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Altman Z-Score Bankruptcy Prediction in Food and Staple Retail Sector

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Abstract

This research investigates bankruptcy potential within Indonesia's food and staple retail sector using the Altman Z-Score methodology. Analyzing nine companies listed on the Indonesia Stock Exchange during 2020-2023, findings reveal that two firms—Hero Supermarket Tbk and Matahari Putra Prima Tbk—demonstrate severe financial distress with Z-Scores ≤1.81. Hero Supermarket Tbk exhibited the most critical condition, showing consistently declining Z-Scores accompanied by negative profitability and liquidity ratios across four consecutive years. Matahari Putra Prima Tbk similarly fluctuated within the distressed zone throughout the observation period. Results underscore the necessity for continuous financial performance monitoring and proactive management interventions to mitigate bankruptcy risks. These findings provide valuable insights for stakeholders regarding financial health assessment and early warning system implementation in retail operations.

Keywords: Bankruptcy prediction, financial distress assessment, Altman Z-Score model, retail sector analysis, financial health indicators.

Introduction

Business enterprises constitute economic entities fundamentally oriented toward profit maximization and value creation for diverse stakeholders including shareholders, employees, and broader society (Beaver et al., 2005). Within increasingly competitive market environments, organizations must continuously innovate, sustain customer satisfaction, and implement sustainable business practices to maintain viability (Brigham & Ehrhardt, 2020). Success in managing these dimensions critically influences competitive positioning, investor attraction capabilities, and long-term operational sustainability.

Indonesia's food and staple retail subsector plays a pivotal role within the national economic structure, primarily because products offered constitute essential consumer necessities (Hammes, 2021). However, the COVID-19 pandemic emergence since 2020 presented unprecedented challenges disrupting subsector stability significantly. Beyond external pressures including consumer behavior shifts, e-commerce competitive intensification, and macroeconomic fluctuations, companies simultaneously confronted internal challenges encompassing management inefficiencies and suboptimal decision-making processes (Rashid & Abbas, 2021). Bankruptcy potential may emerge unpredictably, necessitating preventive and continuous mitigation initiatives to ensure organizational sustainability (Alareeni & Branson, 2013). For early bankruptcy potential detection, predictive models including the Altman Z-Score receive widespread application because they provide early warning signals of financial distress through comprehensive financial ratio analysis (Altman et al., 2017). This model serves as an effective instrument for assessing bankruptcy risk and formulating appropriate mitigation strategies systematically. Therefore, within Indonesia's food and staple retail subsector context, Altman Z-Score application proves essential for identifying companies facing financial crisis risk, particularly during the 2020-2023 period characterized by pandemic-induced economic disruption.

Literature Review

Signaling Theory

Signaling Theory elucidates mechanisms through which organizations utilize financial statements as communication instruments conveying information to external parties, thereby minimizing information asymmetry between management and stakeholders including investors and creditors (Spence, 1973). This theoretical framework demonstrates particular relevance in bankruptcy prediction through Altman Z-Score model application, considering that organizations experiencing deteriorating financial conditions typically signal negative indicators reflected through declining financial ratios encompassing solvency, liquidity, and profitability metrics (Connelly et al., 2011). These ratios constitute critical instruments for evaluating organizational financial health systematically.

Financial Distress Theory

Financial distress represents a condition wherein organizations experience significant financial difficulties potentially culminating in bankruptcy if unaddressed (Wruck, 1990). According to Whitaker (1999), financial distress manifests when organizations generate insufficient cash flows to satisfy current obligations, resulting in liquidity constraints and operational disruptions. This condition typically emerges gradually through various stages, commencing with decreased profitability, progressing to liquidity problems, and potentially concluding with insolvency (Platt & Platt, 2002).

Contemporary research by Outecheva (2007) identifies multiple financial distress indicators including declining profitability ratios, negative cash flows, increasing leverage levels, and deteriorating working capital positions. Organizations experiencing financial distress frequently demonstrate declining sales revenues, increasing operational costs, and diminishing market share positions (Tinoco & Wilson, 2013). Understanding these indicators proves crucial for early detection and intervention strategy development to prevent bankruptcy occurrences.

Bankruptcy Prediction Models

Bankruptcy prediction constitutes a critical research domain within financial management and accounting disciplines, with numerous models developed to assess organizational failure probability (Jones & Hensher, 2004). Among various methodologies, the Altman Z-Score model represents one of the most widely recognized and extensively applied frameworks for bankruptcy prediction globally (Altman et al., 2017).

Beyond the Altman Z-Score, alternative models include Ohlson's O-Score (1980), Zmijewski's Model (1984), and Springate Model (1978), each employing distinct variables and methodologies for bankruptcy assessment (Aziz & Dar, 2006). However, the Altman Z-Score maintains popularity due to its relative simplicity, high predictive accuracy, and extensive empirical validation across diverse industries and geographic contexts (Altman & Hotchkiss, 2020).

Altman Z-Score Model

Edward Altman (1968) pioneered the Z-Score model through discriminant analysis methodology, identifying five financial ratio categories effectively distinguishing between bankrupt and financially healthy organizations. The model underwent several modifications to accommodate different organizational types and contexts (Altman, 2000).

For publicly traded manufacturing companies, the original Altman Z-Score formula is:

$$\mathbf{Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5}$$

Where:

- $\mathbf{X_1}$ = Working Capital / Total Assets (liquidity measure)
- $\mathbf{X_2}$ = Retained Earnings / Total Assets (profitability measure)
- $\mathbf{X_3}$ = Earnings Before Interest and Taxes / Total Assets (operational efficiency)
- $\mathbf{X_4}$ = Market Value of Equity / Total Liabilities (solvency measure)
- $\mathbf{X_5}$ = Sales / Total Assets (asset utilization efficiency)

Classification criteria:

- **Z > 2.99:** Safe zone – low bankruptcy probability
- **1.81 < Z < 2.99:** Grey zone – moderate bankruptcy risk
- **Z ≤ 1.81:** Distress zone – high bankruptcy probability

For privately held manufacturing companies, Altman developed a modified version replacing X_4 (market value of equity) with book value of equity:

$Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$

Classification criteria:

- **Z' > 2.90:** Safe zone
- **1.23 < Z' ≤ 2.90:** Grey zone
- **Z' ≤ 1.23:** Distress zone

For non-manufacturing companies (including retail sector), Altman eliminated the asset turnover ratio (X_5) due to reduced relevance:

$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$

Classification criteria:

- **Z'' > 2.60:** Safe zone
- **1.10 < Z'' ≤ 2.60:** Grey zone
- **Z'' ≤ 1.10:** Distress zone

This research employs the original Altman Z-Score formula for publicly traded companies, as sample firms are listed on the Indonesia Stock Exchange and possess accessible market equity values.

Conceptual Framework

Based on theoretical foundations and empirical evidence, this research proposes the following conceptual framework:

Financial Ratio Components:

1. **Liquidity (X_1):** Working Capital to Total Assets ratio measures organizational capacity to fulfill short-term obligations through current asset-liability management.
2. **Profitability (X_2):** Retained Earnings to Total Assets ratio reflects cumulative profitability and reinvestment capacity, indicating financial strength over time.
3. **Operational Efficiency (X_3):** EBIT to Total Assets ratio demonstrates asset productivity in generating operational earnings independent of financing structure.
4. **Solvency (X_4):** Market Value of Equity to Total Liabilities ratio assesses financial leverage and creditor protection levels.
5. **Asset Utilization (X_5):** Sales to Total Assets ratio measures revenue generation efficiency relative to asset base.

These five components combine through weighted integration into a single Z-Score value, enabling comprehensive financial health assessment and bankruptcy risk categorization.

Research Framework

This research examines how the five financial ratio components (X_1, X_2, X_3, X_4, X_5) collectively contribute to Z-Score calculation for food and staple retail companies listed on the Indonesia Stock Exchange during 2020-2023. The analysis aims to:

1. Calculate individual Z-Scores for each company across the observation period
2. Classify companies into safe, grey, or distress zones based on Z-Score thresholds
3. Identify companies experiencing financial distress ($Z \leq 1.81$)
4. Analyze underlying factors contributing to financial distress conditions
5. Provide recommendations for financial health improvement and bankruptcy risk mitigation

Methods

Research Design

This research employs a quantitative approach utilizing descriptive-analytical methodology to systematically examine bankruptcy potential through financial ratio analysis (Creswell & Creswell, 2018). The quantitative design enables objective assessment of organizational financial health through numerical data analysis and standardized evaluation criteria application.

Data Types and Sources

Research data comprise secondary quantitative data derived from audited financial statements of publicly traded companies. Secondary data sources include:

1. **Indonesia Stock Exchange (IDX) official website** (www.idx.co.id) providing access to annual financial reports and company disclosures
2. **Financial Services Authority (OJK) portal** offering regulatory filings and corporate information
3. **Company investor relations websites** containing supplementary financial information and corporate announcements

Secondary data utilization ensures data reliability through independent auditor verification and regulatory compliance requirements (Zikmund et al., 2013).

Population and Sample

Research Population: All companies classified within the food and staple retail subsector listed on the Indonesia Stock Exchange during the 2020-2023 period, totaling 13 companies.

Sampling Method: Purposive sampling with judgment sampling technique, selecting companies based on specific criteria aligned with research objectives (Etikan et al., 2016).

Sample Selection Criteria:

1. **Sectoral Classification:** Companies categorized within food and staple retail subsector according to IDX classification standards
2. **Listing Status:** Continuously listed on IDX throughout the 2020-2023 observation period without delisting or suspension
3. **Financial Statement Availability:** Complete audited annual financial statements published for fiscal years 2020, 2021, 2022, and 2023
4. **Retained Earnings Data:** Availability of retained earnings information across all observation years (essential for X_2 calculation)
5. **Market Data Accessibility:** Available market equity values for Z-Score calculation (X_4 component)

Final Sample: Nine companies meeting all selection criteria, providing 36 company-year observations (9 companies × 4 years) for comprehensive analysis.

Altman Z-Score Calculation:

For publicly traded companies, the integrated formula:

$$\mathbf{Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5}$$

Classification Thresholds:

- **$Z > 2.99$:** Financially healthy (Safe Zone) – minimal bankruptcy risk
- **$1.81 < Z \leq 2.99$:** Moderate risk (Grey Zone) – requires monitoring
- **$Z \leq 1.81$:** Financial distress (Distress Zone) – high bankruptcy probability

Data Analysis Procedures

The analytical process comprises sequential stages:

Stage 1: Data Collection and Validation

- Retrieve financial statements from official sources
- Verify data completeness and accuracy
- Identify and resolve data inconsistencies

Stage 2: Financial Ratio Calculation
- Compute X_1 through X_5 for each company-year observation
- Organize calculations in standardized formats
- Conduct preliminary descriptive statistical analysis

Stage 3: Z-Score Computation
- Apply weighted formula to calculate annual Z-Scores
- Track Z-Score trends across observation period
- Identify year-over-year changes and patterns

Stage 4: Classification and Interpretation
- Categorize companies into safe, grey, or distress zones
- Analyze temporal patterns and zone transitions
- Identify persistently distressed companies

Stage 5: Comparative Analysis
- Compare financial ratios across companies
- Identify distinguishing characteristics of distressed firms
- Examine industry-wide trends and patterns

Stage 6: Synthesis and Recommendations
- Synthesize findings into coherent conclusions
- Develop practical recommendations for stakeholders
- Identify limitations and future research directions

Results and Discussion

Descriptive Statistics of Financial Ratios

This section presents detailed analysis of the five financial ratio components comprising the Altman Z-Score across nine food and staple retail companies during 2020-2023.

X_1: Working Capital to Total Assets Ratio

The working capital ratio measures short-term liquidity and operational efficiency through current asset-liability management.

Table 1. Working Capital to Total Assets Ratio (X_1)

Company Name	Code	2020	2021	2022	2023
Sumber Alfaria Trijaya Tbk	AMRT	-0.068	-0.078	-0.056	0.001
Diamond Food Indonesia Tbk	DMND	0.486	0.453	0.430	0.415
Enseval Putera Megatrading Tbk	EPMT	0.543	0.551	3.474	3.331
Hero Supermarket Tbk	HERO	-0.152	-0.117	-0.134	-0.306
Kurniamitra Duta Sentosa Tbk	KMDS	0.642	0.290	0.414	0.480
Midi Utama Indonesia Tbk	MIDI	-0.200	-0.182	-0.129	-0.022
Matahari Putra Prima Tbk	MPPA	-0.272	-0.081	-0.199	-0.149
Supra Boga Lestari Tbk	RANC	0.082	-0.041	-0.075	-0.115
Millennium Pharmacon International Tbk	SDPC	0.107	0.124	0.104	0.097

Source: Processed Research Data, 2025

Interpretation: Negative working capital ratios indicate that current liabilities exceed current assets, suggesting potential difficulties in meeting short-term obligations without external financing or asset liquidation (Brigham & Ehrhardt, 2020). Persistently negative positions, particularly when deteriorating, constitute significant bankruptcy risk indicators.

X_2: Retained Earnings to Total Assets Ratio

This profitability metric reflects cumulative earning capacity and financial maturity over organizational lifespan.

Table 2. Retained Earnings to Total Assets Ratio (X_2)

Company Name	Code	2020	2021	2022	2023
Sumber Alfaria Trijaya Tbk	AMRT	0.170	0.218	0.284	0.325
Diamond Food Indonesia Tbk	DMND	0.453	0.466	0.483	0.507
Enseval Putera Megatrading Tbk	EPMT	0.665	0.661	4.153	4.014
Hero Supermarket Tbk	HERO	-0.277	-0.369	-0.326	-0.414
Kurniamitra Duta Sentosa Tbk	KMDS	0.137	0.330	0.320	0.396
Midi Utama Indonesia Tbk	MIDI	0.165	0.189	0.230	0.255
Matahari Putra Prima Tbk	MPPA	-0.368	-0.425	-0.632	-0.729
Supra Boga Lestari Tbk	RANC	0.200	0.153	0.111	0.199
Millennium Pharmacon International Tbk	SDPC	0.085	0.104	0.092	0.097

Source: Processed Research Data, 2025

Interpretation: Negative retained earnings indicate accumulated losses surpassing cumulative profits, signaling chronic unprofitability and depleted financial reserves (Wahlen et al., 2021). Worsening negative trends strongly predict bankruptcy probability as organizations exhaust financial buffers.

X_3: Earnings Before Interest and Taxes to Total Assets Ratio

This operational efficiency metric measures asset productivity in generating earnings independent of financing structure.

Table 3. EBIT to Total Assets Ratio (X_3)

Company Name	Code	2020	2021	2022	2023
Sumber Alfaria Trijaya Tbk	AMRT	0.065	0.102	0.122	0.129
Diamond Food Indonesia Tbk	DMND	0.041	0.068	0.071	0.056
Enseval Putera Megatrading Tbk	EPMT	0.092	0.109	0.674	0.828
Hero Supermarket Tbk	HERO	-0.073	-0.081	-0.000	-0.013
Kurniamitra Duta Sentosa Tbk	KMDS	0.139	0.170	0.251	0.250
Midi Utama Indonesia Tbk	MIDI	0.077	0.077	0.092	0.095
Matahari Putra Prima Tbk	MPPA	-0.031	-0.014	-0.055	-0.030
Supra Boga Lestari Tbk	RANC	0.077	0.023	-0.034	-0.067
Millennium Pharmacon International Tbk	SDPC	0.045	0.056	0.052	0.064

Source: Processed Research Data, 2025

Interpretation: Negative EBIT indicates that operational activities generate losses before considering financing costs, reflecting fundamental business model problems or severe competitive disadvantages (Palepu et al., 2020). Persistent negative EBIT constitutes a critical bankruptcy predictor as organizations cannot sustain operations without external financial support.

X_4: Market Value of Equity to Total Liabilities Ratio

This solvency indicator assesses financial leverage and the cushion available to creditors through market valuation.

Table 4. Market Value of Equity to Total Liabilities Ratio (X_4)

Company Name	Code	2020	2021	2022	2023
Sumber Alfaria Trijaya Tbk	AMRT	1.811	2.811	5.708	6.562

Company Name	Code	2020	2021	2022	2023
Diamond Food Indonesia Tbk	DMND	8.498	6.705	5.260	5.779
Enseval Putera Megatrading Tbk	EPMT	2.154	2.536	2.815	1.917
Hero Supermarket Tbk	HERO	1.163	1.425	1.050	0.851
Kurniamitra Duta Sentosa Tbk	KMDS	24.139	9.458	9.534	9.035
Midi Utama Indonesia Tbk	MIDI	1.226	1.366	1.740	3.711
Matahari Putra Prima Tbk	MPPA	0.182	0.904	0.299	0.249
Supra Boga Lestari Tbk	RANC	0.517	1.862	1.373	1.105
Millennium Pharmacon International Tbk	SDPC	0.141	0.178	0.370	0.147

Source: Processed Research Data, 2025

Interpretation: Ratios below 1.0 indicate that total liabilities exceed market equity value, suggesting potential insolvency where asset liquidation may prove insufficient to satisfy creditor claims (Altman & Hotchkiss, 2020). Declining trends signal eroding market confidence and increasing bankruptcy vulnerability.

X_5: Sales to Total Assets Ratio

This efficiency metric measures revenue generation capacity relative to total asset investment.

Table 5. Sales to Total Assets Ratio (X_5)

Company Name	Code	2020	2021	2022	2023
Sumber Alfaria Trijaya Tbk	AMRT	2.919	3.088	3.152	3.122
Diamond Food Indonesia Tbk	DMND	1.075	1.107	1.230	1.289
Enseval Putera Megatrading Tbk	EPMT	2.447	2.638	17.309	16.687
Hero Supermarket Tbk	HERO	0.753	0.554	0.642	0.884
Kurniamitra Duta Sentosa Tbk	KMDS	0.907	1.075	1.361	1.379
Midi Utama Indonesia Tbk	MIDI	2.137	2.146	2.262	2.228
Matahari Putra Prima Tbk	MPPA	1.495	1.431	1.854	1.898
Supra Boga Lestari Tbk	RANC	2.282	1.909	2.140	2.248
Millennium Pharmacon International Tbk	SDPC	2.269	2.912	2.283	2.051

Source: Processed Research Data, 2025

Altman Z-Score Analysis

This section presents comprehensive Z-Score calculations integrating all five financial ratio components to assess bankruptcy risk systematically.

Table 6. Altman Z-Score Results (2020-2023)

No.	Company Code	2020	2021	2022	2023	Classification
1.	AMRT	4.37	5.32	7.30	7.34	Safe Zone
2.	DMND	2.52	6.55	5.70	6.14	Safe Zone
3.	EPMT	2.62	6.10	30.88	30.18	Safe Zone
4.	HERO	0.62	0.48	0.65	0.40	**Distress Zone**
5.	KMDS	16.81	8.12	8.85	8.75	Safe Zone
6.	MIDI	3.11	3.26	3.77	5.09	Safe Zone
7.	MPPA	0.66	1.23	0.72	0.74	**Distress Zone**

No.	Company Code	2020	2021	2022	2023	Classification
8.	RANC	3.22	3.26	3.14	3.24	Safe Zone
9.	SDPC	2.74	3.49	2.93	2.60	Grey Zone

Source: Processed Research Data, 2025

Classification Distribution by Year:

Year 2020:

- **Distress Zone (Z ≤ 1.81):** 2 companies (HERO, MPPA)
- **Grey Zone (1.81 < Z ≤ 2.99):** 3 companies (DMND, EPMT, SDPC)
- **Safe Zone (Z > 2.99):** 4 companies (AMRT, KMDS, MIDI, RANC)

Year 2021:

- **Distress Zone:** 1 company (HERO)
- **Grey Zone:** 1 company (MPPA)
- **Safe Zone:** 7 companies (AMRT, DMND, EPMT, KMDS, MIDI, RANC, SDPC)

Year 2022:

- **Distress Zone:** 2 companies (HERO, MPPA)
- **Grey Zone:** 1 company (SDPC)
- **Safe Zone:** 6 companies (AMRT, DMND, EPMT, KMDS, MIDI, RANC)

Year 2023:

- **Distress Zone:** 2 companies (HERO, MPPA)
- **Grey Zone:** 1 company (SDPC)
- **Safe Zone:** 6 companies (AMRT, DMND, EPMT, KMDS, MIDI, RANC)

Detailed Company Analysis

Financially Healthy Companies (Safe Zone Throughout)

1. Sumber Alfaria Trijaya Tbk (AMRT)

Z-Score trajectory: 4.37 → 5.32 → 7.30 → 7.34

AMRT demonstrated exemplary financial health with consistently improving Z-Scores significantly exceeding the 2.99 safety threshold. The company showed:

- Progressive working capital improvement, achieving positive territory by 2023
- Strong accumulated profitability growth (0.170 to 0.325)
- Consistent operational efficiency enhancement
- Substantial solvency improvement (1.811 to 6.562)
- High asset utilization rates (2.9-3.2)

This performance reflects effective management, sustainable business model, and strong competitive positioning within Indonesia's convenience store segment (Hayes et al., 2010).

2. Kurniamitra Duta Sentosa Tbk (KMDS)

Z-Score trajectory: 16.81 → 8.12 → 8.85 → 8.75

KMDS maintained exceptionally high Z-Scores throughout the observation period, indicating robust financial health. Despite initial score decline from 16.81 to 8.12 (likely due to equity valuation adjustments), the company stabilized at very safe levels. Key strengths include:

- Exceptionally strong solvency ratios (9.0-24.1)
- Positive and improving profitability metrics
- Effective operational efficiency
- Consistent asset turnover improvement

3. Midi Utama Indonesia Tbk (MIDI)

Z-Score trajectory: 3.11 → 3.26 → 3.77 → 5.09

MIDI exhibited steady financial strength improvement, progressing from marginally safe (3.11) to highly secure (5.09). Notable achievements include:

- Consistent working capital improvement despite initial negative positions
- Steadily growing retained earnings
- Stable operational efficiency
- Substantially improved solvency (1.226 to 3.711)
- Maintained strong asset turnover

4. Supra Boga Lestari Tbk (RANC)

Z-Score trajectory: 3.22 → 3.26 → 3.14 → 3.24

RANC maintained stable financial health within the safe zone despite minor fluctuations. The company showed:

- Moderate but declining liquidity positions
- Fluctuating but generally positive profitability
- Declining operational efficiency (positive to negative EBIT trend requires attention)
- Adequate solvency ratios
- Strong asset utilization

5. Diamond Food Indonesia Tbk (DMND) & Enseval Putera Megatrading Tbk (EPMT)

Both companies demonstrated exceptional financial strength, particularly in 2021-2023, with Z-Scores well above safety thresholds. EPMT's extraordinarily high scores (30.88, 30.18) reflect significant corporate events or restructuring activities.

Companies Requiring Monitoring (Grey Zone)

Millennium Pharmacon International Tbk (SDPC)

Z-Score trajectory: 2.74 → 3.49 → 2.93 → 2.60

SDPC demonstrated volatility, transitioning between grey and safe zones. The 2023 score of 2.60 (just below 2.99 threshold) signals increased bankruptcy risk requiring management attention. Concerns include:

- Modest liquidity positions
- Relatively weak accumulated profitability
- Moderate operational efficiency
- Very low solvency ratios (0.141-0.370) indicating high leverage
- Adequate but inconsistent asset turnover

Recommendations: SDPC should prioritize leverage reduction, profitability enhancement, and liquidity improvement to migrate sustainably into the safe zone.

Discussion

Practical Implications

For Management:

Distressed companies require immediate comprehensive interventions:

1. **Liquidity Enhancement:** Implement aggressive working capital management, renegotiate payment terms, reduce inventory levels, and potentially secure additional financing
2. **Operational Restructuring:** Address fundamental business model problems through cost reduction, revenue enhancement, or strategic repositioning
3. **Debt Restructuring:** Negotiate with creditors for extended terms, reduced obligations, or debt-to-equity conversions
4. **Strategic Alternatives:** Evaluate merger, acquisition, divestiture, or liquidation options if turnaround proves unfeasible

Companies in grey zones should proactively strengthen financial positions before deterioration, implementing preventive measures rather than reactive crisis management.

For Investors:

Z-Score analysis provides valuable screening tools for investment decisions:

1. **Risk Assessment:** Identify high-risk investments requiring avoidance or enhanced due diligence
2. **Portfolio Management:** Monitor existing holdings for deteriorating financial health signals

3. **Opportunity Identification:** Distressed securities may offer value opportunities for specialized investors if turnaround potential exists
4. **Valuation Adjustments:** Incorporate bankruptcy risk premiums in required return calculations

For Creditors:

Financial institutions and suppliers should:

1. **Credit Risk Management:** Utilize Z-Score monitoring for credit approval and limit-setting decisions
2. **Early Warning Systems:** Implement systematic financial health tracking for existing exposures
3. **Workout Strategies:** Engage proactively with deteriorating credits to maximize recovery prospects
4. **Collateral Requirements:** Adjust security demands based on financial health assessments

Conclusion

This research comprehensively examined bankruptcy potential within Indonesia's food and staple retail sector during 2020-2023 using Altman Z-Score methodology

References

Alareeni, B., & Branson, J. (2013). Predicting listed companies' failure in Jordan using Altman models: A case study. *International Journal of Business and Management*, *8*(1), 113-126. https://doi.org/10.5539/ijbm.v8n1p113

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, *23*(4), 589-609. https://doi.org/10.1111/j.1540-6261.1968.tb00843.x

Altman, E. I. (2000). Predicting financial distress of companies: Revisiting the Z-Score and ZETA® models. *Journal of Finance*, *5*(1), 9-12.

Aziz, M. A., & Dar, H. A. (2006). Predicting corporate bankruptcy: Where we stand? *Corporate Governance: The International Journal of Business in Society*, *6*(1), 18-33. https://doi.org/10.1108/14720700610649436

Beaver, W. H., McNichols, M. F., & Rhie, J. W. (2005). Have financial statements become less informative? Evidence from the ability of financial ratios to predict bankruptcy. *Review of Accounting Studies*, *10*(1), 93-122. https://doi.org/10.1007/s11142-004-6341-9

Brigham, E. F., & Ehrhardt, M. C. (2020). Financial management: Theory and practice (16th ed.). Cengage Learning.

Charitou, A., Neophytou, E., & Charalambous, C. (2004). Predicting corporate failure: Empirical evidence for the UK. *European Accounting Review*, *13*(3), 465-497. https://doi.org/10.1080/0963818042000216811

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39-67. https://doi.org/10.1177/0149206310388419

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Pindado, J., Rodrigues, L., & De La Torre, C. (2008). Estimating financial distress likelihood. *Journal of Business Research*, *61*(9), 995-1003. https://doi.org/10.1016/j.jbusres.2007.10.006

Platt, H. D., & Platt, M. B. (2002). Predicting corporate financial distress: Reflections on choice-based sample bias. *Journal of Economics and Finance*, *26*(2), 184-199. https://doi.org/10.1007/BF02755985

Purba, J. H. V., Ratodi, M., & Mulyani, S. (2020). The effect of liquidity and leverage on financial distress in retail trade companies listed on Indonesia Stock Exchange. *Universal Journal of Accounting and Finance*, *8*(3), 91-98. https://doi.org/10.13189/ujaf.2020.080304

Ramli, R. R. (2021, August 1). Giant resmi pamit dari Indonesia [Giant officially exits Indonesia]. Kompas.com. https://money.kompas.com/read/2021/08/01/070100526/giant-resmi-pamit-dari-indonesia