SPECIFIC RISK IN HARD COAL MINING INDUSTRY IN POLAND

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ABSTRACT
Specific risk is hard to parameterize as it is influenced by a number of immeasurable factors or hard to measure ones. There is no universal model allowing the translation of specific risk into an appropriate ratio that could be used in different decisive situations. The objective of the undertaken research is to build the model of specific risk parameterization for the company deriving from the selected industry. The results obtained present the intensification of specific risk in the particular enterprises of the examined industry. Because of them it is possible to analyze the issue of financing the operating and investment activity of enterprises, what may be used in investment effectiveness determination, company value pricing, designing optimal structure of financing sources, restructuring processes and so on. The article is of theoretical and cognitive as well as of a "case – study" character. The study was based on the systematic review and synthesis of subject literature comprising the research problem. The analysis was supplemented by the indicator method to illustrate the discussed issue and to draw conclusions.

KEY WORDS
hard coal mining, specific risk.

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Introduction

Specific risk relates to a company and area of industry where it operates. Industry risk, also called sector risk, refers to a situation in the industry where the company operates. This situation is influenced by the industry life cycle, resources availability, degree of industry concentration, degree of dependence on suppliers and recipients etc. The measurement of this risk is not common in literature or practice. In general, available rankings are adopted or perceived as an average risk of enterprises operating within an industry. Particular organizations deal with research on industry risk, e.g. Institute for Market Economics (IBnGR) which publishes *Investment risk map in the industries of Polish economy* half yearly (Instytut Badań nad Gospodarką Rynkową 2016). It estimates the risk of material investments undertaken in light and heavy industry sectors according to Polish Classification of Activities (PKD). The classification of industries along with the risk map is also published by Export Credit Insurance Corporation Joint Stock Company (KUKE SA) (KUKE 2016). Inter-

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nationally, industrial risk rankings are analyzed by, among others, A. Damodaran, a professor at the Stern School of Business at New York University (Damodaran 2015), and Ibbotson Associates, currently renamed to Morningstar Inc., which publishes Yearbook Indexes (Morningstar 2011). Nevertheless, it is difficult to include the specific risk emerging from the inside of the company. The need to include this risk is visible in subject literature but there are no model solutions explaining how to achieve this. In general, when determining risk, industry risk is the point where analysis stops, using available rankings or risk is indicated in an arbitral way or ‚else, based on experts' opinion.

Additional risk premium for specific risk is added to the *weighted average cost of capital* – WACC, most often when determining the discount rate for investment projects or other undertakings characterized by high uncommonness (Michalak 2014). WACC adjusted with an additional risk premium is called RADR (*Risk Adjusted Discount Rate*) method (Michalak 2013). This method comprises an increased or decreased discount rate, associated with the cost of capital, depending on higher or lower risk as perceived by company managers (Włoszczowski 2005: 37). The undertakings of average risk are discounted using the weighted average cost of capital, if risk is higher or lower than the average one, the accordingly adjusted discount rate is used – higher or lower than WACC. Unfortunately, subject literature does not mention a precise method to determine the desired level of WACC. The adjustments are subjective and arbitral (Rakow 2010; Ogier et al. 2004). This problem may be solved by a proper categorization of specific risk and adoption of ratios measuring the listed categories. In the paper it is assumed that specific risk is divided into two basic categories: operational and financial risk. Their measurement allows calculating specific risk providing properly selected ratios are applied.

When making an attempt to parameterize the specific risk coming from the inside of the company, risk division should be segmented into operational risk and financial risk.

1. Methodology of determining operational risk

Operational risk is connected with the basic business activity and it is depicted in different ways. This risk is most often perceived as a probability of bearing operating loss or failure to achieve the expected level of operating profit as a result of improper or unreliable internal processes, people and system or resulting from external phenomena (Gospodarowicz 2009). Risk connected with an uncertainty concerning the shape of future operating cash flow in the company is also described in a similar way (Duliniec 2001: 50). It is defined as a threat of failing to achieve the objectives, connected with the business activity in a short-term (Staniec 2006: 80). The sources of operational risk are very varied and include the external phenomena accompanying the basic operating activity of the company (financial, technological conditions, natural hazards etc.). Furthermore, this risk is generated by internal factors such as insufficient or defective systems and procedures as well as wrong code of conduct, human errors and technological failures. Operational risk is strictly connected with the specificity of the company, industry and close environment where it functions. It depends on the complexity of the company as an organization, systems adopted, production process, products or services (Thlon 2012).

In particular, operating risk depends on the relationships between operating costs and sales revenues, with the inclusion of fixed and variable costs. The share of fixed costs in total operating costs determines the power of reaction of operating income (EBIT) to the change in sales revenues. Such a relationship is the grounds for the mechanisms of operating leverage that is considered a basic measure of operational risk in a company (Jaruga et al. 2000). The higher the share of fixed costs in the structure of operating costs, the higher the degree of operating leverage and at the same time the more sensitive operating income to the change in sales revenues (if fixed costs are high, even small price or sales volume change may significantly affect the level of operating income). In this situation operating risk is high. The *degree of operating leverage* (DOL) may be calculated as a function of operating income changes (EBIT) and sales revenues changes or using the information about the value of variable costs, in the following way (Wirth et al. 2000):

$$DOL = \frac{S - Kz}{EBIT}$$

where:
$EBIT$ – earnings before interest and taxes, S – sales revenues, Kz – degree of variable operating costs.

2. Methodology of determining financial risk

Financial risk is connected with the mode of financing company activity, furthermore, the basic factor determining its level is capital structure (Jonek-Kowalska, Turek 2011; Michalak 2011). Financial risk is connected with the degree of financial leverage. Financial leverage is the primary ratio reflecting the capital structure in the company (Stretcher, Johnson 2011). Its level expresses the relation of debt capital to equity, which may be written as:

$$financial\ leverage\ ratio = \mathrm{D/E}$$

where:
D – debt, E – equity.

If the financial leverage ratio in the company is higher than 0 (only when the company is financed by external capital) the effect of so-called *financial leverage* occurs measured using DFL ratio – *degree of financial leverage* (Blume et al. 1980). Due to financial costs burden, deriving from interest on debt, income per share may fluctuate more than proportionally in comparison with the fluctuations of operating income. The higher the financial costs, the stronger impact of financial leverage. The effects of financial leverage may be positive when they translate into income per share growth, or negative when they contribute to the income fall. The power of impact depends on the share of fixed financial costs in total costs of the company. The degree of financial leverage indicates the percentage of net income per share change as a result of one percent change (up or down) in operating income. It is expressed by comparing a relative change of net income per share with a relative change of operating income. It is calculated using the following formula:

$$DFL = \frac{EBIT}{EBIT - I}$$

where:
$EBIT$ – earnings before interest and taxes, I – interest on debt capital (financial costs).

The degree of financial leverage is determined for a particular amount of operating income (EBIT). If EBIT is close to debt service cost – net income is close to zero and DFL ratio is high. Along with the increase of EBIT the level of DFL decreases (the share of fixed debt service costs falls in relation to operating income), which confirms the financial risk fall. The higher the share of

debt in capital structure of the company and the higher the debt service cost, the stronger the effects of financial leverage and the higher DFL value. If the company is financed by equity only (I=0), there is no financial leverage and DFL=1. The effects of financial leverage are different for different variants of capital structure in the company, however, the effects (positive or negative) are stronger when the share of debt capital in the financing structure is higher and so are the debt service costs.

In practice, based on DFL, when expressing the relation of operating income and debt service cost, rating estimates are assigned to company's debt and the appropriate financial risk premium is determined, resulting from debt.

3. Results and discussion

Polish mining industry is highly concentrated, only a few mining enterprises of high production potential are currently functioning. At the same time, Poland is the largest producer of hard coal in the European Union and it takes 11th place in the global rankings (Michalak 2015). The four largest mining enterprises take the leading positions in the world in terms of production volume. These are: Kompania Węglowa SA, Katowicki Holding Węglowy SA, Jastrzębska Spółka Węglowa SA and LW Bogdanka SA. At the same time, these enterprises give shape to the whole Polish hard coal mining industry as, apart from them, there is only one more mine of TAURON SA group and three private enterprises functioning with a low yearly production.

In the procedure of specific risk parameterization of mining enterprises the cluster analysis was adopted (Kozłowski et al. 2008; Butra 2004). Its basis is the selection of research sample amongst the global mining enterprises. The basic selection criterion for the cluster is being part of hard coal mining industry and reaching the production level correspondent with Polish mining enterprises or higher. Consequently, cluster analysis involved the largest hard coal producers in the world (Michalak, Nawrocki 2015). These were such enterprises as: Alpha Natural Resources (USA), Arch Coal (USA), CONSOL Energy (USA), Peabody Energy Corp. (USA), Rio Tinto (Great Britain), Walter Energy (USA), Westmoreland Coal (USA), Inner Mongolia Yitai Coal (China), Yanzhou Coal Mining (China), China Coal (China), Shenhua (China), BHP Billiton (Australia), Coal of Africa (Australia), Coalspur Mines (Australia), New Hope Corporation (Australia), Whitehaven Coal Ltd (Australia), Anglo American Coal (Great Britain), Glencore Xstrata (Switzerland), Coal India (India).

Based on the features characterizing the activity of enterprises placed in a given cluster, the averaged norms of diagnostic indicators determining specific risk were indicated for the whole industry in the period of 2009-2013. The procedure starts with an analysis of the main components of specific risk based on the data obtained from the pre-selected enterprises. Average values of the features are compared with the values reached by Polish mining enterprises. When necessary, particular features are reduced to be made comparable, with external factors specific for the enterprises representing different global markets.

In table 1 the diagnostic indicators of specific risk are encompassed, providing their median in the same time span for the global hard coal mining industry. Median was used in research as the distribution of the examined diagnostic features is usually asymmetric, which excludes the use of arithmetic mean.

Table 1. Assessment criteria of specific risk along with a reference point in a form of median of particular ratios in global mining industry in the period 2009-2013

No.	Assessment criterion/diagnostic feature	Median in global hard coal mining
1	DOL	1.55
2	D/E	0.70
3	DFL	1.05

Source: Michalak 2015: 201.

In the next step the creation of three specific risk classes is proposed, depending on the level of particular diagnostic ratios:
– class 0 – low specific risk,
– class 1 – average specific risk,
– class 2 – high specific risk.

Each of the adopted diagnostic features is assessed by assigning the value of 0, 1 or 2, with the assumption that the score of 0 is ascribed to the ratios when their value is more favorable than the industry average of the given diagnostic feature, the score of 1 – for the levels amounting to the industry average with +/- 10%, the score of 2 – unsatisfactory level, that is worse than the industry average. The average sum of scores for all diagnostic features is transferred into *specific risk premium* (SRP). The lower the score, the lower specific risk and in consequence, the lower specific risk premium, and therefore, the lower cost of equity.

The first diagnostic feature seen as operating leverage indicator shows the level of operational risk, the higher leverage, the higher risk. An average industrial level of operating leverage in the examined period equaled to 1.55. The companies where the level of operating leverage is lower than 1.4 (average minus 10%) but higher than 0, are placed in zero risk class. The companies with operating leverage higher than 1.71 (average plus 10%) and negative one are the businesses burdened with high operational risk (second risk class). If the operating leverage takes the value in the range of [1,4; 1,71], the company is in the first risk class. Other diagnostic features are financial leverage and financial leverage effect describing the level of financial risk. On average, in the examined benchmark group of hard coal mining industry, financial leverage amounts to 0.7 and financial leverage effect to 1.05. The increase of these indicators results in risk increase. The companies characterized by D/E ratio higher than 0.63 and DFL lower than 0.95 are placed in zero risk class according to these features. If these ratios take the values: D/E from 0.63 to 0.77, and DFL from 0.95 to 1.16, we will see the first risk class. Consequently, when the values are above these levels we deal with second risk class.

According to the instructions above, an attempt was made to parameterize the assessment criteria of specific risk for four Polish mining enterprises: Kompania Węglowa SA, Katowicki Holding Węglowy SA, Jastrzębska Spółka Węglowa SA and LW Bogdanka SA (Table 2).

Table 2. Scoring assessment of diagnostic ratios of specific risk in Polish mining enterprises

Enterprise	Ratio	2009	2010	2011	2012	2013	Average
Kompania Węglowa SA	DOL	-	2	2	2	2	2
	D/E	1	0	0	0	2	0.6
	DFL	2	2	1	2	0	1.4
	Average score	1.5	1.3	1.0	1.3	1.3	1.28

Katowicki Holding Węglowy SA	DOL	-	2	2	2	2	2
	D/E	0	0	0	2	2	0.8
	DFL	2	2	2	2	2	2
	Average score	1.0	1.3	1.3	2.0	2.0	1.52
Jastrzębska Spółka Węglowa SA	DOL	-	2	0	2	2	1.5
	D/E	0	0	0	0	0	0
	DFL	0	1	1	1	2	1
	Average score	0.0	1.0	0.3	1.0	1.3	0.72
LW Bogdanka SA	DOL	-	2	2	0	2	1.5
	D/E	0	0	0	0	0	0
	DFL	1	1	1	1	1	1
	Average score	0.5	1.0	1.0	0.3	1.0	0.76

Source: own elaboration.

The level of operating leverage in Kompania Węglowa SA is higher than the industry average each year, that is 1.55. Therefore, in terms of this feature, Kompania Węglowa SA is placed in the operating risk class 2. The assessment of this enterprise is more varied in relation to financial risk. An average score of Kompania Węglowa SA indicates high specific risk, higher than average specific risk in other enterprises from the industry. In a scale from 0 to 2, risk is assessed at 1.28 (industry average is at the level of 1). The situation of Katowicki Holding Węglowy SA is also disadvantageous. This enterprise is characterized by high operating risk (class 2 in each analyzed year). In terms of financial risk assessment class 2 is dominant too. This causes that specific risk in a scale from 0 to 2 amounts to 1.52 in average, that is 52% higher than the average mining enterprise performing in this industry. Specific risk in Jastrzębska Spółka Węglowa SA is by 28% lower than the average risk characterizing the examined mining enterprises. It equals 0.72 on average in the examined period. LW Bogdanka SA is positively assessed concerning most of the diagnostic features. The most risky area of this enterprise, similarly as in all the other mining enterprises, is specific risk, as a result of the specificity of mining production, where fixed costs dominate. Average risk in LW Bogdanka SA amounts to 0.76 in the examined period, that means it is by 24% lower than the average specific risk of an enterprise functioning in this industry.

Conclusions

Specific risk is an important indicator of the cost of capital. The basic measures of specific risk include: degree of operating leverage, degree of financial leverage and financial leverage ratio. However, it should be emphasized that the group of ratios measuring this risk may be freely extended. Each industry or even each company, due to its individual character, has a specific configuration of economic-financial, technical, efficiency ratios and others that shape specific risk. However, in literature there is no universal model that could be used in for complex measurement of specific risk. The specific risk parameters, obtained as a result of scoring the conducted assessment, may be used for WACC adjustment as it only includes systematic (market) risk. Future research concerning this issue should be focused on recognizing new criteria of specific risk assessment and on extending the parameterization model of this risk with new specific factors for the particular industry. Next, such model may be adopted to the conditions appearing in other industries.

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