

The Influence Of Macroeconomic Variables, Operational Financial Performance, And Financial Ratios To Detect Financial Distress As An Early Warning System Effort In Coal Mining Companies Listed On The Indonesia Stock Exchange Period 2019 – 2021

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Abstract- This study aims to determine the effect of macroeconomic variables (through indicators of inflation, exchange rates, and interest rates), operational financial performance variables (through BOPO ratio indicators, sales volume growth, and reference coal prices), and financial distress detection variables (through ratio indicators liquidity, leverage, and profitability) to detect financial distress as an effort as an early warning system for coal mining companies listed on the IDX for the 2019 – 2021 period. **The population** used in this study was 27 coal mining companies. **The type of research** used is quantitative research through secondary data sources in the form of published financial reports that have been audited by public accountants. **The results of** this study are divided into 3, namely companies that are not detected as financial distress, companies that are not detected, and companies that are detected as financial distress. From this analysis, it resulted that there were 9 companies not detected financial distress, 0 companies not detected, and 18 companies detected financial distress. While the validity and reliability tests show that H1 macroeconomics has no effect on FD detection, H2 macroeconomics has no effect on EWS, H3 operational financial performance has an effect on FD detection, H4 operational financial performance has no effect on EWS, and H5 FD detection has an effect on EWS.

Index Terms Exchange Rate, Inflation, Interest Rate, BOPO Ratio, Sales Volume Growth, Reference Coal Price, Liquidity Ratio, Leverage Ratio, Profitability Ratio, Financial Distress, Early Warning System.

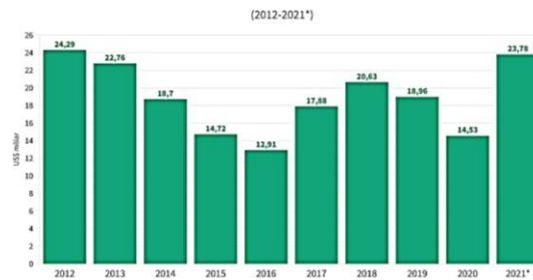
I. INTRODUCTION

Indonesia is a country that has abundant natural resources in the form of coal. The use of coal as an energy source in various industries and power plants makes coal have good economic value. In various countries the tendency to use coal as an energy resource is quite high. From the performance report of the Ministry of Energy and Mineral Resources for 2021, coal production in Indonesia reached 614 million tons, while the total coal exported was 435 million tons, meaning that 70.8% of Indonesian coal was exported to other countries.

However, the economic condition has recently experienced a considerable shock due to the Covid 19 pandemic and various other problems that have occurred. Moreover, countries that are importers of Indonesian coal also experience a weakening economy, resulting in a decrease in the amount of Indonesian coal exports.

The weakening rate of China's economic growth also had an impact on the amount of Indonesian coal exports, because China is the largest consumer of Indonesian coal. If industrial activity in China slows down, the demand for coal will also decrease. This has an impact on domestic coal mining companies that rely on coal sales of more than 70% abroad.

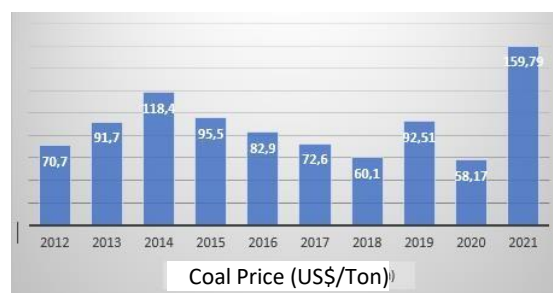
The following is Indonesia's coal export data obtained from the Central Bureau of Statistics :



Source : Central Bureau of Statistics, November 2021.
 Figure 1. Value of Indonesian Coal Exports.

Apart from the problem of the number of Indonesian coal exports, another thing that has a major influence on the condition of the coal mining industry is the price of coal. Where the price of coal always changes every month. This is what makes the condition of coal mining companies not having the certainty of the right profit value.

The following is coal price data obtained from the website of the Ministry of Energy and Mineral Resources :



Source : www.minerba.esdm.go.id/harga_acuan
 Figure 2. Reference Coal Price (HBA) 2012 – 2021.

The problems faced, especially the number of exports and the price of coal, are what cause Indonesian coal mining companies to experience financial distress.

According to Farida (2021:4) Financial distress can be interpreted as a condition in which a company is unable to fulfill its obligations. In theory, there are many indicators that can be used to see and analyze whether a company is experiencing financial difficulties or not. The easiest measure is to use profit indicators.

The company's financial condition is a way to detect financial distress as an Early Warning System (EWS). According to Glantz (2004:90) Early Warning System is a detection of unwanted situations through effective and timely information by identifying and allowing someone to act with the aim of avoiding or reducing risk, thus the Early Warning System can provide early warning of possible the company's financial difficulties in the future and can be used to determine strategic steps in making decisions as a prevention.

There are various methods developed to detect financial distress for companies, one of which is the use of cash flow analysis. The greater the amount of net cash inflow from operations in the future, the greater the company's ability to stand up and cope with changes that occur in the company's operational conditions. In other words, if the company has cash flow from operating activities that is limited, even negative, then there is a possibility that the company is experiencing financial distress.

Based on the background that has been described, that there is a phenomenon that occurs related to the export value and selling price of coal, where this can potentially cause financial distress for coal mining companies in Indonesia, so that researchers are motivated to conduct research to detect financial distress as an early warning system for companies. coal mining listed on the Indonesia Stock Exchange 2019 – 2021 seen from external factors, operational and financial conditions with the hope that the results of this research analysis can become a reference for coal mining companies.

Based on the description of the background that has been formulated previously, the objectives of this study are as follows :

1. Knowing how much macroeconomic conditions can affect financial distress.
2. Know the macroeconomic conditions that can be used as a reference for the early warning system.
3. Knowing how much operational financial performance can affect financial distress.
4. Knowing the operational financial performance that can be used as a reference for the early warning system.
5. Knowing how to detect financial distress as an early warning system.

II. LITERATURE REVIEW

Financial Distress

According to Kristanti (2021:4) financial distress is a condition in which a company is unable to fulfill its obligations. In theory, there are many indicators that can be used to see and analyze whether a company is experiencing financial difficulties or not. The easiest measure is to use profit indicators.

Early Warning System (EWS) According to Buchanan (1994) the main purpose of the Early Warning System is as a watchdog for the emergence of signs of a threat and can trigger early prevention or appropriate response and reduce the impact of the disaster risk.

According to the formal UN in Glantz (2004), an early warning system is an assessment of an unwanted situation through effective and timely information by identifying and allowing someone to act with the aim of avoiding or reducing risk.

Inflation

According to M. Natsir (2014:253) states that the notion of inflation is the tendency to increase prices of goods and services in general and continuously.

Meanwhile, Bank Indonesia defines inflation as a general and continuous increase in prices. An increase in just one or two goods cannot be called inflation unless the increase extends (or causes price increases) to other goods. The opposite of inflation is called deflation (www.bi.go.id).

Exchange Rate

According to Abimanyu (2004:244) states that currency exchange rates are currency prices relative to other countries' currencies, and because this exchange rate includes two currencies, the balance point is determined by the supply and demand of both currencies.

Interest Rate

According to M. Natsir (2014:104) states that the notion of interest rates is a signal in the form of a number in monetary policy transmission that shows the current economic situation, including an overview of challenges in achieving the inflation target.

Meanwhile, Bank Indonesia defines the interest rate as a policy that reflects the attitude or monetary policy stance set by Bank Indonesia and announced to the public. Interest rates are announced by the Board of Governors of Bank Indonesia at every monthly meeting of the Board of Governors and implemented in monetary operations carried out by Bank Indonesia through liquidity management in the money market to achieve monetary policy operational targets.

Ratio of Operating Expenses and Operating Income (BOPO Ratio) According to Veithzal (2013:131) the meaning of the BOPO ratio is the ratio used to measure the level of efficiency and ability of a bank to carry out its operational activities. Systematically according to (Veithzal et al, 2013:131) the BOPO ratio formula is : measure how liquid a company is. The trick is to compare the components on the balance sheet, namely total current assets with short-term debt. This assessment can be carried out for several periods so that the development of the company's liquidity can be seen from time to time.

1. Current Ratio

Is a ratio to measure the company's ability to pay short-term obligations or debts that are due soon when billed as a whole.

BOPO = $\frac{\text{Operating Costs}}{\text{Operating Income}}$

X 100%

Current Ratio =

Current Assets

Operational costs are the total of all costs directly related to operational activities. Operating Income is the total of income resulting from operational activities. In SE BI No. 6/23/DPNP dated 31 May 2004 explains that the value of the BOPO ratio will look efficient if it reaches a maximum value of 93.52%.

Sales Volume Growth

According to Alamiyah and Padji (2003:126) the volume of sales that a company has achieved or wants to achieve in a certain period. According to Dwi Prastowo and Rifka Jualianty (2002:148), where to find the following total sales :

Total Sales = Selling Price Per Unit x Total Units Sold

Based on some of the definitions above, it can be concluded that sales volume is the result of sales activities carried out by the company in an effort to achieve the goal of maximizing profits.

Reference Coal Price (HBA)

According to the regulation of the Director General of Mineral and Coal No. 515.K/32/DJB/2011 HBA is the average price of the steam (thermal) coal price index in the month concerned calculated in terms of coal quality equivalent of 6322 kcal/kg Gross as Received (GAR).

Liquidity Ratio

According to Kasmir (2019:130) the liquidity ratio or often referred to as the working capital ratio is the ratio used to Current Liabilities In practice it is often used that the standard current ratio is 200% (2:1) which is sometimes considered a good enough or satisfactory measure for the company. This means that with the results of such a ratio, the company already feels at a safe point in the short term.

2. Quick Ratio

Is a ratio that shows the company's ability to meet or pay obligations or current debt (short-term debt) with current assets without taking into account the value of inventory (inventory). This means that we ignore the value of inventory, by subtracting it from the total value of current assets. This is done because inventory is considered to require a relatively longer time to be cashed, if the company needs fast funds to pay its obligations compared to current assets.

Current Assets – Inventory

QR = _____

Current Liabilities

Untuk mencari *quick ratio*, di ukur dari total aktiva lancar, kemudian dikurangi dengan nilai persediaan. Terkadang perusahaan juga memasukkan biaya yang dibayar di muka jika memang ada dan dibandingkan dengan seluruh utang lancar.

Leverage Ratio

The leverage ratio is a ratio that serves to assess a company's ability to pay off all of its obligations, both in the short term and in the long term, with guaranteed assets or assets owned by the company.

1. Debt to Asset Ratio (DAR)

Is a debt ratio that is used to measure the comparison between total debt and total assets. In other words, how much the company's assets are financed by debt or how much the company's debt affects asset management.

Total Debt

DAR = _____

Total Assets

From the measurement results, if the ratio is high, it means that there is more funding with debt, it will be more difficult for the company to obtain additional loans because it is worried that the company will not be able to cover its debts with its assets. Likewise, if the ratio is low, a small number of companies are financed with debt. The measurement standard for assessing whether a company's ratio is good or not, is the average ratio of a similar industry.

2. Debt to Equity Ratio (DER)

Is the ratio used to assess debt to equity. This ratio is sought by comparing all debt, including current debt with all equity.

Total Debt

This is demonstrated by the profit generated from sales and investment income.

1. Return on Investment (ROI)

ROI is a profitability ratio calculated from net profit after deducting taxes to total assets. ROI is useful for measuring the ability of the company as a whole to generate profits against the total assets available to the company. The higher this ratio means the better the condition of a company.

Earning After Interest and Tax (EAIT)

ROI = _____

Total Assets

In addition, the return on investment shows the productivity of all company funds, both loan capital and own capital. The smaller (lower) this ratio, the less good, and vice versa. This means that this ratio is used to measure the effectiveness of all company operations.

2. Return on Equity Ratio (ROE)

ROE is a profitability ratio to assess a company's ability to generate profits from the investment of the company's shareholders expressed as a percentage. ROE is calculated from the company's income to the capital invested by the company's owners (common stockholders and preferred stockholders). Return on equity shows

DER = Equity how successful the company is in managing its capital (net worth), so that

For banks (creditors), the greater this ratio, the more unprofitable it will be because the greater the risk borne by the failure that may occur in the company. However, for companies, the greater the ratio, the better. Conversely, with a low ratio, the higher the level of funding provided by the owner and the greater the security limit for the borrower in the event of a loss or depreciation of the asset value.

Profitability Ratio

According to Kasmir (2019:198) The profitability ratio is a ratio to assess a company's ability to make a profit. This ratio also provides a measure of the effectiveness of a company's management.

the level of profit is measured from the investment of capital owners or company shareholders.

Earning After Interest and Tax (EAIT)

ROE =

Equity

III. RESEARCH METHODS

This type of research is quantitative research. The population to be used in this study are 27 coal mining companies listed on the Indonesia Stock Exchange 2019 – 2021. The research data used is secondary data in the form of published financial reports audited by public accountants. And the data is taken from www.idx.co.id which is the official website of the Indonesia Stock Exchange.

IV. RESULTS AND DISCUSSION

List of Research Object Companies

The data that is the object of research are companies engaged in the coal mining sector which publish financial reports for 2019 – 2015 on the IDX. In that year there were 27 coal mining companies listed on the Indonesia Stock Exchange. Of the 27 companies, there were no criteria for the companies studied, but all coal mining companies listed on the IDX that year.

The following are coal mining companies listed on the IDX for 2019 – 2021 :

Table 1. Research object companies.

No	Code	Company
1	ADRO	PT. Adaro Energy, Tbk.
2	AIMS	PT. Akbar Indo Makmur Stimec, Tbk.
3	ARII	PT. Atlas Resources, Tbk.
4	BOSS	PT. Borneo Olah Sarana Sukses, Tbk.
5	BSSR	PT. Baramulti Suksessarana, Tbk.
6	BESS	PT. Batulicin Nusantara Maritim, Tbk.
7	BRMS	PT. Bumi Resources Minerals, Tbk.
8	BYAN	PT. Bayan Resources, Tbk.
9	CNKO	PT. Eksploitasi Energi Indonesia, Tbk.
10	DEWA	PT. Darma Henwa, Tbk.
11	DOID	PT. Delta Dunia Makmur, Tbk.
12	DSSA	PT. Dian Swastatika Sentosa, Tbk.
13	DWGL	PT. Dwi Guna Laksana, Tbk.
14	FIRE	PT. Alfa Energi Investama, Tbk.
15	GEMS	PT. Golden Energy Mines, Tbk.
16	HRUM	PT. Harum Energy, Tbk.
17	INDY	PT. Indika Energy, Tbk.
18	ITMA	PT. Sumber Energi Andalan, Tbk.
19	ITMG	PT. Indo Tambangraya Megah, Tbk.
20	KKGI	PT. Resources Alam Indonesia, Tbk.
21	MBAP	PT. Mitrabara Adiperdana, Tbk.
22	MYOH	PT. Samindo Resources, Tbk.

23	PKPK	PT. Perdana Karya Perkasa, Tbk.
24	PTBA	PT. Bukit Asam, Tbk.
25	PTRO	PT. Petrosea, Tbk.
26	SMMT	PT. Golden Eagle Energy, Tbk.
27	TOBA	PT. TBS Energi Utama, Tbk.

Source : Processed by Researchers

Inflation

Table 2. Inflation Value for 2019 – 2021.

Month	Inflation		
	2019	2020	2021
December	2,72%	1,68%	1,87%
November	3,00%	1,59%	1,75%
October	3,13%	1,44%	1,66%
September	3,39%	1,42%	1,60%
August	3,49%	1,32%	1,59%
July	3,32%	1,54%	1,52%
Juny	3,28%	1,96%	1,33%
May	3,32%	2,19%	1,68%
April	2,83%	2,67%	1,42%
March	2,48%	2,96%	1,37%
February	2,57%	2,98%	1,38%
January	2,82%	2,68%	1,55%

Source : Processed by Researchers

Determination of the data taken in the table is at the end of the year, namely December. Where in 2019 the inflation rate touched 2.72%, while in 2020 it fell to 1.68% and in 2021 it rose to 1.87%.

Exchange Rate

Table 3. Exchange Rates for 2019 – 2021.

Month	Exchange Rate (Rp)		
	2019	2020	2021
December	13.901	14.105	14.269
November	14.102	14.128	14.340
October	14.008	14.690	14.199
September	14.174	14.918	14.307
August	14.237	14.554	14.374
July	14.026	14.653	14.491
Juny	14.141	14.302	14.496
May	14.385	14.733	14.310
April	14.215	15.157	14.468
March	14.244	16.367	14.572
February	14.062	14.234	14.229
January	14.072	13.662	14.084

Source : Processed by Researchers

Determination of the data taken in the table is at the end of the year, namely December. Where in 2019 the rupiah exchange rate against the USD touched Rp. 13,901,-, while in 2020 it will increase to Rp. 14,105,- and in 2021 it will increase to Rp. 14,269,-.

Interest rate

Table 4. Interest Rates for 2019 – 2021.

Month	Interest Rate		
	2019	2020	2021
December	5,00%	3,75%	3,50%
November	5,00%	3,75%	3,50%
October	5,00%	4,00%	3,50%
September	5,25%	4,00%	3,50%
August	5,50%	4,00%	3,50%
July	5,75%	4,00%	3,50%
Juny	6,00%	4,25%	3,50%
May	6,00%	4,50%	3,50%
April	6,00%	4,50%	3,50%
March	6,00%	4,50%	3,50%
February	6,00%	4,75%	3,50%
January	6,00%	5,00%	3,75%

20	KKGI	86%	90%	69%
21	MBAP	65%	67%	46%
22	MYOH	84%	79%	75%
23	PKPK	63%	73%	95%
24	PTBA	65%	74%	54%
25	PTRO	83%	78%	82%
26	SMMT	85%	94%	68%
27	TOBA	83%	89%	83%

Source : Processed by Researchers

Determination of the data taken in the table is at the end of the year, namely December. Where in 2019 the interest rate touched 5.00%, while in 2020 it fell to 3.75% and in 2021 it fell to 3.50%.

BOPO Ratio

Table 5. BOPO ratio.

No	Code	BOPO		
		2019	2020	2021
1	ADRO	72%	77%	56%
2	AIMS	0,0%	95%	91%
3	ARII	100%	113%	81%
4	BOSS	68%	22%	20%
5	BSSR	74%	70%	49%
6	BESS	70%	66%	60%
7	BRMS	116%	28%	41%
8	BYAN	65%	67%	33%
9	CNKO	92%	88%	86%
10	DEWA	94%	98%	89%
11	DOID	84%	91%	85%
12	DSSA	65%	65%	58%
13	DWGL	94%	88%	92%
14	FIRE	85%	78%	73%
15	GEMS	67%	64%	52%
16	HRUM	74%	73%	48%
17	INDY	85%	80%	70%
18	ITMA	0,0%	0,0%	0,0%
19	ITMG	81%	83%	56%

Source : Processed by Researchers

The standard BOPO ratio is if >65% is categorized as bad condition, whereas if <65% is categorized as good condition. This means that 65% is operational costs incurred, 35% net operating income earned.

Sales Volume

Table 6. Sales Volume Growth.

No	Code	Sales Volume Growth		
		2019	2020	2021
1	ADRO	8%	-9%	-6%
2	AIMS	0%	100%	17%
3	ARII	44%	-38%	29%
4	BOSS	89%	-21%	-10%
5	BSSR	12%	-12%	22%
6	BESS	11%	9%	11%
7	BRMS	7%	-37%	16%
8	BYAN	3%	20%	10%
9	CNKO	11%	-12%	3%
10	DEWA	1%	-2%	-2%
11	DOID	10%	-10%	16%
12	DSSA	31%	0%	-3%
13	DWGL	19%	-15%	23%
14	FIRE	-110%	-86%	49%
15	GEMS	5%	-8%	-8%
16	HRUM	-12%	-46%	-75%
17	INDY	2%	-6%	6%
18	ITMA	0	0%	0%
19	ITMG	13%	-19%	-4%
20	KKGI	62%	-35%	-13%
21	MBAP	19%	-14%	5%
22	MYOH	1%	-6%	8%
23	PKPK	-14%	21%	-67%
24	PTBA	0%	5%	8%
25	PTRO	19%	-15%	-11%
26	SMMT	16%	-38%	-20%
27	TOBA	-17%	-31%	-14%

Source : Processed by Researchers

Sales volume growth is the result of the company's annual production achievements.

Sales volume growth is the result of the company's annual production achievements. Of the 27 companies, there is only 1 company that does not have a sales volume growth value, namely ITMA, because the company does not carry out coal sales activities in 2019 – 2021.

Reference Coal Prices (HBA)

Table 7. HBA 2019 – 2021.

Month	HBA (USD/Ton)		
	2019	2020	2021
December	66,30	59,65	159,79
November	66,27	55,71	215,01
October	64,80	51,00	161,63
September	65,79	49,42	150,03
August	72,67	50,34	130,99
July	71,92	52,16	115,35
Juny	81,48	52,98	100,33
May	81,86	61,11	89,74
April	88,85	65,77	86,68
March	90,57	67,08	84,47
February	91,80	66,89	87,79
January	92,41	65,93	75,84

Source : Processed by Researchers

HBA experienced a significant price increase from 2019 – 2021. This will have an impact on company profits which will certainly generate abundant profits. Especially with coal prices reaching >100 USD/ton, the profit value will be higher.

Liquidity Ratio

Table 8. Liquidity Ratio (Current Ratio).

16	HRUM	9,22	10,07	3,07
17	INDY	2,01	1,97	1,89
18	ITMA	9,77	1,05	0,33
19	ITMG	2,03	1,98	2,71
20	KKGI	2,17	3,05	2,42
21	MBAP	3,60	3,74	3,98
22	MYOH	3,28	6,31	6,72
23	PKPK	146,13	3,86	14,20
24	PTBA	2,49	2,16	2,43
25	PTRO	1,52	1,64	1,38
26	SMMT	0,61	0,58	2,13
27	TOBA	0,92	0,73	1,74

Source : Processed by Researchers

The CR standard is if >2 times is categorized as good, while <2 times is categorized as bad. This means that the amount of current assets is 2 times the current liabilities, or every 1 rupiah of current liabilities is guaranteed by 2 rupiah of current assets.

Of the 27 coal mining companies, HRUM, MYOH and PKPK companies have good current ratios (liquidity) or are much higher than average.

Table 9. Liquidity Ratio (Quick Ratio).

No	Code	Current Ratio		
		2019	2020	2021
1	ADRO	1,71	1,51	2,08
2	AIMS	5,91	1,00	1,19
3	ARII	0,24	0,21	0,44
4	BOSS	1,34	0,58	0,59
5	BSSR	1,21	1,58	1,60
6	BESS	0,23	0,97	1,24
7	BRMS	0,33	0,70	2,97
8	BYAN	0,89	3,25	3,13
9	CNKO	0,45	0,24	0,32
10	DEWA	1,04	1,12	0,81
11	DOID	1,83	1,67	1,42
12	DSSA	1,30	1,55	1,70
13	DWGL	1,35	0,89	0,93
14	FIRE	2,80	2,26	1,39
15	GEMS	1,61	1,23	1,02

No	Code	Quick Ratio		
		2019	2020	2021
1	ADRO	1,61	1,42	1,99
2	AIMS	5,91	1,00	1,19
3	ARII	0,22	0,19	0,40
4	BOSS	0,72	0,26	0,39
5	BSSR	1,01	1,45	1,48
6	BESS	0,23	0,97	1,24
7	BRMS	0,32	0,57	2,89
8	BYAN	0,53	2,88	2,93
9	CNKO	0,43	0,23	0,31
10	DEWA	0,88	1,02	0,71
11	DOID	1,62	1,49	1,28
12	DSSA	1,20	1,43	1,58
13	DWGL	1,32	0,83	0,90
14	FIRE	2,01	2,03	1,30
15	GEMS	1,51	1,18	0,95
16	HRUM	8,70	9,59	2,81
17	INDY	1,94	1,91	1,84
18	ITMA	9,77	1,05	0,33
19	ITMG	1,59	1,69	2,54
20	KKGI	1,67	2,47	2,01
21	MBAP	3,29	3,35	3,76
22	MYOH	2,67	5,18	5,78
23	PKPK	144,25	3,86	14,20
24	PTBA	2,19	1,95	2,27
25	PTRO	1,47	1,61	1,33
26	SMMT	0,59	0,49	2,03
27	TOBA	0,45	0,48	1,62

The QR standard is if >1.5 times is categorized as good, while <1.5 times is categorized as bad. This means that the amount means that if it is >1.5 times, then the company does not have to sell inventory if it wants to pay off current liabilities (simply collect receivables).

That of the 27 coal mining companies PKPK has a very good quick ratio value.

Leverage Ratio

Table 10. Leverage Ratio (Debt to Assets Ratio).

No	Code	DAR		
		2019	2020	2021
1	ADRO	45%	38%	41%
2	AIMS	22%	39%	35%
3	ARII	87%	92%	89%
4	BOSS	78%	87%	115%
5	BSSR	32%	28%	42%
6	BESS	65%	49%	35%
7	BRMS	27%	17%	10%
8	BYAN	52%	47%	23%
9	CNKO	142%	204%	201%
10	DEWA	57%	51%	52%
11	DOID	76%	73%	84%
12	DSSA	56%	45%	42%
13	DWGL	105%	107%	89%
14	FIRE	37%	30%	38%
15	GEMS	54%	57%	62%
16	HRUM	11%	9%	26%
17	INDY	71%	75%	76%
18	ITMA	0,03%	0,2%	6%
19	ITMG	27%	27%	28%
20	KKGI	26%	22%	25%
21	MBAP	24%	24%	22%
22	MYOH	24%	15%	14%
23	PKPK	80%	41%	37%
24	PTBA	29%	30%	33%
25	PTRO	61%	56%	51%
26	SMMT	33%	36%	22%
27	TOBA	58%	62%	59%

Source : Processed by Researchers

That of the 27 ITMA coal mining companies whose funding is funded more by shareholders than liabilities.

Table 11. Leverage Ratio (Debt to Equity Ratio).

No	Code	DER		
		2019	2020	2021
1	ADRO	81%	61%	70%
2	AIMS	29%	63%	53%
3	ARII	690%	1179%	845%
4	BOSS	351%	700%	-771%
5	BSSR	47%	38%	72%
6	BESS	185%	96%	55%
7	BRMS	37%	21%	11%
8	BYAN	106%	88%	31%
9	CNKO	-341%	-197%	-199%
10	DEWA	135%	104%	108%
11	DOID	321%	269%	516%
12	DSSA	127%	84%	72%
13	DWGL	-1956%	-1439%	813%
14	FIRE	60%	43%	61%
15	GEMS	118%	133%	162%
16	HRUM	12%	10%	34%
17	INDY	228%	303%	318%
18	ITMA	0,03%	0,2%	6%
19	ITMG	37%	37%	39%
20	KKGI	35%	29%	34%
21	MBAP	32%	32%	29%
22	MYOH	31%	17%	17%
23	PKPK	400%	70%	60%
24	PTBA	42%	42%	49%
25	PTRO	159%	129%	105%
26	SMMT	49%	56%	29%
27	TOBA	140%	165%	142%

Source : Processed by Researchers

The DER standard is if >80% is categorized as bad, while <85% is categorized as good. This means every Rp. 100,- company funding, financed by Rp. 80,- liabilities and Rp. 20,- shareholders.

That of the 27 ITMA coal mining companies whose funding was funded more by shareholders, namely 94%, rather than 6% of its liabilities.

The standard DAR is if >35% is categorized as bad, while DAR <35% is categorized as good. This means every Rp. 100,- company funding, financed by Rp. 35,- liabilities and Rp. 65,- shareholders.

Profitability Ratio

Table 12. Profitability Ratio (Return on Investment / ROI).

No	Code	ROI		
		2019	2020	2021
1	ADRO	6%	2%	14%
2	AIMS	-4%	-4%	11%
3	ARII	-2%	-5%	0,2%
4	BOSS	0,3%	-15%	-32%
5	BSSR	0,01%	12%	47%
6	BESS	2%	8%	17%
7	BRMS	0,2%	1%	7%
8	BYAN	18%	21%	52%
9	CNKO	7%	-24%	-6%
10	DEWA	1%	0,3%	0,2%
11	DOID	2%	-2%	0,02%
12	DSSA	2%	-2%	9%
13	DWGL	-3%	5%	8%
14	FIRE	2%	3%	-9%
15	GEMS	9%	12%	43%
16	HRUM	5%	12%	11%
17	INDY	0,1%	-3%	2%
18	ITMA	9%	8%	7%
19	ITMG	10%	3%	29%
20	KKGI	4%	-8%	17%
21	MBAP	18%	15%	39%
22	MYOH	16%	15%	16%
23	PKPK	-58%	0,04%	-1%
24	PTBA	15%	10%	22%
25	PTRO	6%	6%	6%
26	SMMT	-3%	-3%	24%
27	TOBA	7%	5%	8%

Source : Processed by Researchers

ROI standard is > 30% categorized as good,

Table 13. Profitability Ratio (Return on Equity / ROE).

No	Code	ROE		
		2019	2020	2021
1	ADRO	11%	4%	23%
2	AIMS	-5%	-7%	17%
3	ARII	-12%	-58%	2%
4	BOSS	1%	-121%	212%
5	BSSR	0%	16%	81%
6	BESS	5%	16%	26%
7	BRMS	0,2%	1%	8%
8	BYAN	38%	40%	68%
9	CNKO	-17%	23%	6%
10	DEWA	2%	1%	0,4%
11	DOID	7%	-9%	0,1%
12	DSSA	4%	-4%	15%
13	DWGL	47%	-68%	69%
14	FIRE	3%	4%	-15%
15	GEMS	19%	27%	112%
16	HRUM	5%	13%	15%
17	INDY	0,4%	-12%	7%
18	ITMA	9%	8%	7%
19	ITMG	14%	4%	40%
20	KKGI	6%	-10%	23%
21	MBAP	24%	20%	50%
22	MYOH	21%	17%	19%
23	PKPK	-290%	0,1%	-2%
24	PTBA	22%	14%	33%
25	PTRO	15%	14%	13%
26	SMMT	-4%	-4%	31%
27	TOBA	17%	12%	19%

Source : Processed by Researchers

Standard ROE is >40% categorized as good, while <40% is categorized as bad.

while <30% is categorized as bad). This means that if the rate of return on investment obtained by 30% is good.

That of the 27 coal mining companies BOSS, CNKO, and PKPK which have low profit levels to touch minus values. This means that if the rate of return on investment obtained by 40% is good.

That of the 27 coal mining companies ARII, BOSS, DWGL, and PKPK which have low investment returns to touch minus values. This means that in the period 2019 – 2021 the company continues to experience losses.

Financial Distress Detection

Companies experiencing financial distress can be analyzed based on :

1. BOPO ratio (operating income operating costs).
2. Sales volume growth.
3. Liquidity ratio, through current ratio and quick ratio.
4. Leverage ratio, through debt to assets ratio and debt to equity ratio.
5. Profitability ratios, through return on investment and return on equity.

Assessment of financial distress detection is based on points from each ratio, where

these points are added up from all ratios, so it can be concluded that :

1. It is said that FD is not detected, if it has an average point >3.
2. It is said not detected, if it has no point (-

).

3. It is said to be detected as FD, if it has a number of points <2.

From the results of this analysis, it can be concluded that the coal mining companies listed on the Indonesia Stock Exchange in 2019 – 2021 have detected financial distress, not detected, and not detected financial distress.

Tabel 14. Results of Point Assessment Sum of All Ratios.

No	Code	BOPO Ratio			Sales Volume Growth			Liquidity, Current Ratio			Liquidity, Quick Ratio			Leverage, DAR			Leverage, DER			Profitability, ROI			Profitability, ROE			Ave.
		19	20	21	19	20	21	19	20	21	19	20	21	19	20	21	19	20	21	19	20	21	19	20	21	
1	ADRO	2	2	3	1	1	1	4	4	5	5	4	5	1	1	1	1	2	2	1	1	1	1	1	1	2
2	AIMS	1	1	1	1	5	1	5	3	3	5	4	4	3	1	1	4	2	3	1	1	1	1	1	1	2
3	ARII	1	1	1	3	1	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
4	BOSS	2	4	5	5	1	1	3	2	2	3	2	2	1	1	1	1	1	5	1	1	1	1	1	5	2
5	BSSR	2	2	3	1	1	2	3	4	4	4	4	4	2	2	1	3	4	2	1	1	5	1	1	5	3
6	BESS	2	2	3	1	1	1	1	2	3	2	3	4	1	1	1	1	1	3	1	1	2	1	1	2	2
7	BRMS	1	4	3	1	1	1	1	2	5	2	3	5	2	3	4	4	4	5	1	1	1	1	1	1	2
8	BYAN	2	2	4	1	1	1	2	5	5	3	5	5	1	1	3	1	1	4	2	3	5	4	4	5	3
9	CNKO	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	5	5	5	1	1	1	1	1	1	2
10	DEWA	1	1	1	1	1	1	3	3	2	3	4	3	1	1	1	1	1	1	1	1	1	1	1	1	2
11	DOID	1	1	1	1	1	1	4	4	3	5	4	4	1	1	1	1	1	1	1	1	1	1	1	1	2
12	DSSA	2	2	3	2	1	1	3	4	4	4	4	5	1	1	1	1	1	2	1	1	1	1	1	1	2
13	DWGL	1	1	1	1	1	2	3	2	2	4	3	3	1	1	1	5	5	1	1	1	1	5	1	5	2
14	FIRE	1	2	2	1	1	3	5	5	3	5	5	4	1	2	1	2	3	2	1	1	1	1	1	1	2
15	GEMS	2	2	3	1	1	1	4	3	3	5	4	3	1	1	1	1	1	1	1	1	5	1	2	5	2
16	HRUM	2	2	3	1	1	1	5	5	5	5	5	5	4	4	2	5	5	4	1	1	1	1	1	1	3
17	INDY	1	2	2	1	1	1	5	4	4	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	2
18	ITMA	1	1	1	1	1	1	5	3	1	5	4	2	5	5	4	5	5	5	1	1	1	1	1	1	3
19	ITMG	1	1	3	1	1	1	5	4	5	5	5	5	2	2	2	4	4	4	1	1	4	1	1	5	3
20	KKGI	1	1	2	4	1	1	5	5	5	5	5	5	2	3	2	4	4	4	1	1	2	1	1	1	3
21	MBAP	2	2	3	1	1	1	5	5	5	5	5	5	3	3	3	4	4	4	2	2	5	1	1	5	3
22	MYOH	1	2	2	1	1	1	5	5	5	5	5	5	3	3	4	4	5	5	2	2	2	1	1	1	3
23	PKPK	2	2	1	1	2	1	5	5	5	5	5	5	1	1	1	1	2	2	1	1	1	1	1	1	2
24	PTBA	2	2	3	1	1	1	5	5	5	5	5	5	2	2	2	3	3	3	2	1	3	1	1	3	3
25	PTRO	1	2	1	1	1	1	4	4	3	4	5	4	1	1	1	1	1	1	1	1	1	1	1	1	2
26	SMMT	1	1	2	1	1	1	2	2	5	3	2	5	2	1	3	3	3	4	1	1	3	1	1	3	2
27	TOBA	1	1	1	1	1	1	2	2	4	2	2	5	1	1	1	1	1	1	1	1	1	1	1	1	1

Source : Processed by Researchers

Table 15. FD Detected Company.

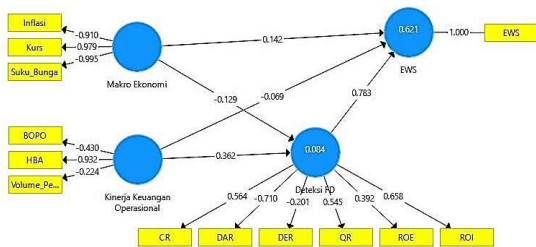
No	FD Detected	Not Not Detected	FD Detected
1	BSSR		ADRO
2	BYAN		AIMS
3	HRUM		ARII
4	ITMA		BOSS
5	ITMG		BESS
6	KKGI		BRMS
7	MBAP		CNKO
8	MYOH		DEWA
9	PTBA		DOID
10			DSSA
11			DWGL
12			FIRE
13			GEMS
14			INDY
15			PKPK
16			PTRO
17			SMMT
18			TOBA
	9	0	18

Source : Processed by Researchers

From the results of the points on all ratios, it can be concluded that out of the 27 companies there are 9 companies that are not detected by FD, meaning that the company has a good financial condition, 0 companies are not detected, meaning that the company is not known whether it is experiencing financial distress or not, usually delisting companies, and 18 companies that were detected by FD, meaning that these companies have financial problems.

Companies that are detected as FD are companies that are included as companies that need to implement an early warning system, so that repairs and/or prevention need to be carried out so that their financial condition does not get worse.

Analisa Validitas Indikator (Outer Model)



Source : Processed by Researchers

Figure 1. Relationship between Indicators.

The value of convergent validity is the value of the loading factor on latent variables and their indicators. While the expected value is >0.5 .

From these data there are 6 model indicators that are acceptable or reliable, namely Current Ratio (CR), Quick Ratio (QR), Return of Investment (ROI), EWS, HBA, and Exchange Rate indicators, because they have a loading factor value of >0.5 . While other indicators cannot be accepted because they have a loading factor value of <0.5 .

Construct Reliability and Validity Test

Table 16. Construct Reliability and Validity Test

Variable	Cronbach's Alpha	AVE
FD Detected	0.510	0.493
EWS	1.000	1.000
Operational Financial Performance	1.000	1.000
Macroeconomics	1.000	1.000

Source : Processed by Researchers

From these data it shows that if the value of Cronbach's Alpha is >0.5 then it is reliable. Whereas Composite Reliability if the value is >0.6 then Reliable. Referring to the Average Variance Extrated (AVE) value, the construct AVE value can be explained by 50% or more of the variance of the item if the value is >0.5 . From these data, the FD detection variable does not pass AVE.

In Cronbach's Alpha, only the EWS variable is reliable because it has a value >0.5 .

Discriminant Validity (Cross Loading) To determine whether a reflective indicator is really a good measure of its construct. Its function is to correlate indicators to the intended variable.

Table 17. Cross Loading.

Indicator	FD Detected	EWS	Operational Financial Performance	Macroeconomics
CR	0.773	0.414	-0.001	-0.062
EWS	0.686	1.000	0.268	0.223
HBA	0.209	0.268	1.000	0.799
Kurs	0.125	0.223	0.799	1.000
QR	0.761	0.390	0.011	-0.051
ROI	0.551	0.540	0.319	0.268

Source : Processed by Researchers

Reflective value if the value of the indicator leading to the variable has a value > 0 . Based on these data, there are indicators that are not reflective of the target variable, including CR on Operational Financial Performance, CR on Macroeconomics, and QR on Macroeconomics.

Bootstrapping (Direct Effects)

The type of testing on bootstrapping uses the One Tiled test type where the testing is carried out in a directed manner. The standard assessment on the T-Statistic is

>1.96 , meaning that if the value is >1.96 then it has an effect, while the P-Value is <0.05 then it is significant.

Table 18. Bootstrapping (Direct Effect).

hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Value
------------	---------------------	-----------------	----------------------------	--------------	---------

FD detection → EWS	0.664	0.675	0.084	7.855	0.000
Operational Financial Performance → FD Detection	0.302	0.290	0.169	1.784	0.038
Operational Financial Performance → EWS	0.046	0.036	0.136	0.339	0.367
Macro Economy → FD Detect	-0.116	-0.129	0.175	0.664	0.254
Macroeconomic → EWS	0.103	0.109	0.112	0.923	0.178

Source : Processed by Researchers

From these data it can be explained as follows :

1. H1, Macroeconomics has no significant effect on FD detection because P-Value >0.05 (0.254).
2. H2, Macroeconomics has no significant effect on EWS because P-Value >0.05 (0.178).
3. H3, Operational Financial Performance has a significant effect on FD detection because P-Value <0.05 (0.038).H4, Operational Financial Performance has no significant effect on EWS because P-Value >0.05 (0.367).
4. H5, FD detection of EWS has a significant effect because P-Value <0.05 (0.000).

Indirect Effect

The standard assessment on the T-Statistic is > 1.96, meaning that if the value is >1.96 then it has an effect, while the P-Value is <0.05 then it is significant.

Tabel 19. Specific Indirect Effects.

Connection	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values
Operational Financial Performance → FD Detection → EWS	0.200	0.197	0.120	1.664	0.048
Macroeconomics → FD Detection → EWS	-0.077	-0.085	0.118	0.650	0.258

Source : Processed by Researchers

From these data it can be explained as follows :

1. Operational Financial Performance on FD Detection of EWS, has a significant effect.

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2. Macroeconomics on FD detection on EWS, has no significant effect.

V. DISCUSSION

Effect of Macroeconomics on FD Detection (H1)

Based on the results of the analysis, it shows that macroeconomics has no significant effect on FD detection, in other words, macroeconomics has no significant effect on FD detection. This shows that changes in macroeconomic conditions which consist of inflation, exchange rates and interest rates may not necessarily affect the detection of FD which consists of liquidity, leverage and profitability. Whereas the hypothesis "Macroeconomics Has a Significant Influence on FD Detection Analysis" was declared rejected and not proven to be true.

Effect of Macroeconomics on EWS (H2) Based on the results of the analysis, it shows that macroeconomics has no significant effect on EWS, or it can be interpreted that macroeconomics has no significant effect on EWS. This indicates that changes in macroeconomic conditions consisting of inflation, exchange rates and interest rates cannot be used as a reference for the Early Warning System. These results indicate that the hypothesis "Macroeconomics can be used as a reference as an Early Warning System" is rejected and has not been proven true.

There is no macroeconomic effect on EWS because macroeconomic conditions in the 2019 – 2021 period did not experience significant changes, so that EWS, which is used as a signal of a company's financial condition, has less effect.

Effect of Operational Financial Performance on FD Detection (H3) Based on the results of the analysis, it shows that operational financial performance has a significant effect on FD detection, or it can be interpreted that operational financial performance has a significant effect on FD detection. This shows that the condition of the operational financial performance which consists of the BOPO ratio, sales volume growth, and the reference coal price (HBA) has a significant effect.

These results indicate that the hypothesis "Operational Financial Performance has a significant effect on Financial Distress Detection analysis" is declared accepted and proven to be true.

Effect of Operational Financial Performance on EWS (H4)

Based on the results of the analysis, it shows that operational financial performance has no significant effect on EWS, or it can be interpreted that operational financial performance has no significant effect on EWS. This indicates that the condition of operational financial performance which consists of the BOPO ratio, sales volume growth, and the reference coal price (HBA) cannot be used as a reference as EWS.

These results indicate that the hypothesis "Operational Financial Performance can be used as a reference as an Early Warning System" is declared rejected and has not been proven true.

Effect of FD Detection on EWS (H5) Based on the results of the analysis, it shows that FD detection has a significant effect on EWS, or it can be interpreted that FD detection has a significant effect on EWS. This shows that FD detection which consists of liquidity ratios, leverage, and profitability has a significant effect on EWS.

These results indicate that the hypothesis "Financial Distress Detection can be used as a reference as an Early Warning System" is declared accepted and proven to be true.

VI. CONCLUSION

Based on the results of the research and discussion, the following conclusions can be drawn :

1. From the sum of the values for all ratios, that of the 27 coal mining companies listed on the Indonesia Stock Exchange for the 2019 – 2021 period, there were 9 companies that had no FD detected, 0 companies that had not been detected, and 18 companies that had detected FD.
2. Companies that were not detected were companies that experienced delisting in the period 2019 – 2021. However, none of the 27 coal mining companies in the 2019 – 2021 period were delisted.
3. H1 shows that macroeconomics has no significant effect on FD detection, in other words Macroeconomics has no significant effect on FD detection.
4. H2 shows that macroeconomics has no significant effect on EWS, or it can be interpreted that macroeconomics has no significant effect on EWS.
5. H3 indicates that operational financial performance has a significant effect on FD detection, or it can be interpreted that operational financial performance has a significant effect on FD detection.
6. H4 shows that operational financial performance has no significant effect on EWS, or it can be interpreted that Operational Financial Performance has no significant effect on EWS.

7. H5 indicates that FD detection has a significant effect on EWS, or it can be interpreted that FD detection has a significant effect on EWS.

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