ECONOMIC VALUE ADDED IN MANAGERIAL ECONOMICS

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Abstract: *Whether a company creates value for shareholders that is one of criteria for business performance evaluating. The paper evaluates the performance of a chosen business sector on the basis of actual business success identification in the area of enterprise value creation. The aim of this paper is to analyse and to evaluate unnamed company which operates in section CZ-NACE 25 (Manufacture of fabricated metal products, except machinery and equipment) based on the calculated values of economic value added (EVA) and to compare the results of the company with those results achieved in the whole CZ-NACE 25 sector. EVA indicator has high explanatory power since it includes the size and internal structure of invested capital, return on invested capital and the overall effect achieved by the use of capital. In order to not to transform accounting data on the economic model it has been used EVA formula based on the narrow value range calculation. The goal of the paper is to analyse and to evaluate the return on equity and the cost of equity used in the calculation of the EVA-Equity indicator both the company and the section CZ-NACE 25.*

Keywords: *Business performance, EVA, EVA-Equity, Business sector, Measurement.*

JEL Classification: *M21, L61,G32.*

Introduction

Business performance measurement and management is not just a tool to serve the managers of organization in their decision making, but it has a strong impact on the owners, or potential shareholders who according to the performance of the company can decide whether to purchase shares of the company or not.

Business performance measurement is important for companies because as argued Fibírová [5, p. 15]: Information about business performance, about ability to evaluate resource consumption in a given period and ability to create profits are important for the assessment of enterprise´s processes and enterprise´s potential development.

Approaches to performance measurement and management can be divided into traditional, modern and comprehensive approaches. The traditional approach is focused on making a profit, mainly because profit maximization is a key business objective. There is evaluated primarily financial performance through a variety of system parameters. The modern approach focuses on value growth of a company. The modern approach connects all company activities and the persons participating in business projects in order to increase value of funds invested into the business. The comprehensive approach is dealing with a deeper analysis of systems of indicators and the relationships among them.

In the last 20 years it has become a trend in the use of value criteria in the area of performance measurement and management. This is mainly due to changes in the economic environment that are affected by, for example, liberalization, globalization and hyper-competition. Martin and Petty [11] state that the effect of capital market in the globalized economy requires assessing current and future performance of company with respect to time value of money and level of risk through cost of capital.

1 Statement of a problem

The paper evaluates the performance of the business sector on the basis of economic value added indicator, this indicator belongs among the economic criteria. "The basis of comprehensive evaluation of the performance of companies is to determine the appropriate circuit of evaluation criteria. The most widespread criteria are economic criteria." [16, p. 54].

Chmelíková [9] highlights differences between EVA indicator and other economic indicators and financial indicators on a sample of companies in the food industry of the Czech Republic. Generally a fairly broad consensus rules - from a theoretical standpoint EVA overcomes the traditional performance indicators [8], [9], [13].

EVA indicator ranks among modern indicators, economic indicators of performance measurement and management of a company. The main contribution of the economic value added is that the indicator gives management real information about company performance and the indicator also motivates management to make decisions that lead to increase the market value of a company. EVA belongs to indicators of value management. EVA is formed both on the use of accounting data as well as market data, and is based on economic profit.

Economic indicators take into account the cost of invested capital, in the cost of invested capital calculation is projected risk factor and time horizon, among the most important economic indicators are involved net present value (NPV), economic value added (EVA) and operating return on investment (CFROI). Modern indicators are based on the creation of shareholder value and the creation of business value. Modern indicators can include economic value added (EVA), market value added (MVA), etc. Economic measures seem to be a best practice with regard to the availability and quality of input data appears, they are partly built on the basis of market values, related to the value of the company and they are relatively stable.

Distribution of the indicators on mentioned traditional and modern indicators divides Wagner [17], however, he indicates that such a resolution of indicators can be misleading and he avoids this classification. "Many of “modern” indicators are traditional approaches and they contain modification rather cosmetic or marketing-oriented and the modification is complemented as "modern"." [17, p. 146].

EVA is a synthetic indicator describing all the areas of business performance. It is a projective indicator based on an assessment of future performance by projecting indicator values describing the current state. EVA indicator is based on the fundamental rule that a company must produce at least as much as the costs on funds are invested. EVA takes into account both the cost of equity capital and the cost of debt capital.

EVA indicator should motivate managers to strive to increase shareholder value. Management of a company should be focused on maximizing value for shareholders through increasing dividends and increasing share prices. The main contribution of EVA is that it gives management real information about company performance and EVA indicator also motivates management to make decisions which lead to market value increase of a company.

Businesses do not sufficiently use EVA indicator in managerial economics, which could help them better manage their company and monitor their performance so that they can better respond to changes in business environment and customer needs [15]. The advantage

of EVA indicator is its use at all levels of corporate management by linking operational and strategic decisions [10, p. 20]. Economic value added has an important position in managerial economics. The paper presents a case study on the example how management of enterprise could calculate EVA indicator and how the management can compare the values of the EVA indicator with values achieved in a sector.

2 Methods

Calculation of the EVA indicator is based on the availability of data needed for EVA calculation and on the method used for the cost of capital determination. Two basic EVA calculation versions exist - EVA-based on operating profit (EVA-Entity) and EVA-based on value range (EVA-Equity). EVA-Entity is processed pursuant to three key values: profit from operating activities after tax, related assets to this profit and weighted average cost of capital.

The economic value added on the basis of the value range shows the difference between the value of return on capital and the weighted cost of capital. It is distinguished the concept of total value range and narrow value range. EVA pursuant to the total value range is dependent upon the difference between the profitability of the total capital and total weighted cost of capital (ie. residual cost of capital).

EVA based on the narrow value range known as EVA-Equity is based on return on equity. The indicator operates with return on equity and capital costs, and it is required to have positive subtract between profitability and costs of capital. Company is successful if the return on equity is higher or equal to the cost of equity. The EVA calculation based on the narrow value range is used in case of the external analysis in order to do a benchmarking. The formula for EVA-Equity calculation is:

$$EVA = (ROE - R_E) * E \tag{1}$$

ROE is return on equity, R_E is the cost of equity, E is the value equity.

Key element influencing the resulting value of EVA is return on equity indicator (ROE) which measures the net income of equity. Profitability ratios generally include the traditional business performance measures. From the perspective of the owner there is important indicator which is called spread ($ROE - R_E$). Spread is the subtract between return on equity and cost of equity. Undesirable is a negative value of spread. Economic value added is then determined by multiplying the spread and the value of equity.

The formula for ROE calculation is:

$$ROE = \frac{EAT}{E} \tag{2}$$

EAT is earnings after interests and taxes , E is the value of equity.

For EVA-Equity calculation it is needed to determine the cost of equity and to calculate the return on equity. Cost of capital significantly affect the EVA values and the determinations of the cost of capital are key issues of EVA calculation because economic value added is sensitive to changes of capital cost. Cost of capital represents the minimum required rate of return that the company should achieve in order to prevent decline in asset value for owners. Cost of equity is determined using CAPM-SML beta model.

The resulting cost of equity is calculated according to the formula:

$$\mathrm{R_E} = \mathrm{R_F} + \beta^{\mathrm{L}}(R_M - \mathrm{R_F}) \tag{3}$$

The value of free risk rate (R_F) is derived from the average annual return on ten-year government bonds of the Czech Republic. These values are obtained from a public database of the Czech National Bank [12]. The analyzed company is traded on the capital market therefore the value of beta coefficient is used for the sector. The values of beta coefficients debt-free company (β^U) are obtained form the webside damodaran.com and subsequently converted to the beta values of indebted company (β^L). The value of the market risk premium for the Czech Republic is also obtained from the website damodaran.com [3].

The Ministry of Industry and Trade of the Czech Republic classifies companies [6], [7]:

- Companies forming value: $ROE > R_E$
- Companies (potential creators) having ROE in the range: $R_F < ROE \leq R_E$
- Profitable companies with ROE in the interval: $0 < ROE \leq R_F$
- Unprofitable companies - companies with negative values of indicators.

Correct conclusion of the financial situation of a company requires pyramidal decomposition of EVA indicator. Pyramidal decomposition affects the relation of the individual indicators. Properly constructed pyramidal system systematically evaluates past, present and future level of business performance.

Pyramidal system of financial indicators lies in the gradual breakdown of the top indicators on the sub-indicators. This decomposition is used to identify and quantify the impact of the sub-makers at the top indicator and reveals the interactions and relationships among the indicators [4]. Partial effects of the individual components may also be expressed using logarithmic techniques and methods of gradual changes [1]. Logarithmic method is used to calculate the impact of indicators, among which the multiplicative bond exists. For additive relationship among indicators, the method of gradual changes was designed within the logarithmic method. Decomposition formulas for calculating the effects of individual indicators on EVA indicator are derived in the following forms:

$$\text{effect E} = \frac{\ln \frac{E_1}{E_0}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{3}$$

$$\text{effect ROE} = \frac{\ln \frac{ROE_1 - r_{e0}}{ROE_0 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{4}$$

$$\text{effect } r_e = \frac{\ln \frac{ROE_1 - r_{e1}}{ROE_1 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{5}$$

$$\text{effect } \frac{EAT}{A} = \frac{\ln \frac{\frac{EAT_1}{A_1}}{\frac{EAT_0}{A_0}}}{\ln \frac{ROE_1}{ROE_0}} * \frac{\ln \frac{ROE_1 - r_{e0}}{ROE_0 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{6}$$

$$\text{effect } \frac{A}{E} = \frac{\ln \frac{\frac{A_1}{E_1}}{\frac{A_0}{E_0}}}{\ln \frac{ROE_1}{ROE_0}} * \frac{\ln \frac{ROE_1 - r_{e0}}{ROE_0 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{7}$$

$$\text{effect } \frac{EAT}{T} = \frac{\ln \frac{\frac{EAT_1}{T_1}}{\frac{EAT_0}{T_0}}}{\ln \frac{\frac{EAT_1}{A_1}}{\frac{EAT_0}{A_0}}} * \frac{\ln \frac{\frac{EAT_1}{A_1}}{\frac{EAT_0}{A_0}}}{\ln \frac{ROE_1}{ROE_0}} * \frac{\ln \frac{ROE_1 - r_{e0}}{ROE_0 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{8}$$

$$\text{effect } \frac{T}{A} = \frac{\ln \frac{\frac{T_1}{A_1}}{\frac{T_0}{A_0}}}{\ln \frac{\frac{EAT_1}{A_1}}{\frac{EAT_0}{A_0}}} * \frac{\ln \frac{\frac{EAT_1}{A_1}}{\frac{EAT_0}{A_0}}}{\ln \frac{ROE_1}{ROE_0}} * \frac{\ln \frac{ROE_1 - r_{e0}}{ROE_0 - r_{e0}}}{\ln \frac{EVA_1}{EVA_0}} * (EVA_1 - EVA_0) \tag{9}$$

3 Problem solving

Cost of equity and other indicators needed for EVA-Equity calculation of the analysed company are listed in table 1. The indication D indicates the value of debt capital in the table 1, indication t is the rate of taxation on profit.

Tab. 1: Cost of Equity Capital Determination

	2010	***2011***	***2012***	***2013***	***2014***
RF [%]	3,71	3,51	2,31	2,26	1,58
β^U	1,3	1,32	0,78	1,46	0,89
t [%]	19	19	19	19	19
D [th.CZK]	10213462	11123927	9044170	10701838	11096540
D/E	0,18	0,19	0,15	0,20	0,24
β^L	1,61	1,59	1,41	3,56	1,66
$R_M - R_F$ [%]	3,94	4,4	7,16	8,25	9,53
RE [%]	10,05	10,5	12,4	31,63	17,39

Source: own processing according to [6], [7]

Cost of equity in an unnamed company was the highest in the year 2013, when the cost of equity value reached 31.63%. There has been a downward trend in the cost of equity indicator, in the year 2014 the cost of equity was 17.39%. The reduce of the cost of equity was mainly due to the downward tendency of the free risk rate of return and mainly due to the declining value of the beta coefficient, which reflects the sensitivity additional return on equity at additional revenue market portfolio. The value of beta coefficient of indebted firms is influenced by the levels of taxation and the size of the company's debt. In the years 2010, 2012 and 2013 there were reductions in tax rates on corporate incomes and declining values of bank loans. When lowering the debt company runs less risk, which may result in decreasing the cost of equity capital because investors with a lower risk also expect lower profitability. Calculation of economic value added is involved in the following Table 2.

Tab. 2: Calculation of EVA - Equity in CZK for the period 2010-2014

	2010	***2011***	***2012***	***2013***	***2014***
EAT [thous.CZK]	1280019,51	840787,29	938274,03	2093445	2431141,29
ROE [%]	2,28	1,48	1,62	4,06	5,31
RE [%]	10,05	10,5	12,4	31,63	17,39
ROE – RE [%]	-7,77	-9,02	-10,78	-27,57	-12,08
E [thous. CZK]	55966517	56801441	57872290	51514821	45726874
EVA-equity	-434859837	-512348997	-623863286	-1420263615	-552380637

Source: own processing according to [6],[7]

Since the year 2008 it is used the international classification of economic activities CZ-NACE, which replaces the Industrial Classification of Economic Activities, which was used from the year 1992. The selected company is classified by CZ-NACE in in section CZ-NACE 25 (Manufacture of fabricated metal products, except machinery and equipment). Calculated EVA values of analysed company are compared with those achieved in the sector CZ-NACE 25. Table 3 shows, inter alia, the EVA values of the industrial sector Manufacture of fabricated metal products, except machinery and equipment.

Tab. 3: EVA values of CZ-NACE 25

	2010	***2011***	***2012***	***2013***	***2014***
ROE [%]	11,33	11,29	14,2	10,37	14,42
RE [%]	13,36	12,85	12,26	11,86	10,26
ROE-RE	-2,03	-1,55	1,94	-1,49	4,16
E [tous.CZK]	107202949	166844703	112128029	100877507	98674146
EVA-equity	-217621986	-258609289	217528376	-150307485	410484447

Source: own processing

The economic value added of analysed company fluctuated in negative values in the reporting period 2010 – 2014. It is possible to say that the company destroys value for the owners. Because the cost of capital exceeded the appreciation. The gradual decrease of the negative value of enterprise´s economic value added was a positive feature, which helped reduce the cost of capital in the year 2014. A negative feature was the gradual increase of the negative values of EVA in the period 2010 – 2013. In the future, it is not be expected that the analysed company could achieve positive values of economic value added.

Negative values of EVA indicators indicate "destruction" of shareholder value. Unfavorable results of EVA were caused by the negative values of the „spread“ because the cost of capital exceeded the return on equity. The company had not a loss in the period 2010 - 2014. The company achieved the highest value of return on equity in the year 2014, the value was 5,31 %. The year 2014 also saw a reduction in the cost of equity by 14.24 percentage points to the level of 17.39%. The results of the economic value added were negative in the period 2010 - 2014, the development trend showed negative trend except the year 2014 where the trend was positive between the years 2013 and 2014. In the year 2013 the company paid dividends, therefore the cost of equity amounted to the 31,63 %.

The EVA values of analysed industry showed positive values except the years 2010, 2011 and 2013. In the years 2012 and in the years 2014 was calculated increased shareholder value in the analyzed industry, return on invested capital was higher than the expected rate of return of capital represented by alternative cost of equity. From this perspective the sector was attractive for investors in the years 2012 and 2014.

Comparing the values of ROE and R_E of company with the values of industry, it was clear that the situation in the company didn´t copy the trend in the industry in the given period. Analyzed company had for example almost three times higher cost of equity compared to the industry in the year 2013. In the company, there is not decreasing cost of equity, which for the future development of the economic value added is negative. The main difference between the company and the sector is in the final „spread“ value. The cost of equity exceeded the return on equity in the company, resulting spread was therefore negative and this was reflected in the negative values of EVA in the analysed period. The industry showed positive values of spead in the years 2012 and 2014. In the year 2013, the value of spead was -1,49%, implying that shareholders' wealth was the appreciation of 1.49 percentage points less than the opportunity cost of capital.

It is necessary to consider the difference between the return on equity and cost of equity. While the industry average of the return on equity indicator prevails five times the value of the analysed company in the year 2010, the cost of equity is higher in the section, but the excess is higher of 0,75 in behalf of the section CZ-NACE 25. Even if the value of equity

in the company is halved the difference between the cost of equity and the return on equity is so negative that even the absolute value of EVA-Equity of the company in negative values exceeds the result of EVA-Equity in the section CZ-NACE 25.

Manufacture of fabricated metal products, except machinery and equipment through a network infrastructure distribution has had a long tradition in the Czech Republic and can be included to perspective sectors because products of this industry are used not only for final consumption, but also as components in other industries. In the years 2010, 2011 and 2013 this sector generated negative economic value added values, which at first sight do not arouse enthusiasm to invest into this sector. However we must not forget that the data obtained are for the industry as a whole and do not distinguish separately production in particular areas of the industry. Different range of production and supply is necessary to take into account also in the analyzed company.

The return on equity did not exceed the cost of equity in the company (period 2010 – 2014), but the return on equity was higher than the free risk rate in the years 2013 and 2014, and therefore the company in those years was ranked in the second category according the Ministry, where companies are belonging to potential creators of the economic value added. Pyramidal analysis of EVA should be used for more detailed analysis of the development of EVA and the sub-indicators of EVA in order to know which factors influenced the EVA indicator in the analysed company. The data needed for pyramidal analysis are involved in the table 4.

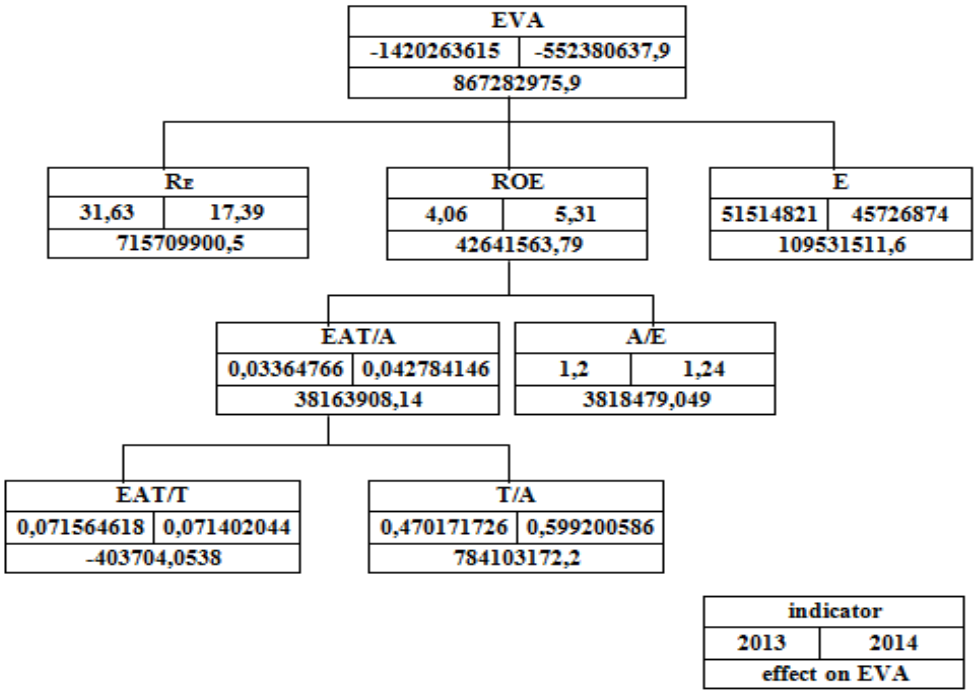
Tab. 4: Data needed for EVA decomposition

	2010	***2011***	***2012***	***2013***	***2014***
R_E	10,05	10,5	12,4	31,63	17,39
E [th. CZK]	55966517	56801441	57872290	51514821	45726874
ROE [%]	2,28	1,48	1,62	4,06	5,31
T [th. CZK]	33565288	40194393	36232709	29252514	34048623
EAT [th. CZK]	1280019,51	840787,29	938274,03	2093445	2431141,29
A/E	1,18	1,19	1,15	1,2	1,24

Source: own processing

Formulas 3, 4, 5, 6, 7, 8 and 9 are used to determine the values of EVA indicator. The figure 1 shows the decomposition of EVA indicator and the figure involves effects of annual changes in the years 2013 and 2014.

Fig. 1: Decomposition of EVA indicator in the years 2013 and 2014



Source: own processing

Pyramidal decomposition and analysis of deviations via functional methods has found that the resulting values of EVA have been affected by the area of costs, revenues and the cost of equity. The key areas of profitability and economic value added are costs and revenues. If the company doesn´t achieve a sufficiently large company profits, return of capital will not cover the cost of capital and the resulting value of EVA will be negative. The company has low values of the EAT indicator. The company was decreasing bank loans in the reporting period. This brought the growth of financial autonomy, but also higher costs of capital, since equity has been more expensive for the company than foreign capital. Reduction of bank loans decreased value of financial leverage indicator. Financial leverage indicator decreased the size of return on equity and the final value of economic value added. Analyzed company has achieved return on capital higher than the cost of foreign capital. Using a larger volume of foreign capital would cause growth of return on capital and that would have profitable effect of financial leverage. The increase of indebtedness could lead to the growth of profitability and to the growth of the resulting values of economic value added.

Revenues are other factor influencing the value of EVA indicator. The strength of the company is executive marketing which is able to find new market opportunities, the marketing maintains and deepens existing business relationships and is able flexibly respond to market conditions. Except households the deliveries of products tend also mainly to construction, electrical and mechanical engineering industries. Revenues can positively influence the EVA values in the future.

4 Discussion

Dissatisfaction with traditional performance measurement methods of companies using indicators derived just from the financial statements has resulted in the effort to develop alternative performance methods of company´s evaluation which would also be able to build indicators of tangible incentives of managers. The economic value added is one of the most

commonly used indicators [8]. According to the followers of EVA indicator statistically demonstrable link exists between the value of EVA and the company's ability to create shareholder wealth [14]. Czech Association for Financial Management states that in the year 2005 the indicator EVA benefited only about 40% of surveyed large enterprises operating on the Czech market. New survey from the year 2010 shows 30% of large enterprises, which is quite a surprising due to finding that almost 80% of large enterprises surveyed in the year 2005 indicated that the indicator EVA considered appropriate for enterprise performance management [2]. This result may be partially explained by the lack of familiarity with this model or the fact that this model was originally designed for large enterprises while in the Czech Republic have been prevailing small and medium sized enterprises. It turns out that Czech businesses still prefer financial indicators of performance measurement. Large companies are using EVA more than SMEs [15]. Managers should try to do everything in order to increase the value of invested funds of company owners, investors. EVA indicator helps to allocate resources, measures the performance of the company and helps to communicate with investors. EVA indicator forms the basis for decision-making in managerial economics.

The EVA indicator can be widely used for example in order to evaluate investment projects where it can be demonstrated that the EVA indicator fully replaces the net present value indicator. The investment project is accepted if the value of the EVA indicator is positive.

The question is how far the calculated cost of capital (the cost calculated based on the risk rates coefficients) is consistent with the reality. The EVA-Equity indicator is influenced by the situation on the stock markets and probably the EVA-Equity is inconsistent with the reality.

Conclusion

The paper evaluates the performance of the business sector CZ NACE 25 and the chosen company from the sector through the economic value added. In order to evaluate the economic performance it was applied the concept of economic value added based on the narrow value range. EVA-equity measures the performance from the owner point of view and measures return on equity and opportunity costs of that capital. The company was evaluated primarily for the period 2010-2014, the influences on EVA indicator of the company were analyzed for the years 2013 and 2014.

In the reporting period EVA didn´t indicate positive results in absolute values. The analyzed company did not create shareholder value and the values of EVA indicator were negative. In the reporting period 2008 - 2014 negative development of EVA indicator was caused by a negative value of spread. The company has not been able to assess the invested capital above the level of profitability required by shareholders. Based on an analysis of indicators affecting the EVA indicator, it is found in the company by using pyramidal decomposition, that the final values of EVA indicator were influenced by revenues and output consumption that all translates into the profit.

Increasing competition, the pursuit of profit maximization and capital improvements can lead to the use of methods for evaluating the business performance based not only on financial analysis but also by using modern methods of business performance. EVA indicator may assist in identifying the best investments this means that the company could be able to generate better performance than its competitors. EVA indicator is very accurate,

taking into account the cost of debt financing and equity financing costs. Managers have to construct the operating costs of the company in order to be successful in a competitive market. The company has to be able to succeed on the capital market for example by reducing the cost of capital.

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