



# Financial Distress and Bankruptcy Prediction Research in Indonesia: Last 20 Years

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**Abstract.** Research on financial distress and bankruptcy prediction is an interesting topic to examine. This can be seen from the many studies on this topic. The emergence of many economics, management, and accounting journals in Indonesia has tried to document and evaluate the results of bankruptcy prediction models. The purpose of this research is to provide empirical evidence on the study of financial distress and bankruptcy prediction in Indonesia. This research is a type of bibliographic study. This study analyzed 100 articles on financial distress, bankruptcy prediction, and the similar from 41 nationally accredited journals indexed by Sinta 1 and Sinta 2 from 2002 to 2021. The approach used in this research is charting the field. Researchers used this approach in mapping financial distress research over the past 20 years based on accredited journals in Indonesia. The results of financial distress and bankruptcy prediction research are mostly published by the Accounting Analysis Journal (AAJ). As many as 72% of research articles use financial distress and bankruptcy prediction as dependent variables. The most widely used research method is the analytical method with the object of research on manufacturing companies. Interest Coverage Ratio (ICR) is the most widely used indicator of financial distress assessment and bankruptcy prediction after Altman Z-Score and Modified Z-Score - EM Score.

**Keywords:** Financial distress · Bankruptcy prediction · Bibliography · Literature review

## 1 Introduction

Company conditions experience dynamics from time to time. The company's ability to earn profits is not always accompanied by the ability to handle debt. The inability to compete can result in decreased profitability. Too much debt burden can cause the company to experience cash flow pressure [1]. Information on the healthy or financially distressed condition of a company is very important. It is important not only for the sector in which the company operates but also for the financial system and the economy as a whole [2]. The fundamental nature of business activities involves taking risks [3]. Some companies are unable to avoid financial distress.

Financial distress is a term in corporate finance used to describe a condition where a company's commitment to pay debts to creditors has been breached or cannot be paid [4, 5]. This is generally associated with high costs for the company because it is unable to pay its obligations, which is called the cost of financial distress [6]. Financial distress is a serious problem that can lead to corporate bankruptcy. Bankruptcy is defined as a condition in which a company's business operations are terminated under a certain legal framework [7].

Recorded since January 2022, there are more than 10 issuers that have the potential to be delisted by the Indonesia Stock Exchange (IDX) and previously had been stopped or suspended for a long time. The IDX can delist the shares of a listed company if the company experiences conditions or events that have a material adverse impact on the company's operations, both financially and legally, or on the continuation of the company's status as a public company. On the other hand, the listed company cannot show adequate indications of recovery. A number of issuers whose shares have been suspended for more than 24 months by the IDX, namely: PT Nipres Tbk (NIPS), PT Sugih Energi Tbk (SUGI), PT Polaris Investama Tbk (PLAS), PT Magna Investama Mandiri Tbk (MGNA), PT Trikonsel Oke Tbk (TRIO), and PT Hanson International Tbk (MYRX). There are 5 issuers that have received warnings from the IDX because they have the potential to be delisted, even though they have not reached the 24-month stock suspension period, namely: PT Leyand International Tbk (LAPD), PT Cowell Development Tbk (COWL), dan PT Garda Tujuh Buana Tbk (GTBO) which have each experienced an 18-month suspension, while for PT Dua Putra Utama Makmur Tbk (DPUM) and PT Bukit Uluwatu Villa Tbk (BUVA) have each experienced a 6-month suspension [8]. Kwee [9] suggests that companies facing potential delisting have generally experienced financial problems in a certain period. These problems can include not publishing financial reports, not paying capital market fees, facing the risk of bankruptcy until business operations are not running at all.

Thai et al. [10], Prihadi [1], and Çolak [2] explain that for lenders, a decrease in the ability to pay can result in a decrease in creditor income. In its most severe form, creditors find that some of their borrowers default. One of the analyses developed from the lender's side is bankruptcy analysis. This analysis can help companies and investors in making decisions in saving the company from bankruptcy. Early indications of a company that can be recognized early if the financial statements are analyzed more carefully in a certain way [10–12].

Financial ratios can be used as an indication of a company's level of financial distress which can then form a prediction model [13–20]. Bankruptcy prediction models that have been successfully developed include univariate analysis [13], Multivariate Discriminant Analysis [21], logit model [14], probit model [22], and hazard model [23]. These prediction models use various financial ratios consisting of liquidity ratios, solvency ratios, profitability ratios, activity ratios [2] and some models include macroeconomic influences in the assessment [23].

Financial distress and bankruptcy prediction is becoming an increasingly interesting area of research. Many academic studies have explored the best accuracy prediction model of company failure [24]. Research on financial distress and bankruptcy prediction is an interesting topic to examine. This can be seen from the many studies on this

topic. The emergence of many economics, management, and accounting journals in Indonesia has tried to document and evaluate the results of bankruptcy prediction models. Motivated by research by [25] on bibliographic research in management accounting, [26] on the development of banking performance, [27] on taxation research, researchers try to examine with similar methods the review of financial distress research and bankruptcy prediction in Indonesia.

The purpose of this research is to provide empirical evidence on the study of financial distress and bankruptcy prediction in Indonesia. This study analyzed 100 articles on financial distress, bankruptcy prediction, and the similar from 41 nationally accredited journals indexed by Sinta 1 and Sinta 2 until 2021. The approach used in this research is charting the field. Researchers used this approach in mapping financial distress research over the past 20 years based on accredited journals in Indonesia. This research is expected to contribute to the development of financial distress research and bankruptcy prediction in Indonesia, so that it can be a literature review for further research that will conduct research on the same theme in Indonesia.

## 2 Research Method

This research is a type of bibliographic study. The research method used in this study is the charting the field method conducted by [25]. In this approach, researchers tried to select several research articles on financial distress research, bankruptcy prediction and the similar published in Sinta 1 and 2 accredited journals, then grouped based on research topics and variables, assessment models, research methods, and research objects. The criteria for selecting the journals are as follows. First, the accredited journals are active in 2022. Second, the journals can be accessed online. Researchers selected structurally and systematically all articles published in each journal. Third, only selected articles related to financial distress research and bankruptcy prediction in Indonesia. The total number of Sinta 1 and 2 accredited journals in the fields of economics, management, accounting, business, and finance is 95 journals. Journals that cannot be accessed online totaled 2 journals and journals that did not provide articles on financial distress, bankruptcy prediction and the similar totaled 52 journals. Based on this selection process, 41 accredited journals were obtained.

## 3 Results and Discussion

This study used 100 articles obtained from 41 Sinta 1 and 2 accredited journals with an observation period of 20 years.

### 3.1 Article Classification by Variable and Research Topic

We refer to research [25] and research [26] however, in this article we classify on 4 classifications namely variables and topics, assessment models, research methods, and research objects. Classification of financial distress and bankruptcy prediction articles based on research variables. There are four types of variables: dependent variables,

**Table 1.** Classification of Articles by Variable Type

Variable	2002 to 2011		2012 to 2021		2002 to 2021	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Dependent	5	5	67	67	72	72
Independent	5	5	19	19	24	24
Control	1	1	0	0	1	1
Moderating	0	0	2	2	2	2
Intervening	0	0	1	1	1	1
Total	11	11	89	89	100	100

**Table 2.** Classification of Dependent Variables

Variable	2002 to 2011		2012 to 2021		2002 to 2021	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Financial Distress	3	4	57	79	60	83
Bankruptcy Prediction	2	3	10	14	12	17
Total	5	7	67	93	72	100

independent variables, control variables, moderating variables, and intervening variables. Table 1, explains the classification of articles that discuss financial distress and bankruptcy prediction in Indonesia based on the position of the variables used.

Table 1 can be concluded that of the 100 sample articles for the period 2012–2021, financial distress and bankruptcy prediction are mostly positioned as the dependent variable or about 67% (67 articles) that discuss the factors that cause financial distress and bankruptcy prediction. The use of financial distress as an independent variable increased significantly from 5 articles to 19 articles. It can be concluded that 24% of the research results state that financial distress and bankruptcy prediction can affect other variables which are important assessments in company performance. Control, moderating, and intervening variables each only play a role at 1–2%.

The classification of research topics is explained in Tables 2, 3, and 4. In Table 2, the theme of financial distress in the dependent variable increases significantly from 4% (3 articles) to a total of 79% (57 articles), which means that the theme of financial distress dominates in this bibliographic study. The remaining 17% (12 articles) used bankruptcy prediction as a research theme. The same thing happens with the independent variables. Based on Table 3, the dominating research theme of 88% (21 articles) is financial distress, the remaining 13% (3 articles) use the theme of bankruptcy prediction. The theme of financial distress also dominates the use of control, moderating and intervening variables (Table 4).

**Table 3.** Classification of Independent Variables

Variable	2002 to 2011		2012 to 2021		2002 to 2021	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Financial Distress	4	17	17	71	21	88
Bankruptcy Prediction	1	4	2	8	3	13
Total	5	21	19	79	24	100

**Table 4.** Classification of Control, Moderating and Intervening Variables

Variable	2002 to 2011		2012 to 2021		2002 to 2021	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Financial Distress	0	0	3	75	3	75
Bankruptcy Prediction	1	25	0	0	1	25
Total	1	25	3	75	4	100

### 3.2 Article Classification by Assessment Model

The assessment model in bankruptcy prediction studies has 2 approaches. First, the accounting-based approach. The accounting-based approach uses various financial ratios in predicting the financial condition of the company.

Financial analysts and investors identify financial distress through profitability, liquidity, solvency, and management efficiency in the implementation of funding and financing policies [2, 12, 28]. Research that uses an accounting-based approach includes univariate analysis [13], Multivariate Discriminant Analysis [21], logit model [14], and probit model [22]. Second, the market-based approach. The market-based approach relies on the market valuation of the company by investors [29, 30]. Valuations with a market-based approach include the hazard model [23, 31]. The classification based on the valuation model is presented in Table 5.

Based on table 5, it is known that the assessment using Multivariate Discriminant Analysis (MDA) statistical classification with the Altman Z-Score and Modified Z-Score - EM Score [32] models is most widely used, which is 15% each. The Z-Score model for private companies and Springate model are 2%, and the Grover model is only 1%. The next assessment, logit Ohlson model is 1%, probit Zmijweski model is 3%, and hazard model with Shumway model and Campbell model is 1%. There were 7% (7 articles) that examined the accuracy of several models at once. Other assessments used to indicate the financial condition of companies in financial distress situations and predict bankruptcy are 52%. In Table 6, it is known that the largest number of studies use Interest Coverage

**Table 5.** Classification of Model Applications

Model	Total	Percentage (%)
<b>MDA</b>		
Z-Score (Altman model)	15	15
Z-Score (Privat Companies)	2	2
Z-Score Modified - Emerging Market Score	15	15
Springate Model	2	2
Grover Model	1	1
<b>Logit</b>		
O-Score Ohlson Model	1	1
<b>Probit</b>		
Zmijewski Model	3	3
<b>Hazard</b>		
Shumway Model	1	1
Campbell Model	1	1
<b>Application of some models</b>	7	7
<b>Others</b>	52	52
Total	100	100

Ratio (ICR), which is 19% as an indicator of financial distress and bankruptcy prediction, followed by Debt Equity Ratio and negative net income, each of which is 17%.

### 3.3 Article Classification by Research Method

Based on the research methods to examine financial distress and bankruptcy prediction in Indonesia, researchers grouped articles into 2 research methods, namely analytical methods, and literature review. Table 7 shows the classification of articles that discuss financial distress and bankruptcy prediction in Indonesia based on the research method used. The study results show that most of the research types di Indonesia especially the theme financial distress and bankruptcy prediction for the last 20 years in Sinta 1 and 2 accredited journals is using analytical methods. The analytical method was used in 95 research articles, the remaining 5 articles used a literature review approach.

### 3.4 Article Classification by Research Object

The study of financial distress and bankruptcy prediction has a variety of prediction models, so that researchers can adjust the use of the model to the object under study. The classification of research objects is presented in Table 8. Financial distress and bankruptcy prediction studies were mostly conducted on manufacturing companies is

**Table 6.** Classification of Other Measurement

Other Measurement	Total	Percentage (%)
Negative Equity	1	2
Interest Coverage Ratio (ICR)	10	19
Merton (1974)	2	4
ROA	2	4
DER	9	17
Negative Net Income	9	17
Non Performance Financing (NPF)	1	2
Credit Risk Model	1	2
Debt Service Coverage Ratio (DSCR)	3	6
EBIT	2	4
EBITDA	1	2
CAMEL	1	2
RGEC	1	2
Negative EPS	3	6
Budget Solvency	1	2
Pefindo Rating	1	2
Moneylender Loans	1	2
DAR	2	4
Current Ratio	1	2
Total	52	100

**Table 7.** Classification of Research Methods

Research Methods	2002 to 2011		2012 to 2021		2002 to 2021	
	Total	Percentage (%)	Total	Percentage (%)	Total	Percentage (%)
Analytical	10	10	85	85	95	95
Literature review	1	1	4	4	5	5
Total	11	11	89	89	100	100

41%, followed by the banking sector, especially conventional banks is 13%, a combination of various industries in one research article is 13%, while in the stocks and sharia banking sector is 11%. Services sector 9%, mining 8%, public sector 4%, and state-owned enterprises only 1%.

**Table 8.** Research Objects

Research Objects	Total	Percentage (%)
Manufacturing Company	41	41
Mining Sector	8	8
Services Sector	9	9
Conventional Banks	13	13
Banks/Sharia Shares	11	11
Public Sector	4	4
State-Owned Enterprises	1	1
Diverse Industries	13	13
Total	100	100

## 4 Conclusion

This study has presented 100 articles that discuss financial distress and bankruptcy prediction published by 41 accredited journals Sinta 1 and 2. The article review is classified based on title, topic and variables, assessment model, method, and research object. The majority of financial distress and bankruptcy prediction research articles in Indonesia are published in Accounting Analysis Journal (AAJ). The topic that is widely discussed is financial distress as the dependent variable as much as 72% (72 articles). Indicators to assess financial distress and bankruptcy prediction for 20 years of research that are most widely used are MDA with the Altman Z-Score model and Modified Z-Score - EM Score. Interest Coverage Ratio (ICR) is another method outside the MDA, logit, probit, and hazard approaches used by most studies. The analytical research method dominated the research from 2002 to 2021 by 95%, and only 5% used the literature review method.

## 5 Limitations and Suggestions

This bibliographic study is only limited to Sinta 1 and 2 accredited journals, so there are limitations of only 41 journals that can be accessed and reviewed. Further research could add a larger amount of data using a more sophisticated approach. The results of this study show the fact that researchers mostly choose analytical methods in the manufacturing sector, this makes further research opportunities to research with the literature review method or use research objects in the public sector and BUMN, which are known to be limited methods and studies in these sectors.

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