ECONOMETRIC ANALYSIS ON THE RELATIONSHIP BETWEEN FINANCIAL INTERMEDIATION AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This paper investigates the nexus between financial intermediation and economic growth in Nigeria for a period of thirty-one (31) years (1985-2016), using time series data for the sampled period, the conventional unit-root test conducted indicates that the variables of interest are integrated of order one I(1), cointegration analysis revealed the presence of a long-run relationship between financial intermediation which is proxy by the ratio of bank credit to the private sector, interest rate and economic growth in Nigeria, and causality test conducted on the granger frame-work indicates that causation stems from financial intermediation to economic growth in Nigeria. The study recommends that, long-term investment loan should be given to the priority sectors of the Nigerian economy at an affordable and attractive interest rate.

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1.1   Introduction

Theoretical presuppositions on finance and growth nexus have recently occupied a key position in the financial economics literature, having its original bench mark from the Schumpeterian hypothesis (Schumpeter, 1934) laying a strong emphasis on the critical roles of financial intermediation in achieving both short-run and long-run economic growth, evidenced by the strength of finances in facilitating technological innovations in both the production of output and the provision of financial services which is performed through the process of channeling of funds from the surplus spending units to the deficit spending unit at relatively lower cost of investment. This argument, however, attracts several theoretical and empirical studies at both country specific and international scopes. Some of these studies hold that there is a strong relationship between financial intermediation of any country and its economic performance, with common notion that the scarcity of long-term finances in developing countries is the major obstacle to higher investment leading to slow output growth in these economies, see (Gross, 2001), (Ngai 2002), (Adeniyi, 2006), (Eatzaz& Malik, 2009).Other studies at panel scopes and using various econometric techniques to analyze the nexus between financial intermediation and economic growth have succeeded in reporting a positive and significant relationship between financial intermediation and economic growth. See (Levine, 2004), (Lee, 2005), and (Shittu, 2012).

Despite the presence of either Uni-directional or Bi-directional relationship in the previous studies, some empirical studies opined that scholars have overstressed the roles of financial intermediation in achieving economic growth, arguing that financial intermediation has no first order effect on economic growth of either developed or developing economies. See (Erick &Muhsin, 2000), (Suleiman & Abu-Qarn, 2006) and (Alisha &Bhutta, 2014). While Ranciere, Tornell and Westermann (2006) argued that the link between financial intermediation and economic growth is multidimensional as it is country specific and largely depend on the proxies adopted for the variable, the period of study and the economic environment. It is against the background that this paper intends to investigate the nexus between financial intermediation and economic growth inNigeria for a period of thirty-one (31) years (1985-2016). The reminder of this paper is structured in five sections including introduction, to be followed by literature review, methodology of the study, discussions of findings and lastly, conclusions and recommendations are made.

2.0 Literature Review

A financial intermediary is typically an institution that facilitates the channeling of funds between lenders and borrower indirectly. That is savers (lenders) gives funds to an intermediary institution (such as bank), and that institution gives those funds to spenders (borrowers). This could be informing of loans or mortgage. Alternatively, they lend money directly via the financial markets, and eliminate the financial intermediary, which is known as financial disintermediation. In the context of climate of finance and economic growth, financial intermediaries generally refer to private sector intermediaries, such as banks, private equity, venture capital funds, leasing companies, insurance and pension funds and micro-credit providers. Increasingly, international financial institutions provide finding via companies in the financial sectors rather than directly financing projects (Shittu, 2012).

To begin with Ang&McKibbin (2007), their studies examined whether financial intermediation lead to economic growth in a small but open economy of Malaysia using time-series data from 1960 to 2001. Adopting cointegration, Granger causality and Lagrange Multiplier (LM) tests, empirical results from this work suggest a favorable effect of financial intermediation in stimulating economic growth. It further revealed a positive correlation between financial depth and economic growth. Study by Yang and Yi (2008) on the Korean economy revealed that financial intermediation control causes economic growth, supporting a unidirectional causation among finance and economic growth. Applying the recently Autorregressive Distributed Lag (ARDL) bound test for cointegration on Pakistan, Anwar, Shabir&Hussain (2011) confirmed the existence of a stable long-run relationship between financial intermediation and economic growth. They also reported that financial intermediation is the base for economic growth at both short-run and in the long-run. Research work that lend to their findings includes Seetanah (2007), Jalil& Ma (2008), Khan &Qayyum (2008).

Abu-Bader & Abu-Qarn (2008) study this nexus in Egypt for the period 1960-2001. Using a trivariate Vector Autorregressive (VAR) framework, they also employ four (4) different measures of financial intermediation and apply Granger causality test based on the cointegration and Vector Error Correction Mechanism (VECM). Their findings revealed a mutual causality between financial intermediation and economic growth. It further demonstrated that financial

intermediation causes economic growth through both increasing resources for investment and enhancing efficiency. Odhiambo (2008) seeks to examine the dynamic causal relationship between financial intermediation and economic growth in Kenya. The study focuses on the period of thirty-four years(1969 to 2005) and included savings as an intermitting variable. To achieve this task, this study adopted two econometric techniques, the dynamic tri-variate granger causality test and the Error Correction Model (ECM). This study concludes a one-way directional causality running from economic growth to finance exists in Kenya. Furthermore, finance plays a minor role in the attainment of economic growth in Kenya.

Applying Cointegration and Error Correction Mechanism (ECM) on the data from the Nigerian economy covering the period 1990-2011, Oriavwote&Eshenake (2014) examines the impact of financial intermediation on economic growth, their results indicates a long-run relationship between financial intermediation and economic growth. Lending to this findings, Chinaemerem&Chigbu (2012) studied the impact of financial intermediation variables on the Nigerian economic growth. Applying various econometric analysis such as the Augmented Dickey-Fuller (ADF) test, Granger causality, Cointegration and Vector Error Correction (VEC) Mechanism, their studies revealed that all exogenous variables Granger causes GDP as a proxy for economic

growth. While To Shittu (2012) used time-series data from 1970 to 2010. Employing econometric techniques for data analysis such as the conventional unit- root test, cointegration and error correction techniques were estimated based on the Granger causality methods. Findings from this research revealed that financial intermediation has a positive and statistically significant impact on the growth of the Nigerian economic growth.

Odeniran&Udeaja (2010) studied the relationship between financial sector development and economic growth in Nigeria over the period 1960-2009. Testing the competing theories on finance and growth based on ratio of broad money to GDP, Growth in private sector credit to GDP, and growth in bank deposit liability to GDP as proxies for financial development. Using Granger causality in a Vector Autoregressive (VAR) framework, their results suggests the existence of bi-directional causality running from financial development to economic growth.

They further reported that financial intermediation Granger cause output even at one percent (1%) level of significance. In a related development, Adu et-al (2013) investigates the long-run effects of financial intermediation on economic growth in Ghana using annual time-series data spanning the period 1961-2010. Adopting credit to the private sector as ratios to GDP, Broad money stock to GDP, Narrow money as a ratio to broad money, ratio of total deposit liabilities to GDP, trade openness and government expenditure as proxies for financial intermediation, while real GDP is treated as proxy for economic growth. Utilizing the Autoregressive Distributed Lag (ARDL) bound test to cointegration and principal component analysis. Result from this research work revealed that credit to the private sector as a ratio to GDP and domestic credit are growth inducing variables while broad money to GDP ratio is not conducive for economic growth. One unique feature of this research work is that it confirms the sensitivity of the effect of choice of the proxy for financial development. This suggests that whether financial intermediation is good or bad for economic growth depends on the indicator used to proxy for financial intermediation which helps in understanding the source of conflicting results in the literature on finance and growth nexus.Empirical studies on financial intermediation and economic growth usually report the presence of supply-leading hypothesis which stresses that the relative abundance of financial products and services is the driving force for achieving economic growth, while demand-following hypothesis suggests that the demand for financial product and services by the real sector in what prompted the growth of financial intermediaries. While, independent hypothesis argued that financial intermediation has no direct effect on economic growth. This paper aimed at contributing towards this direction by filling the time gap and taking the most recent data for analysis.

3.0   Methodology

This paper utilizes secondary data in the form of annual time series data for thirty (30) years ranging from 1985 to 2015. The data was obtained from CBN statistical Bulletin (2015), Annual Reports (2014, 2015), National Bureau of statistic (2015) and Midyear economic Review (2014).

3.1   Variables Measurement

Variables to be measured are the real GDP as a proxy for economic growth which is defined as the total money value of all goods and services produced within a country in any given period as

a dependent variable. Also, domestic credit to private as a percentage of GDP is used as a proxy for financial intermediation. Various researchers including Wolde-Rufael (2009), Akinboade (2000), Hassan et al (2011), Sulaiman et al (2013) and Murtala et al (2015) have explained the variability, complexity and short comings of various financial intermediation proxies. They have concluded that among all proxies, the growth of domestic credit of private sector indicates that there are both growth in financial intermediation and interest rates, which are useful for economic growth.

3.2   Method of data Analysis

The method used for data analysis in this study includes; the conventional unit-root test which is conducted to satisfy the stationarity properties of time-series data on financial intermediation and economic growth in Nigeria, then the cointegration test to ascertain the presence or otherwise of the relationship that exists among these variables. This paper finally uses causality tests based on the Granger frame-work to detect the direction of the flow of the relationship between financial intermediation and economic growth in Nigeria.

3.3   Model Specification

The model for the study is adopted from Anwar et-al (2011) with slight modification which is stated in Equation (i)

$$GDP= f (PSC, Intr) \text{---------------------------------------(i)}$$

The growth model is assumed to have a non-linear relationship existing between the variables based on the cob-Douglas production function. Hence equation (ii) is expressed in cobb-Douglas form as follows:

$$LGDP_t = \beta_0 + \beta_1 f i_t + x_t \text{----------------------------------(ii)}$$

The cob-Douglas production function is a regression function in which the explicit solutions of the unknowns cannot be obtained except it is transformed to a linear function. Thus, the linear transform equation is expressed in an explicit econometric form as:

$$LGDP_t = \beta_0 + \beta_1 Psc_t + \beta_2 Intr_t + \mu_t \text{-----------------------(iii)}$$

Where:

LGDP = Log of Gross Domestic Product

β_0 = The intercept term

PSC = Private Sector Credit

Intr = Interest rate

μ = Error term

β_1, β_2, = Co-efficient of parameters to be estimated

 t = Time series

4.0 Results and Discussions

In analyzing the relationship between financial intermediation this section begins with descriptive analysis which is reported in table 4.1

Table 4.1: Descriptive statistics

Variables	Obsv.	Mean	Std. dev.	Minimum	Maximum
Real GDP	31	1.52E+11	1.78E+11	1.58E+10	5.68E+11
Credit to private sector	31	14.89174	6.533501	8.709660	38.3865
Interest rate	31	-0.031290	17.78165	-43.57	25.2800

Source: Author's computation using EVIEWS software

The data used in the study have been summarized in table 4.1, using descriptive statistic in the form of mean, standard deviation, minimum and maximum amount of variables. The study covers thirty one (31) years as observations. The mean value of Real GDP within the study period is 1.52E+11, with a standard deviation of 1.78E+11 while 1.58E+10 and 5.68E+11 are the minimum and maximum amount of RGDP respectively. Credit to the private sector has a mean of 14.89174 (Billion), a standard deviation of 6.533501, while 8.709660 and 38.3863 are the minimum and maximum amount of credit to the private sector.

Interest rate has a mean of -0.031290, a standard deviation of 17.78165 and a minimum and maximum of   -43.57 and 25.28 respectively

In analyzing the relationship between financial intermediation and economic growth in Nigeria the study begin with conventional unit-root test to satisfy stationarity property of the series based on Augument Dickey-Fuller (ADF) unit-root test presented in table 4.2.

Table 4.2: Result of Augumented Dickey-Fuller unit-root test

Variable	Level value	Difference value	Conclusion
LRGDP	-0.0162061	-4.403959***	I (1)
LCPS	-2.469949	-4.830142***	I (1)
LINT	-5.399411	-6.908087***	I (1)

Source: Author's computation using EVIEWS 7.0 software.

Note: *** indicates level of significance at 1%

Augumented Dickey-Fuller unit-root test table 4.2 presents both the level values and difference values of Real GDP, credit to the private sector and interest rate. The variables are not stationary at level as -0.0162061, -2.469949, and -5.399411are all greater than critical values. However, the variables became stationary after taking their first difference as RGDP -4.403959, credit to private sector -4.830142 and interest rate -6.908087 are stationary at first difference concluded as integrated of order one I (1).

The paper proceeded after this condition was met to conduct cointegration test based on Johansson frame-work.

4.3   Cointegration Analysis

This is conducted to test the presence of long run relationship between financial intermediation and economic growth conducted based on Johansson cointegration frame-work presented in table

4.3.

Table 4.3: Result of Cointegration Analysis

Dependent Variable	Function	F-Statistics
LRGDP	LRGDP (RGDP/CPS)	-0.012604**
LCPS	LCPS (CPS/RGDP)	1.170004***
LINTR	LINTR (INTR/CPS)	3.750002*

Source: Author's computation using EVIEWS 7.0 Software.

***, **, *, indicates level of significance at 1%, 5% and 10% respectively.

The result of Cointegration test as reported in table 4.3 indicated that RGDP and CPS shared a long run relationship as the F-Statistics -0.012604 and 1.170004 are statistically significant at 1% while interest rate has 3.750002 which is only significant at 10%.

4.4 Causality Analysis

The study conducted causality test based on Granger frame-work reported in table 4.4

Table 4.4: Result of Granger causality test

Null Hypothesis	Lags	Obs.	F-Statistics	P-Value
CPS does not Granger cause RGDP	2	29	3.87193	0.0035
RGDP does not Granger cause CPS	2	29	4.11870	0.0290
Intrt does not Granger cause RGDP	2	29	0.05352	0.9480
RGDP does not Granger cause Intr	2	29	3.96141	0.0326
Intrt does not Granger cause CPS	2	29	0.50882	0.6075
CPS does not Granger cause Intrt	2	29	3.97845	0.0032

Source: Author's computation using EVIEWS 7.0 Software

The result of Granger causality test as reported in table 4.4 indicates that after taking a maximum of 2 lags, observation become 29. The Null hypothesis of no causality running from credit to private sector and economic growth indicates an F-Statistics of 3.87193 and a probability value of 0.0035 which is significant at 1%.

Real GDP does not Granger cause credit to private sector has an F-Statistics of 4.11870 and a probability value of 0.0290 which is not significant at either 1, 5 and 10%. It is only significant at 29%.

Interest rate does not Granger cause RGDP has an F-Statistics of 0.05352 and a P-Value of 0.9480. RGDP does not Granger cause interest rate has an F-Statistics of 3.96141 and a probability value of 0.0326. While interest rate does not Granger cause credit to private sector has an F-Statistics of 0.50882 and a probability value of 0.6075. Lastly the null hypothesis of credit to the private sector does not cause interest rate has an F-Statistics and a probability value of 0.0032 significant at 5%.

5.0   Conclusions and Recommendations

The study concludes that financial intermediation has a long run relationship with economic growth, results from this study also suggests that causation is fund to be stemming from financial intermediation to economic growth through interest rate has no first order effect on both financial intermediation and economic growth.

Based on the empirical explorations of this study, the study recommends that long term investment loans are to be disbursed especially to the productive sectors of the Nigerian economy this includes: Agriculture manufacturing and processing industries. As the study found that only credit to the private sector sectors causes economic growth, there is the need for the regulation of interest rate that will attract borrowers to invest in the priority sectors the economy.

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