ANALYSIS OF KEY PERFORMANCE INDICATORS AND CREATION OF THE MODEL COMPARING THE PERFORMANCE OF ENTITIES AS A MANAGEMENT TOOL IN THE ENERGY INDUSTRY

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Abstract: *The aim of this paper is to assess and analyze the performance of the selected entities of the energy industry with the application of credibility model – the combination of conventional and modern methods of performance evaluation. Traditional financial measures of performance are in terms of modern approaches to performance evaluation supplemented by measures, which report the most significant impact on the business value generation. In the model are in addition to financial indicators of performance applied also sectoral indicators of the energy industry. In meeting the objective and solving mentioned problem, standard research methods such as comparative analysis and the method of analysis and synthesis are used. When building the creditworthy model, the method of comparison with mean values as well as the method of scoring will be used. When evaluating the performance, it is necessary in addition to suitable methods to select the appropriate indicators of performance evaluation. Their choice affects the performance evaluation, what we managed to prove.*

Keywords: *Performance. Economic value added. Financial indicators. Sectoral indicators.*

JEL Classification: *C51, C53*

1. INTRODUCTION

Nowadays the attention of enterprises in evaluating and measuring the performance focuses on utilization of such methods of performance measurement which in addition to financial indicators are also based on non-financial ones supporting the business strategy and on indicators, which enable the measurement of performance for each level of enterprise management. In this regard the use of modern performance indicators has started. These indicators take into account the implications of current decisions and activities for the future development of corporate performance and economic profit (represented by indicators such as MVA – Market Value Added, EVA – Economic Value Added, CVA- Cash Value Added). The fundamental change in the development of performance measures has occurred in the 90s of the 20th century, when the evaluation of the performance in relation to the transformation process has moved to the performance measurement by the modification of the market value of the company and Free Cash Flow. In terms of the development of measures and methods of performance measurement and management, the opinions on the performance have also developed from the requirement of maximizing profit to market value maximization and future strategic growth achievement.

2. SCIENTIFIC PROBLEM FORMULATION

The most common method of assessing the financial and economic performance of the company is method of fundamental or technical analysis, which evaluate the enterprise in economic terms on a base of detailed study and analysis of financial statements [4]. In the opinion of many Slovak and foreign authors as the most common indicators to measure the performance of companies are used the financial indicators [8], [3], [20], [28], [21]. These conventional indicators are based mainly on profit maximization – the primary goal of business.

According to the argument that the objective is not only to measure, but in particular to improve performance [7], it must be noted that these conventional financial ratios have low predictive value in analyzing and evaluating the financial performance of the company, in terms of making tactical and strategic decisions in management. This is caused by the fact that these results are judged rather isolated. Conventional performance indicators do not answer the question why the overall results achieve such values or which areas of the company should be improved in order to meet strategic company objectives. It is therefore important to supplement conventional financial indicators with another more dynamic and more prospective indicators, which are adjusted to specific competitive conditions. It means that it is necessary to focus on monitoring and comparing the implementation results describing performance with the planned level of performance, monitoring the strategies direction during their implementation, identifying the accompanying problems of fundamental importance and performing the necessary changes and adjustments [5]. Development of modern indicators of performance evaluation was focused on the processing and designing of indicators most closely connected to the value of shares. These indicators should also enable to use the most of accounting information and data, include calculation of risk, take into account the range of related capital and finally should allow performance evaluation and also the enterprises valuation. [18]. Currently the best known and most utilized modern indicator of performance measurement is Economic Value Added (EVA) indicator.

In the light of above-mentioned, the following scientific problem is formulated: „Can the choice of financial and non-financial indicators influence the final evaluation of enterprises performance".

The aim of this paper is to assess and analyze the performance of the selected entities of the energy industry with the application of creditworthy model – the combination of conventional and modern methods of performance evaluation. Traditional financial measures of performance are in terms of modern approaches to performance evaluation supplemented by measures, which have the most significant impact on enterprise value generation. In addition to financial measures of performance, the sectoral indicators of the energy industry are applied in creditworthy model. These sectoral indicators represent non-financial performance indicators.

3. DATA PROCESSING AND METHODS USED

In addressing the given problem we will use financial indicators representing all areas of the financial performance evaluation of the enterprise according to CIMA (Chartered Association of Certified Accountants) used in international practice [22]:

- operational indicators,
- indicators evaluating the financial structure and ability to pay of the company,
- investment indicators - the group of indicators measuring the enterprise attractiveness, whether present or future, with respect to investors.

These financial indicators are divided into two categories. The first group of indicators is formed by the financial measures with the random selection representing the inputs to creditworthy model number 1: Turn around receivables, Turn around liabilities, Inventory turnover, Grade watered, the Total debt, Routine indebtedness, Return on Equity, Return on Sales, Total liquidity, Current Ratio.

In addition to financial indicators, for the formation of creditworthy model no. 1 will be also used Ex Ante models, especially randomly selected four models of future enterprises success: Quick test, Z – score, Credit score, Taffler index.

The second group of measures represents financial indicators with the greatest impact on enterprise value, represented by EVA indicator. For the selection of these indicators we will apply INFA model [17], factor analysis, regression and correlation. The example of correlation and regression application is summarized in Tab. 1, which shows values of the EVA indicator and Current Ratio. The calculated correlation coefficient indicates a strong dependence of the EVA indicator value on the value of Current Ratio. This finding confirms the theory [18] assuming that in the event of poor performance the company must deal with the liquidity as the first reason of this negative development. Besides it liquidity is the bearer of financial risk, which for the value of current ratio lower than 1,2 represents 10%.

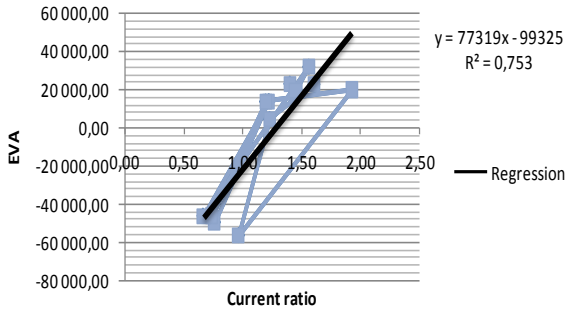

Figure 1 Development of the EVA indicator depending on the evolution of current liquidity ratio
Source: Own processing

To create creditworthy model no. 2 we will use financial indicators which were selected in the same way as Current ratio, Cash-to-cash, Capital turnover, Turn around receivables, Return on assets, Profit margin, Weighted average capital cost, Equity ratio, Return on equity, Interest coverage.

In addition to these financial indicators in the creditworthy model no. 2 will be used also sectoral indicators of the energy industry while by their selection and within the meaning of modern evaluation methods we will try to complement the financial indicators by non-financial ones, which belong within the given industry to key performance indicators. The selected sectoral indicators include: Cost consumption, Return on investment, Point of supply profitability, Tariff for electricity distribution without losses including electricity transmission - Voltage level Mv, Energy efficiency of electricity distribution, Share of losses in the electricity distribution, Average interruption (unavailability) duration of electricity distribution to point of supply – Voltage level Mv Number of events failure to comply with standard of quality to recorded events, Number of events failure to comply with standard of quality to employee, Labor productivity to employee.

In meeting the target and solving the problem, other standard methods of research will be used, such as comparative analysis and the methods of analysis and synthesis. When creating creditworthy model the method of comparison with the optimum values, as well as the method of scoring will be used. To eliminate the lack of conventional financial indicators - the isolated evaluation of the selected indicator – these indicators are converted into a points and the sum of these points constitute the comprehensive assessment of business performance. Within the energy industry the sample of electricity industry with a focus on electricity distribution was specified. The information for the contribution was obtained from the professional journals and internet websites of selected companies of the energy industry, which will be anonymous.

Table 1 Values of the EVA indicator, Current Ratio and the Correlation coefficient of their mutual relationship

Current ratio	1,40	1,45	1,56	0,67	1,23	0,77	0,74	1,20	1,93	0,97	1,23	1,61
EVA in €	23 143,60	19 489,99	32 093,28	-46 545,98	13 949,54	-49 951,46	-46 452,98	13 740,76	19 999,17	-56 833,28	4 519,12	22 828,12

Correlation coefficient	**0,87**

Source: Own processing

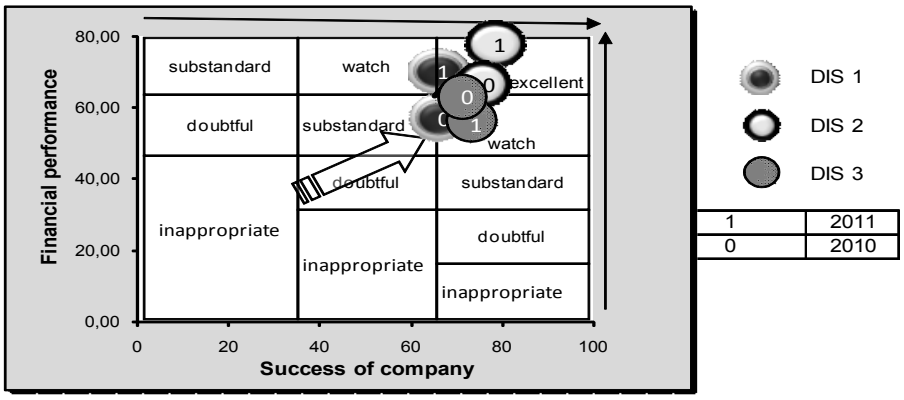

Figure 2 Portfolio no. 1 - Evaluation of the performance of enterprises with the use of financial indicators
Source: Own processing

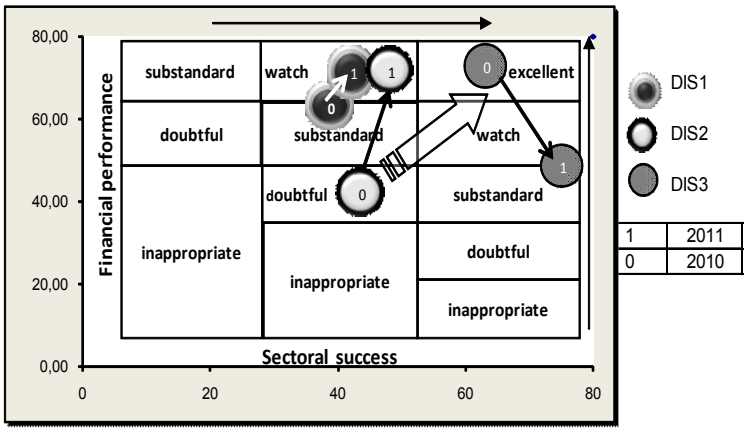

Figure 3 Portfolio no. 1 - Evaluation of the performance of the selected enterprises with the use of financial and non-financial indicators
Source: Own processing

4. CREDITWORTHY MODEL

To evaluate the performance of the selected subjects in the energy industry, we will create creditworthy model. The sum of scores of 10 randomly selected financial indicators is applied to the X-axis. The scores of selected Ex Ante models are applied to the Y-axis. Positions of the selected enterprises of the energy industry are displayed in the appropriate creditworthy model portfolio no. 1.

For the comparison of the performance we will construct creditworthy model no. 2, which utilizes a set of measures with significant impact on the EVA indicator. In this model the sum of scores of selected sectoral indicators in the energy industry is applied to the Y-axis. We proceed in the same way as for creditworthy model no. 1. Positions of the selected enterprises of the energy industry are displayed in the appropriate creditworthy model portfolio no. 2.

5. RESULTS AND DISCUSSION

Creditworthy model is in the field of financial and sectoral indicators divided according to number of points obtained in several areas of evaluation. The best position is excellent. Location in the watch area means that it is necessary to supervise the maintenance of given position, but it also generate a scope for performance improvement towards excellent position. Substandard position is specific for companies achieving average results in terms of performance. Among the worse locations belong positions doubtful and inappropriate creating extensive scope for the enterprise improvement in the field of financial performance and success.

Fig. 2 shows the positions of enterprises in terms of performance, with the use of random selection of financial indicators and Ex Ante models. Enterprises DIS 1 and DIS 2 achieved excellent position in performance. Worst enterprise development achieves DIS 3 whose performance is deteriorating. Performance of this company leads from the excellent position to position watch.

The position of evaluated and analyzed enterprises in Fig. 3 is in the comparison with standard performance evaluation worse. Deterioration of the performance was caused by selection of key indicators of enterprise value and enterprise performance expressed by EVA indicator. So we can say that selection of key performance indicators in the evaluation and measurement of the performance influences the results of the business performance evaluation.

In the model no. 2 we can see that the best performance evaluation and therefore the best position achieved enterprise DIS3 in 2010, but in 2011 the deterioration occurred. It was caused by selected financial indicators, namely current ratio. The decrease of current ratio subsequently increased financial risk of the company and the average price for equity, which reflected negatively in the value of the EVA indicator. Here is also confirmed the strong linkage between liquidity and performance of the enterprise.

Enterprises DIS 1 and DIS 2 does not reach excellent position as in the case of creditworthy model no. 1 but the development of their performance is positive and leading to excellent position. We can notice enormous deterioration in business performance evaluation of enterprise DIS2, which in this model reached doubtful position, while in the creditworthy model no. 1 was located at the excellent position. This deterioration was caused by the selection of indicators, which consisted of measures with the most significant impact on the EVA indicator such as Current Ratio, Cash-to-cash, Rate of equity, Weighted average capital cost and Return on Equity, the level of which is not able to cover Rate of equity. But the most important reason is again the lack of Current Ratio of enterprise.

If we compare the evaluation of enterprises in terms of success we find out that from this point of view the difference between the models is even more pronounced. The sectoral characteristics of the individual companies failed to achieve total number of 80 points. In the total score of sectoral indicators they achieved lower number of points as in the case of financial indicators. The scope for improvement provide primarily indicators in which enterprises achieved only 1 point, for example Tariff for electricity distribution without losses including electricity transmission - Voltage level Mv, Average interruption (unavailability) duration of electricity distribution to point of supply – Voltage level Mv, Cost consumption, Number of events failure to comply with standard of quality to recorded events. The best position in success expressed by sectoral indicators achieved enterprise DIS3 in 2011.

Above-mentioned leads to the conclusion that selection of the financial indicators affects performance evaluation of enterprises.

6. CONCLUSION

Enterprises performance evaluation is difficult process. Lot of attention should be paid to selection of the appropriate financial indicators. They need to be chosen in accordance with the objective, which we follow in the research. Our choice was focused on key measures in relation to EVA indicator. In terms of modern methods of performance evaluation these measures are appropriately complemented by indicators not belonging to standards of financial analysis. In the case of selected industrial sector, we included indicators, which are for given industry and its object specific. In assessing enterprises performance should be taken into account generally valid indicators of performance as well as indicators specific to individual industries, which often have the character of non-financial indicators. Only in this way all functional areas of enterprises and their impact on business performance expressed by EVA indicator will be taken into account.

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REFERENCES

[1] DIXON, J. R. NANNI, A. J. VOLLMANN, T. E.: ***The New Performance Challenge: Measuring Operations for World-class Companies.*** Dow Jones-Irwin. Homewood. 1990.
[2] FISHER, J.: ***Use of Non-Financial Performance Measures. Journal of Cost Management.*** 1992. 6 (1). pp. 1–8.
[3] DUDOKOVÁ, M.: ***Meranie výkonnosti ako predpoklad úspešnej stratégie.*** Dostupné na: <http://www.scss.sk/eommlspj/_data/VEGA%202002-2004/RIESITELIA/DUDOKOVA%20MALVINA/4zilina2004%20AFD.pdf>.
[4] HAMMER, M.: ***Jak zlepšit provozní výkonnost.*** In: Moderní řízení. roč.58. č.9. s. 32-36. ISSN 0026-8720. 2007.
[5] ITTNER, C. LARCKER, D. RANDALL, T.: ***Performance implications of strategic performance measurement in financial services firms***. Accounting. Organizations & Society. 2003. 28. 7/8. p. 715.
[6] MAŘÍK, M. – MAŘÍKOVÁ, P.: ***Moderní metódy hodnocení výkonnosti a oceňovaní podniku***. Praha: Ekopress. 2005. 164 s. ISBN 80-86119-0.
[7] NEUMAIEROVÁ, I., NEUMAIER, I.: ***Výkonnost a tržní hodnota firmy***. Praha: Grada Publishing. 2002. 216 s. ISBN 80-247-0125-1.
[8] NÝVLTOVÁ, R., MARINIČ, P. : ***Finanční řízení podniku***. Praha: Grada Publishing. 2010. 204 s. ISBN 978-80-247-3158-2.
[9] PAVELKOVÁ, D., KNAPKOVÁ, A.: ***Výkonnosti podniku z pohledu finančního manažéra***. 2. Vyd. Praha: LINDE. 2009.333 strán. ISBN 978-80-86131-85-6.
[10] PETŘÍK., T. : ***Ekonomické a finanční řízení firmy***. Praha: Grada Publishing. 2009. 735 s. ISBN 978-80-247-3024-0.
[11] OCHOTNICKÝ, P., LAJZOVÁ, B., KISEĽÁKOVÁ, D.: ***Cenová konkurencieschopnosť a zdanenie energetických vstupov***. In Ekonomický časopis. Bratislava: SAV. 2011. Roč. 59. č. 8 (2011). s. 786-801. ISSN 0013-3035.
[12] STÝBLO, J.: Výkonnosť firiem. In: Moderní řízení. . roč.43. č.11. s. 25. ISSN 0026-8720. 200810.
[13] SUHÁNYIOVÁ, A.: ***Analytický pohľad na účtovníctvo ako zdroj informácií v manažmente***. 1. vyd. Prešov: Prešovská univerzita v Prešove. Fakulta manažmentu. 2009. 192 s. ISBN 978-80-8068-956-8.
[14] http://www.zsdis.sk/
[15] http://www.vsds.sk/
[16] http://www.sse.sk/
[17] http://www.urso.gov.sk/

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