

Analysis of Financial Intermediation Activities on Economic Growth in Nigeria-Vector Error Correction Model Approach

Alimi A. A. *, Adeoye M. A.

Department of Management and Accounting, Faculty of Management Sciences, Ladoko Akintola University of Technology, Oyo State, Nigeria

Abstract Financial intermediation activities are germane to economic growth and development through the financial services they render. This paper specifically evaluated the effect of financial intermediation activities on the growth of Nigeria's economy. Secondary data were used and sourced through the Central Bank of Nigeria Statistical Bulletins within 1983 and 2018. Descriptive statistics such as mean, median, skewness, and mode, etc. and econometric statistics like Ordinary Least Squares (OLS) were used to analyze the data obtained. The multiple regression results showed that the computed F-statistic with corresponding probability value ($F(8, 28) = 464.23$, $\text{Prob} > F = 0.0003$) and adjusted R^2 (0.832), indicated that broad money supply ($\beta = 0.661791$), size of credit ($\beta = 4.337539$), and credit delivered to the private sector ($\beta = 4.31341$) have a positive effect on economic growth at $p \leq 0.05$. The result of the co-integration test using trace statistics suggests a long-run relationship among the variables ($H_0: n=4$ that is, $32.9048 < 45.41$) and the Vector Error Correction Model (VECM) was employed to evaluate the short-run effects of the cointegrated series. It was concluded that financial intermediation activities by banks had a statistically significant impact on the growth of Nigeria's economy. It is therefore recommended that there should be a reduction in lending rate associated with the size of credit, increased volume of credit delivered to the private sector, sustenance of on-going reforms and evolving measures to boost deposit mobilization which would spur investment, innovation and engender growth in the Nigerian economy. Also, there should be a review of monetary policy by the Central Bank of Nigeria (CBN) with the target of increasing the money supply to be able to reduce the costs of borrowing (lending interest rate). The achievement of this will motivate investors and encourage them to borrow more money.

Keywords Financial Intermediation, Economic Growth, Vector Error Correction Model, Central Bank of Nigeria

1. Introduction

The cashless policy was introduced in 2012 by the Central Bank of Nigeria (CBN) to modify the cash-driven economy and condensed operational costs usually passed on to customers through other means. This was planned to promote financial intermediation, eliminate the incidence of corruption emanate from ineffective credit delivery system and also to lessen the amount of cash payment, boost electronic payment and finally to minimize to the barest minimum larger percentage of the Nigerians who still leave in a barbaric world of informal savings. Recent studies suggest that financial intermediaries play important roles in

the growth of the real economy by channeling funds from savers to borrowers in a manner to facilitate investment in physical capital, spur innovation and the creative process. Also, the efficiency and effectiveness of economic policy are positively associated with how well financial markets operate. Through their financial activities, financial intermediaries increase efficiency and effectiveness in many ways for example by decreasing leakages in savings [1]. Financial intermediaries transfer funds from those who have savings to those who can put them into productive use [2].

Financial intermediation is the process by which intermediaries provide a linkage between surplus units and deficit units in the economy. Surplus units are firms/individuals who have excess funds above their immediate needs while those who need this fund for immediate investment programs are referred to as deficit units. It is the financial intermediaries that develop the facilities and instruments which make this lending and borrowing possible [3].

* Corresponding author:

alimabass2014@gmail.com (Alimi A. A.)

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Real Gross Domestic Product (RGDP) is officially the most popular measure of the economic output of a country [4]. RGDP indicates the market value of all officially recognized final goods and services produced within a nation at a specified period [5]. The thrust of this study is to explore the effect of financial intermediation activities on the growth of Nigeria economy.

Statement of the problem

Nigeria's financial reform is an on-going process and has been implemented as part of the wide-range market-oriented economic reforms since the late 1980s [6]. Globally, the financial intermediation activities of banks mirror their unique roles as the instrument of growth in any economy. Central Bank of Nigeria (CBN) has imbued the total of N600 billion naira into the Nigerian banking sector to recapitalize the banks that have liquidity crisis and credit crunch caused by excessive lending, extravagance, and sleaze [7]. The recent audits of the Nigerian banks by the Central Bank of Nigeria (CBN) have exposed the inefficiency and ineffectiveness of the banking sector and revealed that the majority of these banks were ill-managed and that corruption has almost destroyed the system. As a result, the CBN committed himself to clean the financial mess [8]. Factors that motivate financial intermediation activities in the economy are largely under-researched in Nigeria. This is considered very crucial to ensure that financial institutions have the desired impact on the economy at large. There is a dearth of research on the effect of bank intermediation activities on economic growth in Nigeria since the introduction of the merger and acquisition of banks in 2005. This study aims to fill significant gaps on this issue especially concerning intermediation activities of Nigerian Deposit Money Banks.

Research hypothesis

H₀₁: Financial intermediation activities has no significant influence on the growth of the Nigerian economy

H₀₂: Financial intermediation activities has a significant influence on the growth of the Nigerian economy

This paper is therefore divided into five sections. Section one deals with the introduction discussed above while section two dwells on the literature review, section three explains the methodology, section four deals with analyses and discussion of findings and finally section five explains conclusion and recommendations.

2. Literature Review and Conceptual Explanation

2.1. Theoretical Review

Theory of Delegated Monitoring and Financial Intermediation

An intermediary such as a commercial bank has delegated the task of costly monitoring of loan contracts carved with firms who borrow from it [9]. It has an overweight cost advantage in collecting the information because the

alternative is either duplication of effort if each lender monitors directly or a free-rider problem in which case no lender monitors. As a result, financial intermediation theories are generally grounded on some cost advantage for the intermediary.

Financial Repression Theory

Financial repression refers to a wide array of policies that allow a government to place its debt with financial institutions at relatively low-interest rates [10]. Financial repression is caused by interest rate ceilings, liquidity ratio requirements, high bank reserve requirements, capital controls, restrictions on market entry into the financial sector, credit ceilings or restrictions on directions of credit allocation, and government ownership or domination of banks. Economists have commonly argued that financial repression prevents the efficient allocation of capital and thereby impairs economic growth [11].

Information Production theory

Surplus units could incur substantial search costs if they were to seek out borrowers directly. If banks did not exist, then there would be duplication of information production costs as surplus units would individually incur considerable expenses in seeking out the relevant information before they committed funds of specializing agents such as banks that choose to produce the same information [12].

2.2. Concept of Financial Intermediation

Financial intermediation is the process by which intermediaries provide a linkage between surplus units and deficit units in the economy. For financial intermediation to succeed, three qualities are essential and these are cost, convenience and confidence [13]. Finance is germane for different purposes by different organizations, individuals and other economic agents. To provide the needed finance, there are varieties of institutions rendering financial services. Such institutions are called financial institutions. Commercial banks are among such institutions that render financial services. This is known as direct finance [3].

2.3. Review of Empirical Studies

A recent study establishes the relationship between financial intermediation and economic growth, using country-specific data from China [14]. The study focused on the post-1978 reform period, using provincial data (28 Provinces) over the period 1985 to 1999. The study employed the use of a linear model, which expresses economic growth as a function lagged economic growth, financial development indicators (banks, savings, and loan-budget ratio), as well as a set of traditional growth determinants (population growth, education, and infrastructural development). The study uses the one-step parameter estimates for the Generalized Method of Moments (GMM) estimation and finds that financial intermediation has a causal effect and positive impact on growth through the channels of house-holds savings mobilization and the

substitution of loans for state budget appropriations. However, the study reveals that bank, as an indicator of financial development, is significant but negatively related to growth.

This was attributed to the inefficiency in loan distribution and the self-financing ability of the provincial governments. There is also a confirmation from another study that showed the positive impact of finance on economic growth [15]. He investigates the relationship between finance and growth, with emphasis on the effect of financial deregulation and banking law harmonization on economic growth in the European Union. The study establishes that financial intermediation impacts positively on economic growth through three channels.

Evidence from a previous study posited emphasized that financial intermediation leads to economic growth in a small open economy of Sri Lanka using time series macro data for the period 1977-2008 [16]. This investigates the channel and the effect of financial intermediation on economic growth with a new framework. The model framework of the study was developed as per the endogenous growth theory. The model explains the joint effect of financial intermediation, trade openness and other economic factors on economic growth in Sri Lanka. The paper used Engle-Granger two-step methodologies to find out long term relationship between financial intermediation and economic growth and short-run dynamic of the model is explained by the granger causality test. The findings of the study revealed that financial intermediation impacts economic growth in the long run but the relationship is not strong. Further, the study reveals that financial intermediation promotes growth through the productivity channel rather than the accumulation of capital.

3. Methodology

The study area is Nigeria Deposit Money banks. This study focuses on these banks because they contributed majorly to the growth of Nigeria's economy using country aggregate level annual data from the Central Bank of Nigeria. Secondary data was used for this study. The data covered 36 years period, that is, between 1983 and 2018. The Data generated were analyzed through descriptive statistics such as mean, median and mode while the formulated hypothesis was analyzed through econometric statistics such as multiple regression at a 5% level of significance. Unit root test and co-integration tests were also used to test for the presence of stationarity and to establish a long-run relationship of the variables. Finally, this study proceeds to the Vector Error Correction Model (VECM) to evaluate the short-run effects of the cointegrated series.

Model Specification

The models shall take a general form of a multiple regression model expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \dots \quad (3.1)$$

Where Y is economic growth proxied by RGDP

(dependent variables), X_1 - X_n are independent variables β_0 is constant and β_1 - β_n represents the coefficient of independent variables.

Model:

To achieve the objective- “evaluate the effect of financial intermediation activities on growth of the Nigerian economy”, the model specified as:

$$RGDP = f(BMS, SCR, BD, CDP)$$

Specifically, the model is given as:

$$GDP = \beta_0 + \beta_1 BMS_t + \beta_2 SCR_t + \beta_3 BD_t + \beta_4 CDP_t + \mu_t \quad (3.2)$$

RGDP-Real Gross Domestic Product ...

BMS- Broad Money supply

SCR- Size of Credit

BD- Bank Deposits

CDP- Credit delivered to private Sector (Economic volatility)

t= time subscript

μ_t - White noise residual /Error term in time t.

β_0 and β represent the regression constant and regression coefficient of the variables.

4. Results and Discussions

Unit root test

The Augmented Dickey-Fuller (ADF) was used to investigate the stationarity of the data series. The test result shown in table 1 indicated that all the series are integrated at the difference of order one “I(1)”. Hence, the relationship of the series would be spurious if the existence of the unit root test were stated at the level.

Table 1. Unit Root Test

Unit root test			
Variables	Order of Stationarity	Augmented Dickey-Fuller test statistics	Decisions
RGDP	0	4.695	Stationary
RGDP	1	3.421	Stationary
BMS	0	9.828	Stationary
BMS	1	2.959	Stationary
SCR	0	5.723	Stationary
SCR	1	3.292	Stationary
CDP	0	-0.754	Stationary
CDP	1	-8.31	Stationary
BD	0	7.551	Stationary
BD	1	4.826	Stationary

Test critical values: ADF test are 1%, -2.652, 5% -1.950, 10% -1.602

Source: Researcher computation, 2019 using STATA version 12

Co-integration Test

From the result presented in Table 2 for the trace statistic, it either rejects the null hypothesis of no co-integration among the variables or it does not reject the null hypothesis that there are five co-integration relations among the

variables. Start with $H_0: r = 0$. If it rejects, repeat for $H_0: r = 1$. When a test is not rejected, stop testing and that value of r is the estimate used for the number of co-integrating relations. In this test, $H_0: r = 4$ which is not rejected at the 5% (32.9048 < 45.41). The number of co-integration vectors with four lags is equal to four i.e rank ($\pi=4$). Since the rank is equal to 4 which is greater than zero and less than the number of variables, the series is co-integrating among the variables and this suggests a long-run relationship among the variables.

Vector Error Correction Model

From the result of the cointegration test established above,

there exists a long-term equilibrium relationship among variables. Hence, this study proceeds to the Vector Error Correction Model (VECM) to evaluate the short-run effects of the cointegrated series.

Table 3 showed that all the coefficients were statistically significant at a 1% confidence interval. When more than one cointegrating vector is estimated, the coefficients can be interpreted as long-run elasticities. Thus, a 1% increase in credit delivered to the private sector and bank deposit, RGDP is likely to increase by 8.569148 and 2.222514 and this estimation was significant. For a 1% increase in BMS and SCR, RGDP is reduced by -5.089393 and -5.429995. these coefficients were significant at 5% level of significance.

Table 2. Johansen Co-integration Test using trace statistics

Maximum rank	parms	LL	eigenvalue	trace statistic	critical value 5%
0	43	215.62884	.	138.7478	94.15
1	54	331.98556	0.82746	86.0344	68.52
2	66	449.70365	0.69309	50.5982	47.21
3	71	361.75767	0.55229	45.4902	29.68
4	73	271.15571	0.46556	32.9048*	45.41
5	74	374.97576	0.22483	7.6941	3.76
6	77	475.00274	0.00180		

* means 4 cointegration equation

Source: Researcher computation, 2019 using STATA version 12

Table 3. Vector Error-Correction Model (VECM)

Cointegrating equations						
Equation	Parms	chi2	P>chi2			
_ce1	5	188.1413	0.0001			
Identification: beta is exactly identified						
Johansen normalization restriction imposed						
Beta	Coef.	Std. err.	Z	Pr> z	95% conf.	interval
_ce1						
Rgdp	1	.	.	.	.	.
Bms	-5.089393	1.213693	-4.19	0.001	-7.468188	-2.710598
Scr	-5.429995	.8337509	-6.51	0.000	-7.064117	-3.795874
Bd	8.569148	1.622249	5.28	0.001	5.389599	11.7487
Cdp	2.222514	.5220335	4.26	0.000	1.199347	3.24568
-cons	38.82672	.	.	.	.	.

Source: Researcher computation, 2019 using STATA version 12

Descriptive Statistics

Table 4 showed the descriptive statistics of the variables used in this study. The result indicated that the most volatile variable is RGDP with a standard deviation of 33416.77 followed by Broad Money supply with a standard deviation of 4318.224 while the total bank deposit is the least volatile at about 1144.232 standard deviations. A high level of consistency was also shown from the result as the median values fall within the minimum and maximum values of the series.

Table 4. Descriptive Statistics

Stats	GDP	BMS	CDP	SCR	BD
Mean	16550.31	3426.897	2649.969	1931.213	1894.32
Median	2222.23	448.55	281.565	322.22	301.675
Sd	33416.77	4318.224	3217.321	2288.36	1144.232
Max	89043.62	17680.52	17128.98	12544.62	11936.69
Min	220.06	112.69	23.67	8.6	8.08
Skewness	1.644402	1.358581	1.811296	1.760644	1.658955

Source: Researcher computation, 2019 using STATA version 12

Table 5. The Regression Result of the effects of Bank Intermediation Activities on economic growth

Dependent variable	Independent variables	Coefficient	Standard Error	T	P> t	[95%Conf. interval]
RGDP	BMS	.0661791	.3190876	0.17	0.864	-.6007148 .7110731
	SCR	4.337539	1.201418	5.18	0.000	3.7477988 8.68709
	BD	-8.166772	2.415505	-3.38	0.002	-13.13191 -3.201631
	CDP	4.31341	1.595215	4.08	0.000	3.226399 9.784422
	constant	6536.103	2886.275	2.26	0.032	603.2788 12468.93
R-squared = 0.8859		Adj R- squared = 0.8832	Prob> F = 0.0003	F(8, 28) = 464.23	Root MSE = 2317.3	

Source: Researcher computation, 2019 using STATA version 12

Analysis of the effects of financial intermediation activities on Nigerian economic growth.

Table 5 showed the effects of financial intermediation activities on the growth of the Nigerian economy. A unit rise in BMS, SCR and CDP increases the level of Real Gross Domestic Product (RGDP) by .0661791, 4.337539 and 4.31341 units, indicating that there is a positive relationship between RGDP and each of BMS, SCR, and CDP. The result is significant for all the above variables except for BMS since their p-value is less than 0.05. The relationship between BD and RGDP is negative suggesting that if RGDP increases BD reduces. The adjusted R^2 coefficient (0.8832) which is the coefficient of determination indicates that the explanatory variables accounted for 88% of the variation in the influence of RGDP on Broad Money supply (BMS), Size of Credit (SCR), Bank Deposit (BD) and Credit Delivered to Private Sector (CDP) in Nigeria for the period under review. The result remains robust as indicated by the high value of adjusted R^2 , which is 0.8832 (i.e. $\approx 88\%$). Thus, the regression has a good fit.

5. Conclusions and Recommendations

The study examined the effect of financial intermediation on economic growth in Nigeria using country aggregate level annual data sourced from Central Bank of Nigeria from 1983 to 2018. The study used the Ordinary Least Square Regression Analysis method to achieve the study hypothesis with the aid of STATA 12. The results of the study, therefore, revealed a statistically significant impact of financial intermediation activities on the growth of Nigeria's economy. This, therefore, suggest that the performance of the financial intermediaries such as banks influences economic growth and found out that credit delivered to the private sector indicates the capacity and efficiency of financial intermediaries in allotting funds to finance economic growth. The result of the unit root test showed that the stationarity of all the variables has been established. The Johansen co-integration test result showed that the long-run relationship exists among the variables and a short-run relationship was established using the Vector Error Correction Model (VECM).

The financial intermediation activities indices in the study explain a greater proportion of changes in economic growth, however, it was found out that the indices that have an

insignificant effect and unexpected relationship with economic growth, indicating that the banking intermediation role has not been completely explored on the Nigerian economy. This might due to the level of intractable challenges and complexity in implementing a policy that may enhance the smooth flow of financial intermediation to achieve the desired results.

It is therefore recommended that there should be a reduction in lending rate associated with the size of credit, increased volume of credit to the private sector, sustenance of on-going reforms and evolving measures to boost deposit mobilization which would spur investment and engender growth in the Nigerian economy. Also, there should be a review of monetary policy by the Central Bank of Nigeria (CBN) with the target of increasing the money supply to be able to reduce the costs of borrowing (lending interest rate). The achievement of this will motivate investors and encourage them to borrow more money.

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