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The Role of Institutional Ownership Moderation in the Relationship Between Financial Ratios and Financial Distress

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ABSTRACT

Purpose: This study aims to examine the effect of multidimensional financial ratios on corporate financial health, proxied by the Altman Z-Score, and to analyze the moderating role of institutional ownership in non-cyclical consumer-sector companies listed on the Indonesia Stock Exchange during 2022–2024.

Research Method: This study employs a quantitative research design using panel data regression and Moderated Regression Analysis (MRA). The sample was selected through purposive sampling based on the availability of annual financial reports. The independent variables include liquidity, profitability, solvency, leverage, operational efficiency, and firm size, while corporate financial health is measured using the Altman Z-Score. Institutional ownership is used as a moderating variable.

Results and Discussion: The findings reveal that profitability, measured by return on assets, and operational efficiency, measured by total asset turnover, have a significant positive effect on the Altman Z-Score. Meanwhile, liquidity, solvency, leverage, and firm size do not significantly affect financial health. Institutional ownership weakens the relationship between profitability and the Altman Z-Score.

Implications: The findings suggest that institutional ownership may function as a substitute monitoring mechanism rather than always strengthening financial signals.

Originality: This study contributes by integrating multidimensional financial ratios, the Altman Z-Score, and institutional ownership to assess financial health in Indonesia's non-cyclical consumer sector.

Keywords: financial distress; Altman Z-Score; financial ratios; institutional ownership; non-cyclical consumer goods.

1. Introduction

A company's financial stability is one of the key indicators of management's success in managing the organization's resources. However, the dynamics of an increasingly competitive business environment, macroeconomic uncertainty, and pressure from various stakeholders often trigger financial distress. This condition is defined as a situation in which a company has difficulty meeting its financial obligations, potentially leading to bankruptcy if not addressed promptly and appropriately. Following the 2008 global financial crisis and the 2020 COVID-19 pandemic, many companies have faced increased financial

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pressure due to declining demand, supply chain disruptions, and rising economic uncertainty. These conditions have heightened the urgency of using an early warning system to detect potential financial distress before a company experiences more serious failure. Therefore, the ability to predict financial distress is crucial for company management, investors, creditors, and regulators in maintaining corporate stability and business sustainability.

The use of financial ratios as determinants of financial distress has been a long-standing tradition in accounting and finance literature. is one of the pioneers who demonstrated that certain financial ratios possess significant predictive power regarding corporate failure. Subsequently, Altman (1968) developed the Z-Score model as a bankruptcy prediction model based on a combination of several financial ratios reflecting a company's liquidity, profitability, leverage, solvency, and activity. Over time, the Altman model has not only been applied to manufacturing firms in the United States but has also been widely adapted and tested across various industrial contexts and in developing countries. This model was subsequently updated, and its application expanded to emerging markets, including Asian countries. Furthermore, it was confirmed that industry-specific financial ratios have higher predictive accuracy than absolute financial ratios for detecting financial distress, as they account for cross-industry variations that often obscure a company's actual financial condition. In this study, the Altman Z-Score is used as a proxy for a company's financial health, with higher scores indicating healthier financial conditions and a lower probability of financial distress. Thus, the interpretation of the relationships among variables in this study focuses on changes in a company's financial health, as reflected in the Z-Score.

Beyond the financial dimension, the corporate governance literature consistently highlights the role of institutional ownership as an effective external oversight mechanism. It argues that institutional investors, such as insurance companies, pension funds, mutual funds, and investment firms, have greater incentives and capacity to monitor management performance than individual investors. This is because institutional investors possess adequate analytical resources, broader access to information, and significant financial stakes in preserving the value of their investments. A high level of institutional ownership can reduce managerial opportunism, lower agency costs, and encourage more prudent financial decision-making oriented toward long-term sustainability. From an agency theory perspective, institutional ownership can reduce information asymmetry and strengthen monitoring of managerial decisions in corporate financial management. Therefore, institutional ownership is viewed not only as a corporate governance mechanism but also as a factor that can modify the relationship between financial ratios and a company's financial health.

Previous studies have explored the relationship between institutional ownership and financial distress, both as an independent variable and as a moderator. However, the results obtained remain inconsistent, failing to yield conclusive empirical findings. This indicates that the role of institutional ownership in explaining financial distress remains an open issue for further research, particularly in emerging markets such as Indonesia. In the context of direct effects, Peni (2021) found that institutional ownership has a negative but insignificant effect on financial distress. These results suggest that the presence of institutional investors does not necessarily effectively reduce a company's risk of financial distress. Conversely, Setiyoharini & Taufiqurahman (2022) found that institutional ownership has a significant effect on financial distress, indicating that institutional oversight mechanisms can influence a company's financial health. Additionally, Valentina & Tjhai (2020) also reported that institutional ownership did not affect financial distress across 49 non-financial firms during the 2016–2018 period. These differing research findings suggest that the effectiveness of institutional ownership in reducing

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the risk of financial distress remains highly dependent on firm characteristics, ownership structure, and the industry context under study.

On the other hand, some studies have begun to explore institutional ownership as a moderator of relationships among financial variables. Sari & Hermi (2023) found that institutional ownership can weaken the influence of financial distress and leverage on earnings management. This finding suggests that institutional ownership can function as a protective oversight mechanism against opportunistic managerial behavior. However, Rejeki *et al.,* (2023) found that profitability fails to moderate the effect of institutional ownership on financial distress. These differing results indicate that the moderating capacity of institutional ownership is not always consistent and tends to be context-specific, depending on the type of financial variables used in the research model.

Other studies also show that the moderating effect of institutional ownership is specific to certain relationships among variables and does not apply universally. Abbas *et al.,* (2025) found that institutional ownership successfully moderated the relationship between sales growth and tax aggressiveness on financial distress in Indonesian manufacturing firms during the 2018–2021 period. However, the same study found that institutional ownership failed to moderate the effect of operating capacity on financial distress. Meanwhile, Betari & Hanif (2024) found that profitability, rather than institutional ownership, served as a moderating variable in the relationship between institutional ownership and financial distress among firms in the retail trade sector during the 2017–2021 period. Additionally, Ma'dika & Utomo (2024) found that institutional ownership directly affects financial distress among property and real estate firms. However, that study did not test the moderating role of institutional ownership.

Various prior studies indicate that the relationship between institutional ownership, financial ratios, and financial distress remains inconsistent and has not fully explained how institutional ownership modifies the influence of financial ratios on a firm's financial health. Most previous studies have focused on the direct effect of institutional ownership on financial distress, whereas research on institutional ownership as a moderator in the multidimensional relationship between financial ratios and financial distress remains relatively limited. Furthermore, previous research indicates that the effectiveness of institutional ownership as a moderator is highly dependent on the industry context, ownership structure, and the characteristics of the financial variables used.

This study selected the non-cyclical consumer sector because it generally exhibits more stable demand characteristics than sectors heavily dependent on economic cycles. Stable demand can enable companies to operate sustainably, but this does not mean they are immune to financial distress. Non-cyclical consumer companies still face challenges, including cost dynamics, competitive intensity, shifts in funding needs, and potential performance declines that may ultimately be reflected in financial ratios. Furthermore, the non-cyclical consumer sector in Indonesia is dominated by companies with relatively concentrated ownership structures, making it relevant to examine how institutional ownership moderates the relationship between financial ratios and corporate financial health.

Based on the research gap described above, this study aims to analyze the influence of multidimensional financial ratios on financial distress, with institutional ownership as a moderating variable, in non-cyclical consumer sector companies listed on the Indonesia Stock Exchange. The novelty of this study lies in integrating institutional ownership as a moderating variable in the relationship between multidimensional financial ratios and corporate financial health, using the Altman Z-Score approach, in Indonesia's non-cyclical consumer sector. This study is expected to make an empirical

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contribution to the literature on financial distress, corporate governance, and agency theory in the context of emerging markets.

2. Literature Review and Hypothesis Development

Theoretically, studies on financial distress are based on two main frameworks: agency theory and signaling theory. Jensen & Meckling (2019), in their discussion of agency theory, assert that conflicts of interest between principals (shareholders) and agents (management) can lead to suboptimal financial decisions, which in turn increase the risk of financial distress. Meanwhile, signaling theory, as developed by [author], holds that a company's financial information serves as a crucial signal to the market for assessing its business conditions and prospects. In this context, financial ratios function as signaling instruments that reflect a company's ability to meet its obligations. Both theories provide a conceptual foundation for explaining how a company's financial condition and corporate governance mechanisms can influence its financial health. Agency theory explains the importance of oversight mechanisms in minimizing conflicts of interest and the risk of decisions detrimental to the company, while signaling theory emphasizes the importance of financial information as a signal to the market for assessing a company's condition and prospects. Therefore, the combination of financial ratios and institutional ownership is relevant to explaining variations in a company's financial health, as reflected in the Altman Z-Score.

2.1 Agency Theory

Agency Theory explains the contractual relationship between capital owners or shareholders (principals) and managers (agents) who are authorized to run the company's operations (Bodroastuti, 2009; Budiarjo & Rahayuningsih, 2023). Agency problems arise from information asymmetry and conflicting interests, in which managers tend to make decisions based on their own interests rather than on maximizing shareholder welfare. Opportunistic behavior by managers or errors in decision-making can trigger significant losses, leading to financial distress. Oversight mechanisms through institutional ownership are considered capable of mitigating such conflicts by aligning the interests of both parties, thereby minimizing the risk of the company's financial difficulties. In the context of financial distress, such conflicts of interest can drive management to adopt inefficient financial policies, including excessive debt, suboptimal asset management, or investment decisions that increase the risk of further deterioration in the company's financial health. Therefore, institutional ownership is viewed as an external monitoring mechanism that can curb management's opportunistic behavior and strengthen the effectiveness of the company's financial management.

2.2 Signaling Theory

Signaling Theory pertains to the actions of company management in providing instructions or signals to external parties regarding how they assess the company's prospects (Pertiwi, 2018; Budiarjo & Rahayuningsih, 2023). Information disclosed through financial statements, such as profitability, liquidity, and leverage ratios, serves as a signal for investors and creditors to analyze the company's performance. Financial ratios indicating strong levels of profitability, liquidity, and operational efficiency will send a positive signal (good news) regarding the company's financial health. Conversely, a decline in financial

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ratios can serve as a negative signal (bad news), reflecting an increased risk of deteriorating financial health and potential financial distress. Thus, this theory helps predict the likelihood of financial distress based on the information management provides to the capital market (Gaos & Mudjiyanti, 2021).

In this study, the Altman Z-Score is used as a proxy for a company's financial health because it integrates multiple dimensions of financial ratios into a single composite measure. The use of the Altman Z-Score not only enables a more comprehensive identification of financial distress risk but also provides an overview of the company's financial health through interpretation of the resulting score. A higher Z-Score indicates better financial health and a lower probability of financial distress. This approach has been widely used and developed in research on emerging markets, including companies in developing countries (Altman *et al.,* 2017).

2.3 Financial distress

Financial distress is a condition in which a company experiences a decline in its ability to maintain operations and meet its financial obligations. In the literature, financial distress is often predicted using financial ratios because these ratios can capture a company's fundamental conditions in a relatively stable manner over time (Fatmawati & Rihardjo, 2017; Stepani & Nugroho, 2023). Prediction models are important because the risk of distress is multidimensional. Ratios of profitability, liquidity, solvency pressure, asset utilization efficiency, leverage, and firm size are considered relevant determinants of changes in a firm's financial health that cannot be captured by a single ratio alone (Fitri & Syamwil, 2020; Stepani & Nugroho, 2023). Bankruptcy prediction models, such as the Altman Z-Score, can integrate multiple financial indicators to more comprehensively identify a company's potential financial distress (Junaedy, 2023). Thus, an approach based on multidimensional financial ratios is essential for providing a more comprehensive picture of a company's financial health.

In quantitative research, the Altman Z-Score model is widely used to predict financial distress because it combines several financial indicators into a single risk score. The original Altman Z-Score (1968) is considered an early warning system because it combines capital structure and operational performance. This allows for a more comprehensive examination of relationships than a single ratio, as financial distress reflects the accumulation of financial pressures across various aspects of a company. Although the Altman Z-Score model was initially developed for manufacturing companies in the United States, it remains widely used and adapted in research in emerging markets, as it is considered capable of providing a comprehensive overview of a company's financial health (Altman *et al.,* 2017). Therefore, the use of the Altman Z-Score in this study is considered relevant for analyzing the financial health of non-cyclical consumer companies in Indonesia, particularly since this sector continues to face operational pressures, funding-structure challenges, and risks of performance decline that can influence the probability of financial distress.

Financial distress is measured using the Altman Z-Score formula: $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$, with the following criteria: if Z-Score > 2.99, the company is in good condition (non-distressed); if 1.81 ≤ Z -Score ≤ 2.99, the company is in the grey area; whereas if Z-Score < 1.81, the company is in a state of distress. In this study, the Altman Z-Score is positioned as a proxy for the company's financial health, such that a higher Z-Score value indicates better financial health and a lower probability of financial distress. This clarification is important to avoid interpretive ambiguity when explaining the direction of relationships among the study variables. Variable X1 is derived from the ratio of working capital to total assets; X2 from the ratio of retained earnings to total assets; X3 from the ratio

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of earnings before interest and taxes to total assets; X4 from the ratio of market value of equity to book value of total debt; and X5 from the ratio of sales to total assets.

The literature linking financial ratios to financial distress does not always show a consistent direction of the relationship across studies. For example, there is evidence that profitability and liquidity tend to have negative effects on financial distress, as they reflect a company's profit-generating capacity and its ability to meet short-term obligations. In contrast, leverage tends to increase the risk of financial distress by raising the company's debt burden. Additionally, research findings regarding leverage and firm size may vary depending on the company's sector characteristics, financing structure, and the specific financial distress measurement model employed. These differing research findings indicate that the relationship between financial ratios and financial distress remains contextual and is not yet fully consistent across sectors or measurement models. This situation opens the door for further research to re-examine the relevance of financial ratios for explaining the financial health of companies in Indonesia's non-cyclical consumer sector.

2.4 Profitability

Profitability, as proxied by Return on Assets (ROA), is used to measure a company's ability to generate profits from its assets. Theoretically, a higher ROA reflects a company's ability to generate profit surpluses to support its operations, meet financial obligations, and strengthen its financial health. From a signaling theory perspective, a high level of profitability sends a positive signal (good news) to investors and creditors regarding the company's financial prospects and stability, thereby reducing the risk of financial distress. This is supported by Noy (2023), who states that profitability reflects a company's ability to sustain financial performance and operational stability over the long term. Therefore, an increase in profitability is expected to raise the Altman Z-Score and reduce the probability of financial distress. Previous empirical studies have shown that profitability significantly influences financial distress among non-cyclical consumer companies. However, some studies also indicate that the impact of profitability on financial distress may vary depending on ownership structure, industry characteristics, and a company's ability to maintain operational efficiency. Consequently, re-examining the relationship between profitability and a company's financial health remains relevant for non-cyclical consumer companies in Indonesia.

2.5 Liquidity

Liquidity, as measured by the Quick Ratio (QR), represents a company's ability to meet its short-term obligations using its most liquid assets without relying on inventory sales. This ratio is viewed as an indicator of a company's ability to maintain stability in meeting short-term obligations. When liquidity levels decline, companies tend to have difficulty meeting immediate obligations, and such conditions can serve as an early warning sign of financial distress. From a signaling theory perspective, high liquidity levels signal to investors and creditors a company's ability to maintain short-term financial stability. Therefore, the Quick Ratio is expected to be positively related to the Altman Z-Score, as increased liquidity improves the company's financial health and reduces the probability of financial distress. Previous research findings also indicate that liquidity is a relevant determinant of distress in non-cyclical consumer companies (Stepani & Nugroho, 2023). However, some studies indicate that the effect of liquidity on financial distress is not always consistent, as it is influenced by the effectiveness of current

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asset management and the characteristics of the company's sector. These conditions suggest that the relationship between liquidity and financial distress still requires further empirical testing.

2.6 Solvency

Solvency, as proxied by the Debt-to-Asset Ratio (DAR), reflects the extent to which a company relies on debt relative to its total assets. A high DAR indicates that a significant portion of the company's assets is financed with debt, thereby increasing its financial burden. When operational performance declines, a high debt structure can amplify the risk of financial distress, as the company must continue to meet its interest and principal payments on its debt. From an agency theory perspective, excessive debt use can also heighten conflicts of interest between management and shareholders due to increased financial pressure on the company. Therefore, solvency is expected to be negatively related to the Altman Z-Score, such that an increase in the DAR will worsen the company's financial health and increase the probability of financial distress. A previous study by Lestari and Imronudin (2024) showed that the solvability ratio influences financial distress. However, research findings on the impact of solvency on financial distress still vary across sectors and corporate structures, indicating that this relationship is not yet fully consistent in empirical literature.

2.7. Operational efficiency

Operational efficiency, as proxied by Total Asset Turnover (TATO), reflects a company's ability to utilize its assets to generate sales. A high TATO ratio indicates that the company's assets are being used productively and efficiently to support its operational activities. Such operational efficiency increases the company's chances of generating sufficient revenue to cover operating expenses and maintain financial stability. From a signaling theory perspective, high asset efficiency signals the company's ability to manage resources optimally, thereby strengthening its financial health. Therefore, an increase in TATO is expected to raise the Altman Z-Score and reduce the probability of financial distress. In a study of non-cyclical consumer companies, this ratio is considered relevant for describing financial distress (Stepani & Nugroho, 2023). However, the effectiveness of asset utilization in generating sales may vary across companies; thus, the impact of TATO on financial distress requires further testing in the context of Indonesia's non-cyclical consumer sector.

2.8 Leverage

Leverage, as proxied by the Debt-to-Equity Ratio (DER), indicates the proportion of a company's financing that comes from debt relative to equity. A high DER suggests that the company relies more heavily on debt-based financing, thereby increasing its obligations to pay interest and principal on loans. This situation can increase financial pressure on the company, particularly when it experiences a decline in revenue or operational disruptions. From an agency theory perspective, high debt usage can also increase the risk of conflicts of interest and encourage management to make high-risk financial decisions. Therefore, leverage is expected to be negatively related to the Altman Z-Score, as an increase in the DER raises the probability of financial distress and worsens the company's financial health. Previous research indicates that leverage has a significant negative effect on financial distress, as measured by the Z-Score, thereby increasing the risk of distress (Lestari & Imronudin, 2024). However,

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the impact of leverage on financial distress may vary depending on a company's ability to manage its capital structure and the stability of its operating cash flows.

2.9 Company size

Company size (SIZE) is proxied using the natural logarithm of total assets (Ln Total Assets) as a measure of the company's scale. Theoretically, larger companies generally have broader access to financing, better business diversification, and greater resilience in the face of operational pressures and economic uncertainty. From a signaling theory perspective, large firm size can signal operational stability and the firm's capacity to sustain its business. Therefore, firm size is expected to be positively associated with the Altman Z-Score, as larger firms tend to have stronger financial health and a lower probability of financial distress. These conditions lead to firm size being viewed as relevant in explaining financial distress among non-cyclical consumer firms (Stepani & Nugroho, 2023). Nevertheless, some studies indicate that large firms may also face significant financial pressures due to operational complexity and high funding requirements. Hence, the effect of SIZE on financial distress remains mixed.

2.10 Institutional ownership

Institutional ownership (IO) is viewed as a corporate governance mechanism through its monitoring function over company management. In the corporate governance literature, institutional investors tend to have greater resources, experience, and analytical capabilities for overseeing corporate policies than individual investors. Companies with high levels of institutional ownership are expected to be more disciplined, thereby preventing and reducing the risk of financial distress (Lin & Fu, 2017). In line with this, several studies indicate that institutional ownership has a positive effect on the Altman Z-Score, as a higher proportion of institutional ownership supports the company's financial health and reduces the probability of distress. From an agency theory perspective, institutional ownership also serves as an external monitoring mechanism that can curb opportunistic managerial behavior and improve the quality of a company's financial decision-making.

However, the moderating effect of institutional ownership on the relationship between financial ratios and financial distress is not always consistent. There is an argument that institutional ownership may not strengthen liquidity's influence because institutional investors may be more oriented toward profitability and investment value than toward the effectiveness of managing the company's short-term liabilities. Furthermore, the effectiveness of institutional ownership as a moderating variable also depends heavily on the quality of monitoring, ownership structure, industry characteristics, and the company's managerial policies. These conditions indicate that institutional ownership does not always automatically strengthen the relationship between financial ratios and a company's financial health. Therefore, the moderating role of institutional ownership in the relationship between financial ratios and financial distress still requires further empirical testing, particularly among non-cyclical consumer companies in Indonesia.

Based on the conceptual framework outlined above, the proposed hypothesis is as follows:

H1: *ROA has a positive effect on the Altman Z-score*
H2: *QR has a positive effect on the Altman Z-score*
H3: *DAR has a negative impact on the Altman Z-score*

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H4: *TATO has a positive effect on the Altman Z-score*
H5: *DER has a negative impact on the Altman Z-score*
H6: *SIZE has a positive effect on the Altman Z-score*
H7: *IO can strengthen the relationship between ROA and the Altman Z-score*
H8: *IO can strengthen the relationship between QR and the Altman Z-score*
H9: *IO can strengthen the relationship between DAR and the Altman Z-score*
H10: *IO can strengthen the relationship between TATO and the Altman Z-score*
H11: *IO can strengthen the relationship between DER and the Altman Z-score*
H12: *IO can strengthen the relationship between SIZE and the Altman Z-score*

3. Research Method

This study employs a quantitative methodology to analyze the impact of various financial ratios on the risk of financial distress among companies in the non-cyclical consumer sector listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. A quantitative approach was chosen because this study aims to test causal relationships between variables through numerical measurements and statistical analysis based on company panel data. The data sources are derived from companies' annual financial reports published on the official website of the Indonesia Stock Exchange (IDX) and the respective companies' official websites; thus, the data is categorized as secondary data.

Purposive sampling was used based on specific criteria to ensure the sample aligns with the research objectives. The selection criteria include: (1) non-cyclical consumer sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period; (2) companies that published complete annual financial reports during the observation period; (3) companies that presented financial reports with a fiscal year ending on December 31 and used the Indonesian Rupiah; and (4) companies that had complete data regarding all research variables.

In this study, financial distress is proxied by the Altman Z-Score, an indicator of a company's financial health. The Altman Z-Score was chosen because it integrates several dimensions of financial ratios into a single composite measure, making it more comprehensive for explaining a company's financial health than a single ratio. Furthermore, the Altman Z-Score model has been widely used and developed in research on emerging markets, including developing countries (Altman et al., 2017). In this study, a higher Altman Z-Score value indicates better financial health and a lower probability of financial distress.

The Altman Z-Score is calculated using the original Altman (1968) model as follows:

$$Z = 1.2X\_1 + 1.4X\_2 + 3.3X\_3 + 0.6X\_4 + 1.0X\_5 \quad \text{..... (1)}$$

Description:
X_1 = Working Capital / Total Assets
X_2 = Retained Earnings / Total Assets
X_3 = Earnings Before Interest and Taxes / Total Assets
X_4 = Market Value of Equity / Book Value of Total Debt
X_5 = Sales / Total Assets

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The criteria for interpreting the Altman Z-Score in this study are as follows: a Z-Score > 2.99 indicates that the company is in a healthy (non-distressed) condition; 1.81 ≤ Z-Score ≤ 2.99 indicates that the company is in a gray area; and a Z-Score < 1.81 indicates that the company is in financial distress.

Table 1. Operational Definitions of Variables

Variable	Code	Measurement	Formula
Financial Distress	Z-Score	Altman Z-Score	$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$
Profitability	ROA	Return on Assets	Net Income / Total Assets
Liquidity	QR	Quick Ratio	(Current Assets − Inventory) / Current Liabilities
Solvency	DAR	Debt to Asset Ratio	Total Debt / Total Assets
Activity Efficiency	TATO	Total Asset Turnover	Sales / Total Assets
Leverage	DER	Debt to Equity Ratio	Total Debt / Total Equity
Company Size	SIZE	Ln Total Assets	Ln (Total Assets)
Institutional Ownership	IO	Institutional Ownership	Institutional Shares / Outstanding Shares

To analyze the data, this study employs panel data regression in EViews. The panel data regression model was selected using the Chow, Hausman, and Lagrange Multiplier tests to determine the best model among the common effects, fixed effects, and random effects models. Additionally, the study uses Moderated Regression Analysis (MRA) to examine whether institutional ownership moderates the relationship between financial ratios and financial distress.

The regression model of this study is formulated as follows:

$$Z = \alpha + \beta_1 ROA + \beta_2 QR + \beta_3 DAR + \beta_4 TATO + \beta_5 DER + \beta_6 SIZE + \beta_7 (ROA \times IO) + \beta_8 (QR \times IO) + \beta_9 (DAR \times IO) + \beta_{10} (TATO \times IO) + \beta_{11} (DER \times IO) + \beta_{12} (SIZE \times IO) + \varepsilon \quad \ldots\ldots\ldots\ldots \quad (2)$$

Where α is the constant, β_1–β_{12} are the regression coefficients of the independent variables and interaction terms, and ε is the error term. The use of interaction terms in the model aims to test whether institutional ownership strengthens or weakens the relationship between financial ratios and a firm's financial health.

4. Results and Discussion

4.1 Analysis Results

Before testing the hypotheses, this study first tested the classical assumptions to ensure that the regression model met the necessary statistical conditions. The normality test using the Jarque-Bera test yielded a p-value of 0.100783, which is greater than 0.05, indicating that the regression model's residuals are normally distributed. Thus, the normality assumption in the regression model is satisfied, allowing for valid statistical inference.

The heteroscedasticity test was performed using the Glejser test. The results showed that all independent and moderator variables had p-values greater than 0.05. This indicates that the regression model does not suffer from heteroscedasticity, meaning the residual variance is constant (homoscedastic).

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The multicollinearity test was conducted using the centered Variance Inflation Factor (VIF). The test results show that all main variables have VIF values below 10, so the regression model is not affected by multicollinearity. However, in the Moderated Regression Analysis (MRA) test, an increase in multicollinearity among interaction variables is common because they are formed by multiplying two or more variables. This condition is still acceptable because this study has applied the mean-centering technique to minimize the impact of multicollinearity.

The autocorrelation test was conducted using the Durbin-Watson statistic, yielding a value of 1.547821. This value is relatively close to 2, indicating that the regression model does not suffer from serious autocorrelation issues. Thus, the regression model is deemed suitable for testing the research hypotheses.

The panel data regression model was selected using the Chow and Hausman tests. The results of the Chow test showed a probability value of 0.0079, which is less than 0.05; therefore, the fixed-effects model is more appropriate than the random-effects model. Furthermore, the results of the Hausman test indicate a p-value of 0.0091, which is less than 0.05; therefore, the fixed-effects model is more appropriate than the random-effects model. Since both tests yield the same decision, the Breusch-Pagan Lagrange Multiplier test is not required.

Table 2. Summary of the Results of Classical Assumption Tests and Model Selection

Testing	Results	Info
Normality Test (Jarque-Bera)	Prob. = 0.100783	The residuals are normally distributed
Heteroscedasticity Test (Glejser)	Prob. > 0.05	There is no heteroscedasticity
Multicollinearity Test (Centered VIF)	VIF < 10	There is no multicollinearity
Autocorrelation Test (Durbin-Watson)	DW = 1.547821	There is no significant autocorrelation
Chow Test	Prob. = 0.0079	Fixed effect model
Hausman Test	Prob. = 0.0091	Fixed effect model

Source: *Data analysis using Eviews (2026)*

Furthermore, a simultaneous test using the F-test yielded an F-statistic of 8.375746 with a p-value of 0.000000. Since the p-value is less than 0.05, the regression model is considered significant. This indicates that financial ratios and institutional ownership simultaneously influence a company's financial health, as proxied by the Altman Z-Score.

The R-squared value of 0.875461 and the adjusted R-squared of 0.770938 indicate that approximately 77.09% of the variation in a company's financial health can be explained by the independent variables and the moderating variable in the research model. Meanwhile, the remaining 22.91% is explained by other variables outside the research model. The relatively high adjusted R-squared value indicates that the research model has good explanatory power in predicting a company's financial health.

Hypothesis testing was conducted using the t-test with a significance level of 0.05. The results of the panel data regression analysis yielded the following regression equation:

$$Z = -9.516159 + 7.453895ROA + 0.584254QR - 0.461001DAR + 1.164520TATO + 0.010661DER + 0.361526SIZE - 2.735517\,(ROA \times IO) - 0.192657(QR \times IO) - 1.162004(DAR \times IO) - 0.074502(TATO \times IO) - 0.001499(DER \times IO) + 0.036714(SIZE \times IO) + \varepsilon$$

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In the regression equation above, the interaction term DAR×IO is used consistently to represent the moderation of the relationship between the Debt-to-Asset Ratio and the Altman Z-Score by institutional ownership. This improvement was made to avoid inconsistencies in the naming of interaction variables in the regression model.

Table 3. Panel Data Regression Results and Hypothesis Testing

Variable	Coefficient	Probability	Info	Decision
ROA	7.453895	0.0000	Positive significance	H1 accepted
QR	0.584254	0.0549	Not significant	H2 rejected
DAR	-0.461001	0.8669	Not significant	H3 rejected
TATO	1.164520	0.0024	Positive significance	H4 accepted
DER	0.010661	0.8893	Not significant	H5 rejected
SIZE	0.361526	0.3503	Not significant	H6 rejected
ROA×IO	-2.735517	0.0007	Significantly negative	H7 is not supported by the hypothesis.
QR×IO	-0.192657	0.0735	Not significant	H8 rejected
DAR×IO	-1.162004	0.1204	Not significant	H9 rejected
TATO×IO	-0.074502	0.2246	Not significant	H10 rejected
DER×IO	-0.001499	0.8602	Not significant	H11 rejected
SIZE×IO	0.036714	0.0764	Not significant	H12 rejected

Source: *Data analysis using Eviews (2026)*

The test results indicate that profitability, as proxied by Return on Assets (ROA), has a significant positive effect on the Altman Z-Score. These results indicate that the higher a company's ability to generate profits, the better its financial health and the lower the probability of financial distress. Additionally, operational efficiency, as proxied by Total Asset Turnover (TATO), also has a significant positive effect on the Altman Z-Score. This suggests that companies capable of managing assets efficiently tend to have better financial health. Meanwhile, the liquidity (QR), solvency (DAR), leverage (DER), and firm size (SIZE) variables do not show a significant effect on the Altman Z-Score. These results indicate that a firm's financial health is determined not solely by its ability to meet short-term obligations or its capital structure, but also by its ability to generate profits and manage assets productively.

In the moderation test, the ROA×IO interaction showed a significant negative effect on the Altman Z-Score. These results indicate that institutional ownership weakens the positive influence of profitability on a company's financial health. Thus, although the moderating effect was significant, the direction of the resulting relationship did not align with the study's initial hypothesis, which predicted that institutional ownership would strengthen the positive relationship between ROA and the Altman Z-Score. Therefore, H7 was statistically significant but not supported in terms of its direction.

Theoretically, these results indicate that institutional ownership does not always enhance the effectiveness of profitability in improving a company's financial health. Institutional investors are likely more focused on achieving short-term profit targets or maintaining investment stability than on strengthening the company's long-term profitability fundamentals. Additionally, high institutional ownership may increase pressure on management to maintain specific profit targets, thereby reducing the company's flexibility in managing financial resources optimally.

As for the other moderating variables—namely, QR×IO, DAR×IO, TATO×IO, DER×IO, and SIZE×IO—they did not show a significant effect on the Altman Z-Score, these results indicate that

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institutional ownership has not been able to consistently moderate the relationship between financial ratios and a company's financial health in the non-cyclical consumer sector in Indonesia.

4.2 Discussion

4.2.1 The Direct Effect of Independent Variables on Financial Distress

The results of the study indicate that profitability, as proxied by Return on Assets (ROA), has a significant positive effect on the Altman Z-Score. This finding indicates that a company's ability to generate profits from its assets plays a crucial role in strengthening its financial health and reducing the probability of financial distress. Theoretically, these findings support signaling theory, which posits that high profitability signals to investors and creditors a company's ability to maintain operational stability and meet its financial obligations. Companies with high profitability levels tend to have better financial flexibility to cope with economic pressures and business uncertainties. Additionally, the company's profits can serve as internal funding, reducing its reliance on debt-based external financing. These research findings also reinforce the view that profitability is a primary indicator of a company's financial health, as it reflects management's effectiveness in using assets to generate profits.

Liquidity, proxied by the Quick Ratio (QR), shows a positive relationship with the Altman Z-Score; however, the effect is not statistically significant. These results indicate that a company's ability to meet short-term obligations is not necessarily the primary factor determining its financial health. Conceptually, companies with high liquidity should be better able to meet current liabilities, thereby reducing the risk of financial distress. However, for companies in the non-cyclical consumer sector, the ability to meet short-term obligations is likely not the primary concern for investors or creditors, as long as the company maintains profitability and operational stability. Furthermore, high liquidity does not always reflect the efficient management of current assets, as companies may hold large amounts of liquid assets without optimizing them to generate revenue. These conditions mean that liquidity has no significant influence on the Altman Z-Score in this study. The findings of this study align with those of (Maghfiroh *et al.*, 2023; Rachmawati & Maulana, 2022), who also found that liquidity does not significantly affect financial distress. These findings indicate that financial distress is influenced not only by a company's ability to meet short-term obligations but also by other factors, such as profitability, operational efficiency, and asset management strategy.

Solvency, proxied using the Debt-to-Asset Ratio (DAR), shows a negative but insignificant effect on the Altman Z-Score. These results suggest that an increase in the debt-to-asset ratio does not necessarily directly worsen the financial health of companies in the non-cyclical consumer sector. Theoretically, high debt levels can increase the risk of financial distress because companies must bear larger obligations for interest and principal payments. However, the results of this study indicate that the companies in the sample likely still have sufficient capacity to manage their debt structures and maintain operational stability. Furthermore, non-cyclical consumer companies tend to have relatively stable market demand, so the pressure from debt use can be better managed than in sectors highly sensitive to economic fluctuations. These findings also suggest that investors and creditors likely consider not only solvency ratios but also a company's ability to generate profits and maintain operational efficiency when assessing a company's financial health. This finding aligns with the research by Rachmawati and Maulana (2022), which found that solvency does not significantly affect financial distress. Thus, the influence of solvency on financial distress remains contextual, shaped by industry characteristics and a company's ability to manage its capital structure.

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Operational efficiency, proxied by Total Asset Turnover (TATO), has a significant positive effect on the Altman Z-Score. These results indicate that companies capable of efficiently using assets to generate sales tend to have better financial health and a lower risk of financial distress. Theoretically, a high asset turnover rate reflects a company's effectiveness in managing its resources to support operational activities and generate revenue. From a signaling theory perspective, high operational efficiency signals a company's ability to sustain its operations. Companies with high TATO levels tend to generate more stable operating cash flows, thereby having greater capacity to meet financial obligations and withstand economic pressures. These findings align with the research by Lestari and Imronudin (2024), which indicates that operational efficiency significantly influences financial distress. These results demonstrate that the effective utilization of assets is a critical factor in strengthening the financial health of non-cyclical consumer companies in Indonesia.

Leverage, proxied by the Debt-to-Equity Ratio (DER), shows a positive but not significant effect on the Altman Z-Score. These results suggest that the debt-to-equity ratio does not necessarily worsen the financial health of companies in the non-cyclical consumer sector. Theoretically, high leverage is often associated with increased risk of financial distress because companies must bear a heavier burden of liabilities. However, the results of this study indicate that the companies in the sample are likely still able to manage their debt effectively, so the use of debt does not directly impair their financial health. Additionally, non-cyclical consumer companies generally have relatively stable demand, so their operating cash flow remains sufficient to meet debt obligations. These conditions mean that leverage does not emerge as a dominant factor in explaining financial distress in this study. These findings align with research by Stepani & Nugroho (2023), which found that leverage does not significantly affect financial distress. These findings suggest that the use of debt is not always negative, provided companies can manage their capital structure and operating cash flow optimally.

Company size (SIZE) shows a positive but insignificant effect on the Altman Z-Score. These results suggest that a company's size does not necessarily directly improve its financial health. Theoretically, larger companies generally have broader access to funding, better business diversification, and greater capacity to withstand economic pressures. However, this study's findings indicate that large companies also face operational complexities, high funding needs, and higher operational costs; thus, company size does not automatically guarantee better financial health. Furthermore, investors and creditors are likely to consider the effectiveness of corporate management, rather than company size alone, when assessing the risk of financial distress. These findings are consistent with the research by Stepani & Nugroho (2023), which showed that company size does not significantly affect financial distress. Thus, company size is not a primary factor determining the financial health of non-cyclical consumer companies in Indonesia.

4.2.2 The Moderating Effect of Institutional Ownership on the Relationship Between Independent Variables and Financial Distress

The results of the study indicate that institutional ownership (IO) significantly moderates the relationship between profitability, proxied by Return on Assets (ROA), and the Altman Z-Score. However, the direction of this moderation is negative. This finding indicates that the higher the institutional ownership, the weaker the positive influence of profitability on the company's financial health becomes. In other words, institutional ownership does not strengthen the relationship between ROA and the Altman Z-Score as initially hypothesized in the study; rather, it weakens the contribution of profitability

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to improvements in the company's financial health. Although H7 was statistically significant, the direction of the resulting relationship does not support the research hypothesis.

Theoretically, these results offer an interesting explanation from the perspectives of agency theory and monitoring mechanisms. In agency theory, institutional ownership is viewed as an external monitoring mechanism that can reduce conflicts of interest between management and shareholders. However, this study's results indicate that the monitoring function of institutional ownership does not always enhance the effectiveness of profitability in improving a company's financial health. When institutional ownership is low, companies rely more heavily on profit-generating capacity as the primary indicator of financial health. Conversely, in companies with high institutional ownership, institutional investors can signal stability and strong oversight, so that profitability is no longer the sole primary indicator in assessing a company's health. This condition weakens the effect of profitability on the Altman Z-Score.

These results can also be explained from the perspective of institutional investor behavior. Institutional investors generally have different investment orientations, oversight strategies, and investment horizons compared to individual investors. Under certain conditions, institutional investors may place greater emphasis on long-term stability, financial conservatism, and risk control rather than short-term profitability growth. Consequently, when profitability increases, institutions do not always use profits to bolster short-term financial health indicators; instead, they prefer to retain profits, pursue strategic expansion, or allocate resources to long-term investments. This results in increased profitability that does not directly lead to a corresponding increase in the Altman Z-Score, contrary to the initial hypothesis.

The results of this study indicate that institutional ownership can act as a substitute mechanism for profitability signals. In companies with high institutional oversight, investors and the market may place greater trust in the quality of corporate governance rather than relying solely on profitability levels as an indicator of financial health. Consequently, the influence of profitability on financial health becomes relatively smaller because some monitoring functions have been replaced by institutional ownership itself. This finding supports the results of Maghfiroh *et al.,* (2023), who also found that institutional ownership weakens the relationship between profitability and financial distress.

In contrast to H7, the results indicate that institutional ownership does not moderate the relationship between liquidity (QR) and the Altman Z-Score. These results indicate that the presence of institutional ownership has not strengthened or weakened the influence of a company's ability to meet short-term obligations on its financial health. Conceptually, liquidity is more closely related to the management of current assets and short-term liabilities, whereas institutional ownership tends to focus on strategic oversight and general corporate policy. Therefore, institutional investors likely do not directly influence the effectiveness of a company's liquidity management.

Institutional ownership also does not appear to moderate the relationship between solvency, proxied by the Debt-to-Asset Ratio (DAR), and the Altman Z-Score. These results indicate that a high proportion of institutional ownership does not necessarily alter the impact of a company's debt structure on its financial health. This may be because decisions regarding a company's debt structure and financing are more influenced by management policies, market conditions, and operational needs than by institutional investor oversight. Thus, the presence of institutional ownership is not strong enough to alter the impact of solvency on financial distress.

Regarding the relationship between operational efficiency, proxied by Total Asset Turnover (TATO), and the Altman Z-Score, institutional ownership also does not exhibit a significant moderating

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effect. This finding suggests that a company's effectiveness in managing assets to generate sales is more influenced by internal operational efficiency than by institutional shareholder oversight. Institutional investors likely focus more on a company's bottom-line results, such as profitability and investment stability, rather than the direct efficiency of asset utilization. Therefore, institutional ownership has not strengthened the relationship between operational activity and a company's financial health.

Furthermore, institutional ownership was not found to moderate the relationship between leverage, proxied by the Debt-to-Equity Ratio (DER), and the Altman Z-Score. These results indicate that the level of institutional ownership does not significantly influence the impact of equity-based debt usage on a company's financial health. In the context of non-cyclical consumer companies, firms likely maintain relatively stable capital structure policies, so the presence of institutional ownership does not significantly alter the relationship between leverage and financial distress.

Institutional ownership also does not moderate the relationship between firm size (SIZE) and the Altman Z-Score. This finding suggests that firm size is neither strengthened nor weakened by institutional ownership in explaining a firm's financial health. This may occur because firm size better represents a firm's resource capacity and operational complexity, whereas institutional ownership focuses more on monitoring and oversight of corporate governance.

The results of this study indicate that institutional ownership does not always function as a reinforcing mechanism for the relationship between financial ratios and a company's financial health. Only the relationship between profitability and the Altman Z-Score is significantly moderated by institutional ownership, but with a negative moderation direction. These findings suggest that the effectiveness of institutional ownership is highly dependent on the context of corporate management, the orientation of institutional investors, and industry sector characteristics. Thus, institutional ownership cannot be viewed as a governance mechanism that universally strengthens all relationships between financial ratios and financial distress. Instead, the role of institutional ownership is contextual and can act as a mechanism for substitution or control regarding a company's financial signals.

5. Concluding Remarks and Recommendation

This study aims to analyze the influence of financial ratios on a company's financial health, as proxied by the Altman Z-Score, and to examine the moderating role of institutional ownership in non-cyclical consumer sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period. The study employs a quantitative approach using panel data regression analysis and Moderated Regression Analysis (MRA). The results indicate that profitability (ROA) and operational efficiency (TATO) have a significant positive effect on the Altman Z-Score, meaning these two variables can improve a company's financial health and reduce the probability of financial distress. Meanwhile, liquidity (QR), solvency (DAR), leverage (DER), and firm size (SIZE) do not show a significant influence on the Altman Z-Score. In the moderation test, institutional ownership was found to moderate the relationship between profitability and the Altman Z-Score significantly, but in a negative direction. These results indicate that institutional ownership does not strengthen the influence of profitability on a company's financial health as initially hypothesized, but rather weakens the positive influence of profitability on an increase in the Altman Z-Score. Furthermore, the moderation of institutional ownership in the relationships between QR, DAR, TATO, DER, and SIZE and the Altman Z-Score was not significant.

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This study makes a theoretical contribution by demonstrating that institutional ownership does not always function as a monitoring mechanism that strengthens the effectiveness of financial ratios in explaining a firm's financial health. These findings indicate that the role of institutional ownership is contextual and can act as a substitute mechanism for corporate financial signals, particularly profitability. From a practical perspective, the research results confirm that the ability to generate profits and the efficiency of asset utilization are key factors in maintaining the financial health of companies in the non-cyclical consumer sector. Therefore, company management needs to focus its strategies on improving profitability and operational efficiency to reduce the risk of financial distress. For investors and capital market regulators, these findings highlight the importance of considering the structure of institutional ownership and corporate governance mechanisms when assessing a company's financial health more comprehensively.

This study still has several limitations. First, the study uses only companies in the non-cyclical consumer sector and covers the 2022–2024 period, so the generalizability of the research results to other sectors remains limited. Second, the study uses the original Altman Z-Score as a proxy for a company's financial health; thus, the results may differ if other financial distress prediction models are used. Third, the study uses only financial ratios and institutional ownership as research variables; therefore, it remains possible that other factors outside the model influence a company's financial health. Consequently, future research is recommended to expand the scope of sectors and the study period, employ alternative financial distress prediction models, and incorporate corporate governance variables, macroeconomic conditions, and investor behavior factors to gain a more comprehensive understanding of the determinants of financial distress. Additionally, qualitative research on institutional investor behavior and corporate monitoring mechanisms is important for explaining in greater depth why institutional ownership can weaken the influence of profitability on a company's financial health.

Statement of Use of Generative AI

During the preparation of this work, the author used ChatGPT to assist in improving clarity and readability of the text. The author reviewed and edited the output and takes full responsibility for the content of the publication.

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