

MACROECONOMIC ANALYSIS OF THE RELATIONSHIP BETWEEN INTEREST RATE, ECONOMIC GROWTH AND BANK LENDING IN NIGERIA

Lucky E. Ujuju¹ and Dr. Lyndon M. Etale²

¹Department of Banking and Finance, Delta State Polytechnic, Ozoro, Delta State, Nigeria

²Department of Finance and Accountancy, Faculty of Management Sciences, Niger Delta University, Wilberforce Island Bayelsa State, Nigeria

ABSTRACT: *This study examined the relationship between interest rate, economic growth and bank lending in Nigeria. Secondary time series panel data on the study variables were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin for the period 1985 – 2014. The study employed Ordinary Least Squares (OLS) technique to analyze data. The study found that interest rate had negative relationship with bank lending in Nigeria. While economic growth had positive correlation with bank lending in Nigeria. The study recommended a policy shift towards infrastructural development and an increased productive base of the nation in order to improve the financial sector performance by stabilizing the macroeconomic instruments. This it is hoped would not only help in enhancing the profitability of banks in the country but would also improve the standard of living of the Nigerian people.*

KEYWORDS: Bank Lending, Economic Growth, Interest Rate

INTRODUCTION

Banks are globally known as major actors in lubricating the economy through their intermediation role. Interestingly, this role constitutes a major source of their income and a means of distributing income and facilitating the payment system. Banks' income is generated from the spread between lending and deposit rates relative to the volume of loans granted. The volume of loans granted by a bank at any point in time is a function of its internal characteristics such as size, deposit base, liquidity, credit policy and other internal and external factors, which may be relatively within the control of the bank. Though these factors or policies are internal, they, however, to a large extent mimic the general macroeconomic environment, such that the general loan behavior of banks will be a reflection of the signals from the aggregate economy.

Expectedly, if they perceive a stable macro environment they form an expectation that the borrowers will be able to pay back because of their ability to predict the economy more accurately and possibly earn a good return on their investment projects. Therefore, since banks do not operate in a vacuum, their overall lending behavior may generally be influenced by the environmental factors particularly the regulatory and macroeconomic factors. The regulatory environment is more stringent and must be observed but the economic environment is perhaps the more challenging since it affords them the opportunity to exercise their discretion at least relatively, in a manner that will impact positively on their business in the long run.

The economic environment is a systematic risk component that affects every participant within the economy. The general performance of the economy is reflected by the macroeconomic aggregates including the gross domestic product (GDP), employment level, industrial capacity utilization, inflation, money supply and exchange rate. Banks therefore adjust their lending

behavior in response to the signals from these factors, such that positive signals make banks become more favorably disposed to lending and vice versa. Thus, banks' loan portfolio including volume, tenor and structure are generally influenced by their expectations of the performance of economy both in terms of stability and quantum/level of performance. As indicated by Tatavera, Tsapin and Zholud (2006) banks make out more loans during periods of boom and reduced level of macroeconomic uncertainty and curtail lending when the economy is in recession. This finding deserves further investigation in Nigeria especially in the wake of frequent macroeconomic instability in the Last two decades.

There have been studies bothering on lending behavior and macroeconomic instability, which are internationally dominated. Local literature is scarce in this area because of limited attention. As observed by Baum, Mustafa and Nestihan (2005) a very limited attention has been paid to this area of study even in the developed economies. Also, the literature so far reviewed showed a lack of consensus in the findings of past researchers, indicating the existence of a research gap. Therefore, this study examining the relationship between interest rate, economic growth and bank lending in Nigeria attempted to fill the existing research gap.

The rest of the paper is structured as follows: Section two provides the review of related literature while the methodology adopted for the study is presented in section three. Section four dwells on the findings and discussion, and finally the conclusion and recommendations are presented in section five.

REVIEW OF RELATED LITERATURE

Malede (2014) examined the determinants of commercial bank lending in Ethiopia, using time series panel data from selected banks for the period 2005 – 2011. He employed OLS technique to the study variables such as bank size, credit risk, gross domestic product, investment, deposit, interest rate, liquidity ratio and cash reserve requirement. The results revealed significant relationship between bank size, credit risk, gross domestic product, liquidity ratio and commercial bank lending, while deposit, investment cash reserve requirement and interest rate had no effect on bank lending in Ethiopia. In a similar study, Tomak (2013) investigated the effect of bank size, deposit, interest rate, inflation and gross domestic product on bank lending in Turkey, using data collected from selected banks for the period 2003 – 2012. The study employed Breusch-Pagan/Cook-Weisberg test to analyze data. The results indicate that bank lending in Turkey depended on bank size and inflation rate.

Tatavera, Tsapin and Zholud (2006) investigated the macroeconomic uncertainty and bank (ending in Ukraine. They found a negative relationship between bank loan to capital ratio and macroeconomic uncertainty as proxy by the conditional variance of consumer or producer inflation or volatility in money supply (M1 and M2) and its component (demand and time deposit) with banks increasing their lending ratios when macroeconomic uncertainty decreases. The reaction of banks to changes in uncertainty is not uniform and depends on bank-specific characteristics particularly bank size and profitability. The result shows that small banks are less able to change their behavior over time in response to changes in monetary policy and their lending depends to a much greater extent on capital. Also, monetary policy uncertainty factor is significant for bank lending behavior in the case of more profitable banks but less significant for the less profitable.

Micco and Panizza (2004), tested how bank ownership affects bank lending behavior over the business cycle in developed and developing countries and measured lending behavior as the growth rate of loans by banks in each country. They found that loan growth is indeed correlated with macroeconomic shocks as measured by GDP growth. Specifically, a 1-percent increase (drop) in GDP is associated with a 1.46 per cent increase (drop) in lending by private domestic banks with a similar pattern exhibited by public banks. They also found that credit cyclicalities are much lower in industrialized countries than in developing countries (the elasticity goes from 1.4 to 0.5) and that the lending activity of state-owned banks located in industrial countries seems to be counter-cyclical. Erlend and Zicchino (2005) in their study concluded that in economic downturns bank experience losses. An increased incidence of loan-loss provision may eat into capital and result into bank capital requirements becoming binding in recessions.

Olaniyan (2000) in his study of the effects of instability on aggregate investment in Nigeria showed that inflation and the variability of inflation rate are part of the important indicators of macroeconomic instability in Nigeria. The study showed that inflation has a negative and significant impact on investment in Nigeria and therefore advocates that appropriate measures be taken not only to stem the trend of rising inflation but also its variability. Kishan and Opiela (2000) in their study found that lending by banks with a Low capital ratio seems to react more strongly to monetary policy shocks. Generally, if bank equity is Low, the monetary policy effects on Lending via the bank capital channel may be weak initially, but will be much larger after several quarters.

De Young, Gron, and Winton (2005) examined factors influencing debt overhang in the US small banks (banks with assets Less than \$1billion) and found a support for the Loan supply motivations for the pro-cyclic nature of bank lending. During an economic expansion demand for lending was high and business profitability was good, resulting in more profitable loans, more bank capital, and an expanding credit environment in which banks lend more at lower rates as they compete for business. Their findings also indicate that risk overhang effects from outstanding loans work to decrease loan supply during a recession even more than would be implied by the reduction in bank capital alone.

As the controversy between bank capital and lending lingers and while there was lack of consensus among researchers on the relationship between capital and loan supply, Sharpe (1995) in De Young, Gron, and Winton (2005) identified two robust results across studies: (i) bank profitability had positive effect on loan growth, and (ii) loan losses had the opposite effect. Since profits (loan losses) tend to increase (decrease) bank capital, these findings are consistent with a positive association between bank capital and loan growth. In another study, Beatty and Gron (2001) found evidence suggesting that banks with higher capital growth relative to assets have greater increases in their loan portfolios, with the most significant effects coming from the most capital constrained banks.

Van den Heuvel (2002) argued that monetary policy affects bank lending through two channels. According to the thesis of the bank lending channel, monetary policy has a direct effect on the supply of bank loans, and thus the real economy, because banks finance loans in part with liabilities that carry reserve requirements. By lowering bank reserves, the contraction effect of monetary policy reduces the extent to which banks can accept reserve deposits, if reserve requirements are binding. The decrease in reserve liabilities will, in turn, lead banks to reduce lending, if they cannot easily switch to alternative forms of finance or liquidate assets other than loans. Another approach is the capital-adequacy regulations and an imperfect market for bank equity, is the maturity transformation performed by banks, exposing them to interest rate

risk. A consequence of this is that a monetary tightening, by raising the short-term interest rate, lowers bank profits. Unless the bank can reduce dividends substantially, this will result over time in lower bank capital and, given the failure of the Modigliani-Miller Logic, less lending. Thus, monetary policy affects the supply of bank Loans through its effect on bank equity.

Ajayi and Atanda (2012) examined the effect of monetary policy instruments on bank performance in Nigeria using time series data for the period 1980 – 2008. The study model defined bank total loan as a function of minimum policy rate, cash reserve ratio, liquidity ratio, inflation and exchange rate. The study employed a regression model based on the Engle-Granger two-step co-integration approach. They found that interest rate, inflation rate and exchange rate had positive effect on bank loan, while liquidity ratio and cash reserve ratio had negative effect on bank loan. They concluded that monetary policy instruments are not effective stimulants for bank lending in Nigeria. In another study, Amidu (2006) examined the impact of monetary policy on bank lending in Ghana using cross sectional panel data collected from the Bank of Ghana covering the period 1998 – 2004. The study adopted money supply and prime lending rate as proxy for monetary policy and the independent variables. These were regressed against bank loan, the dependent variable. The found that money supply had positive effect on bank loan, but prime lending rate had negative influence on bank loan in Ghana.

METHODOLOGY

This section of the paper deals with the research methodology adopted for this study, and these include study variables, source of data, analysis technique and model specification. This study examined the relationship between interest rate (INTR), economic growth (RGDP) and bank lending (BALE) in Nigeria. Real gross domestic product (RGDP) was used as proxy for economic growth. The study made use of secondary time series panel data for the period 1985 – 2014. Thus, the study adopted a longitudinal research design which deals with already existing data where the researchers lack the power to manipulate the data.

The study variables

The study identified INTR and RGDP as the independent variables. These were regressed against the aggregate value of loans of commercial banks (BALE) listed on the Nigeria Stock Exchange (NSE), the dependent variable. The time period covered by the study was considered long enough to establish a causality relationship between the study variables. Also, the availability of data relating to the study variables was the justification for the choice of the time period.

Source of data

This study used annual data for the period covering 1985 to 2014, obtained from the Statistical Bulletin of the Central Bank of Nigeria (CBN). Also the availability of the relevant required data relating to the study variables was the justification for the inclusion of each one of the listed commercial banks for the study. Besides, this source of data is considered reliable and dependable.

Analysis technique

The study employed an econometric data analysis technique of Ordinary Least Squares (OLS) test of parameter estimates were carried out at 5% level of significance.

Model Specification

To facilitate the analysis of data, a regression model of the following order was developed to capture the causality relationship between INTR, RGDP and BALE:

$$BALE = f(INTR, RGDP)$$

The above regression model was explicitly translated into a regression equation as stated below:

$$BALE = \alpha + \beta_1 INTR + \beta_2 RGDP + e \quad \text{equation 1}$$

Where;

BALE = Bank lending, representing the aggregate value of loans of commercial banks in Nigeria

INTR = Interest rate, one of the independent variable

RGDP = Real gross domestic product, the second independent variables

α = is the constant term

β_1, β_2 = are the coefficients of the independent variables, and each, as expected $\neq 0$

e = is the error term of the equation

FINDINGS AND DISCUSSION

Data Presentation

Presented in table 1 below are the data obtained on the variables adopted for the study from the period 1985 – 2014.

Table 1: INTR, RGDP and BALE in Nigeria for 1985 - 2014.

Year	INTR (%)	RGDP (Nm)	BALE (Nm)
1985	11.00	09,940.00	273.2957
1986	9.50	31,546.80	42.8464
1987	11.00	205,222.18	51.81
1988	11.75	199,685.30	55.7729
1989	11.50	181,500.10	68.6241
1990	13.00	183,563.00	95.5649
1991	11.75	201,036.30	100.8938
1992	12.00	205,971.40	107.4206
1993	19.00	204,806.50	120.1179
1994	17.60	219,075.60	185.7367
1995	24.60	236,729.60	280.0916
1996	27.70	267,550.00	301.2378
1997	20.00	265,379.10	339.8095
1998	31.20	271,365.50	395.6984

1999	36.89	274,833.30	773.9511
2000	20.00	275,450.60	1202.586
2001	20.79	081,407.40	2121.423
2002	20.86	293,745.40	2719.353
2003	23.32	302,022.50	2944.949
2004	28.34	310,898.10	3233.007
2005	27.19	312,183.30	3449.943
2006	28.15	329,170.70	4923.919
2007	21.34	336,994.30	4397.617
2008	30.89	433,203.50	5271.97
2009	20.88	477,533.35	5956.323
2010	20.81	527,570.00	6785.401
2011	19.49	561,931.40	7577.5
2012	10.70	595,825.60	754.442
2013	10.36	634,251.10	786.166
2014	10.80	674,889.00	859.2669

Source: Central Bank of Nigeria Statistical Bulletin 2014

Regression Results

The regression result based on the computer software E-View output is presented in table 2 below:

Dependent Variable: BALE

Method: Least Squares

Date: 21/2/15 Time: 07:36

Sample (adjusted): 1985- 2014

Included observations: 30

Table 2: Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	0.292730	0.050720	5.771458	0.0000
INTR	-0.045250	0.013947	-3.244342	0.0026
RGDP	0.003177	0.003631	0.875090	0.3877
R-squared	0.999874	Mean Dependent Var		5.995921
Adjusted R-squared	0.999860	S.D dependent var		1.720617
S.E. of regression	0.020386	Alkaline info criterion		-4.828686
Sum squared resid.	0.014131	Schwartz criterion		-4.615409
Log likelihood	99.15939	F-statistic		67663.64
Durbin-Watson stat	1.109060	Prob (F-stt5st1c)		0.000000

Source: E-View Output

Discussion of Empirical Result

In the data analyzes, the multiple regression variant of Ordinary Least Square (OLS) method based on the computer software E-View was used to estimate the relationship between interest rate (INTR), real gross domestic product (RGDP) and bank lending (BALE) in Nigeria.

The regression result in table 2 reveals that interest rate (INTR) had negative effect on bank lending, which shows that a rise in interest rate reduces bank lending while a fall stimulates bank lending. On the other hand, economic growth (RGDP) is positively related to bank lending. This implies that an increase in RGDP would stimulate bank lending while a fall retards bank lending during the period under review.

The result also indicates that about 99 percent of the total variation in bank lending is determined by the behavior of INTR and RGDP during the period covered by this study. The test of significance of the overall regression model revealed that it is statistically significant at 5 percent level because F-calculated 67663.6 is greater than F- table 2.4 while serial correlation is minimal with Durbin Watson statistic of 1.12.

Real gross domestic product complies with a priori expectation with a positive sign. However, it is very insignificant at 5 percent level. This implies that a rise in economic growth (RGDP) will spur bank lending to the economy but its level is inadequate to meet up bank required deposit level for improved lending to the economy. Per capita income of Nigeria is below \$1000. This is very low to enhance effective deposit mobilization which commercial banks need for an improved credit lending to the borrowing public. It worthy to note that income level at both national and individual levels determine significantly the level of savings and deposit mobilization of commercial banks which are major ingredients for lending. It is obvious that income accruing to individuals end up for consumption purposes thereby making it difficult for savings, upon which banks mobilize for lending. At the national level, income ends up in the pockets of unpatriotic politicians, who transfer these monies abroad without any injection to the local economy.

The effect of interest rate on bank lending as revealed by the results of this study does not conform to our expectation with a negative sign but it is very significant at 5 percent level. This implies that prime lending rate significantly retards commercial bank lending to the economy. Higher interest rate makes lending more profitable to the banks but interest rate in Nigeria has undergone a number of metamorphoses ranging from regulated to deregulated and managed deregulated by different governments through the monetary authority, Central Bank of Nigeria (CBN). Each of these regimes affects interest rate differently. From the supply side, high interest rate encourages lending while from the demand side, it discourages the borrowing public. In an environment that encourages both the supply and demand side of the money market, the deregulated interest rate regime provides a market that determines interest rate that can enhance efficiency in credit risk management and curb the mismatch that most times characterize banks' lending policy in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between interest rate (INTR), economic growth, represented by the real gross domestic product (RGDP) and bank lending in Nigeria. Data for the study was obtained from the Central Bank of Nigeria Statistical Bulletin for the period 1985 – 2014. Ordinary Least Squares technique was employed to analyze data. This study showed

some mixed results. The insignificant relationship between real gross domestic product and bank lending is very worrisome and the non response of interest rate to investment is most disturbing. However, the positive relationship recorded between real gross domestic product and bank lending to the public calls for its objective manipulations with a view to ensuring that real gross domestic spur bank loans to the economy, especially the private sector. Given that interest rate retards bank lending, it calls for interest rate management strategy that will make interest rate responsive to investment. Thus, an understanding of how banks adjust their lending strategy in the face of a volatile macroeconomic environment will guide bank loan policy formulation and serves as an appropriate guidance for macroeconomic policy makers. Specifically, our result also revealed that the behavior of macroeconomic instruments has serious economic implications on the lending ability and credit risk management of banks in Nigeria. The high level of policy inconsistencies and macroeconomic instability in the polity may have accounted for this result.

For an improved financial sector performance and proper credit risk administration in Nigeria, the study recommended a policy shift towards infrastructural development and an increased productive base of the nation in order to improve the stability of macroeconomic variables investigated. This will not only help in enhancing the profitability of banks but also improve the standard of living of the Nigerian people.

REFERENCES

- Ajayi, F. O. and Atanda, A. A. (2012) Monetary policy and bank performance in Nigeria: A two-step co-integration approach, *African Journal of Scientific Research*, 9(1), 462 – 476
- Amidu, M. (2006) The link between monetary policy and banks lending behavior: The Ghanaian case, *Banks and Bank Systems*, 1(4), 38 - 48
- Baum, C. F, Mustafa, C. and Nestihan, O. (2005) The Second Moment Matter: The Response of Bank Lending Behavior to Macroeconomic Uncertainty, www.gla.ac.uk/media/media_22217en.pdf. Downloaded 11/02/15.
- Beatty, A. and Gron, A. (2001) Capital, Portfolio, and Growth: Bank Behavior under risk-based capital guidelines, *Journal of Financial Services Research*, 20(1), 5 - 31
- De Young, R., Gron, A. and Wiñton, A. (2005) Risk overhang and loan portfolio decisions, Federal Reserve Bank of Chicago, Working Papers, August pp 1-34
- Erlend, N. and Zicchino, L. (2005) Bank weakness and bank loan supply, *Financial Stability Review*, Bank of England, pp 85 - 92
- Kishan, R. P. and Opiela, T. P. (2000) Bank size, bank capital, and the bank lending channel, *Journal of Money, Credit and Banking*, 32(1), 121 - 141.
- Malede, M. (2014) Determinants of commercial bank lending: Evidence from Ethiopia commercial banks, *European Journal of Business and Management*, 6(20), 109 – 117
- Micco A. and Panizza U. (2004) “Bank Ownership and Lending Behavior Inter-American Development Bank Banco Interamericano de Desarrollo (IDB)” Research Department Departamnto de Investigation Working Paper #520, November, pp 1-19
- Okereke, E. J. (2005) Exchange rate fluctuations and macroeconomic stability in Nigeria (1970-2001), *The ICFAI Journal of Applied Finance*, Vol.11 & 12, December

- Olaniyan, O. (2000) The effects of instability on aggregate investment in Nigeria, *The Nigerian Journal of Social and Economic Studies*, 42(1), 23 - 26
- Tatavera, O., Tsapin, A. and Zhotud, O. (2006) Macroeconomic uncertainty and bank lending: The Case of Ukraine, German institute for Economic Research Discussion Paper Series 637. November, 1 - 24
- Tomak, S. (2013) Determinants of commercial bank lending behavior: Evidence from Turkey, *Asian Journal of Empirical Research*, 3(8), 933 – 943
- Van den Heuvel S. J. (2002) Does bank capital matter for monetary policy transmission? *FRBNY Economic Policy Review*, May, 259 - 261