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Research Article

Financial Distress Prediction Using the Modified Altman Z-Score Model: Empirical Evidence from Hospitality Companies Listed on the Indonesia Stock Exchange

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Abstract: This study aims to evaluate the financial condition of hotel sub-sector companies listed on the Indonesia Stock Exchange during the 2020–2023 period using the Modified Altman Z-Score model. A descriptive quantitative approach was employed to assess potential bankruptcy through the analysis of four key financial ratios: liquidity, profitability, solvency, and working capital to total assets. The findings reveal that hotel companies experienced significant financial fluctuations during the COVID-19 pandemic, with a decline in financial performance in 2021–2022 followed by a strong recovery in 2023. Most companies managed to maintain financial stability and demonstrated adaptability to changing economic conditions. Liquidity and profitability were identified as the main indicators of financial resilience, while external factors such as government policy and tourism mobility also influenced overall financial stability. The study confirms the relevance of the Modified Altman Z-Score model as a tool for predicting bankruptcy in the service sector, although its accuracy should be refined by integrating external variables to provide a more comprehensive analysis. The results of this study are expected to provide practical insights for hotel management, investors, and policymakers in developing sustainable financial strategies for the hospitality industry.

Keywords: Altman Z-Score; Bankruptcy; COVID-19 pandemic. Financial performance; Hospitality

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1. Introduction

The hospitality industry is a key pillar supporting the national economy and an integral part of the tourism sector. Its contribution to Gross Domestic Product (GDP) reached 5.1% in 2019, employing well over 13 million workers (Ministry of Tourism and Creative Economy, 2023; BPS, 2021). However, the COVID-19 pandemic, which began in early 2020, has significantly impacted this sector. Travel restrictions, a decline in tourist numbers, and the implementation of public activity restrictions (PPKM) policies have resulted in a drastic drop in room occupancy rates of up to 15% in Bali and a drop in national tourism revenue from IDR 240 trillion to IDR 90 trillion (Ministry of Tourism and Creative Economy, 2022; Armadani et al., 2021). These impacts not only threaten business continuity but also test the financial resilience of Indonesian hotel companies.

To address these challenges, the Altman Z-Score model has long been used to predict bankruptcy based on financial ratios such as liquidity, profitability, and solvency (Altman & Hotchkiss, 2011). While effective for manufacturing companies, its accuracy in service sectors like hotels remains questionable, especially during times of crisis. A study by Armadani et al. (2021) showed that the accuracy of the Z-Score model dropped by 43% during the pandemic, while Mahmuda (2022) found that 40% of companies categorized as "safe" actually experienced severe financial pressure due to external factors. Research by Zulpahmi et al. (2023)

also confirmed that external variables such as tax incentive policies and travel restrictions significantly impact the financial stability of hotel companies. This indicates that bankruptcy predictions relying solely on internal financial ratios have limitations in dealing with the dynamics of the global crisis.

Based on these conditions, this study was conducted to evaluate the reliability of the Modified Altman Z-Score model in predicting bankruptcy in hotel subsector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2023 period. This study employed a descriptive quantitative approach with secondary data in the form of company financial reports. Z-score calculations were performed to determine risk zones (safe, gray, distress) and were compared temporally using descriptive statistical analysis and comparative tests (one-way ANOVA or Kruskal-Wallis). Additionally, external variables such as government policies and tourist numbers were used as interpretive factors in the discussion.

Theoretically, this research contributes by enriching the literature on bankruptcy prediction in the service sector, particularly the hospitality sector, which has been dominated by manufacturing studies (Altman & Sabato, 2007; Gitman, 2015). Practically, the results of this study can be a tool for management, investors, and capital market regulators in assessing a company's financial resilience and establishing risk mitigation strategies during a crisis. The novelty of this research lies in its hybrid approach, which combines internal financial analysis with consideration of external factors relevant to the pandemic context, thus providing a more adaptive and realistic prediction model for the hospitality sector.

The results show that most companies in the hospitality subsector were able to maintain financial stability despite fluctuations in Z-score values between years. This finding underscores the important role of liquidity and profitability management in maintaining business resilience. The practical implication of this research is the need to strengthen risk management strategies and financial policies that are responsive to external dynamics so that hotel companies can be more resilient in the face of future economic uncertainty. Thus, this study not only offers a methodological update in the application of the Altman Z-Score model in the service sector but also provides a real contribution in formulating strategic policies that support the sustainability of the hospitality industry after the COVID-19 pandemic.

2. Preliminaries or Related Work or Literature Review

Research on bankruptcy prediction in the hospitality sector generally uses the Altman Z-Score model as the primary tool for identifying financial distress. Several studies indicate that while the hospitality sector possesses potential and a certain degree of resilience, the risk of bankruptcy remains significant, especially during periods of crisis.

A study by Armadani et al. (2021) found that some hospitality companies in Indonesia were in financial distress, even though the sector was generally considered stable. However, the study also demonstrated the limitations of the Z-Score model during the COVID-19 pandemic, with a relatively low level of accuracy. Conversely, Muhammad Yusril (2021) showed that most hospitality companies remained healthy throughout the pandemic, reflecting managerial resilience. This difference in results indicates that the effectiveness of bankruptcy prediction models is heavily influenced by the economic context and internal company strategies.

The differences in conditions before and during the pandemic were also confirmed by Mahmuda (n.d.), who showed significant changes in bankruptcy prediction results. Meanwhile, Dengang & Oktafiani (2024) noted an increase in the number of hotel companies experiencing financial distress in the 2019–2023 period, indicating the long-term impact of post-pandemic economic uncertainty.

From an international perspective, Altman & Sabato (2007) emphasized the importance of incorporating external variables to improve the accuracy of bankruptcy predictions, while Wieczorek-Kosmala (2021) showed that the Z-Score model remains relevant in the Southeast Asian tourism sector when macroeconomic factors are taken into account. Singh's (2021) research in India also confirmed variations in financial resilience among hotel companies, influenced by economic conditions and management quality.

Based on these studies, it can be concluded that the Altman Z-Score model remains relevant in predicting hotel bankruptcy but has limitations during a crisis. Therefore, there is a research gap regarding the need to re-evaluate the effectiveness of the Z-Score model by considering the dynamics of the crisis and the post-pandemic period, particularly in the context of the hotel industry.

The main instrument in this study is the Modified Altman Z-Score model, adapted for the non-manufacturing sector. The formula used is $Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4$, where X1 is the ratio of working capital to total assets, X2 the ratio of retained earnings to total assets, X3 the ratio of earnings before interest and taxes (EBIT) to total assets, and X4 the ratio of book value of equity to total liabilities. These four ratios are calculated based on data from audited financial statements. The use of this model is supported by research by Altman and Hotchkiss (2011), which confirms the relevance of the modified Z-score model for companies in the service sector, such as hotels.

The obtained data were then analyzed using quantitative descriptive analysis techniques. The analysis steps include (1) calculating the Z-score for each company for the period 2020–2023; (2) grouping the calculation results into three categories: distress ($Z < 1.1$), gray zone ($1.1 \leq Z \leq 2.6$), and safe zone ($Z > 2.6$); (3) comparing trends in Z-score values between years to examine patterns of company financial resilience during and after the COVID-19 pandemic; and (4) conducting comparative tests using one-way analysis of variance (ANOVA) or the non-parametric Kruskal-Wallis test, depending on the data distribution, to identify significant differences between study periods.

To enhance the validity of the results, the quantitative analysis was also strengthened by the interpretation of external factors such as government policies and the number of tourist visits, which were used descriptively in the discussion of the results. This study did not use any experimental tools or materials, as all data came from official financial reports and had been verified by independent auditors. Therefore, the method used is accountable from both academic and practical perspectives.

Overall, this method is designed to provide an empirical overview of the financial resilience of companies in the hospitality subsector in Indonesia during the crisis and post-pandemic recovery period. Through the application of the modified Altman Z-score model and comparative analysis, it is hoped that the results of this study can contribute to the development of bankruptcy prediction theory and become a practical reference for investors, management, and regulators in making strategic decisions in the hospitality sector.

3. Materials and Method

This study uses a descriptive quantitative approach that aims to provide a factual and systematic overview of the financial condition of hospitality sub-sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2020 to 2023. This approach was chosen because it can explain the phenomenon of bankruptcy through the analysis of numerical data sourced from company financial reports, allowing the results to be interpreted objectively and measurably.

The population in this study includes all 15 hospitality sub-sector companies listed on the IDX. From this population, the sample was determined using a purposive sampling technique, namely selecting samples based on certain criteria relevant to the research objectives. These criteria include (1) companies actively listed on the IDX during the period 2020–2023; (2) companies that consistently publish audited annual financial reports; (3) companies that have not been delisted during the study period; and (4) companies that have experienced consecutive losses for four years. Based on these criteria, five companies were identified as meeting the requirements: PT Hotel Sahid Jaya International Tbk (SHID), PT Red Planet Indonesia Tbk (PSKT), PT Panorama Sentrawisata Tbk (PANR), PT Jakarta International Hotels & Development Tbk (JIHD), and PT Dafam Property Indonesia Tbk (DFAM).

The data used in this study is secondary data obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official websites of each company. The data collected consisted of annual financial reports, including balance sheets, income statements, cash flow statements, and statements of changes in equity. All data was collected through documentary study techniques by transcribing and converting financial report information into a statistical analysis format.

4. Results and Discussion

Results

Research results were obtained from the application of the Modified Altman Z-Score model to five hospitality sub-sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2023 period. This study aims to assess the financial condition and potential bankruptcy of these companies based on key financial ratios: working capital to total assets (X1), retained earnings to total assets (X2), earnings before interest and taxes to total assets (X3), and book value of equity to total liabilities (X4).

In general, the results indicate that hospitality subsector companies in Indonesia experienced significant financial fluctuations during the COVID-19 pandemic and the economic recovery period. In 2020, most companies remained relatively financially stable. However, a decline in performance began in 2021 and reached its lowest point in 2022, in line with declining hotel occupancy rates and reduced revenue due to restrictions on public activities. These conditions indicate significant financial pressure in the hotel sector. Entering 2023, financial performance showed improvement, with rising Z-scores for most companies, indicating a financial recovery.

Based on the analysis, four of the five companies in the study sample experienced improved financial conditions in 2023. Only one company, PT Hotel Sahid Jaya International Tbk (SHID), was in the "distress" category in 2022 but managed to return to a "safe" condition the following year. Other companies, such as PT Red Planet Indonesia Tbk (PSKT) and PT Dafam Property Indonesia Tbk (DFAM), were able to maintain stable financial conditions throughout the study period, while PT Panorama Sentrawisata Tbk (PANR) and PT Jakarta International Hotels & Development Tbk (JIHD) showed gradual improvement.

Changes in Z-score values reflect the dynamics of a company's ability to maintain liquidity, profitability, and solvency during the crisis. Companies with good working capital management and maintained operational efficiency have higher financial resilience. Operating profit (EBIT) and retained earnings have been shown to significantly contribute to positive Z-score values. Conversely, companies with high debt burdens and declining operating profits tend to have lower scores.

The analysis also shows that external factors such as travel restrictions, declining tourist numbers, and government fiscal policies also impact a company's financial condition. When travel restrictions began to ease and the tourism sector rebounded in 2023, there was a significant increase in the Z-score for almost all companies studied. This indicates that the hospitality sector is highly sensitive to changes in policies and tourist mobility.

Overall, the results of this study indicate that the Modified Altman Z-Score model remains relevant for assessing bankruptcy potential in the service sector, particularly the hospitality sector, although its accuracy needs to be adjusted to account for external factors. Therefore, it can be concluded that companies in the hospitality subsector in Indonesia generally have the ability to adapt and recover from the economic pressures caused by the pandemic, primarily through strengthened liquidity management and increased operational efficiency.

Discussion

The results of this study indicate that the financial condition of companies in the Indonesian hotel subsector during the 2020–2023 period experienced quite dynamic changes due to the impact of the COVID-19 pandemic. A significant decline in financial performance occurred in 2021–2022, in line with limited tourism activity and low hotel occupancy rates. However, recovery began to appear in 2023 when economic activity returned to normal and the tourism sector showed an increase in domestic and international tourist visits. This finding strengthens the argument that the hotel industry is highly dependent on macroeconomic stability and government policies regarding public mobility.

Interpretation of the research results indicates that internal factors, such as the ability to maintain liquidity and profitability, are the main determinants of the financial resilience of hotel companies. Companies that are able to maintain positive operating profits and have healthy working capital ratios demonstrate a higher level of financial stability. Conversely, companies with large debt structures and low efficiency are more likely to experience financial stress. This aligns with Altman's (1968) theory, which states that the combination of liquidity, profitability, and solvency ratios can indicate a company's bankruptcy risk. However, in the context of the hospitality industry, the results of this study indicate that the Altman Z-Score model needs to be enriched by considering external variables such as changes in fiscal policy and tourism market dynamics.

The findings of this study are also consistent with previous studies, such as those by Armadani et al. (2021) and Zulpahmi et al. (2023), which emphasized the importance of integrating external factors in assessing the financial resilience of the service sector. Therefore, the results of this study can serve as a basis for developing a bankruptcy prediction model that is more contextual and tailored to the characteristics of the hospitality industry in Indonesia. By combining internal financial ratio analysis and external factors, this study provides a new perspective on the application of the Altman Z-Score model in the non-manufacturing sector.

5. Conclusion

Based on the overall research results, it can be concluded that most hotel subsector companies listed on the Indonesia Stock Exchange remain financially sound and able to withstand economic pressures during the pandemic. The Modified Altman Z-Score model has proven effective in identifying potential bankruptcy and observing company financial recovery trends. However, the effectiveness of this model still has limitations because it does not fully reflect the influence of significant external variables on the service sector, particularly hotels.

Practically, the results of this study have implications for hotel management, investors, and policymakers. For management, it is important to strengthen financial risk management strategies through operational cost control and revenue diversification. For investors, the results of this study can be used as a reference in assessing the investment viability and long-term stability of hotel companies. Meanwhile, for the government and capital market regulators, these results can be considered in designing economic recovery policies oriented towards the sustainability of the tourism and hotel sector.

This study has several limitations, including the use of secondary data from annual financial reports, which cannot capture short-term financial dynamics. Furthermore, this study does not quantitatively include macroeconomic variables such as inflation, exchange rates, or interest rates in the analysis. Therefore, further research is recommended to expand the scope by integrating external factors into the prediction model and comparing the effectiveness of several models, such as Springate, Ohlson, and Zmijewski, in the context of the hospitality sector. A combined approach of quantitative and qualitative analysis is also recommended to provide a more comprehensive picture of the financial resilience of hospitality companies in Indonesia.

Thus, this study not only strengthens the empirical evidence regarding the application of the Altman Z-Score model in the service sector but also provides a conceptual contribution to the development of bankruptcy prediction theory and the application of strategic financial management in the hospitality industry. The results of this study are expected to encourage increased financial literacy in the tourism sector and serve as a reference for sustainable strategic decision-making.

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