



ICAN JOURNAL OF ACCOUNTING & FINANCE (IJAF)

Vol. 3, No. 1

September 2014

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A Publication of the Institute of Chartered Accountants of Nigeria

ICAN JOURNAL OF ACCOUNTING & FINANCE
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MACROECONOMIC DETERMINANTS OF BANK LENDING BEHAVIOUR IN NIGERIA

by

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ABSTRACT

Lending activity is possible through banks mobilization of funds from their customers. Banks depend on depositor's money as a source of funds and this means that there is a relationship between the ability of the banks to mobilize deposits and the amount of credit granted to the customers. This study therefore examined the effect of macroeconomic variables on banks' lending behaviour in Nigeria. A time series data were collected from Central Bank of Nigeria (CBN) 2012 Financial Statistical Bulletin that covered the period 1990 to 2012. The study adopted a simplified Ordinary Least Squared (OLS) technique and also conducted the unit root and co-integration tests. The findings of the study revealed that, Gross Domestic Product (GDP), Inflation (INF), Money Supply (M2), Lending Rate (LR), were found to be statistically significant in determining lending portfolio behaviour of deposit money banks in Nigeria. However, the study discovered that foreign exchange rate (N/\$) has no significant relationship with banks lending behaviour in Nigeria. The implication of this finding is that macroeconomic variables have a significant influence on the lending behaviour of banks in the Nigerian economy. The study recommends that all macroeconomic policies of the government through its monetary and fiscal policies should be co-ordinated to complement each other in order to attain the goals of price stability, sustainable growth, conducive and business friendly environment so as to encourage high level of credit demand and absorption in the Nigerian economy.

Keywords: Lending Portfolio, Bank Behaviour, Macroeconomic Determinants, Deposit Money Banks.

INTRODUCTION

1.1 Background of the Study

Lending practices in the world could be traced to the period of industrial revolution which increased the pace of commercial and production activities. Many captains of industry at the period were unable to meet up with the sudden upturn in the financial requirements and therefore, turn to banks for assistance (Adah, 2012). Banks, the world over, thrive on their ability to generate income through their lending activities. The lending activity is made possible only if the banks can mobilize enough funds from their customers. Since banks depend on depositors' money as a source of funds, it means that there are some relationships between the ability of the banks to mobilize deposits and the amount of credit granted to the customers. Thus, the main

function of financial institutions of mobilizing funds from the surplus economic agents to the deficit economic agents is put to test in order to generate economic growth. In the process of carrying out this primary task, banks perform a number of functions which include: the mobilization of savings, stimulation of investment and economic growth, assistance in resources allocation, boosting of international trade and promotion of the payment system (Nwankwo, 1991).

One of the economic parameters for measuring bank performance in the area of economic growth is the ratio of credit to the private sector to Gross Domestic Product (GDP). The higher it is, the higher the contribution to the growth of the economy as credit to the private sector helps to generate employment, enhances production of goods and services, generation of foreign exchange earnings as well as promotion of investment to the productive/real sector of the economy. However, the higher the risk coefficient associated with the macroeconomic variables such as interest rates, exchange rates, inflation and low capacity utilization of industries, the lower the banks positive attitude or determination to create risk assets. Risk assets such as loans and advances are a major source of banks earnings through net interest incomes. Similarly, the lower the banks positive attitude in generating risk assets, the lower the profitability of banks hence there could be a relationship not only between total risk assets generated and macroeconomic variables, but as well as between total risk assets generation, profitability and returns to shareholders wealth as well as to economic growth (Awojori and Amel, 2011 cited in Asekome and Agbonkhese, 2014).

The 2009 banking crisis was triggered by exogenous shock from the global economic and financial crisis of 2007. The fluctuation in equilibrium price position threatens price stability both domestically and externally. External and terms of trade shocks tend to have large consequences on macroeconomic instability in small open economies like Nigeria because they relatively depend on imported goods (Folawewo and Osinubi, 2006). Virtually all sectors of an economy are generally influenced by many factors amongst which are statutory regulations and policies, and macroeconomic indices. The statutory regulatory and policies environment involves government policies, laws, guidelines and rules issued mostly periodically, e.g. fiscal and monetary policies. However, economic environment is persuaded by the more exigent financial, social, industrial, etc vagaries e.g. macroeconomic indices. Macroeconomic indicators such as unemployment rate, exchange rate, inflation rate, Gross domestic product, external debt and money supply are systematic risk component of the economy (Asaolu and Ogunmakinwa, 2011), which influence and affect every participant and sector within the economy. Thus, there is an apparent effect of various macroeconomic indicators on banks' lending behaviour in Nigeria.

This study is presented in five sections: section one deals with the introductory part; section two reviews various conceptual, theoretical and empirical literatures relating to the macroeconomic determinants of banks lending portfolio; section three deals with data sampling and methodology applied in the study; section four provides results of the empirical research and discussion of results; while section five brings up conclusion and recommendations for the study.

1.2 Statement of the Research Problem

Banks in Nigeria are characterized by high competition, huge deposits and varied investment opportunities. As a result of the consolidation of the banking system completed in 2005, Nigeria witnessed increased growth in the banking sector. Banks expanded very rapidly, raising large amounts of new capital and attracting large volumes of new deposits. These were in turn

deployed to fund enormous growth in the banks loan portfolio (Ismail, 2010). Managing an effective lending portfolio is one of the most complex problems which the management of financial institutions in Nigeria has to tackle on a continual basis. Lending constitutes one of the major components of bank's assets, i.e. loans and advances.

Credit growth is seen by many economists as a positive process, because it indicates a healthy banking system and a stable macroeconomic environment. On the other hand, excessive credit growth can affect loan portfolio quality. For this reason it is necessary to reflect the performance of lending in Nigeria. The failure of many banks in Nigeria is not their inability to mobilize adequate deposits from the surplus sector to the deficit sector of the economy, but mainly because their lending portfolio has been poorly managed and their inability to predict and understand the macroeconomic environment in which they operate. The banking reform of 2009 revealed that 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. In the recent times, studies on the factors causing poor portfolio quality have been attributed to economic downturn as measured by performance of GDP and interest rate spread (Constant and Augustin, 2012).

Therefore, the aim of this paper is to investigate the effect of macroeconomic factors affecting the quality of lending in the Nigerian banking industry. Macroeconomic factors to be considered in this study are GDP growth, interest rates, inflation, exchange rate and money supply to the economy. This is to understand the macroeconomic determinants of lending portfolio that can significantly influence lending decisions of deposit money banks in Nigeria and to serve as guide for regulatory authorities and banks' future lending policies.

1.3 Research Questions

In the light of the above problems, the following research questions were raised:

- i) To what extent does Gross Domestic Product (GDP) affect the lending portfolio of deposit money banks in Nigeria?
- ii) To what extent does Inflation (INF) affect the lending portfolio of deposit money banks in Nigeria?
- iii) To what extent does Money Supply (M2) affect the lending portfolio of deposit money banks in Nigeria?
- iv) To what extent does Exchange Rate (FX) affect the lending portfolio of deposit money banks in Nigeria?
- v) To what extent does Lending Rate (LR) affect the lending portfolio of deposit money banks in Nigeria?

1.4 Objectives of the Study

The main objective of this study is to investigate the effects of macroeconomic factors on the lending portfolio of the deposit money banks in Nigeria. Specifically, the study intends to:

- i) determine the effects of inflation on the lending portfolio of money deposit banks in Nigeria.
- ii) investigate the effects exchange rate on the lending portfolio of money deposit banks in Nigeria.
- iii) assess the effects of GDP on the lending portfolio of money deposit banks in Nigeria.

- iv) examine the effects of money supply on the lending portfolio of money deposit banks in Nigeria.
- v) determine the effects of the lending rate on the lending portfolio of money deposit banks in Nigeria.

1.5 Statement of Hypotheses

Based on the research questions, the following null hypotheses were formulated:

- Ho₁: There is no significant relationship between lending portfolio (banks' loans and advances) and Inflation.
- Ho₂: There is no significant relationship between lending portfolio (banks' loans and advances) and Exchange rate.
- Ho₃: There is no significant relationship between lending portfolio (banks' loans and advances) and GDP.
- Ho₄: There is no significant relationship between lending portfolio (banks' loans and advances) and Money supply.
- Ho₅: There is no significant relationship between lending portfolio (banks' loans and advances) and Lending rate.

1.6 Scope of the Study

The scope of the study consists of all the deposit money banks sub-sector of the Nigeria financial system licensed and operating in Nigerian economy between 1990 to 2012 covering a period of 22 years. The Commercial banks were selected from the banking sector because they have wider geographical coverage than any other financial institutions in the banking sector. Also, Commercial Banks control over 70% of assets and liability of the banking sector of the Nigeria financial system (Ajayi, 2007).

1.7 Justification for the Study

Many research works have been conducted on the determinants of lending portfolio in Nigerian deposit money banks such as Ajayi (2007), Olokoyo (2011) and Olusanya, Oyebo and Ohadebere (2012). However, within the scope of the study, it was observed that most of the previous studies focused only on bank specific factors with minimal interest in the macroeconomic variables responsible for banks lending behaviour. However, this work tries to fill this gap by investigating mainly the macroeconomic determinants of bank lending portfolio of the deposit money banks in Nigeria. Specifically, the study investigates the effect of macroeconomic factors on bank lending behaviour.

The result from this work will be of assistance to managers of commercial banks in Nigeria as it will enable them to have a better understanding and control of the various macroeconomic determinants that could significantly influence their lending decisions. Also, knowledge of these findings would be helpful to other stakeholders such as the Central Bank of Nigeria, bankers association, government and other financial authorities in formulating on-going lending policies for Nigerian banks that could aid banks during recession period and reducing risk-taking during boom period. Finally, the study will add to the existing and growing literatures on the determinants of lending portfolio in Nigerian deposit money banks which will also serve as reference for future

researcher interested in the subject matter.

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

The conceptual framework discusses the concepts of loan portfolio, portfolio management and some macroeconomic determinants of lending portfolio in commercial banks. Lending is the principal business activity of most credit institutions. The loan portfolio is typically the largest asset and the predominant source of revenue. As such, it is one of the greatest sources of risk to an organisation's safety and soundness. The lifeblood of each lending institution is its loan portfolio and the success of the institution, therefore, depends on how well that portfolio is managed. A loan portfolio is the cash amount of loans outstanding at any time, that is, money that has been advanced but not yet repaid. A loan portfolio does not include amounts already paid; loans approved but not disbursed; loans being processed; loans written off and loans fully repaid (Compuscan, 2013).

Furthermore, portfolio management is the identification of measured risk exposures that are controlled in the context of defined risk tolerance. Other acceptable definitions include managing a portfolio of assets to achieve the best possible mix as distinct from managing individual assets within the portfolio, and lastly, some other definitions describe portfolio management as a tool for minimising aggregate risk problems while achieving or exceeding hurdle returns for risks the lender is willing to accept (Compuscan, 2013).

2.1.1 Macroeconomic Determinants of Lending Portfolio Behaviour in Banks

It is imperative to highlight and discuss some of the macroeconomic determinants factors of lending portfolio behaviour in banks. Munib and Atiya (2013) identified the following as some of the macroeconomic determinants of bank lending portfolio:

Interest Rate: Interest rate is like a service charge paid by the borrower of an asset to its owner against the use of assets. It can also be defined as the return paid against the borrowed money. The risk free rate of return usually remains in excess of monetary regulators to manipulate in pursuance of monetary objectives.

Inflation: This is an increase in general price level of goods and services in an economy up to a certain extent when a unit of currency buys fewer goods and services. Some economists say increase in the amount of money in circulation is referred to as inflation. Consumer price index can be used as the proxy of inflation as a most comprehensive measure of inflation defines as a change in the price of consumer goods and services purchased by households. Increase in CPI compels monetary regulators to use contractionary measures by increasing the interest rates to control inflation which later increases the cost of borrowing and ultimately causes non-performing loans to come forth.

Gross Domestic Product (GDP): GDP is the market value of all goods and services produced in a country during a specified time, usually one year. Growth in GDP is considered as a symbol of country's progression calculated with sum of private and public consumption with private and public investment if expenditure approach is used. A slow growth rate in developing countries (referred to a stagnant economy) shows that a country is suffering from recession where prices, output and employment levels are not maintained up to a desired level.

Exchange Rate: Exchange rate is the rate used to exchange one currency with another one. Exchange rates are determined by the continuous foreign exchange markets that remain opened for 24 hours a day except during weekends. It comprises wide range of different types of currency traders. This exchange of currency is largely influenced by exchange of capital goods and services across border called international trade. A decrease in home currency will result in costly imported goods which result in a pressure to finance letter of credits issued to trader by commercial banks; and risk of default increases. Therefore, an increase in exchange rate is positively associated with NPLs. We took USD /Naira as a proxy of exchange rate.

Money Supply: Total stock of money available in any economy during a specified time is called money supply. There are different forms of calculating money, and generally it is divided into three forms Reserve Money (Mo), Narrow Money (M1) and Broad Money (M2). In the study the researchers took M2 as the proxy of money supply as the most descriptive form of money also comprises the prior two categories. Reserve money shows the overall money available in tangible form while narrow money band includes reserve money and all demand and time deposits of schedule banks. M2 includes narrow money and all resident foreign currency deposits.

2.2 Theoretical Framework

The theoretical framework adopted for this paper is based on the Keynesian economic theory and the bank capital channel theory that attempts to explain the lending portfolio behaviours of banks.

2.2.1 Keynesian Economic Theory

The Keynesian economic theory extensively explores saving and investment without seriously considering financial intermediation. Also, 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 determine the level of credit contraction for the banking system. However, macroeconomic development pressurizes banks' in creating banking crises. Adverse macroeconomic shock threatens 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 cited in Adeolu Elegbe, 2013).

Nier and Zicchino (2005) also believe that losses suffered by banks during economic downturns are generated by provision made for loan-loss under prudential guidelines. They emphasized that 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. Chang and Velasco (1999) cited in Adeolu Elegbe (2013) 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 undergoes, the more the fragility it would experience from external shocks.

According to Agu and Evoh (2011), monetary policy theory suggests that an increase in the money supply will result to an upward shift in price level, access to credit, investment, real depreciation of exchange rate and increase in real gross domestic product. The expansionary monetary policy (typified by increase in money supply) significantly impacts the growth rate of the economy and credit of the private sector. This is on the basis that such monetary policy expansion induces investment via increase in aggregate demand and thus, output increases. However, a credit crunch economy resulting from contractionary monetary policy (or inflation targeting central bank), risks stifling growth rate in infrastructural development and output.

2.2.2 Bank Capital Channel Theory

Bank Capital Channel Theory. This theory considers the lending portfolio of banks as it is affected by interest rate and capital adequacy requirement. According to Obamuyi (2007) cited in Esisal (2009).

'The bank capital channel views a change in interest rate as affecting lending through bank's capital, particularly when banks' lending is constrained by a capital adequacy requirement. Thus, an increase in interest rates will raise the cost of banks' external funding, thereby discouraging customers from taking loans which will reduce banks' profits and capital. The tendency is for the banks to reduce their supply of loans if the capital constraint becomes binding. However, banks could also become more willing to lend during certain periods because of an improvement in their underlying financial condition.'

2.3 Empirical Framework

Many empirical works have been carried out to determine the factors responsible for the lending behaviour of banks in different countries and also specifically in Nigeria. In view of this, we shall be considering the opinion of various scholars from different countries and some individual's perspectives on the issue as well. In Germany, Ralf, Gerald and Andrea (2000) identified some factors that can explain the financial performance of banks lending activities. They found out that credit ratings, act as an important factor in the bank's lending policy in banks. They concluded that ratings reflecting higher risks lead to higher interest rate. In Chile, Alejandro and Ugo (2006) in their paper "Bank ownership and lending behaviour" observed that state-ownership of banks is correlated with lending behavior over the business cycle. They found out that state-owned banks' lending behaviour is less responsive to macroeconomic shocks than the lending of private banks.

In Italy, Vazakidis and Adamopoulos (2009) indicated that economic growth had a positive effect on credit market development. Again, the central bank's prime rate serves as an indicator to the movement in key economic variables like inflation which in turn affects interest rates. Through the transmission mechanism, an increase in prime rate negatively affects banks' lending behaviour. Exchange rate fluctuations, specifically currency depreciation in a home country results in banks' assets being valued less in foreign currencies as against their liabilities.

In the Central African Economic and Monetary Community (CEMAC), Constant and Augustin (2012) studied the determinants of bank long-term loan in the Central African Economic and Monetary Community (CEMAC) context. The study aimed to test the common bank-level and macroeconomics determinants of bank long-term loan behaviour. The model used is estimated using a sample of six countries from the CEMAC. They found that a bank's ability to extend long-

term business loans depends on its size, capitalization, GDP growth and the availability of long term liabilities. In Ghana, Abdul et. al. (2013) wrote on the persistence of bank asset quality on bank lending behaviour in Ghana. They applied a dataset from the loans and advances in Nigeria financial system: empirical evidence from Nigerian Commercial Bank of Ghana for 25 Ghanaian banks from 2005 to 2010. Their result shows that the effect of the deterioration of bank asset quality (high levels of non-performing loans) on bank lending behaviour is persistent and not contemporaneous. Additionally, that bank deposit mobilization, intermediation spread and equity were also found to influence bank lending behaviour in Ghana.

In Nigeria, Ajayi (2007) investigated the determinants banks. The study covered a period of 37 years from 1970 to 2006. He applied multiple regression analysis and the result showed that four variables: liquidity ratio, interest rate, capital and deposit are factors that determine loans and advances in Nigeria commercial banks. However, Olokoyo (2011) investigated the determinants of commercial banks' lending behaviour in the Nigerian context. The study aimed to test and confirm the effectiveness of the common determinants of commercial banks' lending behaviour and how it affects the lending behaviour of commercial banks in Nigeria. The study covered a period between 1980 and 2005. She however, concluded that commercial banks deposits have the greatest impacts on their lending behaviour. Similarly, Olusanya, Oyebo and Ohadebere (2012) applied *Co-integration Analysis to determine the lending behaviour of commercial banks in Nigeria between the periods: 1975 to 2010*. It was revealed from their result that there is a long run relationship between loan and advances and some of the explanatory variables adopted in the model.

Bynoe, Howard and Moore (2008) attempted to identify the determinants of credit booms in the Caribbean and to establish whether or not those credit booms led to sustained economic growth in the region. The authors utilized panel data to establish the main causes of credit booms in the region. They identified three key groups of variables that made some contribution to the development of credit booms; macroeconomic developments, macroeconomic policy and external shocks. In the case of the Caribbean, it was established that macroeconomic developments were one of the main contributors to credit booms.

From individual perspective, it is worthy to note that the macroeconomic environment within which a bank operates matters for its lending decision. For instance, in the period of economic boom, businesses demand for loans to take advantage of expansion and banks investment opportunities equally soar. On the other hand, in periods of economic recession, demand for credit increases. This provides a pro-cyclical relationship between economic growth and bank lending. Dell'Ariccia and Marquez (2006) cited in Ladime and Osei (2013) find that bank credit expansions tend to be pro-cyclical; that is, high rates of growth in GDP tends to induce a high rate of growth in bank credit. This is because in the period of economic boom, banks relax their criteria and lend to both good and bad projects, then in times of economic recession most loans become non-performing and the source of credit dries up, rationing out even good projects.

Gremi (2013) in his study on macroeconomic factors that affect the quality of lending in Albania analyzed the link between the macroeconomic developments especially GDP growth and interest loan rate and the banking credit risk measure by NPLR. The paper further analyzed the data of commercial banks in Albania over the time period from 2005Q1 to 2013Q1. This study includes 36 observations from banking system employing dynamic panel data approaches. He concluded that the banking credit risk is significantly affected by the macroeconomic

environment.

Nwankwo (1980) observed that investments can act as a cushion between liquid assets and loans. They can be consequently used as liquid assets to augment liquidity and thereby increase demand for loans, investments absorb excess liquidity. Usman (1999) believes that the factors that affect commercial banks' lending behaviour is the choice of certain policy instruments by the regulatory authorities for the regulation of banking operations in Nigeria. Such instruments include a rigidly administered interest rate structure, directed credit, unremunerated reserve requirements and stabilizing liquidity control measures like the stabilization securities of the past. Chodechai (2004) cited in Olokoyo (2011) further stressed that "banks' lending decisions are also influenced by the past relationship with the borrowers". Past relationship according to him can help banks to obtain more private information, leading to a more accurate understanding of the borrower's business and financial situation.

Adah (2007) opined that the minimum capital adequacy ratio as prescribed by Basel committee of central banks' supervision is 8%. This ratio relates capital to what is considered the banks biggest risk namely, credit. He said that the 8% ratio implies that for every N100 credit, a bank needs N8 capital. He stated further that capital serves as a foundation for a bank future growth and as a cushion against unexpected losses. He concluded that adequate capitalized banks that are well managed are better able to withstand losses and provide credit to consumers and businesses alike throughout the business cycle including during downturns.

Finally, Akpansun and Babalola (2012) examine the relationship between banking sector credit and economic growth in Nigeria over the period 1970-2008. The causal links between the pairs of variables of interest were established using Granger causality test while a Two-Stage Least Squares (TSLS) estimation technique was used for the regression models. The results of Granger causality test show evidence of unidirectional causal relationship from GDP to private sector credit (PSC) and from industrial production index (IND) to GDP. Estimated regression models indicate that private sector credit impacts positively on economic growth over the period of coverage of the study. However, lending (interest) rate impedes economic growth. The study recommends the need for more financial market development that favours more credit to the private sector with minimal interest rate to stimulate.

3.0 METHODOLOGY

3.1 Research Design

This study aims to empirically investigate the determinants of commercial banks lending portfolio in Nigeria covering a period of 22 years. In view of this, the study therefore, adopted a time series research design method.

3.2 Source of Data

Secondary source of data was used in this research work. The data were obtained from *Central Bank of Nigeria 2012 Statistical Bulletin: Financial Statistics which covered the period between 1990 to 2012*.

3.3 Method of Data Analysis

The paper adopted econometric approach to test the degree of relationship between the variables by employing multiple regression analysis of the Ordinary Least Square (OLS) and Cointegration

method using E-Views 7.0 package. In order to avoid a spurious regression result, Unit Root Test using the Augmented Dickey-Fuller (ADF) technique, was employed. Serial correlation test and normality test were also conducted to estimate the reliability of the OLS model used in the study.

3.4 Formulation of Empirical Model

It can be observed from the empirical review of this paper that lending in banks are determined by factors which could be micro (bank related factor) and/or macro in nature. However, for the purposes of this paper, only macroeconomic variables will be adopted. Thus, in respect of the hypotheses stated, the main issue is to investigate the relationship that exist between the lending portfolio of the deposit money banks in Nigeria (proxied) by loan and advances (dependent variable) and each of the other explanatory variables that have been identified through literature and theories. Other factors not explicitly included in the model were captured by the error term.

3.5 Empirical Model

To examine the determinant of commercial banks lending portfolio in Nigeria: Pre and Post recapitalization reform. The study adopted and modified the model of Olokoyo (2011) given as $LOA = f(Vd, Ip, Ir, Rr, Lr, Fx, Gdp, Z)$. Where LOA: Loans and Advances, Vd: Volume of Deposits, Ip: Investment Portfolio, Ir: Interest Rate (Lending Rate), Rr: Cash Reserve Requirement Ratio, Lr: Liquidity Ratio, Fx: Annual Average Official Exchange Rate, and Gdp: Gross Domestic Product. However, micro-economic variables: Volume of Deposits and Investment Portfolio were dropped from the original model while macroeconomic variable: money supply was adopted in the new model. The macro economic variables were considered so as to present a moderate and desired result which can adequately reflect the impact of macroeconomic variable on banks' lending portfolio in Nigeria. Thus, the model specification is as follows:

$$LOA = f(LR, GDP, INF, M2, FX) \dots \dots \dots (1)$$

$$LOA = \beta_0 + \beta_1 LR + \beta_2 GDP + \beta_3 INF + \beta_4 M2 + \beta_5 FX + \mu \dots \dots \dots (2)$$

When transformed into a log form equation 2 becomes:

$$\log LOA = \beta_0 + \beta_1 LR + \beta_2 \log GDP + \beta_3 INF + \beta_4 \log M2 + \beta_5 FX + \mu \dots \dots \dots (3)$$

Where:

LOA: LLOA= Loans and Advances

LR: Lending Rate

GDP: Gross Domestic Product

INF: Inflation

M2: Money Supply

FX: Foreign Exchange Rate,

μ : error term controlling for unit specific residual in the model

β_0 : intercept of the regression line

β is (1 to 5) : coefficients to be estimated and their a-priori expectations are as follows:

β_2, β_4 , and $\beta_5 > 0$ implies that the variables have a positive relationship with the dependent variable (LOA) while β_1 , and $\beta_3 < 0$ shows that the variables have a negative relationship with the dependent variable (LOA). Note that the log of the variables was taken so that all observations in each variable will have equal weight so as to avoid serial auto correlation since the data covered a long period of 22 years.

4.0 ANALYSIS AND INTERPRETATION OF RESULTS

In order to avoid a spurious regression result, the test for stationarity of all the variables becomes necessary. According to Engle and Granger (1987), most ordinary least squares (OLS) regressions that are not stationary at levels are mostly not reliable, this is as a result of the likelihood of short run disequilibrium among the variables. In view of this, testing for stationarity of variables to obtain a more reliable result cannot be over-emphasized. This paper carried out stationarity test on the variables using Augmented Dickey-Fuller (ADF) as reported in Table 1. The result shows that all the variables are stationary at first difference. This implied there was no more unit root and the OLS regression can be run. Also, the need to verify the long run relationship or otherwise among the variables becomes imperative. This was achieved through Johansen's Multivariate Co-integration Test

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test for Variables between 1990 and 2012

Variables	t.- statistic	Order of Integration
LOA = LLOA ***	-4.738431	1(1)
GDP = LGDP**	-3.965352	1(1)
INF = INF***	-7.076063	1(1)
FX = FX**	-4.372041	1(1)
LR = LR***	-5.939164	1(1)
M2 = M2***	-6.167247	1(1)

Source: Authors' Computation, 2014

Note: ***Significant at 1 per cent level of significance

**Significant at 5 per cent level of significance

4.1 Ordinary Least Square Estimation

The study was moreover, estimated using the ordinary least square (OLS). The method was adopted because it would be able to capture the essence of the work effectively in addition to its high level of simplicity and global acceptability.

Table 2: Ordinary Least Square Estimation of the Explanatory Variables

Variables	Coefficient	Std. Error	t.- Statistic	Prob.	R-squared (R ²)	F-Statistic	Prob. (F-statistic)	Durbin-Watson Stat
C	-2.022322	1.394128	-1.450600	0.1651	0.802565	453.9193	0.000000	1.816833
LR	-0.009969	0.010792	-0.923810	0.0385				
M2	1.141707	0.180516	6.324675	0.0000				
INF	-0.015048	0.002607	-1.936783	0.0596				
GDP	0.203400	0.207044	0.016423	0.0471				
FX (N/S)	-0.002027	0.002112	-0.960027	0.3505				

Source: Authors' Computation, 2014

4.3 Discussion of Result

From Table 2, an attempt was made to examine the joint impact of gross domestic product (GDP), money supply (M2), exchange rate (EXR), lending rate (LR), and inflation (INF) on the loan and advances of the deposit money banks which represent their lending portfolio. It is apparent that a-priori expectation of all the coefficients of the explanatory variables has the correct signs as expected and in conformity with the theoretical expectations; except foreign exchange which carried a negative sign instead of a positive one. This may be attributable to inconsistencies and

The OLS result on (Table 2) disclosed that the estimated coefficient of Money Supply (M2) and Gross Domestic Product (GDP) is positive. The positive sign of the coefficient established that each of these variables is positively related to loans and advances indicated that for every 1% increase in Money Supply (M2) and Gross Domestic Product (GDP) will cause loan and advances of the deposit money banks in Nigeria to increase by 0.009%, 1.14% respectively. This result is consistent with the economic a-priori condition. M2 is significant at 1% level of significance while GDP is statistically significant at 5% level of significance.

Also, the estimated coefficient for Lending Rate (LR), Inflation (INF), and Foreign Exchange (FX) is negative. The negative sign implied that there is an inverse relationship between loan and advances and each of these variables indicated that for every 1% increase in Lending Rate (LR), Inflation (INF), Foreign Exchange (FX) will cause their loans and advances of the deposit money banks to reduce by 0.009%, 0.01%, and 0.002% respectively. However, only Lending Rate (LR) and Inflation are statistically significant at 5% level of significance. In a nutshell, four of the variables are statistically significant out of the five explanatory variables used in the model.

The Durbin-Watson was 1.8 which is close to 2; this implied the absence of first order autocorrelation in the regression model (Field, 2005). Therefore, we can make valid prediction(s) with the equation. Moreover, the coefficient of multiple determinations - R-squared is 0.802565 which showed that 80% of the variation in the bank lending portfolio as proxied by LOA was caused by the variations in the explanatory variables as explained by the model. This showed that only 20 percent changes in the dependent variable was caused by other variables not found in the equation but measured by the error term. The F-statistics of 453.9193 is significant at 1 percent level of significance; hence the model was of good fit.

To authenticate the reliability of the result, serial correlation test and normality test were conducted. The Jarque-Bera test revealed 0.321198 which is not significant at 5% level of significance. This implied that the error term of the regression analysis is normally distributed (see table 3). Also, the R^2 is also less than the Durbin-Watson statistic meaning that the OLS model is good. In addition to these, the serial correlation test of 0.9639 is also not significant at 5% which indicated that the error term is also not serially correlated (see Table 4). Table 5 provides a snap shot of the findings summary.

Table 3: Normality Tests of Residual

Jarque Bera	Probability
0.321198	0.321198

Source: Authors' Computation, 2014

Table 4: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.024074	Prob. F(2,20)	0.9763
Obs*R-squared	0.073590	Prob. Chi-Square(2)	0.9639

Source: Authors' Computation, 2014

Table 5: Findings' Summary

Hypotheses	Variables	Findings
Ho ₁	There is no significant relationship between lending portfolio (banks' loans and advances) and Inflation.	Significance
Ho ₂	There is no significant relationship between lending portfolio (banks' loans and advances) and Exchange rate.	No Significance
Ho ₃	There is no significant relationship between lending portfolio (banks' loans and advances) and GDP.	Significance
Ho ₄	There is no significant relationship between lending portfolio (banks' loans and advances) and Money supply.	Significance
Ho ₅	There is no significant relationship between lending portfolio (banks' loans and advances) and Lending rate.	Significance

Source: Authors' Computation, 2014

4.4 Cointegration Test

Cointegration may occur when a linear combination of variables that is $I(1)$ produces a stationary series, then the variables may need to be cointegrated (Engle and Granger, 1987). This means that a long-run relationship may exist among them, which connotes that they may wander from one another in the short-run but in the long-run, they will move together. In view of this, we need to establish whether there is a long-run relationship among the variables or not. Hence, we applied the cointegration test using the Johansen's multivariate method. See Table 6.

Table 6. Johansens's Multivariate Cointegration Test

Hypothesized No of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.965066	194.7564	95.75366	0.0000	70.44046	40.07757	0.0000
At most 1 *	0.913631	124.3160	69.81889	0.0000	51.43158	33.87687	0.0002
At most 2 *	0.880780	72.88437	47.85613	0.0001	44.66243	27.58434	0.0001
At most 3	0.573403	28.22194	29.79707	0.0751	17.89022	21.13162	0.1340
At most 4	0.372462	10.33172	15.49471	0.2561	9.784962	14.26460	0.2264
At most 5	0.025700	0.546762	3.841466	0.4596	0.546762	3.841466	0.4596

Source: Author's Computation, 2014.

The test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level; while

** denotes MacKinnon-Haug-Michelis (1999) p values

Using the trace likelihood ratio, the results in Table 6 pointed out that there is cointegration among the variables up to three (3) cointegrating equations at 5% level of significance. This implies that a unique long-run relationship exists among the variables and the coefficients of estimated regression can be taken as equilibrium values. This result agrees with the work of Olokoyo (2011) that macroeconomic variables that affect lending behaviour have a long-run relationship.

Implication of Results

The results of the empirical test on the determinants of lending portfolio behaviour of commercial banks in Nigeria, 1990-2012, was based on Ordinary Least Squares (OLS) estimate procedure which are presented in Table 2. From the result, only four variables are statistically significant out

of the five explanatory variables used in the model (see Table 6). Though only four of the expressed explanatory variables – LR, GDP, INF and M2 were discovered to have significant influence on the lending behaviour of banks, two of the variables are positively correlated while the remaining variables are negatively correlated with bank lending. This implies that the explanatory variables tend to move in different directions with banks' loans and advances.

From the result, money supply (M2) has the highest coefficient of 1.14% which implies that money supply by the Government through the CBN has significant effect on lending portfolio of commercial banks. That is to say that when Government expands its expenditure, there will be more money in the economy which indirectly increases the level of economic activities and encourages the commercial banks to give out more loans to support these activities and vice versa. Keynesian economic theory postulates that money supply responds positively to an increase in total credit, which will in turn boost aggregate demand, investment and increase in output.

The result also revealed that Lending Rate (LR) charged by the deposit money banks is 0.009%. This implied that the effect of high lending rate on banks' lending portfolio is not pronounced in Nigeria. This may be due to the fact that commercial banks still have the highest market share in Nigeria and the other financial institutions are not strong competitors. Another reason may be the relationship factor whereby the trusts the customers have in the banks, make them overlook the high interest rate. This was in support of Chodechai (2004) that relationship factors are important in lending decisions of banks. Although, Capital Channel theory stated that high interest rate will affect lending by reducing profit and capital, the effect of high lending rate in Nigeria did not support the theory as commercial banks in Nigeria charged high interest rate and still recorded high profit (NDIC, 2012).

The price level which is measured by (inflation) of 0.01%, has a positive correlation to loan and advances in Nigeria at a very minimal rate. This further buttresses the fact that expansionary monetary policy that leads to increase in credit to private sector through bank lending has the potential of not reacting to inflation immediately but reacts to a sizeable boost in aggregate demand and investment. This, no doubt, will in turn have a positive impact on the economy and also create jobs. This further lays credence to expansionary monetary policy as against contractionary, as a means of boosting output in Nigeria towards attainment of full employment (Agu and Evoh, 2011).

Gross domestic product has a significant effect of 0.20% on banks' lending which suggests that banks are expected to have considerable familiarity with the economic features of their locality and general economic productivities and trends. However, exchange rate has no significant effect on the lending behavior of deposit money banks in Nigeria. It is worthy to note that, the cointegration result reveals a long-run relationship among the variables; which means that the variables used in this study has long run relationship with one another. This implied they have long run policy implication which should be of interest to policy makers.

Conclusion and Policy Recommendations

Available statistics have shown that banks need to understand how to construct their lending portfolio so as to maximize their performance in terms of profitability. Bank lending constitutes the core of banking activities and is responsible for a sizeable proportion of bank revenue. Banks'

managements therefore, have to formulate policies in guiding these operations and activities toward profit making objective. The policies are affected by macroeconomic variables such as inflation, exchange rate, lending rate, GDP, etc. The higher the risk coefficient associated with the macroeconomic variables such as interest rates, exchange rates, inflation and GDP, the lower the banks positive attitude to lending. The study attempts to empirically examine the effects of macroeconomic variables on lending behaviour of money deposit banks in Nigeria and conclude that macro economic variables: inflation, GDP, Money supply, and lending rate significantly affect the lending behaviour of banks in Nigeria as revealed by our result which corroborates the works of Gremi (2013) and (Iadime and Osei 2013).

Based on our findings, it is recommended that Central Bank of Nigeria (CBN) should moderate the Monetary Policy Rate (MPR), as a tool for regulating commercial banks lending operations which will help to facilitate investment and price stability in the economy. In addition, to attain the goal of price stability in Nigeria, the fundamentals have to be right. If the increase in the money supply is above output growth, then inflation becomes inevitable. Thus, the government should ensure that excessive monetary expansion in the economy is properly managed to reduce inflation.

Bank management should also continue to ascertain the per capital income of Nigerian citizens. This is because a rise in income level boosts economic activities which are an indication of good lending possibilities to add value to the profitability of the deposit money banks in Nigeria. Therefore, lending in the country should focus on those sectors which have a strong connection with the country's GDP, contributing positively to it. There is also the need for Central Bank of Nigeria (CBN) to strengthen banks' lending rate policies through effective and efficient regulation and supervisory framework.

Finally, all the macroeconomic policies of the government through its monetary and fiscal policies should be co-ordinated to complement each other in order to attain the goals of price stability, sustainable growth, conducive and business friendly environment so as to encourage high level of credit demand and absorption in the Nigerian economy.

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Appendix

Dependent Variable: LOA
Method: Least Squares
Date: 07/03/14 Time: 21:27
Sample: 1990 2012
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	-0.009969	0.010792	-0.923810	0.0385
M2	1.141707	0.180516	6.324675	0.0000
INF	-0.015048	0.002607	-1.936783	0.0596
GDP	0.203400	0.207044	0.016423	0.0471
FX (N/\$)	-0.002027	0.002112	-0.960027	0.3505
C	-2.022322	1.394128	-1.450600	0.1651
R-squared	0.802565	Mean dependent var		13.41394
Adjusted R-squared	0.800379	S.D. dependent var		1.923075
S.E. of regression	0.188631	Akaike info criterion		-0.278591
Sum squared resid	0.604887	Schwarz criterion		0.017624
Log likelihood	9.203801	Hannan-Quinn criter.		-0.204094
F-statistic	453.9193	Durbin-Watson stat		1.816833
Prob(F-statistic)	0.000000			

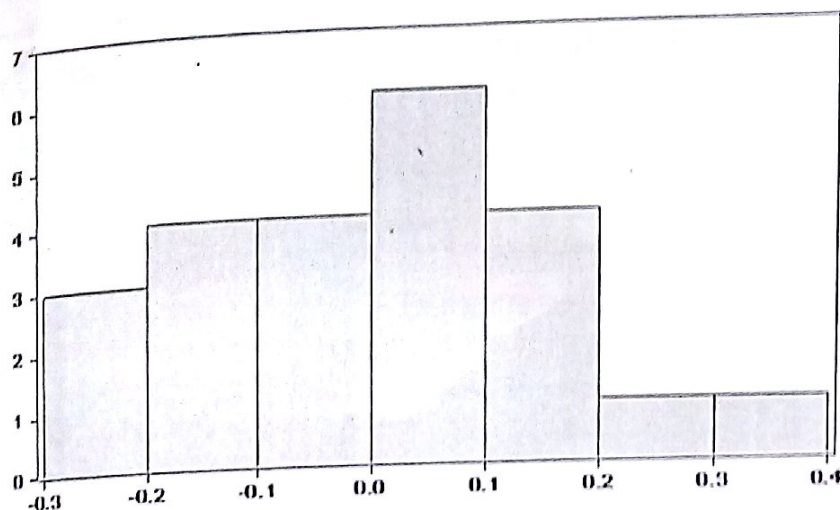
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.024074	Prob. F(2,15)	0.9763
Obs*R-squared	0.073590	Prob. Chi-Square(2)	0.9639

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 07/03/14 Time: 21:29
Sample: 1990 2012
Included observations: 23

Pre Sample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LR	0.000425	0.012077	0.035180	0.9724
M2	-0.007136	0.200603	-0.035572	0.9721
INF	-4.45E-05	0.002799	-0.015886	0.9875
GDP	0.005876	0.228938	0.025665	0.9799
FX__N_\$	0.000122	0.002313	0.052609	0.9587
C	-0.010984	1.515097	-0.007250	0.9943
RESID(-1)	0.029935	0.307525	0.097341	0.9237
RESID(-2)	-0.059696	0.331334	-0.180168	0.8594
R-squared	0.003200	Mean dependent var		-2.06E-15
Adjusted R-squared	-0.461974	S.D. dependent var		0.165816
S.E. of regression	0.200491	Akaike info criterion		-0.107883
Sum squared resid	0.602952	Schwarz criterion		0.287071
Log likelihood	9.240655	Hannan-Quinn criter.		-0.008553
F-statistic	0.006878	Durbin-Watson stat		1.897112
Prob(F-statistic)	1.000000			



Series: Residuals
Sample 1990 2012
Observations 23

Mean -2.06e-15
Median 0.008918
Maximum 0.396894
Minimum -0.276133
Std. Dev. 0.165816
Skewness 0.282813
Kurtosis 2.876590

Jarque-Bera 0.321198
Probability 0.851633

Date: 07/03/14 Time: 21:31
Sample (adjusted): 1992 2012
Included observations: 21 after adjustments
Trend assumption: Linear deterministic trend
Series: LOA LR M2 INF GDP FX__N_\$_
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.965066	194.7564	95.75366	0.0000
At most 1 *	0.913631	124.3160	69.81889	0.0000
At most 2 *	0.880780	72.88437	47.85613	0.0001
At most 3	0.573403	28.22194	29.79707	0.0751
At most 4	0.372462	10.33172	15.49471	0.2561
At most 5	0.025700	0.546762	3.841466	0.4596

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.965066	70.44046	40.07757	0.0000
At most 1 *	0.913631	51.43158	33.87687	0.0002
At most 2 *	0.880780	44.66243	27.58434	0.0001
At most 3	0.573403	17.89022	21.13162	0.1340
At most 4	0.372462	9.784962	14.26460	0.2264
At most 5	0.025700	0.546762	3.841466	0.4596

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-value