“Evaluation of companies by revenues methods in the conditions of Slovakia”

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EVALUATION OF COMPANIES BY REVENUES METHODS IN THE CONDITIONS OF SLOVAKIA

Abstract

Goal of the contribution is to create universal model for evaluation of companies, acting in mining industry in Slovakia. Model is orientated to the companies, acting in mining industry in Slovakia and it consists from several logically relating steps. Also application of suggested process in chosen mining company is made as well as achieved results are mutually compared. Attention is given to the revenue methods with necessity of financial plan, as well as methods that do not demand knowledge of financial plan.

Keywords Evaluation of company, mining industry, revenues methods

JEL Classification D04

INTRODUCTION

Evaluation of a mining company is a complex task. Several methods can be used for estimation of a mining company's value, but some of them are not usable. The reason for that is a specific character of the mining industry. Except for the risks related to the financing of mining projects, the existence of individual raw materials, there is also a certain cyclicality of prices, changes in the costs structure, stock exchange aspects, and considerable volatility. This is the case during the assessment of value depending on the probability of development of analyzed indexes (Kislingerová, E., 2001).

The goal of the article is to find out which methods are appropriate for evaluation of mining companies and to explain, why such companies are evaluated by these methods.

The value of the company depends on the cycle phase (economic one or the price of commodity), in which the company is actually operating (Copeland, T., Koller, T., Murrin, J., 2000).

The value of the mining company is influenced not only by the price of the company, but also by its expected volatility. Mining companies are exposed to bigger price volatility then companies in the industry or services (Damodaran, A., 2010). This has an impact on volatility in regard to incomes, revenues and cash flow.

Mining companies have high fixed costs. Mining companies can maintain services also during periods of low prices of raw materials. The rea-

son is high costs for discontinuance and repeated opening of the services (Copeland, T., Koller, T., Murrin, J., 2000). This also requires proper definition and management of procurement contracts of hired companies (Tkáč, M., Delina, R., Sabolová, M., 2016). In the worst case such events can force a company to finish service and lead to the bankruptcy of the company before the exhaustion of reserves (Jacks, D. S., Fraser, S., Williamson, J. G., 2009). Traditional methods of assessment of the financial situation in mining companies include complex indexes and analysis for determination of the market position of the company. Input data for these methods contain considerable risks (Weiss, E., Čulková, K., Mixtaj, L., 2013).

It is necessary to remember that big initial investments are necessary for mining companies in order to start the service. This explains the fact that a number of mining companies are financed through debt (Kernot, Ch., 2006). Due to the above-mentioned volatility of operational revenues there is an increase in fluctuations of the company's net income (Copeland, T., Koller, T., Murrin, J., 2000). In case when mining companies search further possibilities of their expansion, they use mostly foreign capital, which leads to high volatility of equity and index of indebtedness (Jacks, D. S., Fraser, S., Williamson, J. G., 2009).

Mining projects have also high risks. For mining projects it is possible to identify various risks related to certain circumstances of a given project (Vilamová, Š., Király, A., Kozel, R., Janovská, K., Papouše, D., 2015).

The current business environment in Slovakia is not stable; there are several problems that have significant influence on the value of the company. On the other hand, the selection of a proper country to do business in is not easy (Bosáková, L., Kubák, M., Andrejkovič, M., Hajduová, Z., 2015). Only those companies can besuccessful that can actively manage their value as a main principle of their business strategy (Weiss, E., Čulková, K., Mixtaj, L., 2013).

1. METHODOLOGY

The article is dedicated to the mining companies operating in Slovakia. During the first stage input data were collected about mining companies in Slovakia. 22 mining companies from Slovakia were ranked. The data was obtained from the available public sources, for example, the register of financial statements in Slovakia and published annual reports of individual companies. According to the obtained information of historical data we calculated the probability of development of the companies in the mining industry of Slovakia, as well as their structure, capital, revenues, costs and cash flows. The obtained probability distributions were further used for the creation of financial plans in concrete companies. The economic software Evalent 4.0 was used for evaluation.

The proposed process for the evaluation of companies was further used to determine the value of a chosen mining company. In determining the value of a mining company two alternatives are available:

- estimation of the company's value without the knowledge of its financial plan;
- estimation of the company's value with the company's financial plan.

The most wide-used methods are as the discounting of future cash flows DCF, the payback method PP or internal rates of revenues. External evaluators of the company's value can demand the data that the company does not wish to publish. Therefore, the article is focused on the evaluation of the company from externally available public information. Such methods as DCF, EVA, the methods of capitalized revenues and methods, which do not require financial plans, were used.

The methods of discounted cash flows are the mostly used methods in Slovakia during the determination of the company's value. These methods provide a theoretical and practical concept for the assessment of companies [10].For the basic calculation of the company's value the following equation is used:

$$V_{(0)} = \sum_{t=1}^{t=N} \frac{E(CF)}{(1+r)^t}, \quad (1)$$

where:
$E(CF)$ – future free cash flows;
r – discount rate reflecting the risk of future cash flows;
N – probable life cycle of assets.
During the assessment of the company's value operation cash flows are always considered. The following steps must be undertaken for the estimation of the company's value.

1. To estimate free cash flows.
2. To calculate discount rates.
3. To choose a proper model for the estimation of growth possibilities.
4. To make calculations.

WithDCF models it is possible to use various cash flows. The following cash flows are analyzed:

- cash flows for creditors and shareholders (free cash flows to the firm, FCFF);
- cash flows for shareholders (free cash flow to the equity, FCFE);
- dividends (dividend discount model);
- EVA (cash flows that surpass opportunity costs of shareholders providingthe growth of wealth). [1]

Discount rate in DCF models corresponds to the risk of cash flow in numerator. One of the key parameters during the evaluation of the company is weighted average costs of capital WACC.

$$WACC = r_d \cdot (1-t) \cdot \frac{D}{C} + r_e \cdot \frac{E}{C}, \qquad (2)$$

where:

r_d – interest rate of debt capital;
t – tax income rate;
D – market value of debt capital of the company, while E and D serve as weights for calculation of weighted average;
E – market value of equity;
C – market value of total capital;
r_e – costs of own capital, that is revenue, demanded by shareholders (through dividends and increase in company value).

WACC is the evaluation of the company's base that determines the lower level of profitability. The level of WACC is important for theevaluation.

Debt costs, the costs for creditor capital are the foreign sources used for financing of the company. Belonging to such foreign costs are credits, financial assistance or bonds, emitted by the company. Capital costs can be determined as an average of interest rates of credits from various economic subjects. We can use information from various financial institutions, which provide financial resources. It is also possible to use as interest rates increased by term premiums and premiums for specific risks.

The cost of equity is determined by using the model CAPM. According to the model,the costs of equity are created from three elements, mainly interest rates without risks, systematic risks and risk premiums.

2. MODELS BASED ON ECONOMIC VALUE ADDED EVA

Models, based on economic value added belong to relatively new models for evaluation of companies. The methods remove the shortages of classical profitability indexes, since they include the capital structure and the measure of risks. WACC is used in the model as discount rate. Also in the case of the models based on EVA, there are two possible variants:

- constant growth model;
- double phase model;

Value of the EVA index is influenced by the following indicators:

- economical result from operation activity;
- operation assets (assets used for the creation of operational economic result);
- weighted average cost of capital.

Economical value added can be determined by equation:

$$EVA = NOPAT - WACC \cdot NOA, \quad (3)$$

where:

$NOPAT$ – economic result from operational activity;

$WACC$ – weighted costs of capital;

NOA – invested capital ("operational assets").

3. RESULTS

The goal of the article was to create a general model for the evaluation of mining companies. The process of decision-making is described in the following steps:

1. Creation of a benchmark group of companies

A benchmark group could be chosen consisting of comparable companies that operate in the same economic sector and have certain parameters, as for example, the volume of the company's activities, the region of operation, etc.

2. Data collection

After creating a benchmark group of companies the evaluator should try to obtain possible information from companies. The information about property, capital, revenues, costs and cash flows are usually obtained from publicly available accounting reports (balance sheets, losses and profits statement, cash flow reports, annual reports, etc.).

3. Analysis of data and evaluation of development within a benchmark group

Considering the historical development of individual indexes we carry out an analysis determining the possibilities for future development of the sector. According to the analysis of the data, an evaluator should make conclusions and calculate indexes that can be applied for the analyzed company.

4. Selection of the method, resp. the number of methods for evaluation of companies

A mining company has certain specific characteristics. An evaluator should choose a proper method or several methods. An evaluator could choose from the two groups of methods.

5. Financial plan

Determination of probable development of individual elements of the company, development of economic results and cash flows. An evaluator could create aprobable financial plan. In writing a financial plan it is important to take into account a certain measure of risk and uncertainty. Therefore, investors or other evaluators cannot prove with certainty that economic result, total value of the property and other elements of the company will have a certain value.

6. Evaluation of the achieved results.

Evaluation of mining companies is complex process, connected with certain uncertainty and risk. In case of financial plan creation according probability distribution, created according historical development of compared companies in mining industry also resulting value of mining company will be in form of probability distribution with certain statistics, as for example average value, most probable value of the company, maximal and minimal value, variance of values, etc. In case of more methods using for evaluation of the companies there is proper to compare individual methods mutually.

4. CASE STUDY OF EVALUATION OF THE COMPANY DOLKAMŠUJA, A.S.

4.1. Method of discounted cash flows

After the creation of financial plan a chosen company was evaluated. Since the financial plan does not include absolute values, but probability distri-

Table 1. Comparison of characteristics of distribution of company value – the method of net capitalized revenues

Forecast: Resulting value of the company	DCF	EVA	Capitalized revenues
Statistic	Forecast values	Forecast values	Forecast values
Trials	1 000	1 000	1 000
Base Case	5 069 451	5 427 643	0
Mean	4 883 353	5 104 507	2 103 877
Median	5 574 246	5 818 320	2 103 378
Mode	–	–	–
Standard Deviation	3 460 232	3 958 738	46 518
Variance	11 973 207 668 738	15 671 607 999 608	2 163 943 745
Skewness	–1.13	–2.15	0.1593
Kurtosis	11.41	16.37	2.99
Coeff. of Variation	0.7086	0.7755	0.0221
Minimum	–17 800 470	–30 400 966	1 966 144
Maximum	29 420 694	24 646 064	2 251 303
Mean Std. Error	109 422	125 186	1 471

bution of individual indexes, the resulting value is in the form of probability distribution. The resulting value was determined according to the method of discounted cash flows through Monte Carlo simulation. The results of simulation through statistical Crystall Ballprogram and probability distribution of the total value of the chosen company is illustrated in Figure 1.

During the simulation 1000 trials were conducted. The average value of the company was determined at 4 883 353 EUR, the median one – at 5 574 246 EUR. A standard deviation is 3 460 232 EUR.The minimal value is 17 800470 EUR, the maximal value 29 420 694 EUR.

4.2. The method based on economic value added

Duringthe calculation of the value of the company and according to the method based on economic value added we work with similar input data as with the previous method. The resulting probability distribution of the company's value is the result of Monte Carlo method, shown in Figure 2.

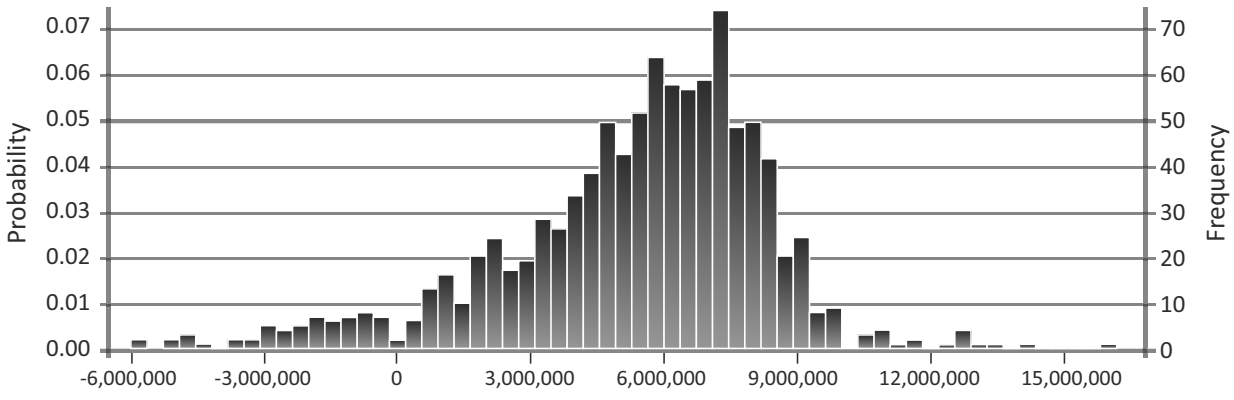

Figure 1. Probability distribution of the resulting value of the company – DCF

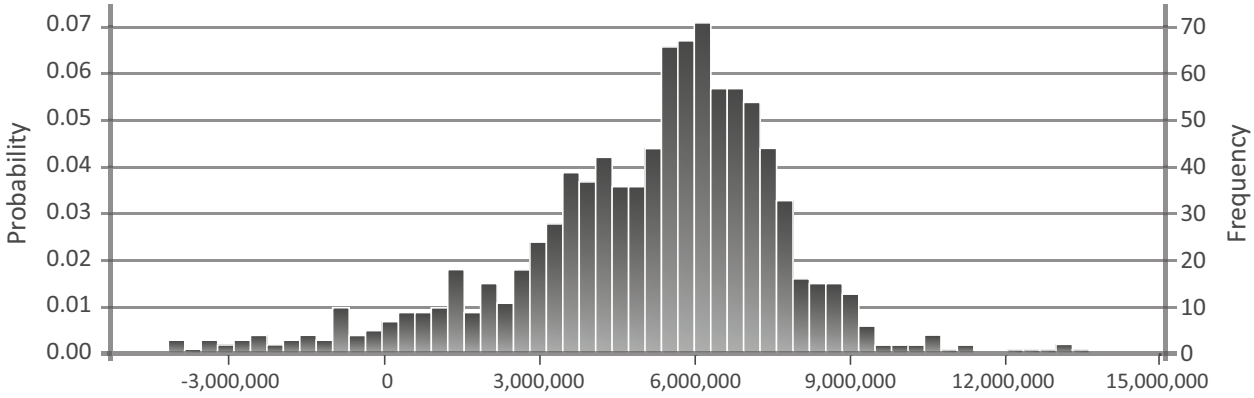

Figure 2. Probability distribution of the resulting value of the company – EVA

During the simulation 1000 experiments were conducted. The average resulting value of the company is 5 104 507 EUR. The median values is 5 818 320 EUR.

The comparison of individual methods is made in Table 1. The highest average values were calculated with the method based on economical value added (in case of median and average values). As for the method based on economical value added, we can state that this method is less exact for the process in comparing with other selected methods. The most precise among the selected methods is the method of net capitalized revenues. With this method an average value is the lowest in comparison with the average values of other selected methods.

Determination of value according to the chosen methods was conducted at the end 2014. In this period the price of one share of the company was 150 EUR. With the total number of the issued shares28 253 the company's market capitalization was at 4237950 EUR. We can state that the value of the company determined according to the discounted cash flow was the closest to the market value of the company.

5. METHODS WITHOUT FINANCIAL PLAN

In using evaluation methods, when a financial plan is not necessary, there is possibility to choose from among three alternatives:

- Model of constant growth;
- Model of extraordinary growth, followed by zero growth;
- Model of extraordinary growth, followed by stable growth.

In determining the company's value according to the methods, where the value of the company is based on the estimation of its parameters, it is necessary to predict the growth of the corrected economic result from operational activity. This trend is predicted according to the development of similar companies from the benchmark group as described in the first step.

5.1. The model of constant growth

In the case of model of constant growth we considered the probability of distribution of the corrected economic results from 22 analyzed Slovakian mining companies. The basic information necessary for calculation is presented in Table 2.

Table 2. Value of the company – model of constant growth

Given trend KPHV (%)	–0.34
Operation value of the company EUR	827 566
Resulting value EUR	641 575
Value of equity EUR	641575
Transaction multiplier (PHF/EBITDA)	2.59

Table 3. Value of the company – model of extraordinary growth followed by zero growth

Trend of extraordinary high growth KPHV (%)	0.31
Value KPHV during period of extraordinary growth	91 799
Value KPHV during period of zero growth	764 995
Operation value of the company EUR	856 794
Resulting value of the company EUR	670 803
Value of equity EUR	641575
Transaction multiplier(PHF/EBITDA)	2.68

Table 4. Value of the company – model of extraordinary growth followed by stable growth

Trend of extraordinary high growth KPHV (%)	0.31
Value KPHV during period of extraordinary growth	91 799
Value KPHV during period of stable growth	736 906
Operation value of the company EUR	828 706
Resulting value of the company EUR	642 715
Value of equity EUR	642 715
Transaction multiplier (PHF/EBITDA)	2.59

Input index for Monte Carlosimulationis used for determining the resulting value of the company. The average resulting value of the company is 641 575 EUR.

5.2. The model of extraordinary growth followed by zero growth

With the model of extraordinary growth of the corrected economic results from operational activity the input value means the distributions of changes at 75% of the highest annual changes of the index during the analyzed period in the selected group of mining companies. The average resulting value of the company is 670 803 EUR. The characteristics are described in Table 3.

5.3. The model of extraordinary growth followed by stable growth

Accordingto the model of extraordinary growth followed by stable growth the average value is 642 715 EUR. The trend of stable growth of the corrected economic results from operation activity is determined by probability distribution of the index changes during the analyzed period.The basic data for this model is presented in Table 4.

CONCLUSIONS

The article is focused on the evaluation of companies according to the revenues methods. Planning presents a certain measure of risk or uncertainty. Therefore, the proposed financial plan does not include absolute values, but probability distribution. The presented input data is necessary for final determination of the resulting value of the evaluated company. We have compared the methods that do not need the knowledge of the financial plan for determining the value of the company.

Since the resulting evaluation of the company is based on probability distribution, we compared the descriptive characteristics as well as the market capitalization of the company at the moment of its evaluation.

The highest average values were achieved with the method based on economic value added. Market capitalization of the company in time of evaluation was4 237 950 EUR. The value of the company determined through the discounted cash flows wasthe closest to this value.

In the case of methods that do not need knowledge of the financial plan during calculation the average values were lower.

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REFERENCES

1. Kislingerová, E. (2001). Oceňovánípodniku. 2. přepracované a doplněnévydání. Praha: C. H. Beck. 367 p.
2. Copeland, T., Koller, T., Murrin, J. (2000). Valuation Measuring and Managing the Value of Companies. Mc Kinsey & Company, Inc., 3rd edition.
3. Damodaran, A., (2010). The Dark Side of Valuation. 2nd edition, p. 417-449.
4. Tkáč, M., Delina, R., Sabolová, M. (2016). Analysis of Request for Proposals in Construction Industry. *Quality Innovation Prosperity, 20*(1), 104-117. http://dx.doi.org/10.12776/qip.v20i1.686
5. Jacks, D. S., Fraser, S., Williamson, J. G., (2009). Commodity Price Volatility and World Market Integration since 1700.
6. Weiss, E., Čulková, K., Mixtaj, L. (2013). Comparison of methods, using for evaluation of mining firms in conditions of Slovak republic – 2013. *Metalurgia international, 18*(10), 105-107.
7. Kernot, Ch. (2006). Valuing mining companies.
8. Vilamová, Š., Király, A., Kozel, R., Janovská, K., Papouše, D. (2015). The use of selected statistical methods as an objective tool of company's management. In: Production Management and Engineering Sciences, TatranskáŠtrba, High Tatras Mountains, Slovak Republic, 16th-17th, April 2015, pp. 317-320. https://doi.org/10.1201/b19259-57
9. Bosáková, L., Kubák, M., Andrejkovič, M., Hajduová, Z. (2015). Doing business abroad: utility function model for country selection in preliminary screening phase. *Central European Journal of Operations Research, 23*(1), 53-68. https://doi.org/10.1007/s10100-013-0328-1
10. Čulková, K., Weiss, E., Mixtaj, L. (2016). Prediction of the financial situation development of mining firm in conditions of Slovak Republic – 2013. Metalurgia International, 18(5), 252-255.