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Effect of Selected Key Financial Ratios on Financial Distress Among Industrial Goods Firms in Nigeria

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Abstract

This paper examined the predictors of financial distress in industrial goods firms listed on the Nigerian Exchange Group between 2015 and 2024, with special attention to three major financial variables: the size of the firm, the price of shares and the growth of revenue. With the proxy of financial distress being Altman Z-score, the study utilized a panel regression analysis in a sample of 11 companies to determine the predictive ability of these variables. The results indicated that there were variabilities in how they correlate with financial distress. The most relevant predictor was share price, which showed a considerable negative correlation (coefficient = -0.058, $p < 0.01$). Conversely, the size of the firm was not calculated to be in statistically significant association with financial distress (coefficient = 0.064, $p = 0.996$). The growth in revenue showed significant marginality (coefficient = 0.004, $p = 0.092$), indicating that growth has the potential to belong to financial stability but the effect is rather low as compared to other variables. The model significantly explained the variation in financial distress (R^2 =0.742), indicating the role of market-based indicator in predicting distress. On the basis of these results, the study suggests that industrial companies should focus more on stability of their share price by means of establishing better contact with investors and full transparent reporting as this variable showed the greatest safeguarding impact against financial distress.

Keywords: *Financial distress, Altman Z-Score, Share price, Revenue growth, Firm size, Industrial Goods Firms*

1. Introduction

Financial distress is a situation when a firm faces difficulties in fulfilling its financial liability, and it is a crucial predicament to stakeholders of such business, such as the investors, managers, creditors, and regulators. In the case of Nigerian industrial goods companies, financial distress not only poses a threat of firm breakdown but also endangers the health of the whole industrial sector which is one of the biggest contributors to national economic growth (Onyenekwe *et al.*, 2023). It is essential to be aware of the reasons for financial distress, particularly in the view of significant financial ratios, in order to improve risk management and corporate planning.

The existing literature has employed financial ratios extensively as predictive indicators of financial distress. Among the key predictors, there are liquidity, profitability, leverage, and market-based indicators such as a share price (Restianti and Agustina, 2018; Dwiantari and Artini, 2021). To take an instance, profitability and liquidity have been mostly

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identified to have a reverse relationship with financial distress, whereby a high level of profitability and liquidity reduces the probability of distress (Octaviany and Ratnasari, 2024). In contrast, high leverage is likely to aggravate financial distress, indicating the necessity for prudent financial management (Marginingsih *et al*., 2024; Dwiantari and Artini, 2021).

Firm size has been a moderating variable in these relationships. Larger firms are generally thought to have better access to resources and markets, which can buffer them against financial distress. Empirical evidence, however, is mixed. For instance, Marginingsih *et al*. (2024) found that firm size did not moderate the effect of liquidity and leverage on financial distress but moderated the impact of profitability. In the same manner, Ramadani and Ratmono (2023) emphasized that firm size may moderate or intensify the impact of crucial financial ratios on financial distress based on the industry setting.

Market-based measures like share price also deserve consideration. Share price is the market's perception of the financial well-being of a firm as well as its future performance. However, an investigation of Nigerian consumer goods firms by Orji and John-Akamelu (2023) revealed that financial distress, proxied with Altman's z-score, was influenced significantly by Book Tax Differences, suggesting that both market-based as well as internal financial management can influence distress levels. Although the study was conducted for consumer goods, the findings are relevant to industrial goods firms since both firms face the same regulatory and operating environment in Nigeria.

Growth in revenue, as one of the primary pointers that mirror operating performance, also influences financial distress. Higher revenue growth can enhance the ability of a company to service financial obligations, reducing the possibility of distress. Octaviany and Ratnasari (2024) established that growth in sales failed to reduce financial distress in Indonesian manufacturing firms effectively, noting that mere growth in revenue might not be adequate if it is paired with high leverage or declining liquidity. This finding underscores the need to examine growth in revenue alongside other financial indicators in the Nigerian industrial context.

Notwithstanding the numerous studies on financial distress predictors globally, there is a perceived shortage of studies tackling the same problem in the Nigerian industrial goods sector. Given the sector's unique operating environment – plagued by infrastructural deficits, tenuous macroeconomic instability, and volatile exchange rates – there is a need to probe the influence of key financial ratios such as firm size, share price, and revenue growth on financial distress in the sector.

Despite the extensive literature on financial distress predictors, empirical studies on the influence of some key financial ratios like firm size, share price, and revenue growth on financial distress in Nigerian industrial goods firms remain limited. This gap in knowledge hinders efficient risk management as well as preemptive corporate governance. In addition, the opposing findings of the existing research across different industries and settings (Marginingsih *et al*., 2024; Ramadani and Ratmono, 2023; Onyenekwe *et al*., 2023) emphasize the need for context-specific research. This study, therefore, seeks to bridge this gap by assessing the effects of these key financial ratios on financial distress in Nigerian industrial goods firms, thereby producing knowledge that can inform management decision-making and policy interventions in the sector.

2. Hypotheses of the Study

The following null hypotheses are formulated for this study:

***HO*$_1$**: *There is no significant effect of firm size on financial distress in industrial goods firms listed on the Nigerian Exchange Group*

***HO*$_2$**: *There is no significant effect of share price on financial distress in industrial goods firms listed on the Nigerian Exchange Group*

***HO*$_3$**: *There is no significant effect of revenue growth on financial distress in industrial goods firms listed on the Nigerian Exchange Group*

3. Literature Review

3.1. Financial Distress

Financial distress can be defined as the condition in which a company is facing compromised ability to fulfill its financial requirements and usually happens before bankruptcy or liquidation (Bhimavarapu *et al*., 2023). The most frequent way to measure it is to evaluate the liquidity, profitability, and leverage of the firm (Marginingsih *et al*., 2024). Stakeholder confidence may be destroyed, operations impaired, and asset devaluation may occur in cases of financial distress

(Inekwe *et al*., 2018). Past researchers have highlighted that financial distress is both an internal issue as well as the operating environment of the firm (Sudarma and Sari, 2020). As an example, Onyenekwe *et al*. (2023) determined that financial leverage has a significant effect on financial distress of non-financial firms in Nigeria. On the same note, Jamiu *et al*. (2024) have indicated the adverse impact of financial distress on the corporate tax planning strategy of Nigerian manufacturing companies, thus its extended implication.

3.2. Altman Z-Score as a Proxy for Financial Distress

One of the most tested and proven models in different markets is the Altman Z-Score model, which was developed by Altman (1968). It is a combination of major financial ratios, namely working capital to total assets, retained earnings to total assets, earnings before interest and tax to total assets, market value of equity to total liabilities and sales to total assets, which are used to forecast the possibility of a firm going bankrupt (Dolinšek and Kovač, 2024). The applicability of the Z-Score model to the emerging markets has been reconfirmed by recent research. As an illustration, Dolinšek and Kovač (2024) showed that the Altman Z-Score model correctly assigned more than 71 percent of Slovenian firms into the distressed and non-distressed groups. Azam *et al*. (2023) used the Z-Score model on Indian pharmaceutical companies, establishing that the model is effective in distinguishing between safe and risky companies. Onyenekwe *et al*. (2023) used the Altman Z-Score to assess financial distress in non-financial firms in Nigeria, highlighting the fact that the model can be applied in the Nigerian environment.

3.3. Firm Size

The size of the firm has been pointed out as a major crucial determinant of financial collapse. Bigger companies may enjoy economies of scale, in addition to the ready availability of capital and risk diversification (Ramadani and Ratmono, 2023). Mixed empirical findings exist however. According to Marginingsih *et al*. (2024), the firm size moderated the association between profitability and financial distress but not the associations of liquidity and leverage. On the other hand, Waqas and Md-Rus (2018) discovered that the size of the firm had negative impacts on financial distress among the Pakistani firms. These results indicate the non-simple role of firm size and show that its effect could be different in various industries and regions.

3.4. Share Price

Share price is one of the principal market-based indicators of a firm's financial health. A falling share price can signal market perceptions of distress or weakened fundamentals, further increasing financial distress (Nugroho *et al*., 2021). Bhimavarapu *et al*. (2023) also discovered that financial distress had a negative effect on firm value, as indicated by market capitalization and Tobin's Q, and suggests investors punish financially distressed companies with lower share prices. Similarly, Inekwe *et al*. (2018) emphasized the importance of share price volatility in understanding the dynamic relationship between financial distress risk and firm performance. Despite its limited attention, share price has received little emphasis in the existing financial distress literature in Nigeria.

3.5. Revenue Growth

Increase in revenue implies that a company has potential in increasing its market share and cash flows that may be of paramount importance in alleviating a financial distress. Octaviany and Ratnasari (2024) researched the impact of sales growth as an independent variable that influences financial distress in Indonesian manufacturing companies and received the result that the growth of sales did not significantly influence financial distress. Nevertheless, Dewi *et al*. (2021) proved that financial distress mediated the association amid profitability and firm value, indicating that the improvement of revenue could have an indirect effect on financial health via its impact on profitability. In conclusion, it is still necessary to conceptualize the position of the revenue growth in financial distress, especially in the industrial goods companies of Nigeria where the potential of growth is vital to the sustainability of the companies.

3.6. Firm Size and Financial Distress

The size of the firms has been many times mentioned as a factor that determines the risk of financial distress of firms. Marginingsih *et al*. (2024) examined the firm size as a possible moderator between financial ratios (liquidity, leverage, and profitability) and financial distress of retail companies that were listed on the Indonesian Stock Exchange. Interestingly, their findings also showed that firm size had no moderating effect on the associations between liquidity, leverage and financial distress but firm size moderated the connection between profitability and financial distress, thus implying that bigger firms are perhaps more robust in terms of sustaining the level of profitability during distress times.

Ramadani and Ratmono (2023) studied the moderating effect of firm size on the association between financial ratios and financial distress in the manufacturing firms. They discovered that firm size lowered the influence that leverage and

operating cash flow had on financial distress, yet deteriorated the connection between liquidity and financial distress. This is an indication that maybe the bigger firms are subject to economies of scale or they have more diversified sources of finance which provides them with a buffer against distress which is driven by liquidity.

Waqas and Md-Rus (2018) have emphasized the firm size as a noteworthy predictor of financial distress among Pakistani firms. Bigger companies also tend to access capital markets and non-diversified revenue structures, which make them less susceptible to financial distress. In the same line of reasoning, Onyenekwe *et al*. (2023) reported that the level of financial distress in Nigerian firms is greatly determined by capital structure decisions, which is closely related to firm size. The bigger companies may be better-resourced to take care of leverage, hence reducing the risk of financial distress.

All these studies have reinforced the subtle nature of the firm size in causing or not causing financial distress, especially in industrial goods sector in Nigeria, whereby economies of scale, diversification and market accessibility can insulate firms against financial distress.

3.7. Share Price and Financial Distress

The price of shares has been considered as one of the market indicators of the degree of investor confidence and the perceived value of a firm. Even though there is a relative paucity of studies that directly relate share price to financial distress in industrial goods companies, there are a number of studies that indirectly confirm the association. As an example, Bhimavarapu *et al*. (2023) concluded that financial distress hurts firm valuation when they used Tobin. The implication is that falling share prices could indicate those firms that are increasingly under financial distress, which destroys investor confidence and impacts the firm capacity to access capital.

Azam *et al*. (2023) applied the same concept to the analysis of pharmaceutical companies in India; in their case share price changes as driven by market sentiment and financial health were a determining factor of financial health using Altman Z-score. Firms whose share prices were going down tended to be at higher distress risk.

Using the sample of Nigerian industrial goods companies, Onyenekwe *et al*. (2023) highlighted that the capital structure (amount of debt) affects financial distress that could be indicated in share prices. Also, highly levered companies might also suffer falling share prices as they are viewed to be risky and this worsens financial distress. In addition, share prices are considered by investors as a gauge of financial health and it therefore represents an important variable to include in analysis of financial distress. Hence, share price may serve as a valuable early indication of financial distress in industrial goods companies that can affect both the internal management and external investors.

3.8. Revenue Growth and Financial Distress

An increase in revenue is one of the most important indicators of the functioning health of a firm and its capability to develop sustainable cash flows which are essential in preventing financial distress. Octaviany and Ratnasari (2024) studied sales growth (which is similar to revenue growth) and they reported that contrary to profitability and liquidity, sales growth did not have a significant positive impact on alleviating financial distress among Indonesian manufacturing businesses. This observation indicates that increase in revenue might not be enough to reduce financial distress without the back up of other financial indices.

Consistently, Restianti and Agustina (2018) concluded that profitability ratios were significant in predicting financial distress, but turnover ratios (associated with revenue growth) did not stellar any effect on financial distress in Indonesian companies. These findings suggest that expansion in the absence of appropriate cost control and profitability might not provide protection of firms against distress. Nevertheless, Waqas and Md-Rus (2018) found profitability and liquidity which are highly related to the revenue growth, to be highly predictive of financial distress. Companies that have prolonged increase in revenue are able to cushion themselves against financial distress by using enhanced liquidity and profitability.

Onyenekwe *et al*. (2023) emphasized, in the context of Nigeria, the significance of increasing revenues by ensuring sound financial management, in particular in terms of debt management and competition in the market. Companies that increase revenue in a responsible manner and manage leverage tend to have a fewer chances of being in a financial distress. Although revenue growth is essential, its relevance in averting financial distress among industrial goods companies in Nigeria is nearer to the efficient administration of profitability, liquidity, and leverage.

3.9. Theoretical Framework

Theoretical foundation for assessing the influence of significant financial ratios on industrial goods firms' financial distress in Nigeria is based on theories of corporate finance that explain firm-level characteristics and how they influence

financial fitness. Financial distress, or when a firm is unable to fulfill its financial commitments, may be caused by factors such as firm size, stock price, and revenue increases. Theories of the Trade-off Theory, Pecking Order Theory, and the Resource-Based View (RBV) provide theory concerning how such variables interact with financial distress. Such a framework is founded on evidence that firm size, corporate governance, and financial ratios are significant factors that determine the likelihood of financial distress (e.g., Onyenekwe *et al*., 2023; Ramadani and Ratmono, 2023; Jamiu *et al*., 2024).

3.10. Trade-off Theory

The Trade-off Theory explains that firms balance the benefits of financing through debt (e.g., tax shields) with potential financial distress costs (Kraus & Litzenberger, 1973). The theory can be applied in examining the effect of leverage (debt ratio) and firm size on financial distress of manufacturing goods firms. Empirical evidence by Dwiantari and Artini (2021) reveals that leverage has a significant positive effect on Indonesian real estate firms' financial distress as predicted by the trade-off hypothesis. Similarly, Onyenekwe *et al*. (2023) employed this theory to examine capital structure and financial distress interaction in Nigeria and deduced that higher levels of leverage can increase the threat of financial distress. Therefore, in conformity with the assertion of the Trade-off Theory, large firms might cope better with distress risk due to their diversification benefit and economies of scale (Marginingsih *et al*., 2024), though such a relationship might also be industry-specific.

3.11. Pecking Order Theory

The Pecking Order Theory (Myers and Majluf, 1984) theorizes that firms utilize internal funds prior to external funds due to asymmetric information and transaction costs. When compelled to raise capital from outside, companies prefer debt to equity to prevent diluting ownership. This hypothesis can explain why companies with lower share prices—evidencing market undervaluation—may experience more financial distress if they are not able to raise equity successfully. Empirical evidence from Ramadani and Ratmono (2023) indicates that firm size is capable of mediating the effect of leverage and liquidity towards financial distress, aligning with the pecking order theory in which firm size impacts the use of external financing. Additionally, Kofi (2021) reiterated that firms in West Africa, like Nigeria, adhere to the Pecking Order Theory where debt increases can sometimes improve financial position, yet increased leverage can heighten the prospect of distress if met with internal cash flow.

3.12. Resource-Based View (RBV)

Resource-Based View (Barney, 1991) posits that firms derive competitive advantage from their differentiated abilities and assets. That is, in the case of financial distress, firms with high revenue growth, strategic assets, and better managerial quality are likely to cope with financial troubles. Octaviany and Ratnasari (2024) highlighted that profitability and liquidity are the key financial resources positively affect financial stability and reduce distress risk. Similarly, Dolinšek and Kovač (2024) demonstrated that resource optimization, such as effective cash management, reduces financial distress risk for manufacturing firms. This view has empirical support from research conducted by Jamiu *et al*. (2024), who noted that financial distress could potentially have a negative impact on tax planning and, by implication, an organization's ability to preserve strategic resources. As such, organizations that leverage their internal resources—like revenue-generating assets and intellectual capital—are in a better position to prevent financial distress.

3.13. Theoretical Anchor of the Study

The Trade-off Theory is the main theoretical anchor for this research. The Trade-off Theory provides a robust approach to the study of the relationship between financial structure and financial distress, particularly for Nigerian industrial goods firms. Focusing on firm size, share price, and revenue growth as significant financial ratios, the study applies the Trade-off Theory to investigate how firms strike the balance of the trade-offs of debt financing to avert financial distress. Empirical support from studies such as Onyenekwe, Amah, and Ogege (2023) and Dwiantari and Artini (2021) justifies the applicability of the Trade-off Theory in explaining financial distress dynamics, thereby making it most appropriately the anchor for this study.

3.14. Empirical Studies

Octaviany and Ratnasari (2024) empirically examined financial determinants of financial distress using 31 firms' data (2018–2022). They applied multiple regression using profitability, liquidity, leverage, and sales growth. Financial distress was reduced by profitability and liquidity, but the influence of leverage and sales growth was insignificant. They recommended improving cash flow, reducing short-term debt, and maximizing resources. Marginingsih *et al*. (2024) analyzed liquidity, leverage, and profitability ratios and the firm size moderating effect on Indonesian retail companies'

financial distress (2018–2022). Using moderated regression analysis, they found that liquidity and profitability alleviated financial distress, whereas leverage increased it. Firm size only moderated the profitability effect. Jamiu *et al*. (2024) studied financial distress as a predictor of tax planning in 29 Nigerian manufacturing firms (2013–2020). They found that financial distress negatively impacted tax strategy and recommended sales growth and cost management to keep companies afloat.

Dolinšek and Kovač (2024) confirmed the validity of the Altman model in bankruptcy prediction for 66 Slovenian firms. The Z-Score accurately separated bankrupt and non-bankrupt firms with an accuracy level of over 70%. Orji and John-Akamelu (2023) applied Book Tax Differences (BTDs) to Nigerian consumer goods firms' Altman Z-Score (2012–2021). Transitory and permanent BTDs improved financial well-being; total and discretionary BTDs were without effects. Ramadani and Ratmono (2023) used SEM-PLS for 128 Indonesian manufacturing firms (2018–2020) to investigate financial ratios that predict financial distress. Leverage and liquidity reduced distress, while operating cash flow increased it. Firm size moderated these relationships. Onyenekwe *et al*. (2023) used Altman's Z-Score to investigate capital structure and financial distress in Nigerian non-financial firms (2011–2021). They concluded short-term debt to equity had a negligible positive impact on financial distress. They recommended considering outside factors and careful financial management.

Bhimavarapu *et al*. (2023) tested financial distress (Altman Z-Score) and transparency on firm value in Indian non-financial firms (2015–2020). Financial distress negatively impacted value, and transparency had no noticeable effect. They warned companies off distress to avoid insolvency. Azam *et al*. (2023) employed Altman's Z-Score to Indian drug firms (2018–2023) and established various insolvency risks. There were certain companies that remained constant in all periods, highlighting the importance of prudent management. Ermawati *et al*. (2023) examined the effect of institutional ownership, leverage, profitability, intellectual capital, and other factors on firm value in Indonesian firms (2017–2021). Leverage and profitability added value; other factors affected value negatively or insignificantly. Independent commissioners sometimes modified these relationships.

Fizabaniyah *et al*. (2023) studied predictors of financial distress (independent commissioners, solvency, profitability, liquidity, institutional ownership, and managerial ownership) for Indonesian manufacturing firms (2020–2021). Quantitative analysis identified that profitability, liquidity, and governance factors counteracted financial distress, but solvency didn't have a significant impact. Nurcahyono *et al*. (2023) studied financial distress in Indonesian transportation companies by using financial ratios and board diversity for five years. Findings suggested managerial ownership and gender diversity reduced distress, whereas profitability and leverage increased it. Timoty *et al*. (2023) investigated the impact of audit committees, intellectual capital, operating cash flow, and leverage on financial distress in Indonesia's financial institutions (2017–2021). They set up that audit committees and intellectual capital raised distress, whereas cash flow and leverage lowered it.

Kofi (2021) studied capital structure and financial distress in West African firms. He found that higher debt at times improved financial health but that high leverage and asset tangibility could make it worse, indicating more effective capital markets. Cındık and Armutlulu (2021) compared financial distress models (Altman Z-Score and others) for Turkish firms (2013–2018). Random Forest was superior to the other models, with a 95% success rate, especially for listed companies. Dwiantari and Artini (2021) examined the impact of liquidity, leverage, and profitability on Indonesian real estate company financial distress (2017–2019). Liquidity and profitability reduced distress, but leverage increased it. Dewi *et al*. (2021) examined financial distress as a mediator between profitability, liquidity, and value in Indonesian industrial firms (2016–2020). Financial distress fully mediated them.

Nugroho *et al*. (2021) analyzed financial distress, systematic risk, profitability, and stock return in Indonesian chemical firms (2018–2020). Financial distress impacted stock returns indirectly through risk and profitability. Sudarma and Sari (2020) analyzed the influence of financial distress, opportunity for growth, and dividend policy on firm value through hedging in Indonesian property firms (2016–2018). Financial distress increased hedging but decreased firm value. Restianti and Agustina (2018) investigated financial ratio and its impact on distress among Indonesian listed companies (2013–2015). The important ratios were EBIT/Total Assets and ROE and others were not significant. In their study, Inekwe, Jin, and Valenzuela (2018) linked the risk of financial distress to the US GDP growth, which had a decrease of up to 9% during the period of 1970 to 2012, in the export and investment sector. Waqas and Md-Rus (2018) founded their cause for concern financial ratios (profitability, liquidity, leverage, cash flow, size of firm), and firm size on Pakistani firms (2007–2016).

4. Methodology

The ex post facto research design was applied in conducting this study as historical data between 2015 to 2024 was utilized in assess the determinants of financial distress among industrial goods companies listed on the Nigerian

Exchange Group. Since one of the issues, financial distress, is a historical phenomenon that cannot be manipulated, such design is suitable, and it was supplemented with a correlational analysis of relationships between variables. The population of the study included 13 industrial goods companies that were listed on August 31, 2024, and a purposive sample of 11 companies was taken on the basis of various criteria like availability of all the data and similarly reporting their financial outcomes. The research used secondary sources of data collection, which included annual reports and financial statements obtained on the Nigerian Exchange Group Factbook and company disclosures. Descriptive statistics, panel data unit root tests, correlation analysis, and panel regression analysis (fixed and random effects models) were used as the analytical methods. The existence of multicollinearity was checked through the Variance Inflation Factor (VIF) and other diagnostics such as Hausman test, Durbin-Watson statistic and Jarque-Bera test made it robust. The analysis was conducted with the help of EViews 13 software and the results are delivered in tables and charts. Table 1 shows the measurement of the variables used in the study.

Table 1: Variables Measurement

Variable	Measurement	*APriori* Expectation
Dependent Variable		
Financial Distress (FIND)	Altman Z-Score was used as a proxy for financial distress. The Z-Score is widely used to predict bankruptcy and financial health (Dolinšek and Kovač, 2024).	
Independent Variables		
Share Price (SHPR)	Annual average market share price derived from stock market records. Higher share price often indicates investor confidence and reduces financial distress (Aldei and Ugwuanyi, 2023).	–
Revenue Growth (RVGT)	Revenue Growth = (Current Revenue - Previous Revenue) / Previous Revenue. Indicates the firm's capacity to expand its operations and market presence (Octaviany and Ratnasari, 2024).	–
Firm Size (FMSZ)	Natural logarithm of total assets; larger firms often have greater resilience to financial distress (Muigai and Muriithi, 2017).	–

Source: Compiled by the Researcher (2025)

4.1. Model Specification

In the current study, the panel data regression model was adopted based on Bhimavarapu *et al*. (2023), Meshack *et al*. (2022), Muigai and Muriithi (2017) and Kanyugi (2016). This study developed the following regression models (in their generic form) to measure the variables of the study:

$$FIND = f(SHPR, RVGT, FMSZ) \quad ...(1)$$

Econometrically, the above equation can be restated as:

$$FIND_{it} = \beta_0 + \beta_1(SHPR_{it} + \beta_2 RVGT_{it} + \beta_3 FMSZ_{it} + e_{it} \quad ...(2)$$

where

$FIND$ = Financial Distress (Altman Z-Score)

$SHPR$ = Share price

$RVGT$ = Revenue growth

$FMSZ$ = Firm Size

e_{it} = Radom error term or stochastic variables

β_0 = Constant while Subscripts *i* denote number of firms, *t* denotes years or time-series dimensions ranging from 2015-2024, *e* is the error term of the model capturing other explanatory variable and $\hat{a}_0$, $\hat{a}_1$, $\hat{a}_2$, $\hat{a}_3$ Stands for Regression model coefficients.

5. Results and Discussion

5.1. Descriptive Statistics

As presented in Table 2, the descriptive statistics indicate important information on the financial distress (FIND) and the chosen financial ratios (SHPR, RVGT, and FMSZ) of the industrial goods companies in Nigeria. The average (8.722) financial distress score corresponds to a fairly moderate financial health, but the standard deviation (11.535) and the maximum score (71.487) points to a high variability. The average share price (SHPR) is rather high (120.494), and the range is also significant (minimum 4.364 to maximum 246.761) as the market has varied valuation of the firms. Revenue growth (RVGT) demonstrates the most significant variation with the mean of 91.744, the standard deviation of 329.553, and the extreme negative and positive values, which means that some companies experience significant revenue drops, whereas others post impressive growth. The firm size (FMSZ) is quite unchanging as the standard deviation (0.971) is low and the mean of this variable is 25.310 implying that the difference in firm size is not as eminent as the other variables. The values of skewness and kurtosis, especially in FIND and RVGT, prove that the data are highly skewed and have outliers, which is also supported by the results of the Jarque-Bera test of non-normal distributions (p-values of 0.000 across variables except SHPR with 0.019). All in all, these figures point to a great deal of heterogeneity in financial health and operational performance amid the Nigerian industrial goods companies.

Table 2: Descriptive Statistics

Statistics	FIND	SHPR	RVGT	FMSZ
Mean	8.722	120.494	91.744	25.310
Median	4.094	109.066	-16.187	25.706
Maximum	71.487	246.761	2033.256	26.413
Minimum	1.416	4.364	-94.854	22.594
Std. Dev.	11.535	74.226	329.553	0.971
Skewness	3.019	0.118	4.074	-0.931
Kurtosis	13.352	1.707	21.920	2.962
Jarque-Bera	658.237	7.919	1944.999	15.914
Probability	0.000	0.019	0.000	0.000
Sum	959.457	13254.286	10091.855	2784.124
Sum Sq. Dev.	14502.145	600535.933	11837990.118	102.753
Obs.	110	110	110	110

Source: Data Analysis (2025)

5.2. Levin, Lin & Chu Panel Unit Root Test

Table 3 shows the results of Levin, Lin & Chu panel unit root test, which indicates that the three independent variables such share price (SHPR), revenue growth (RVGT) and firm size (FMSZ) are stationary at level, i.e., they are integrated of order zero [I(0)]. It means that SHPR, RVGT, and FMSZ series do not display unit roots and can be used in the further analysis without differencing. The variables are stationary, which implies that they can be reliably utilized in the panel regression model to determine their effect on financial distress (FIND), which is measured based on the Altman Z-Score, thereby leading to the credibility of the study findings.

Table 3: Levin, Lin and Chu Panel Unit Root Test			
Variable	**Level Difference**	**Prob**	**Order of integration**
SHPR	-5.959	0.000	I(0)
RVGT	-4.848	0.000	I(0)
FMSZ	-8.557	0.000	I(0)
Source: Data Analysis (2025)			

5.3. Correlation Analysis

Table 4 shows the outcome of the correlation analysis, which relates some interesting findings between the key financial ratios and financial distress (FIND) of the industrial goods companies in Nigeria. Interestingly, share price (SHPR) is also positive but modestly related to financial distress (0.372) such that an increase in share price is related to an increase in the risk of financial distress, possibly as a measure of risk in the firms eyes of the market. Financial distress (FTST) and revenue growth (RVGT) have a weak negative correlation (-0.152), which implies that a high revenue growth is associated with a low financial distress, though the correlation is not strong. Most notably, firm size (FMSZ) is strongly and negatively correlated with financial distress (-0.641), which could be explained by the fact that larger firms have fewer chances of experiencing financial distress because of their potential access to resources and economies of scale.

Table 4: Correlation Analysis				
	FIND	**SHPR**	**RVGT**	**FMSZ**
FIND	1.000			
SHPR	0.372	1.000		
RVGT	-0.152	0.068	1.000	
FMSZ	-0.641	0.075	0.333	1.000
Source: Data Analysis (2025)				

5.4. Variance Inflation Factors

The Table 5 results show that multicollinearity is not an issue in the model that determines the impact of important financial ratios on financial distress (FIND) of industrial goods companies in Nigeria. The centred Variance Inflation Factors (VIFs) of all the independent variables which include share price (SHPR), revenue growth (RVGT) and firm size (FMSZ) are far much below the widely accepted value of 10. In particular, the VIF values of SHPR, RVGT, and FMSZ are 1.780, 1.210, and 2.120, respectively, which indicates that the degree of correlation between the explanatory variables is low. It means that no substantial overlap exists between the information that each of the independent variables brings to the model, which justifies the consistency of the regression estimates in explaining the variances in financial distress based on the Altman Z-Score.

Table 5: Variance Inflation Factors			
Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
SHPR	25959662.381	2.280	1.780
RVGT	0.070	1.340	1.210
FMSZ	342905270.696	2.910	2.120
Source: Data Analysis (2025)			

5.5. Hausman Test

According to the Hausman test outcome indicated in Table 6, the Chi-square value is equal to 13.171, the degree of freedom is 3, and the p-value is 0.011. The traditional significance level of 0.05, the null hypothesis concerning the suitability of the random effects model is rejected since the p-value is smaller than its value. This suggests that the fixed effects model would be more effective in examining the association between the financial distress (FIND) and the independent variables which are the share price (SHPR), revenue growth (RVGT) and firm size (FMSZ). The selection of the fixed effects model indicates that unobserved firm-specific effects are related to the explanatory variables, and without controlling that would lead to biased estimation results. Hence, the interpretations and policy implications that will be made should be pegged on the outputs of the fixed effects regression.

Table 6: Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.171	3	0.011

Source: Data Analysis (2025)

5.6. Regression Analysis (Fixed Effect)

5.6.1. Effect of Firm Size (FMSZ) on Financial Distress

The firm size coefficient (FMSZ) is 0.064 with a standard error that is very high (11.978) and a p-value of 0.996, which means that there is no significant effect of firm size on financial distress among industrial goods companies in Nigeria.

Table 7: Regression Analysis (Fixed Effect)

Dependent Variable: ALTMAN Z-SCORE
Method: Panel Least Squares
Date: 04/12/25 Time: 03:14
Sample (adjusted): 2015 2024
Periods included: 10
Cross-sections included: 11
Total panel (balanced) observations: 110

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHPR	-0.058***	0.009	-6.175	0.000
RVGT	-0.004	0.002	-1.704	0.092
FMSZ	0.064	11.978	0.005	0.996
C	230.780	19.060	12.108	0.000

Effects Specification
Cross-section fixed (dummy variables)

R-squared	0.742	Mean dependent var	8.212
Adjusted R-squared	0.663	S.D. dependent var	9.754
S.E. of regression	6.221	Akaike info criterion	6.274
Sum squared resid	4713.746	Schwarz criterion	6.122
Log likelihood	-723.973	Hannan-Quinn criter.	5.753
F-statistic	13.113	Durbin-Watson stat	1.921
Prob(F-statistic)	0.000		

Note; *** is significant at 1%.

Source: Data Analysis (2025)

This finding indicates that being a large or small company, at least based on the size measure considered here, may not be an advantage or disadvantage in terms of financial distress in the Nigerian industrial goods market.

This result is inconsistent with previous literature. Indicatively, Odita and Oghoghomeh (2018) assumed that larger companies usually possess superior access to capital, economies of scale, and income diversification, which theoretically should make them less susceptible to financial distress. In a similar vein, Bassey *et al*. (2022) discovered that larger industrial companies in Nigeria had more stable cash flows and were less prone to distress than smaller companies. Notably, however, Osazevbaru *et al*. (2019) pointed out that the effect of firm size on financial distress might be insignificant in some industries when managerial inefficiencies and poor corporate governance practices are widespread.

The inclusion of firm size as insignificant in this research could be related to the inconsistency in management quality, governance structures, and market dynamics across industrial goods companies in Nigeria. Even big companies can be vulnerable to distress when they are not managed effectively, when they are highly leveraged, or when they are in volatile industries where size does not necessarily provide immunity.

HO_1: *Firm size has no significant effect on financial distress, as indicated by the extremely high p-value (0.996). Therefore, the null hypothesis (HO_1) cannot be rejected.*

5.6.2. Effect of Share Price (SHPR) on Financial Distress

The regression results indicate that the coefficient of share price (SHPR) is significant and negative (-0.058) (p = 0.000), thus showing that an increase in share prices correlates to a low financial distress of industrial goods companies in Nigeria. This goes hand in hand with the theoretical view that the price of shares represents the mood and the faith of the investors and the market about the financial position of a firm. A drop in stock price can be an indication that the market is worried about the solvency or the profitability of a firm and this may cause the firm to sink deeper into financial distress.

This observation aligns with Otekunrin *et al*. (2022), who, in regards to the Nigerian environment, stated that share price movements are important indices of market confidence and may provide an early warning of financial distress. In a similar manner, Okoye *et al*. (2021) believed that falling share prices do not just reflective worsening fundamentals but also can produce a negative feedback loop, whereby low investor confidence can restrict access to external finance and exacerbate liquidity conditions of firm. Also, Oladimeji and Alade (2020) stressed that in crystalline markets, changes in share prices can be more erratic and responsive to idiosyncratic and macroeconomic variables and thus a powerful indicator of financial fragility.

The strong inverse correlation in this light supports the discussion that share price is a market-based measure that reflects past performance as well as investor expectations. An increasing price of a share can thus be taken as an indicator of market confidence in the strategies and financial standing of a firm which strengthens its financial health and minimizes the chances of being in distress. On the other hand, a decreasing share price could be indicative of market pessimism which could adversely affect the ability of the firm to raise equity capital and increase the cost of capital as well as worsen a financial distress.

HO_2: *There is a significant negative effect of share price on financial distress, as evidenced by the statistically significant coefficient (p = 0.000). Therefore, the null hypothesis (HO_2) is rejected.*

5.6.3. Effect of Revenue Growth (RVGT) on Financial Distress

Revenue growth (RVGT) has a negative coefficient of -0.004 and p-value of 0.092 that shows weak, marginal significance at the 10 percent level of significance. The negative sign implies that a rise in the revenue growth is normally accompanied by a marginal decrease in the financial distress but the effect is not significant to be termed as highly significant at the 5 percent level.

The above discovery is partly aligned with the research conducted by Uwuigbe *et al*. (2016), who determined that although an increase in revenue is a significant predictor of the capacity of a company to produce sales, its association with financial distress relies on the quality of earnings and cost structure. An increase in revenue without a relative increase in profitability could not contribute considerably to the improvement of financial health. Furthermore, Oladimeji and Alade (2020) stated that the growth in revenues in the industrial sector of the Nigerian economy is usually not steady because of the frequent fluctuations caused by economic volatility, inflation, and regulatory uncertainties, thus weakening its ability to predict financial distress.

The weak significance that is observed may also be attributed to the fact that growth in revenues may be surpassed by other factors like cost control, leverage and operating efficiency. This is in line with Ogundipe *et al*. (2021) findings,

which noted that an increase in revenue should reflect in improving the cash flow and long-term profitability to make a significant change in financial stability.

On the whole, revenue growth is an appropriate measure of performance, but in the context of the present research, it is statistically insignificant, which shall mean that Nigerian industrial goods companies should focus not only on top-line expansion but also on operational efficiencies and costs control so that the impact of financial distress could be reduced.

HO_3: *The effect of revenue growth on financial distress is only weakly significant ($p = 0.092$), significant at the 10% level but not at the 5% level. Therefore, the null hypothesis (HO_3) is not rejected at the 5% level but can be rejected at the 10% level*

5.7. Model Summary

The overall model explains approximately 74.2% of the variation in the Altman Z-Score (R-squared = 0.742), indicating a strong explanatory power. The high F-statistic of 13.113 with a p-value of 0.000 confirms that the model is jointly significant, meaning the independent variables collectively explain a significant portion of the variability in financial distress. The Durbin-Watson statistic of 1.921 suggests no significant autocorrelation in the residuals, supporting the robustness of the model.

6. Conclusion and Recommendations

The study establishes the significance of market-based measures of financial health such as share price, and the minor importance of firm size and revenue growth with respect to alleviating distress, in that order. The results provide part of the solution to the definition of financial distress factors in the Nigerian industrial goods market, which can be used by interested stakeholders to improve the level of financial strength. Relevance of these variables is confirmed by the study, although the insignificance of the firm size contradicts the traditional beliefs concerning the protective effect of this variable. Its findings are partly consistent with those of the existing literature but highlight the exceptional nature of the Nigerian industrial sector where the benefits of size can be reduced by macroeconomic instability and structural constraints. Based on the results of the study the following recommendations are offered:

i. Since there is a high negative correlation between the share price and financial distress, industrial companies should adopt effective investor relations programmes and ensure transparent financial reporting. To deal with this, management ought to devise a system that smoothens the share price in volatile markets and tie executive compensation to long-term share-price performance.

ii. Regulators should require more comprehensive disclosures of financial health, such as quarterly reporting of Z-scores, and early warning signs. Transparency and investor protection in the market would be enhanced by standardized reporting of revenue quality metrics and closer surveillance of share price manipulation.

iii. The trends in the share prices should be given more extensive weight in the models of distress prediction by investors than firm size. Sector-specific benchmarks should also be developed and revenue growth and other profitability measures be monitored as they would give superior early warning indicators of financial distress.

iv. Government should develop specific assistance measures such as stabilization funds and special financing schemes. The resilience of the whole industrial sector would be enhanced through the implementation of such tax incentives applied to the financial health indicators and the creation of risk-sharing arrangements of essential inputs.

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