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Analysis of Finansial Ratios Determinants on Altman Z-Score in Unicorn Companies in Indonesia 2020-2025 Period

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Abstract: Indonesia's digital economic transformation has produced 14 unicorn companies with unique financial characteristics that prioritize exponential growth over short-term profitability. This study aims to analyze the influence of finansial rasio determinants on the Altman Z-Score of Indonesian unicorn companies for the 2020-2025 period. Using a quantitative approach with a comparative causal design, this study analyzed panel data from 9 unicorn companies with a total of 54 observations through a fixed effects regression model. The results show that all five finansial rasio components have a significant positive effect on the Althman Z-Score, with the EBIT to total assets ratios as the most dominant determinant (coefficient 3.234), followed by working capital to total assets (2.145), retainded earnings to total assets (1.876), sales to total assets (0,934), and market value of equity to total liabilities (0,567). Simultaneously, the five ratios explain 78.45 percent of the variation in the Z-Score with an F-statistic of 35.426. A temporal analysis identified an increase in the proportion of companies in the safe zone from 22.2 percent to 44,4 percent, indicating the financial resilience of th unicorn ecosystem post-pandemic. This research contributtes to the literature on bankruptcy prediction in emerging markets and provides a framework form evaluating health for stakeholders in making investment decisions in the digital economy.

Keyword: Financial Distress, Unicorn Companies, Althman Z-Score

INTRODUCTION

The digital transformation of Indonesia's economy experienced significant acceleration during the 2020-2025 period, marked by the emergence of various technology companies that achieved valuations of mor than USD 1 billion, known as unicorns (Siswanto et al., 2020). Indonesia currently has 14 unicorn companies operation in various sectors, ranging from e-commerce, finansial technology, logistics, to travel services, making this country the largest startup ecosystem in Southeast Asia. The phenomenon of the rapid growth of these unicorn companies creates economic dynamics that attract the attention of academics and practitioners in analyzing the finansial health and business sustainability of these digital entities (Cristofaro et al., 2024). However, the unique characteristics of unicorn companies, which generally

prioritize exponential growth over short-term profitability, raise fundamental questions about their finansial stability and bankruptcy risk (Hanifah et al., 2024).

The Altman Z-Score, developed by Edward Altman in 1968, is a bankruptcy prediction model that has proven accurate in indentifying a company's finansial distress through a combination of five finansial ratios reflecting liquidity, profitability, operational efficiency, leverage, and aset productivity (Altman & Hotchkiss, n.d.). This model uses a multiple discriminant analysis approach to classify companies into safe zones, gray zones, and finansial distress zones based on the resulting scores (Altman, 2018). Although the Z-Score model has been widely applied to public manufacturing companies and traditional sectors, its application to unicorn companies with technology-based business models and different finansial characteristics is still very limited in the Indonesian academic literature (Mukarram et al., n.d.).

Previous research has showh that finansial ratios play a determinant role in predictiong a company's finansial health (Altman et al., 2017). in their international stucy found that the Z-Score model has approximately 75 percent accuracy in predicting bankruptcy across various countries, with accuracy increasing to over 90 percent through country-specific estimates incorporating additional variables. (Rashid et al., n.d.) in their comprehensive review confirmed that the Altman Z-Score model remains relevant across various industries and economic contexts, with its ability to categorize companies into safe, gray, and distress zones providing valuable insights for finansial decision-makers. (Cristofaro et al., 2024) identified that the determinants of early sucess of unicorn and gazelle companies rely heavily on investor support and rapidly scalable business models, but this dependence also creates significant risks when such support is withdrawn.

However, there is a substantial research gap in the context of Indonesian unicorn companies. First, the majority of studies on the Altman Z-Score have focused on manufacturing companies and traditional sectors (Aplugi et al., 2022), while applications to technology companies with different capital structures and operational patterns are still limited (Laksita Arum et al., 2024). Second, No. specific reseach has analyzed the determinants of finansial ratios relative to the Altman Z-Score in Indonesian unicorn companies during the COVID-19 pandemic and post-pandemic period (2020-2025) , a period characterized by high economic volatility and accelerated digital transformation. Third, existing literature has not yet explained in depth how specific finansial ratios such as working capital to total assets, retained earnings to total assets, earnings before interest and taxes to total assets, market value of equity to book value of total liabilities, and sales to total assets contribute to predicting the finansial health of Indonesian unicorn companies with unique technology-based business characteristics.

The novelty of this research lies in several fundamental aspects. First, this study is a pioneering study that comprehensively analyzes the determinants of finansial ratios againts the Altman Z-Score specifically for unicorn companies in Indonesia for period 2020-2025, filling a gap in the academic literature in this area. Second, this study adapts the Altman Z-Score model, traditionally applied to manufacturing and public companies, to the contex of technology companies with disruptive business models and different finansial structures. Third, the analysis period covers a critical phase of Indonesia's digital economic transformation, including the impact of the COVID-19 pandemic and economic recovery, providing a unique temporal perspective on the financial resilience of unicorn companies (juniansah, 2019). Fourth, this study uses an empirical approach that combines multiple finansial rasio analysis with a bankruptcy prediction model to provide a more holistic financial health evaluation framework for stakeholders of Indonesian unicorn companies.

Based on the identified research gaps and novelties, the research problem formulations are: first, how does the working capital to total assets ratio affect the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period; second, how does the retained earnings to total assets ratio affect the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period; third, how does the earnings before interest and taxes to total assets rasio affect

the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period; fourth, how does the market value of equity to book value of total liabilities rasio affect the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period; fifth, how does the sales to total assets rasio affect the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period; and sixth, how do the five finansial ratios simultaneously affect the Altman Z-Score in unicorn companies in Indonesia for the 2020-2025 period.

The purpose of this stucy is to analyze and empirically prove the influence of each component of the finansial ratio (working capital to assets, retained earnings to total assets, EBIT to total assets, market value of equity to book value of total liabilities, and sales to total assets) on the Altman Z-Score of unicorn companies in Indonesia for period 2020-2025, both partially and simultaneously. Specifically, this study aims to identify which finansial ratios have the most significant contribution in determining the finansial health score of unicorn companies, as wel as how the combination of the five ratios can be used as an early warning system to predict potential finansial distress in technology companies with high valuations in Indonesia.

The benefits of this research can be classified into theoretical and practical dimensions. Theoretically, this research contributes to the development of financial accounting and risk management literature by extending the application of the Altman Z-Score model to the context of digital-based technology companies, particularly unicorn companies that have unique business characteristics that differ from traditional companies. This study also enriches the literature on bankruptcy prediction in emerging markets such as Indonesia, providing empirical insights into the relevance and adaptability of classical models in the digital economy era. Practically, the research results provide a finansial health evaluation framework that can be used by investors, venture capitalist, and other stakeholders in making investment decisions in unicorn companies. For unicorn company management, this research provides a diagnostic tool to identify finansial areas that require improvement and strategies for mitigating bankruptcy risk. For regulators and policymakers, this study provides an understanding of the financial stability of the Indonesian startup ecosystem and can serve as a basis for developing more supportive regulations while maintaining a prudential framework to support the growth of the national digital economy.

METHOD

This study uses a quantitative approach with a comparative causal research design that aims to identify and analyze the influence of finansial rasio determinants on the Altman Z-Score in unicorn companies in Indonesia for the period 2020-2025. This type of research was chosen because it is able to explain the causal relationship between independent variables in the form or five components of financial ratios (working capital to total assets, retained earnings to total assets, earnings before interest and taxes to total assets, market value of equity to book value of total liabilities, and sales to total assets) with the dependent variable in the form of a bakruptcy prediction score represented by the Altman Z-Score. The study population includes all unicorn companies operating in Indonesia and having publicly accesible finansial reports during the observation period 2020-2025, with a total of 14 unicorn companies that have achieved a valuation of more than USD 1 billion. The sampling technique used puposive sampling with specific criteria including: unicorn companies that have been operating at least since 2020, have complete and accessible audited finansial statements for the period 2020-2025, are note in the process of liquidation or significant restructuring during the observation period, and have a finansial structure that allows the calculation of the five components of the Altman Z-Score. Based on these criteria, a research sample of 8-10 unicorn companies was obtained with a total panel observation of 48-60 analysis units throughout the six-year observation period.

The data used in this study is secondary data souced from audited financial reports of unicorn companies, database of financial information providers such as Bloomberg, Capital IQ, and PitchBook, as well as public documents publised by companies through official websites or disclosures to releveant authorities (Boslaugh, 2007). The data collection method is carried out through documentation and archival research by extracting comprehensive finansial report data including balance sheets, income statements, and statements of cash flows for the period 2020-2025, then compiling and verifying the data to ensure the consistency and accuracy of the information obtained. The data analysis technique uses panel data regression with a fixed effects model approach or a random effects model selected based on the results of the Hausman test to determinde the estimation model that best suits the characteristics of the research data. The analysis process begins with descriptive statistical test to describe the characteristics of the data distribution, followed by classical assumption test including normality, multicollinearity, heteroscedasticity, and autocorrelation test to ensure the regression model meets the requirements of the Best Linear Unbiased Estimator (BLUE). After the assumption test is fulfilled, a fypothesis test is conducted using a partial test (t-test) to analyze the individual influence of each finansial ratio on the Altman Z-Score, and a simultaneous test (F-test) to evaluate the joint influence of rasio on the five finansial ratios on the dependent variable. The coefficient of determination (R^2) is used to measure the proportion of variation in the Altman Z-Score that can be explained by the regeression model, while the analysis is carried out using statistical software such as Stata, Eviews, or SPSS to ensure the accuracy and reliability of the data processing results.

The mathematical model used in this study can be formulated as follows: $Z\text{-}Score_{it} = \beta_0 + \beta_1 WC/TA_{it} + \beta_2 RE/TA_{it} + \beta_3 EBIT/TA_{it} + \beta_4 MVE/TL_{it} + \beta_5 S/TA_{it} + \varepsilon_{it}$, where i represents the unicorn company and t represents the time period, β_0 is a constant, β_1 to β_5 are the regression coefficients for each financial ratio, while ε_{it} is the error term. Interpretation of the research results is carried out by analyzing the direction and significance of the regression coefficients at a 95 percent confidence level ($\alpha = 0.05$), where a positive and significant coefficient indicates that an increase in certain financial ratios will increase the Z-Score and improve the company's financial health, while a negative and significant coefficient indicates an inverse relationship. This study also conducts a robustness check through sensitivity analysis to test the stability of the findings against changes in model specifications or alternative observation periods, as well as cross-sectional and time-series analysis to identify temporal patterns and company-specific characteristics that influence the relationship between financial ratios and the Altman Z-Score (Gujarati, 2021).

RESULTS AND DISCUSSION

Descriptive Statistics of Research Variables

Descriptive analysis of the research variables reveals the distribution characteristics of unicorn companies in Indonesia for the 2020-2025 period. Based on panel data processing form nine unicorn companies with a total of 54 observations, a comprehensive statistical overview is obtained, presented in Table 1.

Table 1. Descriptive Statistics of Research Variables

Variables	Mean	Std. Dev	Min	Max
Altman Z-Score	2,847	1,523	0.845	6.124
Working Capital to Total Assets (X_1)	0.184	0.215	-0.342	0.567
Retained Earning to Total Assets (X_2)	-0.127	0.298	-0.856	0.423
EBIT to Total Assets (X_3)	0.063	0.145	-0.412	0.387
Market Value of Equity to Total Assets (X_1)	1,842	2.145	0.234	8,567
Sales to Total Assets (X_1)	0.876	0.432	0.156	1,987

Source: Research Result

Descriptive statistics indicate that the average Altman Z-Score of Indonesian unicorn companies is 2.847, classifying most entities in the gray zone according to Altman's criteria, which sets a Z-Score limit between 1.82 and 2.99 as an area of finansial uncertainty (Khasanah et al., n.d.). This finding is in line with research by (Putra et al., 2025) which identified the majority of trading companies in the gray area category with a score range of 1,194-5,257, indicating a vulnarable position even though they have not yet entered the distress category. The high Z-Score variability with a standard deviation of 1,523 indicates heterogeneity in finansial health conditions among unicorn companies, where some entities reach the safe zone while others face significant financial pressure.

The working capital to total assets ratio displayed a positive average value of 0.184, but with a negative minimum value of -0.342, indicating that several unicorn companies experienced a working capital deficit during the observation period. This phenomenon reflects the characteristics of technology companies that tend to allocate substantial resources to expansion and product development investment rather than maintaining short-term liquidity. The retained earnings to total assets ratio showed a negative average value of -0.127, confirming that the majority of unicorn companies have not achieved positive cumulative profitability, consistent with the findings of (Damayanti & Pamungkas, 2025) who identified significant differences in bankruptcy predictions during periods of economic volatility.

Classical Assumption Test Results

Classical assumption testing was conducted to ensure the regression model met the Best Linear Unbiased Estimator criteria. The normality test using the Jarque-Bera test yielded a statistical value of 3,842 with a probability of 0.147, indicating that the model residuals were normally distributed at a 5 percent significance level. The multicollinearity test using the Variance Inflation Factor calculation showed that all independent variables had VIF values ranging from 1,234 to 2,876, well below the threshold of 10, confirming that there was No. excessive correlation between the predictor variables. The heteroscedasticity test using the Breusch-Pagan test yielded a chi-square value of 8,234 with a probability of 0.144, indicating that the residual variance was homogeneous. The autocorrelation test using the Durbin-Watson statistic yielded a value of 1,987, within the acceptable range of 1.5-2.5, indicating that there was No. serial correlation in the model residuals.

Panel Data Regression Analysis Results

The selection of the estimation model was carried out using the Hauman test, which produced a chi-square value of 18.764 with a probability of 0.002, indicating that the fixed effects model is more appropriate than the random effects model for the research data. The results of the panel data regression estimation using the fixed effects model are presented in Table 2.

Table 2. Panel Data Regression Estimation Results

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.847	0.234	3,618	0.001
Working Capital to Total Assets (X_1)	2.145	0.456	4,705	0.000
Retained Earnings to Total Assets (X_2)	1,877	0.387	4,848	0.000
EBIT to Total Assets (X_3)	3,234	0.612	5,284	0.000
Market Value of Equity to Total Liabilities (X_4)	0.567	0.123	4,610	0.000
Sales to Total Assets (X_5)	0.934	0.287	3,254	0.002

Source: Research Result

R-squared: 0.7845 | Adjusted R-squared: 0.7623 | F-statistic: 35.426 (Prob: 0.000)

The test results show that the five independent variables have a positive and significant influence on the Altman Z-Score at a 95 percent confidence level. The coefficient of determination (R^2) of 0.785 indicates that 78.45 percent of the variation in the Altman Z-Score can be explained by the regression model, while 21.55 percent is influenced by other factors outside the model. The adjusted R^2 value of 0.7623 indicates the consistency of the model's predictive power after taking into account the number of variables and observations.

Partial Hypothesis Test Results

Partial hypothesis testing using a t-test shows that the working capital to total assets rasio has a coefficient of 2.145 with a probability value of 0.000, indicating a significant positive effect on the Altmant Z-Score (Susilawati et al., n.d.). The retained earnings to total assets rasio displays a coefficient of 1.876 with a probability of 0.000, confirming the significant contribution of accumulated profits to finansial health. The EBIT to total assets ratio has the highest coefficient of 3.234 with a probability of 0.000, indicating that operational profitability is the most dominant determinant in predicting unicorn company bankruptcy. The market value of equity to total liabilities ratio displays a coefficient of 0.567 with a probability 0.000, indicating that market valuation has a positive effect on the finansial health score. The sales to total assets ratio has a coefficient of 0.934 with a probability of 0.002, confirming that aset utilization efficiency contributes significantly to the Z-Score.

Simultaneous Hypothesis Test Results

Simultaneous hypothesis testing using the F-test yielded an F-statistic of 35.426 with a probability of 0.000, indicating that the five finansial ratios together significantly influenced the Altman Z-Score in Indonesian unicorn companies for the 2020-2025 period (Badollahi, n.d.). This finding confirm that the combination of the five financial ratio components form a comprehensive framework for predicting financial health and potential finansial distress in digital-based technology companies.

Unicorn Company Z-Score Classification

The distribution of unicorn company classification based on Altman's Z-Score during the observation period is presented in Table 3.

Table 3. Distribution of Z-Score Classification of Unicorn Companies 2020-2025

Year	Safe Zone (Z>2.99)	Grey Zone (1.81<Z>2.99	Distress Zone (Z<1.81)
2020	2 (22.2%)	4 (44.4%)	3 (33.3%)
2021	3 (33.3%)	3 (33.3%)	3 (33.3%)
2022	2 (22.2%)	5 (55.6%)	2 (22.2 %)
2023	4 (44.4%)	3 (33.3%)	2 (22.2%)
2024	3 (33.3%)	4 (44.4%)	2 (22.2%)
2025	4 (44.4%)	4 (44.4%)	1 (11.1%)

Source: Research Result

Temporal analysis shows a positive tren of increasing proportion of unicorn companies in the safe zone from 22.2 percent in 2020 to 44.4 percent in 2025, indicating improving finansial health conditions along with the post-pandemic economic recovery (Kamila et al., 2025). The proportion of companies in the distress zone decreased from 33.3 percent in 2020 to 11.1 percent in 2025, confirming the finansial resilience of the Indonesian unicorn ecosystem in the face of economic pressure. However, the significant proportion of companies consistently remaining in the gray zone throughout the observation period indicates the need for continuous monitoring and bankruptcy risk mitigation strategies.

Discussion

The Effect of Working Capital to Assets Ratio on Altman Z-Score

The research result confirm that the working capital to total assets ratio has a positive and significant effect on the Altman Z-Score with coefficient of 2.145. This finding indicates that every one-unit increase in the working capital ratio will increase the Z-Score by 2.145 units, improving the finansial health of unicorn companies. The working capital ratio reflects an entity's ability to meet short-term obligations through current assets, where a positive value indicates adequate liquidity for ongoing operations (Anisah et al., 2025). The characteristics of unicorn companies that allocate substantial resources for exponential growth often result in negative working capital, placing the entity at risk of short-term financial distress despite having long-term growth prospects. This research aligns with the findings of (Khasanah et al., n.d.) who identified retail companies with consistent working capital deficits experiencing finansial stress, confirming the importance of liquidity management in bankruptcy prediction.

The Influence of Retained Earnings to Total Assets Ratio on Altman's Z-Score

The retained earnings to total assets rasio (RAR) showed a significant positive effect on the Altman Z-Score with a coefficient of 1.876, indicating that accumulated retained earnings are an important indicator of long-term financial health. This rasio reflects a company's ability to generate and maintain cumulative profitability over the operating period, while negative values indicate accumulated losses that erode equity (Damayanti & Pamungkas, 2025). The majority of Indonesian unicorn companies exhibit negative retained earnings, reflecting a strategy prioritizing growth over short-term profitability, common in the early stages of technology company development. However, the persistence of accumulated losses increases vulnerability to finansial distress when investor support declines or economic conditions worsen. These findings confirm that the transition from a growht-oriented strategy to sustainable profitability is a critical success a factor in maintaining the finansial health of unicorn companies.

The Effect of EBIT to Total Assets Ratio on Altman Z-Score

The EBIT to total assets ratio displayed the highest coefficient of 3.234, confirming that operational profitability is the most dominant determintant in predicting the financial health of unicorn companies. This ratio measures management effectiveness in generating operating profit from total assets, reflecting operational efficiency and the ability to create value before considering capital structure and tax burden (Putra et al., 2025). Unicorn companies with positive EBIT demonstrate the ability to generate sustainable operational cash flow, reduce dependence on external funding, and increase resilience to economic volatility. This finding aligns with (Susilawati et al., n.d.) who identified companies with high operational profitability consistently within the safe zone of the Z-Score classification. The dominant significance of this variable implies that unicorn company management's focus on achieving operational break-even is a strategic priority in mitigating bankruptcy risk.

The Influence of Market Value of Equity to Total Liabilities Ratio on Altman's Z-Score

The market value of equity to total liabilities ratio (MVA) shows a significant positive effect with a coefficient of 0.567, indicating that the market valuation of equity relative to total liabilities contributes to predicting financial health. This ratio reflects investor' perceptions of a company's fundamentals and its ability to cover its liabilities, with high values indicating a conservative capital structure with controlled leverage (Badollahi, n.d.). The characteristics of unicorn companies with high valuations but not yet profitable create a paradox where high market values do not always reflect solid financial fundamentals. Significant fluctuations in market valuations in technology companies can result in high volatility in this ratio, reducing

its reliability as a standalone predictor but still providing valuable information when combined with other financial ratios within the Z-Score framework.

The Influence of Sales to Total Assets Ratio on Altman's Z-Score

The sales-to-total-assets ratio (S/T) displayed a coefficient of 0/934 with statistical significance, confirming that the efficiency of asset utilization in generating revenue contributes to the financial health of unicorn companies. This ratio measures asset productivity, with high values indicating a superior ability to convert asset investments into revenue streams (Kamila et al., 2025). Unicorn companies with asset-light business models, such as digital platforms, exhibit a high ratio, reflecting superior scalability compared to traditional, capital-intensive business models. However, an excessive focus on revenue growth without regard for profitability can result in high sales-to-total-assets but low EBIT, indicating unsustainable growth. This finding implies the need for a balanced approach between revenue growth and operational efficiency to maintain long-term financial health (Purwanto, 2022).

CONCLUSION

This study confirms that the five financial ratio components in the Altman Z-Score model significantly influence the prediction of the financial health of unicorn companies in Indonesia for the 2020-2025 period. The results of the panel data regression analysis show that the EBIT to total assets ratio is the most dominant determinant with a coefficient of 3.234, followed by the working capital to total assets ratio (2.145), retained earnings to total ratio (1.876), sales to total assets ratio (0.934), and market value of equity to total liabilities ratio (0.567). Simultaneously, the five financial ratios explain 78.45 percent of the variation in the Altman Z-Score with an F-statistic value of 35.426. The temporal analysis identified a positive tren of increasing the proportion of companies in the safe zone from 22.2 percent (2020) to 44.4 percent (2025), indicating the financial resilience of the Indonesian unicorn ecosystem post-pandemic. These findings provide theoretical contributions through the adaptation of classical models to the context of technology companies, as wel as practical implications as an early warning system for stakeholders in mitigating bankruptcy risks and making strategic investment decisions in Indonesia's digital economy.

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