

EVA as a Tool for Estimation of Management Efficiency and Value Creation in Polish Telecom Sector

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Abstract—The paper presents results of empirical study on creation of added value in Polish telecom sector, based on Economic Value Added (EVA) indicator. First, an EVA analysis was performed for publicly traded telecom companies. Next, the effectiveness of EVA itself in management of telecom companies was evaluated. A statistical analysis was made to investigate dependence between EVA and other indicators of company value, confirming that EVA sign and magnitude are in agreement with indicators based on data from financial books. Finally, the effectiveness of using EVA for prediction of market capitalization of telecom companies was investigated. Overall results do not give a clear picture and cannot allow to state that EVA is a better determinant of value of telecom company than financial indicators like Earnings Per Share (EPS).

Keywords—*Economic Value Added, empirical study, statistical analysis, telecom sector.*

1. Introduction

The purpose of this analysis was to evaluate the creation of added value and usefulness of the Economic Value Added (EVA) indicator in Polish telecom companies in the 2007–2015 period.

EVA is an indicator of company efficiency developed in the 1980s by J. Stern i G. Bennett Stewart III at Stern Stewart & Co [1]. The economic value added is a measure of company efficiency showing the income after deduction of full costs of capital. EVA is a tool used for corporate financial management. The economic value added is understood as a true profit generated by given company after taking into account all costs, including interest, taxes and fees for capital invested by the owners [2]. According to some economists, EVA is the best available indicator of company efficiency in a one-year timeframe, and EVA-based financial management systems allow to make decisions bringing gains for the owners and generating economic profits for the company [3]. At the same time, multiple empirical studies do not confirm such positive evaluation of this indicator.

This analysis is focused on evaluation of efficiency of using the EVA indicator in Polish telecom sector. In the first phase, EVA was used to evaluate the creation of added value by Polish telecom enterprises between 2007 and 2015. Next, EVA values were compared to other efficiency indicators of telecom companies. Finally, the dependence

between EVA and market capitalization of each company listed at the Warsaw Stock Exchange was analyzed in attempt to estimate to what extent the economic value added can be a basis for predicting the future value of telecom company.

2. Evolution of EVA of Polish Telecom Companies

The study was carried out by means of financial and statistical analysis of publicly available data, included in financial reports and annual reports published by telecom companies active in Poland. The sample for analysis comprised of eight telecom companies listed on the Warsaw Stock Exchange: Orange, Netia, MNI, Hyperion, Easy Call, Mediatel, Telestrada, and Open-NET (reports available only for the 2010–2015 period). The study covered a group of listed companies belonging to different sections of telecom market – representing different scale of business, resources, and experience, providing different services and operating in accordance with different business models.

The EVA indicator was calculated according to a standard formula [4]:

$$\text{EVA} = \text{NOPAT} - \text{IC} \cdot \text{WACC}, \quad (1)$$

where: NOPAT denotes the net operating profit after tax, IC the invested capital and WACC the weighted average cost of capital. They are explained in details in the following subsections.

2.1. Net Operating Profit After Tax

The basis for calculation of the EVA indicator in Eq. (1) for a given year is the net operating profit after tax (NOPAT). $\text{NOPAT} = \text{EBIT} \cdot (1 - T)$, in turn, is calculated as an operating profit reduced by a standard tax rate ($T = 19\%$ in Poland); in case of an operating loss the tax equals $T = 0^1$. The net operating profit after tax shall, in accordance with EVA assumptions, reflects the true value generated by company operations. Therefore, the value included in financial reports in accordance with Polish accounting law – the operating profit (or loss) was subject to several corrections,

¹According to annual reports of companies studied for the 2007–2015 period.

Table 1
 Corrections to operating profit during calculation of EVA and their effects

Correction	Description	Evaluation of scale and effect on NOPAT
Proceedings from sale of durable assets during a given year	Profit generated by sale of durable assets reduced the value of net operating profit used in EVA calculation, while a loss increased this value. Sale of assets is excluded from calculation of NOPAT due to being a one-time event and termination of company activity in a given field.	A half (four) of telecom companies analyzed in this study sold some assets during this period. Two of them – Mediatel and Hyperion made large transactions that had a substantial influence on operating profit.
Subsidies and grants	Proceedings from subsidies and grants were excluded from the result as they are not a result of company operations.	Despite use of grants by some of analyzed companies, a substantial effect on operating profit was recorded only by EasyCall in 2014 and 2015.
Write-offs updating the value of assets	Operating profit was corrected of value of write-offs updating the value of company assets.	Write-offs updating the value of assets were made during the 2007–2015 period by all subjects analyzed. Material influence on operating profit occurred in smaller companies: Mediatel, Hyperion, Open-NET, EasyCall, and Telestrada. In most cases, exclusion of updating write-offs improved the operating profit.
Effects of extraordinary events	The effects of extraordinary events in a given year (e.g. compensation received and paid, settlements with trading partners, cancellations of receivables and payments) were removed from the operating profit.	Extraordinary events were recorded in large and medium companies, usually as result of court settlements between companies (Orange, Netia, Mediatel) and cancellations of receivables and payments (Orange, Mediatel, Hyperion). Influence of extraordinary events on operating profit is particularly visible in case of Mediatel and Netia (one-time effect at Netia in 2014 was as much as 141 million PLN due to settlements with Orange).
Interest included in the operating profit	In calculations here, also the interest received and paid as results of loans made to dependent companies or received from them, and included in the operating profit was removed. The interest, being a result of financial operations, does not belong to operating profit as defined in analysis of EVA.	Interest on loans made to dependent companies were present only in case of Netia. The correction had no meaningful effect of operating profit.
Variations in currency exchange rates	Effects of variations in currency exchange rates included in the operating profit were excluded from EVA calculations, similarly as interest.	Variations in currency exchange rates were included in operating profit reported by Orange, Netia and Mediatel. The influence of related corrections on operating profit of companies studied was small.
Excessive depreciation	The methodology of EVA calculation assumes standard depreciation rates. Excessive (above standard) values were excluded from results for a given period.	This correction applies only to Mediatel for the 2008–2010 period. Due to additional depreciation in this period, the correction had positive influence on operating profit of this company.
Costs of research and development activities	Costs related to R&D activities in a given year were excluded from calculation of operating profit. In accordance with methodology of EVA calculation, R&D costs were removed from result for a given year and added, in a capitalized form, to value of capital invested, increasing own capital of given company.	R&D cost were include only in financial reports and annual reports of Orange, and suitable corrections were made for this company only.

as defined in the methodology of calculating the Economic Value Added [5], [6]. Calculations made for the purposes of this study included corrections for the following:

- proceedings from sale of durable assets during a given year,
- subsidies and grants,
- write-offs updating the value of assets,
- extraordinary events,
- interest included in the operating profit,
- variations in currency exchange rates,
- excessive depreciation,
- research and development costs [7].

Detailed list of corrections made in the course of analysis, together with evaluation of their scale and influence on results of the study is presented in Table 1.

Corrections made allowed to correctly estimate the operating profits of telecom companies being a subject of this study. It needs to be noted, that influence of these corrections on final values of EVA was relatively small.

Values of NOPAT calculated this way were subsequently re-calculated into theoretical net values by subtraction of 19% tax on operating profit. In case of operating loss, no taxes were calculated.

2.2. Invested Capital

The invested capital (IC) in Eq. (1) reflects funds engaged in company operations in order to generate the net operating profit after tax – NOPAT [8]. The invested capital is a sum of company own capital, in accordance to balance sheet and debt incurring interest (without taking into account reserves and commercial or formal/legal obligations)². For the purpose of this analysis, the value of invested capital was estimated as balance sheet value of company own³ and balance sheet value of debts incurring financial costs (credits, loans, obligations, leasing).

2.3. Weighted Average Cost of Capital

In general, the weighted average cost of capital (WACC) is a sum of costs of n sources of a company financing weighted by a share of each source in the total financing [9].

$$WACC = \sum_{i=1}^n s_i C_i, \quad (2)$$

where s_i and C_i denote respectively, the share and cost of the i -th capital, n the number of sources of the company financing.

²Values used during analysis were taken from annual reports and financial reports of companies studied for the 2007–2015 period.

³For Orange, the value of capitalized R&D costs was included in company own capital.

For the purpose of the presented analysis, the weighted average cost of capital was calculated in accordance with the following formula:

$$WACC = \frac{E}{V} C_E + \frac{D}{V} C_D \cdot (1 - T), \quad (3)$$

$$V = D + E,$$

where E denotes the cost of the own capital (equity), D the cost of the external capital (debt), C_E the cost of equity, C_D the cost of debt and T the corporate tax rate.

In the presented paper the cost of debt D was calculated from real interest rates paid by companies in a given year, related to an average amount of debt at the end of a given year and preceding one. This approach is simplified, but accurate enough to well reflect costs of financing company with debt.

The cost of the equity E was calculated according to Capital Assets Pricing Model (CAPM), the Bond Yield Plus version [9]:

$$E = R_f + M_p \cdot B, \quad (4)$$

where R_f denotes the risk free interest rate equal to yield of government obligations, M_p – the market premium and B – the beta factor.

In this paper the risk free interest rate R_f was calculated based on the data published by “market-risk-premia” portal

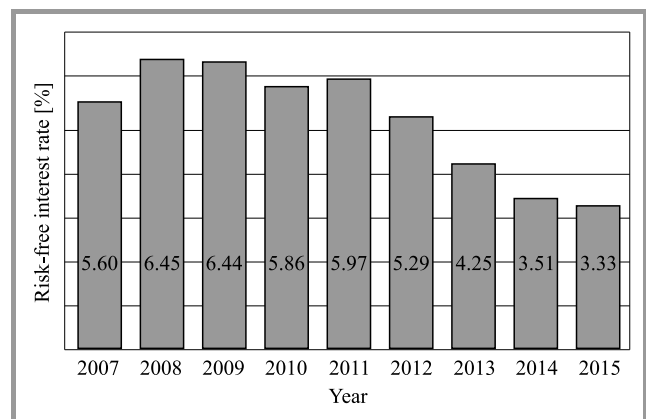


Fig. 1. Risk-free interest rate included in the analysis.

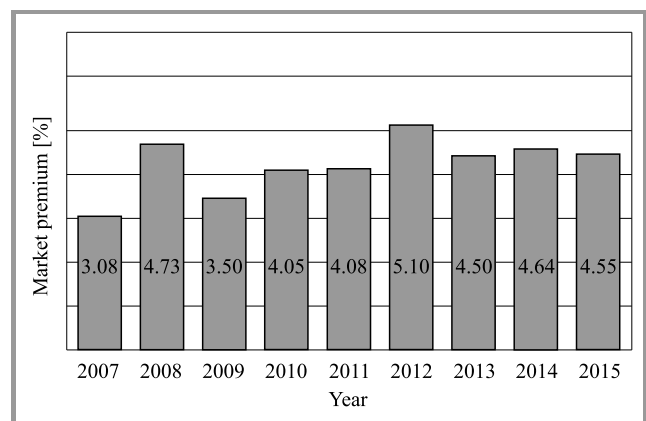


Fig. 2. Market premium used for EVA calculations.

Table 2
Values of beta factor used in this study

Company	Reuters	Stockwatch	Infinancials	Barron's	Average
Orange	0.75	–	0.78	0.59	0.707
Netia	–	0.62	0.32	0.57	0.503
Mediatel	1.55	–	–	0.51	1.030
MNI	0.89	0.51	0.61	0.61	0.655
Hyperion	–	0.15	0.25	0.15	0.183
Open-NET	–	0.44	–	–	0.440
EasyCall	–	0.27	–	–	0.270
Telestrada	–	–	0.20	–	0.200

Table 3
EVA values for individual telecom companies, 2007–2015 (thousands PLN)

Company	2007	2008	2009	2010's	2011	2012	2013	2014	2015
Orange	761,338	428,738	–28,908	–809,716	284,933	–149,498	–545,461	–171,229	–411,149
Netia	–223,946	–269,559	–157,600	47,025	1,603	–230,254	–176,708	–201,264	–133,515
Mediatel	–7,309	–2,432	3,067	–9,229	–745	–585	–6,419	–14,664	–15,732
MNI	–7,779	2,455	5,988	16,592	6,382	–36,180	–25,416	–23,609	–40,368
Hyperion	3,593	3,525	–2,568	–3,715	–6,104	–2,918	5,857	–7,452	–6,720
Open-NET	–	–	–	–253	–795	–979	554	1,663	2,217
EasyCall	5	–37	128	114	–282	136	1,404	301	–3,176
Telestrada	40	–39	922	2,306	2,714	2,980	2,621	959	5,651

for the Polish market in 2007–2015 [10]. Evolution of R_f with time is presented in Fig. 1.

The market premium (M_p) is a standard value reflecting average (for a given market) expectations of investors with respect to return on capital invested in stocks compared to yield generated by investment in risk-free financial instruments. Again, calculations were based on data published by [10]. Evolution of market premium with time is presented in Fig. 2.

The beta factor (B) is a factor reflecting price variability of a given stock compared to market as a whole. Values used in this analysis are average values for each company, taken from publicly available sources⁴. Values of beta factor being considered are listed in Table 2.

EVA values for the period of 9 years were estimated in accordance with rules presented above, using data taken directly from annual reports and financial reports published by eight telecom companies being subject of this study.

3. EVA Values in Telecom Companies

The same procedure of calculating the EVA was applied to all companies for each year from 2007 to 2015 (ex-

⁴Analysis presented was based on values of beta factor published at Reuters, Barrons, Stockwatch and Infinancials websites; average values published for each company were used in calculations.

cept for Open-NET, whose data are available only for the 2010–2015 period). Resulting EVA values for each company are shown in Table 3.

According to rules developed by the creators of EVA methodology, the values of this indicator shall be interpreted as follows:

- the company generates value for shareholders in a given years for $EVA > 0$,
- the company behaves neutrally for $EVA = 0$,
- the company destroys value for shareholders for $EVA < 0$.

The EVA for analyzed telecom companies in Poland during the 2007–2015 period were both positive and negative. Negative values, however, were more frequent, meaning that telecom companies listed on Warsaw Stock Exchange more often generated loss (39 out of 69 observations) than profit (30 out of 69 observations) for their shareholders. The direction and rate of EVA change were different for each company.

It is interesting that a clear tendency of fall in average EVA has emerged among large (Orange, Netia) and medium (MNI, Mediatel, Hyperion) companies beginning from 2012, while it was absent among small companies (Telestrada, Open-NET, EasyCall). On particular interest is

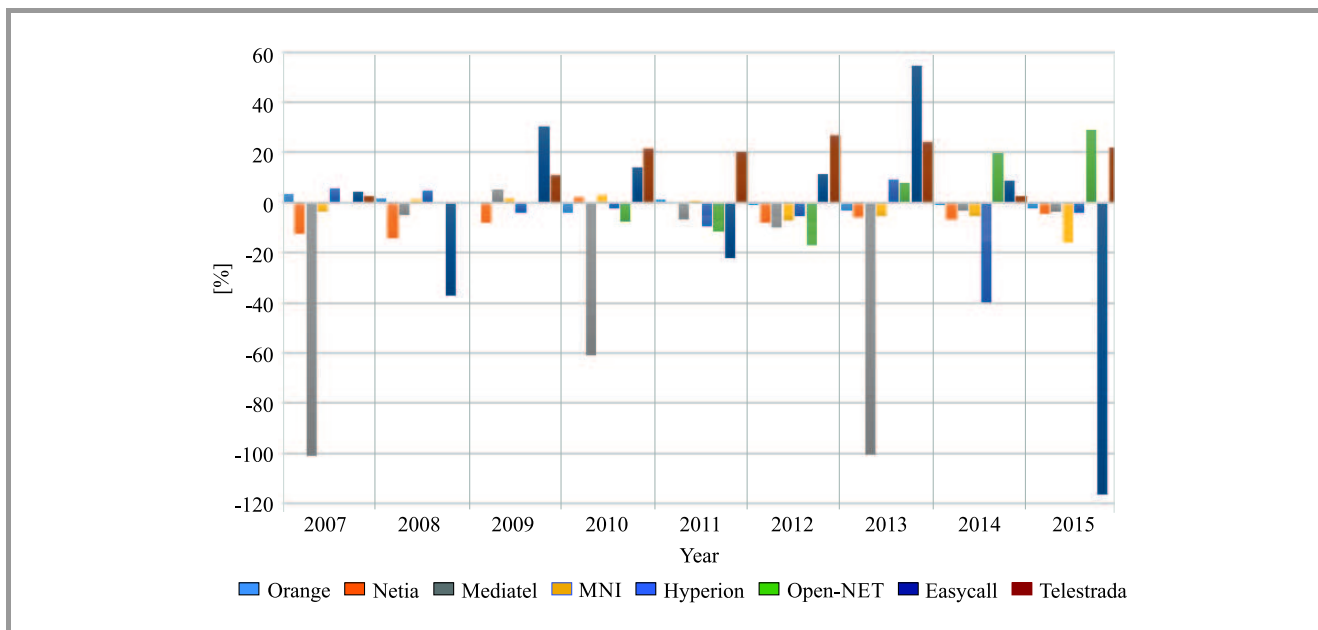


Fig. 3. EVA/IC return rate for individual companies in 2007–2015 period. (See color pictures online at www.nit.eu/publications/journal-jtit)

Telestrada, which had positive EVA during 8 out of 9 years, and its EVA has been rising⁵.

At the same time, no relationship between EVA values for individual companies studies was observed – both when it comes to values in particular years, and trends of EVA changes – values recorded were divergent. The lack of relationship is confirmed by average Pearson factor of -0.08 . This means conditions specific to telecom sector had little effect on EVA.

Global values of EVA cannot be meaningfully compared due to very different size of companies studied (from hundreds of millions PLN in case of Orange to few thousands PLN in case of EasyCall). Therefore, an EVA return rate with respect to invested capital (EVA/IC) was used instead. Its values are presented in Fig. 3.

The best results (measured as relative values) were achieved by Telestrada. For this company, the average return rate defined as ratio of generated EVA to invested capital over the study period was 14.4%. The only other company with a positive result was Open-NET showing average EVA/IC of 3.5%. All other companies have lost value for shareholders, with negative economic results. The outstanding bad performer was Mediatel with average EVA/IC of -31.7% . Return rates for other companies ranged from -0.5% for Orange to -6.3% for Netia.

Average return rate for the whole group of companies included in this study was -4.7% . This is a relatively low value, suggesting a poor operational efficiency of telecom companies in Poland. Studies conducted in other countries indicate a long-term tendency of EVA/IC to approach 0%, usually exhibiting small negative values [11].

⁵The dependence between size of company and EVA was analyzed in a later part of this study.

4. Comparison between EVA and Other Indicators of Operational Efficiency

This section of analysis was devoted to relations between EVA and other indicators of company efficiency, especially those based on accounting data: income from sales, earnings per share (EPS), return on assets (ROA) and return on equity (ROE).

The analysis included, again, search for correlation between factors investigated.

Analysis of relationship between income from sales and EVA confirmed a positive correlation between those variables. For most of companies studied, the respective correlation factor was between 0.40 and 0.91, proving a fairly strong relationship (Fig. 4). The average correlation factor for the whole group was 0.458, indicating a medium

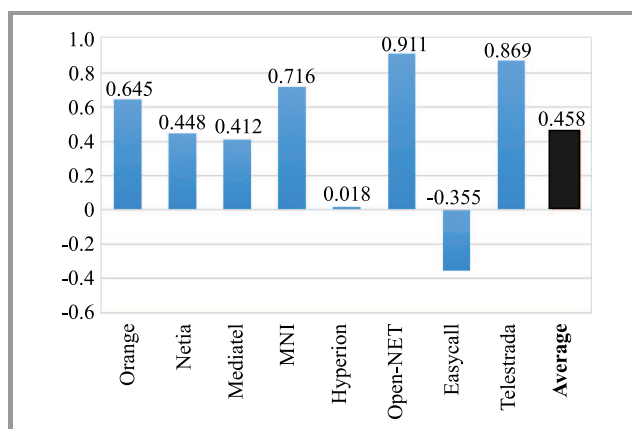


Fig. 4. r-Pearson correlation factor between EVA and income from sales (2007–2015).

level of correlation. This average was significantly lowered by results for EasyCall – correlation factor for this company was -0.355 , indicating a weak negative link (rising sales resulting in fall of EVA) and Hyperion, whose correlation factor of 0.018 , meaning no dependence between sales and EVA. A rejection of those two extreme sets of data would increase the correlation factor between income from sales and EVA to 0.58 , corresponding to a relatively strong relationship.

The next step was to probe correlation between EVA and the most common measure of operating efficiency of publicly traded companies – Earnings Per Share (EPS). Values of respective correlation factors for telecom companies studied ranged from 0.309 for Mediatel to 0.957 for Orange (Fig. 5). Average value for the whole group was 0.659 , indicating a strong correlation between earnings per share and EVA.

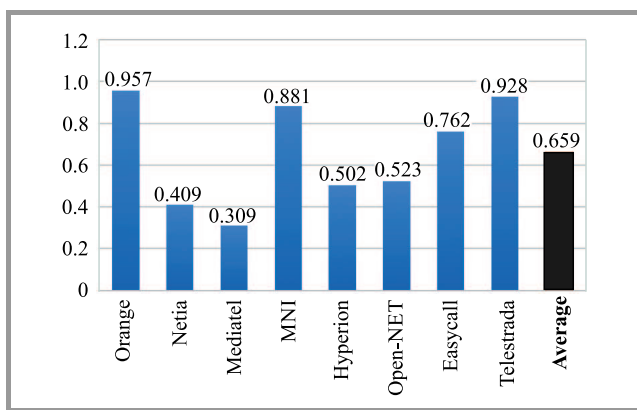


Fig. 5. r-Pearson correlation factor between EVA and earnings per share EPS (2007–2015).

Interestingly, the differences between individual companies were relatively small. Standard deviation of correlation factor was 0.253 , with most of values in the 0.4 – 0.9 range. This confirms strong relationship between EVA and EPS in Polish telecom companies.

Similar analysis done for ROA (return on assets – net profit divided by value of all assets) and ROE (return on equity –

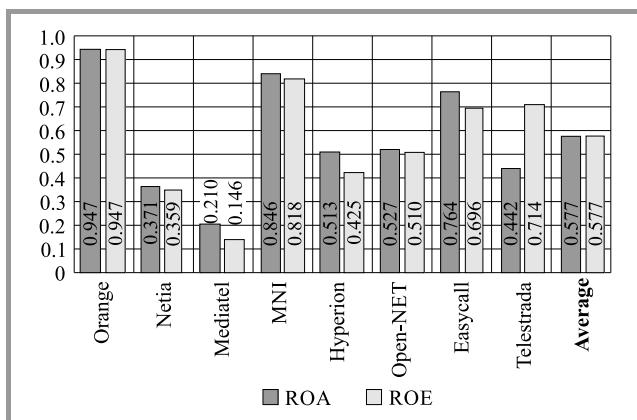


Fig. 6. r-Pearson correlation factor between EVA, and ROA/ROE of telecom companies (2007–2015).

net profit divided by book value of company own capital) confirms that values of EVA are in agreement with other indicators of company efficiency. Average value of correlation factor for relationship between EVA, and ROA or ROE is 0.577 in both cases, indicating a medium level of inter-dependence (Fig. 6).

Most of telecom companies studied exhibit a strong ROA – EVA and ROE – EVA dependence. In case of Orange and MNI values of both correlation factors exceed 0.8 . Average values for the whole group are driven down by Mediatel and Netia, whose values of correlation factors were markedly lower than for other companies.

The analysis presented above confirms that EVA values are changing in the same direction as indicators of current operational efficiency (profitability) of telecom company – income from sales, earning per share, ROE and ROA.

5. EVA Influence on Company Evaluation

The final stage of analysis was investigation of relationship between EVA and capitalization of telecom companies at the end of each year. Investigation of correlation factor and R^2 (R squared) coefficient of determination was performed to verify the assumption that EVA is a good indicator of company value.

It was assumed that a high degree of correlation between company capitalization and EVA value for a given year means a dependence between EVA and evaluation of company own capital. Company capitalization (market evaluation of company own capital) was established by multiplying its share price on the last day of a given year by number of shares in circulation. Next, the values of EVA and capitalization for each company were compared. Results are inconsistent, ranging from a strong correlation for a number of companies to very weak one for several others. Graphs of EVA – capitalization dependence for two extreme cases: MNI – where capitalization was strongly correlated with EVA, and Hyperion, for which the r-Pearson value was only 0.16 , are shown in Figs. 7 and 8.

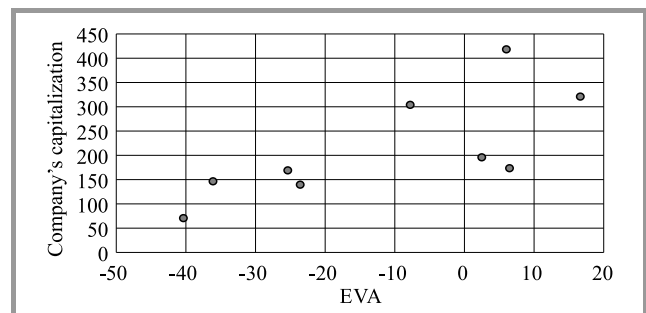


Fig. 7. Dependence between EVA and capitalization at the end of each year (2007–2015) for the MNI company (r-Pearson = 0.73).

The analysis is further complicated by the fact that for two companies – Mediatel and Open-NET the dependence

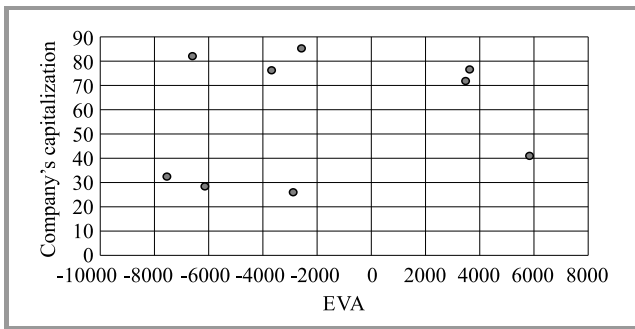


Fig. 8. Dependence between EVA and capitalization at the end of each year (2007–2015) for the Hyperion company (r -Pearson = 0.16).

between EVA and capitalization was a negative one – increase of EVA corresponded to reduced company capitalization.

Average value of correlation factor for the whole group of telecom companies studied was 0.338, indicating a weak dependence and limited impact of EVA on capitalization. Comparison of correlation factors for all companies is shown in Fig. 9.

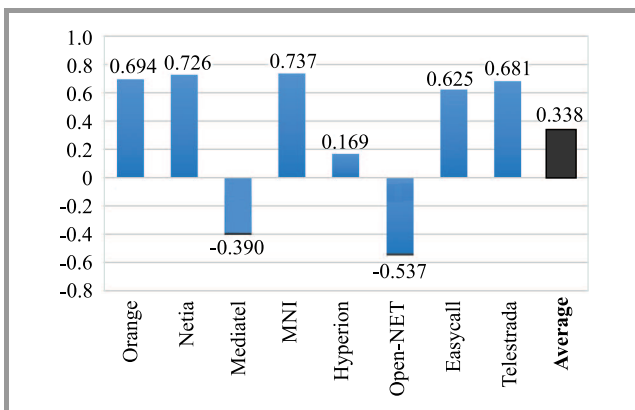


Fig. 9. r -Pearson correlation factor between EVA and company's capitalization at the end of the year (2007–2015).

Because of highly variable results (standard deviation ± 0.53) it is impossible to clearly state that EVA is a good indicator of value of telecom company in Poland. However, there are cases when EVA provides much better explanation of changes in company valuation that standard indicators like earnings per share (EPS). Among them are Netia – where the R squared coefficient of determination was 58% for EVA, while the same coefficient for EPS was only 25%, and Telestrada, where the same values were 46% and 17%, respectively. This means using EVA for prediction of value of company own capital is more than twice as effective than EPS.

6. Conclusion

The analysis presented above revealed that analyzed Polish telecom companies more often destroyed than created

value for their owners in the 2007–2015 period. Values of EVA for individual telecom companies listed at the Warsaw Stock Exchange were more often negative than positive, and average return rate calculated as ratio of EVA to invested capital was 4.9% during the same period.

EVA values calculated for companies active in the telecom sector exhibited signs and trends of change in agreement with other indicators of company value such as income from sales, EPS, ROA or ROE. Particularly strong correlation was observed in case of return on assets (ROA) and return on equity (ROE). Results for sales and earnings per share (EPS) are not clear due to high variability between different companies analyzed.

Because of similarly high variability, it is not possible to unequivocally evaluate the effectiveness of using EVA as a determinant of market value of telecom companies in Poland. Results obtained in this study cannot prove that EVA is a better indicator of company value than simpler to calculate earnings per share (EPS).

To summarize, while EVA finds use in evaluation of telecom companies, it cannot be regarded a more effective indicator of company value than other commonly used indicators.

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