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Analysis of Financial Distress in Telecommunication Companies in Indonesia Using the Ohlson O-Score and Zmijewski Methods

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Abstract

Currently, major telecommunication sub-sector companies in Indonesia are experiencing rapid growth and have become dominant players in the market. However, not all telecommunication companies are profitable, as some dominant subsidiaries have experienced declining profits or losses, potentially leading to financial distress. Financial distress is a condition where a company is unable to meet its current obligations, such as trade payables, tax liabilities, and short-term debts. This study aims to analyze and evaluate the accuracy of the Ohlson O-Score and Zmijewski methods in detecting financial distress in telecommunication companies in Indonesia. The data used in this study are historical financial data from several telecommunication companies listed on the Indonesia Stock Exchange. The results show that the Ohlson O-Score is effective in early detection of potential financial distress, while the Zmijewski method is more effective in evaluating companies already in critical financial conditions.

Keywords: financial distress, bankruptcy prediction, Zmijewski, Ohlson O-Score, telecommunication.

1. Introduction.

The telecommunication sub-sector in Indonesia has seen significant growth, with several companies dominating the market. However, not all telecommunication companies are profitable, as some dominant subsidiaries have experienced declining profits or losses. Intense competition in price wars, where operators offer data tariffs below production costs, has led to an unhealthy industry, particularly in the mobile sector. The drastic increase in traffic is not proportional to revenue, and this loss-making practice threatens the financial condition of operators, potentially leading to financial distress (Winaya et al., 2020).

According Manalu et al. (2017) financial distress occurs when a company is unable to meet its current obligations, such as trade payables, tax liabilities, and short-term debts. If not addressed properly, this condition can lead to bankruptcy, reducing the company's value and investor confidence. Therefore, it is crucial for companies to detect potential financial distress early. Various financial models and indicators, such as the Ohlson O-Score and Zmijewski models, can be used to analyze and predict bankruptcy risk.

The Ohlson O-Score method, developed by James Ohlson in 1980, uses logistic regression to predict bankruptcy. It incorporates various independent variables from financial statements, such as liquidity, profitability, and solvency ratios, which are believed to influence the probability of bankruptcy. Similarly, the Zmijewski Model, developed by Edward Zmijewski in 1984, uses variables like profitability, liquidity, and capital structure to identify bankruptcy risk. The Zmijewski Model is known for its simplicity and ability to provide a clear picture of a company's financial health.

Hudaya et al. (2024) used the Zmijewski X-Score and Ohlson O-Score models to analyze bankruptcy potential in companies with special notations on the Indonesia Stock Exchange (IDX). The results showed that the Zmijewski model detected 60 out of 154 companies at risk of bankruptcy, while the Ohlson model identified 34 companies with similar potential. The study also revealed that companies with certain notations, such as E, B, Y, D, and S, had a higher risk of bankruptcy, serving as a warning for investors.

Winaya et al. (2020), expanded the analysis to the telecommunication sector using the Altman Z-Score and Zmijewski models for the period 2016-2018. Their study found that some telecommunication companies faced financial distress due to unhealthy price competition, significantly squeezing profit margins. Additionally, the differing results between the two models highlight the importance of considering various analytical approaches for a more accurate assessment of bankruptcy risk.

Manalu et al. (2017) compared three bankruptcy prediction models-Altman Z-Score, Springate, and Zmijewski—in the food and beverage sector. Their results showed that all three models could predict bankruptcy potential well,

although the predictions varied depending on the financial ratios used. This study emphasizes the importance of selecting a model that fits the specific characteristics of the company being analyzed.

Table 1. *Research Gap*

Author	Method	Zmijewski	Ohlson O-Score	Telecommunication Companies
Manalu et al., 2017	Altman, Springate, and Zmijewski	Yes	No	No
Winaya et al., 2020	Altman, and Zmijewski	Yes	No	Yes
Hudaya et al., 2024	Zmijewski, and Ohlson	Yes	Yes	No
This research	Zmijewski, and Ohlson	Yes	Yes	Yes

Based on previous research, both the Zmijewski and Ohlson models have been widely used to predict financial distress, but studies focusing on the telecommunication sector in Indonesia are still limited. Therefore, this study focuses on analyzing and comparing the Ohlson O-Score and Zmijewski methods in detecting financial distress in Indonesian telecommunication companies. Using historical financial data from several telecommunication companies listed on the Indonesia Stock Exchange, this study aims to evaluate the accuracy of both methods in predicting bankruptcy risk over a specific period. Additionally, the results are expected to provide insights for telecommunication company management and investors in taking appropriate strategic steps to anticipate financial distress risks.

2. Literature Review

2.1. Financial Statements

According to Munawir, as cited in Dharma et al. (2023) financial statements are the results of the accounting process and can be used to communicate financial data to stakeholders. Financial statements are essential for measuring a company's performance and progress. Prihadi (2019) states that financial statements generally consist of four types: the balance sheet, income statement, cash flow statement, and statement of changes in equity. These statements can be used for financial analysis.

Financial statement analysis is the process of studying financial data to understand a company's financial position, operational results, and progress. This is done by examining relationships and trends in financial statements. Thus, financial statement analysis can serve as a basis for decision-making by stakeholders (Riswan & Kesuma, 2014). Financial statement analysis uses financial ratios, which allow financial managers and stakeholders to quickly assess a company's financial health. Ratio analysis links elements of the balance sheet and income statement to evaluate a company's effectiveness and efficiency (Orniati, 2009). According to Prayitno in Dharma et al. (2023), there are four types of financial ratios:

1. Liquidity ratios, which measure a company's ability to meet short-term obligations.
2. Solvency ratios, which measure a company's ability to meet long-term obligations.
3. Profitability ratios, which explain how a company calculates profit using all its resources.

2.2. Financial Statements

According to Manalu et al. (2017), financial distress occurs when a company is unable to meet its current obligations, such as trade payables, tax liabilities, and short-term debts. There are five types of financial distress: economic failure, business failure, technical insolvency, insolvency in bankruptcy, and legal bankruptcy.

Dwijayanti (2010) states that financial distress can occur in any company and may be a sign of impending bankruptcy. If a company experiences financial distress, management must take action to address the issue and prevent bankruptcy. There are three main reasons why companies experience financial distress and subsequently go bankrupt:

(a) Neoclassical model: Financial distress occurs due to improper allocation of resources for operational activities.
(b) Financial model: Financial distress results from liquidity constraints, even if asset allocation is correct, leading to short-term bankruptcy despite long-term survival potential.

(c) Corporate governance model: Financial distress arises from poor asset management and inefficient financial structures, causing the company to go out of the market.

3. Materials and Methods

3.1. Materials

This study predicts bankruptcy in 15 telecommunication companies in Indonesia, including PT. Bali Towerindo Sentra Tbk, PT. Smartfren Telecom Tbk, PT. Gihon Telekomunikasi Indonesia Tbk, PT. Indosat Ooredoo Hutchison Tbk, PT. Sinergi Inti Andalan Prima Tbk, PT. First Media Tbk, PT. Ketrosden Triasmitra Tbk, PT. Mora Telematika Indonesia Tbk, PT. Dayamitra Telekomunikasi Tbk, PT. Remala Abadi Tbk, PT. Sarana Menara Nusantara Tbk, PT. Tower Bersama Infrastructure Tbk, PT. Visi Telekomunikasi Infrastruktur Tbk, PT. Telkom Indonesia (Persero) Tbk, and PT. XL Axiata Tbk. The data used are secondary data from the companies' 2023 financial reports, obtained from their official websites. The analysis was conducted using Microsoft Excel to calculate the required values for both the Ohlson O-Score and Zmijewski methods.

3.2. Methods

3.2.1. Ohlson O-Score

Hudaya et al. (2024) explain that James Ohlson developed the O-Score model in 1980 to predict bankruptcy using logistic regression. The model incorporates nine independent variables, and the equation is as follows:

$$O = -1{,}32 - 0{,}407X_1 + 6{,}03X_2 - 1{,}43X_3 + 0{,}0757X_4 - 2{,}37X_5 - 1{,}83X_6 + 0{,}285X_7 - 1{,}72X_8 - 0{,}521X_9 \quad (1)$$

X_1 = Log (total assets to GNP price-level index)
X_2 = Total liabilities to total assets
X_3 = Working capital to total assets
X_4 = Current liabilities to current assets
X_5 = 1 if total liabilities exceeds total assets, 0 otherwise
X_6 = Net income to total assets
X_7 = Funds provided by operations to total liabilities
X_8 = 1 if net income was negative for the last two years, 0 otherwise
$X_9 = \frac{(NI_t - NI_{t-1})}{(|NI_t| + |NI_{t-1}|)}$, where NI_t is net income for the most recent period

The cutoff value from this equation is classified into two conditions:
Bankrupt : $O > 0{,}38$
Non-bankrupt : $O < 0{,}38$

3.2.2. Zmijewski

The Zmijewski Model, developed by Zmijewski in 1984, uses ratio analysis to predict bankruptcy by measuring performance, leverage, and liquidity. The model is calculated using the following equation (Hudaya et al., 2024).

$$B = -4.3 - 4.5\,X_1 + 5.7X_2 - 0.004X_3 \quad (2)$$

X_1 = Net Income to Total Asset
X_2 = Total liabilities to Total Asset
X_3 = Current Asset to Current Liabilities

A company is considered to be in financial distress or at high risk of bankruptcy if the B score is greater than 0. If the B score is less than 0, the company is considered non-financial distressed, indicating a low risk of bankruptcy.

4. Results and Discussion

The results of this study are presented in the form of ratios derived from the analysis of annual financial reports for 2023 from 15 telecommunication companies in Indonesia. Two methods were used: the Ohlson O-Score with nine independent variables and the Zmijewski method with three independent variables.

Table 2. Calculation Using the Ohlson O-Score Method

Company Code	O-Score	Description
BALI	3,97647	*Financial Distress*
FREN	4,43564	*Financial Distress*
GHON	3,16496	*Financial Distress*
ISAT	4,27358	*Financial Distress*
INET	-0,1117	*Non-Financial Distress*
KBLV	9,41572	*Financial Distress*
KETR	3,38928	*Financial Distress*
MORA	3,21522	*Financial Distress*
MTEL	2,55839	*Financial Distress*
DATA	3,05947	*Financial Distress*
SMN	5,07172	*Financial Distress*
TBIG	4,70792	*Financial Distress*
TLKM	2,24280	*Financial Distress*
GOLD	1,24261	*Financial Distress*
EXCL	2,00446	*Financial Distress*

Based on the O-Score calculation results presented in Table 1, it is evident that only one company falls into the non-financial distress category, while the other 14 companies are categorized as financial distress. The company classified as non-financial distressed is PT. Sinergi Inti Andalan Prima Tbk (INET). This company has an O-Score value of -0.1117, which is below the threshold of 0.38. The negative value indicates that the company has a very low probability of facing bankruptcy, reflecting its strong financial health. In other words, PT. Sinergi Inti Andalan Prima Tbk has successfully maintained stable financial conditions and effectively managed critical factors such as profitability, leverage, liquidity, and operational efficiency.

On the other hand, the remaining 14 companies have O-Score values exceeding 0.38, indicating that they fall into the financial distress category, with a potential risk of bankruptcy in the future. Among these 14 companies, PT. First Media Tbk (KBLV) has the highest O-Score, suggesting that it has a higher likelihood of bankruptcy compared to the others. The high O-Score value of PT. First Media Tbk reflects significant financial issues, particularly in areas such as low profitability, high debt levels, and inefficient operational management. These factors contribute to the company's vulnerability to financial instability and potential bankruptcy.

Table 3. Calculation Using the Zmijewski Method

Company Code	B Score	Description
BALI	-1,32182	*Non-Financial Distress*
FREN	-0,57496	*Non-Financial Distress*
GHON	-2,43510	*Non-Financial Distress*
INDOSAT	-0,46397	*Non-Financial Distress*
INET	-4,11449	*Non-Financial Distress*
KBLV	4,98738	*Financial Distress*
KETROSDEN	-1,36090	*Non-Financial Distress*
MORA	-1,45822	*Non-Financial Distress*
MTEL	-2,16307	*Non-Financial Distress*
REMALA	-2,95494	*Non-Financial Distress*
SMN	-0,19360	*Non-Financial Distress*
TBIG	-0,25693	*Non-Financial Distress*
TLKM	-2,21700	*Non-Financial Distress*
VTI	-3,96307	*Non-Financial Distress*
XL	-2,64445	*Non-Financial Distress*

In contrast to the Ohlson O-Score method, which identified only one company in the non-financial distress category and 14 companies in the financial distress category, the results of the Zmijewski method show that 14

companies fall into the non-financial distress category, while only one company is categorized as financial distress, as presented in Table 2. Based on the calculations, the smallest B score is held by PT. Sinergi Inti Andalan Prima Tbk (INET) with a value of -4.04318. This indicates that the company has the healthiest financial condition compared to the others. This financial health reflects the company's ability to manage its finances effectively, including high profitability, controlled debt levels, and strong liquidity.

Additionally, the Zmijewski method results reveal that only one company, PT. First Media Tbk (KBLV), has a B-Score greater than 0, placing it in the financial distress category. This indicates a high risk of bankruptcy. The company's financial condition reflects significant issues, necessitating strategic actions from management to improve financial management.

A comparison between the Ohlson O-Score and Zmijewski methods shows that the two approaches yield significantly different results. In the Ohlson O-Score method, PT. First Media Tbk has the most negative O-Score, classifying it as the company with the best financial condition. This aligns with the Zmijewski method, which also categorizes the company as non-financial distressed. However, the difference lies in the number of companies identified as bankrupt or financially distressed. The Ohlson O-Score method identified 14 companies as financially distressed, while the Zmijewski method identified only one company in this category. This discrepancy is due to the number of variables and the approaches used in each method. The Ohlson O-Score incorporates more variables, including external factors such as the Gross National Product (GNP), making it more sensitive to changes in macroeconomic conditions. Therefore, the Ohlson O-Score is more suitable as an early detection tool for predicting bankruptcy potential. On the other hand, the Zmijewski method is simpler and more effective in identifying companies already in critical financial conditions or at significant risk of bankruptcy. By understanding the strengths of each method, their use can be tailored to specific analytical needs.

5. Conclusion

Based on the calculations using both the Ohlson O-Score and Zmijewski methods, only one company, PT. First Media Tbk, is at high risk of bankruptcy. This reflects the company's poor financial condition, requiring strategic management actions to improve financial management.

However, there is a significant difference in the results between the two methods. The Ohlson O-Score identified 14 companies as financial distressed and one as non-financial distressed, while the Zmijewski method identified only one company as financial distressed and 14 as non-financial distressed. This difference is due to the number of variables and approaches used in each method. The Ohlson O-Score, with more variables including external factors like GNP, is more suitable for early detection of bankruptcy risk. In contrast, the Zmijewski method, with its simpler approach, is more effective in evaluating companies already in critical financial conditions. Understanding the strengths of each method allows for their application based on specific analytical needs.

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