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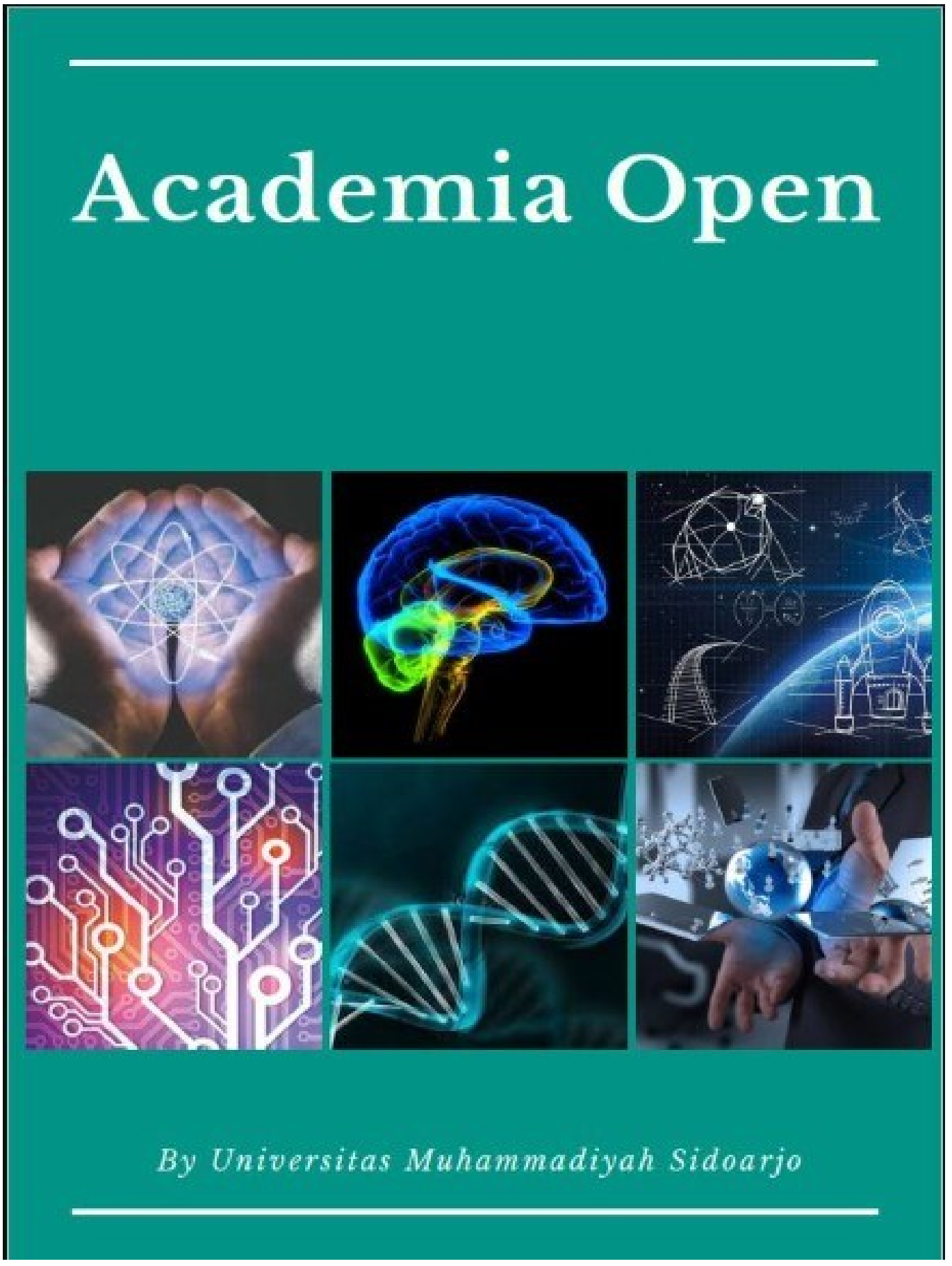

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Bankometer Outperforms Modified Altman Z Score in Bank Failure Prediction

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Abstract

General Background: Bank failure prediction is essential for strengthening financial distress early warning systems in the banking sector. **Specific Background:** This study examines Rural Banks and Islamic Rural Banks in Indonesia whose business licenses were revoked during 2022–2025, reflecting the need for accurate models to identify potential bankruptcy before regulatory action occurs. **Knowledge Gap:** Previous studies have examined financial distress indicators in banking, yet limited evidence compares the modified Altman Z Score and Bankometer models using banks that actually experienced license revocation. **Aims:** This study analyzes and compares the predictive capability of the modified Altman Z Score and Bankometer models one year and two years before bank failure. **Results:** The findings show that both models detected financial distress before bankruptcy. The modified Altman Z Score identified several banks in distress and grey area categories, but many banks remained classified as healthy two years before failure. Bankometer captured broader warning signals, particularly through capital, asset quality, liquidity, and operational efficiency indicators. In the two-year period before failure, Bankometer classified 7 banks as distressed and 8 banks in the grey area, representing 57.69% of the sample receiving early warning signals. Overall, Bankometer showed higher accuracy than the modified Altman Z Score, especially one year before bankruptcy. **Novelty:** This study provides a comparative evaluation of two bankruptcy prediction models using 26 failed Rural Banks and Islamic Rural Banks. **Implications:** Bankometer can serve as a more relevant early warning tool for regulators, management, and investors in assessing bank failure risk.

Highlights:

- Indodax achieved higher task completion rates and faster interaction performance than Tokocrypto.
- Dominant Alpha brainwave patterns indicated lower cognitive burden during Indodax interaction sessions.
- Asset filtering, transaction records, and nominal selection created major interaction difficulties in Tokocrypto.

Keywords: BPRS, Bankruptcy, Regulators

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Introduction

Based on Bank Indonesia Circular Letter (SEBI) No. 6/23/DPNP/2004, bank health is the result of a qualitative assessment of various aspects that influence the condition or performance of the bank through assessments of capital, asset quality, management, profit, and liquidity. Bank health is a concern for all stakeholders, including bank owners and managers, the public as users of bank services, and Bank Indonesia as the government's bank supervisor. Given the important role of banks in financial well-being, it is necessary to assess bank health. The goal is to determine whether the bank's actual condition is healthy, unhealthy, or sick. If the bank is healthy, it is necessary to maintain that health. However, if the bank is unhealthy, immediate action must be taken to address it [1].

From 2024 to October 2025, media reports indicated that dozens of Rural Banks (BPR) and Sharia Rural Banks (BPRS) had their business licenses revoked by the Financial Services Authority (OJK) for failing to implement financial recovery measures as recommended by the regulator. Examples of banks subject to license revocation include BPR Wijaya Kusuma, BPRS Mojo Artho, BPR Bank Pasar Bhakti, and dozens of others, totaling dozens of institutions declared bankrupt during that period. These license revocations were primarily driven by the banks' inability to meet financial health ratios such as minimum capital, credit quality, and liquidity, as well as weaknesses in systematic internal governance. This phenomenon raises the important question of how financial distress prediction models can be used to identify banks at risk of failure before license revocation occurs. Financial distress prediction models are not only useful for internal management but also provide regulators, credit analysts, and investors with a head start in implementing an early warning system so that mitigation measures can be designed more effectively.

The Altman Z-Score (modified) is a bankruptcy prediction model based on financial ratios originally developed for manufacturing companies but later modified for use in other sectors, including banking. This model combines several important ratios, such as the working capital to total assets ratio, the profit to total assets ratio, and the market value of equity to debt. Previous research in Indonesia has shown that this model can provide early indications of banks experiencing financial distress, although adjustments are needed to account for banking characteristics. For example, a study by [2]. Applying the modified Altman Z-Score to both Islamic and conventional banks, we found that financial ratios such as CAR and NPL influence bankruptcy prediction scores.

Bankometer, a banking-specific model that combines various bank health ratios, including core capital, asset quality, liquidity, and profitability. Research by [14] confirms that the Bankometer can be used to measure the risk of financial distress in Indonesian Islamic banks during the study period.

Several previous studies have demonstrated the relevance of these three models in the Indonesian banking context. For example, research conducted by [3] found a significant relationship between CAR, NPL, and other financial ratios and bank financial distress using the CAMEL approach. Previous research on commercial banks in Indonesia by [4] stated that the CAR, NPL, and LDR ratios have a significant positive influence on financial distress. Similar research by [5] shows that the NPL ratio has no significant effect, while the GCG implementation rating has a significant positive effect on financial distress. The GCG rating variable in this study [6] unable to trigger financial distress conditions in banks, so it has no significant impact. Research on BPRs in Indonesia by [7] The CAR ratio has a significant negative effect, while bank size has no significant effect on financial distress.

With the accumulation of recent failed bank phenomena and diverse empirical research results, there is a research gap regarding a comprehensive comparison between the modified Altman Z-Score and the bankometer, as well as the effectiveness of each model in predicting bank failures that actually fail (having their licenses revoked by the Financial Services Authority), as seen in cases up to October 2025. This indicates an opportunity for scientific contributions to provide recommendations for the best model or combination of models that can serve as an early warning system for banks, regulators, and other stakeholders.

Literature Review and Hypothesis

Agency theory fundamentally describes the interaction between a principal and a designated representative (agent) who is tasked with carrying out the operational responsibilities of the organization [8]. he entrepreneur is represented by the stockholder, while the individuals assigned with responsibility are identified as management. The principal and agent are bound by a contractual agreement to exercise their respective rights and responsibilities. The relationship between ownership and managerial control within the entity is a significant factor contributing to the emergence of agency conflicts.

Financial statements convey both positive and negative signals to stakeholders through financial disclosure, according to signaling theory [9]. Management consistently discloses proprietary information deemed significant by shareholders and investors, especially when it is profitable. Indicators of managerial success or failure to owners are explained by signaling theory. According to signaling theory, companies take certain steps to provide investors with an idea of how managers perceive the value or performance of an entity. By producing accurate and reliable financial reporting data, information asymmetry can be reduced by the company, owners, and outsiders using signaling theory. Successful businesses typically release more information more frequently than companies experiencing losses or financial distress.

Bank Indonesia Regulation No. 13/1/PBI/2011 concerning the Assessment of the Health Level of Commercial Banks stipulates that banks are required to conduct individual assessments of their health level using a risk-based approach (Risk-Based Bank Rating) with assessments covering risk profile factors; good corporate governance (GCG); earnings; and capital.

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1. Modified Altman Z-Score Can Predict Bankruptcy

The modified Altman Z-Score serves as a monitoring mechanism that helps reduce information asymmetry through data-based evaluation of financial statements. Financial information reflected in the Altman Z-Score ratios contains signals that can be interpreted by stakeholders. A decline in the Z-Score indicates a negative signal regarding the bank's financial health.

The modified Altman Z-Score model has the ability to detect declining performance trends up to two years before bankruptcy, although its accuracy is generally lower than one-year predictions. This is due to the dynamics of financial conditions, which can still change over a longer period. However, a consistent downward pattern can still be identified as an early indication of financial distress. The Z-Score can be applied to Islamic banks, with consistent predictions of the bank's financial situation [10]. Z-Score accurately predicts distress 1–3 years before failure [11]. Despite shifts in some financial ratios, Islamic banks remain relatively stable; the Z-Score indicates that the impact of the pandemic on stability has not been drastic [12]. Based on the description above, the following hypotheses are proposed:

H1: The modified Altman Z-Score can predict bank bankruptcy one year in advance.

H3: The modified Altman Z-Score can predict bank bankruptcy two years in advance

2. Bankometer Can Predict Bankruptcy

Bankometer acts as a monitoring tool that can reduce this information gap through measurements based on financial indicators relevant to bank operations. Thus, this model helps principals assess the bank's actual condition more objectively.

The ratios used in Bankometer generate signals that reflect a bank's financial condition. A decline in the capital adequacy ratio, an increase in non-performing loans, and weakening liquidity are negative signals indicating financial stress. These signals can be perceived by investors and regulators as early warnings of potential bankruptcy. Because the indicators in Bankometer are specific and sensitive to banking risks, the resulting signals tend to be more accurate in detecting short-term distress. Previous empirical research has shown that banking ratio-based models have good ability to predict bankruptcy within one year. Empirical research shows that the modified Altman Z-Score model has the ability to detect declining performance trends up to two years before bankruptcy, although its accuracy is generally lower than that of one-year predictions. This is due to the dynamics of financial conditions, which can still change over a longer period. However, a consistent downward pattern can still be identified as an early indication of financial distress. Bankometer can be used for bankruptcy prediction; liquidity, credit and capital variables have been shown to have a significant influence on distress [13]. The analyzed Islamic banks were included in the “super sound” category during the period; indicating the reliability of the Bankometer for Islamic bank [14]. Therefore, Bankometer is theoretically and empirically capable of identifying potential bank bankruptcy one year in advance. Based on the above description, the following hypotheses are proposed:

H2: Bankometer can predict bank bankruptcy one year in advance.

H4: Bankometer can predict bank bankruptcy two years in advance

Method

A population is a generalization of an area consisting of items or subjects with certain characteristics that are used to conduct research and then reach conclusions [15]. Banking companies reporting their annual financial statements for 2022-2024 constitute the population of this study, which includes the banking sector that went bankrupt until 2025. Some common reasons for this are time, manpower, and funding constraints, which prevented large-scale and long-distance sampling. The sample selection criteria were as follows:

a. BPR or BPRS that reported financial statements on the official website of the Financial Services Authority for 2022-2024 and have published complete audited financial statements or annual reports for the 2022-2024 financial years ending December 31st.

b. The company has published complete annual reports and financial data used in the study for 2022-2024.

c. The company has the data required for the study.

d. The company publishes financial statements in Rupiah.

This study uses a quantitative descriptive method, using secondary data in the form of the company's financial statements. The data collected in this study was through a documentary study, meaning data was collected through relevant documentation or through searches on the official website of the Financial Services Authority during 2022-2024. Scientific research, accounting, management, and books related to the subject were also used, as well as readily available data such as records, financial reports, and other relevant information.

Modified Altman Z-Score by [16] through the following calculation method:

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under the condition :

$$Z - Score = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (1)$$

X1 = *Working Capital / Total Assets*X2 = *Retained Earnings / Total Assets*\

X3 = (EBIT / *Total Assets)* X4 = *Market Value of Equity / Total Liabilities*

From the linear equation above, companies indicated as bankrupt or not are grouped into three categories:

a. Z-score less than 1.1 (Z" < 1.1) indicates a high probability of bankruptcy.

b. Z-score between 1.1 and 2.6 (1.1 < Z" < 2.6) indicates a gray area, making it uncertain whether the company is healthy or likely to go bankrupt.

c. Z-score greater than 2.6 (Z" > 2.6) indicates a healthy company with a low probability of bankruptcy.

The Bankometer model developed from IMF recommendations in 2000 takes into account the same bank assessment as the CAMEL ratio set by Bank Indonesia (Erari, 2013) . The Bankometer model is:

$$S = 1.5CA + 1.2EA + 3.5CAR + 0.6NPL + 0.3CI + 0.4LA \quad (2)$$

Keterangan:

Capital to Asset Ratio (CA)= Capital / Total Assets

Equity to Asset Ratio (EA)= Equity / Total Assets

Capital Adequacy Ratio (CAR)= Minimum capital provision obligation

Non Performing Loan Ratio (NPL)= Non-performing loans / credit amount

Loan to Asset Ratio (LA)= Operating expenses / Operating income

Cost to Income Ratio (CI)= Total credit / Total assets

The criteria for bankometer results are (Altman, 1968) :

a. S-score below 50 (S < 50) indicates the bank is facing financial distress and is at high risk.

b. S-score between 50 and 70 (50 < S < 70) indicates the bank is in a gray area.

c. An S-score greater than (S> 70) indicates the bank is stable and very healthy.

For the fourth hypothesis, an accuracy test was conducted on the financial distress analysis model. The test calculates correct and incorrect estimates, or the level of accuracy of the dependent variable, the group of banks experiencing bankruptcy. First, it shows the percentage of correct financial distress models across all research objects used. The accuracy level is calculated as follows:

$$\text{Accuracy Level} = \frac{Number\ of\ Correct\ Predictions}{Number\ of\ Samples} x\ 100\% \quad (3)$$

Second, we examine the percentage analysis of error types. This study uses the first type of error, which occurs when the model predicts that the research object will not go bankrupt, but the company actually does. The error rate is calculated as follows:

$$\text{Error Level 1} = \frac{Number\ of\ Errors}{Number\ of\ Samples} x\ 100\% \quad (4)$$

The results of the accuracy and error measurements are then used to determine the most suitable model. The prediction model with the highest accuracy rate in predicting financial distress is the one with the highest percentage.

Results and Discussion

A. Results

The research object in this study focuses on micro-banking institutions in Indonesia, specifically Rural Banks (BPR) and Sharia Rural Banks (BPRS) that have been declared to have experienced permanent operational failure. The main characteristics of the sample companies in this study are banking entities that have been subject to administrative sanctions in the form of revocation of their business licenses by the Financial Services Authority (OJK) during the observation period of 2022 to 2025. The selection of this sample is based on real phenomena in the domestic banking sector, where there is a diversity of operational and geographical profiles, ranging from banks operating with conventional principles such as BPR Wijaya Kusuma in the Madiun area, to banks implementing sharia principles such as BPRS Mojo Artho in Mojokerto City.

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Table 1. Results of Z-Score Calculation of Bank 2 years before bankruptcy (t-2)

No	Bank Name	Years (t-2)	Z-Score	Interpretation
1	BPR Wijaya Kusuma	2022	3,9984	Zona Sehat
2	BPRS Artho Mojo Kota Mojokerto	2022	1,3934	Grey Area
3	BPR Usaha Madani Karya Mulia	2022	9,2378	Zona Sehat
4	BPR Bank Pasar Bhakti	2022	2,3906	Grey Area
5	Perumda BPR Bank Purworejo	2022	4,4189	Zona Sehat
6	BPR EDDCash	2022	−1,9220	Zona Distress
7	BPR Aceh Utara	2022	−1,0815	Zona Distress
8	BPR Sembilan Mutiara	2022	2,5459	Grey Area
9	BPR Bali Artha Anugrah	2022	3,2197	Zona Sehat
10	BPRS Saka Dana Mulia	2022	3,6597	Zona Sehat
11	BPR Dananta	2022	4,6308	Zona Sehat
12	BPR Bank Jepara Arta	2022	3,8468	Zona Sehat
13	BPR Lubuk Raya Mandiri	2022	−0,6263	Zona Distress
14	BPR Sumber Artha Waru Agung	2022	2,3159	Grey Area
15	BPR Nature Primadana Capital	2022	2,7137	Zona Sehat
16	BPRS Kota Juang Perseroda	2022	6,7895	Zona Sehat
17	BPR Duta Niaga	2022	4,2911	Zona Sehat
18	BPR Pakan Rabaa Solok Selatan	2022	0,5898	Zona Distress
19	BPR Kencana	2022	4,9571	Zona Sehat
20	BPR Arfak Indonesia	2022	1,5234	Grey Area
21	BPRS Gebu Prima	2022	4,1815	Zona Sehat
22	BPR Dwicahaya Nusaperkasa	2023	3,7355	Zona Sehat
23	BPR Disky Suryajaya	2023	2,1029	Grey Area
24	BPR Syariah Gayo	2023	5,0290	Zona Sehat
25	BPR Artha Kramat	2023	4,6670	Zona Sehat
26	BPR Nagajayaraya Sentrasentosa	2023	7,7558	Zona Sehat

The Altman Z-Score calculation results for the two-year period prior to business license revocation (t-2) provide an initial overview of the financial health of the 26 banks included in the study sample. The analysis over this time horizon aims to evaluate the extent to which the Altman model is able to capture the potential for financial failure in the medium term, before financial stress develops significantly.

The test results show that the majority of banks, 16 banks, or 61.53%, are still classified as being in the Healthy Zone with Z-Scores above 2.6. This finding indicates that in the two-year period prior to bankruptcy, key financial ratios such as capital structure, profitability, and liquidity remained quantitatively strong and stable. This condition is in line with the findings c which states that financial reports in period t-2 generally do not reflect latent structural or managerial risks, resulting in relatively weak bankruptcy signals. Nevertheless, the Altman Z-Score model is still able to provide early warning indications for some banks. Four banks (15.4%) were recorded as being in the Distress Zone with a Z-Score below 1.1, including BPR EDDCash and BPR Aceh Utara, which showed negative scores. Furthermore, six banks (23.07%) were in the Grey Area category, reflecting early signs of declining financial performance. The presence of banks in these two categories indicates

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that for some entities, financial stress had already begun to be detected two years before the revocation of their business licenses. Overall, the results of this analysis confirm that the predictive ability of the Altman Z-Score model in the two-year period before bankruptcy is relatively limited. Consistent with findings [17], The model accuracy in period t-2 was lower than in the period one year before bankruptcy (t-1). This indicates that the decline in the financial quality of BPRs tends to occur quickly and significantly in a short period of time, so that financial ratios are not yet fully capable of functioning as a medium-term early warning system for bank failure.

Table 2. Bank S-Score Calculation Results 2 years before bankruptcy

No	Bank Name	Years(t-2)	S-Score	Interpretation
1	BPR Wijaya Kusuma	2022	478,76	Zona Sehat (Sound)
2	BPRS Artho Mojo	2022	-315,71	Zona Distress
3	BPR Usaha Madani Karya Mulia	2022	49,57	Zona Distress
4	BPR Bank Pasar Bhakti	2022	47,44	Zona Distress
5	PERUMDA BPR Bank Purworejo	2022	52,019	Grey Area
6	BPR EDDCash	2022	178,21	Zona Sehat (Sound)
7	BPR Aceh Utara	2022	61,04	Grey Area
8	BPR Sembilan Mutiara	2022	82,33	Zona Sehat (Sound)
9	BPR Bali Artha Anugrah	2022	102,43	Zona Sehat (Sound)
10	BPRS Saka Dana Mulia	2022	182,39	Zona Sehat (Sound)
11	BPR Dananta	2022	110,62	Zona Sehat (Sound)
12	BPR Bank Jepara Arta	2022	57,51	Grey Area
13	BPR Lubuk Raya Mandiri	2022	55,74	Grey Area
14	BPR Sumber Artha Waru Agung	2022	17,58	Zona Distress
15	PT BPR Nature Primadana Capital	2022	47,73	Zona Distress
16	PT BPRS Kota Juang Perseroda	2022	79,47	Zona Sehat (Sound)
17	PT BPR Duta Niaga	2022	112,49	Zona Sehat (Sound)
18	PT BPR Pakan Rabaa Solok Selatan	2022	62,54	Grey Area
19	PT BPR Kencana	2022	46,01	Zona Distress
20	PT BPR Arfak Indonesia	2022	52,13	Grey Area
21	BPRS Gebu Prima	2023	60,81	Grey Area
22	BPR Dwicahaya Nusaperkasa	2023	60,93	Grey Area
23	BPR Disky Suryajaya	2023	102,64	Zona Sehat
24	BPR Syariah Gayo	2023	-238,20	Zona Distress
25	BPR Artha Kramat	2023	194,35	Zona Sehat
26	BPR Nagajaraya Sentrasentosa	2023	417,769	Zona Sehat

The results of the Bankometer S-Score calculation for the two-year period prior to bankruptcy (t-2) show that the health of the banks in the sample varied considerably, ranging from healthy to distressed. Overall, the distribution of results indicates that some banks are still in relatively good condition, but quite a few are already showing signs of declining financial performance.

The group of banks categorized as healthy (sound) showed relatively high S-Scores, such as BPR Wijaya Kusuma (478.76), BPR Nagajayaraya Sentrasentosa (417.769), and BPR Artha Kramat (194.35). These high scores reflect that in period t-2, these banks still maintained stable financial conditions, both in terms of capital, liquidity, and operational efficiency. Furthermore, several other banks, such as BPR EDDCash, BPR Bali Artha Anugrah, and BPR Disky Suryajaya, also demonstrated relatively safe performance.

On the other hand, several banks categorized as gray areas include PERUMDA BPR Bank Purworejo, BPR Aceh Utara, BPR Bank Jepara Arta, and BPR Lubuk Raya Mandiri. This position indicates that the banks' financial conditions are beginning to experience pressure, although they have not yet reached a critical stage. Banks in this category are generally in a transitional state, requiring increased attention due to the potential for decline if improvements are not made immediately.

Meanwhile, the distress zone group indicates banks that had experienced quite serious financial problems two years prior to bankruptcy. Several banks, such as BPRS Artho Mojo (-315.71), BPR Syariah Gayo (-238.20), and BPR Sumber Artha Waru Agung (17.58), reflect unhealthy conditions. Low or even negative S-Scores indicate strong pressure, whether in terms of asset quality, efficiency, or liquidity.

Overall, these results demonstrate that the Bankometer model has been able to capture variations in banks' financial conditions since period t-2. Not all banks are in healthy condition, and some have already shown early signs of financial distress. The presence of the gray area category is also an important indicator that the decline in financial condition did not occur suddenly, but rather through a gradual process.

Based on the classification results one year prior to business license revocation (t-1), the Modified Altman Z-Score model demonstrates very high sensitivity to bankruptcy signals. This is evidenced by the majority of sample banks immediately falling into the Distress Zone as soon as their liquidity ratios deteriorate. Therefore, H1 is accepted.

Testing the second hypothesis yields different results. Although Bankometer was specifically designed for the banking

sector, in the one-year period prior to bankruptcy, the model still frequently assigned a "Healthy" classification to several banks that were actually under special supervision. However, due to the presence of a small number of samples that were successfully detected, H2 is accepted, with the caveat.

In the two-year period prior to bankruptcy (t-2), the Modified Altman Z-Score model consistently performed as an early warning system. Most of the sample banks had begun to show a downward trend in their scores toward the Grey Area, indicating that symptoms of financial vulnerability were detected long before administrative decisions were made. Therefore, H3 was accepted.

The results of testing the fourth hypothesis indicated that the Bankometer model was capable of providing early warning signals of potential bank bankruptcy in the two-year period prior to business license revocation (t-2). Based on the analysis, 7 banks (26.92%) were identified as being in distress, and 8 banks (30.77%) were in the grey area category. Thus, a total of 15 banks, or 57.69% of the total sample, received early warning signals. Therefore, the fourth hypothesis (H4) was accepted, with the caveat that although the Bankometer model was quite effective as an early warning system in the two-year period prior to bankruptcy, it still had limitations in detecting all banks experiencing a decline in overall financial performance.

B. Discussion

The results of the study indicate that the Modified Altman Z-Score model is highly effective in detecting financial deterioration in rural banks (BPR/BPRS) whose business licenses have been revoked. This finding confirms Altman's theoretical basis that an entity's financial failure does not occur suddenly, but rather through a systematic, measurable process of financial ratio degradation. In the context of the sample BPRs, working capital and retained earnings are the most sensitive indicators in detecting danger signals before a bank is declared bankrupt. Theoretically, the Modified Altman Z-Score model's superiority over other models in this study lies in its more conservative and realistic nature. This model not only looks at the administrative capital adequacy ratio but also captures asset productivity (X_3) and the solvency structure relative to total liabilities (X_4). A decline in the Z-Score value to a negative number (as in BPR Wijaya Kusuma) reflects a condition where all of the bank's capital has been exhausted and the bank is technically insolvent.

The Bankometer model in this study is used to assess the predictive ability of bank bankruptcy through a financial ratio approach specifically designed for the banking sector. By utilizing indicators such as CA, EA, CAR, NPL, CI, and LA, this model is expected to provide a more relevant picture of bank health, both in the medium term and in the run-up to bankruptcy.

Based on the analysis, in the two-year period prior to the revocation of business licenses (t-2), the Bankometer model demonstrated initial ability to detect potential financial problems. This was reflected in the emergence of several banks entering the distress or grey area categories. Although not all banks could be clearly identified, these findings indicate that most banks had already begun experiencing financial stress during that period. In other words, the Bankometer model was already capable of providing early warning signals, albeit in its early stages.

Bankometer tended to produce more definitive results with a relatively small number of grey areas, thus minimizing uncertainty in interpretation. Conversely, the Altman model placed more banks in the healthy category, even though they were in fact in trouble. This indicates that the Altman model tends to be more conservative or less sensitive to changes in a bank's financial condition. The superiority of the Bankometer model is understandable because this model was developed specifically for the banking sector, taking into account relevant ratios such as capitalization, asset quality, operational efficiency, and liquidity. Meanwhile, the Modified Altman Z-Score was primarily designed for companies in general and therefore may not fully capture the risk characteristics unique to the banking industry. Nevertheless, the Altman model still plays a role as a supporting tool in the analysis. The presence of the grey area category can provide an early indication of a potential decline in financial conditions, although not as strong as the signal generated by Bankometer. Overall, the results of this comparison indicate that the Bankometer model is superior to the Modified Altman Z-Score in predicting bank bankruptcy, both in periods t-2 and t-1. Therefore, Bankometer can be considered as a more relevant model for use as an early warning system in assessing bank health, especially in Rural Credit Banks.

Conclusion

This study concludes that both the Modified Altman Z-Score and Bankometer models are able to identify financial distress among BPR and BPRS prior to business license revocation, yet the Bankometer model provides a more relevant and sensitive prediction framework for the banking sector. The findings show that Bankometer captures bank-specific risk dimensions, including capital adequacy, asset quality, liquidity, and operational efficiency, more clearly than the Modified Altman Z-Score, particularly in detecting early warning signals before failure. These results imply that regulators, bank management, and investors should prioritize banking-specific financial indicators when assessing institutional vulnerability and designing preventive supervision mechanisms. The study also contributes to financial distress prediction literature by demonstrating that model suitability depends on sectoral characteristics rather than general financial ratios alone. Further research is recommended to expand the sample, include non-failed comparison banks, extend the observation period, and integrate additional risk indicators such as governance quality, macroeconomic conditions, and digital banking risk to develop a more comprehensive bank failure prediction model.

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