

Prediction of Potential Bankruptcy of Mining and Petroleum Companies in Indonesia



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ABSTRACT: This research was conducted to provide information to stakeholders about the sustainability of mining and oil companies in Indonesia. Thus, the financial distress model (Altman Z-score) was adopted in this study to predict bankruptcy potential in mining and oil companies in Indonesia. This research uses descriptive method with a quantitative approach. The population in this study consists of mining and oil companies listed on the Indonesia Stock Exchange (IDX) in the 2010-2018 period. The sampling technique used purposive sampling technique. The results of the data calculation show that working capital to total assets (X1), retained earnings to total assets (X2), earnings before interest and taxes to total assets (X3), market value of equity to book value of debt (X4), and sales to total assets (X5) has a positive value. This means that all mining and petroleum companies in the sample have a very healthy financial condition and indicate that the company is in the non-bankrupt company category. This study only analyses financial statements (fundamental analysis), thus ignoring the cost of capital. This will make it difficult to know whether a company has succeeded in creating value or not.

KEYWORDS: Bankruptcy; Sustainability; Financial distress; Risk analyst; Financial Accounting

I. INTRODUCTION

Geologically, Indonesia is an archipelagic region that has unique geological conditions, because the archipelago is formed from a pile of large tectonic plates, namely the Eurasian Continental Plate, the Indian-Australian Continental Plate, and the Pacific Ocean Plate which gave birth to a geological structure that has a wealth of potential natural resources in the form of minerals. Almost all of the Indonesian archipelago contains potential minerals, such as: metals and non-metals, coal and/or other minerals. This natural wealth is a gift that should be utilized optimally and carefully considering its non-renewable nature, as shown in Figure 1.

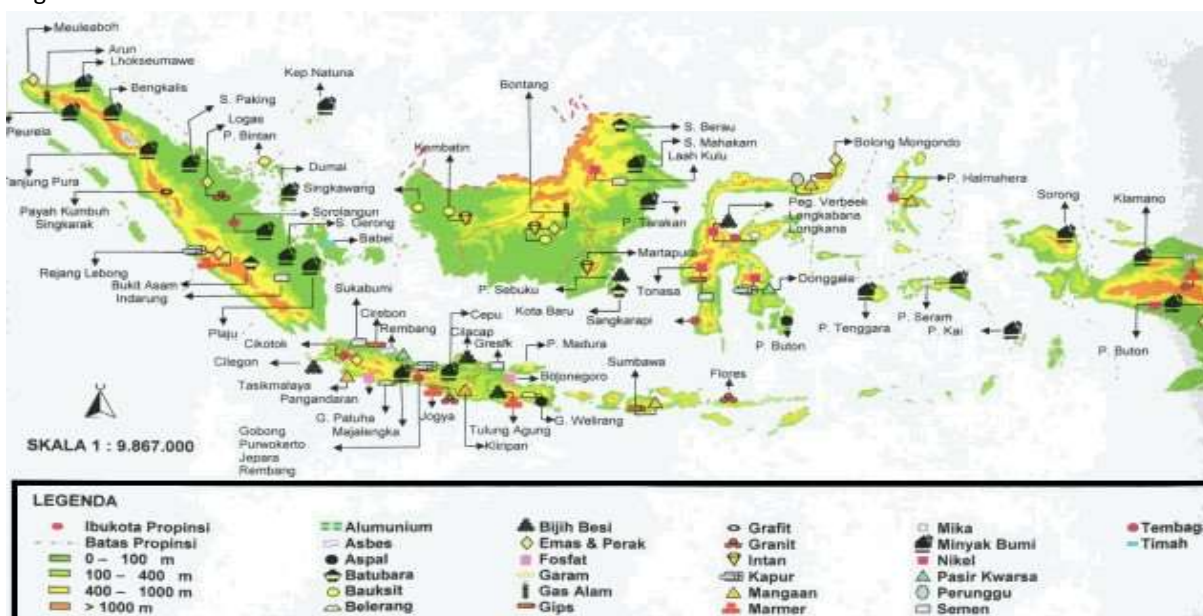


Figure 1. Map of the distribution of mining products in Indonesia

Source: ESDM, 2019.

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The following minerals are found in every region in Indonesia:

1) *Sumatra*

The island of Sumatra is rich in mining products, namely oil, gold, silver, coal, manganese, natural gas, sulfur, platinum, tin, bauxite, granite, copper, iron ore and limestone.

2) *Java and Nusa Tenggara*

The islands of Java and Nusa Tenggara also have potential natural wealth, in the form of limestone, marble, gold, silver, manganese, sulfur, iron ore, coal, gypsum, phosphate, petroleum, natural gas and lead.

3) *Borneo*

The island of Borneo is known as one of the "richest" islands in the world for its natural resources. The main mining commodities on this island are oil, diamonds, bauxite, aluminum, nickel, coal, iron ore, gold, silver, manganese, natural gas, bronze, sulfur and gypsum.

4) *Sulawesi and Maluku*

Sulawesi and Maluku also have mining wealth that battery manufacturers are looking for, namely Nickel. In addition, mining materials in Sulawesi include: gold, silver, copper, granite, limestone, lead, gypsum, sulfur, marble, petroleum, iron ore and manganese.

5) *Papuan*

The area at the eastern tip of our country, however, has the largest natural wealth in Indonesia. Papua is famous for its abundant precious metal mining products, namely gold, nickel, copper, marble, petroleum, aluminum and coal.

Based on Figure 1 above, the mining and oil sector can be indicated as one of the sectors that affect the growth rate of the Indonesian economy. This is based on the function of the mining sector as a provider of industrial energy sources, such as coal, oil and natural gas, which are currently used as industrial energy sources, and this energy is also used by most other industrial sectors for production.

Indonesia is a country rich in natural resources. Indonesia's natural wealth is found on the surface of the earth, in the bowels of the earth, at sea and in the air. Based on their availability, natural resources are divided into two major groups, namely renewable and non-renewable natural resources. Non-renewable natural resources are oil, natural gas, minerals and coal. Therefore, if mining or oil is exploited on a large scale, it can cause deforestation, deforestation, flat land, like a giant puddle. Ecologically, these conditions can have impacts that threaten the preservation of environmental functions and hinder the implementation of sustainable eco development (Zandi et al., 2019).

The nature and characteristics of companies in the mining and petroleum industry are very different from other industries (Jaya & Perwono, 2019). Every expensive investment large, long-term, fraught with high risks and uncertainties, raises issues regarding funding, in development company. Mining and oil companies require very large capital explore natural resources (Sustainable & Restuningdiah, 2021). For it, mining companies and many oil companies enter the capital market to absorb capital investment and strengthen its financial position. Investment is a term related to finance and economics (Schmitz, 2017). This is also related to the accumulation of an asset with the hope of obtaining profits in the future (Jaya et al., 2022). Sometimes, investment is also called as capital investment (Singleton, 2018). One of the tools used by companies to attract investment capital from potential investors is the financial performance report (Bensaid et al., 2021).

Companies that perform financially, either consistently or progressively, are expected to provide prosperity for stakeholders (Danso et al., 2019). Thus, the company's management always evaluates the financial performance report every year (Garrett et al., 2020). This is done so that the company can know the results of its achievements in meeting its targets. In addition, evaluation is also carried out by management to analyze the sustainability of a company (Edwards, 2021). Not only that, the business actors and mining and oil industry stakeholders will also face several other challenges, such as downstream integration policies. Global issues such as environmental protection, responsible sourcing of materials, and the welfare of communities around mining areas will become a special concern for the government in the future.

Companies must respond immediately by implementing best practices for environmental protection and land rehabilitation (ENDIANA et al., 2020). The government has a big task to reposition the mining and oil industry as a driver of the local and regional economy, not just as an object of activity that generates state revenue. For this reason, the government will encourage mining and oil companies to play a more strategic role in maximizing the development and empowerment of communities around their operational areas.

This phenomenon is very important to be studied more seriously, in order to determine the sustainability of a business, especially in the mining and oil industry. This research was conducted to provide information to stakeholders about the sustainability of mining and oil companies in Indonesia. Thus, a financial distress model is needed in order to be able to identify

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potential financial distress conditions that will be experienced by companies from an early age and to provide anticipatory policies for conditions that lead to bankruptcy.

Most statistical prediction models for financial distress have been developed and tested in several developed countries, such as America. Among the most commonly used models, namely the Altman Z-Score model. However, this model has been modified twice (Hanani & Dharmastuti, 2015). Many previous researchers have developed financial distress models to determine the level of a company's financial performance, such as (Altman, 1968, 1984, 1995; Beaver, 1996; Springate, 1978). The Altman model is proven to be able to be used to predict bankruptcy in companies (Altman, 1968, 1984). Altman's accuracy in predicting bankruptcy reached 72% at the beginning of the study in 1968, and in the two years before bankruptcy (Altman, 1968). Meanwhile, Altman again conducted a series of subsequent studies covering three different time periods up to 1999 and the results of the accuracy in predicting bankruptcy in companies one year ahead reached 80-90% (Altman, 1995). So that, The Altman Z-Score model has been the most widely used tool for accountants, auditors and creditors to evaluate companies since 1985 until now (Agustia et al., 2020; Hanani & Dharmastuti, 2015; Shahsavari, 2016). Thus, this model (Altman) was adopted in this study to be able to predict bankruptcy potential in mining and oil companies in Indonesia.

II. LITERATURE REVIEW

A. Forecasting concept

Forecasting is the art and science of predicting events that will occur in the future (Serrano-Cinca et al., 2019). Forecasting can be done using historical data and calculation processes to predict a projection of future events or with subjective intuition (mathematical models) compiled by company management (Cormier & Magnan, 2015). The future is uncertain, so humans cannot predict uncertain future events. However, humans still have to think scientifically to think about conditions that might occur in the future (Mauborgne & Kim, 2016). Scientific basis is used by observing the situation in the present and past events (Altman, 1968).

The process of formulating and making strategic policies really needs the ability to predict future events. This is also needed so that the policy direction made can respond to any changes in conditions that will occur (Yeung, 2021). The paradox of planning for the future illustrates that policies made based on the current situation can affect conditions and situations in the future, but the effect is often not in accordance with what has been planned. Therefore, every strategic planning arrangement requires a framework that can imagine a concept of a future situation that will occur as a result of changes in events in the present (Robson et al., 2001). This framework of thinking requires visionary abilities, imagination and creativity to be able to imagine the direction and paths of change in the future, so that strategic goals (short term and long term) can be planned that can respond to these changes. The rationale and clear forecasting projections are those that can be used by management as a basis for making decisions that are useful in anticipating scenarios of future events.

B. Bankruptcy Analysis

Bankruptcy is a condition where the company is no longer able to pay off its obligations (Serrano-Cinca et al., 2019). This condition can be known earlier by the company if its financial statements are analyzed more thoroughly and in detail in a certain way. Financial ratios can be used as an analysis of potential indications of bankruptcy in a company (Jia & Bradbury, 2021). Bankruptcy is considered as a process of company liquidation or company closure or insolvency (Altman, 1995). Bankruptcy as a failure is divided into two, namely:

1. Economic failure

Economic failure means that the company's income is no longer able to cover its own operating costs. This condition means that the profit rate is less than the cost of capital and the operating cash flow is less than the total liabilities. This failure may also mean that the rate of return on the historical cost of the investment is less than the company's cost of capital.

2. Financial failure

Financial failure can be interpreted as insolvency that distinguishes between cash flows and stocks. There are two types of insolvency based on cash flow, namely:

a. Technical insolvency

The company is considered a failure, if the company can no longer fulfill its obligations at maturity. This condition can also occur if a company fails to comply with one of the provisions of its debt, such as the ratio of current assets to current liabilities that has been determined and the ratio of net worth to total assets required. Technical insolvency can also occur when a company's cash flow is insufficient to pay the principal interest on its debts.

b. Insolvency in the sense of bankruptcy.

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Bankruptcy in this case is defined as a negative net worth in a conventional balance sheet or less than its total liabilities. Another term is known as liquid. Liquidation is a process that occurs when a company is disbanded. Liquidation places more emphasis on the aspect of the company's juridical status as a legal entity with all its rights and obligations. Liquidation or dissolution of a company always results in business closure, but liquidation does not always mean a company goes bankrupt. Liquidation can also mean that the company will carry out another phase of change that is more sustainable in the face of its competitors.

Some signs of a company that will experience bankruptcy or financial difficulties include:

- 1) There was a significant decrease in sales and revenue
- 2) Profit or cash flow from operations has decreased
- 3) Decrease in total assets
- 4) There was a significant decrease in the close price
- 5) High probability of failure in the industry, or industry with high risk
- 6) There was a big dividend cut
- 7) Young company

C. Altman Prediction Model (Z-Score)

Z-Score is a score determined from a standard calculation multiplied by financial ratios to indicate the level of probability of bankruptcy of a company (Altman, 1968). The Z-Score formula is a multivariate formula used to measure the financial health of a company. Five types of financial ratios that can be combined to see the difference between companies that will go bankrupt and those that do not go bankrupt (Altman, 1968). The Altman formula (Z-score) was originally as follows:

$$\text{Z-Score} = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5$$

Information:

X1 = working capital to total assets

X2 = retained earnings to total assets

X3 = earnings before interest and taxes to total assets

X4 = market value of equity to book value of total debt

X5 = sales to total assets

Z = overall Z-Score index

Meanwhile, the Altman model (Z-Score) for companies that have gone public is determined using the following formula:

$$\text{Z-Score} = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 1.0 X5$$

Information:

$$X1 = \frac{(\text{current assets} - \text{current liabilities})}{\text{total assets}} \times 100\%$$

$$X2 = \frac{\text{retained earnings}}{\text{total assets}} \times 100\%$$

$$X3 = \frac{\text{earnings before interest and taxes}}{\text{total assets}} \times 100\%$$

$$X4 = \frac{\text{Market value of common stock and preference}}{\text{Book value of total debt}} \times 100\%$$

$$X5 = \frac{\text{Sale}}{\text{total assets}} \times 100\%$$

The assessment criteria are as follows:

- 1) Z-Scores > 2.99 is categorized as a very healthy company, and not experiencing financial difficulties.
- 2) 1.81 < Z-Score < 2.99 is in the gray area or categorized as a company that has the potential to experience financial difficulties. However, the possibility of being saved and going bankrupt is just as great. Thus, depending on the policy decisions of management and company owners as decision makers.
- 3) Z-Scores < 1.81 is categorized as a company that has enormous financial difficulties and has a high potential for bankruptcy.

III. RESEARCH METHOD

This research uses descriptive method with a quantitative approach. Descriptive research was conducted to determine the value of the independent variable, either one variable or more, without making comparisons or connecting with other variables (Jaya, 2020). The data used in this research is secondary data. This data was obtained through the official website of the Indonesia

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Stock Exchange. Thus, the data used is accurate and can be accounted for its authenticity. The focus of this research is to predict potential bankruptcy with the Altman method (Z-Score) based on five categories, namely:

- Liquidity ratio (working capital to total assets or X1)
- Profitability ratio (retained earnings to total assets or X2)
- Profitability ratio (earnings before interest and tax to total assets or X3)
- Leverage/solvability ratio (market value of common stock and preferred stock to book value of total debt or X4)
- Performance ratio (sales to total assets or X5)

The population in this study consists of mining and oil companies listed on the Indonesia Stock Exchange (IDX) in the 2010-2018 period. There are 44 mining and oil companies recorded. This data consists of 22 companies in the mining sub-sector, 9 companies in the oil and gas sub-sector, 11 companies in metals and other minerals sub-sector, and 2 companies in the rocks sub-sector. The sampling technique used purposive sampling technique. The criteria for selecting the sample in this study are as follows.

Table 1. Sample Criteria to be Examined

No.	Listing
1.	Mining and petroleum companies that have published complete and audited financial statements for the period December 31 2010 to December 31 2018
2.	Financial statements of mining and oil companies using the rupiah currency as a unit of money for the period 31 December 2010 to 31 December 2018
3.	Mining and petroleum companies that have experienced losses in at least one financial reporting period during the study period (2010-2018)

Source: Processed data, 2020.

Based on the results of the sampling that has been carried out, a total of 27 mining and petroleum companies were recorded after the research period or in the middle of the sampling observation period. Thus, it was excluded from the data sample because it did not match the criteria. In addition, there are 2 mining companies that have been delisted from the Indonesia Stock Exchange since May 2015. Thus, the results obtained from a sample of 15 mining and petroleum companies are ready for data analysis.

Some of the steps that will be taken in the process of completing this research analysis include the following:

- Calculating the value of X1, X2, X3, X4, and X5 for each mining and Petroleum Company during 2010-2018.
- Calculating the Z-Score based on mathematical calculations as follows:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

- Analyzing the financial statements of mining and petroleum companies during 2010-2018 based on time series financial ratios.
- Calculating each mining and petroleum company score according to the Altman Z-Score formula.
- Categorizing each mining and petroleum company according to predetermine cut offs.
- Draw conclusions from the performance of mining and oil companies and predictions of the company's bankruptcy.

IV. RESULTS AND DISCUSSIONS

Data that has been tabulated using fundamental analysis formula, produces the following values (Table 2).

Table 2. X and Z scores of Mining and Petroleum Companies in 2010-2018

Stock code	Year	X1	X2	X3	X4	X5	Z-Scores	Category
ADRO	2010	0.14665	0.20801	1.27460	0.54118	1.80777	3.97821	Very healthy
	2011	0.10991	0.20933	1.26592	0.52251	1.77909	3.88677	Very healthy
	2012	0.17318	0.21066	1.25724	0.50383	1.75041	3.89532	Very healthy
	2013	0.16977	0.21198	1.24856	0.48515	1.72174	3.83720	Very healthy
	2014	0.18304	0.21330	1.23989	0.46647	1.69306	3.79576	Very healthy

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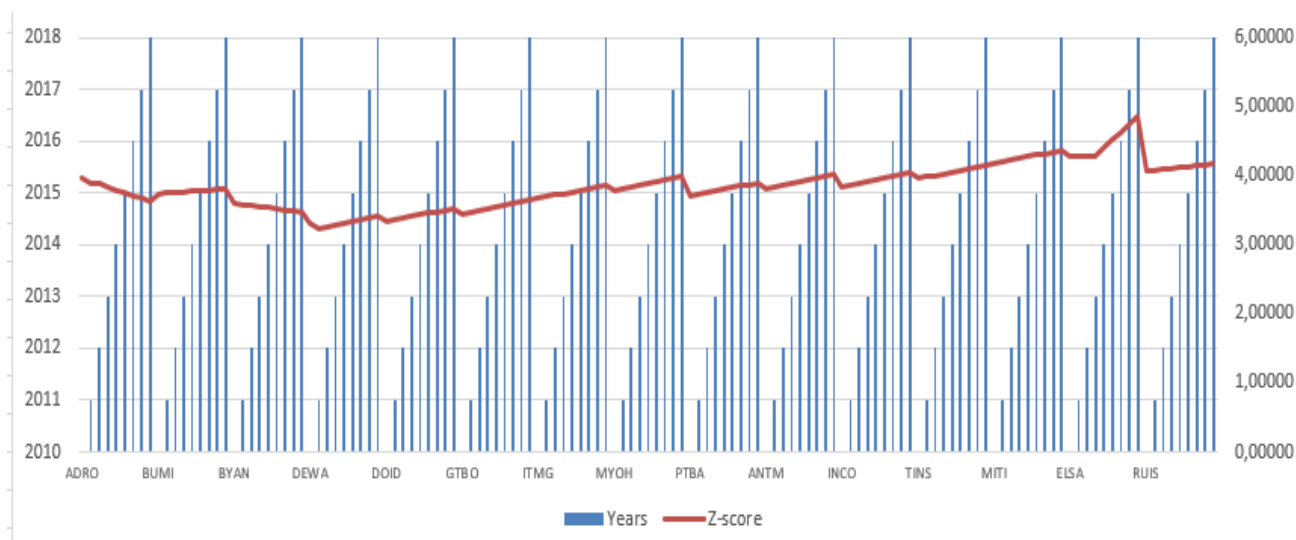
	2015	0.19630	0.21462	1.23121	0.44779	1.66438	3.75431	Very healthy
	2016	0.20957	0.21595	1.22253	0.42912	1.63570	3.71286	Very healthy
	2017	0.22283	0.21727	1.21385	0.41044	1.60702	3.67141	Very healthy
	2018	0.23609	0.21859	1.20518	0.39176	1.57835	3.62997	Very healthy
EARTH	2010	0.14936	0.01991	1.19650	1.55308	0.81967	3.73852	Very healthy
	2011	0.16262	0.02123	1.18782	1.55441	0.82099	3.74707	Very healthy
	2012	0.17589	0.02256	1.17914	1.55573	0.82231	3.75562	Very healthy
	2013	0.18915	0.02388	1.17046	1.55705	0.82364	3.76418	Very healthy
	2014	0.20241	0.02520	1.16179	1.55837	0.82496	3.77273	Very healthy
	2015	0.21568	0.02652	1.15311	1.55969	0.82628	3.78128	Very healthy
	2016	0.22894	0.02784	1.14443	1.56102	0.82760	3.78983	Very healthy
	2017	0.24221	0.02917	1.13575	1.56234	0.82892	3.79839	Very healthy
	2018	0.25547	0.03049	1.12707	1.56366	0.83025	3.80694	Very healthy
BYAN	2010	0.26873	0.03181	1.11840	1.56498	0.61341	3.59733	Very healthy
	2011	0.28200	0.03313	1.10972	1.56630	0.59056	3.58171	Very healthy
	2012	0.29526	0.03445	1.10104	1.56763	0.56771	3.56609	Very healthy
	2013	0.30853	0.03578	1.09236	1.56895	0.54486	3.55047	Very healthy
	2014	0.32179	0.03710	1.08368	1.57027	0.52200	3.53485	Very healthy
	2015	0.33505	0.03842	1.07501	1.57159	0.49915	3.51923	Very healthy
	2016	0.34832	0.03974	1.06633	1.57291	0.47630	3.50360	Very healthy
	2017	0.36158	0.04107	1.05765	1.57424	0.45345	3.48798	Very healthy
	2018	0.37485	0.04239	1.04897	1.57556	0.43060	3.47236	Very healthy
GOD	2010	0.18811	0.04371	1.04030	1.57688	0.46836	3.31735	Very healthy
	2011	0.10137	0.04503	1.03162	1.57820	0.48531	3.24153	Very healthy
	2012	0.11464	0.04635	1.02294	1.57953	0.50226	3.26571	Very healthy
	2013	0.12790	0.04768	1.01426	1.58085	0.51921	3.28990	Very healthy
	2014	0.14117	0.04900	1.00558	1.58217	0.53616	3.31408	Very healthy
	2015	0.15443	0.05032	0.99691	1.58349	0.55311	3.33826	Very healthy
	2016	0.16769	0.05164	0.98823	1.58481	0.57006	3.36244	Very healthy
	2017	0.18096	0.05296	0.97955	1.58614	0.58701	3.38662	Very healthy
	2018	0.19422	0.05429	0.97087	1.58746	0.60396	3.41080	Very healthy
DOID	2010	0.10749	0.05561	0.96219	1.58878	0.62091	3.33498	Very healthy
	2011	0.12075	0.05693	0.95352	1.59010	0.63787	3.35917	Very healthy
	2012	0.13401	0.05825	0.94484	1.59142	0.65482	3.38335	Very healthy
	2013	0.14728	0.05957	0.93616	1.59275	0.67177	3.40753	Very healthy
	2014	0.16054	0.06090	0.92748	1.59407	0.68872	3.43171	Very healthy
	2015	0.17381	0.06222	0.91880	1.59539	0.70567	3.45589	Very healthy
	2016	0.18707	0.06354	0.91013	1.59671	0.72262	3.48007	Very healthy
	2017	0.20033	0.06486	0.90145	1.59803	0.73957	3.50425	Very healthy
	2018	0.21360	0.06619	0.89277	1.59936	0.75652	3.52843	Very healthy
GTBO	2010	0.12686	0.06751	0.88409	1.60068	0.77347	3.45262	Very healthy
	2011	0.14013	0.06883	0.87542	1.60200	0.79043	3.47680	Very healthy
	2012	0.15339	0.07015	0.86674	1.60332	0.80738	3.50098	Very healthy
	2013	0.16665	0.07147	0.85806	1.60465	0.82433	3.52516	Very healthy
	2014	0.17992	0.07280	0.84938	1.60597	0.84128	3.54934	Very healthy
	2015	0.19318	0.07412	0.84070	1.60729	0.85823	3.57352	Very healthy
	2016	0.20645	0.07544	0.83203	1.60861	0.87518	3.59770	Very healthy
	2017	0.21971	0.07676	0.82335	1.60993	0.89213	3.62189	Very healthy
	2018	0.23297	0.07808	0.81467	1.61126	0.90908	3.64607	Very healthy
ITMG	2010	0.24624	0.07941	0.80599	1.61258	0.92603	3.67025	Very healthy

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	2011	0.25950	0.08073	0.79731	1.61390	0.94299	3.69443	Very healthy
	2012	0.27277	0.08205	0.78864	1.61522	0.95994	3.71861	Very healthy
	2013	0.28603	0.08337	0.77996	1.61654	0.97689	3.74279	Very healthy
	2014	0.29929	0.08469	0.77128	1.61787	0.99384	3.76697	Very healthy
	2015	0.31256	0.08602	0.76260	1.61919	1.01079	3.79116	Very healthy
	2016	0.32582	0.08734	0.75392	1.62051	1.02774	3.81534	Very healthy
	2017	0.33909	0.08866	0.74525	1.62183	1.04469	3.83952	Very healthy
	2018	0.35235	0.08998	0.73657	1.62315	1.06164	3.86370	Very healthy
MYOH	2010	0.26561	0.09131	0.72789	1.62448	1.07859	3.78788	Very healthy
	2011	0.27888	0.09263	0.71921	1.62580	1.09554	3.81206	Very healthy
	2012	0.29214	0.09395	0.71054	1.62712	1.11250	3.83624	Very healthy
	2013	0.30541	0.09527	0.70186	1.62844	1.12945	3.86043	Very healthy
	2014	0.31867	0.09659	0.69318	1.62977	1.14640	3.88461	Very healthy
	2015	0.33193	0.09792	0.68450	1.63109	1.16335	3.90879	Very healthy
	2016	0.34520	0.09924	0.67582	1.63241	1.18030	3.93297	Very healthy
	2017	0.35846	0.10056	0.66715	1.63373	1.19725	3.95715	Very healthy
	2018	0.37173	0.10188	0.65847	1.63505	1.21420	3.98133	Very healthy
PTBA	2010	0.08499	0.10320	0.64979	1.63638	1.23115	3.70551	Very healthy
	2011	0.09825	0.10453	0.64111	1.63770	1.24810	3.72970	Very healthy
	2012	0.11152	0.10585	0.63243	1.63902	1.26506	3.75388	Very healthy
	2013	0.12478	0.10717	0.62376	1.64034	1.28201	3.77806	Very healthy
	2014	0.13805	0.10849	0.61508	1.64166	1.29896	3.80224	Very healthy
	2015	0.15131	0.10981	0.60640	1.64299	1.31591	3.82642	Very healthy
	2016	0.16457	0.11114	0.59772	1.64431	1.33286	3.85060	Very healthy
	2017	0.17784	0.11246	0.58904	1.64563	1.34981	3.87478	Very healthy
	2018	0.19110	0.11378	0.58037	1.64695	1.36676	3.89897	Very healthy
ANTM	2010	0.10437	0.11510	0.57169	1.64828	1.38371	3.82315	Very healthy
	2011	0.11763	0.11643	0.56301	1.64960	1.40066	3.84733	Very healthy
	2012	0.13089	0.11775	0.55433	1.65092	1.41761	3.87151	Very healthy
	2013	0.14416	0.11907	0.54566	1.65224	1.43457	3.89569	Very healthy
	2014	0.15742	0.12039	0.53698	1.65356	1.45152	3.91987	Very healthy
	2015	0.17069	0.12171	0.52830	1.65489	1.46847	3.94405	Very healthy
	2016	0.18395	0.12304	0.51962	1.65621	1.48542	3.96824	Very healthy
	2017	0.19721	0.12436	0.51094	1.65753	1.50237	3.99242	Very healthy
	2018	0.21048	0.12568	0.50227	1.65885	1.51932	4.01660	Very healthy
INCO	2010	0.02374	0.12700	0.49359	1.66017	1.53627	3.84078	Very healthy
	2011	0.03701	0.12832	0.48491	1.66150	1.55322	3.86496	Very healthy
	2012	0.05027	0.12965	0.47623	1.66282	1.57017	3.88914	Very healthy
	2013	0.06353	0.13097	0.46755	1.66414	1.58713	3.91332	Very healthy
	2014	0.07680	0.13229	0.45888	1.66546	1.60408	3.93750	Very healthy
	2015	0.09006	0.13361	0.45020	1.66678	1.62103	3.96169	Very healthy
	2016	0.10333	0.13493	0.44152	1.66811	1.63798	3.98587	Very healthy
	2017	0.11659	0.13626	0.43284	1.66943	1.65493	4.01005	Very healthy
	2018	0.12985	0.13758	0.42417	1.67075	1.67188	4.03423	Very healthy
TINS	2010	0.04312	0.13890	0.41549	1.67207	1.68883	3.95841	Very healthy
	2011	0.05638	0.14022	0.40681	1.67340	1.70578	3.98259	Very healthy
	2012	0.06965	0.14155	0.39813	1.67472	1.72273	4.00677	Very healthy
	2013	0.08291	0.14287	0.38945	1.67604	1.73968	4.03096	Very healthy
	2014	0.09617	0.14419	0.38078	1.67736	1.75664	4.05514	Very healthy
	2015	0.10944	0.14551	0.37210	1.67868	1.77359	4.07932	Very healthy

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	2016	0.12270	0.14683	0.36342	1.68001	1.79054	4.10350	Very healthy
	2017	0.13597	0.14816	0.35474	1.68133	1.80749	4.12768	Very healthy
	2018	0.14923	0.14948	0.34606	1.68265	1.82444	4.15186	Very healthy
MITI	2010	0.16250	0.15080	0.33739	1.68397	1.84139	4.17604	Very healthy
	2011	0.17576	0.15212	0.32871	1.68529	1.85834	4.20023	Very healthy
	2012	0.18902	0.15344	0.32003	1.68662	1.87529	4.22441	Very healthy
	2013	0.20229	0.15477	0.31135	1.68794	1.89224	4.24859	Very healthy
	2014	0.21555	0.15609	0.30267	1.68926	1.90920	4.27277	Very healthy
	2015	0.22882	0.15741	0.29400	1.69058	1.92615	4.29695	Very healthy
	2016	0.24208	0.15873	0.28532	1.69190	1.94310	4.32113	Very healthy
	2017	0.25534	0.16006	0.27664	1.69323	1.96005	4.34531	Very healthy
	2018	0.26861	0.16138	0.26796	1.69455	1.97700	4.36950	Very healthy
ELSA	2010	0.18187	0.16270	0.25929	1.69587	1.99395	4.29368	Very healthy
	2011	0.16951	0.16402	0.25061	1.69719	2.01090	4.29224	Very healthy
	2012	0.15716	0.16534	0.24193	1.69852	2.02785	4.29080	Very healthy
	2013	0.14480	0.16667	0.23325	1.69984	2.04480	4.28936	Very healthy
	2014	0.24927	0.16799	0.22457	1.70116	2.06175	4.40475	Very healthy
	2015	0.35375	0.16931	0.21590	1.70248	2.07871	4.52014	Very healthy
	2016	0.45822	0.17063	0.20722	1.70380	2.09566	4.63553	Very healthy
	2017	0.56269	0.17195	0.19854	1.70513	2.11261	4.75092	Very healthy
	2018	0.66717	0.17328	0.18986	1.70645	2.12956	4.86631	Very healthy
RUIS	2010	0.01247	0.01460	0.18118	1.70777	2.14651	4.06254	Very healthy
	2011	0.01451	0.01592	0.17251	1.70909	2.16346	4.07549	Very healthy
	2012	0.01655	0.01724	0.16383	1.71041	2.18041	4.08845	Very healthy
	2013	0.01859	0.01856	0.15515	1.71174	2.19736	4.10140	Very healthy
	2014	0.02063	0.01989	0.14647	1.71306	2.21431	4.11436	Very healthy
	2015	0.02266	0.02121	0.13779	1.71438	2.23127	4.12731	Very healthy
	2016	0.02470	0.02253	0.12912	1.71570	2.24822	4.14027	Very healthy
	2017	0.02674	0.02385	0.12044	1.71702	2.26517	4.15323	Very healthy
	2018	0.02878	0.02518	0.11176	1.71835	2.28212	4.16618	Very healthy



Source: Data analysis, 2023.

a) X1 Calculation (Working capital to total assets)

This variable indicates the company's liquidity level and the company's ability to meet its short-term obligations. This liquidity ratio aims to test the adequacy of funds, which must be fulfilled immediately. The mining and petroleum companies that have

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been tested all have positive X1 values during the 2010-2018 period. This positive value indicates that all companies have the ability to pay their short-term obligations. The higher the liquidity, the greater the current assets owned by the company compared to its current liabilities. Company liquidity plays an important role in the continuity of the company, when the value of the company's liquidity level is not good, this will reduce external parties, especially creditors, to provide loans.

b) Calculation of X2 (retained earnings to total assets)

The variables belonging to this profitability ratio serve to describe the measurement of the company's retained earnings which reflects the age of the company and the strength of the company's earnings. Profit value held and a low X2 indicates that the company is having a bad year in business. Meanwhile, the high value of retained earnings and X2 indicates that the company is in a healthy business year. Based on test results from mining and oil companies in Indonesia during 2010-2018 it shows that all companies have a positive X2 value, so this value means that all companies are in a good business year. A high company profitability ratio indicates that the return on investment from the company's assets is very good. The profit generated by the company is sufficient to fund the company's operations and is able to return investments from investors. This also shows that the company's financial condition is in good condition and far from financial distress. The more profits the company achieves, the better the company's financial performance will show, so that the company will be further away from financial distress. This reflects that it is important for mining companies to increase profitability in an effort to overcome financial distress in the future.

c) X3 calculation (EBIT to total assets)

This variable serves to measure the company's ability to generate profits from the assets used, so that it can be referred to as a measure of the productivity of the company's assets. Profitability measures can be of various kinds, such as operating profit, net income, rate of return on investment/assets, and rate of return on owner's equity. X3 which has a positive value indicates that the company has a high ability to generate profits from its assets. Apart from being an indicator of the company's ability to meet the obligations of its funders, company profit is also an element in creating company value that shows the company's prospects in the future. Effectiveness is assessed by relating net income which is defined in various ways to the assets used to generate profits. The profitability ratio shows the company's success in generating profits. Profitability analysis is an analysis used to measure the profit strength of a company.

d) X4 calculation (Market value of common stock and preferred stock to book value of total debt)

X4 serves to describe the solvency (leverage) of the company in the form of the company's long-term financial ability and to determine the amount of company capital used to bear the debt burden. The X4 value of all the companies that are the research sample shows a positive value during the 2010-2018 period, so that it can be seen that all companies have good long-term financial capabilities with guaranteed assets or assets owned by the company. Solvability itself is the ability of a company to pay off all debts by using assets as collateral for debt which is the basic concept of accounting. The company's solvency will also reflect the company's ability to pay off or repay all loans through the total assets it owns. This ability will also affect the financial statements of a company. A company can be declared healthy if its liquidity level is at least equivalent to its solvency level. If solvency is higher than liquidity, then this company is in an unhealthy financial condition. Thus, requiring balance sheet restructuring or other financial strategies.

e) Calculation of X5 (sales to total assets)

This X5 variable is used to measure management's ability to use assets to generate sales and illustrates the turnover rate of all company assets. The total asset turnover ratio is part of the activity ratio. This ratio focuses on managing the company's assets. X5 which has a positive value is a sign that the company has a good ability to use assets to generate sales and has a high asset turnover rate. The calculation results show that all companies that are the object of research have a positive X5 value from 2010 to 2018, so that it can be seen that the management of these companies have a good ability to use assets to generate sales and have a good level of asset turnover. This financial ratio is needed by all parties, from management to investors. The function of this ratio is to find out how effective and efficient a company is in managing its assets. Knowing the total assets and sales owned by the company. The company is able to find out the assets used in boosting sales. So, by knowing this ratio you can find out how quickly assets can be rotated to increase company income. The function of this ratio is to find out how effective and efficient a company is in managing its assets. Knowing the total assets and sales owned by the company. The company is able to find out the assets used in boosting sales. So, by knowing this ratio you can find out how quickly assets can be rotated to increase company income. The function of this ratio is to find out how effective and efficient a company is in managing its assets. Knowing the total assets and sales owned by the company. The company is able to find out the assets used in boosting sales. So, by knowing this ratio you can find out how quickly assets can be rotated to increase company income.

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DISCUSSIONS

Indonesia has abundant natural resource wealth, both renewable natural resources and non-renewable natural resources. Therefore, Indonesia is called one of the richest countries in the world. One of the abundant natural resources in Indonesia when compared to other countries is the result of mining and quarrying. The Indonesian mining and quarrying sector is one of the sectors that drives the country's economy and development. In fact, the Association of National Oil and Gas Companies noted that the potential for oil and natural gas in Indonesia is very abundant. In fact, oil reserves in Indonesia reached 4.2 billion barrels. However, while there are many oil and gas fields that have not been explored, especially in the high seas, Eastern Indonesia whose infrastructure has not yet been built, because it requires expensive operating costs. However, the large potential of natural resources in the mining sector will be wasted if not managed properly and wisely.

There are obstacles faced by the mining sector, so it is necessary to have several efforts that must be carried out immediately, such as accelerating the ratification of the Mineral and Coal Draft Law which regulates the use of minerals and coal, synchronizing and harmonizing policies on all legal products relating to the mining sector, which are cross-sectoral both central and regional, encouraging an increase in local expenditure by increasing the use of products from domestic supporting industries, encouraging the growth of the domestic mineral product processing industry, so as to increase the added value of national mineral and coal products as well as a one-door policy in licensing for investment mining sector.

The results of calculating the research data that has been carried out show that the five variables used are Working Capital to Total Assets (X1), Retained Earnings to Total Assets (X2), Earning Before Interest and Taxes to Total Assets (X3), Market Value of Equity to Book Value of Debt (X4), and Sales to Total Assets (X5), are proven to have a positive value in each of the financial ratios used as indicators in this study. This means that all mining and oil companies have very healthy financial conditions and indicate that the company is in the non-bankrupt company category. The results of this calculation should be used by observers and potential investors now to start investing in Indonesian oil and mining companies. This is due to the large reserves of natural resources and the company's good financial condition, so it is estimated that for the next 10-20 years, the consistency of the mining and oil industry in Indonesia will still be very profitable. The government is also currently trying to finalize the revision of Law Number 22 of 2001 concerning Upstream Oil and Gas to ensure legal certainty in the future upstream oil and gas sector. The Ministry of Industry is also pushing to provide easy access to the establishment of industrial estates in carrying out industrial downstream activities, including nickel-based ones. This is because Indonesia has nickel reserves of 72 million tons, or 52 percent of the world's total nickel reserves. This certainly makes Indonesia a great attractiveness for investment in the industrial sector.

The development of industrial estates outside Java will certainly accommodate downstream natural resource-based industrial policies. This will automatically increase the added value of commodities significantly, as well as contribute to import substitution efforts, increase labor absorption, and improve people's welfare and the economy in the region. In the meantime, there is 36 industrial estates with development priorities outside Java, supported by the provision of around 50 thousand hectares of land and the construction of new Small and Medium Industry (IKM) centers, at least one IKM center in each district or city. In Southeast Sulawesi province, which is one of the 22 industrial growth center areas according to Government Regulation number 14 of 2015 concerning the national industrial development master plan for 2015-2035, there are industrial designated areas covering an area of 4,244.68 hectares, with four industrial areas, including true industrial archipelago industrial area.

The government really wants to develop an eco-friendly and sustainable modern industrial estate ecosystem. For this reason, the government fully supports the investment climate in Indonesia to get better, by continuing to increase investment attractiveness through the provision of licensing facilities, fiscal and non-fiscal incentive facilities, to the imposition of a ban on the export of raw materials. This is done primarily for domestic production of nickel ore, because its main objective is to support the raw material needs of the domestic industry, taking into account environmental social governance, meaning that the industrial sector also pays attention to environmental management and its sustainability, as well as regional and community development.

Indonesia is a perfect investment destination for foreign investors. Why? Because if foreign investors make and invest in Indonesia, it has a huge potential to gain profits. The main factor that is one of the important factors for foreign investors to look at Indonesia is because of natural resources. Indonesia has abundant natural resources, ranging from petroleum resources, mining resources, and natural gas resources. Indonesia is also the largest archipelagic country which is one of the highlights in the world because it has a very strategic location. So there are many interesting and profitable factors when foreign investors invest in Indonesia. However, for foreign investors must pay attention to the obligations that they live and carry out while investing in Indonesia. In addition to getting benefits and rights while investing in Indonesia, of course every obligation that must be carried out and fulfilled by foreign investors must also be carried out first, so as not to harm one another.

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CONCLUSIONS

Building a company is certainly a challenge in itself, especially regarding finances (Zhu & Westphal, 2021). This is important because this issue of financial health determines whether a company can continue to grow or not. The company's financial health can be seen in terms of profit ratios, liquidity, solvency and activity (Baker et al., 2021). Financial management aims to maintain the income of funds, utilize funds optimally and efficiently, to create safe investment opportunities. Therefore, you as a financial manager will at least be tasked with calculating the required business capital, determining investments to increase profits, allocating profits for business progress, and carrying out the financial control function. That way, implementing financial management will assist companies in planning and obtaining funds, utilizing and allocating funds received effectively, making important financial decisions, assisting in increasing organizational profitability, and maintaining the company's economic stability (Ilahiyah et al., 2021; Ratnawati, 2020).

Based on the results of the research conducted, the conclusion regarding the results of the bankruptcy prediction analysis using the Altman method (Z-Score) is that of all the mining and petroleum companies that were the research samples, all were classified as very healthy during the year of the study period (2010-2018). However, company management should always check and evaluate periodically regarding the company's financial condition and financial ratios. The goal is to find out the company's financial condition, as well as to find out early if financial problems occur in the company, so that company management can determine policies and solutions to problems that occur.

Fundamental analysis is influenced by financial ratios which are one indicator of a company's financial performance. Measurement of conventional financial performance is important and is usually the center of attention of investors and financial analysts including analysis of the company's competitive advantage position, the company's asset liquidity, especially those related to the company's financial ability to meet its short-term obligations, the level of leverage on shareholders' equity, and the composition and the growth of the company's sales operations based on historical financial reports. Furthermore, it is known the financial ratios and other measures associated with the market model. Fundamental analysis states that the level of profit will affect stock prices, the higher the profit, the higher the stock return.

One of the benefits of performance analysis of the company's financial statements is to predict the viability of the company. Prediction of the company's survival is very important for all parties, both internal and external parties, to anticipate the possibility of potential bankruptcy. Misprediction of the continuity of a company's operations in the future can be fatal, namely loss of income or investment that has been invested in a company. Therefore, the importance of a bankruptcy prediction model for a company is very much needed by various parties such as lenders, investors, government, accountants, and management.

On the other hand, mining companies are an important pillar in the development of the Indonesian nation. This mining company is one of the main sectors contributing to the income of the state treasury. The rapid development of the mining sector that has occurred in Indonesia in recent years has attracted the interest of investors to invest in this sector. The high wealth of natural resources in Indonesia does not make this country free from problems in the mining sector. Various efforts have been made, such as the efficiency of the mining operating system through technical, administrative and management innovations, which are visible efforts to answer this challenge.

The weakness of this study is that the measurement only analyzes financial statements (fundamental analysis), so the main weakness is ignoring the cost of capital, making it difficult to know whether a company has succeeded in creating value or not. To correct these weaknesses, the EVA and MVA approaches emerged. EVA and MVA can be used for further research with the aim of measuring the company's financial performance. This step can be done as one of the right ways to be able to find out the company's financial performance in order to improve the welfare of the funders (stakeholders).

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