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Zmijewski (X-Score) Model for Financial Distress Prediction: Implementing Good Corporate Governance In Indonesia

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Abstract: *Financial distress is an indication that a company's finances are not healthy but are still some distance from bankruptcy. Companies can identify financial problems earlier as a foundation for internal assessment and communication. One of the causes of financial distress is the state of corporate governance. The purpose of this research is to determine the effect of good corporate governance, as proxied by managerial ownership, institutional ownership, an independent board of commissioners, audit committee, and managerial agency costs, on financial distress, as calculated using the Zmijewski model (X-Score), in consumer goods companies listed on the Indonesia Stock Exchange from 2019 to 2021. The sampling technique uses the purposive sampling method and22 consumer goods industry companies met the criteria with 66 data used as research samples. The analytical method used in this research is logistic regression analysis. The results show that the independent board of commissioners has a significant effect on financial distress using the Zmijewski approach. Meanwhile, managerial ownership, institutional ownership, audit committee, and managerial agency costs do not have a significant effect on financial distress with the Zmijewski approach.*

Keywords: Financial distress, good corporate governance, zmijewski (x-score) model.

I. INTRODUCTION

Companies which experience financial difficulties are closely related to corporate bankruptcy, which is often referred to financial distress. It is starting from short-term liquidity problems as a sign of the smallest financial difficulties to bankruptcy as the most serious financial problems. Financial distress is a business stage where a company becomes financially incapacitated and unable to meet financial obligations (Abugri, 2022). Platt & Platt (2002) stated that financial distress is a stage of financial decline that occurs before bankruptcy or liquidation.

Companies in a variety of industries should be able to comprehend their internal conditions and assess the magnitude of the impact of financial distress. The manufacturing sector is classified as a consumer goods industry whose activities are highly dependent on investor capital, it must be able to maintain financial stability. It can be seen that the growth of the consumer goods industry in Indonesia has tended to slow down over the last few years. In 2017, the industry only grew 2.7%, compared to the 11% Compounded Annual Growth Rate (CAGR) from 2003 to 2017. This decrease is evidenced in the performance of several issuers listed on the Indonesia Stock Exchange (IDX), such as P.T. Unilever Indonesia Tbk. (UNVR) whose performance has decreased to 19.7%, P.T. Indofood CBP Sukses Makmur Tbk. (ICBP) whose shares slipped by 3.57%, and P.T. Kalbe Farma Tbk. (KLBF) also decrease to 20.23% (Muamar, 2018). The performance of the consumer goods industry sector on the Indonesia Stock Exchange is unclear since the beginning of 2019 which has fallen by almost 20%, 19.31% to be precise (Muamar, 2019).

One of the reasons for the decrease in the company's growth rate is the company's internal control factors. Its control can be the party that directs the company's activities needed to increase the rate of growth with the policies and strategies made by management. One thing that companies can do is to better improve the mechanism of Good Corporate Governance (GCG). It is required to develop an effective and efficient environmental business strategy. The phenomenon of growth slowly manufacturing companies due to the lack of management to ensure effective corporate governance functions avoiding financial distress (Munawar et al.,2018).

In Indonesia, the corporate governance system is still relatively weak because the principles implementation is not well understood by stakeholders, which can trigger Indonesia's recovery from prolonged economic crisis. Besides, it causes financial difficulties for companies. These difficulties are often the result of management negligence, as the case with PT Indofarma Tbk. this is due to the old management buying obsolete medical devices so they cannot be sold and then discarded, causing financial distress (Yudha & Fuad, 2014). Corporate governance problems not just have an impact on the deteriorating condition of the company, but also have an impact on company value. The company value is very important because it reflects the company's performance which can affect investors' perceptions of the company.

Implementing a corporate governance mechanism can help companies plan their goals and objectives. This system can facilitate company to monitor the emergence of good corporate governance to avoid financial distress (Alifah et al., 2022). The purpose of corporate governance is to increase value for all interested parties that the conflicts do not arise between agents and principals which have an impact on reducing agency costs (Bodroastuti, 2009). Agency costs described by Bodroastuti (2009) can occur because the parties involved between principals (shareholders) and agents (fund managers) have conflicts of interest. The emergence of these problems requires a control mechanism that is used to align the differences between company management and stakeholders.

Good corporate governance practices can create additional value for all stakeholders and shareholders. This concept emphasizes two things: First, the importance of the rights of shareholders to receive correct and timely information. Second, the company's commitment to disclose accurate, timely and transparent information about all company activities, owners, and stakeholders (Fathonah, 2017). Financial distress is expected to be avoided if good corporate governance can be implemented that the company's performance can be monitored properly.

One way to indicate financial distress in this study was calculated using the Zmijewski (X- Score) model approach. This model is chosen for this study because Husein & Pambekti (2015) found that the Zmijewski model had a stronger and more accurate significance than the other models. This model emphasizes financial ratios of the return on assets (ROA), leverage, and liquidity to obtain more precise patterns (Zmijewski, 1984) in the calculations (Permana et al., 2017).

II. LITERATURE

2.1 Financial Distress

Financial distress is a stage of financial decline that occurs before bankruptcy or liquidation (Platt & Platt, 2002). Financial distress can be described as when the company is unable to pay obligations that are due. One of the causes of financial distress occurs due to company mismanagement that occurs between the principal (owner) and agent (management) which is supported by agency theory. Agency problems occur because agents do not always act in the interests of the principal (Jensen & Meckling, 1976). Whereas on the other hand in stewardship theory managers are considered (stewards), where they carry out the duties and responsibilities given by the owner (stakeholders), regardless of material or money, but aimed at the organization (Pasoloran dan Rahman, 2001). Therefore, a tool is needed to detect the possibility of bankruptcy of an enterprise. The financial distress company indicator in this study uses calculations from the Zmijewski model.

2.2 Good Corporate Governance

Indonesian Corporate Governance Forum(FCGI, 2006) takes the definition of Corporate Governance from the Cadbury Committee of the Unitary Kingdom, which means a set of regulations governing the relationship between shareholders (company managers), creditors, government, employees, and other internal and external stakeholders, relating to their rights and obligations, or in other words, a system that regulates and controls the company. When good corporate governance is implied within the company, it can function as a control tool to minimize financial and non-financial risks that the company can generate high profits for shareholders. The implementation of good corporate governance must be based on certain principles that the implementation is in accordance with the rules and policies that have been set. These principles are explained in the general guidelines for good corporate governance in Indonesia, namely: (1)Fairness, (2)Transparency, (3)Accountability, (4)Responsibility, and (5)Independence.

2.3 Managerial Ownership

Managerial ownership is the proportion of company share ownership by managers or managers are also shareholders (Imanta & Satwiko, 2011). Managers who are also shareholders will try to optimize their duties and responsibilities that they do not only prioritize their interests. Jensen and Meckling (1976) mentioned that management will be more active in meeting the needs of the interests of shareholders that agency problems will be reduced and financial distress will be avoided. Research conducted by Manan & Hasnawati (2022), and Laksmiwati (2021) has proven that managerial ownership influences financial distress so that managerial

ownership can reduce agency conflict in companies which can reduce the level of organizational financial distress.

H_1: Managerial ownership affects financial distress

2.4 Institutional Ownership

Institutional ownership is the percentage of shares owned by institutions of all outstanding company shares (Idarti & Hasanah, 2018). This can reduce agency problems because institutional shareholders will help oversee the company to ensure that management does not act based on shareholder decisions. The presence of this institutional part allows institutional investors to control management actions and also reduces the possibility of high institutional ownership of companies that use debt as a source of financing. According to Jannah et al., (2021), qualified institutional ownership can monitor the performance of company management that financial distress is minimized.

H_2: Institutional ownership affects financial distress

2.5 Independent Board of Commissioners

Independent commissioners are members of the board of commissioners who are not affiliated with management, other members of the board of commissioners and controlling shareholders, who are free from business relationships or other relationships that may affect their ability to act independently or act solely for the benefit of the company (KNKG, 2006). The existence of independent commissioners in Indonesia is regulated in the Financial Services Authority Regulation No. 57/POJK.04/2017, explaining that securities companies must have independent commissioners of at least 30% of all members of the board of commissioners. A large number of independent commissioners will minimize the potential for financial distress because the supervision of implementation of the company's management is more supervised by independent parties (Indrati et al., 2021).The results of research conducted by Hasniati et al., (2017) and Indrati et al., (2021) proved that the proportion of independent commissioners by policies can minimize the occurrence of financial distress.

H_3 : Independent board of commissioners affects financial distress

2.6 Audit Committee

The audit committee is a committee that is responsible to the board of commissioners and aims to assist them in carrying out their supervisory functions in running of the company (Indrati et al., 2021). The company has at least three audit committees. One member the audit committee must have accounting and/or finance knowledge and skills (Ellen & Juniarti, 2013). According to agency theory, the audit committee, as an observer role in a company, is a parameter of corporate governance to reduce agency competition within the company (Manan & Hasnawati, 2022). This statement is supported by research conducted by Munawar *et al*., (2018) and Usman *et al*., (2022) shows that audit committees carry out internal controls that help supervise management to minimize financial distress.

H_4 : Audit committee affects financial distress

2.7 Managerial Agenct Cost

Managerial agency cost is the costs incurred by company owners to regulate and control performance of managers that managers work to maximize the interests of the company (Fadhilah & Syafruddin, 2013). These costs are related to managing company activities, such as managerial salaries, management fees, travel expenses, representative fees, meeting costs, social security taxes, and other costs included in the company's administrative costs (Prastiwi & Dewi, 2019). Thus, agency costs can be considered the closest condition of consumption and managerial discretion in allocating company resources. Research conducted by Rimawati &Darsono (2017) shows that the greater managerial agency costs in a company, the greater the possibility of financial distress.

H_5 : Managerial agency costs affects financial distress

III. INDENTATIONS AND EQUATIONS

3.1 Population and Sample

The population of this study is 52 consumer goods industry companies listed on the Indonesia Stock Exchange (IDX). Purposive sampling is the sampling technique used in this study. The sample for this research is 22 companies, with a total of 66 samples collected during the 2019-2021 period.

The research sample selection process is presented in Table 1 below:

Table 1. Research Sample Selection Process

Description	Amount
Consumer goods industry companies listed on the IDX 2019-2021	52
Companies that do not present audited financial reports and annual reports in the 2019-2021 period	(1)
Companies that do not have data complete related to the variables needed in research during 2019-2021	(29)
The number of samples used was	22
Total processed research data= 22 x 3 years	**66**

Sourch: Data Management Results, 2022

Data collection uses the documentation method, namely records of past events, carried out by studying company records according to the required data. The collection of research data was obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official websites of related companies.

3.2 Measurement of Operational Variables

This study uses independent variables and dependent variables as follows:

Table 2. Measurement of Operational

Variables	Indicator	Source
Financial Distress (*Zmijewski-X Score*)	X-Score = -4,3 –4,5 (X1) + 5,72 (X2) – 0,004 (X3) a. If X-Score > 0 = Unhealthy b. If X-Score < 0 = Healthy	Mettana et al.(2021)
Managerial Ownership (MO)	$MO = \frac{\text{The Number of Shares Owned by Management}}{\text{Total Outstanding Shares}} \text{x } 100\%$	Munawar et al.(2018)
Institutional Ownership (IO)	$IO = \frac{\text{The Number of Shares Owned by Institution}}{\text{Total Outstanding Shares}} \text{x } 100\%$	Munawar et al.(2018)
Independent Board of Commissioners (IBC)	$IBC = \frac{\text{The Number of Independent Commissioners}}{\text{Total Members of the Commissioners}} \text{x } 100\%$	Munawar et al.(2018)
AuditCommittee (AC)	$AC = \sum \text{Audit Committee within the Company}$	Dewi et al.(2020)
Managerial Agency Costs (MAC)	$MAC = \frac{\text{Administration and General Expenses}}{\text{Income}}$	Rimawati (2017)

3.3 Data Analysis Techniques

In this study, hypothesis testing used analysis using logistic regression analysis, the dependent variable is a dummy variable with a category value of 0 (zero) for companies that are not affected by financial distress, and a value of 1 (one) for companies experiencing financial distress. The feasibility of the regression model was determined from the results of Hosmer & Lemeshow's Goodness of Fit Test, to assess overall model fit based on the decrease of -2 Log Likelihood of the model, and then coefficient of determination using Nagelkerke's R Square. This study uses a significance value of 5%, with the following regression model:

$$\text{Ln } p/(p-1) = a + b1MO + b2IO + b3IBC + b4AK + b5MAC + e$$

The formula Ln p/(p-1) shows the probability of companies experiencing financial difficulties using independent variable measures described in table 2.

IV. DATA ANALYSIS AND DISCUSSION

4.1 Descriptive Statistical Analysis

Table3. Descriptive Statistical Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
X-Score	66	0.00	1.00	0.06	0.240
MO	66	0.00	68.28	10.5065	17.75120
IO	66	21.40	93.40	63.5141	19.37578
IBC	66	25.00	60.00	40.4573	8.53306
AK	66	2.00	4.00	2.9697	0.24618
MAC	66	-0.39	-0.01	-0.0979	0.07951

Source: Data process, 2022

Based on the descriptive statistical test in table 3, it shows that financial distress with a minimum value of 0 is a consumer goods industry company that has a negative X-Score or below 0 (zero), which means it is not affected by financial distress. The maximum value of 1 is a consumer goods industry company that has a positive X-Score value or above 0, which means it is experiencing financial distress. The standard deviation value is 0.240 with an average of 0.06. This shows on average the 66 companies have a relatively small probability of experiencing financial distress, where as much as 6% of all consumer goods industry companies have a probability of experiencing financial distress.

Managerial Ownership (MO) has a minimum value of 0.00% and a maximum value of 68.28%, while the mean is 10.5065% with a standard deviation of 17.75120%.Institutional Ownership (IO) has a minimum value of 21.40% and a maximum value of 93.40%, while the mean is 63.5141% with value a standard deviation of 19.37578%.The Independent Board of Commissioners (IBC) has a minimum value of 25.00% and a maximum value of 60.00%, while the mean is 40.4573 with a standard deviation of 8.53306%.Audit Committee (AK) minimum score of 2.00 members and maximum value of 4.00 members, while the mean is 2.9697 with a standard deviation value of 0.24618.Managerial Agency Costs (MAC) have a minimum value of -0.01 and a maximum value of -0.39, mean is -.0979 with value a standard deviation of 0.0951.

4.2 Discussion

The number of companies sub-classified in the consumer goods industry that are listed on Indonesia Stock Exchange (IDX) which issued audited financial reports and annual reports consecutively for 2019-2021 totaled 51 companies, but there were 29 companies that did not have complete data regarding the variables used in the research period. Based on the criteria there are 22 companies per year there are 66 final samples in3 study periods (Table1).

Table 4. Hosmer and Lemeshow's

Chi-square	Df	Sig.
5.068	7	0.652
Overall Model Fit		
-2 Log Likelihood Block N = 0	-2 Log Likelihood Block N = 1	
30.179	21.608	
Coefficient of Determination		
-2 Log Likelihood	Cox and Snell R Square	Nagelkerke R Square
21.608	0.122	0.332

Source: Data process, 2022

The results of testing the model with the Hosmer and Lemeshow's Goodness of Fit Test show this a Chi-Square value of 5.068 and a significance value of 0.652 (greater than 0.05) which means that research model is feasible to use and matches the observation data, this model can be used for analysis. Furthermore, these results are supported by the -2 Log Likelihood value in Block 0 of 30.179, after the independent variables are included in the regression model, the -2 Log Likelihood Block 1 value drops to 21.608. Decreasing -2 Log Likelihood means that adding independent variables to model can improve model fit and show a better regression model or the model is hypothesized to fit with the data. The Nagelkerke R Square coefficient of determination shows a figure of 0.332, meaning that the variability of each factor of good corporate governance can explain financial distress of 33.2%, while 66.8% is explained by other factors not present in the research model.

Hypothesis testing was carried out by logistic regression analysis with a significance level of 0.05 (5%) showing the regression equation as follows:

Ln p/(p-1)= -5,392 + 0,045 MO+ 0,015 MI – 0,285 IBC+ 3,874 AK+ 4,015 MAC+e

Results of hypothesis testing this research can be seen in table 5 below:

Table 5. Hypothesis Testing Results

Variable	B	Wald	Sig.
MO	0.045	0.156	0.693
IO	0.015	0.034	0.853
IBC	-0.285	4.613	0.032*
AK	3.874	0.058	0.810
MAC	4.015	0.162	0.687
Constant	-5.392	0.012	0.911

Source: Data process, 2022

The test results in state that managerial ownership does affect financial distress when using Zmijewski model. A coefficient value of 0.045 was obtained with a significance level of 0.693 where the value is greater than 0.05 (0.693 > 0.05), then **H1 is rejected**. The results of this study are different from the findings of Manan & Hasnawati (2022), and Laksmiwati (2021), but support the findings of Indrati et al., (2021).This research shows that managerial ownership during the Covid-19 pandemic cannot be used as an appropriate procedure to eliminate conflicts of interest that occur between shareholders and managers mentioned in agency theory, because at this time the company needs more injections of funds from investors to support the company's performance.

The test results a state that institutional ownership does not affect financial distress when using the Zmijewski model. A coefficient value of 0.015 was obtained with a significance level of 0.853 where the value is greater than 0.05 (0.853 > 0.05), then **H2 is rejected**. The results of this study do not support the research of Jannah et al., (2021), but are in line with Idarti & Hasanah (2018), and Indrati et al., (2021). This shows that institutional ownership only provides a strategy implemented by the company that institutional investors carryout a monitoring role and managers do not take detrimental actions in the long term. The possibility of financial distress cannot be proven based on the percentage of institutional ownership. For one reason, institutional investors play only a passive role in monitoring company management activities (Idarti & Hasanah, 2018).

The test results state that the independent board of commissioners affects financial distress when using the Zmijewski model. A negative coefficient value of -0,285 was obtained with a significance level of 0.032 where the value is less than 0.05 (0.032 < 0.05), then **H3 is accepted**. The results of this study are in line with the research of Hasniati et al., (2017) and Indrati et al., (2021). This means that their presence in the structure of the company's board of commissioners minimizes the occurrence of financial distress and is in line with agency theory whose role is to control the activities of directors and commissioners, that good corporate governance is implemented. In addition, the opportunistic nature and selfish behavior of managers are reduced so that decision-making is consistent with interests of shareholders (Jensen & Meckling, 1976). The possibility of a significant result comes from the number of independent commissioners who met the criteria or follow the rules of the OJK which stipulated that the number of independent commissioners is at least 30% of the total number of commissioners. They can run the company optimally and reduce the occurrence of financial difficulties.

The test results a state that the audit committee does not affect financial distress when using Zmijewski model. A coefficient value of 3.874 was obtained with a significance level of 0.810 where the value is greater than 0.05 (0.810 > 0.05), then **H4 is rejected**. The results of this study are different from those conducted by Munawar et al., (2018), and Usman et al., (2022) but support the findings of Indrati et al., (2021), and Ekayanthi et al., (2021). This condition contradicts agency theory, where the company's audit committee functions as an internal management mechanism to reduce agency costs. Besides, it plays an important role in the performance of the board of commissioners in fulfilling their managerial duties (Miglani et al., 2015; Indrati et al., 2021). The test results state that managerial ownership has an effect on financial distress. Because the authority of the audit committee is only limited to a delegation tool, the number of audit committee members has no effect on financial distress.

The test results state that managerial agency costs does not affect financial distress when using Zmijewski model. A coefficient value of 4.015 was obtained with a significance level of 0.687 where the value is greater than 0.05 (0.687 > 0.05), then **H5 is rejected**. The results of this research support the findings of Salim & Dillak (2021), but not the results of Rimawati & Darsono (2017). There is no influence between managerial agency costs in predicting financial distress, one of which is because of the sample companies. Management is able to manage

effectively the resources owned by company. This can be proven by the level of sales or income that is greater than the costs incurred.

V. CONCLUSION

The results of this study indicate that of the five proxies of good corporate governance, only than the independent board of commissioners has an effect, while managerial ownership, institutional ownership, audit committee and managerial agency costs have no effect on financial distress using the Zmijewski model approach in consumer goods industry companies listed on the Indonesia Stock Exchange (IDX) during 2019-2021. The use of the Zmijewski model is less sensitive in this study during the Covid-19 pandemic it showed less accurate results than under normal conditions. Zmijewski's lack of sensitivity to good corporate governance should be considered in future research to add or replace other variables such as the frequency of audit committee meetings, the board of directors, the company secretary, the General Meeting of Shareholders (GMS) or the company's financial size, due to the ability of the model in this study still small in terms of explaining the causes of the phenomenon of financial distress. And using a financial distress calculation approach other than Zmijewski, for example using the Grover, Olson, or Zavgren models which are still rarely used.

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