

Firm Attributes and Corporate Financial Distress of Listed Manufacturing Firms at The Nigeria Exchange Group

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ABSTRACT: *This study investigated the effect of firm attributes on corporate financial distress of listed manufacturing firms in Nigeria. The specific objectives of this study was to investigate the relationship between six dimensions of firm characteristics (profitability, financial leverage, tangibility, liquidity, operating capacity and firms size) and corporate financial distress of manufacturing firms in Nigeria. Ex-post facto research design and a cross sectional time series secondary data covering the period of one hundred and fifty observations (2018-2022) was extracted from the audited financial statement of thrifty (30) manufacturing firms listed on the floor of Nigerian exchange group. The data collected was analysed using descriptive statistics, correlation analysis and Generalized Method of Moments (GMM) of regression analysis. The result from the regression analysis indicated that profitability does positively and significantly affect corporate financial distress; financial leverage does negatively and significantly affect corporate financial distress; tangibility does positively and insignificantly affect corporate financial distress; liquidity does positively and insignificantly affect corporate financial distress; firm size does positively and insignificantly affect corporate financial distress and operating capacity does positively and insignificantly affect corporate financial distress of listed manufacturing firms in Nigeria. Based on the findings, the study generally concluded that firm attributes impact on corporate financial distress of listed manufacturing firms in Nigeria. Hence, it was suggested that corporate managers need to determine and maintain the appropriate level of profitability to ensure smooth operation and continual survival of the organization in term of short run but should be careful in evaluating the long term profitability.*

KEYWORD: firm characteristics, corporate financial distress, tangibility and operating capacity

INTRODUCTION

The concept of corporate financial distress is a very attractive and fascinating topic in the field of accounting and financial management as a result of poor corporate governance practices and the global financial crisis that affected companies across the world. Financial distress is the inability

of companies to pay back maturing obligations as and when due. Walela et al (2022) noted that corporate financial distress are situations that make companies the inability to meet maturing financial obligations to their creditors and may result in corporate bankruptcy and restructuring. According to Isayas (2021), a financially distressed firm is when the operating cash flows of the firm is insufficient in meeting the current financial obligations of the firm, thus imposing the arrangements of mergers and acquisition, and other forms of capital reconstructions. Also Njogu et al (2017) maintained that corporate financial distress of firms can be categorized into the decline in financial performance, failure of the firm, insolvency and financial default. Hence, studies have revealed that firm attributes has been a major factor responsible for the high level of corporate financial distress of firms (Kristanti et al., 2016; Devji & Suprabha,2016; Idrees & Qayyum, 2018; Ikpesu & Eboiyehi, 2018; Wesa & Otinga, 2018; Rafatnia, et al 2020; Susilowati et al, 2020).

Financial distress has been a major challenge of firms listed on the NGX and considerable evidence has been recognized to explain the determinants responsible for distress of listed companies. However, empirical evidence notes that financial distress and liquidity issues still remain a major concern of listed firms in Nigeria (Ikpesu & Eboiyehi, 2018; Ikpesu, 2019). According to Walela et al (2022), empirical investigations suggest that more studies be conducted in the area of financial distress in its various dimensions and current literature have revealed the need for the investigation of financial soundness and financial distress of companies for the purpose of eliminating the occurrence of distress and its negative effects on corporate growth and expansion. According to Walela et al (2022), empirical studies across the globe that have investigated financial distress include investigations on early warning signals, theories of financial distress, comparisons made between distress models before and after collapse, audit quality and financial distress, operating and cost of financial distress, examination of credit risk and financial distress etc. Hence, financial distress is a global problem for firms and government to handle. However, despite the problem of financial distress internationally, it is still a subject that remains unsolved globally.

The empirical studies on firm attributes and corporate financial distress presented diverse and disaggregated results. Studies such as Rafatnia et al (2020); Susilowati, et al (2020); Heniwati and Essen (2020); Ikpesu (2019); Abdioglu (2019); Gathecha (2016); Ikpesu and Eboiyehi (2018); Tesfamariam (2014); Kristanti et al (2016) showed different outcomes. It remains unclear the explanations empirical results often show varying outcomes. These conflicting outcomes reveal that firm characteristics and corporate financial distress is still inconclusive. The inconclusive outcomes have made the debate open to future research. The gap in terms of time, location, literature and methodology are also a contributory reason to the differences in the various outcomes of the effect of firm attributes and corporate financial distress. Following the above listed gap created by the prior studies in the light of mixed perspectives in research outcomes by different scholars, this study will fill the gap by introducing clearer variables of firm characteristics on corporate financial distress in Nigeria. Also, this study expands on prior research by updating the data to 2022 and by using a more robust statistical tool. Hence, the aim of this study was to investigate the effect of firm characteristics on corporate financial distress of listed manufacturing

firms listed on the Nigeria Exchange Group (NGX) from 2018 to 2022. The specific objectives are:

1. to investigate the relationship between profitability and Altman Z Score of listed manufacturing firms in Nigeria;
2. to evaluate the relationship between financial leverage and Altman Z Score of listed manufacturing firms in Nigeria;
3. to determine the relationship between tangibility and Altman Z Score of listed manufacturing firms in Nigeria;
4. to investigate the relationship between liquidity and Altman Z Score of listed manufacturing firms in Nigeria;
5. to determine the relationship between firm size and Altman Z Score of listed manufacturing firms in Nigeria;
6. to evaluate the relationship between operating capacity and Altman Z Score of listed manufacturing firms in Nigeria.

The following research questions were analysed in this study:

1. What is the relationship between profitability and Altman Z Score of listed manufacturing firms in Nigeria?
2. What is the relationship between financial leverage and Altman Z Score of listed manufacturing firms in Nigeria?
3. What is the relationship between tangibility and Altman Z Score of listed manufacturing firms in Nigeria?
4. What is the relationship between liquidity and Altman Z Score of listed manufacturing firms in Nigeria?
5. What is the relationship between firm size and Altman Z Score of listed manufacturing firms in Nigeria?
6. What is the relationship between operating capacity and Altman Z Score of listed manufacturing firms in Nigeria?

The following null hypotheses were tested in this study:

H₀₁: Profitability does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

H₀₂: Financial leverage does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

H₀₃: Tangibility does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

H₀₄: Liquidity does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

H₀₅: Firm size does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

H₀₆: Operating capacity does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

LITERATURE REVIEW

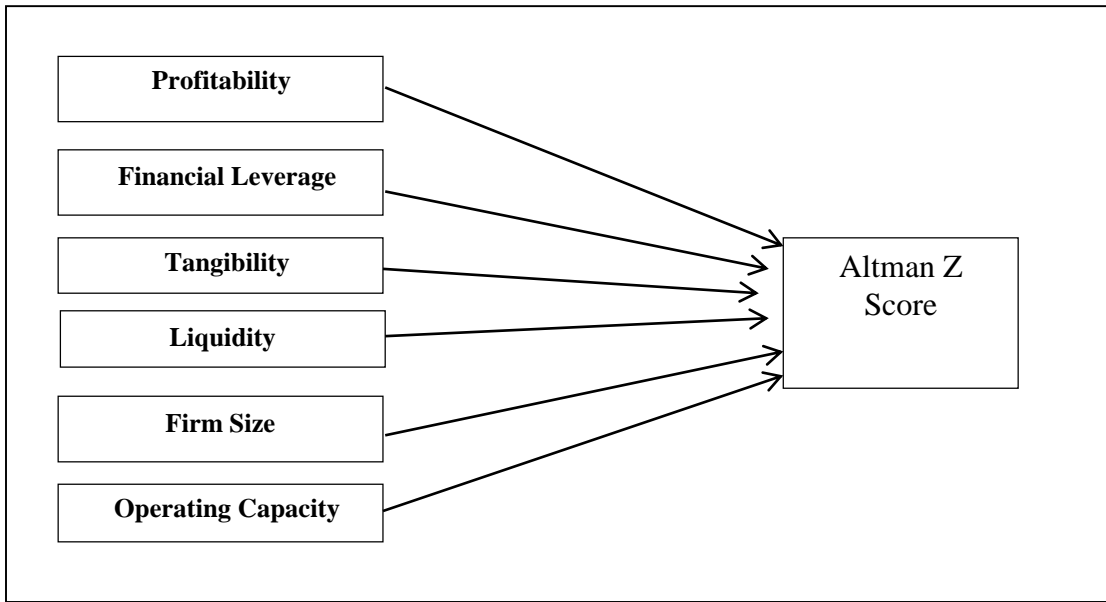


Fig. 1: Conceptual Framework of Firm Attributes and Financial Distress

Firm Attributes: This study adopted the following dimensions as firm attributes for this study:

Profitability: Profitability of companies influences the corporate financial distress. According to Heniwati and Essen (2020), profitability is an important element used by investors to analyse firm's advancement in financial performance in terms of profit-making. Profitability has been measured in previous empirical studies on corporate financial distress as return on assets (ROA). Return on asset shows how profitable a company's assets are in generating revenue. Return on assets (ROA) is a ratio that measures a company's earnings before interests and taxes (EBIT) relative to its total assets (Sani et al, 2019). It is defined as the ratio between net income and total average assets, or the amount of financial and operational income a company receives in a financial year as compared to the average of that company's total assets (Banda, 2019; Sani et al, 2019). The ratio is considered to be an indicator of how effectively a company is using its assets to generate earnings. EBIT is used instead of net profit to keep the metric focused on operating

earnings without the influence of tax or financing differences when compared to similar companies.

The greater a firm's earnings in proportion to its assets (and the greater the coefficient from this calculation), the more effectively that firm is said to be using its assets. The ROA, expressed as a percentage or decimal, provides insight into how much money is generated from each naira invested into the organization. This allows the organization to see the relationship between its resources and its income, and it can provide a point of comparison to determine if an organization is using its assets more or less effectively than it had previously. In circumstances where the company earns a new naira for each naira invested in it, the ROA is said to be one, or 100 percent (Urhoghide & Omolade, 2017).

It is indispensable information for investors as a source to investigate the business development in profit-making. The higher level of the firm's profitability will give a positive signal to investors, meaning that they will have a positive return from their investments. Prior studies (Murtadha, et al, 2018; Thim et al, 2011) found that profitability ratio is negatively influenced by financial distress. The studies of (Boubaker, et al., 2018; Dalci., 2018; Charalambakis, & Garrett, 2019; Dary & James., 2019) revealed a positive association between profitability and financial distress.

Financial Leverage: This is a company's level of external borrowing used in financing its short and long term financial deficit (Al-Najjar, 2017). It can be employed to measure the ability of firm to meet its long term financial obligations (Putri, et al, 2018). It is the approach which contains the application of loan in the procurement of investment with the objective that the asset's after-tax profit and asset price appreciation will compensate the cost of borrowing cost (Imeopkaria et al, 2021). According Afolabi et al (2019), financial leverage determine the amount of equity and debt capital utilized by a firm to finance appropriate investment opportunities. Financial leverage can be employed to extent a firm can meet its long period financial requirements (Solanke, 2020). Grossman and Hart (2017) noted that the contributions of equity and debt with other financial assets determine financial leverage. Financial leverage is also another firm characteristic employed by previous studies to investigate leverage and corporate financial distress. A number of previous studies on financial leverage and corporate financial distress have produced mixed findings. The study of Ahmad (2013) revealed that corporate financial distress will increase when there is an increase in financial leverage of companies. Similarly, studies by Gathecha (2016) also showed that the relationship between corporate financial leverage and financial distress is positive. However, studies conducted by Kristanti et al., (2016) revealed that the relationship between leverage and financial distress is negative. However, findings by Baimwera and Murinki (2014) revealed that leverage had no significant influence on corporate financial distress.

Tangibility: This refers to the number of tangible assets in a firm's statement of financial position. It is the cost of aggregate outlay made by an organisation in non-current assets and is typically measured by dividing the amount of total non-current assets in the statement of financial position by the amount of the total assets of the entity (Oeta et al, 2019; Nangih & Onuora, 2020). The

concept of tangibility demonstrates the ratio between non-current assets and the total assets of the firm. It is of countless significance, not merely as it influences the financial condition of the firm, nonetheless similarly influences the assets efficacy and its performance. Tangible assets are the physical assets such as property, plant and equipment. Firms with low and small tangible assets should borrow less because they don't have the capacity to meet constant debt payment contracts which may negatively impact on their financial distress (Maina & Ishmail, 2014). According to Akintoye (2010), companies that retain more tangible assets as their investments have the capacity to manufacture more products that are transformed into sales which in turn improves their profitability and reduces their level of financial distress. The study of Wesa and Otinga (2018) of listed companies on the Nairobi Stock Exchange indicated that tangibility positively and insignificantly influences corporate financial distress of listed companies.

Liquidity: Liquidity is a vital element for any organization and a short fall in liquidity would result into corporate failure because it will not be in a position to settle its obligations as at when due whereas having too much liquidity means making sub optimal investment decisions which in the long term if left unchecked can erode the gains that could have been made if the funds had been invested. Liquidity is the point to which current liabilities outstanding for payment within one financial year can be paid from the total current assets of the firm without disturbing the functioning procedures of the business (Mohammed & Yusheng, 2019; Etim et al, 2020). The authors further noted that liquidity of a business demonstrates the soundness of the business in a short period and if correctly managed, ought to influence positively on the financial performance. Shimenga and Miroga (2019) opined that liquidity is the ability of an organisation to meet their existing liabilities as they fall due. Accordingly, liquidity comprises placing and controlling present resources and current liabilities in a manner that takes out the danger of failure to meet temporary obligations on one hand and break away from uncontrolled curiosity in these benefits before again. Therefore, a firm with low liquidity level may be unable to meet its current obligation when it falls due which may expose it to financial distress (Ong'era, et al., 2017). Wesa and Otinga (2018) study in Kenya found that liquidity positively and significantly influence corporate financial distress of listed companies on the Nairobi Stock Exchange. Prior studies conducted by Praowo et al. (2010), Tesfamariam (2014), Gathecha (2016), and Kristanti et al., (2016) reveal that liquidity has a positive relationship with corporate financial distress. The study conducted by Baimwera and Murinki (2014) disclosed that liquidity does not affect corporate liquidity.

Firm Size: This is the quantity and diversity of the productive ability and capacity possessed by an organization or the diversity and amount of services a company ought to offer simultaneously to consumers (Mule et al, 2015). It denotes to how small or big the firm and constitutes one of the most important determinants organisation's financial robustness. The relevance of corporate firm size on financial distress is well documented. According to Muigai and Muriithi (2017), corporate firm size influences the relationship between financial distress and capital structure of Kenyan firms. The authors further stated that the size of a firm affects corporate financial distress and capital structure. The study of Tinoco and Wilson (2013) documented that the firm size has an

opposite relationship with financial distress. In a study conducted by Kristanti et al. (2016) disclosed that the size of a firm does not influence corporate financial distress.

Operating Capacity: Operating capacity evaluates the firm's dimensions to carry out daily activities. The higher the firm's asset turnover rate shows that the firm has efficiently employed its assets in producing sales revenue. It means that the firms' management attempts to maximize their performance to decrease financial distress. Firms with fruitless sales, thus less in generating income, will tend to experience financial hitches due to a lack of asset turnover (Heniwati & Essen, 2020). If firms could effectively and efficiently manage their assets, they will receive a short-term return, which usually can be calculated by total asset turnover. Low total asset turnover shows that firms cannot effectively and efficiently manage their assets in their operational activities, thus resulting in low performance, and eventually leading to corporate financial distress. It is the level of efficiency or effectiveness of the firm's operating activities. This is measured as the total asset turnover ratio. High total asset turnover shows the effectiveness of the firm in using assets to generate sales well. This is a signal of good news for investors because the effectiveness of the use of assets to generate sales is expected to provide greater profits for the firm and show that the financial performance achieved by the firm is getting better so that the possibility of financial distress is getting smaller. Widhiari and Merkusiwati (2015) documented that operating capacity has a negative influence on financial distress. In a similar study conducted by Hanifah and Purwanto (2013), operating capacity also has a negative consequence on corporate financial distress.

Concept of Corporate Financial Distress: Corporate financial distress is a situation in which a company experiences a decline in financial conditions before bankruptcy. According to Wesa and Otinga (2018), corporate financial distress means that financial difficulties experienced by firms in maintaining their normal operations. The authors further noted that these are events preceding and including bankruptcy. This is a condition when a company cannot meet (or has difficulties paying off) its financial obligations to its creditors. It occurs when operating cash flows are not sufficient to satisfy current obligations and firms are forced to take corrective actions. Abdioglu (2019) argued that financial distress takes place due to macro or firm specific factors. The author further argued that economic factors such as economic recessions, implementation of tight monetary policy, the decrease in the stock market index are some elements that escalates the probability of financial failure. In addition, manufacturing defect, unsuccessful projects, the problems between employee and employer, higher level of leverage and overgrowth are among the firm specific factors that affect financial failure (Abdioglu, 2019). Handriani et al (2021), financial distress is a situation in which a business suffers a deterioration in financial conditions before bankruptcy. The financial complications of firms can be credited to three broad expressions used in finance and accounting research: failure, bankruptcy, and default. Failure occurs when the proportion of yield on an outlay is not in agreement with financed capital, or income that is not sufficient to cover costs, where the yield on average outlay is persistently below the cost of capital. The authors further noted that financial distress happens earlier than bankruptcy of a firm. The

current study employs Altman Z Score to measure financial distress. Altman (1968) defines Z Score as follows: $Z \text{ score} = 1.2 * X1 + 1.4 * X2 + 3.3 * X3 + 0.6 * X4 + 1.0 * X5$

Where

X1 = Net working capital/Total assets,

X2 = Retained earnings/Total assets,

X3 = Earnings before Interest and Taxes/Total Assets,

X4 = Market value of equity/Book value of total liabilities,

X5 = Net Sales/ Total Assets

If a firm has Z Score which is equal to 2.7 or higher than 2.7, this firm is in safe and the probability of financial distress and bankruptcy is lower. If Z Score is lower than 1.8, probability of bankruptcy and financial distress is higher. If Z Score is between 1.8 and 2.7, the firm is at risk of going bankrupt unless an action is taken to survive.

Theoretical Review

Agency Theory: This study anchored on agency theory. This theory was first advocated by Berle and Means (1932) but was further advanced by Jensen and Meckling (1976), Fama and Jensen (1983). Sani et al (2019) submitted that agency problem arises in a situation where the principal (owners, shareholders) employ the agent (board/management) to undertake number of duties on behalf of the owners for a reward. Olugbenga, et al (2014) stated that agency theory is the application of game theory to the explanation of the circumstances in which a person (the agent) acts on behalf of the principal for the advancement of the principal's objectives. According to Adeyemi, et al, (2019), agency theory is a unit of finance and accounting that explains the conflicts of interest between stakeholders with diverse interests in the same asset. According to Wangana and Karanja (2015), the agency model explains the separation of the principal and the agent which results in a conflict of interest in the ownership. Hence, managers of corporate entities must be monitored to reduce hazards using monitoring structures that checks behaviour of managers. This theory provides that a relationship between the owners and manages leads to conflict which may result in additional costs related to resolving the conflicts between owners and managers (Jensen & Meckling, 1976 in Kisangi, 2021). Agency theory is the most popular issue in corporate governance studies as it hypothesizes that in contemporary firms where share ownership is held widely, management actions depart from those required to maximize the wealth of shareholders. Atuahene (2016) maintained that agency theory is the beginning point for corporate governance debate. The author further noted that this is due to the conceptual simplicity and the notion of human beings as self-interested is universally accepted (Atuahene, 2016). Several scholars have criticized agency theory. According to Dallas (2011), the theory fails to identify which social returns needed to be pursued by organisations given their focus on maximization of profit. The author also stated that the theory does not set the rules defining an acceptable level of risk (Narbel & Muff, 2017). Rappaport (2005) noted that agency theory over time has resulted in shareholders becoming fascinated with quarterly earnings thus forcing executives to concentrate solely on reported short-term financial performance measures (Narbel & Muff, 2017). Agency theory is

faced with several limitations despite the popularity of this theory. Atuahene (2016) noted that in agency theory, the agent may have succumbed to self-interest, opportunistic behaviour and falling short of congruence between the principal's aspirations and the agent's pursuit. This is because both the principal and agent may behave rationally and opportunistically in their dealings. Urhoghide and Omolaye (2017) maintained that one of the critiques of the agency theory is the implicit presumption that the conflicts are between strong, entrenched managers and weak, dispersed shareholders. This theory is relevant to the current study because it explains how management is supposed to fulfill their fiduciary duty of acting in the best interest of the principal and to prepare and present financial statements to the owners of the business. As a result, the agency theory is assumed to provide a all-encompassing theoretical foundation as the research prime objective which is the relationship between corporate firm characteristics and financial distress of listed companies (Ndinda, 2021).

Empirical Review

Rafatnia et al (2020) investigated financial distress prediction across firms in Iran. The study used ex post facto and correlation research designs with a sample of three hundred (300) public Iranian firms for the periods 2000 to 2007 and 2009 to 2016. The data for the study were collected from the financial statements of sampled firms for the periods under review. The study used financial distress as dependent variable while the independent variables consisted of accounting variables of profitability, liquidity, and leverage; the earning management of free cash flow and accruals while macroeconomic variables of interest rate, gross domestic product and inflation. The data collected from the financial reports of sampled firms were analysed using descriptive statistics, logistic regression and decision trees. The results from the logistic regression indicated that profitability and liquidity negatively and significantly affects financial distress while leverage ratio and free cash flow positively related to financial distress. Additionally, interest rate, inflation and GDP positively and significantly affect financial distress of listed firms in Iran.

Susilowati et al. (2020) examined the determinants of financial distress in Indonesia. The research used ex post facto research design. The population of this study consisted manufacturing companies listed on the Indonesian Stock Exchange from 2014 to 2017 and non-probability sampling technique was applied for the selection of the sample size of 250 firms while data was collected from the financial statements of sampled companies for the period under review. The data collected from the annual reports were analysed using univariate analysis and multivariate analysis. The study used financial distress as dependent variable while liquidity, leverage, profitability, operating capacity, sales growth, firm size, institutional ownership and managerial ownership. The result from the logistic regression revealed that leverage positively influence financial distress; profitability, operating capacity, and firm size negatively affect financial distress while liquidity, sales growth and institutional and managerial ownership had no influence on financial distress of listed manufacturing companies in Indonesia.

Ikpesu (2019) examined determinants of financial distress in Nigeria. The study used exp post facto research design and the population consisted of all manufacturing companies listed on the Nigerian Stock Exchange while purposive sampling was used to determine a sample size of eighteen (18) firms. The study used secondary data from the annual financial statements of sampled firms. The dependent variable of this study consisted of financial distress using Altman Z score while the independent variable firm determinants using liquidity, profitability, leverage, and firm size. Additionally, control variables of revenue growth and share price were used in the study. The secondary data obtained from the financial statements were analysed using descriptive statistics, correlation matrix and regression analysis. The results from the regression analysis disclosed that leverage positively influence financial distress; liquidity inversely affect financial distress; revenue growth inversely influence corporate financial distress; share price inversely affect corporate financial distress; and profitability and firm size positively impact on the corporate financial distress of manufacturing firms in Nigeria.

Wesa and Otinga (2019) analysed the determinants of financial distress of listed firms in Kenya. The study employed descriptive survey design and a target population of sixty – five (65) listed companies on the Nairobi Stock Exchange while census sampling method was used to determine the sample size of listed firm adopted in the study. The study used Altman Z score as the dependent variable while the independent variable consisted of leverage, liquidity, capital structure, asset structure. The study also used secondary sources of data collection from the annual reports of sampled companies while univariate, bivariate and multivariate analysis were used for data analysis. The results from the analysis disclosed that liquidity, financial leverage, capital structure, positively and significantly affect financial distress while asset structure positively and insignificantly impact on corporate financial distress of listed firms in Kenya.

Walesa et al (2022) investigated financial risk, firm size and financial distress of listed firms on the Nairobi Stock Exchange in Kenya. The study employed explanatory and descriptive research designs with a population of sixty – six (66) listed firms and census method was adopted as the sampling technique. The study used positive research philosophy and Wreckers theory, Trade – off theory and Distress theory with quantitative secondary method of data collection and the use of diagnostic tests before data analysis using descriptive statistics and inferential statistics such as binary logistic regression. The results from the regression analysis indicated that firm size moderates the correlation between financial risk and financial distress of listed companies in Kenya.

Widhiadnyana and Ratnadi (2019) analysed managerial ownership, institutional ownership, proportional of independent commissioners and intellectual capital on financial distress of listed manufacturing firms in Indonesia Stock Exchange from 2014 to 2016. The study used ex post factor and correlational research design with a population of all listed manufacturing firm while non probability sampling was used for the determination of sample size. The study used positive accounting theory and agency theory while secondary data was collected from the financial reports

of sampled firms. The data collected from the sampled companies were analysed using descriptive statistics and inferential statistics. The regression analysis revealed that managerial ownership, institutional ownership and intellectual capital negatively and significantly influence financial distress while proportion of independent commissioners positively and significantly affects financial distress of listed companies in Indonesia.

Issak and Oluoch (2023) analysed firm characteristics and financial distress of manufacturing firms in Kenya. The study adopted the quantitative causal research design and the target population consisted of thirteen (13) listed manufacturing firms from 2013 to 2022 while only ten (10) firms were used for the study due to availability of data. The study independent variable of firm characteristics consisted of firm size, leverage, profitability and turnover while the dependent variable financial distress consisted of B ratio while secondary data was used as the basis for data collection. The data collected from the financial reports of sampled firms were analysed using descriptive statistics and inferential statistics. The results from the panel regression analysis indicated a negative and significant association between firm size, turnover and profitability on financial distress while leverage positively and significantly influence financial distress of listed manufacturing firms in Kenya.

Zelie (2019) investigated the determinants of financial distress in insurance firms in Ethiopia. The study adopted quantitative explanatory and causal research design and a target population of seventeen (17) firms and a sample of nine (9) was used for data analysis. The study also used secondary data from the financial reports from the sampled firms. The independent variable of determinants consisted of profitability, efficiency, firm size, leverage and liquidity while the dependent variable of financial distress adopted Altman Z score. The data collected from the secondary sources were analysed using descriptive and inferential statistics. The result from the analysis disclosed that profitability and liquidity positively and significantly impact on financial distress; leverage negatively and significantly influence financial distress while efficiency and firm size positively and insignificantly impact on financial distress of insurance firms in Ethiopia.

METHODOLOGY

The methodology of this study consisted of research design, sources and methods of data collection, population and sample of the study, methods of data collection, variables, measurement and model specification.

Research Design: This study was designed to explain the relationship between firm characteristics and financial distress of listed consumer and industrial goods firms listed on the Nigeria Exchange Group (NGX). The study adopted a combination of ex post facto and correlational research designs. Ndiyo (2005) observe that ex post facto research design is a systematic empirical study in which the researcher does not in any way control or manipulates independent variables because the situation for study already exists or has already taken place

(Appah, 2020). Appah (2020) contend that correlational design shows the relationships between independent and dependent variables. These research designs were considered appropriate because they facilitate a comprehensive perspective of the major research questions and hypotheses in the study.

Population and Sampling Technique: The target population consists of all the consumer and industrial goods companies listed on the Nigerian Exchange Group (NGX) as at 31 December, 2022. This study utilizes simple random sampling technique in selecting sample due to availability and completeness of data for the period under review. Therefore, the target population consists of all the sixty (60) manufacturing companies listed on the Nigeria Exchange Group (NGX). This study utilizes convenience sampling technique in selecting sample due to availability and completeness of data for the period under review. The sample size of thirty (30) companies was used for data analysis.

Methods of Data Collection: The data for this study was sourced from the published annual reports and accounts of sampled companies for the period 2018 to 2022.

Variable, Measurement and Model Specification: The dependent variable for this study is financial distress and the independent variable consists of firm characteristics (Firm size, liquidity, profitability, leverage, tangibility and operating capacity. The variables for this study were measured using appropriate dimensions on the basis of prior studies as follows:

Table 1: Measurement of Variables

Variables	Type of Variable	Symbol	Measurement	Sources
Altman score	Z Dependent Variable	AZS	$1.2*X_1 + 1.4*X_2 + 3.3*X_3 + 0.6*X_4 + 1.0*X_5$	(Abdioglu, 2019). Handriani et al (2021),
Profitability	Independent Variable	ROA	PAT/Total Assets	Dalci., 2018;Charalambakis, & Garrett, 2019; Dary & James., 2019); Wesa and Otinga (2018); Heniwati & Essen (2020)
Financial Leverage	Independent Variable	FIL	Total Debt/Total Equity	Putri, et al, (2018); Grossman and Hart (2017),
Tangibility	Independent Variable	TAN	Non-current assets/Total Assets	Wesa and Otinga (2018)
Liquidity	Independent Variable	LIQ	Current Assets/Current Liability	Wesa and Otinga (2018); Heniwati & Essen (2020)
Operating Capacity	Independent Variable	OPC	Sales/Total Assets	Wesa and Otinga (2018); Heniwati & Essen (2020)
Firm Size	Independent Variable	FIS	Natural Log of total assets	Heniwati & Essen (2020)

Source: Researchers Compilation (2023)

Model Specification: Gujarati & Porter, (2009) stated that model specification is the determination of the endogenous and exogenous variables to be included in the model as well as the a priori expectation about the sign and the size of the parameters of the function. The following model was developed based on the study variables:

$$\text{Corporate Financial Distress} = f(\text{Firm Attributes}) \dots\dots\dots (1)$$

$$\text{AZS} = \beta_0 + \beta_1\text{ROA}_{it} + \beta_2\text{FIL}_{it} + \beta_3\text{TANR}_{it} + \beta_4\text{LIQ}_{it} + \beta_5\text{OPC}_{it} + \beta_6\text{FIS}_{it} + \varepsilon \dots\dots\dots (2)$$

$\beta_0 - \beta_6$ are the coefficients of the regression, while ε is the error term capturing other explanatory variables not explicitly included in the model. The subscript, i , indicates the cross-sectional dimension of the panel data while the subscript, t , indicates the time series dimension. The p value shows what is the smallest level at which we would be able to accept the null hypotheses of a test. We used a 5% level of significance; hence we conclude that the coefficient is significantly different from zero at the 5% level if the p-values is less than or equal to 0.05. If it is greater than 0.05 then we cannot reject the null hypothesis that the coefficient is actually zero at our 5% significance level. The secondary data obtained from the sample companies were analysed with univariate, bivariate and multivariate analysis techniques.

RESULTS AND DISCUSSIONS

Table 2 Descriptive Statistics of the Variables

	AZE	SSS	ROA	FIL	TAN	LIQ	OPC	FIS
Mean	2.967667	13.73740	0.080227	0.526527	0.497133	1.339133	0.923333	7.138267
Median	2.800000	3.365000	0.060000	0.300000	0.485000	1.270000	0.785000	7.115000
Maximum	11.12000	223.7800	0.370000	11.60000	0.910000	6.740000	7.690000	8.900000
Minimum	1.250000	0.300000	0.002000	0.009000	0.030000	0.050000	0.050000	0.640000
Std. Dev.	1.328962	29.62331	0.072203	1.043404	0.218820	0.748777	0.792624	1.004474
Skewness	3.163689	4.101224	1.747465	8.270435	0.030149	2.806506	4.730031	-1.807331
Kurtosis	19.19075	23.02636	6.008978	86.16741	1.995895	19.90115	37.57172	13.06236
Jarque-Bera	1888.601	2927.096	132.9280	44940.11	6.324144	1982.217	8029.356	714.4807
Probability	0.000000	0.000000	0.000000	0.000000	0.042338	0.000000	0.000000	0.000000
Sum	445.1500	2060.610	12.03400	78.97900	74.57000	200.8700	138.5000	1070.740
Sum Sq. Dev.	263.1547	130753.6	0.776774	162.2152	7.134467	83.53939	93.60973	150.3361
Observations	150	150	150	150	150	150	150	150

Source: Author computation using E-views 12

The results in Table 2 disclosed the descriptive statistics results of firm attribute variables represented as profitability (ROA); financial leverage (FIL); tangibility (TAN), liquidity (LIQ), operating capacity (OPC) and firm size (FIS). The study dependent variable of corporate financial distress measured by Altman Z score (AZS) from 2018 to 2022 under investigation. The results disclosed that dependent variable Altman Z score (AZS) recorded a Mean value 2.967. The independent variables ROA, FIL, TAN, LIQ, OPC and FIS disclosed a Mean values 0.082, 0.526,

0.497, 1.339, 0.943 and 7.138 respectively for the time period investigated. The descriptive statistics also disclosed the standard deviation for the study variables AZS, ROA, FIL TAN LIQ, OPC and FIS reported 1.332, 0.072, 1.043, 0.218, 0.748, 0.792 and 1.004 standard deviation values respectively. From the result above, it is discovered that firms size (FIS) has the highest Mean value, minimum and maximum fellow by liquidity (LIQ), operating capacity (OPC) financial leverage (FIL), tangibility (TAN) and lastly, return on assets (ROA). Furthermore, the mean and standard deviation values for all the variables are clear indications that the variables are not constant over time. The skewness statistics indicated that AZ, SSS, ROA, FIL, TAN, LIQ and OPC variables that represented firm characteristics are positively skewed which shown the variables has a long right tail while FIS that represented firm characteristics is negatively skewed which indicated the variables has a short right tail.

The information provided by kurtosis, AZS, SSS, ROA, FIL, LIQ, OPC and FIS respectively have leptokurtic values suggested that the variables are higher than the kurtosis value of (3) that is clearly mesokurtic while TAN has mesokurtic value which suggested that TAN value is lower than kurtosis value 3. The Jarque-Bera test statistic is used to ascertain the difference of the skewness and kurtosis of the series with those from the normal distribution. The null hypotheses of the Jarque-Bera test statistics disclosed that the variables Altman Z score (AZS), return on assets (ROA), financial leverage (FIL), tangibility (TAN), liquidity (LIQ), operating capacity (OPC) and lastly, firm size (FIS) are not normally distributed. This implied that their corresponding probability value was less than 5% significant level. Hence, the researcher conducted diagnostic test such as Unit Root test, Histogram Residual Normality Test, before running the estimated model.

Table 3 Results from the Unit Roots Test

Group unit root test: Summary
 Series: AZE, SSS, ROA, FIL, TAN, LIQ, OPC, FIS
 Date: 11/29/23 Time: 00:14
 Sample: 1 150
 Exogenous variables: Individual effects
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0 to 1
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.9346	0.0000	8	1188
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-15.0137	0.0000	8	1188
ADF - Fisher Chi-square	247.616	0.0000	8	1188
PP - Fisher Chi-square	312.413	0.0000	8	1192

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Author computation using E-views 12

The stationarity properties of the data were examined using Im, Pesaran and Shin W-stat, Fisher-ADF and PP-Fisher Chi-square from table 4 above, all the eight variables that represent firm characteristics and corporate financial distress were stationary at levels. This is supported by the Prob.** value with regards ADF - Fisher Chi-square are less than the Prob.** value of 5%. The null hypothesis of panel unit root is therefore rejected with 95% certainty. This indicated that the data series have been cleansed of unit root.

Table 4 Correlation Matrixes

	AZE	SSS	ROA	FIL	TAN	LIQ	OPC	FIS
AZE	1	0.063...	0.322...	-0.075...	-0.025...	0.215...	0.265...	0.012...
SSS	0.063...	1	0.129...	-0.008...	-0.108...	0.057...	0.035...	0.286...
ROA	0.322...	0.129...	1	-0.123...	-0.229...	0.235...	0.188...	-0.025...
FIL	-0.075...	-0.008...	-0.123...	1	-0.069...	-0.124...	-0.095...	0.011...
TAN	-0.025...	-0.108...	-0.229...	-0.069...	1	-0.394...	-0.122...	-0.043...
LIQ	0.215...	0.057...	0.235...	-0.124...	-0.394...	1	0.506...	-0.004...
OPC	0.265...	0.035...	0.188...	-0.095...	-0.122...	0.506...	1	0.127...
FIS	0.012...	0.286...	-0.025...	0.011...	-0.043...	-0.004...	0.127...	1

Source: Author computation using E-views 12

The results in table 4 produced a correlation coefficient of R-value of 0.322 and 0.129 in ascertaining the relationship between profitability (ROA) and corporate financial distress (AZE). Thus, in applying R-decision rule, we agreed that there is a moderate positive relationship between profitability and corporate financial distress of listed manufacturing firms in Nigeria. Table further produced a correlation coefficient of R-value of -0.075 in ascertaining the relationship between financial leverage (FIL) and corporate financial distress (AZE). Thus, in applying R-decision rule, we agreed that there is a very weak negative relationship between financial leverage and corporate financial distress of listed manufacturing firms in Nigeria. The R-value of -0.025 and -0.108 in ascertaining the relationship between tangibility (TAN) and corporate financial distress (AZE) implied that there is a very weak negative relationship between tangibility and corporate financial distress of listed manufacturing firms in Nigeria. The correlation coefficient of 0.215 and 0.057 indicated that there is a moderate positive relationship between liquidity and corporate financial distress of listed manufacturing firms in Nigeria. The correlation coefficient of 0.265 and 0.035 indicated that there is a moderate positive relationship between operating capacity and corporate financial distress of listed manufacturing firms in Nigeria. Finally, the table produced a correlation coefficient of 0.012 in ascertaining the relationship between firms size (FIS) and corporate financial distress (AZE). Thus, in applying R-decision rule, we agreed that there is a moderate

positive relationship between firm size and corporate financial distress of listed manufacturing firms in Nigeri

Table 5: Results for Panel GMM

Variables	(ALZE)	
	Coefficient	t-Statistics/P-value
ALZE(-1)	-0.219	-0.974 (0.337)
ROA	5.926	4.9090 (0.000)
FIL	-0.157	-14.140 (0.000)
TAN	0.561	1.064 (0.296)
LIQ	0.184	1.151 (0.259)
OPC	0.443	1.822 (0.078)
FIS	0.072	1.631 (0.113)
Mean Dependent	0.115	4.332
S.E of Regression	1.353	19.938
Prob (J-statistic)	0.578	0.262

Source: Author computation using E-views 12

Hypotheses Testing and Discussion of Findings

H₀₁: Profitability does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between profitability on corporate financial distress indicated positive and significant impact with t-statistic of 4.909 and prob value of 0.000. This implies that 1 per cent increase in firm characteristics in term of profitability would led to increase in corporate financial distress by 4.909 on the short run. Based on the decision, the study concluded that profitability does positively and significantly affect corporate financial distress on the short run but positively and insignificant affect corporate financial distress on the long of listed manufacturing firms in Nigeria. The findings from this study reinforces the research conducted by Ikpesu (2019), Zelie (2019) that profitability positively and significantly influence financial distress of listed firms. However, the outcome of this study do not agree with the research conducted by Rafatnia et al (2020), Susilowati et al. (2020), Issak and Oluoch (2023) that profitability negatively and significantly affect financial distress of listed firms.

H₀₂: Financial Leverage does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between financial leverage on corporate financial distress indicated negative and significant impact with t-statistic of -14.140 and prob value of 0.000. This implies that 1 per cent increase in firm characteristics in term of financial leverage would led to decrease in corporate financial distress by 14.14 on the short run. Based on the decision, the study concluded that financial leverage does negatively and significantly affect corporate financial distress on the short run but negatively and insignificant affect corporate financial distress on the long of listed manufacturing firms in Nigeria. The finding from this study reinforces the research conducted by Zelig (2019) that leverage negatively and significantly affect financial distress of listed companies. Conversely, the outcome of this study do not agree with the research conducted by Rafatinia et al (2020), Susilowati et al. (2020), Issak and Oluoch (2023), Ikpesu (2019), that leverage positively impact on financial distress of listed companies.

H₀₃: Tangibility does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between tangibility on corporate financial distress indicated positive and insignificant impact with t-statistic of 1.064 and prob value of 0.296. This implies that 1 per cent increase in firm characteristics in term of tangibility would led to increase in corporate financial distress by 1.064 on the short run. Based on the decision, the study concluded that tangibility does positively and insignificantly affect corporate financial distress on the short run but negatively and insignificant affect corporate financial distress on the long of listed manufacturing firms in Nigeria. The finding from this study reinforces the research conducted by Isayas (2021) that tangibility positively impact on financial distress of companies. Conversely, the findings of this study disagree with the research Gathecha (2016) that tangibility negatively and significantly affect financial distress of listed companies.

H₀₄: Liquidity does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between liquidity on corporate financial distress indicated positive and insignificant impact with t-statistic of 1.151 and prob value of 0.259 This implies that 1 per cent increase in firm characteristics in term of liquidity would led to increase in corporate financial distress by 1.15 on the short run. Based on the decision, the study concluded that liquidity does positively and insignificantly affect corporate financial distress on the short run of listed manufacturing firms in Nigeria. The findings of this study concur with the research done by Wesa and Otinga (2019), Zelig (2019) revealed that liquidity positively affects the financial distress of listed companies. However, the study conducted by Rafatinia et al (2020), Ikpesu (2019) indicated a negatively influence financial distress of listed companies.

H₀₅: Firm size does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between firm size on corporate financial distress indicated positive and insignificant impact with t-statistic of 1.631 and prob value of 0.113 This implies that 1 per cent increase in firm characteristics in term of firm size would led to increase in corporate financial distress by 1.63 on the short run Based on the decision, the study concluded that firm size does positively and insignificantly affect corporate financial distress on the short run listed manufacturing firms in Nigeria. The findings of this study concur with the study done by Ikpesu (2019), Zelie (2019) that firm size positively influence financial distress of listed companies. Conversely, the findings of this study disagree with the study conducted by Susilowati et al (2020), Issak and Oluoch (2023), Wangsih et al (2021), Runis et al (2021) that firm size negatively impact on financial distress of listed companies.

Ho 6: Operating capacity does not positively and significantly affect Altman Z Score of listed manufacturing firms in Nigeria.

The association between operating capacity on corporate financial distress positive and insignificant impact with t-statistic of 1.822 and prob value of 0.078 This implies that 1 per cent increase in firm characteristics in term of operating capacity would led to increase in corporate financial distress by 1.822 on the short run Based on the decision, the study concluded that operating capacity does positively and insignificantly affect corporate financial distress on the short run of listed manufacturing firms in Nigeria. The result of this study reinforces the study conducted by Hadi and Andayani (2014) that operating capacity has a positive impact on financial distress of listed companies. This result from the study disagrees with the study conducted by Issak and Oluoch (2023), Susilowati et al (2020) that operating capacity impact negatively on the financial distress of listed firms.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This study investigated the effect of firm characteristics on corporate financial distress of listed manufacturing firms listed on the Nigeria Exchange Group (NGX) from 2018 to 2022. According to the empirical findings of this study, the study concludes that profitability does significantly affect corporate financial distress of listed manufacturing firms in Nigeria, financial leverage does significantly affect corporate financial distress of listed manufacturing firms in Nigeria, tangibility does not significantly affect corporate financial distress of listed manufacturing firms in Nigeria, liquidity does not significantly affect corporate financial distress of listed manufacturing firms in Nigeria, firm size does not significantly affect corporate financial distress of listed manufacturing firms in Nigeria and finally, operating capacity does not significantly affect corporate financial distress of listed manufacturing firms in Nigeria. Note, based on the individual conclusions, the study generally concluded that, firm characteristics positively and insignificantly affected corporate financial distress on the short run but it negatively and insignificantly affect corporate financial distress on the long run of listed manufacturing firms in Nigeria.

Thus, the recommended as follow;

1. Corporate managers need to determine and maintain the appropriate level of profitability to ensure smooth operation and continual survival of the organization in term of short run but should be careful in evaluating the long term profitability. This study affirmed that it has significant effect on the short term profit maximisation but has insignificant effect on the long run profit maximisation.
2. Manufacturing firms listed in the Nigeria Exchange Group should assess fiscal advantages and bankruptcy costs associated with loan funding. Levels of debt should be kept at appropriate levels because a high debt level has been shown to increase financial distress.
3. Managers should be more observant if their companies employed massive amount of short-term debt as the maturity for shortterm debt is only one year.
4. The government needs to pay special attention to the manufacturing firms by creating a conducive atmosphere and infrastructural facilities to reduce the likelihood of financial distress in the sector.
5. he Securities and Exchange Commission (SEC) should properly supervise and monitor the financial progress of listed companies and advice them appropriately on ways of minimizing financial difficulties and failures as this will help firms from going into liquidation.
6. Manufacturing firms listed in the Nigeria Exchange Group should assess fiscal advantages and bankruptcy costs associated with loan funding. Levels of debt should be kept at appropriate levels because a high debt level has been shown to increase the probability of financial distress.

Heuristic Model

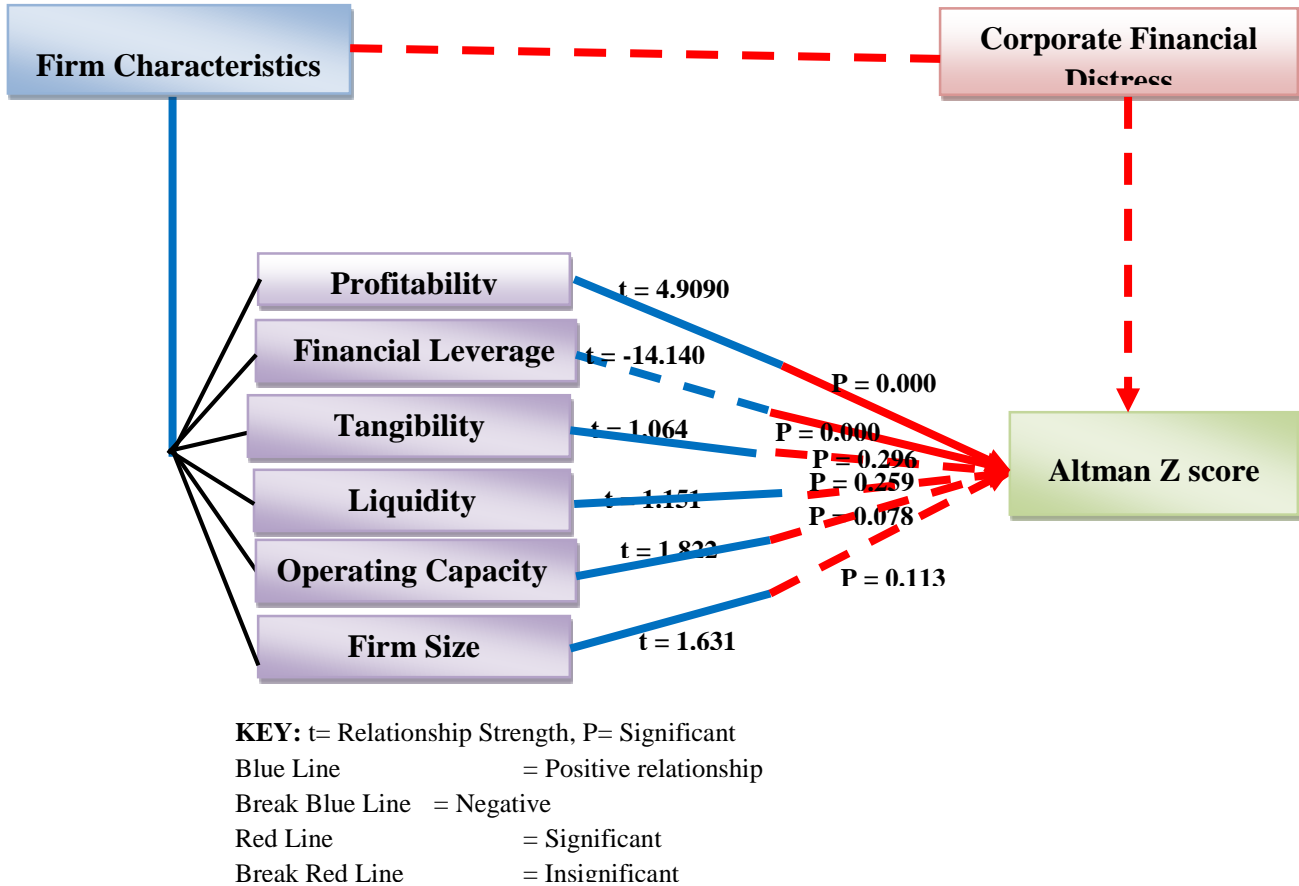


Figure 2: Heuristic Model showing the results of firm characteristics and corporate financial distress of listed manufacturing firms in Nigeria

Source: Constructed by Researcher's (2023)

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