

Evaluation of mining companies by investors

Daniela Marasová¹, Martin Bittner², Peter Bokša¹, Peter Maras³, Ľuboš Caban¹ and Omar Mohamad Abdulhafiz Mhemed⁴

The present time of economic crisis overcoming is influencing also mining industry when companies are fighting with high indebtedness. High level of debt means a number of mining companies started to have big problems, a decrease of production and a single recession. One of the possible ways to solve the situation is private equity, which has a single impact especially to the mining industry. Contribution provides an evaluation in the area of PE investors in the mining industry with the aim to compare the performance of the mining industry with PE participation, attractiveness and total impact to the mining companies. The goal was to find out if PE means benefit for the mining industry and if so, what are benefits, reflecting in the performance of the company. The determined goal was achieved by a so-called micro index that could according to analytical results and evaluation of mining companies present certain informative structure about individual parts of the companies and to which measure these parts are qualitatively managed from the view of PE investor. Results of the analysis show that PE in the mining industry records better results than companies without PE participation. Through analysis of the mining industry, we found out the mining industry achieved better performance than the whole European industry. PE acting in the industry had a positive impact on the mining companies. The situation can be solved through simple micro index and summary of individual risks, which mining company should avoid with the aim to increase attractiveness for PE investors and at the same time to increase the stability of the company.

Keywords: mining industry, investments, private equity, business risk, investor, gross domestic product

Introduction

The economic crisis, rising in 2007, caused a number of industrial sectors, mainly mining industry, had to borrow financial sources. High level of debt means a number of mining companies started to have big problems, a decrease of production and a single recession. Results of research by Axelson et al. (2009) speak about debt financing that is still greatly influenced by debt conditions that have bigger power to influence a single structure of the industry and companies. The present economic decrease in the frame of national economies provides a broad spectrum of evidence, according to which we can search and validate various alternative economic scenarios. Dvořáček et al. (2012) calculate financial bankruptcy models in order to determine the ratio of non-bankrupt and bankrupt industrial firms. Also, the solution could be private equity (further PE), since it reacts to the economic decrease more intensively than the single business model without the involvement of leverage (Hege et al., 2018). It means that during economic decrease companies, supported by PE can achieve better results than their competition at the market, mainly due to the stable core of the company and the broader structure of financing. PE could present better and more prompt reaction to the changes in the frame of industries.

Private equity (further PE) is a type of investment concept, presenting the selling process of the firms (Fidrmuc et al., 2012). It presents alternative to various other types of breakup transactions and buyouts, as divestitures, spin-offs, equity carve-outs, tracking stock and strategic buyouts (Betton et al., 2007, Boone and Mulherin, 2007; Straka et al, 2018, Khouri et al 2017). PE has the economic role of mergers by performing a comparative study of mergers and internal corporate investment at the industry and firm levels. Andrade and Stafford (2004) found strong evidence that merger activity clusters through time by industry, whereas internal investment does not. Research by Jensen (1989) proved that PE positively improves the operating performance of the industrial companies. John et al. (1992) provided successful empirical evidence that fear of sale or takeover by other company increased motivation and performance of the given company. The result of research by Kaplan (1989) states the fact that PE companies help to increase the profit of target companies; it can improve cash flow and also other financial indexes. Similar results have also been achieved by other studies, for example, the study by Guo et al. (2009), and study by Muscarell and Vetsuypens (1990). Results of mentioned studies showed similar results in the frame of various PE segments, which emphasises still the more total opinion of the positive effect of PE investments. Another study that had been orientated to the PE is the study by Bloom et al. (2009) that studied managerial contribution to total PE position and also PE benefits from the management point

¹ Daniela Marasová, Peter Bokša, Ľuboš Caban, Technical University Košice, Institute of Logistics, Slovakia, daniela.marasova@tuke.sk, peter.boksa@tuke.sk, lubos.caban@tuke.sk

² Martin Bittner, Barclays PLC Banking and Financial services, London, UK, martinbitt@gmail.com

³ Peter Maras, Technical University Košice, Institute of earth resources, Slovakia, peter.maras@gmail.com

⁴ Omar Mohamad Abdulhafiz Mhemed, Technical University Košice, Faculty of Economics, Slovakia

of view. Results showed that PE management is more successful than management in other companies in the frame of industries. Also, some cases exist that emphasise the opposite effect of PE investments, while the company is still achieving significant profits (Bargeron et al., 2008). Such a phenomenon was presented in a study by Bernstein et al. (2010) and Rasmussen (2008). A number of authors studied the influence of PE in various countries (e.g. Fang et al., 2018, Saini and Singhania, 2018). From mentioned researches there is obvious, PE using is influenced by different economic conditions.

Methodology

The goal of the contribution is to make an evaluation of private equity with impact to the mining industry and to evaluate by way of comparison and analytical methods performance of mining industry with PE participation, the attractiveness of total PE impact of an investor in the frame of mining companies.

Solving is possible by a so-called micro index that could according to analytical results and evaluation of mining companies present certain informative structure about individual parts of the companies and to which measure these parts are qualitatively managed from the view of PE investor. Micro index of private equity and risk capital are presented by the research of Groh et al. (2008). Main factors, influencing the index are:

- economic activity,
- capital market,
- taxes,
- protection of investor and corporate management,
- working and social environment and
- business possibilities (Čulková et al., 2015).

Economic activity belongs among the most important factors and partial components of the total index. It is obvious that in a number of dynamic environment segments with private equity operation and risk capital, the economy will grow rapidly, providing more possibilities (Gompers, Lerner, 1998).

Total goal is to find when PE brings benefits for the mining industry and what benefits are reflecting in performance and management of mining companies. The goal is achieved by EVCA data, data presented for individual industries with the acting of PE investors. The more exact interpretation of results at various levels of activities is divided to four quarters, but during analysis deep analysis from the view of quarters had been not done due to the necessary information about a number of employees that were not provided from publicly available sources.

During the research, there was necessary to adapt the total GDP per inhabitant when the method of data adaptation had been used (Groh et al., 2008), mainly adaptation of:

- total GDP annual change,
- a measure of unemployment,
- emission of new shares,
- the capitalisation of share market of the country,
- value of the paid dividend of the share market,
- the market of acquisitions and mergers,
- a discount rate of the central bank,
- private capital and other financial institutions,
- the activity of private equity and risk capital,
- state expenses to education,
- a number of university students, etc.

Partial role during index construction also has education, working laws, index of bribes, corruption and crimes. From the view of business possibilities following indexes are favourable - general index of innovation, expenses on development and research, level of company restructuring, activity on share market and obstacles in the frame of new companies rising. Evaluation of total conditions of the economy is very important, since the level of conditions from the view of GDP, capital accumulation for investments, start-up companies and their financing has a considerable noticeable value of attractiveness (Romain 2004).

There are three methods for calculation of individual indicators in the frame of the total index. The first method is simple, consisting of a process to add the same weight to every partial indicator. The second method is orientated to the indicator analysis, and the third method is orientated to the various multiplication analyses of the indicators. Nicolletti et al. (2000) mention the division of used indicators to three levels of the index. Such an approach will enable better and easier interpretation of achieved results and provide easy identified evidence regarding the weaknesses and strengths of individual countries. According to this single division process of indexes, aggregation will be simpler due to the massive number of data. For example in the case of the indicator,

mentioning the human and social environment, the indicator has four partial indexes, but according to the used methods, the indicator will be presented by a single value in the main index.

Certain deflation was made at chosen data with the aim of heterogeneity of data providing due to the removing of the influence of the main index by improper direction. Due to the maintaining of differences between countries and observing proportional trend view to the development of individual countries we used deflator on GDP or number of inhabitants in the country. The reason for the mentioned was removing of vast difference, based on the size of individual countries.

Results of the presented analysis are illustrated by tables and by the application in the mining industry. Graph lines show the percentage change in performance trend observed in productions, and the dotted lines within the graph indicate on a four-year trend in these productions (World-Mining-Data, 2017 and Invest Europe, 2017). Given study is dealing in the frame of a chosen mining company that is in the stage of bankruptcy, or recession, and the goal is to show how PE investor could revive such company.

Data normalisation

The primary goal of data normalisation is to normalise data for further analysis and index construction, which can be done by various methods. Methods used by Freudenberg (2003), present standardisation and change of scales level. So-called z-score standardisation means conversion of normal distribution data, where mean value is given by zero or standard deviation 1.

$$z = \frac{x - \mu}{\sigma} \quad (1)$$

where:

- x - value of single factor,
- μ - mean value of evaluated factors,
- σ - standard deviation of evaluated factors.

Because some of the indicators were in values that had very different scales, we used methods of scales change and format of values due to the normalisation by a linear transformation. Further analysis showed if such methods can be used for all indicators since time difference included a massive decrease in share market in Europe, as well as in the whole world. Method of scales change and harmonisation is rather not effective in case of transactions, which are presented by extreme values. In our case, it is very frequent.

$$y = \frac{x - \min(x)}{\max(x) - \min(x)} \quad (2)$$

where:

- y – linear data normalization,
- x – value of single factor,
- $\min x$ – minimal value of given factor,
- $\max x$ – maximal value of given factor.

The z-score method is broadly used method during the analysis, orientated to the accumulation of data or indexes. We choose to use the method due to the chosen data, presenting useful data files, including significant „gap” among individual years of single crisis and since the z-score method is able to eliminate such shortages.

Results


Different accesses during evaluation of mining companies result from the complicated character of evaluation in commodity companies, which value is greatly influenced by high cyclicity of the mining industry. In the mining industry, there are two main cycles: the price of commodities and the economic cycle (Csikosova et al., 2016). A number of projects in the frame of the company and single companies operate during various cycles of their existence and in the frame of evaluation and management of the company they must take into consideration various risks. Most important risks are: financial risk, the risk to obtain permission for mining and its lengths, risk connected with geological tasks, risks regarding metallurgy, economic risks, and risks of individual countries, political risks, geographical and social risks (Blistan et al. 2012; Blistan et al. 2015; Cehlár et al 2011; Cehlár et al 2016).

Among the most important evaluation processes of mining companies (investments) are such processes that deal with the evaluation of incomes and cash-flow, market and costs. Given evaluation is distinguished according to the level of company development and according to what type of company is doing deposits

finding, if the company is dealing with preparation of deposit for single mining or if the company is making mining activity (Taušová et al., 2017).

A short analysis of the situation in the frame of Europe and mining industry presents an economic situation and PE acting in a given region during 2007-2011. Table 1 illustrates the economic situation from the view of production in the mining industry. There is a decrease in gross domestic product GDP in Europe and the annual production of the mining industry.

Tab. 1. Percentage change of production in the mining industry.

World mining production	
2017 16,9 billion metric tons	
2000 11,3 billion metric tons	
1985 9,7 billion metric tons	

Source: World-Mining-Data, Vienna 2017

Production of the mining industry did not correlate directly with production in the frame of European industries. The single analysis shows that mining industry showed with previous year GDP decrease in the frame of the whole European economy (Fig. 1).

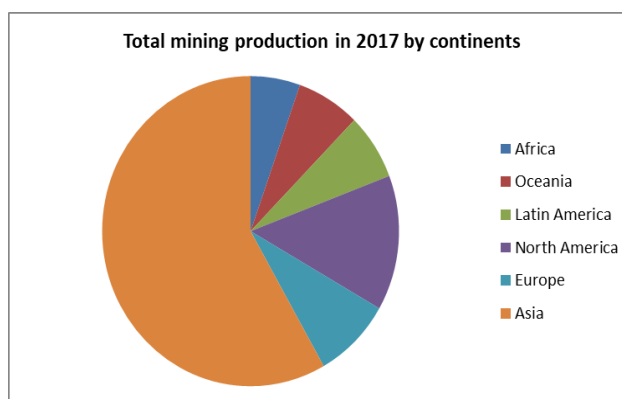


Fig. 1. Total mining production in 2017 by continents (World-Mining-Data, 2017).

Visual illustration of PE acting of investors in the frame of Europe and concretely in the mining industry in comparing with other sectors is illustrated in Figure 2. We can see that PE activity in companies is expressed by the volume of investments. PE activity of investments in the mining industry in Europe recorded a single decrease, or negative change of investments volume, which was similar in all industrial sectors. As mentioned, PE reacts more flexible and promptly to the changes in world markets, which means that also a change of investments volume in the frame of European industries is more rapid (Invest Europe, 2017).

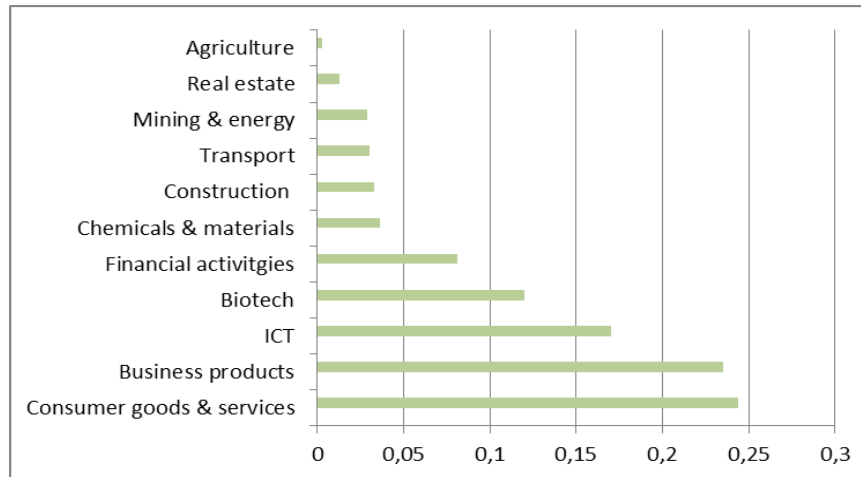


Fig. 2. The activity of Private equity investments in 2017 in the mining industry in comparing with other sectors (Invest Europe, 2017).

Absolute growth of the industry with PE participation of investor and industry without PE investor is illustrated in Table 2. As presented in the mentioned table, the average growth of total production in industries with PE investor participation is 36,6 %, and industries without PE mean 4,25 %. Results speak about very strong average growth of industries with PE participation.

Tab. 2. Comparing of industry growth.

Industrial sector	Average growth without PE	Average growth with PE
Agriculture	5.80 %	-0.94 %
Business and industrial products	8.29 %	61.22 %
Business and industrial products	2.11 %	44.79 %
Communications	-46.84 %	34.24 %
IT and electronics	17.31 %	17.91 %
Constructions	13.13 %	103.94 %
Retail	8.36 %	48.87 %
Consumers services	7.9 7%	107.34 %
Energetics, mining and living environment	3.45 %	23.90 %
Financial services	7.21 %	-7.30 %
High-tech	15.27 %	11.09 %
Chemical industry	11.31 %	1.67 %
Research and development	3.69 %	40.26 %
Real estate market	5.00 %	29.42 %
Transport	1.72 %	28.01 %
Average	4.25%	36.30 %

Source: own calculation according to data from EVCA (2017)

Our view and analysis are orientated to the evaluation of mining industry rate at the total GDP in Europe and analysis what is the rate of PE at investments and production of the given industry. Consequently, we analysed what is growth potential in the mining industry with PE investor participation comparing without PE investor. The rate of the mining industry in GDP in Europe has prevalingly stable or slightly growing trend during the analysed 9 years period recorded except 2009 when production of the mining industry was higher than the previous year. The single decrease in 2009 was more or less expected since industrial production across the whole European industrial market slowed down. Given the level of industrial production at GDP in Europe is moving averagely around 20 %. In the following Figure 4, we can see what the rate of the industry is during the

analysed period at total GDP in the European countries, where we can see the level of PE investments, directly orientated to the mining industry and what is the level of the investments achieved with a time of global crisis outbreak.

PE investment deals and amount deployed in 2017 was an encouraging year for investments by mining private equity firms with \$2.3bn invested across 60 deals. Both the number of deals and the amount invested were up on 2016 levels but down from 2015 peak activity of \$3.2bn across 119 deals. 2015 peak activity was driven by increased stakes, often to protect investment in distress situations. Over the last four years, investments by way of strategic stakes have nearly doubled, and this reflects the recovery in the sector generally as well as the second wave of fundraising by the mining private equity funds themselves (Tab. 3).

Tab. 3. Private equity investments in the mining industry.

	2015	2016	2017
PE volume	3,2 bn\$	1,75 bn\$	2,3 bn\$
number of deals	119	30	60

(own processing according to Keepin, 2018)

Mentioned Table 3 illustrates the level of PE investments to the mining industry in the frame of Europe, which more or less follows the changes in the amount of PE investments in the European market. Given development reflects that the mining industry is attractive from the view of PE investors and immediately after the first year of crisis there was the growth of investments to the mining industry.

Development of investments to the mining industry and mainly its rate at total GDP could be influence also to a certain level by a single rate of individual industries at total GDP. Interesting analysis proved the trend of the industry at total GDP and trend of PE investments as the rate of GDP. Following Figure 3 illustrates trends of the percentage rate of mining on GDP, which speaks about the level of mining industry development against GDP.

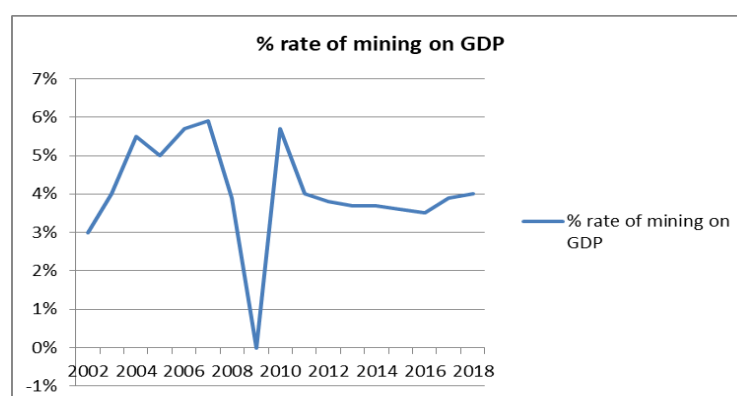


Fig. 3. The trend of mining industry development from the view of GDP (own processing according to www.pwc.com/mining).

As we can see, the activity of the mining industry is less expressive than the activity of PE investments in the mining industry. The single trend of PE investments to European industry recorded a growing trend, and the trend was in correlation with the mentioned trend in the Figure. PE investments have a growing trend in most years not only in comparing with the rate of industries at GDP but also in comparing with a single rate of mining industry at total GDP in Europe.

According to given findings, we can state that the mining industry has better performance during analysed 11 years in comparing with the whole development of the industry. Further, we can state according to the analysis that the mining industry with the influence of PE investors has higher performance than a single mining industry. The trend of growth of the mining industry is more expressive from the view of all evaluated factors. The last comparison of PE investors' contribution from the view of the mining industry is comparing of production and performance of the mining industry from the view of PE investors acting and without PE investors. Given comparing is illustrated in Table 4.

Tab. 4. The activity of the mining industry in Europe.

Year / Analysis	The rate of the mining industry on GDP	PE investment % GDP	PE investment in the mining industry (Mld. Eur)	PE investment to mining industry % GDP
2008	3,9 %	0,38 %	840 403	0,0081 %
2009	-,01 %	0,39 %	911 155	0,0084 %

2010	5,7 %	0,50 %	1 331 658	0,0118 %
2011	4,0 %	0,84 %	2 008 666	0,0168 %
2012	3,8 %	0,75 %	1 980 663	0,0157 %
2013	3,7 %	0,65 %	1 424 994	0,0112 %
2014	3,7 %	0,60 %	638 823	0,0053 %
2015	3,6 %	0,29 %	1 165 885	0,0093 %
2016	3,5 %	0,39 %	1 243 258	0,0095 %
2017	3,9 %	0,44 %	1 250 360	0,0098 %

Source: own calculation according to database EVCA (2017) and www.pwc.com/mining

Development, production and value added of the mining industry are significantly different in case of PE investors acting and in the case when PE investor is not part of single companies in the frame of the industry. Companies without PE investor during 11 analysed years achieved very stable, but stagnating development. In one year when companies, supported by PE investor achieved lower performance than in 2002, companies without PE achieved slightly higher performance in 2002. From the view of performance and growth of the company, there is obvious that company with PE investor would achieve higher performance and growth, which in the long term also enables the growth of the company and creation of new working posts. Since the growth of the company during more than 10 years is unchanging, the company could not provide sufficient possibilities for higher employment or increasing value added.

According to mentioned mining industry has investment potential from the view of PE investors, which is reflected in 10 years growth in companies, supported by PE investors, which was also reflected in the whole European mining industry. In comparing with companies without PE investor, the companies are stable but did not achieve any significant growth from the European view. Given analysis proved the mining industry has significant potential for attracting of PE investors.

Discussions and Conclusions

Among the most important approaches for evaluation of mining companies (investments) belong such approaches, dealing with evaluation of incomes and cash flow, market and costs. For example, well-known method Balance scorecard is described by Antošová et al. (2014), who states that the BSC is not meeting the management expectations to the required level it was implemented into practice, yielding limited contribution, or reduced functionality. Given evaluation should be distinguished according to the level of social development, if the company is in the frame of deposit finding, or if the company is already dealing with deposit preparation for mining, yet the company, making mining activity.

Mining companies are acting in the whole world, and single knowledge, obtained from individual continents can be used in case of any company. It is obvious that any mining company would be in a different stage and different history. Strong prices of commodities and trust in long term base of mining sector have to revise investments to mining and to develop new projects or to start up the production. Such increased investments are connected with risk company could slow down the trend and increase costs. Important risks, connected with lack of skills influence the production, late completion of projects and growing costs per working power. Single risks in mining sector developed from two main factors: low level of commodity prices, which led to higher risk in mining companies from short time view. The second factor is changes in capacities in the sense of skills and infrastructure that had a direct impact on short term liabilities of the company from the view of capital projections. Among most important risks belong lack of qualitative working power, access to necessary infrastructure, cost inflation, capital projection, currency and price volatility, management of accesses and capital, corruption and stolen property and political risk.

Due to the creation of the value of the mining company, there are important in the following areas:

1. Optimising of business strategy in the frame of growing and operative goals with a primary orientation to development of strategic possibilities, capital effectiveness, radical improving business, the creation of growing power, using of advisory services in the frame of Technologies, following of possibilities in the area of financing.
2. Cost savings, improving services through outsourcing with an orientation to sharing of individual mining services, using of outsourcing of employees.

3. Management of sustainability with an orientation to the following aspects: sustainable mining, security analysis, investments to the corporate social environment.
4. Effective using of available technologies, with a primary orientation to the following aspects: reconfigured software solutions, the integrity of usable applications, application of managerial services, IT, risk following and consequent value creation.
5. Optimising of tax and legal position, with an orientation to the following: using of tax advisory services, tax effective net, transfer evaluation, using of advisory, agreements optimising, optimising of managerial evidence.
6. Proper addressing of talent challenges, with a primary orientation to the development of talents and evaluation possibilities, the design of individual services, orientated to the employee's evaluation, various e-learning possibilities.

The basic model for micro index derived from attractiveness and extended by necessary factors that are necessary to regard in case of mining companies. The result presents a simple micro index and summary of individual risks, which mining company should avoid with the aim to increase attractiveness for PE investors and at the same time to increase the stability of the company. The process of the model is illustrated in Figure 4.

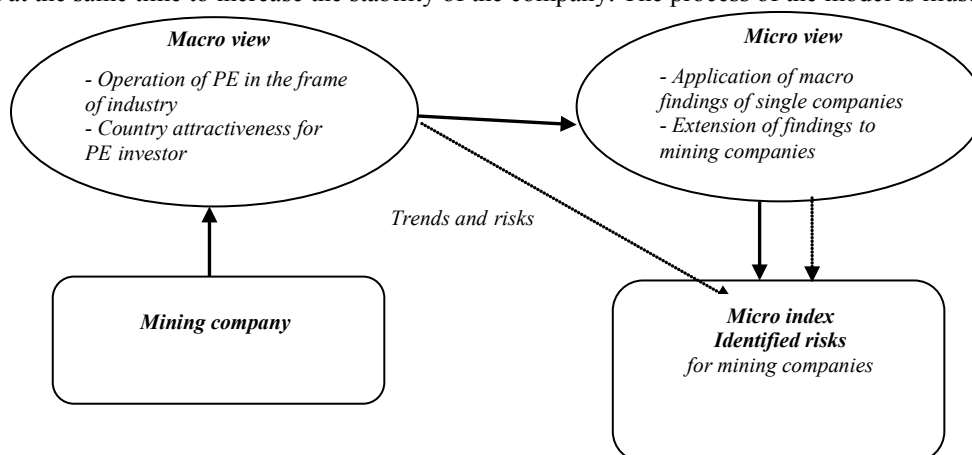


Fig. 4. The process of model creation.
Source: own processing

Increasing of the company value can be done through determination of mentioned areas. It was applied in a mining company that is bankruptcy proceedings and presenting materials for PE investors. After some discussions with PE investors, the company found out the situation is so negative that single decision to participate at PE investments must be compensated with a considerable measure of return of investment. As modern portfolio theory presents, growing risk demands also increasing measure of expected return. Such a problem can be overcome by transformation from a micro view to the mining company in the level of PE to a macro view of the mining company in the level of European PE investors. According to the obtained information, we made extrapolation of proper indexes and factors for individual companies in the mining industry. The obtained information is applicable to single mining companies. Moreover, the competitiveness of the mining company is determined by long term developments of national policies in the energy and mining industry (Madzik et al., 2016). Companies that have innovation activity have a chance to pass through a period of slow growth without substantial problems (Pawliczek et al., 2015).

The process of PE establishment to the mining company should be as follows: (Gadiesh and MacArthur, 2008)

- To define total potential: with the aim to have a higher value of equity. A strategic audit can help to determine a proper number of increasing cash flow to equity.
- To construct the plan: which will be the map for filling the potential – who, what, when, how.
- To speed up performance: running of an organisation must be adapted to the plan and key initiatives. It means the creation of a precise program – consisting of concrete tools, processes and merits for achievements of the highest possible performance.
- Engaging of talents: it means to create proper offers with the aim to obtain and motivate most talented people that they behave in the same way as investors and owners.

- Maximal use of the capital: it means to understand principles of the leveraged buyout – aggressive management of the working capital, discipline in the frame of capital expenses and emphasise to the balance.
- Orientation to the results: the goal is to impress PE discipline that would become part of the company culture and to create a repeatable model for results achievement.

Summary

The present time of economic crisis overcoming is influencing also mining industry when companies are fighting with high indebtedness due to the lack of own and cheap financial means, necessary of financing of mining activity. Mainly private equity presents one of the possible ways how to solve indebtedness in mining companies and to have easy access to low-cost financial sources. Such new sources of debt financing and cheap money support massive growth mainly in industrial sectors of individual countries, and it has a single impact especially to the mining industry since private equity supports mining industry by its presence, which could influence single mining companies by practical contributions.

Contribution provides results of evaluation in the area of PE investors in the frame of the mining industry with the aim to compare the performance of the mining industry with PE participation, attractiveness and total impact to the mining companies. The goal was to find out if PE means benefit for the mining industry and if so, what are benefits, reflecting in the performance of the company. Results of the analysis show that PE in the mining industry records better results than companies without PE participation.

Through analysis of the mining industry, we found out the mining industry achieved better performance than the whole European industry. PE acting in the industry had a positive impact on the mining companies. According to mentioned, we can state that PE participation in the frame of the mining industry from European view achieved interesting position and trend of performance, recorded in the mining industry with PE investors was significantly better than without PE participation.

Total results prove PE provides higher value added to invested companies, increases employment and there is a difference among industries with high or low PE participation in industries. Private equity investor has better management and mainly due to the mentioned we did not find higher vulnerability of the companies with PE investors against aggregated economic shocks.

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