FINANCIAL PERFORMANCE EVALUATION OF METALLURGY OF THE CZECH REPUBLIC

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Abstract

This paper is dedicated to financial performance evaluation of metallurgy industry of the Czech Republic. Financial performance of the industry or company is a random process, which can be decomposed into the particular indicators. It is very important to find and to quantify main factors which influence financial performance of an industry the most.

The aim of this paper is to evaluate financial performance of metallurgy industry in the Czech Republic in the period 2007 to 2016 according to the Economic value added indicator and to find main value drivers metallurgy industry in this period. For the analysis annual data in the period 2007 to 2016 will be used. The data for the analysis will be taken from the website of Ministry of industry of the Czech Republic.

Firstly, Economic value added of the metallurgy industry will be determined in the analyzed period. Then, the method of pyramidal decomposition will be applied to Economic value added indicator. Dynamic analysis of metallurgy industry of the Czech Republic will be performed and main value drivers of metallurgy industry will be determined. In the conclusion of the paper, the role of metallurgy industry of the Czech Republic in manufacturing industry will be evaluated.

Keywords: Metallurgy, manufacturing industry, financial performance, pyramidal decomposition

1. INTRODUCTION

Financial performance is one of the main key activities for each company. It is a random process, which can be decomposed into the particular indicators. Financial performance of an industry can be evaluated according to accounting indicators, economic or market indicators. In the past, financial performance has been analyzed by traditional indicators. These indicators are based on accounting information, see [1] or [2]. According to financial indicators it is not possible to show a proper picture on financial performance of an industry or company [3]. Based on other researcher, as [4] or [5] traditional measures of financial performance of industry or company based on accounting principles of determining income may be unsuitable in the new economic world where competitive advantage is driven by intellectual capital. That´s why nowadays modern indicators are more used. Modern methods used for financial performing of an industry or a company were presented e.g. [1], [5].

The aim of this paper is to evaluate financial performance of metallurgy industry in the Czech Republic in the period 2007 to 2016 according to the Economic value added indicator and to find main value drivers metallurgy industry in this period.

2. METHODOLOGY

In this chapter there are described methods used for financial performance of metallurgy industry in the Czech Republic in the analyzed period. For financial performance of metallurgy industry will be used pyramidal decomposition of economic value added and analysis of deviation, in this paper.

2.1. Economic value added

Traditional financial performance measures, such as NOPAT, ROI or ROE have been criticized due to their inability to incorporate full cost of capital and therefore accounting revenue is not a consistent predictor of firm or industry value and cannot be used to measure financial performance of industry or company, [3]. One such innovation in the field of internal and external performance measurement is Economic value added. This indicator is based on the concept of the economic profit. When the economic profit is positive, it means that company earns more than the weighted average costs of capital, which also means that some wealth for the shareholders is created.

There are many ways how Economic value added can be expressed. Financial performance of metallurgy industry will be analyzed according to EVA - equity in this paper. EVA - equity is expressed as

$$EVA = (ROE - R_e) \cdot E, \tag{1}$$

where *ROE* is return on equity, *E* is equity, R_e are costs of equity. By using building model of Ministry of industry and trade of the Czech republic it is possible to express costs of equity as

$$R_e = R_F + RP_1 + RP_2 + RP_3 + RP_4 \tag{2}$$

where R_F is risk free rate, RP_1, RP_2, RP_3 and RP_4 are risk premiums which are determined according to methodology of Ministry of industry and trade of the Czech Republic, mpo.cz.

2.2. Pyramidal decomposition and analysis of deviation

The pyramidal decomposition together with the analysis of deviation helps to identify the relationships between the financial ratios and quantify the impact of selected ratios on the base ratio, [6]. It is useful to apply the analysis of deviations for in-depth analysis of the impact of component financial ratios on the base financial ratio. It is possible distinguish two operations according to this analysis - additive relationship and multiplicative relationship, [6]. For the quantification of the impact under the additive relationship, see [7]. According the way in which the multiplicative relationship is handled, five basic methods can be distinguished, [7]. In this paper, integral method will be used for the deeper analysis of financial performance of metallurgy industry. Resulted influence quantification according integral method for any component ratio is expressed as

$$\Delta x_{a_i} = \frac{R_{a_i}}{R_{x'}} \cdot \Delta y_x, \tag{3}$$

where $R_{a_i} = \frac{\Delta a_i}{a_{i,0}}$ and $R_{x'} = \sum_{i=1}^{N} R_{a_i}$, R_x *d*

iscrete return of base ratio, R_{a_i} are discrete return of component ratio.

There is in **Figure 1** proposed pyramidal decomposition of economic value added of metallurgy industry. Economic value added is decomposed to these financial ratios where *E* is equity, *ROE* is return on equity, *EAT* is earnings after taxes, *EBT* is earnings before taxes, *EBIT* is earnings before interests and taxes, *A* is assets, *RC* is registered capital, *OL* is other liabilities, *R* is revenues, *T* is tax income, R_F is risk free rate and RP_1, RP_2, RP_3 and RP_4 are risk premiums.

From the **Figure 1** it is clear, that economic value added is mainly influenced by the equity and spread, while spread is the main influencing factor. The impact of profitability, debt and determination of costs of equity are figured in other levels of decomposition.

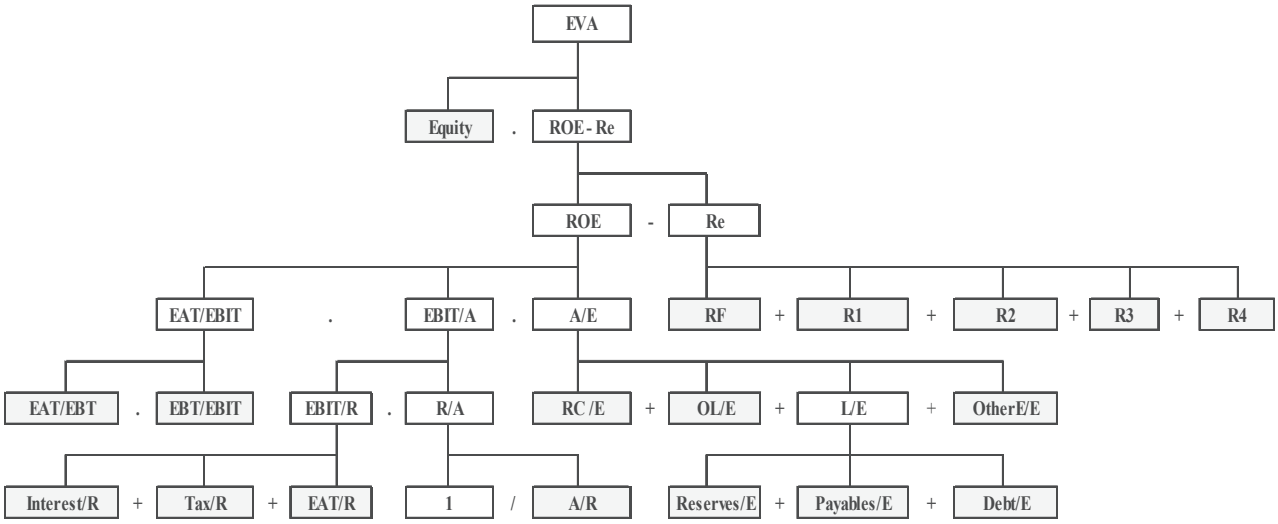

Figure 1 Pyramidal decomposition of economic value added of metallurgy industry

3. ANALYSIS OF FINANCIAL PERFORMANCE OF METALLURGY INDUSTRY AND THE ROLE OF METALLURGY IN MANUFACTURING INDUSTRY SECTOR

The manufacturing industry (C) of the Czech Republic is an important segment of the economy, which is a significant carrier for the development of technologies, expertise and job opportunities. It has a long tradition in the Czech Republic. Its development has demonstrated the ability to maintain its position in the competitive environment, especially due to the entry of foreign capital, [8]. Manufacturing industry contains 24 segments. The absolutely dominant segment of the manufacturing industry of the Czech Republic is the automotive industry (29), which also acts as a multiplication factor for the development of other related sectors. Financial performance of automotive industry is analyzed in [8].

According CZ-NACE classification metallurgy industry (24) is part of manufacturing industry (C). Metallurgy industry was chosen for the financial performance analysis. In the **Table 1** there are amount of total revenues of whole manufacturing industry, metallurgy industry and automotive industry in the period 2007 to 2016.

Table 1 Total revenues of manufacturing industry, metallurgy industry and automotive industry (mld. CZK)

Total Revenues	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
C	2.302	2.260	1.880	2.180	2.478	2.575	2.567	2.930	3.020	3.024
29	637	572	512	610	736	769	762	919	1.005	1.106
24	201	215	120	156	177	163	155	173	161	149

Metallurgy industry is broken into the following groups according to a Ministry of industry of the Czech Republic: (1) manufacture of iron, steel and ferro - alloys and sheet products, hot shaping of products, (2) manufacture of alloys and steel pipes and tubes, (3) manufacture of other products of fist processing of iron and steel, (4) manufacture and first processing of non-ferrous metals and (5) casting of metals.

Czech metallurgical production is a highly material and energy intensive division. Czech metal processing is undergoing structural development, which began with the outbreak of the global crisis. Since 2013 there has been a turn towards growth and although steel production is unlikely to return to pre-crisis levels, production and consumption are growing and should continue to do so.

3.1. Economic value added of metallurgy industry

Financial performance of metallurgy industry is analyzed in the period 2007 to 2016. For the analysis annual data are used. Annual data of metallurgy industry were taken from the website of Ministry of industry of the Czech Republic. Financial performance of metallurgy industry is analyzed according to EVA - equity formula (1).

Metallurgy industry of the Czech Republic is one of the main parts of the manufacturing industry in the Czech Republic. In the **Figure 2** there is illustrating the evolution of economic value added of metallurgy industry compared to the economic value added of the manufacturing industry. From the **Figure 2** it is clear that almost in all analyzed years economic value added of metallurgy industry is negative, only in 2007 and 2008 the value of economic value added of metallurgy industry is positive. Trend of economic value added of metallurgy industry is decreasing and the biggest fall is between years 2008 to 2009.

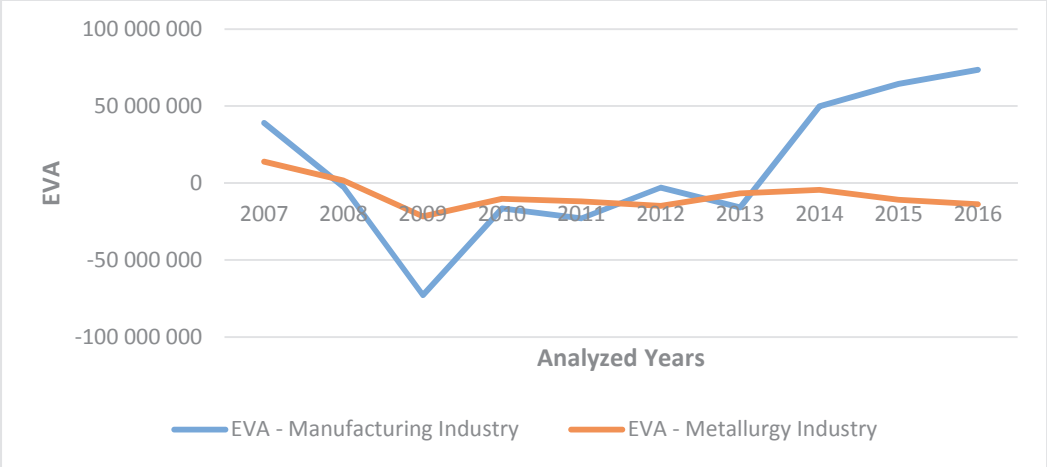

Figure 2 Economic value added of metallurgy industry and manufacturing industry (thousand CZK)

3.2. Pyramidal decomposition of economic value added of metallurgy industry

Method of pyramidal decomposition was applied for deeper analysis of the factors affecting economic value added of metallurgy industry evolution. Integral method was used for influence quantification according to formula (3).

In **Table 2** it is shown total change of economic value added of metallurgy indistry in 2007 - 2016. Economic value added of metalurgy industry decreased by 27.715.834 thousand CZK during the analyzed period. This decreaisng was caused mainly by the spread. Spread is difference beetwen ROE and R_e. If the spread is negative it means that costs of equity are higher than return on equity. For a deeper analysis of all years of the analyzed period should be done.

Table 2 Change of economic value added of metallurgy industry in 2007- 2016 (thousand CZK)

Ratio	Influence
EVA	**-27.715.834**
Equity	3.980.712
Spread (ROE - Re)	-31.696.546

After applying method of pyramidal decomposition to economic value added positive and negative effects of component ratios are found.

In the **Figure 3** there is possible see the main influencing factors of the economic value added of metallurgy industry in analyzed period. Share of payables to equity ratio has the largest positive effect (7.227.213 thousand CZK) to economic value added. Risk free rate is the second indicator which has the largest positive effect (5.200.792 thousand CZK) to economic value added. Share of earning after taxes to revenues ratio (-14.405.881 thousand CZK), share of earning before taxes to EBIT ratio (-4.476.222 thousand CZK) and risk premium of financial structure (-12.859.209 thousand CZK) belongs to ratios with the largest negative effect. Economic value added of metallurgy industry is decreasing because of these ratios.

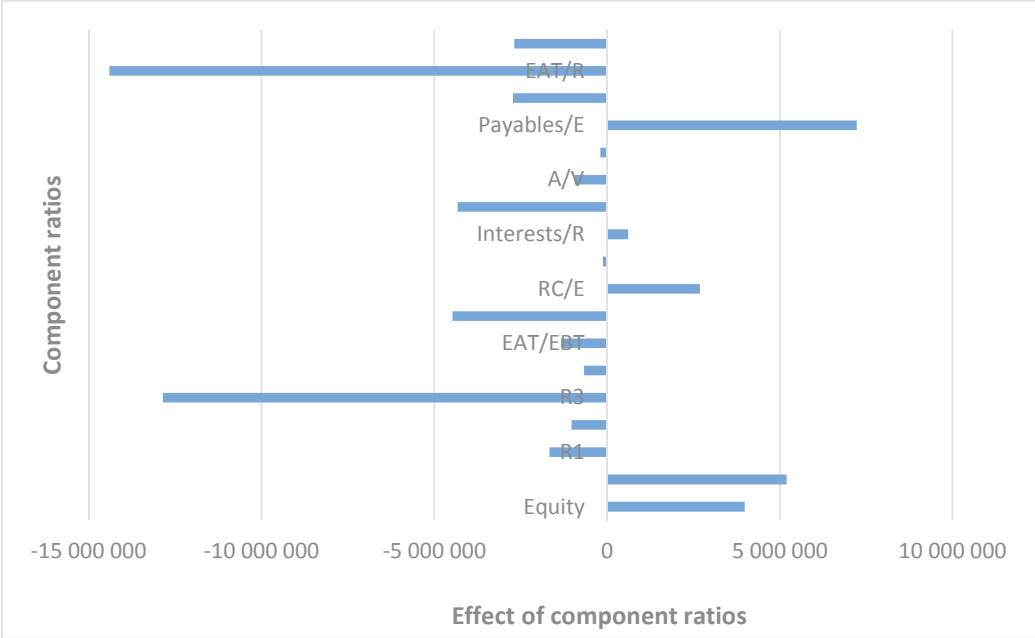

Figure 3 Component ratios of Economic value added 2007 - 2016 (thousand CZK)

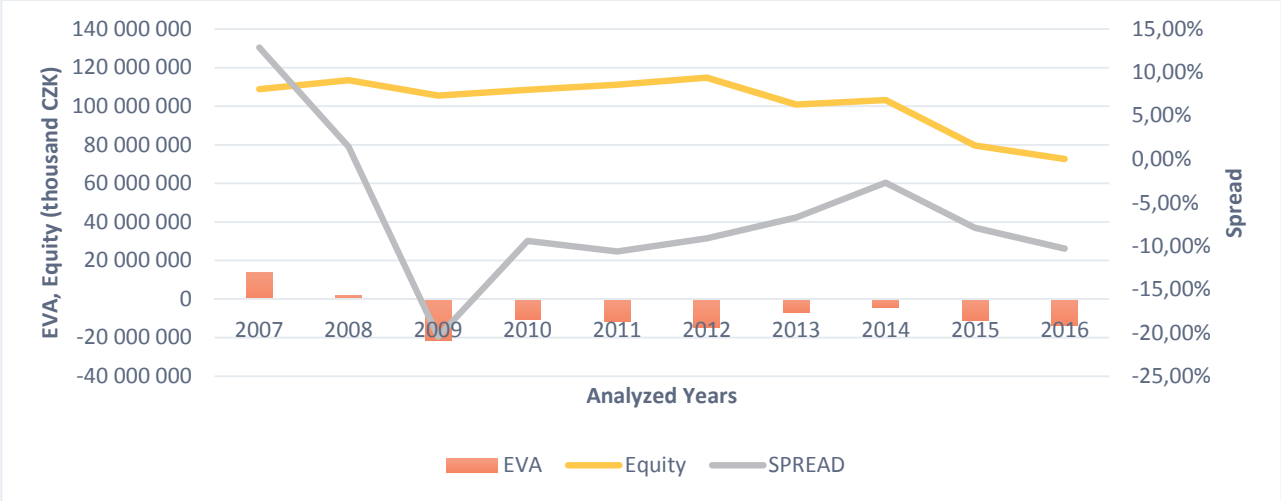

Figure 4 Evolution of EVA, Equity and Spread of metallurgy industry 2007 - 2016

In the **Figure 4** it is shown the evolution of economic value added of metallurgy industry in period 2007 to 2016 and also the evolution of equity and spread as the main influencing factor of economic value added. The largest fall of economic value added was between the years 2008 and 2009. This was caused mainly because of negative profit in 2009. Only in 2007 and 2008 spread was positive. In the period 2009 - 2016 spread was

negative. This was because of the low value of ROE. It means that firms in metallurgy generated low EAT and they were not able to evaluate their equity. Costs of equity were higher than profitability of equity in these years.

3.3. Discussion

Financial performance of industry or company can be analyzed according to accounting, economic and market measures. Czech steel industry has been evaluated according to return on equity ratio, see [9]. Return on equity ratio is one of the accounting measures of the financial performance of an industry or company. According to this ratio it is possible to analyze only profitability of equity. Other disadvantage of accounting measures of financial performance of an industry or company is that these indicators are based on accounting data and does not reflect costs of capital. That´s why in this paper financial performance of metallurgy industry is analyzed according to economic value added. Economic value added indicator is one of the economic measures. According to this indicator it is possible analyze whole financial performance of an industry. Economic value indicator respect costs of capital and also owners requirements. Economic value added indicator can be decomposed in different ways, one of the way of decomposition can be found on the website of Ministry of industry of the Czech Republic. In this paper it is applied detailed pyramidal decomposition of EVA which reflect costs part, debt part and use of assets of industries or companies. Based on the results this analysis is detailed and unique.

4. CONCLUSION

This paper was dedicated to financial performance of metallurgy industry in period 2007 to 2016. Financial performance of metallurgy was analyzed according to economic value added indicator. Method of pyramidal decomposition was applied to this indicator and main influencing factors were found.

Metallurgy industry is part of the manufacturing industry of the Czech Republic. The evolution of economic value added of metallurgy industry was compared to evolution of economic value added of manufacturing industry.

Economic value added of metallurgy industry decreased in analyzed period. Economic value added was positive only in year 2007 and 2008. The largest fall of economic value added was between the years 2008 and 2009, because in 2009 profit of metallurgy industry was negative. From 2009 to 2016 the spread was negative, it means that firms in metallurgy generated low EAT and they were not able to evaluate their equity.

Between 2007 and 2016 the main influencing factors of the economic value added of metallurgy industry were share of payables to equity ratio, risk free rate, share of earning after taxes to revenues ratio, share of earning before taxes to EBIT ratio and risk premium 3. Share of payables to equity ratio and risk free rate had the largest positive effect, meanwhile share of earning after taxes to revenues ratio, share of earning before taxes to EBIT ratio and risk premium 3 have the largest negative effect, specially share of earning after taxes to revenues ratio. This also leads to decreasing of economic value added of metallurgy industry.

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