

The Determinants of Survival of Listed Deposit Money Banks (DMBs) in Nigeria

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1.0 INTRODUCTION

DMBs in Nigeria operate in a highly regulated sector of the Nigerian economy because of their cardinal function of mobilizing funds from surplus units to deficit units of the economy. As a result of the massive profitability potentials of the sector, huge investments are made in the industry, which call for a constant examination of their activities by investors to facilitate informed judgements. Over the years, DMBs had been facing issues of incessant non-performing loans, inability to meet customers' withdrawals when demanded and unstable market share price among others (Soludo, 2007). These unhealthy signs pose a risk of loss of investment to investors. This clearly points to the pivotal nature of investment decisions to business success; hence investors employ different techniques for portfolio analysis and decision-making. The Altman Emerging Market score (EM score) is a model widely used by investors to predict probability of business survival. Consequently, the examination of a firms' going concern status and its determinants is necessary because the collapse of a company would not only affect the shareholders but all its stakeholders as well as the economy in which the company operates.

The term 'going concern' simply implies the basic declaration of business intention to keep running its activities without the threat of liquidation or bankruptcy for the foreseeable future at least for one year. This is a basic assumption to preparing financial statements considering the conceptual framework of the International Financial Reporting Standards (IFRS). This study was anchored on the fact that Profitability, Solvency, Liquidity, Leverage and Assets Management would influence going concern of listed firms in Nigeria. This is because a firm survives when it makes a stable profit, meets up with obligations as at when due, is effective in debt, equity and dividends decisions and possesses the ability to utilise its assets efficiently with the vision of growing the market value of its shares as well as meeting other stakeholders' interest.

The study on DMBs was motivated by series of banking reforms in Nigeria. The reforms are an integral part of the country-wide reform programs undertaken to reposition the Nigerian Economy to achieve the objective of macroeconomic goals of price stability, full employment, high economic growth and internal and external balances. As part of the vision, the banking sector is expected to effectively play its actual role in intermediation and for the banks to be among global players in the international financial markets. These reforms include the 2004 reform on consolidation programme, which was majorly done through mergers and acquisitions. In this programme, banks were compelled to raise the capital base from N2 billion to a

minimum of N25 billion. This led to the reduction of banks from 89 to 25 in 2005, later to 24 in 2007 and to 16 in 2017 listed on the floor of Nigerian stock exchange. Similarly, other regulatory reforms include: zero tolerance in regulatory framework for data/information reporting and infringements and strict compliance with corporate governance codes in banking. Others include speedy process for delivery of returns by banks through e-FASS; review and acquainting of relevant laws for effective corporate governance and safeguarding greater transparency and accountability in the execution of banking regulations among others.

The establishment of Asset Management Corporation of Nigeria (AMCON) in 2010 was intended at addressing the issues of non-performing loans in the Nigerian banking industry, among others. In consonance with its mandate, AMCON had acquired the non-performing risk assets of some banks worth over N1.7 trillion. That was expected to boost the bank's liquidity hence, enhance their safety and soundness. With AMCON involvement, the banking industry ratio of non-performing loans to total credit had significantly reduced from 34.4 per cent in November 2010 to 4.95 per cent in 2011.

To further stimulate public confidence and customer protection in the banking system, the CBN created the Consumer and Financial Protection Division to provide an avenue through which consumers can seek redress. In the first three months of its operation, the Division received over 600 consumer complaints, which was a display of non-effective consumer complaints resolution mechanism in the banks. The CBN had directed banks to establish Customer Help Desks in all their branches and head offices.

In addition, the CBN has begun an all-inclusive review of the Guide to Bank Charges with a view to making the charges consumer friendly. Also, CBN integrated the banking system into global best practice in financial reporting and disclosure through the adoption of the International Financial Reporting Standards (IFRS) in the Nigerian banking sector effective 2012. This had helped to enhance market discipline, and reduce reservations, which limit the risk of unjustified contagion

The Bank recently introduced 'Cashless Policy' as part of ongoing reforms to address currency management challenges in Nigeria, as well as enhance the national payments system. It is obvious that the Nigerian economy is severely cash-oriented in business transactions. This huge cash transaction increases the operational costs, which is then passed on to the customers in the form of higher lending rates or service charges. These operational costs are significant due to the high cost incurred in cash management, currency sorting, cash movements and frequent printing of currency notes among others (Sanusi, 2012). All these reforms are tailored toward achieving and maintaining stakeholders' interest, hence cushion survival of deposit money banks in Nigeria.

The importance of Z-score has been underscored by a number of studies in different sectors and countries such as telecommunications (Permatasari, 2006), wood industry (Muhammad, 2008), industrial Firms in Jordan (Al- Rawi, Kiani, & Rishma, 2008), automobile industry in India (Ray, 2011), banking sector in India (Pradhan, 2014), private company in the UK (Abdulkareem, 2015), trading sector in Sri Lanka (Nireesh, & Pratheepan 2015), general partnership, limited partnership, private limited

company, a joint-stock company in Slovakia (Boda and Uradniecek, 2016), manufacturing company in Indonesia (Kurniawati, 2017) among others. In all these locations, it was found that the respective industries had different survival status. The studies attested that Altman model of EM score provides the basis for predicting financial distress or otherwise of an entity.

From the relevant literature reviewed, it is deduced that there is a paucity of studies in Nigeria that focused specifically on DMBs, the scope of existing studies is less than ten years, commonly used method is ratio analysis with Microsoft Excel to compute the EMscore, while interpretations are made and conclusions drawn in line with the coefficient zones of discrimination of Altman Z-score without any tests for validity and reliability. This makes the findings from the studies to be unreliable and difficult to generalize.

This study harmonizes and contributes to the literature by studying the entire listed DMBs for a period of eleven years, using a multiple regression model to include three moderating variables. It employed descriptive, correlation and regression statistical tools of analysis and carried out the diagnostic test for data normality with the aid of STATA package to enhance validity and reliability of results that would aid generalization in the industry of study.

The objective of this study is to examine the determinants of survival of listed DMBs in Nigeria using the Altman Emerging Market score (EM score) model as a measure of survival of listed DMBs in Nigeria. To achieve the stated objectives, the study formulates hypotheses in a null form that Liquidity, Profitability, Leverage, Solvency and Asset management have no significant influence on the survival of listed DMBs in Nigeria. The paper is divided into five sections. Section one deals with introduction, section two dwells on literature review, section three presents methodology, section four deals with results and discussion and section five gives conclusion & recommendation.

2.0 Literature Review

2.1 Conceptual Review

Cefis and Marsili (2012) consider survival as the ability of firms not to close their operations temporarily or permanently. A firm survives as long as it acquires inputs from suppliers, processes them and provides outputs to stakeholders. A firm fails when resource providers cannot be persuaded to supply resources and the firm cannot meet both short-term and long-term obligations to its stakeholders. Firm survival depends on numerous factors, both external and internal. In the same vein, Timothy (1991), as cited in Odibi, Basit, and Hassan (2015), posits that bankruptcy is a legal proceeding in which an individual is unable to pay their bills petition. It is a lawful process whereby an illiquid corporation or individual is dismissed of total liabilities for its obligations by making a court permit arrangement for their partial settlement.

2.1.1 Determinants of Firm's Survival

Babajide, Olokoyo & Adegboye (2012) tried to predict bank failure in Nigeria using survival analysis approach. The study used Hazard ratios estimated from Cox regression, the result showed that the survival of banks in Nigeria was most strongly

influenced by 10 predictor variables (one reform level, which is used as treatment for the survival of banks in the equation and nine financial ratios) used for the survival analysis. The reform variable is categorized into three periods, the period before the 2004 reform, the 2004 bank consolidation reform and the 2009 financial reform respectively. The Nine (9) influential financial ratio variables are total loan to total asset of the banks (TLTA), long term liability to total bank asset (LTLTA), total bank deposit to total asset (TBDTA), net income to average total asset (ROA), operating expenses to average total asset (OEATA), shareholders' funds to average total asset (SFATA), non-performing loan to average total asset (NPLATA), non-performing loan to total loan and advance plus lease (NPLATLL), total loan and advance to total deposit (TLATD).

Several empirical studies such as Helmers and Rogers (2010) evaluated the factors that influence the likelihood of firm survival. These factors include firm level, location level, environmental level, market level, innovation, diversification, firm size, research and development activities, human capital and productivity. On the other hand, Biswas (2014) and Rahman and Islam (2018) employed CAMEL (Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality and Liquidity Management) for evaluating and predicting banks' survival.

Similarly, Agosto & Co. (1995) bank rating is a current (short term) assessment of the financial condition of banks and the ability to meet its obligations to depositors as at when due. The company made use of Key indicators of financial condition such as profitability, quality of earnings, liquidity, asset quality, capital adequacy and market position over the latest five years and formulated a model incorporating them.

There are two commonly used models for assessing the distress of industrial corporations according to Altman (2000). These are the so-called Z-score model (1968) and Emerging Market Score (2005) model. The Z-score is usable in the manufacturing sector while the emerging market score applies to non-manufacturing firms. The EM score encompasses Profitability, Solvency, Liquidity, Operating Efficiency and Assets Management as discriminate factors between failed and successful Banks. From the above, this study focused on Profitability, Solvency, Liquidity, Leverage and Asset Management as factors that influence going concern of listed DMBs in Nigeria as used by Sanja, Mirela & Stevan (2014) and Meeampol, Lerskullawat, Wongsorntham Srinammuang, Rodpetch & Noonoi (2014).

From these determinants, the liquidity ratio states a company's capacity to repay short-term creditors out of its total cash. The higher the current ratio, the more capable a firm is by settling its obligations. The retained earnings of a company are the percentage of net earnings not paid out as dividends; but to be reinvested in the firm or pay outstanding debts. The ratio of retained earnings to total assets supports a measure to the extent to which a company relies on debt or leverage. The lower the ratio, the more a company is funding its assets by borrowing instead of through retained earnings, which, again, increases the risk of bankruptcy if the firm cannot meet its debt obligations. The ratio of total liability and value equity includes both common stock and preferred stock. The higher the ratio, the better the financial management. Assets efficiency means how a firm manages its assets. The higher ratio

indicates that manager manages the assets efficiently. Therefore, DMBs are to keep all variables high in the ratio in order to prevent bankruptcy. Finally, it can be argued that the model offers insight into measuring the combined financial situation of a firm, a device for stakeholders that could be used to monitor the security of their investments.

2.2 Empirical Literature

Several studies such as Meeampol et al. (2014), Sajjan (2016), Salim and Sudiono (2017), Suci (2017), Hariyani and Sujianto (2017) investigated factors that determine bankruptcy and survival of firms across the globe. These studies adopted different models in predicting the financial health of an entity and came up with different findings from different sectors and countries.

Syamni, Majid and Siregar (2018) explored the usefulness of the Springate (1978), Ohlson (1980), Zmijewski (1983) Altman Modification (2000) and Grover (2001) models for predicting bankruptcy of 19 coal mining companies. It also attempted to measure the effects of the scores of these bankruptcy prediction models on the stock prices of the coal mining companies in Indonesia. The technique of analysis employed in the study was OLS panel regression. The results of the study showed that the bankruptcy prediction scores of the Ohlson (1980) and Altman Modification (2000) were found to be the dominant prediction models that affected the stock prices of the coal companies in Indonesia. That indicated that the bankruptcy prediction model could be used as one of the approaches to measure the movement of stock prices and performance of the coal mining companies in Indonesia.

Pakdaman (2018) investigated the significance of Altman (2000), Springate (1978), Zmijewski (1983) and Grover (2001) bankruptcy models in predicting survival of firms on the Tehran Stock Exchange; they compared the results of the models and concluded that, the models had a better ability to predict corporate financial crises. The statistical population of the study was 35 companies from textile and ceramic tile companies listed on the Tehran Stock Exchange between 2011 and 2016. The study found that among the high bankruptcy models using Model Determination Coefficient R^2 , Grover (2001) was ranked first with 0.98 R^2 , Altman second with 0.92 R^2 , Springate (1978) third with 0.84 R^2 and Zmijewski (1983) fourth with 0.09 R^2 . The study concluded that Altman (2000), Springate (1978), Zmijewski (1983) and Grover (2001) bankruptcy models are able to predict financial crises.

Rahman and Islam (2018) evaluated and compared the performance of firms in the banking sector in Bangladesh. One of the most effective supervisory techniques, CAMELS rating system was used to rank the banks based on their performances. In the study, seventeen conventional private commercial banks were chosen as samples to meet the purpose of the study. Data for analysis was collected from the banks' annual reports for the period (2010-2016). The result from this comparative analysis showed that Eastern Bank stood at the top position among all the selected banks based on CAMEL rating system.

Ganga and Christian (2017) compared two forensic accounting tools the Beneish M-score and the Altman Z-score models, for the effective detection of fraud in corporate bodies in Japan. Using a data set from Toshiba's published corporate financial statements from 2008 to 2014, analyses were made with the primary intent of detecting malfeasance using the two models. The study opined that frauds usually led to bankruptcy of firms. The results of the study do not indicate Beneish model efficacy in spite of its popularity in predicting fraudulent financial statements. Whereas, the Altman Z-score provided some indication that the company's financial statements were flawed. The study concluded that selecting the right forensic tool can influence the outcome of fraud detection, hence, bankruptcy status of an entity. The outcome of the study provides useful direction to investors, financial auditors, and forensic auditors when making policy decisions. Maija (2017) evaluated the best method to predict possible future financial distress between multivariate EMscore and logistic regression for Finnish companies, post-financial crises. The study data for 2011-2015 was collected randomly on 10 bankrupt companies, ranging from manufacturing, travel and advertising industries and were analysed and tested using SPSS. The study found that the models gave very similar results, with both of them having the percentage of correct predictions around 50-60%, with the exception of the training sample of the logistic model, which gives the prediction rate of 72%.

Salim and Sudiono (2017) determined the bankruptcy possibility of Coal Mining Companies listed in Indonesia Stock Exchange. The study employed Altman Model (Z-score), Springate Model (S-Score) and Zmijewski Model (X-Score) approaches. The study used purposive sampling technique to select 19 firms out of 22 companies as population of the study. The study was a desk research for a period from 2011 – 2014. The result of the study showed that Zmijewski Model is the most accurate predictive model that can be applied to coal mining companies listed on the Indonesia Stock Exchange because the model provides the highest level of accuracy as compared to other predictive models that are equal to 78.95%, followed by Springate Model with an accuracy rate of 47.37%, with the least being Altman Model with 5.26%.

Suci (2017) analysed the financial distress of 125 manufacturing companies in Indonesia using Altman Z-Score model in 2013 and 2014. The study employed historical research design. The findings of the study are not consistent with the reality indicating that the Altman method cannot be used as a tool to indicate a tendency towards company's financial distress. Whereas, Sajjan (2016) investigates the applicability of the Altman's bankruptcy model to examine the financial soundness of manufacturing & non-manufacturing firms in India. The study covers six listed companies in BSE & NSE for a period from 2011 to 2015. The study reveals that many of the companies completely belong to the Safe Zone except for a few years. Most of the firms are in Distress Zone which clearly indicates that these firms may go bankrupt in the near future. The study recommended top level management to design effective strategies for better control and management of resources. This may result in a win-win situation for both management and investors.

Hariyani and Sujianto (2017) examined empirical evidence that the Altman, Springate and Zmijewski model is the most appropriate model for predicting bankruptcy of Islamic Banks listed on the Indonesia Stock Exchange. This study used secondary data

from the financial statements of Islamic banks in 2010-2014. The study tested the hypotheses by using normality test, homogeneity test, and one-way ANOVA test. The results showed that Springate model is the most appropriate model in predicting the survival of Islamic banks in Indonesia with an accuracy of 38, Model Zmijewski with 28.00 % accuracy rate and Model Altman with an accuracy of 0.00.

Martin and Vladimir (2016) challenged the widespread use of Altman's bankruptcy Z-score model by investigating its usability in the Slovak economic environment. The verification juxtaposes three variants of the Z-score model and assesses their prediction ability using a data set of Slovak enterprises for the period from 2009 to 2013. Both the original 1968 Z-score model and the revised 1983 Z-score devised for the US economic environment are compared with the Z-score model re-estimated to the Slovak data adopting the methodological procedure of Altman. The results indicated that Altman's bankruptcy formula is applicable to the Slovak economic conditions and useful for predicting financial difficulties. Altman's original and revised formulation of the model are preferable if overall classification accuracy is the main interest. The study recommends re-estimation of the coefficients of the model if financially distressed enterprises are the focus and the goal is to classify distressed enterprises as best as possible.

Mohammed (2016) assessed the financial health of firms in Oman. The study sampled Rysut Cement Company and its four subsidiaries for the period from 2007 to 2014. The study applied descriptive research design and obtained secondary data from the published annual reports. The study revealed that Rysut Cement Company and its subsidiaries were financially sound as they had higher Z score than the benchmark (2.99) for five years and faced challenges of distress for three years. The distress period was corrected by debt restructuring and assets and liquidity management. The study concluded that the findings of the study could be useful for the managers to take a financial decision, the stockholders to choose investment options and others to look after their interest in the concerned cement manufacturers of the country. It recommended that Altman Z score model is adopted as an appropriate model in assessing the going concern of firms.

Odibi, Basit, and Hassan (2015) examined the reliability and relationship of Altman' Z-score model to corporate survival. A sample of 34 public listed manufacturing companies in the Kuala Lumpur Stock Exchange (KLSE) known as Bursa Malaysia were used from 2010-2014. The Study found that four out of five financial ratios were significantly related to the prediction of corporate failure using the Z-score model. The study opined that multiple discriminant analysis seems to be the best model that achieves a very high result of accuracy levels. Also, the regression analysis showed that the model is a great fit with the significance of 0.000 and accuracy levels of 86% and 99.6%. Ilahi, Jamil, Kazmi, Ilahi, and Lodhi (2015) explored commercial banks' financial difficulties. The study data was collected from commercial banks listed on Karachi Stock Exchange for the period 2009 to 2013. The study found that all commercial banks in this model were in monetary trouble but in fact, they were operating successfully. The study concluded the Z score model is unable to predict bankruptcy of Commercial Banks.

Meeampol et al. (2014) analysed prediction of business bankruptcy by applying the Z-score model and EM score model on companies listed in the Stock Exchange of Thailand. The study found out that both models can predict possible bankruptcy and were more effective when two years of information were used compared to one year. The EMscore model achieved 89.66% (2010) and 80.77% (2011), while the Z-Score model achieved 75.86% (2010) and 46.15% (2011) prediction accuracy when it is applied to forecast bankruptcies on the sample used. The study opined that liquidity ratio, retained earnings, capital efficiency and operating efficiency are most significant in bankruptcy prediction for the Stock Exchange of Thailand. Vikas (2014) investigated the financial health of logistics industry in India based on Z score analysis for the period from 2005 to 2010. The study employed ex-post facto research design for a population of 35 firms out of which 20 firms were sampled randomly. The study revealed that Indian logistic industry was a healthy industry. The average Z score value increased from 2006 to 2010 (2.54 to 3.01) when the Indian economy was hit by global recession. This indicated healthy performance of the Indian logistics industry. The study concluded that the overall performance of Indian logistics industry was good and recommended that Indian logistics industry was a good industry for potential investors to invest in.

Biswas (2014) evaluated the performance of two public sector banks viz., Andhra Bank and Bank of Maharashtra in India using CAMEL model. The study adopted an analytical and descriptive research design on sampled banks for a period of 2011-2013 which were collected from the annual reports of the banks. The study found that Andhra Bank dominated in Management Efficiency and Earning Quality. However in the area of Assets Quality & Liquidity, Bank of Maharashtra dominated over Andhra Bank. Both banks were on par with respect to the Cash Adequacy Ratio. Ray (2011) investigated the financial health and tested whether Altman's Z score model can correctly foresee the corporate financial distress of 62 sampled Automobile companies listed on the Bombay Stock Exchange in India. Secondary data used covered a period of 2004 to 2010. The study found that the Z values for all the seven years were more than 1.81 and observed gradual decline from 2007-08 after the global recession hit the Indian economy in general and automobile industry in particular. Similarly, it was found that the overall financial performance of the sampled industry was at grey level and opined that the position may lead to corporate bankruptcy in the near future except effective measures were put in place.

Fadare (2011) studied the determinants of Banking Sector liquidity and Financial Crisis in Nigeria from 1980 to 2009. The study employed a linear least square model and time series data on sampled DMBs. The study found that liquidity ratio is significant for predicting financial crisis in Banking Sector. The result suggests that during periods of financial crises, DMBs are significantly illiquid as compared to standards, and opined that getting liquidity policies correct during crisis is crucial in ensuring the survival of the DMBs.

Mwendamo (2010) ascertained whether Altman's Z-score (2000) can assist South African auditors to more accurately assess the appropriateness of management's use of the going concern assumption in the preparation of financial statements. This was

done by applying two corporate failure prediction models developed by Altman (200) to South African listed companies. The study compared the predictive accuracy of the two models against each other and against auditors' actual going concern decisions. The study found that the EM score was quite accurate in predicting failure for companies that eventually fail (delisted and liquidated or in the process of being liquidated) and opined that the auditor could have made more accurate going concern judgment decisions.

2.3 Theoretical Framework

The theoretical framework upon which this study is anchored is the Bankruptcy and Stakeholder theories. The theories are a subset of positive accounting theory that deals with why and what is happening in the field of accounting. These are adopted to ascertain the determinants of going concern and predicting the financial health of DMBS. Bankruptcy predictions were based on accounting ratios of Profitability, Solvency, Liquidity, Assets Management and other financial variables. Linear discriminate analysis (LDA) was the first statistical method applied to systematically explain which firms were bankrupt or survived. One of the classic works in the area of ratio analysis and bankruptcy classification was performed by Beaver (1967). The study found that a number of indicators such as Profitability, Solvency, Liquidity, Operating Efficiency and Assets Management could discriminate between matched samples of failed and non-failed firms. The results were used to explain empirical observations of Beaver on the power of various financial ratios to predict the failure of firms.

The emerging market score model portrays interest of stakeholders such as creditors, management, investors, shareholders, and analyst. This is because their interests are internalised in Profitability, Solvency, Liquidity, leverage and Assets Management. Hence, this study introduces control variables such as firms' share value, age, and size as factors capable of defining firms' survival or bankruptcy potentials.

3.0 Methodology

This paper adopted descriptive and ex-post facto research designs. The population of this study are made up of the sixteen listed DMBS in Nigeria as at December 2017 (see appendix A). Jaiz Bank Plc was not included due to data paucity.

3.1 Sources of Data and Sample Size

Fifteen DMBS constituted the sample size for the study. The data of the selected DMBS for the years used in this study (2007-2017) were sourced from the published annual reports of the DMBS. Robust Generalised Least Squares (GLS) Regression analysis were employed for a balanced panel data for the study. This is because it eases diagnostic test to be conducted and any anomaly would be corrected scientifically to enhance reliability of outcome. The balanced panel data analysis would make an adequate basis for generalization and conclusion of findings in the area of study.

3.2 Measurement of Variables

Table I Variable Definition and Measurement

Conceptual Description	Functioning Definition	<i>A priori</i> Expectation
GC=EM Score Model (Dependent Variable)	$EM = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 + 3.25$ Survival status of firms. As used by Sanja, Mirela & Stevan (2014). A score value of below 1.1 indicates weak performance/distress zone; 1.1-2.6 indicates grey zone and above 2.6 indicates safe zone/sound performance	Healthy and sound performance
Independent Variables		
Working Capital/Total Assets	Liquidity proxy as used by Meeampol et al., (2014). The lower the value the higher the chance of bankruptcy; that is, the higher the threat to going concern.	Significant positive impact on going concern
Retained Earnings/Total Equity	Leverage proxy as used by Sanja, Mirela, and Stevan (2014). A high ratio indicates that growth may be sustainable as it is not fully financed by debt.	Significant positive impact on going concern
EBIT/Total Assets	Profitability proxy as used by Sanja, Mirela, and Stevan (2014) and Meeampol et al., (2014). An increasing ratio indicates the company is able to utilize its assets for earnings and increasing return on assets investment.	Significant positive impact on going concern
Value of Equity/Total Liabilities	Solvency proxy Sanja, Mirela, and Stevan (2014) and Meeampol et al., (2014). The higher the ratio, the higher the risk of surviving, the closer to bankruptcy.	Significant positive impact on going concern
Turnover/Net Assets	Asset Management proxy Sanja, Mirela, and Stevan (2014) and Meeampol et al., (2014). The higher the ratio, the better the chances of surviving.	Significant positive impact on going concern
Moderating Variables		

The Market Value of Shares	Operating Efficiency proxy Meeampol et al., (2014). High value implies growth in market shares.	Significant positive impact on going concern
Age	Maturity proxy. The older a firm, the better the competence and experience of the firm. This would add value in decision-making over time. Age of a firm is measured as logarithm of age from date of listing.	Significant positive impact on going concern
Size	Customer loyalty proxy. The greater the size, the higher the extent to which customers and other stakeholders needs are attained. Measured as logarithm of total assets.	Significant positive impact on going concern

Source: Authors' compilation

3.3 Model Specification

Emerging Market Score Model for non-manufacturing firms (EM Score Model) is adopted to measure the survival (going concern) of listed DMBs in Nigeria as used by Sanja, Mirela and Steran (2014).

$$EMscore = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 + 3.25$$

Where;

EMscore = Overall index

X₁= Liquidity

X₂= Leverage

X₃= Profitability

X₄= Solvency

Zones of discriminations:

Z > 2.6 - "Safe" Zone

1.1 < Z < 2.6 - "Grey" Zone

Z < 1.1 - "Distress" Zone

Multiple Regression model used is formulated thus:

$$Y_{it} = \alpha_0 + \beta_1 X_{it} + \beta_2 C_{it} + \varepsilon_{it} \text{ --- (1)}$$

Where Y_{it} = dependent variable of firm i for time period t;

α_0 = constant;

β_1 = Coefficient of explanatory variables;

X_{it} = Explanatory variables of firm i for time period t;

β_2 = Coefficient of control variables;

C_{it} = Control variables of firm i for time period t; and

ε_{it} = Error term of firm i for time period t.

From equation 1 above, the following models were developed:

$$Y_{it} = f(\text{EM Score}) \text{ --- (2)}$$

$$X_{it} = f(\text{WCTA, ROE, EBITTA, ETL and NAT}) \text{ --- (3)}$$

$$Cit = f(\text{MSPR, SIZE and AGE}) \text{ --- (4)}$$

Substituting equations 2, 3, and 4 into model 1, the following model is obtained.

$$GC_{it} = a_{it} + \beta_1 WCTA_{it} + \beta_2 ROE_{it} + \beta_3 EBITTA_{it} + \beta_4 ETL_{it} + \beta_5 NAT + \beta_6 MSPR_{it} + \beta_7 SIZE_{it} + \beta_8 AGE_{it} + e_{it}$$

Where:

WCTA=Working Capital/Total Assets (WCTA) of the firm I for time period t.

ROE=Retained earnings/Total Equity (RE/TE) of the firm I for time period t.

EBITTA=Earnings before Interest and Taxes/Total Assets (EBITTA) of the firm I for time period t.

ETL=Book Value of Equity/ Total Liabilities (BVE/TL) of the firm I for time period t.

NAT= Turnover/Total Net Asset of the firm I for time period t.

MSPR=Market value of a share for the firm I for time period t.

FIRMAGE=natural log of age from the date of listing of the firm I for time period t.

FIRMSIZE= natural log of total assets of the firm I for time period t.

The GC model is formulated to include asset management which is one of the major concern of management to coordinate the deposits and loans which center on their core activities. The *a priori* expectations are $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$.

4.0 Result and Discussion

This session provides the result of descriptive statistics, correlation, regression, diagnostic test and test of hypothesis formulated for this study.

4.1 Descriptive Statistics

The descriptive statistics are presented in Table 2 where the minimum, maximum, mean and standard deviations of the variables used in the study are shown.

Table 2: Descriptive Statistics

Variables	Obs.	Mean Stat	Std. Dev. Stat	Min Stat	Max Stat	Skewness Stat	Kurtosis Stat
EMSCORE	165	5.4835	10.037	-51.253	89.927	4.096	44.808
WCTA	165	-.0967	.818	-6.4432	6.248	0.1914	45.362
ROE	165	1.7194	21.615	-168.88	145.332	-0.131	40.52
EBITTA	165	0.1452	1.669	-12.865	12.598	0.793	46.83
ETL	165	0.2171	.281	0.0037	2.609	5.692	42.83
NAT	165	6.926	38.488	-0.222	262.79	6.007	37.84
MSPR	165	10.130	9.777	.5	46.533	1.643	5.523

SIZE	165	9.1590	.880	7.86	11.693	1.649	5.620
AGE	165	1.0779	.379	0	1.672	-0.211	2.441

Source: Descriptive Statistics Results using STATA 12.0, 2018.

Table 2 shows the detailed account of the descriptive statistics for the dependent and independent variables respectively. EMSCORE= going concern, WCTA= working capital to total assets, ROE= retained earnings to total equity, EBITTA= earnings before interest and tax to total assets, ETL= Equity to total liabilities, NAN= Net asset turnover, MSPR= market value of share SIZE= Size of the companies and AGE= Number of Years from date of listing. The most prominent among the results in the descriptive statistics are the higher standard deviations of NAN (38.45) and lowest standard deviation of ETL (0.28) relative to the standard deviations of other independent variables used in the model which range from 0.4 to 10.

From Table 2, it is shown that NAN, ROE, EBITTA, and ETL have mean values of 6.93, 1.72, 0.15 and 0.22 respectively with average survival score of 5.4835.

The mean value of the MSPR, SIZE, and AGE of the companies examined are high at 10.1, 9.2 and 1.1 respectively. The DMBs experienced a high growth rate in their market value of share up to the maximum of 47 and a minimum of 0.5, high growth in size from a minimum of 8 to maximum of 12 and there was no decrease in size growth for the period studied. It could, however, be noted that this growth in size coupled with maturity really translated to the maximum survival rate of 89.9 with the average value of 5.4835 EMscore.

Finally, the variables are skewed to the right except ROE and Age that skewed to both side of the tail. While the kurtosis reveals that the data for each variable are leptokurtic in nature.

4.2 Correlation Matrix

Table 3 below displays the correlation values between regressor and the regressed and the relationship between the independent variables themselves. The values are gotten from the Pairwise correlation of two-tailed significance. It shows the correlation matrix with the top values displaying the Pairwise correlation coefficient showing the two-tailed significance of these coefficients.

Table 3 presents the correlation results between determinants of firm survival variables (WCTA, ROE, EBITTA, ETL, NAT, SMSPR, SIZE, and FIRMAGE) and the going concern (EMSCORE) of the listed DMBs in Nigeria. The table result shows that WCTA is negatively related with EMscore from the correlation coefficient of 0.2833 which is significant at 5% level of significance. This indicates that the going concern (EMscore) of listed DMBs has negative association with liquidity (WCTA). The table shows that there is a positive relationship between ROE & EBITTA with the going concern (EMscore) of listed DMBs from the correlation coefficient of 0.2661 and 0.9727 respectively which are significant at 5% level of significance. This result indicates that

profitability and leverage had positive association with the going concern (EMscore) of listed DMBs in Nigeria.

Table 3: Pearson Pairwise Correlation Matrix of the Sampled Observations

	EMSCORE	WC TA	ROE	EBITTA	ETL	NAN	MSP R	SIZE	AGE
EMSCORE	1.0000								
WCTA	-0.2833*	1.0000							
ROE	0.2661*	0.2261*	1.0000						
EBITTA	0.9727*	-0.4047*	0.1247	1.0000					
ETL	-0.0151	0.0622	-0.0223	-0.0296	1.000				
NAT	0.5037*	0.0073	0.4748*	0.3461*	-0.071	1.0000			
MSPR	-0.0728	0.0456	-0.1334	-0.0483	0.164*	-0.1046	1.0000		
SIZE	0.0303	0.1044	-0.0691	0.0161	-0.044	0.1054	-0.1191	1.000	
AGE	-0.0559	-0.0523	0.0533	-0.0582	0.099	-0.0584	0.0703	-0.212*	1.000

Source: Results of Correlation Coefficient using STATA 12.0, 2018.

*** Correlation is significant at 0.05 level (2-tailed)**

Furthermore, the table shows that there is negative association between ETL and the EMscore from the correlation coefficient of -0.0151 which is insignificant at 5% level of significance. This result indicates that solvency (ETL) increases the going concern (EMscore) of listed DMBs in Nigeria. Similarly, the table portrays a positive relationship between Asset Management (NAT) and going concern with 0.503 coefficient and significant at 5%. This suggests that DMBs' ability to manage their net assets is positively related to EMscore up to 50%. The result from table 8 indicates that among the control variables, only size has a positive relationship with EMscore with 0.030 coefficient while MSPR and age have a negative relationship with EMscore from the correlation coefficient of 0.0728 and 0.0559 respectively. Following the analysis of the relationships between determinant of firm survival (liquidity, leverage, profitability and solvency) and going concern (EMscore) of the listed DMBs in Nigeria, the study in the following section presents and discusses the regression results of the model of the study from which the hypotheses of the study are tested and the relevant inferences are drawn about the relationship between determinants of firm survival and the going concern of listed DMBs in Nigeria.

4.3 Diagnostic Test

For better reliability and validity of all statistical inferences to be drawn for the study, this section presents the result of the diagnostic test conducted. Shapiro-Wilk W Test for normal data was conducted and it was found that the data used for the study are not normally distributed as it revealed significant p-value (See appendix ii). Similarly, Multicollinearity Test was conducted to check whether there is a strong correlation between the independent variables which could mislead the result of the study. The result of the diagnostics test reveals no multicollinearity in the data. The variance

inflation factor and the tolerance were found to be consistently lower than ten and one respectively indicating the absence of multicollinearity (see appendix ii). Heteroscedasticity Test evidenced from Breuch Pagan/Cook-Weisberg coefficient of 40.21 with a p-value of 0.000 confirms the presence of the effects of heteroskedasticity for the model, that is, there is constant variance in the residuals. This suggests the use of Robust Generalised Least Square model.

4.4 Regression Result

The variance inflation test was conducted to check the presence of multicollinearity among explanatory variables of the study. The outcome of the test showed Variance Inflation Factor (VIF) of more than 1 and less than 5, which implies the absence of perfect multicollinearity among explanatory variables of the study. From the summary of fixed random effect regression results in Table 4, Hausman specification test was conducted in selecting between fixed and random effect regression. The χ^2 of 15.2 and $\text{prob} > \chi^2$ of 0.0554 suggests the adoption of fixed effect as against the random effect GLS regression.

Table 4: Summary of Fixed Random Effect Regression Results

Variables	FIXED EFFECT EMSCORE		RANDOM EFFECT EMSCORE	
	Coefficient	Sig P	Coefficient	Sig P
CONST.	11.015	0.000	3.7572	0.001
WCTA	0.0066	0.017	0.0109	0.000
ROE	.03714	0.000	.04159	0.000
EBITTA	5.4349	0.000	5.465	0.000
ETL	0.950	0.024	.3001	0.422
NAT	.03176	0.000	0.0381	0.000
MSPR	-.01532	0.276	-.01051	0.304
SIZE	-.7492	0.012	.03807	0.740
AGE	0.1236	0.832	0.1553	0.557
R ² :Within	0.9854		0.9844	
Between	0.9592		0.9921	
Overall	0.9792		0.9856	
F. Sig.	0.0000		0.0000	

Source: Regression Result Output from STATA 12.0, 2018.

For better and reliable result of the fixed effect regression, the robust fixed effect result is appropriate. This is because robustness filters out other statistical disturbance elements from the result. Thus, the robust fixed effect GLS regression result is presented below and used to test the hypothesis of the study.

The result for the model above shows that the explanatory variables Liquidity, Profitability, Leverage, Solvency and Asset Management all have a significant positive impact on the dependent variable GC. It is also observed that size is significant at 5% and negatively impacted on GC while Operating Efficiency and Age are immaterial at 95% confidence level.

Regression equations:

$$GC=11.015+0.0066 WCTA+0.3714ROE+5.4349 EBITTA+0.95 ETL+.03176N AN-0.0153 MSPR -0.7492 SIZE +0.124AGE+ e_{it}$$

Table 5: Robust Fixed Effect GLS Regression Results

EMSCORE			
Variables	Coefficient	Sig P	VIF
CONST.	11.015	0.000	-
WCTA	0.0066	0.017	1.22
ROE	.03714	0.000	1.38
EBITTA	5.4349	0.000	1.15
ETL	0.950	0.024	1.19
NAN	0.03176	0.000	1.5
MSPR	-.01532	0.276	1.08
SIZE	-0.7492	0.012	1.09
AGE	0.1236	0.832	1.08
R ² : Within	0.9854		
Between	0.9592		
Overall	0.9792		
F. Sig.	0.0000		

Source: Result of Robust FE Regression output from STATA 12.0, 2018.

The logical explanation for this finding is that an increase in the WCTA, ROE, EBITTA, ETL and NAT would enhance the survivability of the listed DMBs by 1%, 4%, 54% 10% and 3% respectively. The cumulative influence of all the exogenous variables put together is able to explain the dependent variable up to 98% as indicated by the overall adjusted R². This provide the adequacy of the model used as suggested by f-sig figure of 0.0000. The remaining 2% is explained by other factors not captured in this study. The variance inflation factor (VIF) of 1.22, 1.38, 1.15, 1.19, 1.5, 1.08, 1.09 and 1.08 stand for the explanatory variables WCTA, ROE, EBITTA, ETL, NAT, MSPR, SIZE, and AGE respectively.

4.5 Test of Hypotheses

The regression result is used to test the hypotheses and presented below:

H₀₁: Liquidity, measured by the variable WCTA, has no significant impact on the survival of listed DMBs in Nigeria using the variable EMSCORE as a proxy for survival.

Survival measured by EMscore is found to positively associate with WCTA and statistically significant with 0.017 coefficient and a p-value of 0.01 indicating that working capital to total assets significantly influences survival of listed DMBs in Nigeria. Hypothesis 1, H₀₁ is rejected, and this result is in line with the prior expectation of the study as its findings show that there should be a significant positive relationship between working capital to total assets and survival.

H₀₂: Profitability, measured by the variable ROE, has no significant impact on the survival of listed DMBs in Nigeria using the variable EMscore as a proxy for survival

Survival measured by EMscore is found to be positively associated with ROE and statistically significant with a coefficient of 0.04 and p-value of 0.000 indicating that ROE has significantly influenced survival of listed DMBs in Nigeria. Therefore, retained earnings to total equity have a significant impact on the EMscore. Hypothesis 2, H₀₂ is rejected and the result is in line with the prior expectation of the study. This finding shows that there should be a significant positive relationship between retained earnings to total assets and survival.

H₀₃: Leverage, measured by the variable EBITTA has no significant impact on the survival of listed DMBs in Nigeria using the variable EMscore as a proxy for survival

Survival measured by EMscore is found to be positively associated with EBITTA and statistically significant with a p-value of 0.000 and 5.6948 coefficient indicating that earnings before interest and tax to total assets significantly influences survival of listed DMBs in Nigeria. For any 1% increase in retained earnings to total assets, the EMscore will increase by 5.43. Therefore, earnings before interest and tax to total assets have a significant impact on the EMscore. Hypothesis 3, H₀₃ is rejected, and the result indicated that there should be a significant positive relationship between earnings before interest and tax to total assets and survival.

H₀₄: Solvency, measured by the variable ETL has no significant impact on the survival of listed DMBs in Nigeria using the variable EMscore as a proxy for survival

Survival measured by EMscore is found to positively associate with ETL and statistically significant with 0.95 coefficient and a p-value of 0.024 indicating that book value of equity to total liabilities significantly influences survival of listed DMBs in Nigeria. Hypothesis 4, H₀₄ is rejected, showing that there should be a significant positive relationship between the book value of equity to total liabilities and survival.

H₀₅: Asset management, measured by the variable NAT, has no significant impact on the survival of listed DMBs in Nigeria using the variable EMscore as a proxy for survival

Survival measured by EMscore is found to positively associate with NAT and statistically significant with 0.032 coefficient and a p-value of 0.000 indicating that book net asset turnover significantly influences survival of listed DMBs in Nigeria. Hypothesis 5, H₀₅ is also rejected, indicating that there should be a significant positive relationship between the book value of equity to total liabilities and survival.

4.6 Discussion of Research Findings

The research results show that the survival of listed DMBs in Nigeria is a function of liquidity, profitability, leverage, solvency and asset management. The study finds out that an increase in WCTA, ROE, EBITTA, ETL and NAT will increase the survival (EMscore) of the listed DMBs in Nigeria. While SIZE has a negative impact on EMscore, AGE and MSPR have inconsequential impact on survival of listed DMBs. It is also discovered that EMscore variable of profitability, leverage, solvency, liquidity and asset

management are key in determining survival of listed DMBs in Nigeria. The results of the study is consistent with Shisia et al. (2014) and Makini (2015) whose studies concluded that the EMscore model is suitable to predict the financial health of banks. The study has numerous theoretical, practical and regulatory implications. These implications represent the contributions to knowledge in the study which are expected to benefit DMBs, existing body of knowledge within the accounting research, accountants in practice, investors, regulators and providers of accounting services as the outcome of this study would enable DMBs to appreciate to the extent liquidity, leverage, profitability, solvency and asset management is to the organization in the area of survival.

This study is in line with bankruptcy and stakeholder theories. As argued by the proponent of stakeholder interest maximization as the main objective of an organisation, DMBs would survive only if they are able to meet substantially the interest of their major stakeholders including management, shareholders, depositors, investors and regulatory agencies as at when due. Inability to meet or sustain these interests over a given period of time say five years could be tantamount to bankruptcy or liquidation, with either stakeholders applying for such or through voluntary filing by the management. In the event of these, not only would the stakeholders lose, but the Nigerian economy as a whole would be affected negatively.

Liquidity of a DMB is the ability of a bank to pay its short-term obligations as at when due. The lower the value, the higher the chance of bankruptcy, that is, the threat to going concern of DMBs. Leverage is the ability to pay dividend or re-invest in the lucrative venture. A high ratio indicates that growth may be sustainable as it is not fully financed by debt. Profitability is the earning power of DMBs' assets. An increasing ratio indicates that banks are able to utilize their assets for earning and increasing return on assets investment. Solvency is the extent to which DMBs use equity to finance its assets. By how much would the DMB's market value decline before liabilities exceed assets? The higher the ratio, the higher the risk of surviving, the closer to bankruptcy. Asset Management is the extent to which any one naira spent on Net assets by DMBs contributes to going concern. The higher the ratio, the better the chances of surviving. DMBs size explain how efficiently banks employ strategy to maintain stakeholder's confidence. High value implies growth in market shares. Bank size explains customer loyalty. The higher the size, the better the extent to which customers and other stakeholder's needs are attained. The older a DMB, the better the competence and experience of the bank. This would add value in decision-making over time. In summary, DMBs should maintain survival determinants up to 50% so as to guarantee their going concern. This is because the mean coefficient for liquidity, solvency and leverage are -9.7%, 14.5% and 21.7% respectively which could downsize stability of their present status if not improved. This result was augmented by the significant positive effects of other determinants including profitability (172% efficiency) and Asset Management (693% efficiency).

5.0 Conclusion and Recommendations

The EMscore model is a very practical tool that can be used to assess the going concern of DMBs. The result of this empirical study suggests that explanatory variables in EM score model are relevant in determining DMBs' survival in both the developed

economy and as well in Nigeria. This is true despite profound institutional differences that exist between Nigeria and the developed countries. Specifically, the study concludes that WCTA, ROE, EBITTA, ETL, and NAT have statistically positive significant impact on the survival of listed DMBs in Nigeria whereas SIZE has a significant negative impact on survival of listed DMBs in Nigeria.

Overall, the empirical results from this study offer some support for the bankruptcy theory. With the adjusted r^2 of 0.98 with f sig. of 0.000 from the model used in the study, the study concludes that liquidity, leverage, profitability, solvency and assets management have a significant impact on survival of listed DMBs in Nigeria.

In line with the findings and conclusions from this study, the following are recommended: The study clearly asserts that DMBs listed in Nigeria have enough scope to enhance their survival by handling their MSPR in more efficient ways through efficient employment of strategy to maintain stakeholder's confidence in term of reporting material information about its operations in line with global best practice to stakeholders and adherence to CBN regulations. This is because DMBs MSPR affects survival negatively. Similarly, the management of DMBs should enhance their decision on WCTA, ROE, EBITTA, ETL and NAT by improving the individual ratio up to 50% for stability in survival status as suggested by findings of a positive significant relationship with survival. This study highly recommends to the potential investors in companies to use the EMscore model as an assessment tool. The results could raise certain questions about the going concern of DMBs and could ultimately result in an investor judging DMBs that is profitable and well managed since declining EM score values depict a threat to survivability.

References:

- Aasen M. R. (2011). *Applying Altman's EMscore to the Financial Crisis: An Empirical Study of Financial Distress on Oslo Stock Exchange*. Master thesis in Financial Economics, Norwegian School of Economics.
- Abdulkareem H. (2015). *The revised Altman Z'-score Model Verifying its Validity as a Predictor of Corporate Failure in the Case of UK Private Company*. A dissertation submitted to the University of Leicester In partial fulfillment of the requirements for the degree of MSc Banking and Finance. *Conference Paper*154.
- Agarwal, R., & Audretsch, D. (2001). Does entry size matter? The impact of the life cycle and technology on firm survival. *Journal of Industrial Economics*, 49(1), 21-43.
- Agarwal, R., & Gort, M. (2002). Firm and product life cycles and firm survival. *American Economic Review*, 92(2), 184-190.
- Agarwal, R., & Sarkar, M. (2002). The conditioning effect of time on firm survival: An industry life cycle approach. *Academy of Management Journal*, 45(5), 971-994.
- Agarwal, R., Sarkar, M., & Echambadi, R. (2002). The conditioning effect of time on firm survival: an industry life cycle approach. *Academic Management Journal*, 45, 971- 994.
- Agusto & Co. Limited (1995). Banks Rating Model, Marina, Lagos-Island, Lagos. Nigeria.
- Al- Rawi, K. Kiani, R. & Rishma R.V. (2008). The Use of Altman Equation for Bankruptcy Prediction in an Industrial Firm in Jordan. *International Business & Economics Research Journal* 7(7), 115-125.

- Alloy N. and Pratheepan, T. (2015). The Application of Altman's EMscore Model in Predicting Bankruptcy: Evidence from the Trading Sector in Sri Lanka. *International Journal of Business and Management*; 10(12), 269-275. ISSN 1833-3850 E-ISSN 1833-8119
- Altman E. I. (1968). "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *Journal of Finance*.
- Altman, E. I. (2000). Predicting financial distress of companies: Revisiting the Z-score and ZETA models. *Stern School of Business, New York University*.
- Altman, E. I., Iwanicz-Drozowska M., Laitinen E.K. & Suvas A., (2016). Financial Distress Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model. *Journal of International Financial Management & Accounting*, 0:01- 41. doi:10.1111/jifm.12053
- Altman, E. I., Iwanicz-Drozowska, M., Laitinen, E. K., & Suvas, A. (2017). Financial Distress Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model. *Journal of International Financial Management & Accounting*. 28(2): 131-171.
- Altman, E., Haldeman R. & Narayanan, P. (1977). "Zeta Analysis: A New Model to Identify Bankruptcy Risk of Corporations," *Journal of Banking & Finance*.
- Altman, E.I. (1968). Financial Ratios: Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4), 589-609.
- Babajide A. A, Olokoyo, F. O. & Adegboye, F. B. Predicting Bank Failure in Nigeria Using Survival Analysis Approach.
- Banbury, C., & Mitchell, W. (1995). The effect of introducing important incremental innovations on market share and business survival. *Strategic Management Journal*, 16, 161-182.
- Biswas M. (2014). Performance Evaluation of and Ihra Bank & Bank of Maharashtra with CAMEL Model. *International Journal of Business and Administration Research Review*, 1,(5) 220-225.
- Bode, R., & Nucci, A. (2000). On the survival prospects of men's and women's new business ventures. *Journal of Business Venturing*, 15(4), 347-362.
- Box, M. (2008). The death of firms: Exploring the effects of environment and birth cohort on firm survival in Sweden. *Small Business Economics*, 31(4), 379-393.
- Buddelmeyer, H., Jensen, P., & Webster, E. (2010). Innovation and the determinants of company survival. *Oxf. Econ. Pap*, 62(2), 261-285.
- Cefis, E. & Marsili, O. (2005). A matter of life and death: Innovation and firm survival. *Industrial and Corporate Change*, 14(6), 1-26.
- Cefis, E. & Marsili, O. (2006). Survivor: The role of innovation in firm's survival. *Research Policy*, 35(5), 626-641.
- Cefis, E., & Marsili, O. (2012). Going, going, gone. Exit forms and the innovative capabilities of firms. *Research Policy*, 41, 795-807.
- De Silva, D., & McComb, R. (2012). Geographic concentration and high tech firm survival. *Regional Science and Urban Economics*, 42(4), 691-701.
- Dunne, T., M. J. Roberts, & L. Samuelson (1988) 'Patterns of Firm Entry and Exit in U.S Manufacturing Industries', *Rand Journal of Economics*, 104, 671-698.
- Fadare O. S. (2011). Banking Sector Liquidity and Financial Crisis in Nigeria, *International Journal of Economics and Finance* 3(5), 3-11.

- Ganga B. and Christian T. A. (2017). M-score and Z-score for detection of Accounting Fraud. *Accountancy Business and the Public Interest* 68-83.
- Gemar, G., Moniche, L., & Morales, A. (2016). Survival analysis of the Spanish hotel industry. *Tourism Management*, 54, 428-438.
- Grover, J., & Lavin, A. (2001). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy: A Service Industry Extension of Altman's Z-Score Model of Bankruptcy Prediction. Working Paper. Southern Finance Association Annual Meeting.
- Hariyani D. S., & Sujianto A. (2017). Analisis perbandingan model altman, model springate, dan model zmijewski dalam memprediksi kebangkrutan bank syariah di indonesia. *Inventory Jurnal Akuntansi, Prodi. Akuntansi*, 1(1),13-23.
- Helmets, C., & Rogers, M. (2010). Innovation and the survival of new firms in the UK. *Review of Industrial Organization*, 36(3), 227-248.
- Ilahi I., Jamil R. A., Kazmi S., Ilahi N., & Lodhi M. S. (2015). Financial Performance Analysis of Pakistan Banking Sector Using the Altman Z-Score Model of Corporate Bankruptcy. *Applied Research Journal* 1(1), 34-40.
- Kivuvo, R. M. & Olweny T. (2014). Financial Performance Analysis of Kenya's SACCO Sector Using the Altman Z Score Model of Corporate Bankruptcy. *International Journal of Business and Social Science*, 5(1), 34-52.
- Maija N. (2017). *Bankruptcy Prediction Methods: A Comparison with Finnish Data*. A Thesis submitted to School of Business and Governance, Department of Business Administration, Tallinn University of technology, Tallinn.
- Makini, A. P. (2015). *The validity of Altman Z-score Model in predicting financial distress of listed companies at the Nairobi stock exchange*. Unpublished MBA research project in University of Nairobi, Kenya.
- Mamo, A. Q. (2011). *Applicability of Altman (1968) model in predicting financial distress of commercial banks in Kenya*. Unpublished MBA Research Project, University of Nairobi.
- Martin B. & Vladimir U. (2016). The portability of Altman's Z-score model to predicting corporate financial distress of Slovak companies, *Technological and Economic Development of Economy*, 22(4), 532-553.
- Martin B. and Vladimír Ú. (2016). The portability of Altman's EMscore model to predicting corporate financial distress of Slovak companies, *Technological and Economic Development of Economy*, 22:4, 532-553.
- Meeampol S., Lerskullawat P., Wongsorntham A., Srinammuang P., Rodpetch V. & Noonoi R. (2014). Applying Emerging Market Score Model to Predict Bankruptcy A Case Study of Listed Companies in the Stock Exchange of Thailand (Set). *Management, knowledge and learning, International Conference* 1227-1235.
- Mizan, A. N, & Hossain, M.M. (2014). Financial Soundness of Cement Industry of Bangladesh: An Empirical Investigation Using Z-score. *American Journal of Trade and Policy*, 1, 16-22.
- Mizan, N.K., Amin, M.R. & Rahman, T. (2011). Bankruptcy Prediction by Using the Altman Z-score Model: An Investigation of the Pharmaceutical Industry in Bangladesh. *Bank Parikrama*, 36(2-4), 33-56.
- Mohammed, S. (2013). *Bankruptcy prediction of firms listed at the Nairobi Securities Exchange*. Unpublished MSc Research Project, University of Nairobi.

- Mohammed, S. (2016). Bankruptcy Prediction by Using the Altman Z-score Model in Oman: A Case Study of Raysut Cement Company SAOG and its subsidiaries. *Australasian Accounting, Business and Finance Journal*, 10(4), 34-64.
- Mwendamo I.M. (2010). *Using Altman's Z-score to assess the appropriateness of management's use of the going concern assumption in the preparation of financial statements*. A research report in partial fulfillment of the Masters of Commerce Degree in Financial Management, Department of Accounting, University of Cape Town, South Africa.
- Odibi I., Basit A., & Hassan Z. (2015). Bankruptcy prediction using Altman Z-score model: a case of public listed Manufacturing Companies in Malaysia. *International Journal of Accounting & Business Management* 3(2), 178-185. ISSN: 2289-4519. DOI: 10.24924/ijabm/2015.11/v3.iss2/178.186.
- Ohlson, J. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 18(1), 109-131.
- Pakdaman H. (2018). Investigating the Ability of Altman and Springate and Zmijewski and Grover Bankruptcy Prediction Models in Tehran Stock Exchange *ESPACIOS Journal*. 39(14) 33.
- Pradhan R. (2014). Z-Score Estimation for Indian Banking Sector. *International Journal of Trade, Economics, and Finance*, 5(6), 516-520. DOI: 10.7763/IJTEF.
- Rahman Z. and Islam S. (2018). Use of CAMEL Rating Framework: A Comparative Performance Evaluation of Selected Bangladeshi Private Commercial Banks. *International Journal of Economics and Finance*; 10,(1); 2018. DOI: 10.5539.
- Ray S. (2011). Assessing Corporate Financial Distress in Automobile Industry of India: An Application of Altman's Model. *Research Journal of Finance and Accounting* 2(3), 155-168. ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online).
- Richard, M. & Tobias, O. (2014). Financial Performance Analysis of Kenya's SACCO Sector Using the Altman Z Score Model of Corporate Bankruptcy. *International Journal of Business and Social Science* 9(1), 34- 52.
- Sajjan R (2016). Predicting Bankruptcy of Selected Firms by Applying Altman's EMscore Model. *International Journal of Research – Granthaalayah*, 4(4) 152-158.
- Salim M. N. & Sudiono (2017). An Analysis of Bankruptcy Likelihood on Coal Mining Listed Firms in the Indonesian Stock Exchange: An Altman, Springate and Zmijewski Approaches. *Eurasian Journal of Economics and Finance*, 5(3), 2017, 99-108 DOI: 10.15604/ejef.2017.05.03.008.
- Sanja V.B, Mirela M., Stevan T., (2014). The Enterprise Creditworthiness Evaluation– By Z" Score Model. *Economic Themes*, 52 (2) 184-196. DOI 10.1515/ethemes-2014-0013.
- Sanusi L.S (2012). Banking Reform and its Impact on the Nigerian Economy, Lecture delivered at the University of Warwick's Economic Summit, UK. 1-17.
- Shisia, A., Sand W., & Okibo W.B. (2014). An in-depth analysis of the Altman's failure prediction model on corporate financial distress in Uchumi supermarket in Kenya. *European Journal of Business Management*, 6(23). 27-41.
- Springate, G. L. (1978). Predicting the Possibility of Failure in a Canadian firm. (Unpublished Thesis). British Columbia, Canada: Simon Fraser University.
- Suci K. (2017). Bankruptcy Analysis Using Altman Z Score Model In Manufacturing Company At Indonesia Stock Exchange. *Journal of Auditing, Finance, and Forensic Accounting* 5(1), 1–16.

- Syamni, G., Majid, M.S.A., & Siregar, W.F. (2018). Bankruptcy Prediction Models and Stock Prices of the Coal Mining Industry in Indonesia. *Etikonomi: Jurnal Ekonomi*. 17(1): 57 – 68. doi: <http://dx.doi.org/10.15408/etk.v17i1.6559>.
- Uzonwanne, M. C. (2015). Deposit Money Banks and Financing of Small and Medium Scale Enterprises in Nigeria. *Journal of Economics and Sustainable Development*, 6(8), 185-195.
- Vikas, T. (2014). The Financial Health Of Selected Firms With Special Reference To Indian Logistic Industry: An Application of Altman's Z-score. *Industrial Engineering Letters*,4(4), 43-52.
- Zmijewski, M. (1983). Predicting Corporate Bankruptcy: An Empirical Comparison of the Extant Financial Distress Models. Document de travail. State University of New York at Buffalo.

Appendix A
Population and Sample Listed DMBs

S/N	BANK NAME	YEAR OF LISTING
1	ACCESS BANK PLC	1998
2	DIAMOND BANK PLC	2005
3	ECOBANK PLC	2006
4	FIRST BANK OF NIGERIA PLC	1971
5	FCMB PLC	2004
6	FIDELITY BANK PLC	2005
7	GTBANK PLC	1996
8	SKYE BANK PLC	2005
9	STANBIC BANK PLC	2005
10	STERLING BANK PLC	1992
11	UBA PLC	1970
12	UNION BANK PLC	1971
13	UNITY BANK PLC	2005
14	WEMA BANK PLC	1990
15	ZENITH	2004
16	JAIZ BANK PLC *	2017