PREDICTION ANALYSIS OF BANKRUPTCY USING THE ZMIJEWSKI MODEL ON CONSTRUCTION SUBSECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE

Ilfa Hanafi

Faculty of Economics and business, Makassar State University

Corespondensi author email: ilfahanafi304@gmail.com

Anwar

Faculty of Economics and business, Makassar State University

anwar@unm.ac.id

Muh. Ilham Wardhana Haeruddin

Faculty of Economics and business, Makassar State University

ilham.wardhana@unm.ac.id

Siti Hasbiah

Faculty of Economics and business, Makassar State University

hasbiahsitti@gmail.com

Muh Ichwan Musa

Faculty of Economics and business, Makassar State University

m.ichwan.musa@unm.ac.id

Abstract

This research aims to analyze bankruptcy predictions for construction sub-sector companies listed on the Indonesia Stock Exchange using the Zmijewski model. This research uses secondary data in the form of financial statements and closing stock prices of each company for the period 2017-2021. The sampling was conducted using purposive sampling techniques, and 15 companies that met the predetermined criteria were obtained. The research results indicate that out of 15 companies, PT Acset Indonusa Tbk, PT Adhi Karya (Persero) Tbk, and PT Waskita Karya (Persero) Tbk are predicted to be at risk of bankruptcy. The calculation results of stock returns indicate that the decrease and increase in stock returns do not correlate with the predicted bankruptcy outcomes of the company.

Keywords: *Bankruptcy, Zmijewski, Construction Sector Sub-Industry..*

Abstrak

Penelitian ini bertujuan untuk menganalisis prediksi kebangkrutan terhadap perusahaan sub-sektor konstruksi bangunan yang terdaftar di Bursa Efek Indonesia dengan menggunakan model Zmijewski. Penelitian ini menggunakan data sekunder yang berupa data laporan keuangan dan harga saham penutupan (closing price) masing-masing perusahaan periode 2017-2021. Pengambilan sampel dilakukan dengan teknik purposive sampling dan diperoleh 15 perusahaan yang sesuai dengan kriteria yang telah ditentukan. Hasil penelitian menunjukkan bahwa dari 15 perusahaan, PT Acset Indonusa Tbk, PT Adhi Karya (Persero) Tbk, dan PT Waskita Karya (Persero) Tbk diprediksi berpotensi mengalami kebangkrutan. Hasil perhitungan return saham menunjukkan bahwa penurunan dan peningkatan return saham tidak berbanding lurus dengan hasil prediksi kebangkrutan perusahaan.

Kata Kunci : Kebangkrutan, Zmijewski, Perusahaan Sub-Sektor Konstruksi Bangunan.

INTRODUCTION

A company is formed to achieve a certain goal, whether it is a short-term or long-term objective. One of the company's short-term goals is to generate sustainable profits that are expected to increase each year, allowing the company to survive and grow. (Maarif, 2019). Profit is the difference between the total revenue and expenses generated by the company's operational and non-operational activities that is positive over a certain period (Kristanti, 2021). Companies can use profit as financing to carry out their operational activities and, most importantly, to sustain the company's survival.

Company activity financing can also come from debt, which is external capital and temporary in nature, thus it needs to be repaid according to the specified time. (Andini & Kharisma, 2021). A company that is in debt is not necessarily a bad thing if it is able to pay it back. Debt to a company can bring about benefits in the form of assistance in developing the business, but it can also lead to drawbacks that result in bankruptcy.

According to Setyono (2017), the causes of bankruptcy can stem from both internal and external factors of the company. Internal factors arise from any issues that are not effectively addressed, which can threaten the company if these problems worsen. External factors come from the outside world of the company, which is constantly changing, so the company needs to pay attention to these changes in order to compete with other companies and avoid bankruptcy.

Bankruptcy is a situation when a company cannot operate, making it difficult to obtain funds to finance normal operational activities and the inability to meet the company's obligations. (Lerinsa, 2021). To avoid bankruptcy, a company needs to pay close attention to its financial condition. Financial condition is very important for the development of a company because most bankruptcies begin with the occurrence of financial distress caused by poor financial management of the company (Anwar et al., 2022). Financial distress is a phenomenon where the financial condition of a company deteriorates before experiencing liquidation or bankruptcy. (Nilasari & Haryanto, 2018). The condition of financial distress can be seen from the balance sheet composition, namely the comparison of total assets and liabilities when assets are insufficient or less than the amount of debt, the imbalance between equity and the receivables owed by the company due to negative working capital, which causes the company to struggle in meeting operational financing. (Kadim et al., 2019). Financial distress can also be seen from the income statement, specifically when a company continues to incur losses, and from the cash flow perspective, when cash outflows exceed cash inflows.

A variety of preventive measures are needed to avoid financial distress that could lead to bankruptcy, one of which is conducting early detection of a company to identify any potential bankruptcy before the company unexpectedly goes bankrupt. The potential for bankruptcy in any company can raise concerns for various parties, both internal, such as management, and external, such as investors and creditors. For investors, it means losing their shares and gains, while for creditors, it results in losses because the borrowed capital cannot be repaid. (Saputri & Effendi, 2021). Therefore, an analysis of financial statements is necessary to serve as an alternative to test whether the financial information produced by financial accounting is useful for investors in making predictions and classifications regarding the company's value in the form of stock prices in the capital market.

The stock price is the price set by the company for parties who wish to acquire rights to the company's shares (Nurminawati, 2019). The stock price can serve as a superior value for the company to achieve its long-term goals in maximizing shareholder value. If the company is able to provide positive signals regarding its value, potential investors will consider the company as a suitable investment option.

Financial statement analysis can be used to be vigilant about the potential for bankruptcy. Financial statement analysis is a method or technique for transforming data obtained from financial statements into more useful, detailed, and clear information. (Masdiantini & Warasniasih, 2020). Conducting a financial report analysis is useful for understanding the financial condition and development of a company, as well as the results that have been achieved in the past and present.

Financial statement analysis can be conducted using several models to predict bankruptcy, one of which is the Zmijewski model. The Zmijewski model was introduced by Zmijewski, who conducted a study reviewing research on bankruptcy from 20 years prior, using several financial ratios selected from previous studies. He then sampled 75 bankrupt companies and 3,573 healthy companies from 1972 to 1978 (Permatasari et al., 2019). The selected ratios used in the Zmijewski model, developed in 1983, include liquidity ratios, leverage, and measures of company performance. (Utari & Akbar, 2020).

This research will analyze construction companies in the building sub-sector listed on the Indonesia Stock Exchange during the period of 2017-2021. Building construction companies, which are a sub-sector of the industry listed on the Indonesia Stock Exchange, are one of the key sub-sectors that can drive economic growth and have experienced significant development. (Nadia & Susila, 2021). The building construction sub-sector plays a crucial role in the economy as it contributes significantly to the infrastructure development process and influences a large part of the country's economic sectors. Companies in the building construction sub-sector encompass all activities whose end result is the integration of buildings with their locations, whether used for housing or other activities, such as roads, bridges, tunnels, railways, power plants, and so on.

An important factor that determines the expansion and speed of economic development in a country is the level of infrastructure availability. (F. Y. L. Y. Nasution, 2020). Infrastructure development serves as a capital to enhance the economic productivity of the country and the living standards of the wider community. The construction industry, which serves as one of the producers of the multiplier effect, has a relationship of dependency with other sectors that is not only static but can also be dynamic. (Siregar, 2021). This means that when there is demand in the construction industry, it will automatically stimulate the building materials industry, consulting services, and various small industries, while construction products in the form of buildings can drive sectors such as manufacturing, agriculture, and other sectors. The construction industry also contributes to creating jobs both directly and indirectly, playing a role in the nation's economy. The provision of labor refers to the stages of planning materials and equipment, direct construction work, and management.

From 2015 to 2019, infrastructure became the focus of development with an increase in the budget; however, this was not matched by the profits of construction companies, particularly those owned by private entities, which were known to experience a decline in profits. (Pratama et al., 2021). In 2018, the number of government projects that state-owned enterprises could undertake decreased compared to the previous year due to the new contract values not rising significantly.

This is a common occurrence as the presidential election approaches, which is scheduled for April 2019. (Audriene, 2018).

One of the reasons construction companies are weakening on the Indonesia Stock Exchange is due to the high sentiment surrounding their debt burden, which is negatively impacting their operational cash flow. (Wareza, 2019). When undertaking infrastructure projects, construction companies require substantial funding, leading them to continually increase their debt and face the risk of financial difficulties, especially during the Covid-19 pandemic. (Ruhulessin, 2021). The total asset growth of construction companies listed on the Indonesia Stock Exchange tends to decline. The companies that have consistently experienced annual growth are only PT Adhi Karya (Persero) Tbk and PT Wijaya Karya (Persero) Tbk. Both companies are state-owned enterprises (BUMN), and this growth occurred because state-owned companies were instructed to undertake projects valued at over Rp. 100 billion, resulting in a greater number of projects being handled by state-owned companies compared to private companies. The company that experienced the most drastic decline is PT Acset Indonusa Tbk, which in 2018 saw a total asset growth of 68.4% to Rp. 8,939,391 million. In 2019, it increased by 16.9% to Rp. 10,446,519 million, then dropped by 70.8% in 2020 to Rp. 3,055,106 million, and in 2021, it fell by 18.9% to Rp. 2,478,713 million. The decrease in total assets is due to a decline in gross receivables from employers, as well as a reduction in fixed assets and non-current retention receivables. The decline in assets is also due to the disruption of the company's operational activities, where the progress of projects being undertaken by PT Acset Indonusa Tbk has been hindered due to the Covid-19 pandemic, such as the Indonesia 1 building project.

The total debt growth in construction companies listed on the Indonesia Stock Exchange from 2017 to 2021 has shown a tendency to increase. Companies that have continuously experienced an increase in total debt during the years 2017-2021 include PT Adhi Karya (Persero) Tbk, PT Mitra Pemuda Tbk, and PT Wijaya Karya (Persero) Tbk. The increase in total debt among construction companies is due to the need for these companies to add to their debt to finance ongoing projects. (Kevin & Wareza, 2018). Other companies also experienced an increase in total debt, although not continuously, such as PT Paramita Bangun Sarana Tbk, which saw a decrease in debt of 45.2% in 2018 to Rp. 121,442 million, then an increase of 52.4% in 2019 to Rp. 185,055 million, a decrease of 10.2% in 2020 to Rp. 166,214 million, and an increase of 17.9% in 2021 to Rp. 195,989 million. The decrease in debt at PT Paramita Bangun Sarana Tbk in 2018 occurred due to the settlement of retention debts, while the decline in 2019 was attributed to a reduction in customer advances and accounts payable, following the completion of work on several projects in the field.

The profits of construction companies listed on the Indonesia Stock Exchange from 2017 to 2021 tend to experience a decline. The companies that experienced a decline in profits over the 5-year research period are PT Jaya Konstruksi Manggala Pratama Tbk, PT Nusa Raya Cipta Tbk, and PT Total Bangun Persada Tbk. The decline in profits for construction companies can be caused by project completions taking longer than scheduled and delays in several projects. (Pratomo, 2019). The delay in project completion leads to an increase in financing costs, overhead costs, and other expenses allocated for accelerating the completion of the project. The company that experienced the most drastic decline in profits, PT Cahayasakti Investido Sukses Tbk, recorded a profit of Rp. 131 million in 2017, but this plummeted by 24,662% in 2018, resulting in a loss of Rp. 32,177 million. In 2019, the loss decreased by 71.2%, leading to a recorded loss of Rp. 9,258 million. In 2020, the growth of losses fell by 234.4%, and the company achieved a profit of Rp. 12,446 million. Profit growth then increased by 59.2% in 2021, reaching Rp. 19,810 million. PT Cahayasakti Investido Sukses Tbk's losses were attributed to high company expenses, with the cost of goods sold significantly rising despite efforts to cut marketing costs for efficiency. (Prima, 2019).

The review above indicates that there has been a decline in the company's financial condition, which, if left unaddressed, could have adverse effects on the company and even potentially lead to bankruptcy. Certainly, this situation is very concerning, so follow-up actions are necessary to address it.

Several previous studies have conducted analyses on bankruptcy prediction. Utari & Akbar (2020) conducted a study to predict financial distress in Islamic banking in Indonesia during the period of 2016-2018. The predictive tool used in this research is the Zmijewski X-Score model, and the population for this study consists of 14 Islamic banking companies, with a saturated sampling method applied so that the entire population serves as the sample size. Liana et al. (2019) conducted a study to predict the potential bankruptcy of textile companies during the period of 2013-2017, using the Zmijewski model for bankruptcy prediction. The population in this study consisted of 12 textile companies, with a sample of 7 companies being selected for the research. R. Sari et al. (2022) conducted a study to detect bankruptcy in manufacturing companies listed on the Indonesia Stock Exchange during the period of 2015-2019, using the Zmijewski model for bankruptcy prediction. The sample in this study consisted of 8 manufacturing companies.

The analysis of bankruptcy potential is essential as a forecast of the company's financial condition in the future, so that any possible occurrences can be anticipated early on. The results of the analysis can be linked to the company's value to observe the impact of bankruptcy predictions on the company's stock price. In this research, to predict the potential bankruptcy of companies, the author uses the Zmijewski model,

as this model focuses on financial ratios that measure a company's ability to meet all obligations, both short-term and long-term debts. This is in line with companies in the building construction sub-sector, which tend to have high levels of debt when undertaking projects.

RESEARCH METHOD

Based on the title used in this research, the variables employed are bankruptcy potential measured using the Zmijewski model, which consists of ROA (Return on Assets), Leverage (Debt Ratio), and Liquidity. (Current Ratio).

The design of this research aims to facilitate the process of conducting research by illustrating the initial steps in analyzing financial statements to obtain information about the company being studied. The approach used in this research is a quantitative approach aimed at explaining the characteristics of the variables being studied by using data in the form of numbers.

The implementation of this research was conducted on construction sub-sector companies listed on the Indonesia Stock Exchange. Subsequently, field research was carried out to obtain data on financial statements, specifically the statement of financial position, income statement, and statement of changes in equity, which were obtained through the website www.idx.co.id using documentary data collection techniques. Literature research was conducted to obtain literature or a literature review regarding bankruptcy potential and the Zmijewski Model, while simultaneously field research was carried out to observe financial statements and collect the necessary data for further analysis of the financial statements, which would be processed into financial ratios. After the data has been processed, the obtained data is then entered into the Zmijewski equation to identify the potential for bankruptcy in the construction sub-sector companies.

1. Population

The population used in this study consists of the financial statements and closing stock prices of all companies in the building construction sub-sector listed on the Indonesia Stock Exchange consistently during the research period, which is from 2017 to 2021.

2. Sample

In this study, purposive sampling technique is used, which is the selection of data source samples based on certain considerations. Here are the criteria for sampling:

      a. Companies that are part of the building construction sub-sector on the Indonesia Stock Exchange during the period of 2017-2021.

b. Companies in the building construction sub-sector that published complete financial reports for the period from December 31, 2017, to December 31, 2021.

c. Companies in the building construction sub-sector that have closing price data for the period of 2017-2021.

The data used in this research is secondary data in the form of financial reports and closing stock prices of construction sub-sector companies listed on the Indonesia Stock Exchange from 2017 to 2021. The data collection technique in this research was carried out through documentation study, which involves examining and analyzing documents in the form of articles, company history, financial reports, and so on, to serve as informational data and literature study to gather various references supported by company data through books, literature, notes, and reports related to the research.

RESULT AND DISCUSSION

The analysis using the Zmijewski model on construction companies listed on the Indonesia Stock Exchange aims to determine the prediction of bankruptcy in these companies. Based on the analysis results, it can be concluded that PT Cahayasakti Investindo Sukses Tbk, PT Nusa Konstruksi Enjiniring Tbk, PT Indonesia Pondasi Raya Tbk, PT Jaya Konstruksi Manggala Pratama Tbk, PT Nusa Raya Cipta Tbk, PT Paramita Bangun Sarana Tbk, PT PP (Persero) Tbk, PT Surya Semesta Internusa Tbk, PT Totalindo Eka Persada Tbk, PT Total Bangun Persada Tbk, PT Wijaya Karya Bangunan Gedung Tbk, and PT Wijaya Karya (Persero) Tbk are predicted to have no potential for bankruptcy during the period from 2017 to 2021 due to the X-score obtained being below the established cutoff value. In the Zmijewski model, a positive X-score or one greater than 0 indicates that the company has potential for bankruptcy, while a negative score or one less than 0 indicates that the company does not have potential for bankruptcy. Unlike PT Waskita Karya (Persero) Tbk, which is predicted to potentially go bankrupt for 3 periods from 2019 to 2021 during the five-year research period, PT Acset Indonusa Tbk is predicted to potentially go bankrupt for 4 periods from 2018 to 2021. Meanwhile, PT Adhi Karya (Persero) Tbk shows that the company is continuously predicted to experience bankruptcy throughout the five-year research period from 2017 to 2021.

The X_1 ratio indicates the company's ability to use its total assets to generate profit. The higher the X_1 value, the more efficient the company's use of total assets in obtaining profit, and vice versa. The calculation results of X_1 for PT Waskita Karya (Persero) Tbk show a decline in 2019 and 2020. In 2021, the company experienced an increase, but the X_1 value still remained in negative territory. The decline in X_1 was caused by a decrease in profit in 2019 and 2020, while in 2021 there was an increase, but the company's profit was still negative. The decline in profits in 2019 was caused

by a decrease in operating income due to the completion of the company's projects, delays in securing new contract values, the unfulfilled land acquisition, and a lack of clarity that hindered work, as well as the divestment of toll roads, which only materialized for 2 segments instead of the previously planned 3 segments. In 2020, the company's profits experienced a decline due to the impact of Covid-19, government regulations regarding large-scale social restrictions that hindered project execution, and costs associated with maintaining health protocols for customers, suppliers, and employees. In 2021, the company's profits increased due to the success of the cost efficiency program, which resulted in a decrease in the cost of goods sold that exceeded operating income for the year. Additionally, there was an expansion into external markets and diversification of steel products, accompanied by comprehensive efficiency from all aspects. Total assets also affect the decline in X1. In 2019 and 2020, the company experienced a decrease in assets, but this decline was accompanied by a decrease in liabilities. In 2021, the company saw an increase, although it was not greater than the total asset acquisition in 2019; this was due to the increase coming solely from the addition of current assets.

The X1 calculation at PT Acset Indonusa Tbk shows that the company has continued to experience a decline from 2018 to 2020. In 2021, there was an increase, but the X1 value still remains in the negative. The decline in X1 is caused by profits that have continued to decrease from 2019 to 2020, while in 2021 there was an increase, but the company's profits are still negative. In 2018, the company's profits declined due to an increase in the cost of goods sold, which was caused by several changes in ongoing projects that led to higher construction costs and financial expenses related to project completion. In 2019, the company incurred losses with negative profits due to rising costs of goods sold, selling expenses, and financial costs resulting from delays in project completion. In 2020, the company suffered losses influenced by the Covid-19 pandemic, which hindered project completion. In 2021, the company experienced an increase even though it still reported a loss; this was due to improvements in operational performance and an increase in the number of projects undertaken. In addition to profit, total assets also affect the calculation of X1. In 2020 and 2021, the company experienced a decline in total assets due to a decrease in gross receivables from employers, a decline in retention receivables, and a decrease in capital goods purchases for the acquisition of fixed assets.

The calculation of X1 at PT Adhi Karya (Persero) Tbk shows that the value of X1 is fluctuating. In 2018, the value of X1 increased due to the rise in total assets and profits from 2017. In 2019, the company experienced an increase in profits and total assets; however, compared to 2018, the value of X1 decreased. This indicates that the company was less efficient in utilizing its total assets to maximize profits. In 2020, the company's X1 value experienced a decline due to a significant drop in profits caused by the Covid-19 pandemic, which led to delays in tenders and the acquisition of new

contracts. Additionally, there was a slowdown in revenue generation. In 2021, the X1 value saw an increase, attributed to a rise in profits and total assets of the company. The increase in profits was due to the acceleration of project production, while the increase in assets was a result of receiving payments from projects that boosted cash and cash equivalents, a decrease in accounts receivable, and payments received from the LRT Jabodetabek and Sigli Banda Aceh toll projects.

The X2 ratio shows the total liabilities of a company as a percentage of total assets in using debt to finance its assets. This ratio measures the company's ability to repay its debts with its assets; a higher proportion of debt compared to total assets indicates greater risk. The calculation results of X2 at PT Waskita Karya (Persero) Tbk indicate that the value of X2 tends to show an increase. The decline only occurred in 2019, where the total assets decreased by 1.4% along with a total debt reduction of 2.13%, primarily due to a decrease in short-term bank debt. In 2020, total assets also fell alongside total debt, but the percentage of decline was different from that in 2019, with total assets dropping by 13.87% and total debt decreasing by 4.77%, mainly due to a reduction in long-term liabilities such as long-term bank loans, long-term bond debt, long-term subcontractor gross debt, deferred tax liabilities, and employee benefit liabilities. In 2021, the company's total assets experienced a decline along with total debt, which decreased by 1.34%, stemming from a reduction in short-term liabilities such as accounts payable, long-term bank loans maturing within a year, and medium-term debt securities. At PT Waskita Karya (Persero) Tbk, the increasing value of X2 indicates that the decline in total assets is greater than the smaller decrease in liabilities, resulting in a reduced ability of assets to settle the company's obligations.

The results of the X2 calculation obtained by PT Acset Indonusa Tbk indicate that in 2018 and 2019, the X2 value increased, followed by a decrease in 2020 and 2021. In 2018 and 2019, the total assets and total liabilities of the company increased. Total debt increased in 2018 due to the rise in trade debt and short-term bank loans, which occurred alongside the increase in operational activities. Total debt increased in 2019 due to an increase in loans from shareholders and trade payables, as well as employee benefit liabilities. In 2020 and 2021, total assets and total liabilities experienced a decline. In 2020, the decrease in total liabilities was due to a reduction in trade payables, loans from shareholders, and third-party loans. In 2021, the decline in total liabilities was caused by the company fully repaying the balance of loans from shareholders and a decrease in third-party loans.

The results of the X2 calculation obtained by PT Adhi Karya (Persero) Tbk show a tendency to increase, with a decline occurring only in 2018, where the X2 value dropped from 0.7928 in 2017 to 0.7913 in 2018. The total assets and total liabilities of the company during the research period showed a continuous increase. Total debt increased due to the rise in bond debt, bank loans, trade payables, gross subcontractor debt, retention debt, and deferred revenue. In 2018, the total debt also

rose as the company spun off its Transit Oriented Development department into a subsidiary.

The X3 ratio indicates the company's ability to meet its short-term obligations. Therefore, companies need to have current assets greater than current liabilities. The calculation results of X3 at PT Waskita Karya (Persero) Tbk indicate that the X3 value in 2019 and 2020 experienced a decline, meaning the company's ability to meet short-term obligations using its current assets has decreased. This is due to a decrease in the amount of current assets that exceeds the decline in current liabilities. The decline in current assets in 2019 was primarily due to a decrease in gross receivables from service users, while in 2020 it was caused by a reduction in joint venture receivables. The X3 calculations obtained by PT Acset Indonusa Tbk indicate that the company experienced a decline from 2018 to 2020. In 2018, although the company experienced a decline, the liquidity ratio remained above 1.0, indicating that the company had sufficient current assets to meet its obligations. This can be seen from the current assets held by the company being greater than its current liabilities. In 2019, the decline in the liquidity ratio was caused by an increase in the company's current liabilities, influenced by rising loans from shareholders and trade payables. In 2020, there was a decline in assets due to a decrease in the gross receivables from employers.

The results of the X3 calculations obtained by PT Adhi Karya (Persero) Tbk show a continuous decline from 2017 to 2021; however, the company is still able to meet its short-term obligations well, as indicated by a liquidity ratio above 1.0. This is due to the increase in the company's current liabilities in line with the rise in current assets, which are greater than the current liabilities held by the company.

Next, to determine whether the companies predicted to be at risk of bankruptcy experienced a decline in stock returns, calculations of stock returns were conducted using a sample of stock prices. The results indicate that PT Acset Indonusa Tbk has continued to decline; however, in 2021, stock returns increased by 2.37%, suggesting that the bankruptcy prediction does not align with the stock return results from 2017 and 2021. Meanwhile, PT Adhi Karya (Persero) Tbk has also seen a continuous decline, with an increase only occurring in 2020 by 56.51%, indicating that the bankruptcy prediction does not correlate with the stock return results from 2020. Stock returns for PT Waskita Karya (Persero) Tbk decreased in 2018, then increased from 2019 to 2020, before dropping by 52.87% in 2021, which means that the bankruptcy prediction does not correspond with the stock return results from 2018 to 2020.

CONCLUSION

This research aims to determine bankruptcy predictions for companies in the building construction sub-sector listed on the Indonesia Stock Exchange (BEI) using the Zmijewski model and to find out whether bankruptcy predictions have an impact on stock prices by calculating the returns of the companies' stocks. The conclusion of this research is as follows:

1. The results of the Zmijewski bankruptcy model analysis indicate that out of 15 sampled companies, there are 3 companies that have the potential to experience bankruptcy. PT Acset Indonusa Tbk did not have the potential to face bankruptcy in 2017, but from 2018 to 2021, it faced the potential for bankruptcy. Meanwhile, PT Adhi Karya (Persero) Tbk has been facing bankruptcy from 2017 to 2021. PT Waskita Karya (Persero) Tbk did not show potential for bankruptcy in 2017 and 2018, but from 2019 to 2021, it has been at risk of bankruptcy.

2. The bankruptcy prediction results using the Zmijewski model do not always correlate with the company's stock return results. PT Acset Indonusa Tbk had bankruptcy predictions that did not align with stock returns in 2017 and 2021, PT Adhi Karya (Persero) Tbk in 2020, and PT Waskita Karya (Persero) Tbk from 2018 to 2020.

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