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## Where the EBITDA metric is used in coal companies

### Introduction

Ensuring long-term growth in company value and ongoing provision of liquidity are two basic goals of any company that wants to survive in the market and foster its own development. Implementing these goals, which should be known not just to company management tasked with their implementation, but most importantly to all company employees, must balance the goals of all stakeholders in accordance with company strategy. The implementation of aptly defined goals guarantees the company's success in a competitive market. Gearing all decisions towards the achievement of predefined goals and the achievement of the intended results is the responsibility of a rational manager. The profit the company subsequently generates constitutes a reflection of these goals. Profit is not only an attestation of the economic efficiency of the functioning of the business entity but also a kind of insurance against risk. The company's profit covers the cost of replacing machines, decline in their value and the cost of market risk. Drucker (2005) argues that from that point of view, profit

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does not, in fact, exist. Instead, there is a “cost of being in business” and a “cost of staying in business”. The role of profit is to cover the cost of staying in business. Managers must ensure a level of profit that will enable expansion, provide shareholders with an acceptable dividend, and increase shareholder value. Consequently, the ability to make long-term profits bears witness to financial stability and shows to what extent a company is achieving its goals.

The profit a company generates is disclosed in its financial statements. Their main purpose is to provide external stakeholders with information which can be used to make decisions. This information should be understandable, useful and comparable, with the comparability and reliability of this reflection of reality being recognized as the main features of financial statements (Kaczmarczyk 2016; Kozłowska 2018). Information which lacks these qualitative characteristics has only limited value (Garstecki 2014). Financial statements present the results of the sale of products and services, results of operating activities, net income before tax and net income after tax. In order to compare the results between companies, use is mostly made of EBIT (Earnings Before Interest, Taxes) or EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization).

The paper aims to present areas where EBITDA is used for the purpose of managing coal mining companies. Two research hypotheses were adopted for the purpose of the study:

- ◆  $H_1$  – instability of profit in coal companies is mainly occasioned by changes in coal prices caused by fluctuations in the economic situation.
- ◆  $H_2$  – Polish coal companies listed on the main floor of the Warsaw Stock Exchange are in a better financial condition than their listed counterparts from around the world.

The hypotheses are verified based on data from companies’ financial statements.

## 1. Theoretical considerations of a company’s use of EBITDA

In the most summary form, operating profit reflects the level of effects obtained, while overlooking the strategy underlying the selection of financing sources. The level of operating profit depends mainly on the specificity of the industry, company’s life cycle, the level of risk involved in its activity, etc. Thus, for instance, highly capital-intensive industries are disproportionately more encumbered with resource depletion costs. Hence, the quest for a profit category that will reflect the profit/loss related to operating activities to the full and allow the assessment of a company’s management’s ability to generate profit from the capital employed in pursuit of company activities.

Various profit categories based on operating profit can be used to measure the operating efficiency of enterprises. The most commonly used ones include:

- ◆ operating profit (EBIT),
- ◆ operating profit + depreciation and amortization (EBITDA),
- ◆ operating profit + charge related to the depletion of resources charged to costs + + amortization and depreciation (EBIT(D)DA),

- ◆ operating profit + depreciation and amortization + rent costs (EBITDAR),
- ◆ operating profit + charge related to resource depletion + depreciation and amortization + rent costs and other fees related to the use of external assets (EBIT(D)DAR).

In practice, the levels of EBITDA, EBITDAR and similar economic categories are determined in a variety of ways. More often than not, operating profit disclosed in the income statement is adjusted for the effects of one-off, discontinued activities recorded as other operating income and expenses. These result from the sale of property, plant and equipment and intangible assets, results of asset valuations, donations given and received, penalties received and paid, damages, inculpable shortfalls of fixed and current assets and results of other similar operations. In some cases, operating profit is additionally reduced to account for adjustments for receivables and provisions for operational risk. Consequently, after adjustments are made, elements of profit/loss remain, which reveal the result of deliberate and intentional actions of the management board. Differences in the ways in which companies of a capital group calculate their EBITDA distort the comparability of this category within a capital group. Group companies can often have diversified operations, hence the ways to adjust operating profit/loss can differ. For example, in the coal mining industry, the level of provisions for mine closure fixed at 8% of depreciation recorded under other operating costs is not included in adjustments to the profit/loss, as it is calculated each year and does not constitute a one-off operation (Królikowska and Sierpińska-Sawicz 2016).

EBITDA calculated in order to determine the cost of debt financing reducing the income tax base is established differently. Under tax regulations, EBITDA is the difference between the sum of revenues from all sources (excluding interest income) and the sum of tax deductible costs minus depreciation write-offs and debt financing costs not included in the initial value of a fixed or intangible asset. The costs of debt financing will include interest, fees, commissions, bonuses, interest part of leasing installments, penalties and charges for the late payment of liabilities and costs of securing liabilities. Tax deductible costs also include commissions and other bank charges for the prepayment of loans. The essence of the new interest limit is explained in Art. 15c paragraph 1 of the Corporate Income Tax Act. According to this stipulation, taxpayers will be able to include financing costs of up to PLN 3 million or 30% of EBITDA in the taxable costs for a given year (CIT Act, art. 15c).

To determine EBITDA, adjusted operating profit is increased by the depreciation of tangible assets and the amortization of intangible assets. By adding depreciation/amortization to the operating profit/loss, the result approximates operating cash flow. A high level of EBITDA implies stable operating fundamentals, which is why it tends to be called a measure of a company's financial health. In very capital-intensive industries, with a high potential for depreciated assets, EBITDA is largely determined by the amount of depreciation, whose level can be so high that even a loss suffering company will achieve positive EBITDA. This is a scenario which manifested itself in companies during a crisis in the coal industry.

In addition to EBITDA, the EBITDAR measure is used in business practice. It reports the operating profit/loss plus depreciation of fixed assets and amortization of intangible assets and so-called rents for leasing, rents for assets as well as costs of using trademarks

and other intangible assets. Most of these fixed payments can be made to companies in the same capital group. The EBITDA measure is used to:

- ◆ create indicators used to assess the financial condition of companies and reward their boards,
- ◆ value companies using the profit multiplier method,
- ◆ to assess the possibilities and effects of company restructuring,
- ◆ to assess the attractiveness of target companies.

EBITDA-based ratios are used to compare efficiency across borders and within industries as well as between classes of activity of individual industry groups in a given country. In order to evaluate profitability, use is made of the EBITDA margin determining the ratio of EBITDA to Total Revenue. To assess the capacity for debt repayment, use is commonly made of the Net Debt to EBITDA ratio.

The values in this ratio are included in loan and bond agreements in the form of so-called covenants. Broadly speaking, covenants can be divided into financial and non-financial (descriptive). Achleitner et alia (2012) distinguished two groups of financial covenants: maintenance covenants and incurrence covenants. The former group is one that should be used all the time, regardless of the actions undertaken by companies. The second does prohibit specific actions from being carried out if these were to lead to exceeding the indicated threshold indicator values (e.g. debt issuance is possible unless, as a result of the same, the debt service indicator falls below the required level) (Brycz et al. 2015). The vast majority of entries in loan agreements focuses on financial covenants presented in the form of indicators simply because they are easier to control than descriptive covenants.

Financial indicator covenants relate mainly to the level of companies' indebtedness and their ability to timely service their debt (Szczepankowski and Sierpińska-Sawicz 2019).

1. The level of companies' indebtedness is typically measured by means of:
  - ◆ Assets/equity ratio,
  - ◆ Liabilities/equity ratio,
  - ◆ Debt/equity ratio.
2. Companies' ability to service their debt is measured in terms of:
  - ◆ Net debt/EBITDA ratio,
  - ◆ Net debt/EBIT ratio
  - ◆ Debt/EBITDA ratio,
  - ◆ EBITDA/interest,
  - ◆ EBIT/interest,
  - ◆ EBITDAR/interest.

Loan and bond agreements stipulate the maximum permitted level of corporate debt by invoking various ratios. They mostly invoke the total-assets-to-equity ratio listed above. The total debt-to-equity ratio or the financial debt/equity ratio are also used. Financial liabilities are assumed to include any liabilities that generate financial costs, i.e. loans and borrowings, debt securities issues, financial leasing and other cost-generating liabilities. All of these ratios indirectly express the structure of broad capital engaged in financing a company's

assets. To assess the level of indebtedness of the analyzed companies, the paper relies on the assets/equity ratio, which captures this structure in the clearest way.

In reality, to assess companies' ability to repay their debt, the net debt/EBITDA ratio tends to be used the most. The level of net debt is determined as the difference between cost-generating debt (short- and long-term loans and borrowings as well as bond issues and finance leasing) and short-term investments. This is a category which includes cash and other instruments from which the company will recoup cash before the balance sheet date. Most often, only cash is deducted from the debt and other short-term investments, including loans to subsidiaries of the capital group, are omitted.

The debt/EBITDA ratio shows over what time frame the company will be able to repay its debt from the EBITDA generated in a given financial year. The writing of this ratio, which is specified in terms of points is of utmost importance for a company. For example, if a limit is fixed at 4.0, and a company exceeds it at, e.g. 4.12, this may result in contractual penalties for failure to comply with a covenant. Companies would benefit more if they had this level recorded as a range of, e.g. 3.9–4.1, as this would curtail the risk of them failing to meet the cut-off level and thereby eliminate additional costs of bond issue (Szczepankowski and Sierpińska-Sawicz 2019).

In financial institutions, which virtually do not depreciate tangible assets, in order to calculate the above ratio use is made of EBIT, i.e. adjusted operating income. The adjustments are made in very much the same way as when determining EBITDA. Financial metrics based on operating profit/loss at the EBIT level reflect the company's operational efficiency without distorting the assessment resulting from financial operations. A large number of businesses currently operate within capital groups, with subsidiaries pursuing diversified activities. Some of them may even conduct financial activities. Consequently some of them do not report large depreciation. Hence, the degree of diversification of coal companies' activities will have an impact on the results measured on the basis of EBITDA.

Research to date shows that the ratio of net debt to EBITDA in the hard coal mining industry stood at 2–4, indicating that the coal industry was able to pay back its liabilities minus cash within 2 to 4 years (Sierpińska-Sawicz and Bąk 2016). In order to assess a company's ability to repay its debt arising from loans, bond issues and repayment of rent debt use should be made on the forecasted EBITDA. Indeed, leveraged investments will generate additional profit. Depreciation charged on newly created fixed assets will also be higher. In order to assess a company's ability to repay debts over a twelve-month period, use can be made of the ratio of EBITDA to the annual sum of interest and principal instalments. Continued debt servicing means that financial liquidity in the long run is maintained.

EBITDA-based ratios can be used to create bonus systems for management boards of state-owned companies (Act 2016). Research shows that adopting a company's EBITDA to assess management effectiveness and reward managements is a questionable approach, to say the least. A company may be excessively indebted and generate high costs of debt financing or even face liquidity problems and pay penalty interest for late payments. The effects of selecting sources of finance and maintaining liquidity are recorded in the

income statement as finance costs. Revenues from the application of financial surpluses are recognized in financial revenues. However, this is not reflected in the level of EBITDA, possibly winning the management board a bonus. For the purpose of assessment, it would be better to use the net income, since it reflects the effects of all management board decisions not only at the operational level, but also at the financial level (Sierpińska-Sawicz and Sierpińska 2019).

EBITDA can be used for due diligence of the takeover or merger targets and the cost-effectiveness of their restructuring processes. It shows the amount of surplus realized from the company's operating activities. Meanwhile, the company may be experiencing problems maintaining financial liquidity and be indebted or even face bankruptcy. Hence, EBITDA is insufficient to evaluate these processes. As a metric, it has many flaws and does not provide information on the scale of generated operating cash flow. EBITDA overlooks changes in net working capital demand. During increased sales or in the face of stiffer competition and the need to extend invoice payment dates, the demand for net working capital needed to finance expanded inventory and receivables increases. This may lead to a decline in liquidity, but EBITDA will not capture this outcome. High EBITDA may discourage willing entities from acquiring a given company. It fails to inform about the need to incur capital expenditure necessary to sustain the company in a competitive market or to ensure its financial liquidity. In an EBITDA based assessment, the development potential of specific companies is therefore overlooked. Hence, this metric should be used with extreme caution. In assessing the profitability of acquisitions by means of EBITDA, numerous mistakes were made and the acquisitions did not bring the expected synergies (Stumpp et al. 2000).

In practice, EBITDA is used to value companies by means of the comparative method. By multiplying EBITDA by the appropriate multiplier characteristic for a given company, its size and industry specifics, the value of the company's operating effects is obtained. Other non-operating assets should be valued separately. The value of the entire company is the sum total of the values of operating assets and other assets (Damodaran 2002; Fernandez 2002; Rutkowski 2006). Popular types of enterprise value multiples (EV Enterprise Value), i.e. sums of equity and debt based on operating profit, include:

- ◆ EV/EBIT,
- ◆ EV/EBITA,
- ◆ EV/EBITDA.

In the EBITA (operating profit + amortization) measure, the amount of decrease in value i.e. the depreciation of tangible assets is omitted. However, EBITDA continues to be the most widely used metric in company valuations. It is used by investors in the capital market and in private companies, by owners and management alike as a criterion for the economy and size of the generated surplus. The value of the EBITDA multiple is determined as the adjusted average value of a group of comparable companies. EBITDA multiple should be calculated based on forecasted values because these values are related more to future achievable operational benefits rather than to past results. In order to choose a group of comparable companies, a number of criteria can be used. The most popular are:

- ◆ **Industry** – companies offering similar products. Coal industry companies are a grouping comprising not only coal mining companies but also companies with diversified activities. For example, the American company Peabody extracts, sells and distributes coal, as well as has an energy and metallurgy leg. Jastrzębska Spółka Węglowa (JSW), in turn, mines mainly coking coal, which has a much higher price than steam coal. In order to determine the EBITDA multiple, it is therefore necessary to choose companies pursuing similar activities.
- ◆ **Like technological processes.** To calculate the EBITDA multiple, opencast and deep-pit mines must be separated.
- ◆ **Size of the company.** Companies operating in the coal industry may differ significantly in terms of size, which affects their cost structure, profitability level and resilience to change in their environment. Significant differences exist between Polska Grupa Górnicza (PGG – Polish Mining Group), JSW and Lubelski Węgiel Bogdanka in the Polish coal mining sector. PGG operates a dozen or so mines, JSW has several and LW Bogdanka is a single mine coupled with a power plant and is therefore not as heavily exposed to the environment in which it operates as the other Polish coal mining capital groups.
- ◆ **Level of indebtedness.** A lower level of indebtedness may be indicative of a potential for future development inherent in the company and an increase in its shareholder value. On the other hand, the higher the debt, the bigger the risk inherent in business operations.

## 2. Sources of information and research methodology

This assessment of coal companies is based on data from their 2014–2018 financial statements retrieved from the internet. The base contains comparable financial statements of companies listed on global stock exchanges. The comparability and uniform method of building economic ratios makes it easier to make inferences and rank companies on the basis of a given ratio. Two sub-periods can be distinguished in the study period: 2014–2016, which saw a decline in coal prices and 2017–2018, when coal prices spiked. To show how EBITDA is used in various areas of corporate decision-making, several ratios were applied.

Companies' profitability was assessed on the basis of the ratio of EBITDA to revenues and the ratio of net profit to revenues. Their comparison allows to determine to what extent the differences between these two indicators are caused by the level of depreciation/amortization charges and tax on profit. In addition, the ratio of depreciation/amortization to revenues was determined. It shows what percentage of the revenue from the sale of products and services is allocated to simple replenishment of assets. On the other hand, the level of after-tax profit and dividend payments is indicative of investment possibilities in coal companies. Earnings retained by the company afford it the opportunity to use external sources of investment finance.

The assets/equity ratio and net debt/EBITDA ratio were used to assess the level of indebtedness and a company's ability to repay its debt. These metrics are widely used around the world to evaluate a company's ability to pay back its debts. The acceptable level of these ratios is laid down in loan and bond agreements.

The above ratios are presented throughout the paper in tables, whose content is explicated in the empirical part. Negative values in the tables are bracketed.

### 3. Assessment of coal companies efficiency by means of the EBITDA metric

The financial standing of coal companies is well reflected by the internationally comparable ratios of EBITDA to sales revenue and net income to revenues from sales of products and services. Income tax rates vary from country to country. Income tax may absorb a part of generated profit, hence the net profit margin shows the company's bottom line and whether shareholders can count on a dividend as well as the company's development opportunities. The EBITDA margin varies considerably from company to company (Table 1). At Belon in 2018 it

Table 1. EBITDA margin of coal companies in 2014–2018 (%)

Tabela 1. Marża EBITDA spółek węglowych w latach 2014–2018 (%)

Company	2014	2015	2016	2017	2018
Arch Coal Inc.	9.9	10.0	7.5	14.7	16.6
Baotailong New Materials Co. Ltd.	18.4	13.2	21.3	17.3	22.7
Bayan Resources Tbk PT	5.5	15.2	29.6	45.4	43.8
Belon OAO	3.2	25.5	4.6	44.5	299.7
China Coal Energy Co. Ltd.	12.0	13.4	20.1	20.2	18.7
Corsa Coal Corp.	2.9	14.3	(7.8)	18.0	12.6
Jastrzębska Spółka Węglowa SA	6.2	10.7	21.0	61.1	48.0
Lubelski Węgiel Bogdanka SA	36.8	3.3	34.0	67.7	24.8
Mechel PAO	11.0	17.2	25.6	27.0	23.4
Mongolian Mining Corp.	(14.6)	(66.6)	(1.3)	36.7	36.8
Peabody Energy Corp.	11.7	12.4	8.7	25.0	23.3
Ramaco Resources Inc.	N/A	N/A	(139.5)	(20.9)	16.0
Raspadskaya PAO	11.3	46.3	40.4	52.3	54.4
Warrior Met Coal Inc.	–	(28.3)	(2.1)	43.8	44.6
Whitehaven Coal Ltd.	56.0	47.8	62.3	63.6	59.1

Source: calculations based on companies' financial statements.



sky-rocketed to 300%, which means that its EBITDA was three times higher than the overall revenue. In Mongolian Mining, losses on the back of a fall in coal prices were higher than the level of EBITDA in 2014–2016. In Polish companies, the EBITDA margin dropped in the first two years of the study period, but was not negative in any of the years under review.

The EBITDA margin suffered mainly from a fall in revenues on the back of declining coal prices. Coal prices are primarily affected by the type of coal mined. Steam coal is priced lower than coking coal and its price is more dependent on the economic situation and demand for energy. On the other hand, the price of coking coal is correlated with the economic situation in the iron and steelmaking industry which relies on coke for steel production. Neither should organizational solutions in the coal industry be overlooked. A coal mine organizationally twinned with a coal-fired power plant enjoys more stable revenues due to its long-term contracts than a mine selling its coal on the free international market. Stiff competition from open-cast mines means that deep-pit mines, where mining costs are much higher than in open-cast mines, have a worse competitive position. As the depth of mining operations increases, mining costs rise.

Table 2 presents companies' net margin. The data in the table shows that in 2014–2016 coal companies reported losses. In 2015, only Baotailong New Materials and Whitehaven

Table 2. Net margin of coal companies 2014–2018 (%)

Tabela 2. Marża netto spółek węglowych w latach 2014–2018 (%)

Company	2014	2015	2016	2017	2018
Arch Coal Inc.	(19.0)	(113.2)	64.6	24.6	12.7
Baotaotailong New Materials Co. Ltd.	3.5	5.9	5.0	5.3	9.3
Bayan Resources Tbk PT	(22.8)	(17.6)	3.2	31.7	31.3
Belon OAO	(23.2)	(7.8)	(19.9)	371.6	26 919.0
China Coal Energy Co. Ltd.	1.7	(3.5)	4.8	5.1	6.0
Corsa Coal Corp.	(30.7)	(118.3)	(35.2)	49.9	2.2
Jastrzębska Spółka Węglowa SA	(9.6)	(47.4)	0.1	28.6	17.9
Lubelski Węgiel Bogdanka SA	13.6	(14.8)	10.2	37.5	3.1
Mechel PAO	(50.1)	(45.6)	3.4	4.2	4.3
Mongolian Mining Corp.	(86.1)	(188.7)	(128.3)	65.1	14.0
Peabody Energy Corp.	(10.2)	(31.8)	(14.1)	17.8	11.7
Ramaco Resources Inc.	N/A	N/A	(144.1)	(25.3)	11.0
Raspadskaya PAO	(69.0)	(30.1)	36.9	36.8	41.3
Warrior Met Coal Inc.	–	(57.0)	(30.2)	35.6	50.4
Whitehaven Coal Ltd.	(44.9)	1.8	22.9	23.2	21.2

Source: calculations based on companies' financial statements.

Coal reported a positive net margin. JSA's net deficit exceeded 47%, while in LW Bogdanka the same totalled 14.8%. Mongolian Mining Corp generated losses almost two times higher than revenues from sales of coal. The following year, losses amounted to 128% of revenues. Losses in the coal industry in 2014–2016 came on the back of a fall in both energy and coking coal prices. The latter are fixed by means of a benchmark formula based on coal quality parameters, in particular the CRI and CRS indicators. In the case of steam coal, the price level is affected by the level of content of chlorine, mercury and phosphorus, which negatively affect further coal processing.

Rapid price rises in the last quarter of 2016 allowed companies to reduce their losses, hence more than half of the companies analyzed generated a net profit. At Arch Coal Inc., the return on sales reached almost 65% in this year alone, only to in subsequent years. Coal prices jumped in 2017 and remained relatively stable in 2018. In 2018, on a country by country basis, an exceptionally high return on sales relative to the median in the coal industry was reported by Warrior (50.4%), Rospadskaya (41.3%) and Bayan Resources (31.3%). In other companies, it ranged between 2–20%, while in 2017 the spread was 4–65%.

Coal prices in Poland come under considerable pressure of the global economic situation and EU's energy policy. Apart from coal prices, financial results are enormously influenced by the costs of coal mining. In the cost structure of coal mines, fixed costs weigh almost 90%, and the chance of them being reduced is limited. Payroll accounts for the largest share of mining costs at approximately 50% of the total mining costs. Hence, rationalization of the use of the human factor, improvement of the organization of mining processes leading to an increase in work efficiency and change in the pay system, reduction of basic pay supplements to several components and a stronger link between wages and work efficiency should be the basic factors underlying cost cuts. Any measures undertaken in a bid to reduce the costs of coal production come after a time lag.

Deteriorating extraction and geological conditions, especially increasing depth of coal mines and the scale of natural hazards make a significant contribution to the rising costs of the coal industry in Poland. In addition, the possibility of reducing mining costs should stem from better use of mines' production assets and extending the life of machinery and equipment. It should be noted that large fluctuations in coal prices are cyclical. Coal companies should therefore have reserves to cover losses and maintain financial liquidity in periods of falling coal prices. In the long run, the economic results of coal companies in Poland will be dominated primarily by the possibility of keeping costs down. Companies must restructure, taking the country's energy strategy seeking to explore changes in the structure of fuel consumption, reduce coal consumption and boost production of renewable energy into account. The possibility of close integration of the coal industry with the energy sector should also be considered, as this will ensure the coherence of restructuring processes in the coal extraction industry with the directions of changes in the energy sector ([Report 2018](#)).

In order for a company to grow steadily and generate a profit for its owners over a long period of time, capital expenditure is needed. The replacement, modernization or creation of new assets is to guarantee the planned inflow of revenue and profit. It is assumed that

generating PLN 1 of sales requires investing part of it in assets so as to maintain (or increase) the ratio of net sales to the value of fixed assets. Depending on the stage of development and a company's environment, expenditure on fixed assets may be for reasons of replacement or development. The latter is financed from retained earnings and debts incurred.

Replacement investments are financed out of the depreciation charge. In coal companies, depreciation is an important part of EBITDA. During a decline in operating profit, in the companies analyzed depreciation was a basic part of EBITDA, with its level in many cases exceeding EBITDA.

As presented in Table 3, in 2014–2018, the ratio of depreciation to sales revenues followed a downward trend. Only in Corsa did it double, and in Peabody it actually rose by 2.6 percentage points. The depreciation charged to revenues varied widely in the researched coal companies. In 2014, this ratio ranged from 6.6% in Bayan Resources to almost 28% in Australia's Whitehaven. More than one in two of the companies reported that in 2018 the ratio of depreciation to revenues did not exceed 10%. In three of them it hovered around 10%.

Table 3. Ratio of depreciation/amortization to total revenue in coal companies in 2014–2018

Tabela 3. Stosunek amortyzacji do całkowitych przychodów spółek węglowych w latach 2014–2018

Company	2014	2015	2016	2017	2018
Arch Coal Inc.	14.2	14.7	11.3	5.3	4.9
Baotaotailong New Materials Co. Ltd.	7.9	10.0	9.0	6.1	5.3
Bayan Resources Tbk PT	6.6	9.4	8.2	3.5	2.4
Belon OAO	–	–	–	–	–
China Coal Energy Co. Ltd.	7.1	10.3	9.6	7.5	6.9
Corsa Coal Corp.	9.6	16.3	19.5	8.9	17.8
Jastrzębska Spółka Węglowa SA	13.1	15.2	12.2	11.7	11.1
Lubelski Węgiel Bogdanka SA	21.1	21.6	20.1	18.8	20.1
Mechel PAO	6.3	5.5	5.6	4.6	4.4
Mongolian Mining Corp.	14.0	39.4	26.9	10.6	10.1
Peabody Energy Corp.	9.6	10.3	9.9	11.5	12.2
Ramaco Resources Inc.	–	–	0.6	5.2	5.4
Raspadskaya PAO	19.9	10.7	8.4	5.9	4.7
Warrior Met Coal Inc.	–	22.7	20.7	6.4	7.1
Whitehaven Coal Ltd.	42.4	39.8	29.6	28.4	27.8

Source: calculations based on companies' financial statements.

In 2014–2015, the decline in coal prices led to a decline in revenue, which resulted in an increase in the share of depreciation in revenue. Because of the crisis in the hard coal industry, auditors reviewing financial statements conducted tests for the impairment of assets. Charges on this account were charged to the costs of coal mining. This was one of the largest factors behind the deterioration in coalmines' profit/loss, which, in turn, led to the restructuring of many entities in the coal industry, some bankruptcies, acquisitions and mergers. As a result of the decline in the value of assets, the depreciation base decreased, causing it to decline.

Attention should be paid to the relatively stable depreciation/amortization burden in Polish coal companies. At JSW, the ratio dropped from 13% in 2014 to 11% in 2018. Depreciation/amortization levels, however, decreased by 42%. In 2014, depreciation/amortization amounted to PLN 1,291 million, compared to PLN 756 million in 2018. This improved company's profit/loss situation but at the same time the funds for replacement investments were cut. During the period in question, a relatively stable depreciation/amortization charged to revenue occurred in Lubelski Węgiel Bogdanka. One-fifth of the company's revenue was spent on simple replacement of assets.

The level of the indicator largely depends on how companies use tangible assets. Fluctuations in the economy, insufficient funding of development investment, declining coal consumption on the back of changing structure of fuel consumption in the energy sector and an increase in production of renewable energy all prompt coal companies to use external assets. Companies use leasing, rent or lending, which allow them to use assets flexibly and contributes to cost reduction. During an economic slowdown, a company may opt out of using some of its leased machines. Some equipment may be leased from companies which, due to changes in local mining conditions or the lack of further concessions, are forced to limit their mining operations.

#### **4. Assessment of companies' debt level and their ability to service debt based on EBITDA**

The Assets/Equity ratio presented in Table 4 indirectly captures the structure of financing companies' assets.

The ratio's median hovers around 2, indicating that 50% of assets are financed with equity and 50% with debt. However, the financial standing of individual companies in terms of asset financing structure varies considerably. 2017–2018 witnessed a marked decline in the indebtedness of Polish coal companies, as well as in other coal mining giants globally. In 2015, JSW's assets were more than three times higher than its equity, i.e. less than 30% of these assets were financed with equity, while over 70% of assets were leveraged. In 2018, assets were only 70% higher than equity. Therefore, debts accounted for 41.2% of total sources of finance. At LW Bogdanka, 42% of assets were financed by means of liabilities in 2014, while in 2018 this share dropped to 25.4%.

Table 4. Assets/Equity ratio in coal companies in 2014–2018

Tabela 4. Wskaźnik aktywów/kapitału własnego w spółkach węglowych w latach 2014–2018

Company	2014	2015	2016	2017	2018
Arch Coal Inc.	5.05	–	2.86	2.97	2.68
Baotailong New Materials Co. Ltd.	1.96	1.89	2.07	1.80	1.80
Bayan Resources Tbk PT	7.90	11.40	7.36	2.05	1.77
Belon OAO	2.38	1.89	1.78	1.00	1.00
China Coal Energy Co. Ltd.	2.80	3.08	2.81	2.82	2.87
Corsa Coal Corp.	2.33	6.31	7.84	3.17	2.80
Jastrzębska Spółka Węglowa SA	2.16	3.08	2.88	1.89	1.70
Lubelski Węgiel Bogdanka SA	1.73	1.72	1.67	1.44	1.34
Mechel PAO	–	–	–	–	–
Mongolian Mining Corp.	4.24	7.36	4.77	2.12	2.10
Peabody Energy Corp.	4.84	11.94	67.73	2.70	2.19
Ramaco Resources Inc.	–	3.06	–	1.31	1.33
Raspadskaya PAO	3.43	8.88	4.32	2.04	1.64
Warrior Met Coal Inc.	–	–	1.26	2.40	1.96
Whitehaven Coal Ltd.	1.46	1.41	1.20	1.33	1.38

Source: calculations based on companies' financial statements.

It is worth noting the extreme values of the Assets/Equity ratio presented in Table 4 for selected companies. In 2016, Peabody's assets exceeded its equity almost 68-fold, which means that equity represented 1.5% of the company's total sources of finance. In 2015, equity in the Russian company Raspadskaya accounted for a mere 11.3% of sources of asset financing. In 2014–2016, almost all of the surveyed companies reported an increase in debt as a result of losses covered out of equity. The increase in coal prices in Q3 2016 and the dramatic improvement in the profit/loss levels resulted in a decrease in the share of debts in total sources of asset financing.

A company's ability to repay its debts is shown by the (Total Debt – Cash)/EBITDA ratio (Table 5).

Owing to its EBITDA in 2014–2016, Arch Coal Inc. would have liquidated its debts over an average of 15 years. The median during this period was 2 years. At China Coal Energy, the time needed to pay off debt varied from 15 years in 2015 to 4.4 years in 2018. Compared to the surveyed companies, Polish coal companies reported very good results in terms of their ability to service debt. Apart from 2015, when LW Bogdanka incurred losses,

Table 5. (Total Debt – Cash)/EBITDA in coal companies in 2014–2018

Tabela 5. (Dług ogółem – gotówka)/EBITDA w spółkach węglowych w latach 2014–2018

Company	2014	2015	2016	2017	2018
Arch Coal Inc.	14.10	16.71	14.90	–	–
Baotailong New Materials Co. Ltd.	4.66	8.51	4.78	3.03	1.67
Bayan Resources Tbk PT	10.83	6.67	2.64	0.48	–
Belon OAO	17.64	0.97	0.62	–	–
China Coal Energy Co. Ltd.	7.40	10.17	7.12	5.22	4.42
Corsa Coal Corp.	2.20	1.37	–	0.42	0.60
Jastrzębska Spółka Węglowa SA	–	1.55	0.67	–	–
Lubelski Węgiel Bogdanka SA	0.70	8.62	0.45	–	–
Mechel PAO	12.70	9.49	6.08	5.03	5.54
Mongolian Mining Corp.	–	–	–	3.47	2.08
Peabody Energy Corp.	7.09	8.40	6.22	–	0.32
Ramacco Resources Inc.	–	–	–	–	–
Raspadskaya PAO	9.68	2.36	2.06	0.43	–
Warrior Met Coal Inc.	–	–	–	0.13	0.44
Whitehaven Coal Ltd.	1.90	1.59	0.52	0.27	0.26

Source: calculations based on companies' financial statements.

the payback period was less than a year. This means that their EBITDA is so high that there is no risk of the companies losing their ability to pay back their debt. After a period of losses in 2014–2016, the Russian company Mechel needed just 5 years to repay its debt. Australia's Whitehaven topped the list: even in the face of declining profits, the payback period did not exceed 2 years, and in 2016–2018 it dipped to several months. However, the ratio of net debt to EBITDA must be viewed relative to the debt level. A low ratio may be indicative of low indebtedness. A company that does not make investments at the level of simple replacement of assets financed from depreciation to sustain extraction will not be able to survive long. On the other hand, in the absence of new concessions and the depletion of their resources, companies should diversify their operations and enter market segments guaranteeing stability (water, heat, energy supply). This will reduce the burden on mining companies' bottom line suffering from the cyclical nature of prices in the coal market. The need to restructure coal companies may reflect a decrease in overall coal production resulting from changes in the consumption structure of different energy carriers and the wider use of renewable energy. Yet, rather than decline, demand for energy will have risen by 2050 by 50%. The demand

will be covered mainly with renewable energy. Nevertheless, the demand for coal will not drop drastically, but will rather grow 0.4–0.5 per year, especially in Asia ([Report 2018](#)).

## Conclusions

EBITDA is a measure of companies' financial health. It can be used for both intra-industry and international comparisons. Comparison of companies' results across borders requires recognition of values in the same single accounting system (IFRS or GAAP). The analysis of pertinent publications on the subject has shown that the EBITDA metric can be used in the decision-making process in many areas of company activities. EBITDA-based ratios are used most widely to assess the current and future financial standing of companies. They are used for comparisons of profitability and debt servicing. Given that coal companies have relatively stable assets and the share of intangible assets in their asset structure is virtually non-existent or insignificant, EBITDA well lends itself to the assessment of these entities. Intangible assets are amortized over a short period of time, which could interfere with the comparability of ratios. Likewise, this comparability is upset by large investment outlays incurred over short time periods. These limitations however do not apply to the coal industry, in which investment cycles are long, extending over several years, and expenditures are spread over time. In addition, the pace of technical progress necessitating the need to implement large technology projects is not high there. Therefore, there is no interference with comparability arising from large investment expenditure incurred over a short period of time. In addition, the terms and conditions of coal sale, including extending invoice due dates, do not generate additional demand for net working capital which is not accounted for at EBITDA level.

A study into over a dozen or so coal companies allowed verification of the research hypotheses. The instability of profit/loss in coal companies results from large price fluctuations occasioned by changes in the economic situation, rather than by a dramatic decline in demand for coal from the energy industry and its replacement with renewable energy. A large share of fixed costs at 90% of overall coal mining costs prompts coal companies to periodically boost their production in order to reduce their costs, which reduces prices and deteriorates their financial results. The impact of the economic change on coal prices is greater for coking coal than for steam coal. The decline in coal prices is additionally affected by the situation in the steel industry.

The analysis of the financial condition of coal companies showed that Polish coal companies reported a higher profit than their listed counterparts around the world. This is especially true with regard to ratios illustrating the level of debt and debt servicing capacity. After a period of decline in profit/loss in 2014–2016, coal companies regained its robustness in 2017–2018.

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#### WHERE THE EBITDA METRIC IS USED IN COAL COMPANIES

##### Key words

EBITDA margin, net margin, amortization, net debt

##### Abstract

The paper presents areas where the EBITDA measure is used in coal companies. The metric and the ratios where it is utilized are employed to assess companies and management efficiency, hence they are used as criteria for rewarding board members. EBITDA-based ratios are also used to evaluate the profitability of company restructuring and its goodwill in mergers and acquisitions. EBITDA, also tends to be used to value companies on the capital market. It is a good tool for efficiency assessment in coal companies with relatively stable fixed assets and small share of intangible assets, which amortized over short periods of time could interfere the comparability of relations based on this measure. The comparability is also disturbed by large investment expenditure incurred in the short term. This does not apply to the mining industry, in which investment cycles are long, last several years and expenditures are spread over time. In addition, the rate of technical progress imposing the need to implement large technology projects is not high compared to technology companies with high development dynamics.

EBITDA based ratios were used to assess a number of listed coal companies. The analysis revealed that the profit/loss of these companies is mainly determined by coal prices. The cost of coal mining is 90% fixed and projects undertaken to reduce it bear fruit only over the long term. Cyclically changing coal prices cause major losses in companies when prices are low, which leads to bankruptcies or a need to restructure. After a period of decline in 2014–2016, the profit/loss of Polish coal companies as well as companies from around the world improved in 2017–2018. The financial standing of Polish companies was better than that of their counterparts from other parts of the world.

## OBSZARY WYKORZYSTANIA MIERNIKA EBITDA W SPÓLKACH WĘGLOWYCH

## Słowa kluczowe

marża EBITDA, rentowność netto, amortyzacja, dług netto

## Streszczenie

W artykule zaprezentowane zostały obszary wykorzystania miernika EBITDA w spółkach węglowych. Miernik ten i budowane na jego podstawie relacje są wykorzystywane do oceny efektywności funkcjonowania spółek i skuteczności zarządzania, stąd służą do premiowania członków zarządu. Relacje oparte na EBITDA służą też do oceny opłacalności restrukturyzacji spółek, wyceny ich wartości w procesach fuzji i przejęć oraz wyceny spółek na rynku kapitałowym. EBITDA jest dobrym narzędziem do oceny efektywności spółek węglowych, które mają względnie stabilne aktywa, a w ich strukturze udział wartości niematerialnych i prawnych jest niewielki. Wartości te są amortyzowane w krótkim okresie czasu, co może zakłócać porównywalność relacji ustalanych w oparciu o ten miernik. Porównywalność zakłócają, duże wydatki inwestycyjne ponoszone w krótkim okresie czasu. Nie dotyczy to branży górniczej, w której cykle inwestycyjne są długie, a nakłady są rozłożone w czasie. Ponadto tempo postępu technicznego narzucające konieczność realizacji dużych przedsięwzięć technologicznych w branży węglowej nie jest wysokie w porównaniu do spółek technologicznych o dużej dynamice rozwoju.

Relacje oparte na EBITDA wykorzystane zostały do oceny kilkunastu spółek węglowych notowanych na giełdach. Przeprowadzona analiza wykazała, że wyniki finansowe tych spółek są zdeterminowane głównie cenami węgla. Koszty wydobycia węgla w 90% mają charakter stały, a przedsięwzięcia podejmowane w celu ich obniżki skutkują w długim okresie czasu. Zmieniające się cyklicznie ceny węgla powodują w okresie ich spadku głębokie straty w spółkach, co prowadzi do ich upadłości bądź konieczności restrukturyzacji. Wyniki finansowe polskich spółek węglowych po okresie spadku w latach 2014–2016 podobnie jak i spółek światowych odbudowały swoje wyniki w latach 2017–2018. Spółki polskie mają dobrą kondycję finansową w porównaniu ze spółkami światowymi.