BANK FAILURE AND ECONOMIC DEVELOPMENT IN NIGERIA: AN EMPIRICAL APPROACH

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Abstract
This paper examines the effect of bank failure on Nigeria economic development using the OLS method for regression models on a sample data ranging from 2001 to 2010, findings showed that a percentage increase in non-performing loans hampered GDP by 1.57% while increase in interest rate decline the economy by 8.48%. The Granger causality test revealed that the monetary policy stimulated bank failure and fiscal policy through government expenditure increase the rate of non-performing loans which reduced the aggregate economic activity. Finally, the industrial production shrinks by 0.15% due to 1% increase in non-performing loans and period of banking failure had contagious effect on industrial output reducing it by 0.29% invariably undermining consistent economic development.
Key words: Bank failure, economic development, non-performing loans, interest rate, Nigeria.

1. INTRODUCTION

Bank failure remains a major threat to consistent economic growth that leads to development, but to what length does it affect economic activity? The Great Depression provided researchers the basis in establishing empirical characterization that occurred during business cycle. The impact caused by economic contraction prevalent during this phase originated due to several shocks resulting in liquidity preference increase among depositors who preferred holding more currency to demand deposits and other liabilities. To this end, capital squeeze created reduction in money supply that affected entrepreneurial financing leading to slowdown in economic activity (Friedman and Schwartz, 1963). But the degree of bank failure impact determines its classification as systemic and non-systemic. Indeed, it is emphatic to argue that the modern integration of financial market made the impact of the recent subprime mortgage crisis had immediate and inevitable influence on global economies creating a systemic shock.

In recent times, 439 banks have failed in the U.S from 2008 till date (FDIC report, 2012) likewise in Nigeria since the establishment of banking in 1892 through to the present period, a significant number of banks had failed. This sector was initially dominated by foreign banks such as the Bank of British West Africa now First Bank of Nigeria, Barclay bank now Union bank of Nigeria until local banks was licensed between 1920 through to 1930s. The rapid rate of bank failure that followed this period resulted in 21 from the 25 established indigenous banks failing leaving only 4 (Uzoaga, 1981). The main purpose of constituting local banks was to create loans accessible by SMEs but this was undermined by continuous financial distress which led to their failure (Brownbridge, 1998). The initial bank failures were attributed to lack of regulation and control, thus the establishment of the Central Bank of Nigeria in 1958. However, the institutional framework could not prevent the failing of banks. Financial distress continues to cause the liquidation of banks, 5 banks were closed in 1994, 17 distressed banks were took over by CBN in 1995 and 1 in 1996. The amendment of Bank and Other Financial Institutions Act (BOFIA) in 1991 saw the revocation of licences of 27 banks with effect from January 16, 1998 and 3 banks were closed in 2000. The 2005

banking sector reform swept away 13 additional banks and banks were reduced from 89 to 25 as at 2006. In 2009, 8 out of the 24 banks were declared insolvent due to huge non-performing loans, totalling in excess of N2.2 trillion ($14.67billion) which is equivalent to 5.2% of GDP likewise crashing the stock market capitalisation by 70% from N10.3 trillion in 2007 to N5.3 trillion in 2009. The critical question is 'Has bank failure played a pivotal role in under developing Nigeria economy over the years'? The concern about the economic constituent's variable which bank failure affect provided the basis for this research and previous empirical literature focus on developed countries leaving a gap in developing countries like Nigeria. Therefore, this paper investigates the degree to which bank failure has affected the Nigeria economic development focusing on economic variables from 2001 – 2010. This paper is organized into sections. Section 1 gives introduction to the paper; Section 2 discusses the recent banking crisis in Nigeria, Section 3 gives theoretical and empirical literature on bank failure; Section 4 describes the econometric methods; Section 5 reports the empirical results and analysis; and the last section summarizes and concludes.

2. RECENT BANKING CRISIS IN NIGERIA

The 2009 banking crisis was triggered by exogenous shock from the global economic and financial crisis of 2007. Eight banks out of the Twenty-four operating failed the stressed test in 2009 and were declared insolvent by the Central bank of Nigeria (CBN). The stock market capitalisation also crashed by 70% and the non-performing loan in the banking system reached an excess of N2.2trillion ($14.67billion). However, Central Bank of Nigeria injected N620billion into the banking sector to prevent systemic bank run. According to Sanusi (2010), the Nigeria banking sector has experienced several failures prior to this incident but he described this as a ''monumental fraud'' because owners and managers of these financial institutions constantly devised means by which the banks were defrauded. The antecedent of the crisis purported financial institutions engaging in foreign exchange trading, direct importation of goods using hoax companies and purchasing government treasury bills, banking licenses were easily obtained in order to trade in these non-core banking activities (Soludo, 2004). Soludo emphasized that the weaknesses of the financial institutions are evident in ''overdrawn positions with CBN, high incidence of non-performing loans, capital deficiencies, weak management and poor corporate governance''. Hence, the consolidation of the sector in 2006 with no regulatory and supervisory framework prepared it for failure. A description of the factors that led to the failure is explained below:

2.1 Macroeconomic Instability

The fluctuation in equilibrium price position threatens price stability both domestically and externally. The inflation rate monitors the domestic price level while the exchange rate remains a policy strategy used in maintaining external stability (Folawewo and Osinubi, 2006). External and terms of trade shocks tends to have large consequences on macroeconomic instability in small open economies because they relatively depend on imported goods. However, these countries export only few goods and rely on export earnings. The instability in export revenues is due to recurrent and sharp fluctuations in world demand and prices. The Nigeria economy and government expenditure has being aligned alongside oil prices, since the discovery of oil in late 1950s and it abundances in

1970s.The fluctuations in oil prices; however pose a major threat to the Nigeria economy. Oil prices between 2004 – 2008 increased from $40 to a record high of $147.02 per barrel, thus increasing government expenditure. The excess revenue derives from crude oil sales were shared among the three tier of government whereby increasing banks liquidity. Banking deposits and credit facility increased four times from 2004 to 2009, banking assets also grew on average at 76% per year since consolidation in 2006 (Sanusi, 2010). This excess liquidity derived from oil revenue and capital inflows were channelled to the Nigeria Stock Exchange in form of marginal loans and proprietary trading painted as loans. The Nigeria Stock Exchange market capitalisation increased from N2trillion in 2004 to N12trillion as at the close of 2007 and banking stocks market value also increased 9 times respectively. The Central Bank of Nigeria failed to regulate the increasing credit levels and over inflation of bank stock prices leading to the stock market crash in late 2009.

2.2 Disclosure and Transparency

Reporting among banks was falsified, manipulated, incomplete and late. This made supervision by the regulator (CBN) impossible, leaving investors with incorrect information to make investment decision. The lack of transparency subverts the ethics of good corporate governance. The regulator failed to enforce data quality in banks and banks even manipulated their financial report inclusive of stock prices through liaising with one another. The huge non-performing loans were classified as commercial papers and bank acceptances on their various balance sheets, through this loss were hidden (Sanusi, 2010). NDIC, however concluded that the decline in asset quality coupled with large provision for non-performing loans and high exposure to the capital market in form of share loans and margin loans resulted in the collapsed (NDIC report, 2009).

2.3 Weak Corporate Governance

The NDIC examination report 2009, revealed weakness in banks corporate governance as the main problem that led to the bank failure, they emphasized poor risk management, weak board and management oversight, inaccurate financial reporting, abuse and fraudulent use of subsidiaries poor book keeping practices, noncompliance with banking laws, rules and regulations and non performing insider – related credits as the channel of weak corporate governance (NDIC report, 2009). According to Sanusi (2010), the tenets and processes of banking were not strictly followed by the banks CEOs. After the consolidation process in 2006, the misconduct among specific banks CEOs were left unchecked by the CBN. The undue advantage of un-secured loan received by most banks Board pave way for executive management manipulation. The Board failed to curb the excessiveness of the banks management. ''The extent of insider abuse (trading) in several banks, CEOs set up special purpose vehicles to lend money to themselves for stock price manipulation or the purchase of estates all over the world. 30% share capital of a designated bank was purchased with customer deposits while another used 80% of its depositor's fund for its IPO'' (Sanusi, 2010). Depositor's funds were subsequently erased due to fall of the capital market and trillions of Naira was lost.

3. LITERATURE REVIEW
3.1 Theoretical Literature

The Keynesian economic theory extensively explore saving and investment without seriously considering financial intermediation. However, Keynes explanation on moral hazard of lending remains a focal point in explaining economic contraction. According to

Keynes, changes in lending rate and credit availability or surplus determines the level of credit contraction for the Banking System. Moreover, the supply of credit in free competitive market depends on correlation of quantity and price. But in practice, the conditions of a free competitive market for bank-loans are imperfectly fulfilled due to credit rationing by banks to borrower, the amount lent depends on the security, interest rate offered, client-firm purposes and established banking relationship. Although a fringe of unsatisfied clients who are unable to facilitate credit but to whom the bank would be quite ready to lend if it were to find itself in a position to lend more. The existence of this unsatisfied fringe allows the banking system a means of influencing the rate of investment supplementary to the mere changes in the short-term rate of interest. Assuming recession or sequence of bank failures, securing short term loans depends on established relationship between investors and financial institutions which without hinders firms' investment.

Consequently, macroeconomic development pressurize banks in creating banking crises. Adverse macroeconomic shock threaten banks liquidity by exacerbating the inability of bank borrowers meeting debts repayment obligation. Sudden changes in aggregate spending or international capital flows may subvert the ability of domestic bank to continue facilitating lending obligations, thereby generating crisis. Furthermore, an unexpected upsurge in bank deposits demand and foreign capital create bank lending opportunities probably resulting in large doubtful loans and vulnerability to small shock (Gavin and Hausmann, 1996).

Chang and Velasco (1999) also argued that bank run could be triggered when the demand deposits and foreign short-term debt exceeds bank liquidation value. They developed theoretical model of the financial sector illiquidity for an open economy which major on capital inflow and external debt financing. They concluded that the more insolvency the banking system undergo, the more the fragility it would experience from external shocks. Oviedo (2003) however based is argument on recessions, emphasizing that its impact is adequate to produce insolvency of the banking system. Bank dependent firm required loan in facilitating projects but the risk associated with projects is not entirely diversifiable thus economic downturns tend to trigger a large ratio of poor project returns, depreciating the worth of banks' portfolio. Nier and Zicchino (2005) also concur that losses suffered by banks during economic downturns are generated by provision made for loan-loss under prudential guidelines. They emphasized the inability of banks issuing new securities during recession are largely due to cost and uncertainty of viable return. They concluded that banks would rather cut lending than issuing new securities in order to retain its solvency.

3.2 Empirical Literature

There is a wide range of literature between bank failure and economic growth that cut across countries. For instance, Bernanke (1983) investigates the influence of financial crisis on GDP during the U.S Great Depression. The study was based on an argument that the contraction in money supply was insufficient in explaining the financial crisis and fall in GDP. This empirical work focused on the non-monetary channel through which supplementary effect of the financial crisis affected GDP, using regression model in analysing the effects of money and price shocks on real GDP. He found that the money shock, price shock and non-monetary variables (failed businesses liabilities and failed banks deposit) including the lagged differences were significant. However, the non-monetary outcome on the financial system resulted in short run determination of GDP. He concluded that the proxies (failed businesses liabilities and failed banks deposit) captures the nonmonetary effect and forecast the subsequent decline in output. However, Anari and

Kolari (1999) empirical research employs different methodology compared to Bernanke's. The vector autoregression (VAR) and co-integration model were used to examine the non-monetary effects during the Great Depression. They employed the industrial production index, wholesale price index, nominal money stock, failed business and failed bank deposits liabilities as the explanatory variables, analysing based on monthly data from July 1929 to August 1933. They found that the actual GDP was greater than the expected GDP by 17.6 units, resulting in 30.3 units positive own shock in GDP including

5.9 and 8.0 unit negative shocks in prices and money supply respectively. While the unit shocks in failed businesses liabilities and failed banks deposit indicate insignificant level of nonmonetary effect. They further ascertain that the negative shocks in prices especially money supply contributed to GDP decline. However, the failed businesses liabilities and banks exerted no impact on the GDP declines during 1929 to 1932 but evidence shows during post-Depression that deposit of failed banks affected GDP. They concluded that ''when bank failures occurred for an extended period of time, the repeated shocks from the banking sector eventually began to adversely affect the real economy''. According to Calomiris and Mason (2003), the decline in economic activity during this period resulted from reduced bank loan supply which subsequently decreased the amount of income and investment at the state and county level.

Recent studies focus on client firms of failed banks, Joeveer (2004) used the logit model to study the performance of 119 client firms of the failed ''Land Bank of Estonian'' from 1996 through 2000. Analysis shows 19% illiquidity rate for firms founded between 1996 – 1997 compare to those established in 1996, while bank dependent firms have 13% probability of bankruptcy in relation to independent firms. He concluded that the certainty of losses in bank-dependent firm through decrease in liquid assets and liquidity squeeze are generated by insolvency experienced by the failed banks which serves as exogenous shocks to client firms. Kang and Stulz (2000) also state bank dependent firms performed poorly during the Japanese banking crisis in 1990 -1993. They attributed the limited supply of credit and increase in the cost of fund to losses made by bank dependent firm.

Hori (2004); Brewer et al (2002) also examined the effect of Japanese banking failure on its client's profitability. Hori findings were however not consistent with major proposition that bank failure adversely affects client firms. He analysed over 10,000 firms including those of failed Hokkaido Takushiku Bank (HTB) from 1996 to October 2000 using sample selection method and juxtapose the profitability of client's firm with independent firms. The profit of client and independent firms were both statistically insignificant. Both study concluded that though firm's quality and bank mode of liquidation serves as insulator to client's firm, the market value of client's firm do plunge downward upon the notice of bank failures. Brewer et al (2002), however analysed 1,000 firms and the failed HTB in 1997, the long Term Credit Bank of Japan and the Nippon Credit Bank in 1998. Ongena et al (2003) however found that the near-collapse of Norwegian banking system in 1998-1991 resulted in inconsequential and temporal changes in stock prices of dependent firms.

Chava and Purnanandam (2006) also found evidence that fluctuations in financial soundness of the banking sector influence bank-dependent borrowers' performance. The Russian banking crisis and Brazilian capital flight of 1998 was used as exogenous shock to examine the effect which U.S bank health have on bank-dependent firm (stock market performance). They used event-study methodology to approximate the market model beta subsequently adjusting the returns for all firms during the 16 days. They found that though the mean and

median of both bank-dependent firm and external debt firms are statistically significant, the median (mean) of bank-dependent firms returned 5.57% (4.82%) lower compared to firms which have access to public securities market. They concluded that the harmful shock to the banking sector remain imperceptible to public securities market while losses are articulated to bank dependent firms.

Levintal (2008) studied the effect of banking shock by analysing the banking sector of 30 OECD countries over the period of 1979 – 1996 using the multi-linear log model. He looked at the disparity in banking profit, capital, reserves and its effect on the real economy. He found that a percentage (1%) decrease in bank ROA tend to reduce the aggregate GDP by 0.3% in the following year while 1 standard deviation decline in Reserves will cause GDP to decline by 0.15%. He concluded that the adverse effect of banking shock creates large externalities in countries with larger banking sector (United .States, United Kingdom, France etc), the impact of bank reserves on GDP growth is less compared to bank profit and the ''variation in bank capital do not show any significant effect on the real economy''. Banking shock affects investment firms, thus investment tend to exhibit higher sensitivity to banking shocks.

Kupiec and Ramirez (2008) also argued that bank failure generates negative externalities that reduce economic growth, but poor economic growth does not trigger bank failure. They used data from pre- Depression era 1900 to 1930 to study whether bank failure affected U.S economic growth. The time frame measured depicts government policies stability but also marred with distress in the banking sector majorly in 1901, 1907 and 1920s. They employed vector auto-regression analysis (VAR) to evaluate the impact of bank failure on industrial production and GDP growth rate. An increase of 0.12% in the share failed banks liabilities resulted in 17% point reduction in industrial production growth rate causing the real GNP growth to decline by 4%. Likewise, Wagner (2009) concur that externalities arising from bank failure do not only collapse the payment system but generate loss of consumption reducing consumer's confidence.

4. METHODOLOGY

4.1 Model Specification - Multiple Linear Logarithmic Models

The multiple regression models with m explanatory variables are written as:

$$Y = \alpha + \beta_1 + \beta_2 X_2 + \ldots + \beta_m X_m + e$$

For ith observation on the dependent and explanatory variables, the above model is express in multiple log-linear forms as: $\ln Y_i = \alpha + \beta_1 + \beta_2 \ln X_{2i} + \beta_3 \ln X_{3i} + \ldots + \beta_k \ln X_{ki} + e_i$

where β_1 and β_2 are partial slope elasticity coefficients and β_2 measures the elasticity of Y with respect to X_2 (likewise β_3 and X_3 respectively) ,holding the influence of X_3 constant; this measure the percentage change in Y for a percentage change in X_2, holding the influence of X_3 constant (Gujarati, 2006).

In other to achieve the hypothesis "Banking failure reduces Nigeria's industrial and economic growth'', the empirical model is inclusive of the non-performing loans as an independent variable to ascertain its contagious effect on economic growth. Previous empirical studies have employed the share liabilities of failed banks as a variable to indicate the negative impact of bank failure on economic growth (Bernanke 1983; Ramirez and Shively, 2005; Kupiec and Ramirez, 2008). However, findings revealed 63.41% strongly

agreed that non-performing loans generates banking failure in Nigeria (Babalola, 2010). Sanusi (2010) also argued that the asset quality of banks declined as a result of huge non-performing that was classified as commercial paper on failed bank balance sheet. Thus, ''the immediate consequence of large amount of NPLs in the banking system is bank failure'' (Hou, 2007) therefore, this study employs it as vital explanatory variables.

An econometrics model of the real output growth rate as the dependent variable that measure economic growth as a function of money supply, interest rate, industrial production index, cash reserve ratio and non-performing loans is develop as below:

$$\text{Log GDP}_t = \alpha_o + \alpha_1 \log \text{MS}_t + \alpha_2 \log \text{INR}_t + \alpha_3 \log \text{IIP}_t + \alpha_4 \log \text{CRR}_t + \alpha_5 \log \text{NPL}_t + e_t \dots (1)$$

where log GDPt is the logarithm of the real GDP growth rate, log MSt is the logarithm of the money supply represented by demand deposits at deposit money banks, log INRt is the logarithm of the interest rate over time, log IIPt is the logarithm of industrial production index, log CRRt is the logarithm of the cash reserve ratio, log NPLt is the logarithm of the non-performing loans over the sample time. et is the residual error term which will capture any variations in the model that cannot be attributed to independent variables used in the equations.

Commercial banks fund the expansion of assets through loan creation; however depositors are the main funding sources of these assets. As loan grows likewise the non-performing asset portfolio, when banks are in poor condition ridden by high level of NPLs, the willingness for the banks to expand loans to firm is decreased, which implies that loan growth will not be consistent with the expansion of deposits (Hou,2007). A model of industrial production index as a function of NPLs and period of bank failure is developing:

$$\text{Log IIP}_t = \alpha_o + \alpha_1 \log \text{INR}_t + \alpha_2 \log \text{CRP}_t + \alpha_3 \log \text{INF}_t + \alpha_4 \log \text{NPL}_t + \alpha_5 \log \text{GDP}_t + \alpha_6 \text{DUM}_t + e_t (2)$$

Where log IIPt is the logarithm of the industrial production index, log INRt is the logarithm of interest rate, log CRPt is the logarithm of the total banking credit to the private sector, log INFt is the logarithm of the inflation rate, log NPLt is the logarithm of the non-performing loans over the sample time, log GDPt is the logarithm of the growth rate of GDP over this period, DUMt represent dummy variables, we set Dummyt = 1, for period with banking failure while Dummyt = 0 as period with no banking failure and et is the residual error term.

4.2 Granger Causality Tests

Regression analysis tends to answer whether the explanatory variables cause the change in dependent variable. Economic theory helps in categorizing variables as dependent and explanatory but the possibility of bias is vicious likewise the determinant of the variable causing increase influence on dependent variable (Koop, 2005). Since Granger Causality could be run on both direction and ascertain the possible relationship between several important variables, hence it relevant to this study.

A time series R is said to Granger-cause S if S helps in predicting R, or equivalently if the coefficients of the lagged of R are statistically significant. This test would determine the present and lagged values of how one variable affect another respectively.

The equations are expressed below:

R(t) =∑j=1pA11, j R1(t−j)+∑j=1pA12,jS1(t−j)+E1(t).. (3)

S(t) =∑j=1pA21, j R1(t−j)+∑j=1pA22,jS1(t−j)+E2(t).. (4)

Where E1 and E2 represent the residual error for each time series, R1 and S1 signifies the first differenceof the predictive value.

The hypothetical testing is:

Ho: R does not Granger Cause SHo: R does not Granger Cause S

OR

Hi: S does not granger cause RHi: S does not granger cause R

Ho representing null hypothesis which we accept if different level of significance is not fulfilled, whileHi represent alternative hypothesis.

4.3 Data Sources

The real GDP growth rate and GDP per capita data was collected from the World Bank database and its range from 2001 to 2010. The consumer price index serves as a proxy for inflation rate which was obtained from the IMF World Economic Outlook database for the same time period. The money supply, interest rate, cash reserve ratio, banking credit to private sector and cash reserves was sourced from the Central bank of Nigeria annual report for the year 2005 and 2010. The non-performing loans, unemployment rate, government expenditure, numbers of banks and years of their failure were obtained from different publications from the Central Bank of Nigeria.

5. EMPIRICAL RESULTS AND ANALYSIS

5.1 Multiple Linear Logarithmic Analysis

The application of data into the two specified model generated subsequent result presented in the Tables below. The summary statistics indicate that the series is normally distributed with the Jarque-Bera statistics probability values greater than the benchmark of 0.05 (values range from 0.6 to 1.4 > 0.05) and no essential variables omitted from the endogenous variables.

Table 5.1: Summary Statistics of Equation 1

	LOG(GDP)	LOG(MS)	LOG(INR)	LOG(IIP)	LOG(NPL)	LOG(CRR)
Mean	1.673683	14.27225	2.931001	4.884956	13.06508	1.400199
Median	1.824549	14.30391	2.884801	4.799914	12.78549	1.435085
Maximum	2.360854	15.30892	3.210844	5.056246	14.99969	2.360854
Minimum	0.405465	13.07744	2.740840	4.768988	11.81847	0.000000
Std. Dev.	0.577560	0.874592	0.154991	0.123148	1.129598	0.854930
Skewness	-1.228742	-0.070812	0.832139	0.328182	0.938327	-0.416149
Kurtosis	3.697884	1.467774	2.463648	1.283225	2.450562	2.006089
Jarque-Bera	2.447352	0.887916	1.146561	1.266799	1.433893	0.630218
Probability	0.294147	0.641492	0.563673	0.530784	0.488241	0.729709
Sum	15.06315	128.4503	26.37901	43.96460	117.5857	12.60180
Sum Sq. Dev.	2.668607	6.119284	0.192178	0.121324	10.20794	5.847246
Observations	9	9	9	9	9	9

The OLS results of model 1 showed a high value of R-squared that is well fitted to the regression line. R- squared value is 0.94 while the adjusted R-squared is 0.8446. This model also shows variables whichexert influence on GDP.

Table 5.2: Regression result of model 1

Dependent Variable: LOG(GDP)				
Method: Least Squares				
Date: 07/08/12 Time: 00:35				
Sample: 2001 2010				
Included observations: 9				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	58.04926	23.14408	2.508168	0.0871
LOG(MS)	-1.962558	0.773569	-2.537017	0.0849
LOG(INR)	-8.483013	1.873216	-4.528583	0.0201
LOG(IIP)	-5.268130	2.529073	-2.083028	0.1286
LOG(NPL)	1.569781	0.413742	3.794106	0.0321
LOG(CRR)	1.230923	0.402167	3.060724	0.0550
R-squared	0.941736	Mean dependent var		1.673683
Adjusted R-squared	0.844630	S.D. dependent var		0.577560
S.E. of regression	0.227657	Akaike info criterion		0.112764
Sum squared resid	0.155483	Schwarz criterion		0.244247
Log likelihood	5.492560	Hannan-Quinn criter.		-0.170976
F-statistic	9.698029	Durbin-Watson stat		2.679786
Prob(F-statistic)	0.045272			

Note: P-value below 5% signify rejection of null hypothesis. Source: Estimation generated by Eviews 6.0

From the above result we estimated the prediction equation as:
LOG GDP $_t$ = 58.04926 – 1.962558*LOG MS $_t$ – 8.483013*LOG INT $_t$ – 5.268130*LOG IIP $_t$ +1.569781*LOG NPL $_t$ + 1.230923*LOG CRR $_t$

The non-performing loans (NPLs) and the interest rate (INR) showed a statistical level of significance in explaining the variation experienced by the GDP growth rate. The P-value on which basis we can reject the null hypothesis that non-performing loans does not affect economic growth is 0.0321 (3.21%), since the P-value is less than 5% (benchmark) we reject null hypothesis and conclude that holding all other variables in the model constant, non-performing loans in the Nigeria banking sector influences economic growth (GDP) negatively but the sign of the coefficient is positive and significant. While theoretical ideas emphasize that non-performing loan adversely affect GDP as provisions are made for loan losses under the prudential guideline, thus restricting banks from further lending. Moreover, the market imperfection in Africa, previous banking crises, inconsistencies in government policies in transition economies and several banking reforms might have played a major role in the distortion of finding.

The P-value of the interest rate also show a level of significant at 2.01%, explicitly stating an increase interest rate by 1% reduces real GDP growth rate by 8.48%.

The interest rate correlation with the real GDP growth rate is in conformity with economic

theory. Increase in interest rate reduces borrowing as organization and businesses tend to reframe from acquiring additional cost of lending.

Table 5.3: The Correlation Matrix for Model 1

	CRR	GDP	IIP	INR	MS	NPL
CRR	1.000000	-0.358956	0.714149	0.788078	-0.863086	-0.677926
GDP	-0.358956	1.000000	-0.153893	-0.639784	0.383541	0.349051
IIP	0.714149	-0.153893	1.000000	0.565949	-0.806886	-0.472844
INR	0.788078	-0.639784	0.565949	1.000000	-0.633769	-0.240544
MS	-0.863086	0.383541	-0.806886	-0.633769	1.000000	0.781658
NPL	-0.677926	0.349051	-0.472844	-0.240544	0.781658	1.000000

The endogenous variable is fairly correlated with the explanatory variables in excess of 0.383 in regard money supply. The correlation value between Industrial Production Index and Credit Reserve Ratio is 0.714 while Non-performing loan & Money supply, Interest rate & CRR are 0.78 respectively. The model exhibits high degree of correlation among the exogenous variables which might have originated as a result of government control and influence on the financial and credit market. Weeks (2010) emphasize the consequential effect of monetary policy in sub-Saharan Africa, stating that the inflation rate or the real exchange rate only compile public debt burden on borrowers who seek to maintain the high real rate of interest. He further gave an estimation of the median ratio of domestic formal sector credit to GDP of 46 Africa countries as 13% with only six having a ratio above 30% (Nigeria inclusive). The revised model to empirically proof whether banking failure has a contagion effect on Nigeria's industrial production is given by model 2.

Table 5.4: Summary Statistics of Equation 2

	LOG(IIP)	LOG(INR)	LOG(CRP)	LOG(INF)	LOG(NPL)	LOG(GDP)	F
Mean	4.884956	2.931001	14.58288	2.431176	13.06508	1.673683	0.333333
Median	4.799914	2.884801	14.42439	2.463172	12.78549	1.824549	0.000000
Maximum	5.056246	3.210844	16.13209	2.803057	14.99969	2.360854	1.000000
Minimum	4.768988	2.740840	13.54758	1.881905	11.81847	0.405465	0.000000
Std. Dev.	0.123148	0.154991	0.919645	0.289323	1.129598	0.577560	0.500000
Skewness	0.328182	0.832139	0.518701	-0.595634	0.938327	-1.228742	0.707107
Kurtosis	1.283225	2.463648	1.950825	2.530213	2.450562	3.697884	1.500000
Jarque-Bera	1.266799	1.146561	0.816364	0.614933	1.433893	2.447352	1.593750
Probability	0.530784	0.563673	0.664858	0.735308	0.488241	0.294147	0.450735
Sum	43.96460	26.37901	131.2459	21.88059	117.5857	15.06315	3.000000
Sum Sq. Dev.	0.121324	0.192178	6.765975	0.669663	10.20794	2.668607	2.000000
Observations	9	9	9	9	9	9	9

The Jarque-Bera statistics also indicate that the series data are normally distributed since the P-values are greater than 0.05 and the addition of explanatory variables would not be required.

Table 5.5: Regression result of model 2

Dependent Variable: LOG(IIP)		
Method: Least Squares		
Date: 07/08/12 Time: 01:01		

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Sample: 2001 2010				
Included observations: 9				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.142187	0.726875	-0.195614	0.8630
LOG(INR)	1.318922	0.155243	8.495858	0.0136
LOG(CRP)	0.146709	0.024416	6.008618	0.0266
LOG(INF)	0.094223	0.038781	2.429590	0.1357
LOG(NPL)	-0.145433	0.015822	-9.191717	0.0116
LOG(GDP)	0.357174	0.041090	8.692377	0.0130
F	0.285491	0.035667	8.004245	0.0153
R-squared	0.987393	Mean dependent var		4.884956
Adjusted R-squared	0.949573	S.D. dependent var		0.123148
S.E. of regression	0.027654	Akaike info criterion		-4.286596
Sum squared resid	0.001530	Schwarz criterion		-4.133199
Log likelihood	26.28968	Hannan-Quinn criter.		-4.617626
F-statistic	26.10730	Durbin-Watson stat		2.792252
Prob(F-statistic)	0.037346			

$$\text{LOG IIP}_t = -0.142187 + 1.318922 \cdot \text{LOG INT}_t + 0.146709 \cdot \text{LOG CRP}_t + 0.094223 \cdot \text{LOG INF}_t - 0.145433 \cdot \text{LOG NPL}_t + 0.357174 \cdot \text{LOG GDP}_t + 0.285491 \cdot F$$

This model shows a high level of correlation, $r^2 = 0.9873$ meaning 98.7% of the variation in the log of Industrial production index (IIP_t) is explained by the variation in the log of the explanatory variables. Interpreting the result on the basis of the P-value, the interest rate (p-value $0.0136 < 0.05$), credit to private sector (p-value $0.0266 < 0.05$), non-performing loans (p-value $0.0116 < 0.05$), real GDP growth rate (p-value $0.0130 < 0.05$) and banking failure period dummies (p-value $0.015 < 0.05$) all are statistically significant at the 5% level. The relevant of each explanatory variable are signify by their coefficient, 1% increase in production of additional unit of goods by firms resulted in interest rate/cost of fund/lending increased by 1.318%, likewise a percentage increase in credit to private sector raised industrial production by 0.147%. As firms produce more, the requirement for their working capital can only be provided by banks. According to Weeks (2010), banks only lend money to government securities in Africa because of manipulated interest rate.

If industrial sector is highly productive, banks will prefer to grow their asset portfolio with viable higher returns project from the sector rather than exposure to government bonds. With the increasing figures of non-performing loans (1%) in the banking sector, bank-dependent firm prospect of expanding production shrink by 0.145%.

Hou (2007) stated NPLs as one of the major force impeding banks from providing credit, high NPLs station banks to engage in internal consolidation to improve asset quality rather than lend. This loan reduction might aggravate business failure which in turn trigger another set of banking failure as firms' cannot meet their financial obligation in term of loan repayment on time. A liquidity squeeze arises with a depressed economic growth; higher level of NPLs is generated making more banks to suspend lending, further diminish production and aggregate demand. Koivu (2002) also found that non-performing loan is negatively correlated with economic growth, stating that for each percentage increase in NPLs, the economic shrinks by 0.11%.

Economic growth additional improves the goods and services produce in the industrial sectors. The correlation signifies economic growth stimulating industrial production, 1%

increase in GDP will produce 0.357% increase in industrial production index. The model picked the relevance of the dummy variable where we set banking failure period to be 1 and 0 for non-failure. The correlation between the two variables indicates bank failures transmit contagious effect on industrial production. A percentage failure in banking sector (1%) had 0.285% contagion effect on industrial output. These findings aligned with the work of Kupiec and Ramirez (2008), who also found that bank failure prior to the Depression era resulted in 17% point reduction in the growth rate of industrial production and 4% declined in real GNP growth. The correlation matrix in Table 5.6, only give 0.60 relations between interest rate and industrial production index. While others are readily low; erasing the notion of multicollinearity.

Table 5.6: Correlation Matrix for Model 2

	Log(IIP)	Log(INR)	Log(CRP)	Log(INF)	Log(NPL)	Log(GDP)	F
Log(IIP)	1.000000	0.602381	-0.543152	0.157435	-0.520941	-0.308959	0.319458
Log(INR)	0.602381	1.000000	-0.729877	0.343547	-0.405395	-0.762177	0.346782
Log(CRP)	-0.543152	-0.729877	1.000000	-0.229122	0.418483	0.458297	-0.505470
Log(INF)	0.157435	0.343547	-0.229122	1.000000	0.109029	-0.307905	0.239875
Log(NPL)	-0.520941	-0.405395	0.418483	0.109029	1.000000	0.494380	0.151175
Log(GDP)	-0.308959	-0.762177	0.458297	-0.307905	0.494380	1.000000	-0.425616
F	0.319458	0.346782	-0.505470	0.239875	0.151175	-0.425616	1.000000

Basis on the level of significant of the explanatory variables, we reject null hypothesis and assert that interest rate, banking credit to the private sector, non-performing loans, GDP and the seasonal failures of banks influence industrial production in Nigeria.

5.1 Granger Causality Analysis

The Granger causality test is used to further analyse the set of variables. The result of one variable granger causing another are summarised below:

H_0: R does not Granger cause S, H_0 is rejected for the following R and S variables.

At 1% level of significance, the F-statistics is large and we can easily conclude $R^2 = 0$. The macroeconomics channel has been identified as means of contagious generation for banks.

Table 5.7: Result of Granger Causality Test

Variables (Null Hypothesis)	Lags	F-statistic	P-value
GDPC does not Granger cause CR	2	13.2566	0.0324
GDPC does not Granger cause CRP	2	12.9246	0.0335
INF does not Granger cause GDP	2	14.8746	0.0277
LUN does not Granger cause CR	1	24.4393	0.0026
CR does not Granger cause LUN	1	14.6548	0.0087
CR does not Granger cause CRP	1	23.9534	0.0027
MS does not Granger cause CR	1	16.9133	0.0063
NPL does not Granger cause CR	1	7.94014	0.0304
CR does not Granger cause NPL	1	14.1228	0.0094
EX does not Granger cause CRP	1	34.1348	0.0011
GDPC does not Granger cause CRP	1	9.52388	0.0215
CRP does not Granger cause LUN	1	9.58128	0.0212
MS does not Granger cause CRP	1	15.6373	0.0075
NPL does not Granger cause CRP	1	12.5006	0.0123

CRP does not Granger cause NPL	1	20.3997	0.004
EX does not Granger cause NPL	1	7.75315	0.0318
MS does not Granger cause LUN	1	13.3651	0.0106
MS does not Granger cause NPL	1	19.7801	0.0043

Where GDPC = GDP per Capita, CR = Capital and Reserves, CRP = Banking credit to private sector INF = inflation, GDP = Gross Domestic Product, LUN = Unemployment, MS = Money Supply, NPL = Non-Performing loans, Ex = Government Expenditure. Since non-performing loans can be attributed to failures of most banks in Nigeria, monetary policy medium continues to aggravate banking failures. The increase in inflationary trends granger cause economic growth, according to Fatukasi (2011), the continuous increase in budget deficit, money supply, interest and exchange rate account for 72% pressure on Nigeria inflationary trend which reduces people's standard of living.

Money supply Granger Cause non-performing loans, since Central Banks are unable to directly curtail money supply, banks increasingly continue to create more risky asset portfolio leading to large non- performing loans.

The statistical significance of these variables made us to reject null hypothesis (p-value = 0.0043 < 0.01). While the significance level of Credit to private sector also Granger cause non-performing loans (p-value

= 0.004 < 0.01), this however empirical corroborate Sanusi (2010) explanation of the 2009 banking failure. As the export earnings from oil grew from $40 - $147.02 in 2004 – 2008, government expenditure (p-value = 0.0318 < 0.05) increase with excess revenue (money supply) increasing bank liquidity. Banking deposits and credit facility increased four times from 2004 to 2009, banking assets also grew on average of 76% per year since consolidation in 2006.

The Granger test also revealed dual causality between capital & reserves and non-performing loans implying that fluctuation in monetary policy either increase or decrease bank liquidity and asset. Fofack (2005) emphasises that ''economic contraction and cyclical downturns may negatively affect banks portfolio, possibly leading to a deterioration of asset quality and accumulation of impaired loans''. Invariably, banking crisis and upsurge in non-performing loans have contributed to economic downturns while monetary policy will continue to stimulate banking failure.

6. SUMMARY AND CONCLUSION

This paper investigates the adverse effect and channel which banking failure has thwarted Nigeria economic development. The banking industry was analysed in relation to failure between 2001 to 2010 using the Ordinary Least Square model (OLS) to ascertain the linkage between the dependent (Gross Domestic Product, Index of Industrial Production) and independent (Inflation rate, Interest rate, non- performing loans, money supply, banking credit to the private sector and period of failure as dummy variables) variables. The result suggests the non-performing loans and interest rate explained the variation in GDP between the time periods. The percentage increase in non-performing loans hampered economic growth by 1.57% while the increase in interest rate caused the economy to decline by 8.48%. This study also assessed the impact of banking failure on industrial production using the OLS method to further examine whether the stimulation of banking credit to private sector during this period enhanced growth. Evidence also suggest that the non-performing loans, interest rate, banking credit to private sector, GDP and period of banking failure explained fluctuation in Nigeria industrial growth. These explanatory variables showed high

level of significance in relation to industrial production index. The non-performing loans gave P-value of 0.0116 with correlation coefficient of -0.145 representing 1% increase in non-performing loans in the banking sectors caused bank-dependent firms' prospect of expanding production to shrink by 0.145%. The interest rate also increases by 1.318% with every additional unit of production input. The remediation to stimulate economic growth during the crisis showed that a percentage increase in credit to private sector increased industrial production by 0.147%. The model picked the correlation between banking failure and industrial production estimating a percentage failure in the banking industry caused contagious effect on industrial output shrinking it by 0.285%.

Furthermore, the study employs Granger Causality Test to ascertain the veracity of the explanatory variable causing the fluctuations evident in GDP and industrial production. The analysis revealed that macroeconomic channels exert shock on the banking industry. The rate of money supply (MS), cash and reserves (CR) Granger cause non-performing loans with P-value of 0.0318, 0.0094 respectively. The monetary policy played a crucial role in money supply reduction which affects bank's ability to create new money through loan facilitation to firms; this contraction in monetary policy reduces investment, output level and employment. The implication of these findings is that, monetary policy and macroeconomic channel serves as avenue of banking failure while increased in non-performing loans in the sector has been undermining industrial production and Nigeria economic growth. Hence, monetary and fiscal policy should complement each other so as to check for counteracting variation. However, ensuring an increase in price stability would help in curbing inflationary trends and policies channelling loanable funds towards productive sector especially small and medium enterprises likewise viable project should be encouraged to secure future economic development.

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