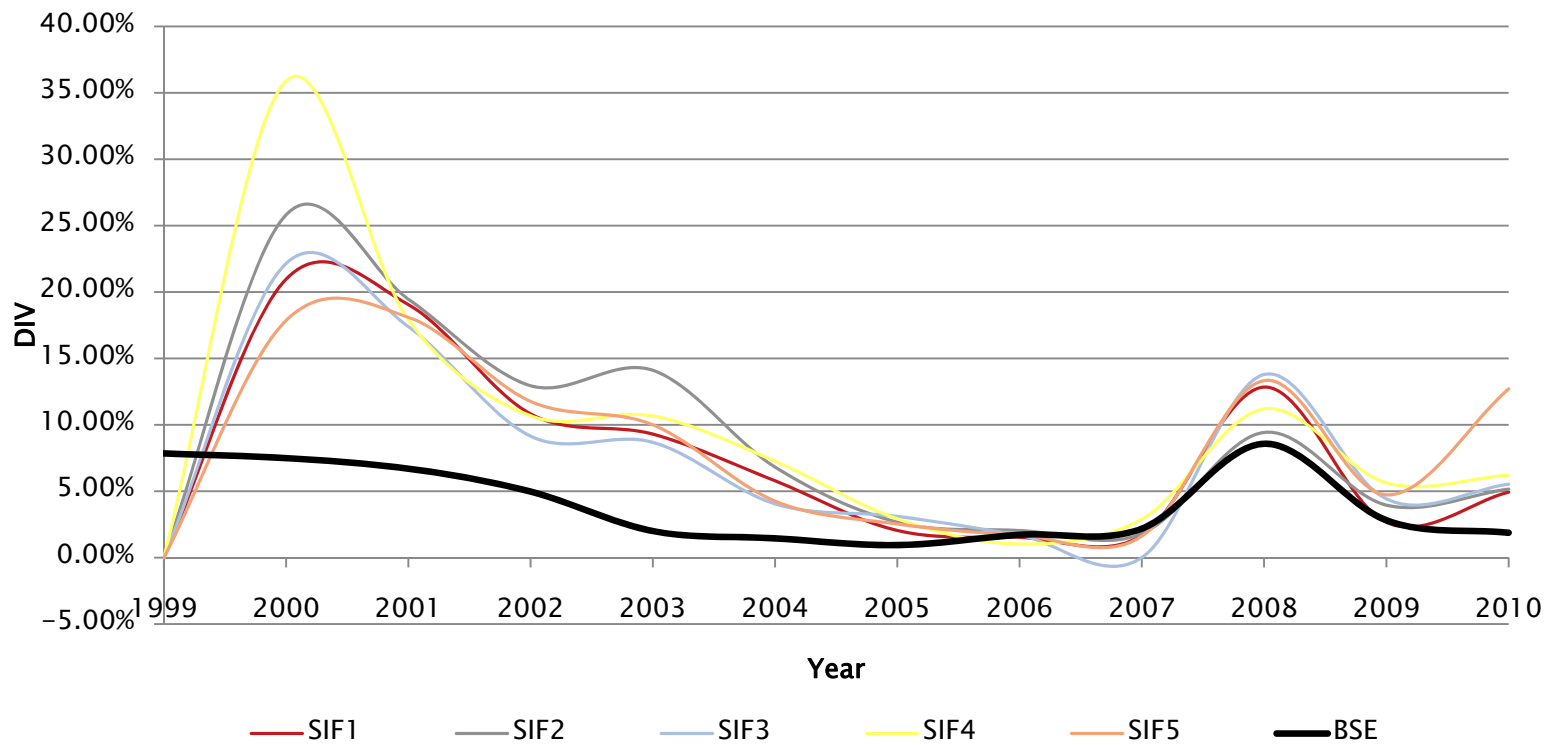
SIFs position at BSE (contd.)

SIF's and BSE – P/E evolution



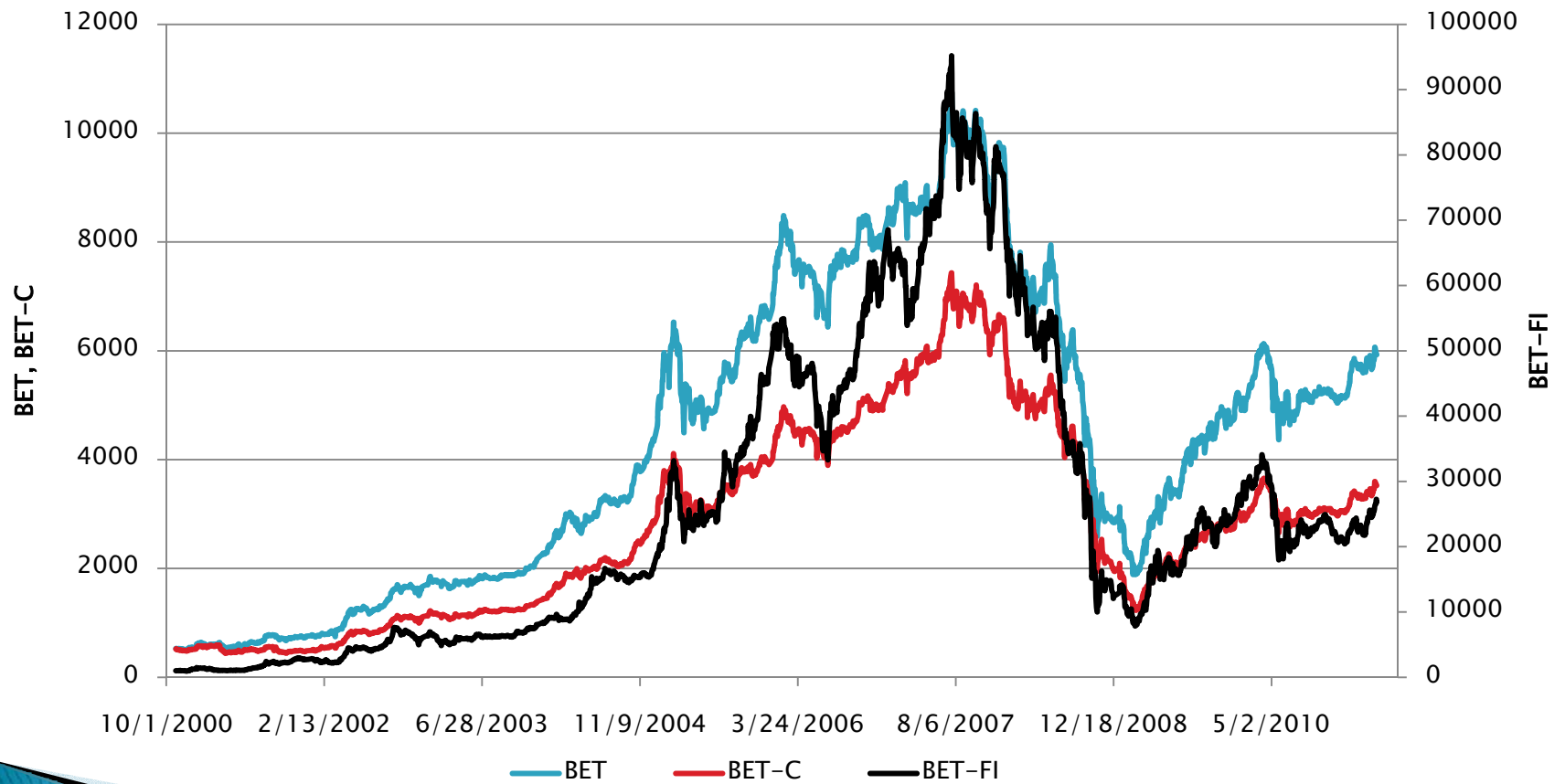
SIFs position at BSE (contd.)

SIF's and BSE – DIV evolution



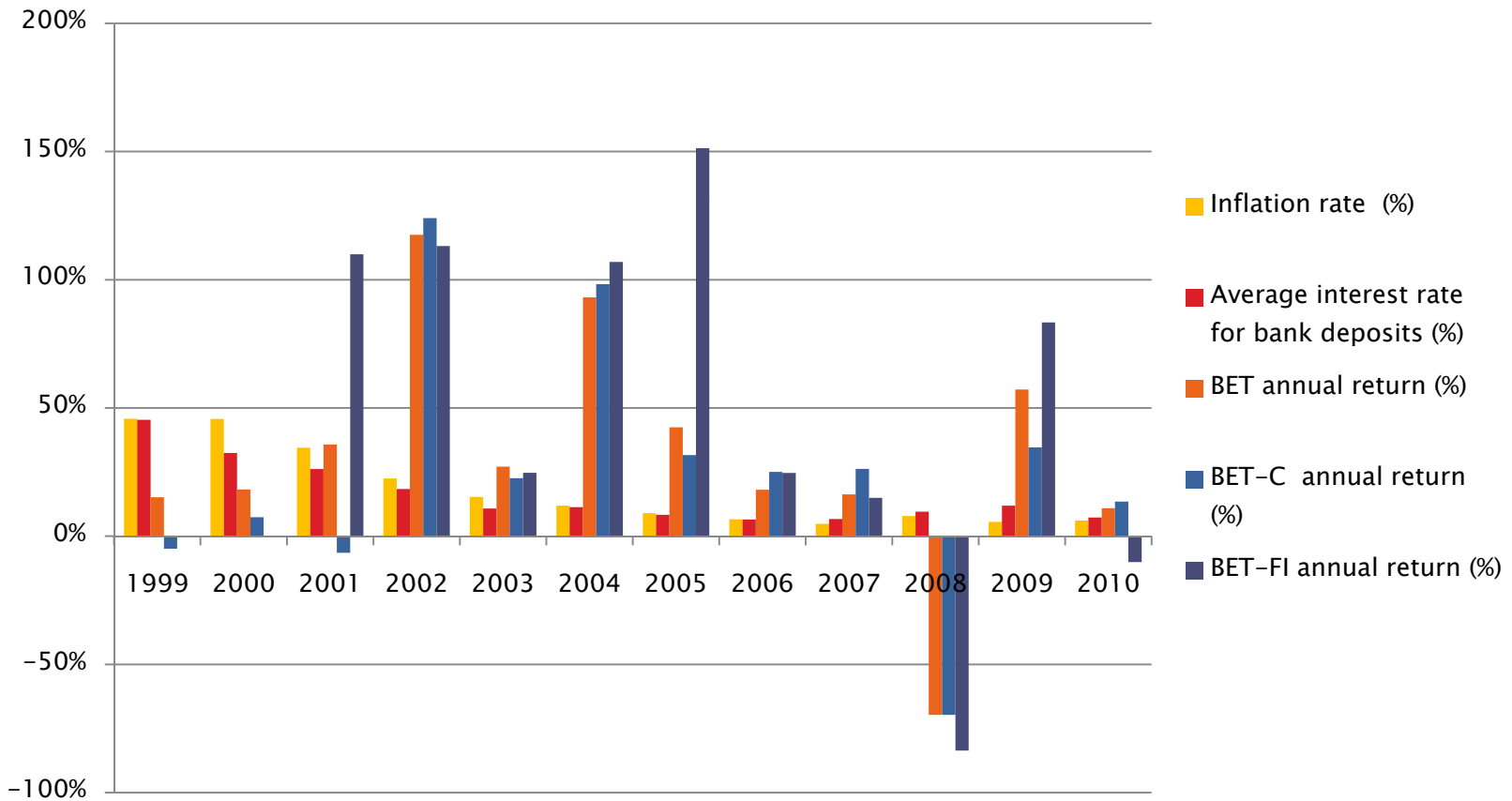
SIFs Performance

Indices evolution



SIFs Performance (contd.)

Annual Rates Comparison

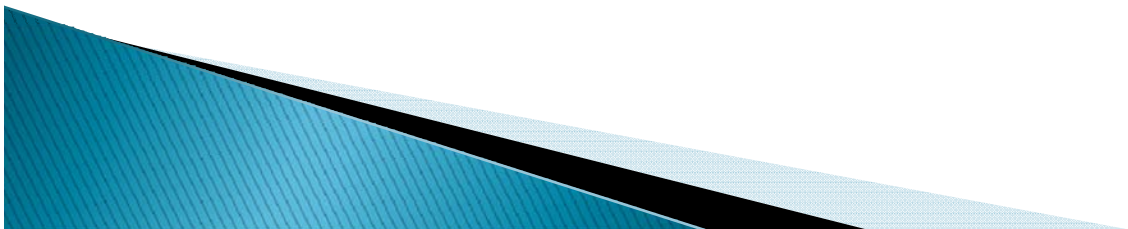


Do SIFs influence BSE?

DESCRIPTIVE STATISTICS FOR BET, BET-C, BET-Fi AND SIFs DAILY RETURNS (Nov.2000 - March 2011)

| | BET | BET-C | BET-Fi | SIF1 | SIF2 | SIF3 | SIF4 | SIF5 |
|------------------|---------|--------|---------|---------|---------|---------|---------|---------|
| Mean | 0.093 | 0.074 | 0.127 | 0.124 | 0.146 | 0.120 | 0.113 | 0.142 |
| Std. Dev. | 1.807 | 1.656 | 2.704 | 3.025 | 3.155 | 2.977 | 2.943 | 3.050 |
| Skewness | -0.305 | -0.577 | -0.101 | -0.279 | -0.263 | -0.202 | -0.228 | -0.238 |
| Excess Kurtosis | 7.476 | 7.291 | 4.816 | 4.953 | 4.642 | 4.718 | 4.921 | 4.744 |
| Largest (1) (%) | 14.576 | 10.89 | 13.825 | 13.976 | 13.935 | 13.915 | 13.935 | 13.976 |
| Smallest (1) (%) | -13.116 | -12.12 | -16.075 | -16.164 | -16.245 | -16.227 | -16.251 | -16.251 |

Number of observations: 2590



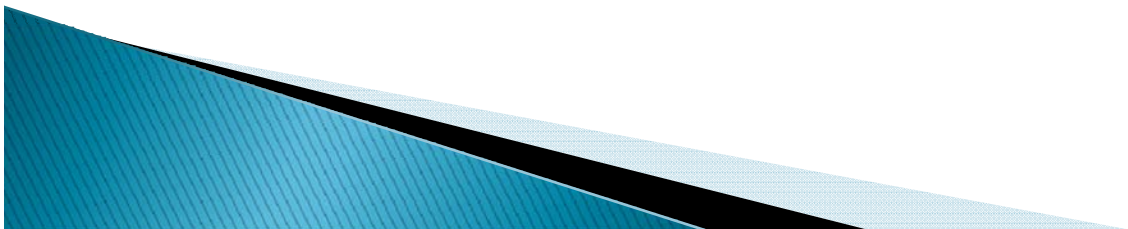
Do SIFs influence BSE? (contd.)

CORRELATION BETWEEN BET AND BET-Fi BASED ON DAILY RETURNS

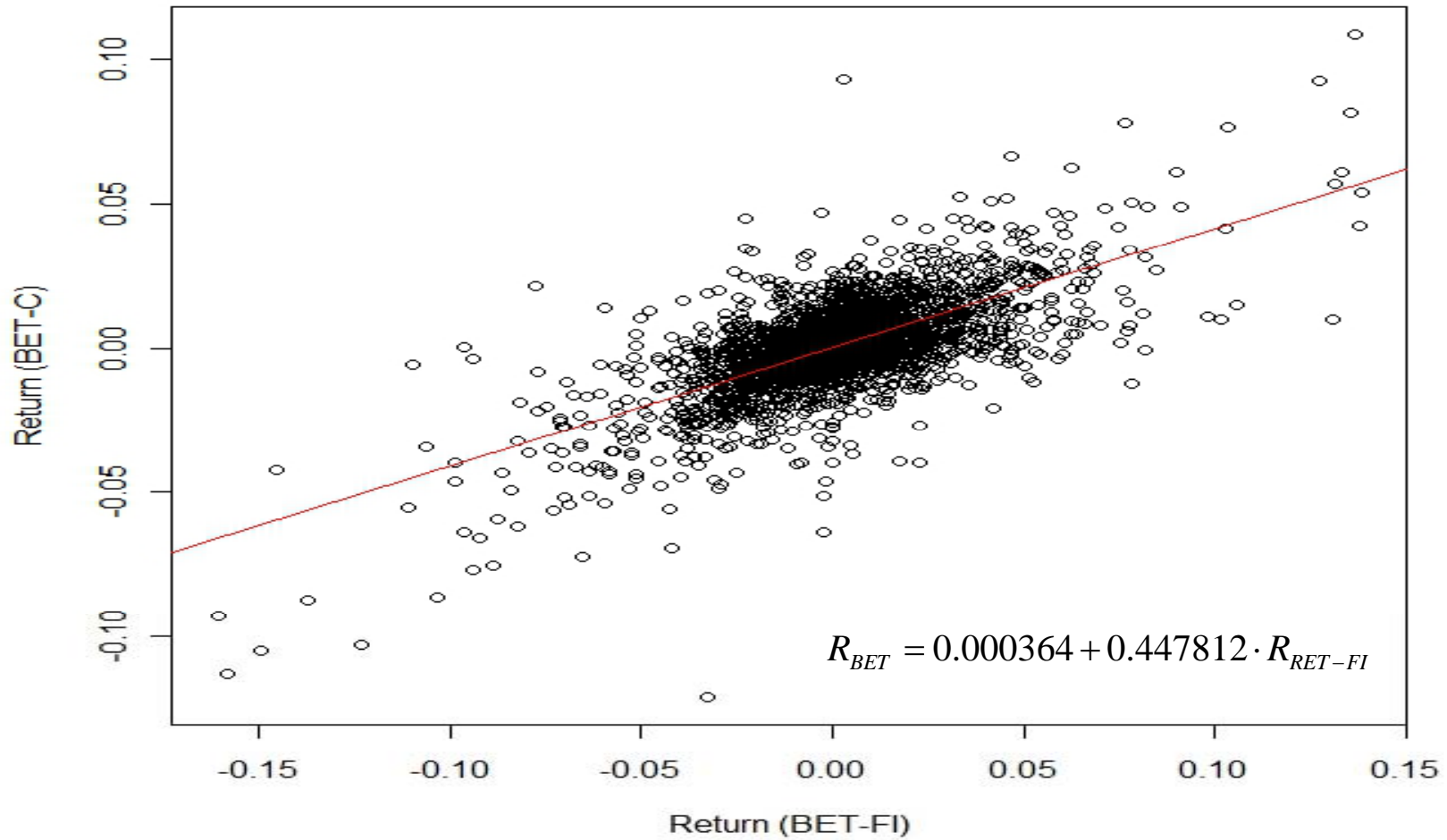
| Entire period | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.670 | 0.196 | 0.281 | 0.414 | 0.535 | 0.218 | 0.645 | 0.580 | 0.675 | 0.874 | 0.769 | 0.846 | 0.637 |

CORRELATION BETWEEN BET-C AND BET-Fi BASED ON DAILY RETURNS

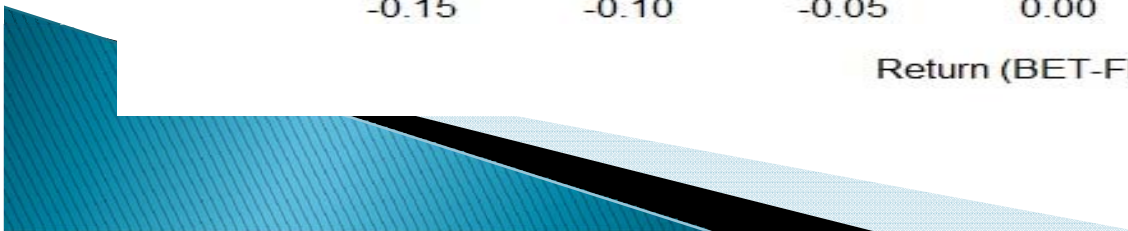
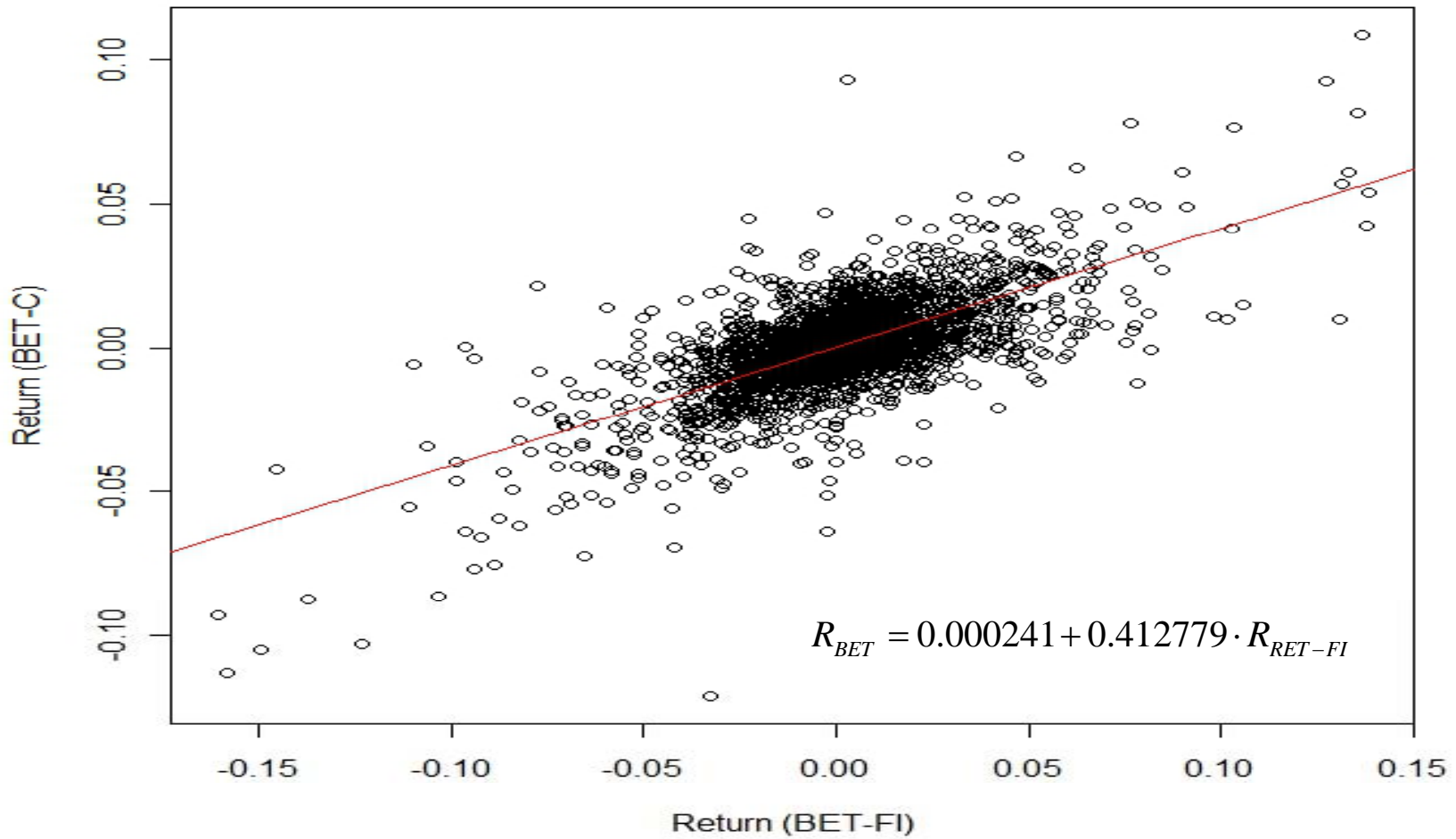
| Entire period | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.674 | 0.186 | 0.210 | 0.472 | 0.548 | 0.265 | 0.637 | 0.626 | 0.682 | 0.874 | 0.777 | 0.845 | 0.612 |



Regression BET/BET-Fi



Regression BET-C/BET-Fi



Bivariate Granger Causality Test

- Evaluates whether the past values of BET-FI are useful in predicting BET (or BET-C)

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

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

- Null Hypothesis: BET-FI does not Granger-cause BET
 - p-values of F-test are reported
- Using: `granger.test` function in R

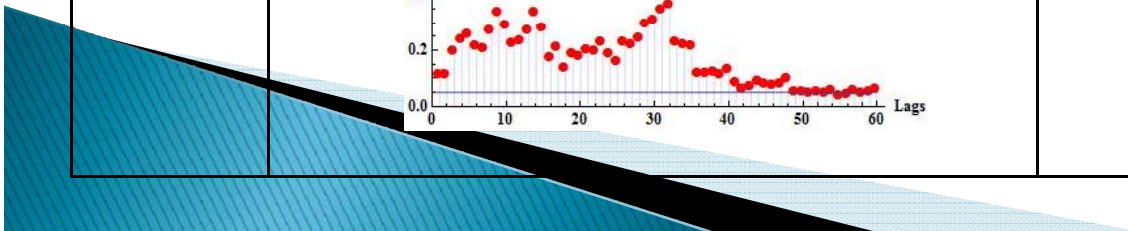


Granger Causality test p-values for BET/BET-Fi

| Period | BET-Fi Granger causality on BET | BET Granger causality on BET-Fi |
|-----------|---------------------------------|---------------------------------|
| 2000-2011 | | |
| 2000-2004 | | |
| 2005-2011 | | |

Granger Causality test p-values for BET-C/BET-Fi

| Period | BET-Fi Granger causality on BET-C | BET-C Granger causality on BET-Fi |
|-----------|-----------------------------------|-----------------------------------|
| 2000-2011 | | |
| 2000-2004 | | |
| 2005-2011 | | |



BET-Fi/BET - Granger causality probabilities for lags 1 to 15 (Nov 2000- March 2011)

| Lags | BET-FI causes BET | BET causes BET-FI | BET-FI causes BET-C | BET-C causes BET-FI |
|------|-------------------|-------------------|---------------------|---------------------|
| 1 | 0.0068 | 0.3234 | 0.5668 | 0.0391 |
| 2 | 0.0006 | 0.3037 | 0.4833 | 0.1205 |
| 3 | 0.0016 | 0.4759 | 0.5790 | 0.1926 |
| 4 | 0.0036 | 0.6101 | 0.6623 | 0.1379 |
| 5 | 0.0106 | 0.0959 | 0.6195 | 0.0396 |
| 6 | 0.0181 | 0.1396 | 0.6803 | 0.0615 |
| 7 | 0.0054 | 0.2088 | 0.4451 | 0.1027 |
| 8 | 0.0077 | 0.1279 | 0.5759 | 0.0745 |
| 9 | 0.0135 | 0.0850 | 0.6708 | 0.0777 |
| 10 | 0.0199 | 0.0781 | 0.7372 | 0.0884 |
| 11 | 0.0241 | 0.0964 | 0.5331 | 0.0983 |
| 12 | 0.0349 | 0.1286 | 0.6024 | 0.1301 |
| 13 | 0.0429 | 0.1672 | 0.6657 | 0.1723 |
| 14 | 0.0613 | 0.2126 | 0.7247 | 0.2146 |
| 15 | 0.0867 | 0.1301 | 0.7877 | 0.1150 |

Conclusions

- ▶ Peculiar situation of the small emerging market of Romania –BSE
- ▶ 5 Investment Companies dominate the entire market
- ▶ BET–Fi is an index leader for BSE blue chips (BET)
- ▶ BET–Fi shows mixed results over BET–C



Future Work

- ▶ Analyze Granger Causality at the intraday level
- ▶ Monitor the evolution of BET-FI in 2011 due to structural changes

