D. Vasiu, Doctor of Sciences (Economics), Assistant,
L. Ilie, Doctor of Sciences (Economics), Professor
Lucian Blaga University of Sibiu, Sibiu, Romania

CORRELATIONS BETWEEN FINANCIAL PERFORMANCE INDICATORS OF COMPANIES WITH CORE ACTIVITY IN THE ENERGY SECTOR AND RELATED INDUSTRIES, TRADED ON BUCHAREST STOCK EXCHANGE, AND THE BET-NG INDEX

The results we obtained are invalidating the research hypothesis: there is a strong and direct link between the evolution of BET-NG index and the financial performance ratios of the component companies.

The analysis performed on the correlations between the evolution of BET-NG index and financial performance ratios indicates that in the majority of the cases the links are inverse and in 25% of the cases they are strong.

In what concerns the intensity of the correlations between the major financial performance ratios (ROA; ROE; EPS; Net Margin) and average values of BET-NG index, there is no strong link to justify the identification of a regression model. Consequently, we can affirm that the evolution of BET-NG index is determined by other factors, different than the financial performance of the component companies. This situation outlines new research developments that need extending the timeframe and the financial ratios used.

Key words: BET-NG INDEX, Financial Performance Indicators, Bucharest Stock Exchange.

Introduction. Stock indices reflect the stock price evolution of the most traded companies on the Stock Exchange, or of some representative industries like the financial sector or the energy sector [15].

In a previous research [14, p. 357] we analyzed the correlation between the main indicators of financial performance and the BET Index, for the companies participating in the BET Index, in the period 2011–2015. The analysis identified a strong correlation between EPS and BET Index, BET variation being explained in a proportion of 75% of the independent variable EPS. Between ROA, ROE and BET index, a weaker and reverse link has been found. This situation could be explained by the fact that EPS is used most frequently by investors when evaluating a security, being easier and faster to calculate, comparing with ROA and ROE.

Taking into account the obtained results, the aim of this paper is to continue the research, this time analyzing the correlation between the main indicators of financial performance for companies with core activity in the energy sector and related industries, traded on Bucharest Stock Exchange, and the BET-NG index.

Stock indices. Stock indices are synthetic products which are expressing the evolution of security prices in a particular market [1, p. 497], and represent the average price of all securities or of the representative ones that are listed on the stock exchange [11, p. 219]. They were developed to have a financial product that is reflecting the evolution of the market not only the evolution of a particular security.

Representing the numerical expression of the trends of the most representative titles in a market, measured in points, stock indices can be considered a mirror, reflecting the evolution of the reference market as a whole [3, p. 160].

Any investor in equity securities is interested to have a general idea of how the overall equity market performs, to guide their actions and to act as a benchmark against which to judge the performance of the securities they invest in [4, p. 332]. This role is played by the stock index. Investors are encouraged to invest if the stock index is moving upward and are encouraged to liquidate their holdings and invest in money market assets or funds when the sock index has a downward trend.[4, p. 333]

The first stock index, Dow Jones Industrial Average, was developed in 1896 at New York Stock Exchange, followed by the British index – FTSE 30, and the Japanese one – Nikkei. Along with many others, these first generation indices were having a limited information capacity due to the fact that in their structure there were shares of companies belonging to the same industries.

The second generation of indices was a step forward for better characterizing the stock market by including more stocks from a variety of industries. These indices, named composite indices, provide more information about the stock market and are more relevant.

The diversity of stock indices is in close connection with the diversity of stock market products. They evolved from indices build based on one security (shares) or for one single market to indices that take into account different securities and are European or even global.

The stock indices are the most synthetic indicators of an economy since most of the representative companies in the respective economies are listed on the stock exchange [3, p. 160]. Representativeness for the stock exchange is ensured by the way the securities quoted on the stock exchange are included in the composition of the stock index, the quotations being in real time. Stock indices can be build based on the quoted securities or based only on the most active and representative ones. The securities can have equal weights in the stock index, or different weights based on the stock price or on the market capitalization.

There are several studies that analyze the correlation between the financial performance of the entities and the stock returns, respectively the value of the indexes to which they belong.

On the Romanian stock market, Tudor [13, p. 73] conducted an earlier research regarding the relationship between firm-specific ratios and stock returns. The results, calculated for the period 2002 to 2008, indicates that the variation in stock returns is determined mostly by size and E/P ratio. In the same time, ROA and ROE have little impact on returns.

The correlations between financial performance of companies and stock returns, in case of Oil and Gas Sector in Pakistan have been studied by Saleh [7, p.30]. Despite study limitations, highlighted by author, the study showed that in Pakistan's Oil and Gas sector, stock returns are significantly influenced by net profit margin, return on assets and return on equity, but also the fact that there are other factors that influence this relationship.

A highly influence on the stock prices in case of in Colombo Stock Exchange has been determined by Sujeewa

Kodithuwakku [6, p. 76] as due Earnings per Share, Dividend per Share, and Net Asset Value per Share.

In case of Pakistan, Khan [5, p. 171] analysis the effect of dividends on stock prices, during 2001–2010 for 29 companies which were listed at KSE-100 Index. A significant positive relation to stock market prices was registered in case of Stock Dividend, Earnings per Share and Profit after Tax, while Retention Ratio and Return on Equity have the negative insignificant relation with stock prices in case of chemical and pharmaceutical sector of Pakistan.

An analysis of the factors affecting stock price in case of he Case of Bahrain Stock Exchange was performed by Taimur [12, p. 207], the results indicating return on equity, book value per share, dividend per share, dividend yield, price earnings, and firm size as significantly determinanting the share prices.

Studies regarding the determinants of share price had been performed by Sharma [9, p. 58] in case of India, finding that earning per share, dividend per share and book value per share has significant impact on the market price

of share. Furthermore, dividend per share and earnings per share were identified as having the strongest determinants of market price.

Sattam Allahawiah [8, p. 241] analysis the Amman Stock Exchange and the factors which influences on share prices in the Bahrain market. Research has revealed that a significant influence was registred in case of return on equity, dividend yield, dividend per share, book value per share, price earnings and firm size.

In case of Romania, [10, p. 86] studied the correlations between BET-FI index and six companies forming the index, using a dynamic conditional correlation, during 2011–2016. The results indicate a high volatility. Almost all pairs correlations calculated between constituents recorded a downward trend, which means that components are becoming more independent.

The BET-NG index [15] was launched on July 1st, 2008. It is a sectorial index and reflects the evolution of the quoted companies on Bucharest Stock Exchange with core activities in the energy or utilities related industries. The index is composed based on 11 companies:

Tab l e **1. The structure of BET-NG Index**

Symbol	Company	Percentage (%)
SNP	OMV PETROM S.A.	29,86
SNG	S.N.G.N. ROMGAZ S.A.	23,24
EL	SOCIETATEA ENERGETICA ELECTRICA S.A.	16,29
TGN	S.N.T.G.N. TRANSGAZ S.A.	14,76
TEL	C.N.T.E.E. TRANSELECTRICA	7,59
COTE	CONPET SA	3,54
SNN	S.N. NUCLEARELECTRICA S.A.	2,64
RRC	ROMPETROL RAFINARE S.A.	1,54
OIL	OIL TERMINAL S.A.	0,36
PTR	ROMPETROL WELL SERVICES S.A.	0,17
PEI	PETROLEXPORTIMPORT S.A.	0,01

Source: www.bvb.ro

Out of the 11 companies, six (S.N.T.G.N. Transgaz S.A, C.N.T.E.E. Transelectrica, Rompetrol Rafinare S.A., Oil Terminal S.A, Rompetrol Well Services, Petrolexportimport S.A) are in the index from the beginning in 2008.The highest weight of a company in the index is 30%. The weight of each security is determined based on the market capitalization adjusted by the free float factor and the representativeness. The calculation methodology allows the BET-NG index to be an underlying asset for derivatives and structured products.

According to BSE statistics [18], 5-year historical performance on June 30, 2016 indicates a decrease of 27.3% in the value of BET-NG index, as compared to January 2011. In addition, five of the companies participating in the BET Index are among the 10 most traded companies on Bucharest Stock Exchange (BSE), which means that they are recording higher financial performance.

In this context, the question is: How much of the BET-NG Index Value is determinate by the performance of component companies?

Methodology. In order to analyze the correlation between the BET-NG index and the financial performance of the companies that compose the index we used the financial statements and data available on www.bvb.ro and www.tradeville.eu.

For the homogeneity of the results, we considered the financial statements for the timeframe 2011–2015, when for the listed companies is compulsory to prepare the

financial statements based on national legal regulations (O. M. P. F. no. 1286/2012.) According to it, companies listed on a regulated market are required to apply IFRS in preparing individual financial statements. As a result, for the period 2012–2015 financial statements are consistent, being compiled according to a uniform methodology.

The average values of the BET-NG index were determined based on daily value over the period 2011–2015. The financial ratios Return on Total Assets (ROA),Return on Equity (ROE), Earnings per Share (EPS), Net Margin (NM) had been used, in order to evaluate the financial performance of the analyzed companies. They were computed as follows [2, p. 111]:

$$ROA = \frac{Net\ profit}{Total\ assets}\ ; \qquad (1)$$

$$ROE = \frac{Net\ profit}{Equity}\ ; \qquad (2)$$

$$EPS = \frac{Net\ profit}{Number\ of\ shares\ on\ the\ market}\ ; \qquad (3)$$

$$NM = \frac{Net\ profit}{Turnover} \qquad (4)$$

The research is based on the hypothesis that there is *a strong and direct correlation between the evolution of the BET-NG index and the financial performance ratios of the component companies.*

Results. Using daily values of the BET-NG index, average annual values were computed (arithmetic mean). The results are the following:

T a b l e **2. The average annual value of BET-NG Index**

Year	2012	2013	2014	2015	2016
The *average annual value* of BET-NG Index	614,6865	654,4118	683,06	671,2024	562,1188

Source: authorial computation.

During 2012–2016, BET-NG Index registred an *average annual value* of which has decreased in average by 2.21% annually. The evolution of the index is presented in Figure 1.
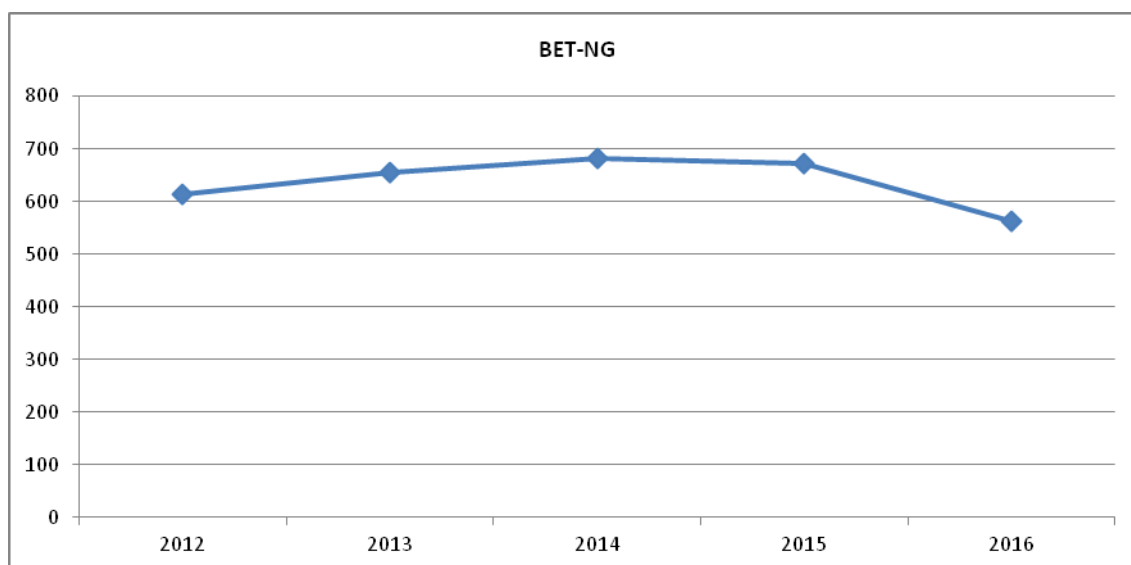
Fig.1. The evolution of BET-NG Index, 2012–2016

Source: authorial calculation.

Based on individual performances, we computed for each company and each financial ratio the average annual values, using the arithmetic mean.

T a b l e **3. The average annual value of financial ratios**

Year	2012	2013	2014	2015	2016
The *average annual value* of ROA	6.22%	6.65%	5.03%	18.13%	3.93%
The *average annual value* of ROE	8.09%	8.40%	5.49%	14.12%	5.05%
The *average annual value* of EPS	5217.86	5000.09	4820.43	6148.93	5517.31
The *average annual value* of NM	11.61%	14.46%	17.66%	3.99%	18.75%

Source: authorial computation.

Over the analyzed timeframe, there have been registered decreases for the *average annual value* of ROA, (by 10.85% annually) and for the *average annual value* of ROE (by 11.12% annually).Over the same timeframe, there have been registered increases for the *average annual value* of EPS (by 1.40% annually) and for the *average annual value* of NM (by 12.74% annually).

In order to determine the connections between the values of the BET-NG index and the financial performance ratios for the component companies we computed Pearson correlation coefficients. We obtained the following results:

• between the *average annual value* of ROE and the *average annual value* of BET-NG Index there is a medium, direct link, of 44.8%;

• between the *average annual value* of ROA and the *average annual value* of BET-NG Index there is a medium, direct link, of 46.7%, this being the strongest correlation;

• between the *average annual value* of EPS and the *average annual value* of BET-NG Index there is a week, reverse link, of-12.4%;

• between the *average annual value* of Net Margin and the *average annual value* of BET-NG Index there is a medium, reverse link, of – 40.2%

Considering the results, we can conclude that no financial performance ratio analyzed is significantly influencing the evolution of the BET-NG index. Moreover, the links of medium intensity (both direct and reverse) do not justify the development of a regression model. These results should be interpreted with prudence taking into account the relative high heterogeneity of values used to

compute the averages and the existence of some statistically aberrant values.

Based on these aspects, we computed for each company and each financial performance ratio the correlation coefficients with the average annual values of BET-NG index:

T a b l e 4. The Correlation coefficient of financial ratios and BET-NG index

Company	Correlation coefficient ROA- BET-NG index	Correlation coefficient ROE- BET-NG index	Correlation coefficient NM- BET-NG index	Correlation coefficient EPS-BET-NG index
SNP	-3.25%	-4.72%	-8.89%	-2.04%
SNG	3.27%	-13.16%	-79.22%	-22.79%
EL	-10.23%	-4.29%	-3.00%	14.65%
TGN	-88.06%	-93.38%	-96.56%	-94.82%
TEL	42.56%	48.61%	38.02%	40.21%
COTE	-36.36%	-28.40%	-38.51%	-28.60%
SNN	36.42%	36.37%	32.61%	19.67%
RRC	-52.81%	-52.73%	-53.04%	-53.16%
OIL	-72.46%	-72.25%	-69.82%	-72.75%
PTR	-7.29%	-7.23%	-3.33%	-3.84%
PEI	39.79%	34.93%	-81.79%	51.32%

Source: authorial computation.

The majority of correlation coefficients (more than 63%) indicate a reverse link, the direct link being present only in 37% of the cases, as we can see in the Figure 2. The most negative correlations are encountered in the case of Net Margin.
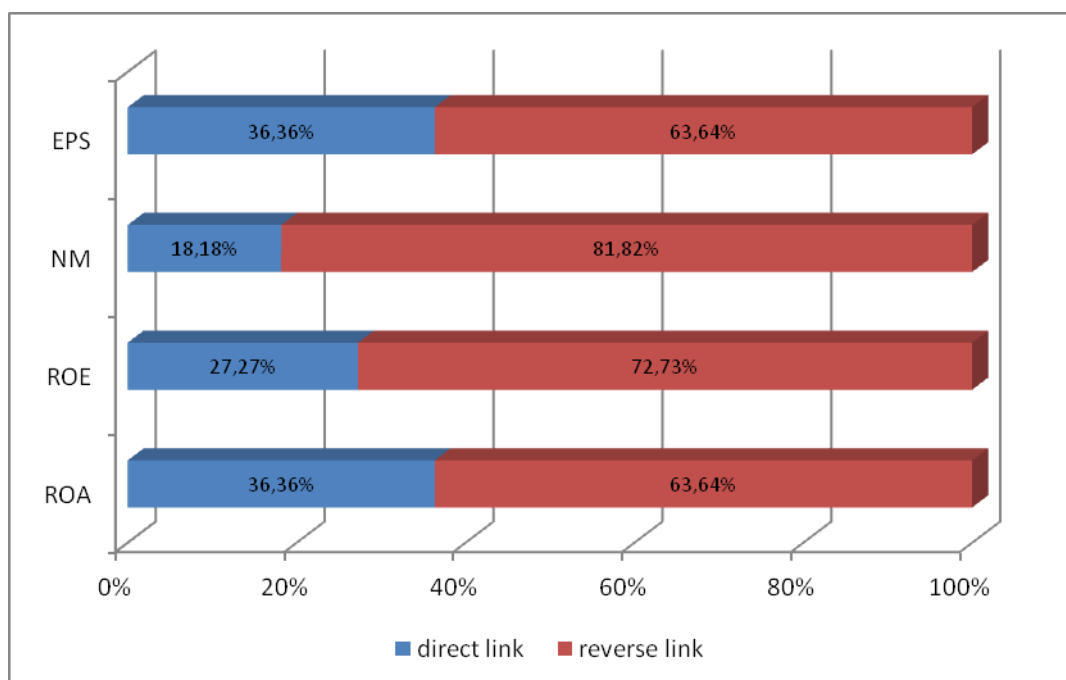
Fig.2. Direct and reverse links between financial ratios and BET-NG index

Source: authorial calculation.

In what concerns the intensity of the correlations (defined as week if the correlation coefficient is between 0 and 25%, medium if the correlation coefficient is between 25–50%, and strong if the correlation coefficient is above 50%), we present them in Figure 3. In the case of Net margin, 45% of the links are inverse and strong.
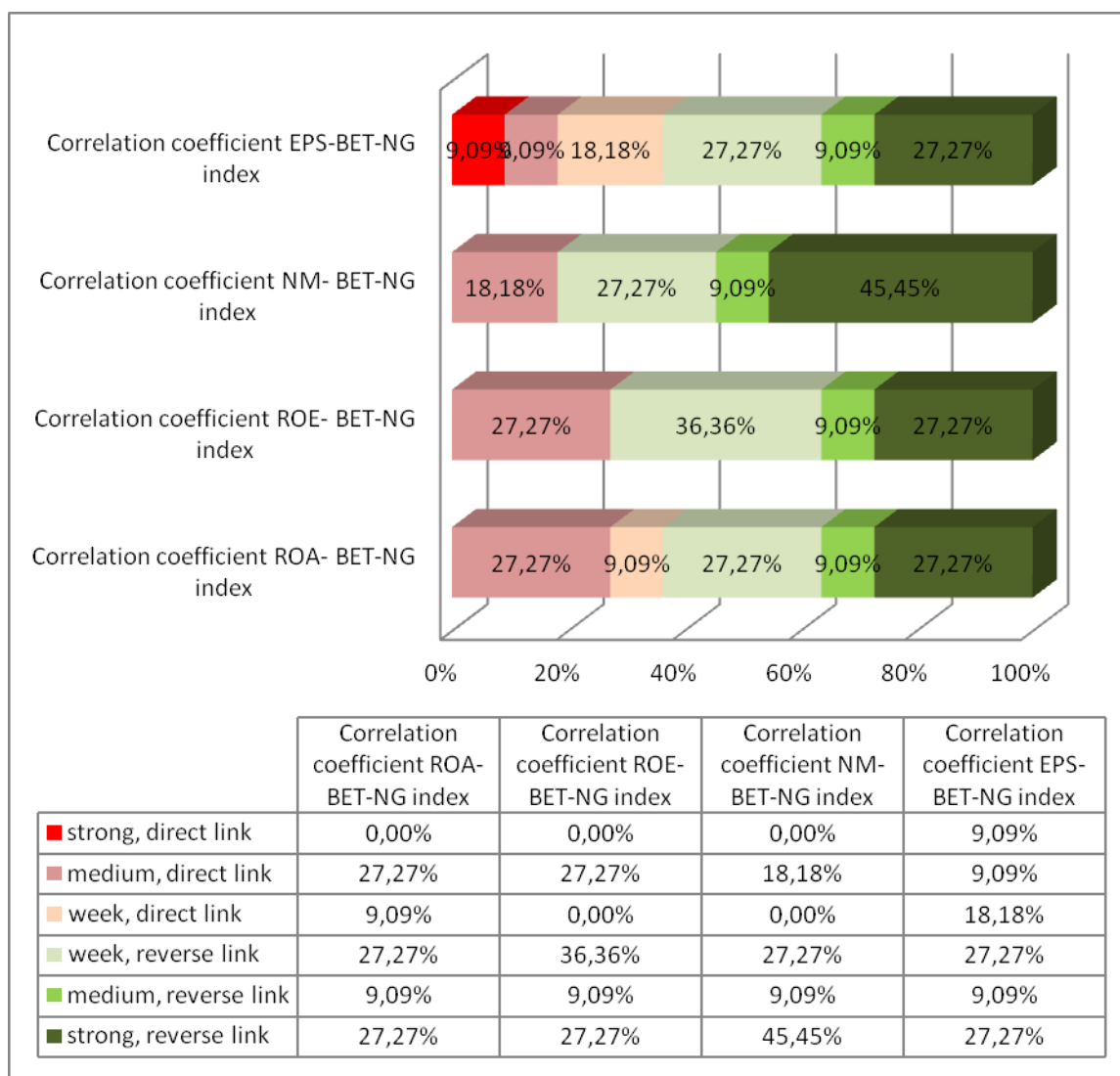
Fig.3. The intensity of the correlations between financial ratios and BET-NG index

Source: authorial calculation.

Conclusion & Discussion. The results we obtained are invalidating the research hypothesis: *there is a strong and direct link between the evolution of BET-NG index and the financial performance ratios of the component companies.*

The analysis performed on the correlations between the evolution of BET-NG index and financial performance ratios indicates that in the majority of the cases the links are inverse and in 25% of the cases they are strong.

In what concerns the intensity of the correlations between the major financial performance ratios (ROA; ROE; EPS; Net Margin) and average values of BET-NG index, there is no strong link to justify the identification of a regression model. Consequently, we can affirm that the evolution of BET-NG index is determined by other factors, different than the financial performance of the component companies. This situation outlines new research developments that need extending the timeframe and the financial ratios used.

References
1. Anghelache, G., 2009. Piaţa de capital în context european, Ed. Economică, Bucureşti.
2. Halpern, P., Weston, J., Brigham, F., 1994. Finance managerial Editura Economică, Bucureşti, pp. 88-120.
3. Hurduzeu, G., 2006. Pieţe şi burse internaţionale de valori. Ed. Pro Universitaria, Bucureşti.
4. Jones, C. P., 1991. Investments. Analysis and Management, Third Edition, John Wiley & Sons.
5. Khan K. I., 2012. Effect of Dividends on Stock Prices – A Case of Chemical and Pharmaceutical Industry of Pakistan, Management, Vol. 2, No 5, pp. 141-148.
6. Kodithuwakku S., 2016. Impact of Firm Specific Factors on the Stock Prices: A Case Study on Listed Manufacturing Companies in Colombo. Stock Exchang International Journal for Research in Business, Management and Accounting, Vol. 2 Issue 3, pp. 67-76.
7. Saleh M., 2015. Relationship between Firm's Financial Performance and Stock Returns: Evidence from Oil and Gas Sector Pakistan, Journal of Energy Technologies and Policy, ISSN 2224-3232, ISSN 2225-0573, Vol. 5, No 10, 2015, pp. 27-32.
8. Sattam A., Sameer A. A., 2012. Factors affecting Stock Market Prices in Amman Stock Exchange: A Survey Study European, Journal of Business and Management, Vol. 4, No 8, pp. 236-246.
9. Sharma S., 2011. Determinants of Equity Share Prices in India. Journal of Arts, Science & Commerce, Vol. II, Issue 4, pp. 51-60.
10. Stanciu, C. V., 2016. Correlation Analysis of the Bet-Fi Index's Constituents. Annals of the "Constantin Brâncuşi" University of Târgu Jiu, Economy Series, Special Issue, Vol. II/2016, pp. 86-92.
11. Stancu, I., 2007. Finance. Pieţe financiare şi gestiunea portofoliului. Investiţii directe şi finanţarealor. Analiza şi gestiunea financiară financiară a întreprinderii. Ediţia a patra, Ed. Economică, Bucureşti.
12. Taimur S., Purohit H., Rekha P. 2015. Analysis of Factors Affecting Share Prices: The Case of Bahrain Stock Exchange, International Journal of Economics and Finance, Vol. 7, No 3, pp. 207-216, DOI: http://dx.doi.org/10.5539/ijef.v7n3p207.

13. Tudor, C., 2008. Firm-Specific Factors as Predictors of Future Returns for Romanian Common Stocks: Empirical Evidence, International Journal of Economics and Finance, Vol. 5, No 3, pp. 73-78.

14. Vasiu D. E., 2016. Case Study Regarding the Correlation Between the Main Indicators of Financial Performance and The Bet Index, For the Companies Participating in The Bet Index, in The Period 2011-2015, Land Forces Academy Review, Nicolae Balcescu Land Forces Academy, Sibiu, Romania, No 4, pp. 357-364.

15. Index management rules, avilable on www.bvb.ro, last accesed may 2017.

16. www.bvb.ro.

17. www.tradeville.eu.

18. http://www.bvb.ro/info/indices/2016/2016.06.30%20-%20BET-NG%20Factsheet.pdf.

Д. Васі, д-р екон. наук, асист.,
Л. Іллє, д-р екон. наук, проф.
Університ імені Лучіана Блага, Сібіу, Румунія

КОРЕЛЯЦІЇ МІЖ ПОКАЗНИКАМИ ФІНАНСОВОЇ ЕФЕКТИВНОСТІ КОМПАНІЙ З ОСНОВНОЮ ДІЯЛЬНІСТЮ В ЕНЕРГЕТИЧНОМУ СЕКТОРІ Й СУМІЖНИХ ГАЛУЗЯХ, ЩО ТОРГУЮТЬ НА БУХАРЕСТСЬКІЙ ФОНДОВІЙ БІРЖІ, ТА ІНДЕКСОМ BET-NG

Отримані авторами результати не відповідають гіпотезі дослідження: існує сильний і прямий зв'язок між еволюцією індексу BET-NG та показниками фінансової ефективності компаній-компонентів. Аналіз, виконаний на співвідношеннях між еволюцією індексу BET-NG та показниками фінансової ефективності, указує на те, що в більшості випадків зв'язок є зворотним і в 25% випадків він є сильним.

Що стосується інтенсивності кореляцій між основними показниками фінансової ефективності (ROA; ROE; EPS; чиста маржа) та середніми значеннями індексу BET-NG, то не існує міцного зв'язку, щоб виправдати ідентифікацію моделі регресії. Отже, можна стверджувати, що еволюція індексу BET-NG визначається іншими факторами, які відрізняються від фінансових показників компаній-компонентів. Ця ситуація окреслює нові науково-дослідні розробки, які потребують продовження термінів і використання фінансових показників.

Ключові слова: BET-NG INDEX, показники фінансової ефективності, Бухарестська фондова біржа.

Д. Васи, д-р экон. наук, ассист.,
Л. Илле, д-р. экон. наук, проф.
Университет имени Лучиана Блага, Сибиу, Румыния

КОРРЕЛЯЦИИ МЕЖДУ ПОКАЗАТЕЛЯМИ ФИНАНСОВОЙ ЭФФЕКТИВНОСТИ КОМПАНИЙ С ОСНОВНОЙ ДЕЯТЕЛЬНОСТЬЮ В ЭНЕРГЕТИЧЕСКОМ СЕКТОРЕ И СМЕЖНЫХ ОТРАСЛЯХ, ТОРГУЮЩИХ НА БУХАРЕСТСКОМ ФОНДОВОЙ БИРЖЕ, И ИНДЕКСОМ BET-NG

Полученные результаты не соответствуют гипотезе исследования: существует сильная и прямая связь между эволюцией индекса BET-NG и показателями финансовой эффективности компаний-компонентов. Анализ, выполненный на соотношениях между эволюцией индекса BET-NG и показателями финансовой эффективности, указывает на то, что в большинстве случаев связь является обратной и в 25% случаев она сильна.

Что касается интенсивности корреляций между основными показателями финансовой эффективности (ROA; ROE; EPS; чистая маржа) и средними значениями индекса BET-NG, то не существует прочной связи, чтобы оправдать идентификацию модели регрессии. Следовательно, можно утверждать, что эволюция индекса BET-NG определяется другими факторами, отличающимися от финансовых показателей компаний-компонентов. Эта ситуация определяет новые научно-исследовательские разработки, требующие продления сроков и использования финансовых показателей.

Ключевые слова: BET-NG INDEX, показатели финансовой эффективности, Бухарестская фондовая биржа.