

Full Length Research Paper

Firm specific determinants of financial distress: Empirical evidence from Nigeria

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This paper in an attempt in answering the basic research question on what actually determines financial distress of firms in the manufacturing sector in the country employed the fully modified ordinary least square (FMOLS) on annual time series data of eighteen listed manufacturing firms on the Nigeria stock exchange (NSE) which was obtained from their audited financial statement. The endogenous variable used in the study is financial distress which is measured using the Altman Z score while the exogenous variables employed in the study are firm size, liquidity, profitability, and leverage. The study also employed a list of control variables such as revenue growth and share price. Findings from the study showed that leverage, liquidity, profitability, firm size, revenue growth, and share price are the firm-specific determinant of financial distress of firms in the manufacturing sector in the country. The findings of this study pose significant policy directions. First, managers and owners of the corporate organization need to pay critical attention to these variables when making financial decisions. Second, to ensure smooth operation and continued survival of firms, corporate managers need to design policies that will determine the appropriate level of liquidity, leverage, profitability and revenue growth. Also, management needs to set up control measures that will detect early warning signal of financial distress.

Key words: Leverage, financial distress, fully modified ordinary least square, Nigeria.

INTRODUCTION

The basic research question this paper attempts to address is to investigate the firm-specific determinants of financial distress in Nigeria. Studies have shown that financial distress in recent times has become one of the topical and debated issues in the field of finance due to the collapse of some big firms in the world and its adverse effect on corporate organization. The adverse effect of financial distress in an organization threatens the continued survival of firms, hence, the renewed interest

among scholars, academicians and practitioners in investigating what determines financial distress at the firm level.

Financial distress refers to situation when firms are unable to meet their financial obligation as at when due. According to Ray (2011) a firm experience corporate financial distress where there is violation of loan contracts and when organization incur constant losses and fails to honour obligation as at when due. When firm experiences

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corporate financial distress, the operating conditions of the firm deteriorate thus leading to heavy financial burden on the firm resulting to inability of the firm in paying both secured, preferential and unsecured creditors (Garlappi and Yan, 2011; Benmelech et al., 2012).

Research findings by Chan and Chen (1991) showed that financial distress firm have leverage and cash flow problem and thus perform poorly leading to lose in their market value. Similarly, according to Kazemian et al. (2017) financial distress, firms are firms that encounter numerous financial problems and have a weak financial performance. Furthermore, Wesa and Otinga (2018) noted that financial distress firms are usually faced with two possible major problems either they are experiencing cash shortage on the asset side or overdue obligation on the liabilities sides of the statement of financial position. As documented by Ijaz et al. (2013) both circumstances showed that there are insufficient cash flows to cover current obligation.

The manufacturing sector has been one of the drivers of the Nigerian economy but in recent times, the sector has witnessed negative shock leading to some firms going into liquidation (Uchenna and Okelue, 2012a). According to Uchenna and Okelue (2012b) there has been more manufacturing firms going into distress than their counterpart in the banking sector due to unfavourable government policies, inflation, exchange rate problem, political unrest, inadequate social and infrastructural facilities among others.

In the literature, liquidity, level of profitability, leverage, and firm size have also been identified as the causes of corporate financial distress. Several empirical studies have shown that leverage is one of the major influential factors that cause financial distress of firms (Pranowo et al., 2010; Tesfamaria, 2014; Kristanti et al., 2016; Gathecha, 2016). Also, other studies have shown that revenue growth, leverage, share price, liquidity and profitability are the firm specific determinants of corporate financial distress in firms (Becchetti and Sierra, 2003; Ong et al., 2011; Zeli, 2014; Ikpesu and Eboiyehi, 2018).

The conflicting result on the determinants of financial distress as shown in the literature provides the motivation for the study. In the empirical literature, some studies found that leverage, profitability, firm size, revenue growth, share price and liquidity affect financial distress positively while others documented that the aforementioned variables negatively affect financial distress. In Nigeria, studies investigating the firm specific determinants of financial distress are sparse thus, providing another motivation of the study. Another motivation for the study is that majority of the study on financial distress conducted in the country focused on the financial sector especially the banking sector (Maryam and Adamu, 2017; Adekanmbi, 2017). This study utilized firms in the manufacturing sector that are listed in the floor of Nigerian stock exchange (NSE) in a bid to account for the firm specific factors that significantly

determines financial distress in the sector. The findings from the study will provide firms and the regulators an outlook and idea on what actually determines financial distress of manufacturing firms as this will trigger initiatives and early warning signals that could help avert the probability of corporate financial distress in the sector. According to Kazemian et al. (2017) financial distress affects an organization profitability and it operates via its cost implication such as legal cost and administrative cost which is often linked with bankruptcy cost (that is, direct financial cost) and increased cost for supplies and debt (indirect financial distress cost). The implication of these cost (direct and indirect financial distress cost) lowers the market value of firms (Rahman et al., 2016). Hence, it becomes imperative in ascertaining the firm specific factor that influences financial distress in Nigeria especially the manufacturing sector.

REVIEW OF THEORIES AND EMPIRICAL LITERATURE

Review of theories

Several theories in the literature have been used to account for what determines financial distress among firms. One of such theories is the credit risk theory which was formulated by Merton (1974). According to the theory, the inability of firm to adequately manage their credit risk exposes such firm to the likelihood of financial distress. Apart from the credit risk theory, the cash management theory states that the failure of cash management function would arise as a result of the imbalance between cash inflow and cash outflow and a consistent in such imbalance would cause financial distress in firm (Aziz and Dar, 2006).

In the literature, the trade-off theory has also been used to explain the determinants of financial distress. The trade-off theory was formulated by Modigliani and Miller (1963). According to this theory, the use of debt raises the value of the firm. However, there is a certain point at which further use of debt becomes unfavourable and continuous use of debt will increase both the agency cost and bankruptcy cost which has the implication of reducing the value of the firm leading to the likelihood of financial distress. The theory, thus argue that firm can achieve optimal capital structure through trade-off of the benefit in the use of debt against the cost of the use of debt. The Pecking order theory has also been used to explain why a firm goes into financial distress. This theory states that firm first exhaust the internal source of funds before going for the external source of funds (debt and equity) in a bid to preserve the stability and value of the firm. The implication of this theory according to Wesa and Otinga (2018) is that an increased use of external source of funds may affect the firm negatively if not judiciously utilizes and this may increase the likelihood of financial distress in firm.

Empirical evidence on the determinants of financial distress

Investigating the factors that influences financial distress in listed firms in Kenya, Wesa and Otinga (2018) employed a multiple regression and found that financial leverage, liquidity and capital structure were the key significant factor that influences corporate financial distress in firms in Kenya. In the literature, several factors have been accounted as the determinants of financial distress in firms. These factors include firm size, liquidity, leverage, profitability, revenue growth, and share price.

Firm size

In the literature, the vital role of firm size in explaining financial distress is well documented. According to Honjo (2000) small firms have the likelihood to fail than big firms because small firms have poor market experience, limited connection and limited financial resources. Studies conducted to show that firm size is one of the key determinants of corporate financial distress have however shown mixed result. Research findings by Chancharat (2008) revealed that the likelihood of financial distress is expected to increase when firm size rises. Similarly, Parker et al. (2002) and Thim et al. (2011) research findings all indicate that the link between firm size and financial distress is positive. These findings were also supported by the research work of Parker et al. (2002), Rath (2008) and Tesfamariam (2014). On the other hand, studies carried out by Le Clere (2005), Hensher et al. (2007), Slezak (2008) and Tinoco and Wilson (2013) all confirmed that firm size has an inverse link with financial distress. Study by Kristanti et al. (2016) however, indicate that firm size does not determine corporate financial distress.

Liquidity

Studies have also shown that liquidity is another determinant of corporate financial distress. Liquidity which indicates the firm ability to meet short term maturing obligation is measured by the ratio of current asset to current ratio. Research work of Elloumi and Gueyee (2001), Turetsky and McEwen (2001) and Nahar (2006) showed that increase in liquidity leads to decrease in corporate financial distress. Similarly, research work of thim et al. (2011) indicates that there is a negative link between liquidity and financial distress. However, studies conducted by Praowo et al. (2010), Tesfamariam (2014), Gathecha (2016), and Kristanti et al., (2016) indicate that liquidity has a positive link with financial distress. However, research work by Baimwera and Murinki (2014) revealed that liquidity had no significant influence on corporate financial distress.

Leverage

Andrade and Kaplan (1998) study indicates that leverage is the key factor influencing corporate financial distress. The firm leverage which gives an indication on the amount of debt used by the firm is measured as the ratio of total debt to total equity. The relationship between leverage and corporate financial distress in the literature has shown mixed findings. Studies conducted by Elloumi and Gueyee (2001) and Ahmad (2013) indicate that corporate financial distress will rise when there is an increase in firm leverage. Similarly, studies by Abdullah (2006), Chancharat (2008), and Gathecha (2016) also showed that the link between leverage and financial distress is positive. However, studies conducted by Pranowo et al. (2010) and Kristanti et al., (2016) revealed that the relationship between leverage and financial distress is negative. In the same vein, Tesfamaria (2014) indicates that leverage has a negative link with corporate financial distress. However, findings by Baimwera and Murinki (2014) revealed that leverage had no significant influence on corporate financial distress.

Profitability

Profitability which is measured by return on equity has also been seen as a factor that determines whether a firm will become financially distress. Research findings by Tesfamariam (2014) revealed that there is an existence of a positive link between profitability and financial distress. Similar finding was also found by Ikpesu and Eboiyehi (2018) while studies by Thim et al. (2011) revealed that profitability negatively affects financial distress. Research work of Baimwera and Murinki (2014) indicates that profitability negatively affects financial distress. In similar vein, Campbell et al. (2011) documented that profitability has an inverse link with financial distress.

The extant review of literature indicates the presence of gap in the literature in respect to firm specific determinants of financial distress of manufacturing firms in Nigeria. Majority of the studies on financial distress conducted in the country focused on the banking sector particularly the determinants of bank distress; hence, the motivation of the study. Furthermore, the controversial conclusion reached by both developed and developing economies necessitated the need to embark on the study.

DATA AND METHODOLOGY

Data

The study employed annual data of eighteen manufacturing firms listed in the floor of Nigeria stock exchange (NSE) spanning the period of 2010 to 2017. The data was sourced from the financial statement of the firms that has been audited. The selection of firms

and covering period was as a result of data availability. In assessing the specific firm determinants of corporate financial distress, the dependent variable employed in the study is the Altman Z score (AMZ) which is used in measuring financial distress. The Altman Z score is used in measuring a firm financial health by predicting the likelihood that a firm will become distress within a 2 year period (Cheluget, 2014; Kristanti, 2015; Kristanti et al., 2016; Eboiyehi and Ikpesu, 2017; Ikpesu and Eboiyehi, 2018). When the z score is greater than 2.9, the firm is in a safe zone, if the z score is between 1.23 and 2.9, is an indication that the firm is in a grey zone but if the z score is below 1.23, the firm is regarded to be in a distress zone. The independent variables used in the study include liquidity (LIQ), profitability (ROE), leverage (LE), and firm size (FZ)

$$AMZ = \beta_0 + \beta_1 LIQ_{it} + \beta_2 PROF_{it} + \beta_3 LEV_{it} + \beta_4 LEV_{it} + \beta_5 FZ_{it} + \theta_i X_{it} \varepsilon_{it} \quad (1)$$

where AMZ is Altman Z score which is used in measuring corporate financial distress. LIQ is liquidity, Prof is profitability, LEV is leverage, FZ is firm size, and X is a list of control variables such as revenue growth (REVGR) and share price (SP). β_0 is constant, β_1 to β_6 and θ are the estimated parameter coefficients. The ε is the error term. The model was estimated using fully modified ordinary least square (FMOLS). The FMOLS provide a reliable and accurate estimate for a small sample size. The usefulness of the technique lies in its ability in providing a check for robustness of the result (Bashier and Siam, 2014). According to Kalim and Shahbaz (2008), FMOLS helps to achieve the asymptotic efficiency because the FMOLS modified the least square so as to account for serial correlation and the existence of endogeneity in the regressor. The technique also ensures consistent and efficient estimation and handles the problem of non-stationary regression (Babatunde, 2017).

RESULTS AND DISCUSSION

Table 2 shows the outcome of the panel stationarity test. The result indicates that at first difference, the variables became stationary. Thus, the study rejects the null hypothesis (presence of unit root) and concludes that the variables does not have unit root.

The outcome of the descriptive statistics is shown in Table 3. On the average, the financial distress is 3.2 years. This implies that the listed firms used in the study are within the safe zone. On the average, the firm liquidity is 1.12 while the maximum is 3.23. The result also showed that the average probability of the firm is 17.12% while on the average, leverage of the firm is 90% which shows a high gearing ratio an indication that the sector relied on debt financing in carrying out their operation. A high gearing ratio is an indication that the firms utilize more of debt financing than equity financing. The result also revealed that the average share price is ₦96.52 while the maximum is ₦1, 555.99. On the average, the descriptive statistic result revealed that the firm revenue grow at 13.84%.

The outcome of the correlation between the variables is shown in Table 4. The result indicates that the correlation between the variables is below 0.8 which is an indication that the variables do not possess multicollinearity problem. Hence, the study concludes that there is a non-

The study also used a list of control variables such as revenue growth (REVGR), and share price (SP). The variables, notation, measurement and justification of the variables are shown in Table 1.

Econometric issues and model

The empirical model for the study based on the objectives of the study, theories, empirical literature and taking into consideration the heterogeneity of the coefficient is stated as:

existence of multicollinearity among the explanatory variables. Multicollinearity occurs when the explanatory variables in a regression model are correlated. The existence of multicollinearity among the explanatory jeopardizes the regression outcome because it reduces the precision of the estimates of the coefficient.

Table 5 shows the fully modified ordinary least square estimates. The outcome of the FMOLS indicates that leverage has a positive relationship with financial distress. This suggests that a rise in the firm leverage will result to a rise in the likelihood of financial distress which is consistent with previous findings (Eloumi and Gueyee, 2001; Abdullah, 2006; Chancharat, 2008; Ahmad, 2013; Gathecha, 2016). The more a firm uses more of debt to finance its operation the more the firm is exposed to financial distress. The outcome of the FMOLS also revealed that liquidity has an inverse relationship financial distress. This suggest that a fall in the liquidity position of the firm will increase the probability of such firm going into financial distress since the firm will be unable to meet and honour their obligation as at when due. Firms with low liquidity have insufficient fund to meet both short-term, medium-term and long-term obligation. The failure of firm in meeting their obligation as at when due usually result in such firm becoming financial distressed. The result is in support with the research findings of Eloumi and Gueyee (2001), McEwen (2001), Abdulla (2006), and Thim et al. (2011) who found that liquidity has a negative link with financial distress.

In addition, the result of the FMOLS indicates that revenue growth has an inverse relationship with corporate financial distress. This implies that a fall in the revenue growth will lead to the likelihood of the firm going into financial distress. Firms with low revenue growth indicates that such firms are exposed to financial distress as such firms may find it difficult to embark on other profitable investment opportunities, meet creditors repayment and service loan repayment as at when due.

Furthermore, the outcome of the FMOLS also showed that share price has an inverse link with corporate financial distress. This implies that a fall in the share price of a firm might increase the likelihood of the firm

Table 1. Variable, definition and source.

Variable	Notation	Measurement	Justification
Endogenous variable			
Financial distress	AMZ	Altman Z score	Ray (2011), Cheluget (2014), Kristanti (2016), Kazemian et al. (2017), Ikpesu and Eboiyehi (2018)
Exogenous variable			
Liquidity	LIQ	Ratio of current asset to current liability	Eloumi and Gueyee (2001), McEwen (2001), Abdulla (2006), Tesfamaria (2014), Gathecha (2016), Kristanti et al. (2016)
Profitability	PROF	Return on equity	Thim et al. (2011), Baimwera and Murinki (2014), Campbell et al. (2015), Ikpesu and Eboiyehi (2018)
Leverage	LEV	Ratio of total debt to total equity	Pranowo et al. (2010), Tesfamaria (2014), Kristarti (2015), kristanti et al. (2016)
Firm Size	FZ	Total asset	Chancharat (2008), Parker et al. (2002), Thim et al. (2011), Tinoco and Wilson (2013), kristanti et al. (2016)
Control variable			
Revenue growth	REVGR	Growth in revenue	Thim et al. (2011), Ikpesu and Eboiyehi (2018)
Share price	Market price of share	Market price of share	Devji and Suprabha (2016), Idrees and Qayyum (2018)

Table 2. Panel stationarity test.

Variable	First Difference			
	LLC	IPS	ADF	PP
AMZ	-16.0532*** (0.0000)	-4.65229*** (0.0000)	88.7367*** (0.0000)	107.500*** (0.0000)
LIQ	-15.0610*** (0.0000)	-5.28129*** (0.0000)	100.049*** (0.0000)	130.601*** (0.0000)
PROF	-11.3350*** (0.0000)	-4.28801*** (0.0000)	91.3485*** (0.0000)	108.295*** (0.0000)
LEV	-15.1680*** (0.0000)	-5.36347*** (0.0000)	98.6923*** (0.0000)	129.547*** (0.0000)
SP	-48.9674*** (0.0000)	-7.0995*** (0.0000)	83.0589*** (0.0000)	129.547*** (0.0000)
FZ	-9.74550*** (0.0000)	-3.51093*** (0.0002)	79.0680*** (0.0000)	107.050*** (0.0000)
REVGR	-11.1428*** (0.0000)	-3.89312*** (0.0000)	85.8150** (0.0000)	104.242 (0.0000)

*, **, and *** indicate the level of significance at 10, 5 and 1%. The figure in parentheses shows the associated probabilities.

becoming financially distress. A continuous fall in the share price of a firm might discourage the prospective investors for investing in such firm. Also, existing shareholders due to the continuous fall in the share price of the firm might decide to pull out their investment from such firm. This, in turn, might affect the operation and stability of

such firm thus increasing the probability of such firm going into distress. In addition, the outcome of the FMOLS showed that profitability affects financial distress and this is consistent with previous research work of Tesfamariam (2014) and Ikpesu and Eboiyehi (2018). This implies that the more unprofitable a firm becomes the more

the likelihood of such firm going into distress. Finally, the FMOLS outcome showed that firm size positively affects financial distress which also supports the research findings of Parker et al. (2002), Rath (2008), Chancharat (2008), Parker et al. (2002), Thim et al. (2011), and Tesfamariam (2014). Large firm has the propensity of raising

Table 3. Descriptive statistic result.

Parameter	AMZ	LIQ	PROF	LEV	SP	FZ	REVGR
Mean	3.2679	1.1261	17.1687	90.6306	96.5206	11.8948	13.8393
Median	2.8	1.07	16.49	50.25	17.15	42.5129	10.34
Maximum	11.13	3.23	99.19	1141.59	1555.99	104.0176	128.67
Minimum	-0.56	0.27	-188.03	0	0.62	10.767	-38.27
Std. Dev.	2.1629	0.4621	35.0768	154.9735	223.2709	187.8899	25.5749

Table 4. Correlation result.

Correlation	AMZ	LIQ	PROF	LEV	SP	FZ	REVGR
AMZ	1						
LIQ	0.1329	1					
ROE	0.6039	0.256	1				
LEV	-0.3031	-0.2877	-0.6006	1			
SP	0.6787	-0.1472	0.3979	-0.0508	1		
FZ	-0.1896	-0.4733	-0.3369	0.3335	0.0304	1	
REVGR	0.0744	0.1669	0.1459	-0.0797	0.0093	0.1925	1

Table 5. Regression output of FMOLS.

Dependent variable	AMZ
LIQ	-551.1750* (56.5174)
PROF	26.5740* (2.8892)
LEV	9.7616* (0.9619)
FZ	0.0256** (0.0023)
REVGR	-15.1785* (1.4959)
SP	-32.0141** (2.8295)
Listed manufacturing firm number	18
Number of observation	135

*, **, and *** indicates the level of significance at 10, 5 and 1%. The value in bracket shows standard errors.

more debt finance and this can expose the firm to financial distress if the debt finance raised was not judiciously utilised. In summary, the outcome of FMOLS revealed that firm size, liquidity, profitability, leverage, share price, and revenue growth are the firm specific determinants as well as the drivers of financial distress in the manufacturing sector of Nigeria. Hence, managers and owners of corporate organisation need to pay crucial attention to these variables when taking financial decision.

Conclusion

The basic research question this paper attempts to

address is to investigate the firm specific determinants of firms in the manufacturing sector in Nigeria. In answering the research question, this paper employed a fully modified least square (FMOLS) on annual time series data obtained from audited financial statement of eighteen firm in the manufacturing sector that are listed in the floor of Nigeria Stock Exchange (NSE) between the periods 2010 and 2017. The dependent variable used in the study is financial distress which is measured as the Altman Z score while the independent variables are liquidity, leverage, firm size and profitability. The study also employed control variables such as revenue growth and share price. The outcome of the study revealed that firm size, leverage, liquidity, profitability, revenue growth and share price are the major firm specific determinants

of financial distress in the manufacturing firm in Nigeria.

The findings of this study pose significant policy directions. Firstly, the board of directors in making financial decision needs to take into cognisance note on the implication of their financial policy on the aforementioned determinants of financial distress. Secondly, the outcome of the study should serve as a signal for corporate managers in monitoring their firm financial position as this might provide an early warning signal for corporate financial distress. Thirdly, corporate managers need to also design policies so as to determine the appropriate level of liquidity, leverage, profitability and revenue growth to be maintained by the firm so as to ensure smooth operation and continual survival of the organisation. Fourthly, government needs to pay special attention to the manufacturing industry by providing them tax incentives, conducive atmosphere and infrastructural facilities so as to reduce the likelihood of financial distress in the sector.

Future studies may investigate the firm specific determinants of financial distress by comparing non-financial firms and financial firms to see if the same variables determine financial distress. Also, future studies can employ a mix of macroeconomic variable, financial variables and non-financial variables in investigating the determinants of financial distress.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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