International Journal of Academic Management Science Research (IJAMSR)
ISSN: 2643-900X
Vol. 9 Issue 3 March - 2025, Pages: 376-384

Detecting Bank Insolvency In Nigeria: What Can We Look Out For?

EHIEDU, V.C and OMONODE, A.

Department of Banking & Finance, Faculty of Management Sciences, Delta State University, Abraka, Delta State, Nigeria.

Abstract: This study examined the determinants of banks' insolvency in Nigeria. In this study, the researcher aimed at assessing how hank-specific variables such capital adequacy, assets quality, liquidity coverage, size and profitability; and macroeconomic variables such as interest rate and inflation rate, influence the survival of banks in Nigeria. To achieve this objective, emphases were laid on quoted DMBs, thereby defining the sample of the study which consist 10 DMBs in Nigeria selected by the researcher with regards to period of operation which is from 2011 to 2020. Secondary data were collected form the financial reports of the selected DMBs and used to draw averages over the study period of 10 years spanning 2011 to 2020. Data collected for the purpose of this study were analyzed using the OLS regression estimation technique. First, diagnostic tests were obtained to provide assurance for the data set and the model used using the Breusch-Godfreyfor serial correlation, ADF test for unit root, and the model summary which were acceptable. Findings farm this study revealed that t bank-specific variables such as capital adequacy, asset quality, liquidity coverage, size and profitability are core determinants of the survival or otherwise of DMBs in Nigeria, while macroeconomic factors such as interest rate and inflation rate are also capable of altering chances of survival for DMBs in Nigeria when they have to respond to economic shocks brought about by the instability or unfavourable dispositions of those macroeconomic variables. Given these findings, it was recommended that the CBN and other core regulators of DMBs in Nigeria should intensify their regulatory measures in areas pertaining to the capital adequacy, asset quality, liquidity and profitability of DMBs in Nigeria.

Keywords: Insolvency, Capital Adequacy, Asset Quality, Liquidity Coverage, Profitability, Size, Aktman 'sZ-score

Introduction

The insolvency of banks is distinguished as one of the major critical issues around the world, nearly for quite a long time. History has kept a few disappointments in accordance with banks, both in evolving as well as evolved nations (Ephrem, 2015). Bank disappointments are likewise recognized in those nations with high value-based economies (Lepetit&Strobel, 2015). In excess of fifty nations, greater part of the banks were, shut, particularly during the time of 1997 and 2002 (Fentaw, 2016).

As of now, it is vital to take note of that the issue of bank indebtedness has been expanded as of late and it has unfavorably affected a few nations with less huge misfortune. Bankruptcy happens when any organization, association, individual, or any obganizations neglect to pay the obligations and hence end in twofold due (Caprio&Klingebiel, 2015; Nwidobie, 2017). So, neglecting to meet the monetary commitments, for example, paying obligations is known as bankruptcy (Doumpos et al., 2015). Since the last part of the 1970s bank bankruptcies have become progressively normal. Where these disappointments are fundamental, they can deplete a nation's monetary, institutional, and strategy assets bringing about enormous misfortunes, misallocated assets, and more slow development. Utilizing another information base covering a few 86 episodes of indebtedness, this article looks at the circumstances and end results of these emergencies and how states have answered (Kinyariro, et al., 2016). It finds that both macroeconomic and microeconomic variables have figured in bank emergencies and that, in view of the standards created here, scarcely any legislatures have answered well to these episodes (Kinyariro, et al,, 2016; Nwibodie, 2017).

To more readily oversee bankruptcies, policymakers should foster an administrative system that permits banks to answer all the more powerfully to shocks and guarantees legitimate administration and oversight. That brokers have not routinely made arrangements for shocks proposes that they have not had the motivator to do as such. At the point when banks become bankrupt, a significant number of these unfavorable results can be conceded (Akani&Uzah, 2018). The main component representing this distinction is that the result and creation cycles of nonfinancial firms frequently are more straightforward than those of banks, reflecting both the data escalated nature of banking and its intertemporal quality, most bank items or administrations incorporate a guarantee to pay from here on out, implying that it can require investment for a bank's powerlessness to satisfy its agreements to become obvious. Banks can cover issues by turning over terrible credits or by raising more stores and expanding the size of their accounting reports (Kinyariro, 2016).

At the point when keeps money with a low or negative total assets stay open, bank proprietors or ranking directors are less propelled to screen them, so bank staff and officials have an optimal chance to take part in an assortment of defalcations (Sahut&Mili, 2015). The subsequent inclination for wiped out banks to build their misfortunes has been generally noted and recommends the requirement

for instant, restorative activity. Hence the significance of bank indebtedness comparative with that of nonbanks can be recognized by the chance of a fundamental emergency (Zhang et al., 2014).

The genuine expense for the economy of terrible credits, whether as a component of a summed up emergency or as separated issues, is the misallocation of assets. Albeit a significant part of the loaning upheld by bankrupt banks is believed to endorse useful speculations, these banks' misfortunes are proof that this isn't generally the situation. Fundamental bank indebtedness additionally drives assets out of the formal monetary area and into less useful purposes (Zhen-Jia-Liu, 2015). Notwithstanding a direct monetary effect, boundless bank bankruptcies can have the additional expense of changing government strategy in a negative heading, for example, by crashing adjustment programs or by impeding or switching monetary and nonfinancial area changes (Zamorski& Lee, 2015).

Creating and change economies specifically are unable to manage bank bankruptcies since they need profound capital business sectors, which can spread the expenses of indebtedness over various years. Without this support, and with a more restricted charge base, non-industrial nations are bound to depend on an expansion duty to back banks' misfortunes (Ephrem, 2015).

Literature

Conceptual Framework

Why Does Bank Solvency Matter?

Although there have been numerous historical writings on banks' insolvency andfinancial crisis dating as far back as the 13th century. During the early economic depression, developed countries like U.S., UK and Italy recorded series of bank failures owing to a number of economic factors. However, bank insolvency or distress according to Akani and Uzah (2018) is the failure of banks to meet their core liquidity-related obligations. According to Altman (2006), insolvency can also be conceptualized as another term used interchangeably with theterm "distress" in relation to banking firms, but in its real conceptual sense, insolvency is a banks inability to cover its total liability with regards to its total assets; indicating a negative net worth. In many countries, the central banks of many countries were originally established just in the 20th century, but until that period, market forces were relied upon to take care of the insolvency problem of banks, and generally, depositors had no regulatory assurance of protection over their funds, Although the widespread hank insolvency was common in the U.S because many U.S states had single unit banks with only one off ice.

Hence, their inability to diversify made them prone to economic shocks and insolvency- related failures, By the end of the 20 century however, government intervention birthed the now deposits insurance schemes which was geared towards fostering confidence on the banking sector. In Nigeria, all DMBs are, by law, mandated to insure the deposits of customers with the Nigerian Deposit Insurance Commission (NDIC).

Type of Bank Insolvency

Literature has embodied three common types of insolvency in banks, and these common

jtypes are; insolvency that is particular to a given bank or number of banks (i.e., bank-specific non-systemic insolvency); insolvency that can be recognized easily (i.e., apparent insolvency); and the quiet type of bank insolvency (i.e., systemic insolvency). The apparent insolvency is often easy to recognize when they occur, and a very good example is what we generally refer to as the "Banking Panic" which drives through like a wave following a given economic or financial crisis. When there is economic crisis, bank debtors find it difficult to meet theirobligations, thereby resulting

However, the apparent type of insolvency often occurs very fast and also come to an end very quickly. The no-systemic insolvency can continue affecting few banks continuously, but may progress, with time, into the apparent insolvency when the general public starts losing confidence on the validity of regulatory guarantees to intervene and/or resolve the insolvent institution.

During the period of insolvency, banks often downplay the need to acknowledge the uncertainties in trying to separatethe systemic from other insignificant banking problems. However, Bartholomew et al. (1995) as quoted in Fentaw (2016) identified systemic risk as "the likelihood [emphasis addedj of a sudden, usually unexpected, collapse of confidence in a significant portion of the banking or financial system with potentially large real economic effects. Their definition downplays any attempt at quantification, and also shifts the emphasis on scope to the judgment of bankers. This is because the attempt to provide answers to questions such as; is the collapse likely? If Yes, then when? or what is the probability level? Given that sudden bank crises are often attributed to opacity, and trying to conceptualize what constitutes "Bank Crisis" can be inherently subjective.

How is Banks' Insolvency Different from Other Non-Banks?'

In market economics, insolvent firms are firms that are unable to source for new funds to meet current obligations. This problem often forces such firms to pounce unnecessary on profits, and also prevents them from taking advantage of profitable investments. For firms, insolvency is a very big problem to mangers because it distorts their incentives and increases their tendency to engage in dark financial practices- a set of activities termed "corporate fraud". During insolvency, managers and owners' incentive to exert efforts consistent with the future financial wellbeing of the firm is taken away. Judging by firm-specific characteristics, smaller firms are often prone to failure compared to bigger firms, but according to CaprioandKlingebiel (2015),non-financial firms often get impacted the most with high tendency to become insolvent due to core operations continuous investment opportunities.

In the case of banks, insolvency as evidenced by any of the highlighted adverse consequences are often differed. This is simply traceable to the difference in operations between the firms identified in the previous paragraph and banks. Capri andKlingebiel (2015) also argued that the output and process of production firms (i.e., non-banks) are often direct and more open than those of banks. We can also consider the extent of impact that bank insolvency will be felt in market economies. Banks often hold the funds of corporate organizations, and when these firms find it difficult to access their funds at any point in time, this shock can affect the normal operation of the corporate firms.

Although this is very unlikely because banks are capable of concealing their problems by rolling over bad loans and rising more deposits to make the balance sheet more robust. Of course, in today's world, depositors enjoy absolute protection, and so, given their confidence, banks will continue to receive huge deposits, hence, their ability to hide insolvency problems.

Detecting Bank Insolvency

Early discovery of patterns towards bankruptcy has often been a crucial issue in the management of banks. The answer for this issue has brought about the provision of numerous diagnostic models. In light of such models, the ongoing situation analysis shows outcomes that are near the real world. However, frequently this isn't sufficient to affirm the indebtedness of the dissected bank. To begin with, the apparently best model might show the outcomes that are not altogether right. Besides, to make dependable estimates of the unfurling circumstance, it is important to examine the state of a bank in a specific period, and the more extended this time frame, the more solid the conjecture is.

In terms of measuring the tendency of a bank to be insolvent or become insolvent at any given time, a number of studies have presented the presented the Altman Z-score as suitable for achieving this fit (see Lepetit&Strobel, 2013, 2015; Doumposet al., 2015; Nwidobie, 2017). Hence, in this study, the Altman Z-score was used to proxy banks' insolvency level in Nigeria.

Theoretical Framework

Entropy Theory (ET)

The ET directs that it is feasible to distinguish the likely gamble of thonetary misery via cautiously taking a gander at changes in their statement of financial position (Aziz &Dar, 2006). As per this hypothesis, in the event that a firm isn't equipped for keeping up with harmony state in their monetary record part (Asset and risk) and can't handle in not so distant future, it is bound to predict trouble. ET utilizes the Univariate Analysis (UA) and Multiple Discriminate Analysis (MDA) in looking at changes in the design of accounting reports.

Univariate Analysis is the utilization of single bookkeeping based proportions markers for the pain risk evaluation. The monetary proportions of each organization, consequently, are looked immediately at a time and the qualification of those organizations through a solitary proportion with a cut - off esteem is utilized to characterize an organization as either upset or non-troubled (Monti&Moriano, 2010). MDA, which has created to conquer the weaknesses of univariate investigation, is a measurable examination by which more than one variable is dissected simultaneously. Up until this point, Sayari (2013) and Sun and Li (2008), as located in Kinyariro (2016) have involved the ET assumptions in theoretical starting point for focusing their financial resources on insolvency-related studies.

Gambler's Ruin Theory (GRT)

GRT, which was proposed by Feller in 1968, depends on the likelihood of a gambler's wins/loses of cash by some coincidence. The card shark begins with appositive, erratic, measure of cash where the speculator wins a dollar with likelihood p and loses a dollar with likelihood in every period. The game goes on until the card shark winds up in a tight spot financially (Espen, 1999). The firm can be considered as a card shark playing more than once with some likelihoodof shortfall, proceeding to work until its total assets/capital goes to nothing.

With an expected starting measure of money, in some random period, there is a net positive that a company's incomes will be reliably regrettable over a run of periods (Aziz &Dar, 2006). The significant shortcoming of this hypothesis is that it expects that an

organization begins with a specific measure of money; that implies, the organization has no admittance to protections markets and the incomes are consequences of free preliminaries (Espen, 1999).

Empirical Review

Capital Adequacy (CA) and Banks' Insolvency

The CA of a bank is the capital level a bank needs to ensure that a balance is maintained in relation to their level of risk exposure. A bank's level of risk exposure, as referred to in this study, can be in such areas as credit risk, operational risk, and market risk among others. A number of studies have emerged highlighting CA as a core determinant of banks' insolvency; in some studies, it is argued that a good CA level enable banks to easily cover losses and still look healthy and running their routine banking activities. For example, Akani and Uzah (2018) examined how CA impacts the profitability of banks in Nigeria.

In their study, the capital adequacy ratio (CAR) was used in relation to profitability indicators such as ROT and ROE. Findings indicated that, when it comes to banks' profitability and long run survival, the CAR is a significant indicator. Hence, when a bank's CA level is below the required standard, such ban risks survival at that particular period, as a little trigger is capable of officially ushering in bank insolvency, and ultimately; failure. For the purpose of this study, banks' CA will be proxy by the CAR, and given the empirical arguments above, the following null hypotheses has been proposed;

HO1: Capital adequacy is not a significant determinant of banks' insolvency in Nigeria

Asset Quality and Banks' Insolvency

Assets of a banking firm have also been presented in existing literature as a key factor that can predict a bank's survival. In banking firms, loan portfolios are core asset categories that are often classified with great priority in the financial statements, but in the banking business (especially for DMBs), the biggest risk is the risk of loan losses (i.e., a surge in the level of non- performing loans-NPL). Here, credit analysts often perform credit risk management tests to assess the quality of banks' loan portfolios via trend and pattern analysis. In the empirical study of Grier (2007) findings showed that bank's poor asset quality is a core factor responsible for their failure in most cases. The study of Zhen-Jia-Liu (2015) also attempted to identify determinants of insolvency in banks using a sample of 772 banks spread across the G20 nations. Findings from this study showed that NPLs with a positive and significant relationship with banks' insolvency has proven to be a core determinant of insolvency in banks.

Furthermore, Zhang et al. (2014) while highlighting the power of a bank's assets quality emphasized that the decline in loan quality accompanied by a rise in NPL was the core factor responsible for the banking crises in Africa in the early 1980s and 1990s. It was also emphasized that loans are the most risky assets in banks' statement of financial position and survival. For thepurpose of this study, asset quality will be proxy by the NPL to TL ratio, and given the empirical arguments above, the following null hypotheses has been proposed;1102: Assets quality is not a significant determinant of banks' insolvency in Nigeria

Profitability and Banks' Insolvency

Banks, like every other firm, must be profitable in order to survive, as continuous losses in the financial statement will considerably lead to a bank's failure (Baklouti et al, 2016). For bank to prevent insolvency and remain highly competitive, they must be able to generate low volatile income, and they must also ensure diversification of income, in order to spread the risk of failure across the several income sources. Akani and Uzah (2018) argued that a consistently profitable bank does not only increase the confidence of the public (i.e., customers, investors and government) in the bank, but also strategically absorbs loan losses with adequate provisions made in the books. In an empirical argument by Zamorski and Lee (2015), it was stated that it is also important for banks' to ensure a balanced financial structure through consistent and healthy earnings in order to achieve sustainability.

It was concluded that higher returns often gives a banking firm more room to cover unexpected loan losses and remain far from insolvency. For the purpose of this study, banks' profitability will be proxy by the RCA, and given the empirical arguments above, the following null hypotheses has been proposed;

H03: Profitability is not a significant determinant of banks' insolvency in Nigeria

Liquidity Coverage and Banks' Insolvency

Banks are highly sensitive firms, and by implication, are expected to be adequately liquid in order to meet core current and future needs. The availability of cash-convertible assets without undue losses in the process speaks volume of the survival of such banks (Kinyariro et al, 2016). The liquidity management strategy of banks should be geared towards an adequate level of liquidity sufficient to meet the bank's financial obligations at the right time. Sahut and Miii (2015) argued that, bank insolvency can also be traced to

inappropriate management of short run liquidity. They also argued that the extents to which banks are capable of meeting their respective obligations will either show a high liquidity level or otherwise.

Kinyariro et al. (2016) looked at how the Basel III is helping to forestall Kenyan banks. Using a 43 bank sample over a period from 2013 to 2014, the authors argued that banks' liquidity has a significant role to play in determining the survival of such banks. For the purpose of this study, banks' liquidity will be proxy by the liquidity coverage ratio (LCR), and given the empirical arguments above, the following null hypotheses has been proposed;

H04: Liquidity Coverage is not a significant determinant of banks' insolvency in Nigeria

Bank Size and Financial Distress

Concerning the size of banks and whether or not tis variable matters when discussing the issue of insolvency, there have been somewhat disagreements among scholars and their empirical submissions. Two schools of thought have emerged in this aspect of banks' insolvency argument; the first school of thought argue that "the bigger the better" that is, big banks tend to be more profitable, hence, the lower chance of insolvency; but the second school of thought argue that "the bigger the more problem" that is, smaller banks tend to be more effective and strategic in managing crisis and preventing insolvency given their size and ability to navigate survival options easily. For instance, following the first school, Bongini et al. (2015) carried out an empirical investigation and argued that, given the rule of profitability, a large bank may havea lower chance of experiencing insolvency and managing crises due to their high level of profitability and revenue diversification.

On the other hand, Bakiouti et al. (2016), while judging through the lens of governanceduring crises management, focused on the argument that during crises, large banks are often exposed to excessive risks due to their size, and that it is often difficult to solve insolvency problems when it affects every aspect of the bank. For the purpose of this study, banks' size will be proxy by the ratio of total assets to total deposit, and given the empirical arguments above, the following null hypotheses has been proposed;

H05: Bank size is not a significant determinant of banks' insolvency in Nigeria

Macroeconomic Determinants of Banks Insolvency

Studies have also been carried out linking macroeconomic factors such as interest rate and inflation rate with banks' failure. Unexpected fluctuations in these macroeconomic variables can result in great economic shocks that financial institutions in general, and banks in particular, my not easily recover from. During economic crises, bank borrowers are often affected in terms of their inability to generate the required profits to meet their loan obligations with banks, thereby resulting to high NPL ratio for banks. Boyd et al (2001) have argued in earlier studies that inflation and bank solvency are negatively correlated, such that when the inflation rate rises beyond normal, the solvency of banks begin to fall until they hit the rock bottom.

Akan and Uzah (2018) using a sample of commercial banks in Nigeria included macroeconomic variables in their model and revealed, apart from the bank-specific determinants already aforementioned, there are macroeconomic variables shaped monetary policies (e.g., money supply, interest rate and inflation rate) that are capable of influencing the solvency level of bapks in Nigeria.

This result followed the conclusion of Evan and TomislavGalac (2015) that high interest rates were a source of solace for highly insolvent banks, hence, the correlation between interest rates and banks' insolvency in their study. In this study, it is suggested that macroeconomic factors like interest rates and inflation rates are capable of influencing the solvency of banks, hence, the following null hypotheses has been proposed;

H06: Interest rate is not a significant determinant of banks' insolvency in Nigeria

H07: Inflation rate is not a significant determinant of banks' insolvency in Nigeria

Methodology

This study is conducted using the ex-posto fact research design which helps to establish cause-and-effect relationship given an already exiting phenomenon. Given that this study concerns the insolvency of banks, the researcher resolved to focus on quoted DMBs in Nigeria. Secondary data were collected from the publicly available annual reports of the selected DMBs to make up the bank-specific variables which include CAR, AQR, ROA, LCR, SZE, INT, and INF while the CBN statistical bulletin for 2021 was visited to obtain data on the selected macroeconomic variables including interest rate and inflation rate.

To determine banks' insolvency score for selected DMBs, the Altman Z-score was applied. The study period is 10 years from 2011 to 2020 and the choice of this study period has defined the study sample size of quoted DMBs in Nigeria as at January 2011 to

December 2021 which includes 10 DMBs. In this study, given the presence of macroeconomic data which are often time series in nature, the OLS regression estimation technique was used for the purpose of data analysis.

Model Specification:

The general model specification to identify the relationship between the determinants of bank insolvency (i.e., independent variables) and the Z-scores for each DMB (dependent variable) are specified in the model below:

ZSC= f (CAR, AQR, LCR, SZE, ROA, TNT, INF) ……. (I)

Given the model above in terms of the set objective of this study, the required model to be entered for analysis is presented below;

ZSC =1+ 2CAR+f33AQR + I34LCR + 5SZE +j35ROA +f37INT + j38INF+E …… (II)

Where:

ZSC: is the Z-score used to proxy the insolvency level of selected DMBs. The Z-score is determined using the standard formula; Altman Z-Score = 1.2A + 1.4B + 3.3C + O.6D + 1.OE,

Where;

A = working capital I total assets
B = retained earnings / total assets
C = earnings before interest and tax / total assets
D = market value of equity I total liabilities
E = sales / total assets
CAR: capital adequacy ratio of selected DMBs
AQR: assets quality ratio of selected DMBs
LCR: liquidity coverage ratio of selected DMBs
SZE: size of selected DMBs
ROA: return on assets of selected DMBs
TNT: the interest rate of Nigeria
INF: the inflation rate of Nigeria
fi 1is intercept; fl2'fl3,fl4' fls, fi6are slope

Results and Discussion

Testing Serial Correlation

The Breusch-Godfrey LM Test forTable 1:Correlation LM Test:

	NO	
F-Statistic	0.741523	0.5147.f(2.100)
Obs* R-squared	1.564518	0.5784,prob.chi-Square(2)

Source: Eviews 9.0 Output 2022

The p-value is 0.4586, as shown in Table 1. The null hypothesis that there is no serialcorrelation of residuals is therefore accepted because this value is bigger than 0.05. This is an indication that the data series were not serially correlated.

Table 2: Summary of Unit Root Test

Variables	ADF	Critical value	Prob. (p-value)	Remark	Decision
ZSC	-12.4123	-3.7451	0.0000	Significant	stationary
CAR	10.6523	2.5489	0.0042	Significant	stationary
AQR	7.4152	2.5489	0.0001	Significant	stationary
LCR	14.3252	2.5489	0.0001	Significant	stationary
SZE	14.3256	2.5489	0.0001	Significant	stationary
ROA	14.3256	2.5489	0.0001	Significant	stationary
INT	10.5422	2.5489	0.0001	Significant	stationary
INF	10.7458	2.5489	0.0001	Significant	stationary

Source: Eviews 9.0 Output 2022

Table 2 has evidenced that the ADF value for every variables is greater than their corresponding critical values at 5% level of significance, while the probability values aie all less than 0.05, indicating significance. It is therefore imperative to state that the data series used in this study are stationary.

Regression Model Fitness

Regression Estimation for Model

Model: ZSC $=\beta_1+ \beta_2$CAR$+\beta_3$AQR $+ \beta_4$LCR $+ \beta_5$SZE $+\beta_6$ROA $+ \beta_7$INT $+ \beta_8$INF $+\varepsilon$.....(II)		
Items	***Coefficient***	***Sig.***
Constant	0.545123	0.0100
Capital Adequacy Ratio (CAR)	0.378569	0.0224
Assets Quality Ratio (AQR)	0.325124	0.0311
Liquidity Coverage Ratio (LCR)	0.278957	0.0245
Size of Banks (SZE)	0.610237	0.0411
Return on Assets (ROA)	0.511283	0.0174
Interest Rate (INF)	0.547818	0.0312
Inflation Rate (INF)	0.425166	0.0001
Model Summary:		
R-squared	0.841526	
Adjusted R-squared	0.814152	
F-test	1.511548	0.0002
Durbin-Watson stat (DW)	1.985444	

So

M

A summarized on Table 3, the R-squared that explains how much of the systematic variations in the Z-score is explained by the selected predictors is high at 84% indicating that the selected independent variables captures 84% of what goes in with the dependent variable, but most importantly, only 16% is lost to error term. Fur hermore, the Adjusted R-squared also explains the strong predictive potential of the independent variables, as the selected determinants of can explain 81% of the changes in banks' solvency state as captured by the Z-score.

The DW score of 1.985444 simply highlights the absence of autocorrelation, while the F- statistics is high at 1.511548. The overall result is significant with a P-value of 0.0002. This summary merely verifies the statistical reliability of the chosen model, demonstrating that there is a considerable correlation between the selected determinants and banks' insolvency.

Findings on the Determinants of Banks' Insolvency in Nigeria

Findings summarized on Table 3 show that; as a bank's capital adequacy level increases, its z-score also increases significantly, and vise-versa. This positive and significant relationship places the capital adequacy of DMBs in Nigeria as a core determinant of their insolvency. The implication of this result is that, when things go wrong with the capital of DMBs, it is likely to force them into bankruptcy in the long run.

This result confirms the argument of Akani and Uzah (2018) that when a bank's CA level is below the required standard, such ban risks survival at that particular period, as a little trigger is capable of officially ushering in bank insolvency, and ultimately, failure

Table 3 also reveals that; as a bank's assets quality increases, its chances of survival also increase with a corresponding positive and significant z-score which also increases significantly, and vise-versa. This positive and significant relationship places the asset quality of DMBs in Nigeria as a core determinant of their insolvency. The implication of this result is that, owing to the argument of Zhang et al. (2014), when NPL level is kept very low, then the overall asset quality of DMBs will be less risky as reflected on their statement of financial position, and hence, their chances of survival remains unshaken.

Looking at the relationship between banks' liquidity level as a determinant of their survival, findings show that a positive and significant impact is expected from a bank with high liquidity coverage. It is expected that such banks will score a comfortable i-score which indicates a greater chance of survival. This argument can be likened to the reports in Sahut and Mili (2015) claiming that a bank's insolvency can also be traced to inappropriate management of short run liquidity. Here, liquidity was interpreted as the extents to which banks are capable of meeting their respective obligations will either show a high liquidity level or otherwise.

Table 3 also reveals that; as a bank's size increases, its chances of survival also increase with a corresponding positive and significant i-score which also increases significantly, and vise-versa. This positive and significant relationship places the size of DMBs in Nigeria as a core determinant of their survival. The implication of this result is that, owing to the rule of profitability as emphasized by Bongini et al. (2015), big banks are expected to have a lower chance of becoming insolvent due to their high level of profitability.

However, this result does not sit well with the argument of Baklouti et al. (2016) that, if governance is considered, larger banks are often exposed to greater risks during financial crises. This study also provided findings to support the claim of Bongini et al. (2015); as ROA which measures banks' profitability in this study showed a positive and significant impact on the reported Z-score, thereby indicating that highly profitable banks have a greater chance of survival. On this trend, Zamorski and Lee (2015) has findings emphasizing the need for banks to ensure a balanced financial structure through consistent and healthy earnings in order to achieve sustainability.

When it comes to the interplay of macroeconomic variables such as interest rate and inflation rate, this study has provided evidence to support the claims of Akani and Uzah (2018) that macroeconomic variables also determine the bankruptcy or survival of banks in a country. However, in the case of macroeconomic factors, the resultant effect tend to be widespread across the banking sector, thereby ushering the "survival of the fittest" struggle between banks in response to economic shocks brought about by the instability or unfavourable dispositions of those variables.

Conclusion and Recommendation

Going with the findings revealed in this study, and in line with the arguments expressed by prior empirical studies reviewed, this study hereby conclude that bank-specific variables such as capital adequacy, asset quality, liquidity coverage, size and profitability are core determinants of the survival or otherwise of DMBs in Nigeria, while macroeconomic factors such as interest rate and inflation rate are also capable of altering chances of survival for DMBs in Nigeria when they have to respond to economic shocks brought about by the instability or unfavourable dispositions of those macroeconomic variables.Following the findings of this study, it is therefore suggested that the CBN and other core regulators of DMBs in Nigeria should intensify their regulatory measures in areas pertaining to the capital adequacy, asset quality, liquidity and profitability of DMBs in Nigeria. It is also important for the CBN and regulators to ensure that economic policies are designed with great consideration for small DMBs in order to give them a fair fight for survival during economic shocks.

References

Akani, H. W., &Uzah, C. K. (2018). Determinants of Bank Distress in Nigeria CommercialBanks: A Multi-Dimensional Study. International Journal of Innovative Finance and Economics Research, 6(4):67-87

Altman, El., & Hotchkiss, E. (2006).Corporate financial distress and bankruptcy, 3"edition, John Wiley & Sons, Inc.

Aziz, J. & Dar, H. (2006). Predicting Corporate Financial Distress: Whither Do We Stand? Corporate governance, 6(1),8-33.

Baklouti, N., Gautier, F., &Affes, H., (2016).Corporate Governance and Financial Distress of EuropeanCommercial Banks Journal of Business Studies Quarterly, 7ç3).

Baklouti, N., Gautier, F., &Affes, H., (2016).Corporate Governance and Financial Distress of European Commercial Banks Journal of Business Studies Quarterly, 7(3).

Bartholomew, Philip B, Larry R. Mote, & Gary Whalen. (1995). "The Definition of Systemic Risk." U.S. Office of the Comptroller of the Currency, Department of Economic and Policy Analysis, Bank Research Division, Washington, D.C

Bongini, C. &Ferri, G. (2015).The political economy of distress in East Asian financial institutions. Journal of Financial Service Research, 19(1), 5-25.

Boyd, L. & Smith, R. (2001).The Impact of Inflation on Financial Sector Performance.Journal of Monetary Economics, 47(2), 22 1-48

Caprio, G., &Klingebiel, D. (2015). "Bank Insolvencies: Cross-Country Experience." Policy Research Working Paper 620.World Bank, Washington, D.C.

Doumpos, M., Gaganis, C. &Pasiouras, F. (2015). Central bank independence, financial supervision structure and bank soundness: An empirical analysis around the crisis. Journal of Banking & Finance, 61, 69-83

Ephrem, G., (2015). Determinants of Financial Distress Conditions of Commercial Banks in

Ethiopia: A Case study of Selected Private Commercial Banks. Journal of Poverty, Investment and Development, 13, 59-73.

Espen, S., (1999).Assessment of Credit Risk in Norwegian Business Sector. Master's Thesis, The University of Bergen, Bergen, Norway.

Evan, K., &Tomislav, G., (2015). Deposit interest rates, asset risk and bank failure in Croatia

Fentaw, L. (2016). Determinants of commercial bank's liquidity risk: evidence from Ethiopia. Research Journal of Finance and Accounting, 7(15), 47-61

Grier, W. A., (2007). Credit Analysis of Financial Institutions2nd ed. Euro money Institution Investor PLC.

Kinyariro, et al., (2016). Implications of base III accord adherence on financial distress status on commercial banks in Kenya, International Journal of economics, commerce, and management, Vol. IV, Issue 7.

Kinyariro, S. U. (2016). Implications of base III accord adherence on financial distress status on commercial banks in Kenya, International Journal of Economics, Commerce, And Management, 5(7), 451-468

Lepetit, L., &Strobel, F. (2013).Bank insolvency risk and time-varying Z-score measures. Journal of International Financial Markets, Institutions and Money 25, 73-87

Lepetit, L., &Strobel, F. (2015). Bank insolvency risk and Z-score measures: A refinement. Finance Research Letters, 13, 2 14-224

Monti, EN., &Moriano, G. R., (2010).A Statistical Analysis to Predict Financial Distress.Journal Service and Management, Vol. 3, pp. 309-335.

Nwidobie, B. M. (2017). Altman's Z-Score Discriminant Analysis and Bankruptcy Assessment of Banks in Nigeria.Covenant Journal of Business & Social Sciences (CJBSS), 8(1), 1-15

Sahut, 1. M., &Mili, M., (2015).Banking distress in MENA countries & the role of mergers as a strategic policy to resolve distress.Economic Modeling, 28(2), 138-146.

Zamorski, M., J., & Lee, M., (2015). Enhancing bank supervision in asia: lessons learned from the financial crisis, Asian Development Bank, Economics Working Paper Series 443.

Zhang, Z., Xie, L., lu, X., & Zhang, Z., (2014). Determinants of financial distress in U.S. large bank holding companies.Munich Personal RePEc Archive, Paper, 5(3),5-45

Zhen-Jia-Liu, (2015).Cross-country study on the determinants of bank financial distress. RAE São Paulo, 55(5), 593-603.