

BANK DISTRESS IN NIGERIA: DOES INSOLVENCY RATIO MATTER?

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ABSTRACT

This study used multiple regression to investigate the effects of insolvency on bank distress in Nigeria. With a study population of banks operating in Nigeria between 1998 and 2017, data was obtained from the published accounts of the investigated banks. Loan quality was found to be a significant determinant of bank distress. Other variables such as insider lending and government ownership did not prove to be significant contributors to bank distress within the studied period. It is therefore recommended that enhanced credit appraisal should be adopted to stem the incidences of both individual bank and systemic distress in developing economies such as Nigeria.

Keywords: Distress; Regression; Loan Quality; Insider Lending & Nigeria.

1. INTRODUCTION

Bank distress manifests when a set of complex and inter-related problems manifests in a bank. It usually occurs when a bank is evidently illiquid and insolvent. Illiquidity in a bank is when a bank can no longer meet its liabilities as and when they fall due. Simply put, an illiquid bank cannot pay back depositors their money when demanded as customers could no longer draw-down on approved loans. Insolvency, on the other hand, is a situation where the total value of realizable assets of a bank is less than the total value of its liabilities, a condition of negative net-worth (NDIC, 2008). Benston et al, (1986), likens distress to a condition of complete loss of shareholders funds, and when an independent operation of bank service or activity is possible by virtue of financial assistance from a deposit insurance institution. Adeyemi (2011) citing CBN (1997), posits that bank distress occurs when a reasonable number of banks in the system could no longer meet their obligations to their customers, the owners and the economy due to weakness in their total operation and conditions which would have put them in such condition of either illiquid and/or insolvent. According to Alashi cited in NDIC (2002), a bank that is either insolvent or illiquid or both is in crisis. With many banks in Nigeria classified as distressed, some licenses withdrawn and some banks acquired by the regulatory authority, the issue has ceased to be whether banks will fail or not (CBN/NDIC, 1995). What rather should concern everybody is how to identify the possible causes of bank distress, and problems averted (Anyanwaokoro 2008). This is so because banks are expected to be safe havens for people's money and valuables. Banks mobilize savings from the surplus unit and channel them to the deficit unit of the economy (Adekanmbi 2017). Thus the thought of liquidating banks is understandably uncomfortable.

The Committee on Banking Supervision (2001) argues that financial distress in Nigeria started in 1930 when about 21 banks reportedly failed, before CBN was established in 1958. Some of the depositors were reportedly said to have lost their lives as a consequence. The failure became worse as there were no banking regulation or an institution to oversee to the orderly liquidation of the failed banks. The banks reportedly, closed their doors, never to re-open them (NDIC, 2008). A number of factors was said to have contributed to the crisis including lack of regulation and supervision amongst others.

Uche (1997) posits that the origin of bank distress in Nigeria was during the indigenous banking crisis of the colonial administration of 1950s. The crisis necessitated to the passing into law of the 1952 Banking Ordinance which required that indigenous banks in the British West African Colony of Nigeria to have a nominal share capital of at least twenty five thousand pounds of which not less than two thousand five hundred pounds should be paid up. Sections 5 (2) and 6 (2) of the Ordinance according to Uche (1997) requires existing banks to within three years to have complied with the provisions of the Ordinance. What precipitated a run on these indigenous banks was a three year maximum period given to the indigenous banks to meet with the requirements of the ordinance or face

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liquidation. Added to that, they were no deposit insurance scheme in place to compensate depositors in the event of such liquidation (Uche 1997).

For instance, only 4 indigenous banks survived out of a total of 21 banks then in existence between 1953 and 1954. Notwithstanding that most of these banks were poorly capitalized and staffed, what caused their mass failure was the government insistence on regulation. Thereafter, the banking system remained fairly stable until 1986 when pressure from the International Monetary Fund and World Bank forced the administration of Babangida to launch the Structural Adjustment Program,(SAP) which degraded the economy, creating risks and opportunities for banks and increased competition among banks and non-bank finance institutions that were also a creation of government deregulation. The introduction of Structural Adjustment Program(SAP) in Nigeria brought in the new spirit of competition amongst the financial institutions. Government thereafter shifted attention to the protection of the depositors by the establishment of the Nigerian Deposit Insurance Corporation (NDIC) in 1988, as the survival forces of demand and supply fundamentally changed the structure of banking in Nigeria. The new spirit of competition meant that the decision as to whether banks should fail or not was now to be determined by the market forces. Government therefore focused on protecting the depositors, hence the establishment of the Nigerian Deposit Insurance Corporation in 1988.

Banking crisis in the 1990s started when suddenly Federal Government withdrew deposits from all Money Deposit and Merchant banks which led to a serious liquidity problem that necessitated the introduction of liquidity support program by NDIC, valued at N2.3 billion for the affected 9 banks. The government further stretched Nigerian banks with excessive taxation. Government fiscal indiscipline also did not help matters as it assisted in sabotaging macro-economic stability which, in turn, further dislocated the inter-bank market and spreading to all segments of the financial system. Available report from NDIC (2003) posits that about 31 banks were closed between January 1994 and January 1998, while 6 banks were closed between 2000 and 2003. A very high proportion of non-bank financial institutions were also reportedly became distressed. There were also reports that about 52.2% of all banks existing at the time were in distress (NDIC, 2003). Soludo (2004) report on the condition of Nigerian banks was quite revealing. Ogunloye (2010) attributes the failure of banks to the owners' and directors' penchant to abuses and misuse of their positions. The problem became pronounced when the ability of the supervisory agencies to contain them became compromised. Up till this moment, the ghost of distress in the Nigerian banking industry still hovers threatening the survival of the Nigerian financial system and by extension, the economy. For instance, Sanusi (2010) blamed the problems on critical gaps in regulatory framework and regulation, among other reasons.

The paper aims to ascertain the effects insolvency, rather than illiquidity has in bank distress in the Nigerian banking industry using multiple regression model of analysis.

Observational panel data obtained from banks' published accounts were used (Stock and Watson, 2007). Based on the rule of thumb provided by Green (1991) and Field (2005), the minimum acceptable data size for the conduct of this study is 108. Barely exceeding this minimum, a total of 113 complete bank observations were utilized in this study.

The work is arranged in the following order: Section two reviews related literature while section three presents data and method of empirical analysis. The next to the last section discusses the results and the last section concludes the study.

2.0 Literature Review

Chen et al (1998), argues that ownership structure could be employed to explain distress in the financial system due to frequency in the change of board membership which may be as a result in changes in the federal and state governments. Olufon, (1992) suggests that lack of management cohesion, irregular board meetings, and chaos in the bank, and loss of public confidence, affect the performance of banks adversely. Sanusi (2009) on the other hand argues that banks insolvent technically due to poor credit risk management, liquidity problem, poor capital and poor credit corporate governance. Ugoani (2015) on his own, blamed high level of insider loans as the major factor triggering the series of bank failure in Nigeria, As Ogunleye (2010) posits that directors and owners of banks sometimes abuse their positions and are self-serving. Insider loans according to (NDIC, 1994) account for 65 per cent of the total loans of some liquidated banks in 1994. Okpara (2009) in Iwedi (2017) made a case of banks that granted loans without proper documentation and analysis of loan applicants, and approval of loan request on the basis of who you know. Ogunleye (2000) cited in Olukotun et al (2013) also posits that most of the failed banks directors did not make purely commercial judgment as to the safety of their loan disbursement and deposit collection. Ologun (1994) in Asikhia (2010) argues that banks were manned by academically qualified people who most of them lack the practical strategy of modern banking system. Uche (2001) argues that the volume of fraud and fraudulent activities increased between 3 percent in 1990 (N804 million) to 22 percent (2,199 million) in the year 1998. John, Gianni and Elena (2008) insists that illiquidity, insolvency, undercapitalization etc when became

pronounced and persistent could lead to weak corporate governance and bank distress. Ogubunka (2003) blamed weak internal control, and poor management among others as the cause of bank distress, while Ogundina attributed ownership structure accountable for bank distress. CBN/NDIC (1995) asserts that the causes of bank distress in any economy are basically empirical. Brownbridge, (1998) argues that moral hazard on the part of banks and their customers and adverse selection of the borrowers contribute to the factors leading to bank distress.

Joining the debate, Ogunleye, (2003) posits that the single biggest contributor to the bad loans of many of the failed banks was insider lending. Uche (2001) insists that fraudulent practices were among the determinant to bank distress, citing the instances in the 1920s when many indigenous banks failed as a result of fraudulent practices.

Mamman and Oluyemi (1994) posits that poor and inadequate screening of borrowers to distinguish good from bad risks contributed to the problem for many of the failed banks. Brownbridge (1998) blamed high inflation that make loan appraisal difficult as some of the reasons for bank distress. Kariuki (1993) hinges bank distress to outdated bank regulation and supervision as CBN supervision department in the 80s and 90s were under staffed when many banks were set up due to deregulation. Iwedi (2017) posits that the lax in regulatory prudential guidelines, failure to carry out some of the functions of banks, inadequate regulatory framework contribute to the collapse of some of the banks. Joining the argument, Nzotta (2004) says that weak deposit base, poor capital base, poor management, asset mismatch or even weakness in operational condition were among the reasons for bank distress in Nigeria. Again, Iwedi (2017) argues that in order to meet the new capital requirement as set by the CBN in 2004, fourteen out of the eighty-nine commercial banks in existence then disappears from the scene through mergers acquisitions and absorption. Ugoani (2015) posits that almost all the failed bank exceeded their authorized limit. Also Sanusi (2010) posits that management misled board and boards also participating themselves in obtaining unsecured loans that led to banks becoming distress.

3.0 Data and Method

3.1 Data

Data used in this study were all cross sectional with time frequency making them panel data from banks’ annualized financial statement of the studied banks. Following the rule of thumb in line with Green (1991) and Field (2005), the minimum acceptable data size for the conduct of a study such as this, is 108 and the study, therefore used 113 observations for the respective series.

3.2 Empirical Model Specification

The study sought to investigate the effect of insolvency in the determination of bank distress in Nigeria. The functional relationship under investigation is of the form captured in the regression model below:

$$\hat{Y} = \alpha_0 + \partial_1 X_1 + \partial_2 X_2 + \partial_3 X_3 + \partial_4 X_4 + \varepsilon_t \quad \dots (1)$$

Where \hat{Y} = Predicted bank solvency ratio, X_1 = Bank Capital Size; X_2 = Size of Insider Loans; X_3 = Loan quality; X_4 = Extent of government ownership; ∂_{1-4} are coefficients of the parameter estimates; α_0 = Regression intercept ε_t = Stochastic term.

3.3 Model Variables

The variables used in this study are shown in table 1 below:

Table 1. Description of Model Variables

Variable	Estimation Formular	Role
Solvency	$\frac{Total\ Assets}{Total\ Liabilities}$	Regressand
Capital Size	$\frac{Shareholder's\ Fund}{i.e\ \sum\ total\ assets\ less\ \sum\ total\ liabilities}$	Regressor
Insider Loan	As given in the financial statements of the banks under study	Regressor
Loan Quality	$\frac{Total\ Performing\ loans\ and\ advances}{Total\ Loans\ and\ advances}$	Regressor
Government Ownership	As given in respective NDIC annual reports.	Regressor

3.4 Techniques of Data Analysis

The following five steps were followed in the analytic framework:

- (i) The first step in the SPSS analysis was the conducting of visual tests for outliers. Field (2005) explains that outliers tend to adversely bias regression estimates.

- (ii) The second step involved testing the normality of the series following the Kolmogorov-Smirnov and Shapiro-Wilk tests.
- (iii) The third step involved testing for multicollinearity among the regressors. A correlation matrix test (Field, 2005: 175) was employed for this purpose. The rule for this test is: “where the correlation between two predictors is found to be statistically significant at $p < .01$, two-tailed, one of the regressors has to be expunged from the model”.
- (iv) The fourth step involved computing the regression estimates and conventional supporting indices. A regressor is deemed statistically significant if $\alpha < 0.05$.
- (v) The final step involved testing for a possible existence of first-order autocorrelation (Koutsoyiannis, 2003: 200-232) in the regression function. Its existence would necessitate a modification of the model. Koutsoyiannis (2003: 226) explains that the presence of autocorrelation in a model makes the result spurious as most of the estimators become unreliable including the goodness of fit measure (R-squared). This further affects the predictive capacity of the model as the standard error, t-statistics and F-statistics are biased by the presence of autocorrelation.

The test for the existence of a first-order autoregressive scheme was done in two stages. During the first stage, correlation tests were employed. The rule for each test was: “where the correlation between Y_t and Y_{t-1} or X_t and X_{t-1} is found to be statistically significant at $\alpha = .01$, two-tailed, first-order autocorrelation is deemed to have been identified and Y_{t-1} or X_{t-1} , as the case may be, shall subsequently be included in the model as a regressor”. During the second stage, the regression residuals were statistically analyzed, with the aim of correcting autocorrelation disturbances from the model’s variables, if such disturbances were identified.

4.0 Result

This section was done to point out the visual tests for outliers. This among other things helped in justifying the choice of the requisite empirical and statistical estimation method used in this study. Figures 1-4 reveal the consistent existence of two outliers which may tend to bias the multiple regression model to be developed (Field, 2005). Therefore, those two outliers were identified and expunged from the dataset before final analyses were conducted.

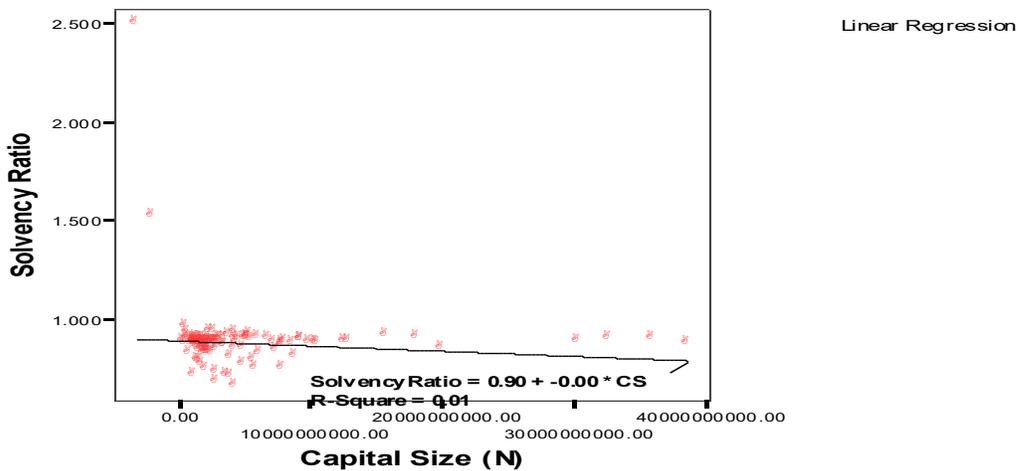


Fig 4.1: Visual Tests for Outliers between solvency ratio and capital size

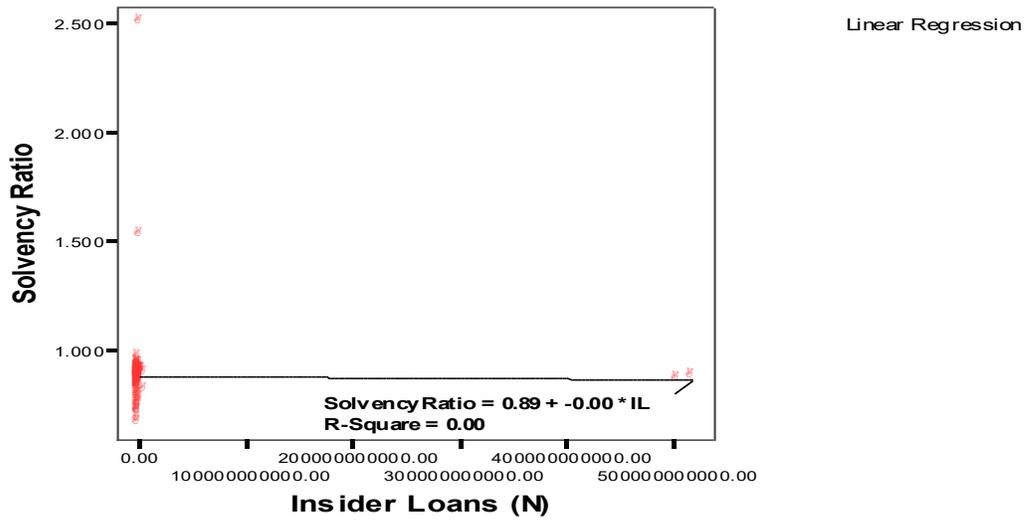


Fig. 4.2: Outliers in Solvency Ratio vs. Insider Loan

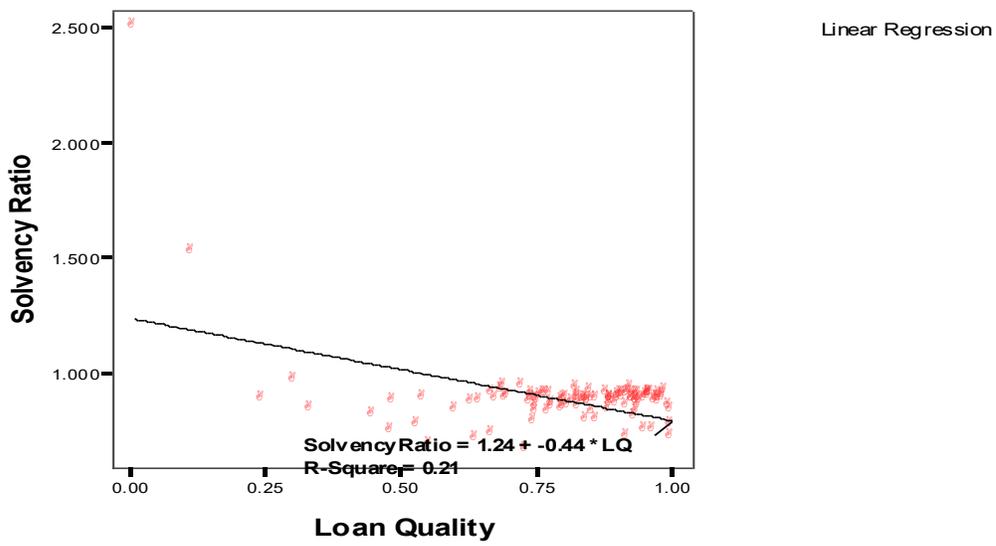


Fig. 4.3: Outliers in Solvency Ratio vs. Loan Quality

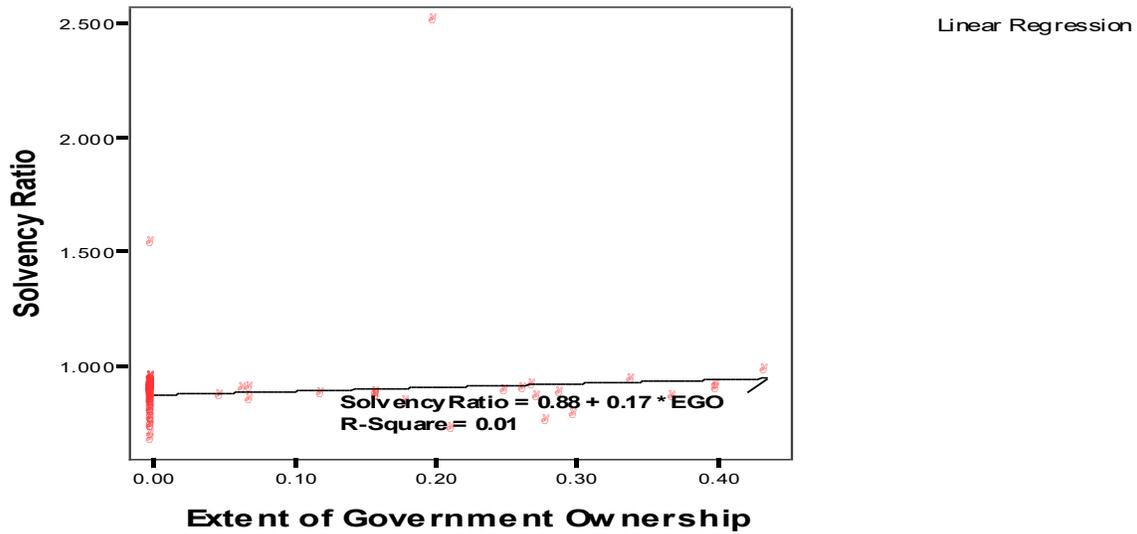


Fig. 4.4 Outliers in Solvency Ratio vs. Extent of Government Ownership

Figures 1-4 reveal the consistent existence of two outliers which may tend to bias the multiple regression model to be developed (Field, 2005). Therefore, these two outliers have to be identified and expunged from the dataset before final analysis is conducted.

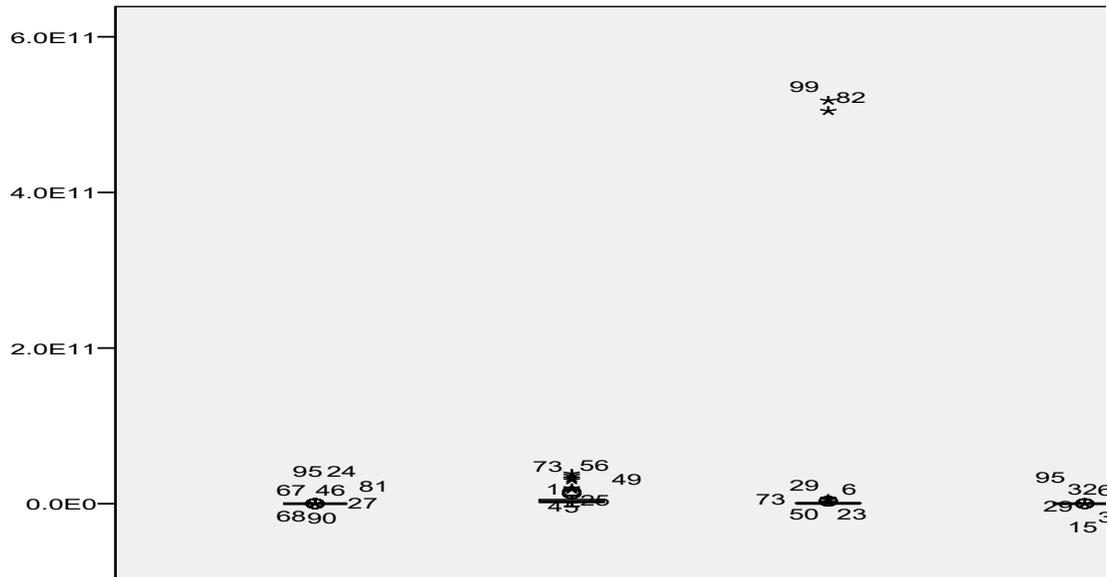


Fig 4.5: Specific Identification of the Outliers

Figure 5 clearly indicates that cases 82 and 99 in the dataset are the cases producing the outliers identified in Figures 1-4. Cases 82 and 99 were left out of the multiple regression to ensure the reliability of the obtained estimates.

Table 2- SPSS Summary of the Kolmogorov-Smirnov and Shapiro-Wilk Tests for Normality

		Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent

Solvency Ratio	111	98.2%	2	1.8%	113	100.0%
Capital Size (N)	111	98.2%	2	1.8%	113	100.0%
Insider Loans (N)	111	98.2%	2	1.8%	113	100.0%
Loan Quality	111	98.2%	2	1.8%	113	100.0%
Extent of Government Ownership	111	98.2%	2	1.8%	113	100.0%

Table 3- SPSS Normality Tests Results

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Solvency Ratio	.356	111	.000	.338	111	.000
Capital Size (N)	.233	111	.000	.612	111	.000
Insider Loans (N)	.234	111	.000	.680	111	.000
Loan Quality	.150	111	.000	.810	111	.000
Extent of Government Ownership	.465	111	.000	.512	111	.000

aLilliefors Significance Correction

Source: Researcher’s computations

Significance of the Kolmogorov-Smirnov and Shapiro-Wilk statistic across the distributions indicates non-normality and this should be noted when interpreting regression estimates.

Correlation Matrix Test for Multicollinearity

Table 4- Correlation Matrix of the Regressors

		Capital Size (N)	Insider Loans (N)	Loan Quality	Extent of Government Ownership
Capital Size (N)	Pearson Correlation	1	.398(**)	.142	-.170
	Sig. (2-tailed)		.000	.137	.074
	N	111	111	111	111
Insider Loans (N)	Pearson Correlation	.398(**)	1	-.121	-.122
	Sig. (2-tailed)	.000		.204	.202
	N	111	111	111	111
Loan Quality	Pearson Correlation	.142	-.121	1	-.218(*)
	Sig. (2-tailed)	.137	.204		.021
	N	111	111	111	111
Extent of Government Ownership	Pearson Correlation	-.170	-.122	-.218(*)	1
	Sig. (2-tailed)	.074	.202	.021	
	N	111	111	111	111

** Significant at the 0.01 level (2-tailed)

* Significant at the 0.05 level (2-tailed)

The correlation between capital size and insider loans is statistically significant at $p < .01$, two-tailed. Allowing both variables to remain in the predicted model will produce multicollinearity and its adverse effects in the regression function.

The researcher decided to expunge capital size from the function because the Pearson correlation coefficients between capital size and other regressors are higher than the Pearson correlation coefficients between insider loans and other regressors. The Pearson correlation coefficients between capital size and other regressors are also

more statistically significant than the Pearson correlation coefficients between insider loans and other regressors.

$$\hat{Y} = 1.217 + 0.104X_1 - 0.448X_2 + 0.016X_3 + \varepsilon_t$$

(0.000)(0.234)(0.000)(0.855)

$$R^2 = 0.226 \text{ or } 22.6\%; \bar{R}^2 = 0.204 \text{ or } 20.4\%; \text{Durbin Watson Stat} = 2.256 \approx 2$$

Note: Level of statistical significance are bracketed

2. Correlation Test for Existence of First-Order Autoregressive Schemes

$$\text{VAR } 00006 = Y_t$$

$$\text{VAR } 00007 = Y_{t-1}$$

$$R_{Y_t, Y_{t-1}} = -0.062$$

$$\text{Significance Level (2-tailed)} = 0.522 > 0.01$$

∴ There is no first-order autoregressive scheme in variable Y.

Table 5- Correlation Results for $X_{1,t}$ and $X_{1,t-1}$

	VAR00006	VAR00007
VAR00006 Pearson Correlation	1	-.040
Sig. (2-tailed)		.684
N	111	108
VAR00007 Pearson Correlation	-.040	1
Sig. (2-tailed)	.684	
N	108	111

$$\text{VAR } 00006 = X_{1,t}$$

$$\text{VAR } 00007 = X_{1,t-1}$$

$$R_{X_{2,t}, X_{2,t-1}} = -0.040$$

$$\text{Significance Level (2-tailed)} = 0.684 > 0.01$$

∴ There is no first-order autoregressive scheme in variable X_1 .

Table 6- Correlation Results for $X_{2,t}$ and $X_{2,t-1}$

	VAR00006	VAR00007
VAR00006 Pearson Correlation	1	.059
Sig. (2-tailed)		.547
N	111	108
VAR00007 Pearson Correlation	.059	1
Sig. (2-tailed)	.547	
N	108	111

$$\text{VAR } 00006 = X_{2,t}$$

$$\text{VAR } 00007 = X_{2,t-1}$$

$$R_{X_{2,t}, X_{2,t-1}} = 0.059$$

$$\text{Significance Level (2-tailed)} = 0.547 > 0.01$$

∴

	VAR00006	VAR00007
VAR00006 Pearson Correlation	1	-.062
Sig. (2-tailed)		.522
N	111	108
VAR00007 Pearson Correlation	-.062	1
Sig. (2-tailed)	.522	
N	108	110

Table 7- Correlation Results for $X_{3,t}$ and $X_{3,t-1}$

There is no first-order autoregressive scheme in variable X_2 .

	VAR00006	VAR00007
VAR00006 Pearson Correlation	1	.035
Sig. (2-tailed)		.723
N	111	108
VAR00007 Pearson Correlation	.035	1
Sig. (2-tailed)	.723	
N	108	111

VAR 00006 = $X_{3,t}$

VAR 00007 = $X_{3,t-1}$

$R_{X_{3,t},X_{3,t-1}} = 0.035$

Level of significance (2-tailed) = 0.723 > 0.01

∴ The suspicion of a first-order autoregression in Variable X_3 is overruled.

2. Durbin-Watson Test for Existence of First-Order Autocorrelation

Based on the regression results given in Section 4.4, Durbin-Watson Statistic = 2.256 Following Koutsoyiannis (2003: 214) specification and given that:

$d^* = 2.256$

$d_L = 1.48 (\alpha = .01)$

$d_U = 1.60 (\alpha = .01)$

It is concluded that there is no first-order autocorrelation in the entire estimation.

Response to Research Questions and Test of Hypotheses

1. Research Question 1 and Research Hypothesis 1

Due to the multicollinearity problem explained in Section 4.3, capital size had to be expunged from the model. As a result, an answer cannot be provided to Research Question 1. In a similar vein, Research Hypothesis 1 cannot be tested in this study.

2. Research Question 2 and Research Hypothesis 2

The regression results reported in Section 4.4 answers Research Question 2 and provides a base for the test of hypothesis two.

Following the estimates, insider lending is found not to be a significant determinant of bank distress in Nigeria. In addition, given that

∂_1 at the 0.05 significance Level = 0.234; $\alpha = .05$, and following the two-tailed specification, null hypothesis is not rejected, hence, there is a conclusion that insider lending is not a significant contributor to bank distress in Nigeria.

3. Research Question 3 and Research Hypothesis 3

The regression results reported in Section 4.4 answers Research Question 3 and provides a base for the test of hypothesis three as well. The result shows that bank distress is a significant function of loan quality. In the same vein, the null hypothesis is rejected with a conclusion that loan quality positively and significantly contributes to bank distress in Nigeria. The decision is premised on the fact that:

∂_2 Significance Level = 0.000; $\alpha = .05$, two-tailed

Research Question 4 and Research Hypothesis 4

The regression results given in Section 4.4, shows that the extent of government ownership is not a significant determinant of bank distress in Nigeria. It is concluded in the test of hypothesis four that no significant relationship can be established between government ownership and bank distress in Nigeria. The empirical basis for the decision is:

∂_3 Significance Level = 0.855; $\alpha = .05$, two-tailed

5. Conclusion

The study investigates the contributory effect of some determinants on the bank distress syndrome in Nigeria with particular attention insolvency rather than illiquidity as largely espoused in empirical literature. Empirical evidence emanating from the study reveal as follows:

- That insider lending is not a push-factor for bank distress in Nigeria
- That Loan quality significantly contributes to bank distress in Nigeria
- Extent of government ownership is not a significant determinant of bank distress.

The results differ markedly with Chen et al.,(1998)and others who held that ownership structure is one of the major variables that could be used to explain financial distress.Following the results of this study, there is the need for an inclusive approach to distress investigation and resolution as the causal factors are arguably multi-dimensional.

Aside due diligence in regulation by monetary authorities, credit procedures, such as loan documentation, loan securities, loan monitoring and adequate internal controls should be vigorously followed with the ultimate aim of stemming the tide of bank distress (Mamman and Oluyemi,1994). This is expedient not just for Nigeria but for developed, emerging and developing banking systems given the widespread contagion that goes with bank distress.

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