



ANALYSIS OF ECONOMETRIC RELATIONSHIP BETWEEN FINANCIAL INTERMEDIATION AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This paper seeks to examine the impact of financial intermediation on economic growth in Nigeria. Time series data from 1970 to 2010 were used and were gathered from the CBN publications. For the analysis, the unit root test and cointegration test were done accordingly and the error correction model was estimated using the Engle-Granger technique. The paper established that financial intermediation has a significant impact on economic growth in Nigeria.

Keywords: *Economic Growth, Financial Intermediation, Money supply, Commercial Bank*

Introduction

The role of financial intermediation has been exemplified in numerous literatures of finance. Besides the performance of specialized tasks, several theoretical models posit that they mitigate the costs associated with information acquisition and the conduct of financial transactions (Benston and Smith, Jr; 1975). In addition to these, several studies have revealed that financial intermediation does more than cost mitigation. It makes provision for insurances and risk sharing (Allen and Gale; 1997, 2004), stimulates the funding of liquidity needs through credit lines (Holmstrom and Tirole; 1998), and aids the creation of specialized products (Benstom and Smith. Jr; 1975). The concept of financial intermediation is not relatively new. For decades, it has been a subject

of study at both the macro-level, and the microlevel. At the macro-level, the significance of financial intermediation cannot be over-emphasised. However, there are mixed feelings about this. While some argue that it facilitate the efficiency of the financial system (Gromb and Vayanos; 2010, Anad and Subrahmanyam; 2008), others have also argued that it is passive in nature and serves as a conduit through which monetary policy is effected (Benstom and Smith. Jr; 1975) and contracts, not available in the financial market, are implemented (Holmstrom and Tirole; 1998). At microlevel, studies have shown that financial intermediation stimulates the restructuring and liquidation of distressed firms (Araujo and Minetti; 2007), as well as eliminating the inefficiencies associated with the absence of intertemporal smoothing, as a result of incomplete market (Allen and Gale; 1997). Recently, the impact of financial intermediation on the growth of an economy generated a heated debate. While some studies opined that financial intermediation drives economic growth (see Odedokun;1998, Nieh, et al; 2009, Islam and Osman; 2011), others have argued that economic growth drives financial intermediation. However, there are studies, which have argue that a bi-directional causality exists between financial intermediation and economic growth (see Odhiambo; 2011). This study seeks to contribute to the body of literature by examining the relationship between financial intermediation and economic growth in Nigeria.

Prior to June, 2004, there were eighty-nine commercial banks, among other financial intermediaries, with capitalization of less than 10 million USD and 3,330 branches, while the top ten banks accounted for about 50 percent of the industry's total assets/ liabilities (Soludo; 2004: 5). Besides the poor capital base of these banks, there are other issues hindering the effective performance of these banks. Some of the issues include inefficiency in management, operational incompetency, poor corporate governance and unhealthy competition. Thus, these culminated in gross performance, which was below expectation. These hindered the financial sector from delivering financial services optimally to the satisfaction of both investors and customers. The Central Bank of Nigeria (CBN) has been trying hard to ensure that the financial sector in Nigeria maintain a considerable depth and remain liquid with a view to competing effectively globally. Beyond competition at the global scale, the CBN seeks to ensure that the financial sector plays it role in the achievement of growth and development in Nigeria. In view of these, several reforms have been

implemented. The reformation exercise led to the increase in the minimum capital requirements for the commercial banks, and micro-finance banks respectively. This brings to bear the existence of twenty five commercial banks. In the post consolidation era, there are fewer banks now with improved minimum capital requirement of ₦25 billion each. Unfortunately, the fear of systemic risk lingers, the supply of credit to investors is still questionable, while economic growth relatively stable.

It is in the light of the above that this study seeks to examine the relationship between financial intermediation and economic growth in Nigeria. To achieve this task, this paper is divided into five sections. The second section will focus on the review of literature, Section three focuses on the research methodology, section four focuses on the presentation and analysis of results, while the final section focuses on the summary of findings and conclusion.

Literature Review:

Finance and economic growth

According to King and Levine (1993), citing Schumpeter (1911), “*the services provided by financial intermediaries- mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions- are essential for technological innovations and economic development.*” These aroused their curiosity and were motivated to test, empirically, the logic behind this statement. Their quest for knowledge yielded a result, which became the genesis of empirical argument over the need to justify the relationship between finance and economic growth. Beyond this, quite a number of studies have shown that there is a relationship between finance and economic growth. Some of these works include; Jayaratne and Strathan (1996), Demirgüç-kunt and Maksimovic (1998), and Rajan and Zingales (1998). King and Levine (1993) conduct a pooled cross-country time-series survey of eighty countries for the period 1960 -1989 with a view to establishing the relationship between financial development and economic growth. Four variables were developed and used as proxy for financial development. These include; financial depth, relative importance of specific financial institution, proportion of credit allocated to the private sector, and the ratio of claims on the non-financial private sector. On the other hand, the average long-run real per capital GDP, the rate of physical capital accumulation, the ratio of domestic investment to GDP, and residual

measure of improvement in the efficiency of physical capital allocation were used as a proxy for economic growth. Using the cross-country regression and some other statistical test, this study established that the four indicators of financial development were positively and statistically related to growth, and other indicators of economic growth.

Jayarathne and Strathan (1996) affirm that financial development impacts positively on economic growth but with a clause that there is an improvement in the quality of bank lending. Using the bank deregulation reform in the US as a case-study, it was established that the rate of real, percapita growth in income increased significantly. This impact of the reform in the financial system on economic growth was attributed to the improvement in the quality of bank lending, and not the increase in volume of bank lending. Odedokun (1998), in his study, emphasised that even though financial intermediation promotes economic growth, the growth-promoting effects are more pronounced in the low-income countries. Using a cross-country data analysis of 71 less developed countries (LDCs) for the period 1960 to 1980, the study expanded the neo-classical one-sector aggregate production function with financial development as an input. Two models were derived with economic growth as the dependent variable, while the regressors include; labour force growth, investment-GDP ratio, real export growth, and financial depth. The models were estimated using the ordinary least squares (OLS) technique, as well as the Generalized Least Squares (GLS) technique. Besides the strong positive relationship that manifested between financial intermediation and economic growth, the study establishes that the impact of financial intermediation is at par with export growth and capital formation. However, its impact on economic growth is superior to labour force growth. Rajan and Zingales (1998) seek to establish the impact of financial development on industry-specific growth. This necessitated a cross-country, cross-industry study. The primary hypothesis was, “industries that are more dependent on external financing will have relatively higher growth rates in countries that have more developed financial market.” The study designed a multiple regression model, which specified growth as the dependent variable and the financial development, external finance dependency, country specific factors, and industry-specific factors. The average annual real growth rate of value-added was used as a proxy for growth, while value-added and grossfixed capital formation for each industry obtained from

the Industries Statistics Year Book (1993). Two finance indicators were used as a proxy. These are capitalization ratio and accounting standards. The study asserts that financial development enhances growth in indirect ways.

Demirgüç-Kunt & Maksimovic (1998) carried out a firm level-based study to justify their assertion with respect to the relationship between finance and economic growth. This study shows that a developed financial system and legal system stimulates growth. This was achieved by using cross-sectional data drawn from thirty countries (developed and developing) for the period 1983 to 1991. They are of the view that an active stock market is an indication of a well developed financial system. While the firms in a country with a high rate of compliance with the rules and regulations have access to the capital market, the developed financial system will ensure growth of these firms.

Hence, finance stimulates growth.

Levine, Loayza, and Beck (2000) changed the face of the argument on the relationship between financial intermediation and economic growth. This study seeks to establish the impact of the endogenous component of financial intermediation on economic growth. A robust methodology, which comprises two models and two estimation techniques, was employed. The first model, which defines economic growth as function of finance indicators and a vector of economic growth determinants, was estimated using the pure cross-sectional estimation technique. The second model is a dynamic panel model and is estimated using the Generalized Methods of Moments (GMM). Both tests confirm the strong positive impact of the endogenous components of financial intermediation on economic growth. They, however, noted that countries with high priority for creditors' protection, strong will to enforce contracts, and unambiguous accounting standards have the potential for a developed financial intermediation.

McCaig and Stengos (2005) introduced more instrumental variables with a view to establishing a more robust empirical relationship between financial intermediation and economic growth. The study uses a cross-country analysis of 71 countries for the period 1960 to 1995. A linear regression model, which defines economic growth as a function of financial intermediation and a set of conditioning variables, was estimated using the Generalized Method of Moments (GMM). While the instrumental variable introduced included;

religious composition, years of independence, latitude, settler mortality, and ethnic fractionalization, three conditioning variable were also used. These include; simple sets (initial GDP, and level of education), the policy set (simple set, government size, inflation, black market premium, and ethnic diversity), and the full set (simple set, policy set, number of revolution/ coup, number of assassination per 1000 inhabitants, and trade openness). This study also supports the argument that a positive relationship exist between financial intermediation and economic growth. However, it emphasized that this will be true if financial intermediation is measured by liquid liabilities and private credit as a ratio of GDP, while it will be weaker if it is measured using the

Commercial-Central Bank ratio.

Hao (2006) seeks to establish the relationship between financial intermediation and economic growth, using a country-specific data from China. 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 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.

Romeo-Avila (2007) also confirms the positive impact of finance on growth. He investigates the relationship between finance and growth, with emphasis on the effect of financial deregulation and banking law harmonisation on economic growth in the European Union. The study establishes that financial intermediation impacts positively on economic growth through three channels.

The study by Deidda (2006) is quite informative and unique. It is a micro-based study and uses the inter-temporal approach to explain the theoretical rationale of the impact of financial intermediation on economic growth. It assumes a

transition from period 1 (financial autarky) to the period 2, which is the period when financial intermediation is attained. Although this study is theoretical in nature, the General Equilibrium Analysis was used and it concludes that the growth effect of costly financial development is ambiguous when regime switch is associated with the adoption of more capital intensive technology. There is no empirical work to this effect yet.

2.2 The Causal Relationship between finance and economic growth The study by Odhiambo (2008) proves very useful in this regard. The study prepared a simple table, which summarizes previous empirical studies on the causal relationship between finance and economic growth. Several studies, however, have been conducted since then to further enhance the understanding of the causal relationship between finance and economic growth. While Liang and Teng (2006), Odhiambo (2008), Coccorese (2008), and Odhiambo (2011) emphasize that economic growth granger cause financial development, others, which include; Abu-Bader and Abu-Qarn (2008), Wolde-Rufael (2009), Kar, Nazlioglu and Agir (2011), and Bangake and Eggoh (2011) argue otherwise. Odhiambo (2008) seeks to examine the dynamic causal relationship between financial depth and economic growth in Kenya. The study focuses on the period, 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 Modelling). This study concludes that one-way direction causality, from economic growth to finance, exists in Kenya. In other words, finance plays a minor role in the attainment of economic growth in Kenya. Wolde-Rufael (2009) is of a contrary opinion. Using a different econometric technique, the Quad-variate Vector Autoregressive (VAR) framework and data from 1966 to 2005, it concludes that two-way directional causality exists in Kenya. Abu-Bader and Abu-Qarn (2008) seeks to examine the causal relationship between financial development and economic growth. The study focuses on Egypt over the period, 1960 to 2001. Using the trivariate VAR model, this study concludes that two-way directional causality exists in Egypt. In other words, finance leads growth, and economic growth induces financial development. Conversely, Odhiambo (2011) argues that economic growth granger causes financial development in South Africa. This study seeks to examine the dynamic causal relationship between financial development, economic growth, and poverty reduction.

Using a trivariate causality model and the ECM modelling to analyze the data collected from 1960 to 2006, it concludes that the hypothesis of finance-led growth do not hold in South

Africa.

Gries, Kraft, and Meierrieks (2009) seek to test for the causality between financial deepening, trade openness, and economic development. This study focuses on 16 Sub-Saharan African countries, using annual time series observations. For the purpose of establishing the causal relationships, the Hsiao-Granger method, the Vector Auto-Regression (VAR), and the Vector Error Correction Model (VECM) were used. This study shows sparse support for the hypothesis of finance-led growth. It, however, suggests that the adoption of a more balanced policy approach may reduce financial system deficiencies among the Sub-Saharan Countries.

Kar, Nazlioglu, and Agir (2011) focused on developing countries and also introduced new indicators of financial development with a view to establishing the causal relationship between financial development and economic growth. Using countries, which constitute the Middle East and North Africa (MENA) for the period 1980 to 2007, the study uses a simple linear model. This model defines economic growth as a function of financial development. Six new indicators of financial development was introduced and these include; the ratio of narrow money to income, ratio of broad money to income, ratio of quasi money to income, ratio of deposit money bank liabilities to income, ratio of domestic credit to income, and ratio of private sector credit to income. On the other hand, the real income was employed as a proxy for economic growth. The Granger Causality test was employed to establish the causal relationship between financial development and economic growth. The study concludes that the direction of causality is bi-directional, but it is country or financial development indicator specific. This study, however, suggests that a strong link may exist between financial development and the real sector.

Bangake and Eggoh (2011) also support the view of anexisting twoway directional causality between financial development and economic growth among developing countries. This study focuses on seventy-one countries, which included eighteen developing countries, for the period 1960 to 2004. The study carried out its empirical analysis using both the Panel Cointegration tests

and the Panel cointegration estimation (i.e. Dynamic OLS and panel VECM approach). It establishes that both financial development and economic growth have influence on one another, but suggests that a long-run policy approach may prove beneficial among the developing countries. Hassan, Sanchez and Yu (2011) focused more on the low- and middleincome countries from 1980 to 2007. This study comprises 168 countries, which are classified by geographic regions, and uses the panel estimation techniques (i.e. the VAR models). The study came up with two important findings. These include; a strong long-run linkage between financial development and economic growth, and two-directional causality exist between financial development and economic growth among the Sub-Saharan African countries, the East Asian countries, and the Pacific countries. This study emphasized the need for the adoption of long-run policy measures among the developing countries.

The Model Specification and Methodology:

3.1 The Theoretical Background

The fundamental theories of growth are quite explicit on the roles of capital, labour, and technological progress. However, the Schumpeterian growth models were more explicit on the relationship between finance and growth. Carlin and Soskice (2006:542) gave a brief explanation of these models as follows;

$$x = \gamma * \delta * q \quad (1)$$

Where technological progress (x) is defined as a function of research and development (q), while the two parameters define the probability that each unit spent on R&D yields a successful innovation (γ) and the extent to which each innovation raises the productivity parameter (δ), respectively. The economic determinants of the R&D are assumed to be taken as exogenous by the entrepreneur. Thus, these may include; the discounted value of expected returns, the real interest rate, capital per efficiency unit, and institution features of the economy.

$$q = q \{ \gamma, \delta, r, comp, ppr, \varepsilon \} \quad (2)$$

From the equation above; the R&D intensity (q) is assumed to be positively related to the discounted value of expected return as measured by γ and δ , negatively related to real interest rate (r), and positively related to capital per efficiency unit (k), while product market competition ($comp.$) and property right

(*ppr*) are examples of institutional features within the economy. ε depicts all other institutional features of the economy not cited in the equation. From equation 1 and 2, the “Schumpeter relationship” can be derived as;

$$x = x\{k\} \quad (3)$$

This states that since the rate of technology (x) depends on q , which in turn, depends on k , x is a function of k , the capital efficiency per unit. A positive relationship also exists between the two variables. Thus, an increase in the saving rate in the economy will increase the capital efficiency per unit, which in turn stimulates more R&D activities via innovation. This will bring about growth in the economy. Thus, in a steady state, x is similar to economic growth.

The Model Specification

Following a detailed review of previous studies and improving upon the theoretical postulate described in equation three above, economic growth is expressed as a function of financial intermediation, F_t , and a set of control variable, Z . This is expressed by equation (4) below;

$$Y_t = f\{F_t, X_t\} \quad (4)$$

Following the empirical specifications in Christopoulos and Tsionas (2004), Khan, et al (2004) and Jalil, et al (2010), the equation above will be expanded to accommodate the indicators of financial intermediation, as well as the determinants of traditional growth, such as capital stock and trade ratio. Thus,

$$Y_t = \alpha + \beta F_t + \delta Z_t + \varepsilon_t \quad (5)$$

From above; y_t is the growth rate of real gross domestic product, F_t is the financial intermediation indicators, while Z_t is the set of other growth determinants. The parameters include; α , β , and δ . ε_t is the residual term.

The Data

This study uses annual data for the period 1970-2010 collected from the CBN Statistical Bulletin (2008), Annual Reports (2009, 2010), and MidYear Economic Review (2011). Economic growth is the explained variable. The growth rate of the real gross domestic product is used as a proxy for this

variable. For financial intermediation, two indicators commonly used in the literature are used as proxy. These are the ratio of broad money supply (M2) to nominal gross domestic product (NGDP) and the ratio of domestic credit to the private sector (CPS) to the nominal gross domestic product (NDGP). While the former measures the capability of the banks to mobilize funds for investment purposes, the latter measures the financial opportunities available to firms, most especially new firms.

Unfortunately, these variables have their shortcomings. These would not be discussed for it is not within the scope of this study. In addition, it is important to state that the ratio of broad money supply to nominal gross domestic product shows the degree of monetization in the economy (WoldeRufael, 2009; Jalil, et al, 2010). Thus, an increase in this ratio implies an extensive use of currency rather than an increase in bank deposits. In other words, this is an increase in monetization instead of financial depth. In Nigeria, M₂ is regarded as the intermediate monetary target and it comprises both the narrow money supply (M₁) and Quasi-money. I am aware of the challenges of the stock-flow issues associated with these proxies.

Empirical studies have identified that the stock-flow issues associated

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with the balance sheets of financial intermediaries. To resolve this issue, this study follows the procedure initiated in King and Levine (1993) and made popular in Levine, et al (2000). This adjustment requires four steps exercise. The end-of-the-current-year items of the balance sheet of the banking institutions will be deflated by the corresponding end-of year CPI. Similarly, the end-of-the-previous-year items of the balance sheet of the banking institutions will be deflated by the corresponding end-of-the-previous-year CPI. The average of these two is then divided by the GDP at the end-of-the-current year. This study follows suit, and have the financial intermediation indicators adjusted accordingly before the application of the econometric analysis. In addition to the measure of economic growth and financial intermediation, this study uses several control variables associated with either economic growth. Two of these variables are included in the model. These are capital stock and trade ratio. The ratio of capital expenditure to nominal gross domestic product and the share of gross capital formation are used as proxy for the capital stock,

while the trade ratio is defined as the ratio of the total value of exports and imports to the nominal gross domestic product.

Table 1(see next page) presents the descriptive statistics and correlations for the explained variable and the explanatory variables. The probability of each is presented in parenthesis. All the explanatory variables are positively correlated with the growth rate of the real GDP, except capital expenditure. Broad money supply is positively correlated with capital expenditures, but negatively correlated with credit to the private sector and trade value respectively. In addition, the credit to the private sector is negatively correlated with trade values, while the trade value, in turn, is negatively correlated with capital expenditures.

Table 1: Summary Statistics and Correlation Analysis

	LRGDP	M2 NGDP	PSC NGDP	CEXPNGDP	EXIMNGDP
Mean	1.567	0.0065	4.2939	0.0799	0.5073
Median	1.7969	0.002	0.7867	0.0746	0.4711
Std Dev	1.4877	0.023	5.8259	0.0473	0.1504
Maximum	6.3109	0.1405	18.929	0.2047	0.8823
Minimum	-1.4934	-0.0019	0.116	0.0069	0.2155
Correlation Analysis					
LRGDP	1				
	0.6941	1			
M2NGDP	(0.000)				
	0.1139	-0.1330	1		
PSCNGDP	(0.4780)	(0.4069)			
	-0.0536	0.1727	-	1	
CEXPNGDP	(0.739)	(0.2801)	0.6125		
			(0.000)		
	0.0011	-0.0497	0.5179	-0.1973	1
EXIMNGDP	(0.9941)	(0.7575)	(0.005)	(0.2161)	

Analysis of results and discussion of findings

Testing for Stationarity

In an attempt to estimate the relationship between economic growth and financial intermediation in Nigeria, the first task is to test for the presence of unit root. This is necessary in order to ensure that the parameters are estimated using stationary time series data. Thus, this study seeks to avert the occurrence of spurious results. To do this, both the Augmented Dickey-Fuller (ADF) and Phillips-Perron tests are used. The essence of the ADF tests is the null hypothesis of nonstationarity. To reject this, the ADF statistics must be more negative than the critical values and significant. On the other hand, the Phillips-Perron test differs because it is a robust test for serial correlation and time dependent heteroskedasticities.

Table 2 (see the next page) presents the results of ADF and PP test statistics for the levels and first differences of the annual time series data for the period, 1970-2010. The asterisk (*) denotes rejection of the unit root hypothesis at the 1% level. The ADF statistics were generated with a test for a random walk against stationary AR (1) with drift and trend with maximum lag of 9. While the PP test uses the automatic bandwidth selection technique of Newey-West.

Table 2: Stationary test statistics (ADF and PP statistics)

	ADF		PP	
	Level	First difference	Level	First difference
<i>RGDP</i>	-2.04	-12.301	-1.899	-6.909*
<i>CEXP</i>	-3.66	-16.899	-3.689	-8.69*
<i>TRD</i>	-3.55	-18.717	-3.56	-9.707*
<i>M2</i>	-0.891	-11.662	-1.987	-5.91*
<i>PSC</i>	-1.86	-11.505	-2.009	-5.826*

Testing for cointegration

This step seeks to identify the number of cointegrating relationships that exist among these variables. This paper uses the methodology developed by Johansen (1991), popularly known as the Johansen cointegration test. This test identifies the number of stationary long-run relationships that exist among the set of integrated variables. It offers two tests, the trace test and the eigenvalue test, with a view to identifying the number of cointegrating relationships.

Table 3: Results of Johansen Trace Test

Null Hypothesis	Alternative	Trace Statistic	Critical Value (95%)
$r = 0$	$r \geq 1$	382.81 **	95.75
$r \leq 1$	$r \geq 2$	67.62	69.81
$r \leq 2$	$r \geq 3$	40.87	47.85
$r \leq 3$	$r \geq 4$	15.85	29.79
$r \leq 4$	$r \geq 5$	4.6	15.49
$r \leq 5$	$r \geq 6$	0.91	3.841

The trace test tests the null hypothesis that there are at most r cointegrating relationships. In other words, a rejection of the null hypothesis means that there are more than r cointegrating relationships. Panel A of table 3 displays the results from the trace test. The trace test rejects the null hypothesis if the trace statistics exceeds the critical value, which is generated automatically by Eviews. The first row of table 3 shows that the trace statistics (382.81) exceeds the critical value of 97.75 at 95 percent confidence level. This suggests that the null hypothesis of no cointegrating relationships is rejected. This result confirms that there is one cointegrating relationship among the variables employed for the use of this paper. The eigenvalue test tests the null hypothesis of r versus $r+1$ cointegrating relationships. This test rejects the null hypothesis if the eigenvalue test statistics exceeds the respective critical value. Panel B of table 2 presents the results from this test. Similarly, the result from the first row of table 4 (see next page) shows that the eigenvalue test statistics (115.19) exceeds the critical value (40.07) at 95 percent confidence level. This suggests that the null hypothesis be rejected. Hence, the failure to reject the alternative hypothesis indicates that there is one cointegrating relationship among the variables. These results confirm the presence of a long-run relationship between the explained variable and one of the explanatory variables.

Table 4: Results of Maximum Eigenvalues

Null Hypothesis	Alternative	Λ_{\max} value	Critical Value (95%)
$r = 0$	$r = 1$	115.19 **	40.07
$r \leq 1$	$r = 2$	26.74	33.87
$r \leq 2$	$r = 3$	25.02	27.58
$r \leq 3$	$r = 4$	11.25	21.13
$r \leq 4$	$r = 5$	3.68	21.13
$r \leq 5$	$r = 6$	0.91	3.841

The Error Correction Model:

Following a thorough discussion of the cointegration results, the error correction model will be estimated. There are at least three methods of estimating the error correction model. These include; Engle-Granger 2-step method, the Engle-Yoo, and the Johansen technique based on VAR. This paper, however, chooses to use the Engle-Granger 2-step method. The choice of this method is based on the fact that it is easy to use and possesses some unique capabilities. It is able to estimate both the short and long term effects of the explanatory variables on the explained variable. Also, it is able to determine the speed at which the explained variable returns to equilibrium after a deviation has occurred. However, one of its major drawbacks is that it can estimate only up to one cointegrating relationship between variables. The results are displayed in table 5 on the next page.

Three models of the error correction model were estimated. In the two models, the financial intermediation indicators were used interchangeably. The first had only credit to the private sector and the second has only the broad money supply. The third model, however, has the two variables examined together with a view to determining the short-run relationship between financial intermediation and economic growth in Nigeria. The results shown above are quite fascinating.

The determinants of economic growth included in these models are statistically not different from zero, even though they exert a negative impact on economic growth. Both financial intermediation indicators exert a positive impact on economic growth in the short-run. However, the results show that the credit to the private sector is insignificant when compared to the relevance of broad money supply. Also, the magnitude of the impact of the broad money supply

far outweighs the magnitude of the impact of credit to the private sector on economic growth.

Furthermore, the statistical relevance of the joint influence of all the explanatory variables on economic growth is significant for both the second and third models. This confirms the supremacy of the role of money supply on the volume of credit disbursed to the private sector in influencing economic growth. The coefficient of determination also attests to the supremacy of both models over the first model. While 53 percent of the changes in the explained variable (economic growth) can be ascribed to the explanatory variables in the second, changes in these variables are responsible for only 55 percent of the changes in economic growth in the third model. These results affirm that at least 47 percent of the changes in economic growth are attributable to factors not included in these models. This is quite revealing and informative.

Table 5: Results of the estimated Error Correction Model (ECM)

Variables	Model I	Model II	Model III
C	2.11 (1.73)	2.07 (2.47)	1.90 (2.25)
CEXPNGDP	0.07 (0.01)	-6.76 (-1.68)	-2.715 (-0.535)
EXIMNGDP	-1.45 (-0.714)	-0.48 (-0.38)	-1.28 (-0.915)
ECM (-1)	-2.03 (-0.797)	-1.16 (-0.65)	-1.30 (-0.74)
M2NGDP		46.21 (6.12)	46.50 (6.21)
PSCNGDP	0.048 (0.757)		0.057 (1.28)
R²	0.037	0.53	0.55
Adj R²	-0.075	0.47	0.48
F statistics	0.33	9.75	8.29
DW statistics	1.56	1.19	1.27

() presents the t statistics

Although credit to the private sector is positively related economic growth, available data from the CBN reveals that the average annual increase in the volume of loans available to the private sector declined consistently in the last decade. In the year 2000, the sum of ₦596 million worth of loan was lent to the private sector. This increased to

₦1.211 billion (2003) and ₦5.056 billion (2007) with an average annual growth rate of 9.78 percent and 34.73 percent respectively. The last three years of the decade witnessed a continuous rise in the volume of loans but at a declining growth rate. Ironically, on the basis of the results shown above, these volumes of loan cannot be justified. The determinants of economic growth included in the model, trade and capital expenditure, were statistically irrelevant. This is not strange considering the volume of non-oil products that are created for exportation in Nigeria. Unfortunately, the exportation of crude oil still dominates and this encourages the neglect of infrastructural facilities that could have sustained the growth and vibrancy of the real sector of the Nigerian economy. The last decade witnessed an average annual growth rate of 3.98 percent in the manufacturing capacity utilization rate between the year 2000 and 2010. Between the years, 2001 and 2003, the capacity utilization rate grew by an average annual rate of 9.78 percent but declined sharply from 56.5 percent to 53.38 percent (2004-2007). However, a marginal increase of average annual growth rate of 0.49 percent was recorded in the last three years of the decade.

Conclusion

This paper examines the relationship between financial intermediation and economic growth in Nigeria. Following a detailed time series analysis, the findings reveal that financial intermediation has a positive impact on economic growth in Nigeria. Although two indicators of financial intermediation were used for the purpose of this paper, only one (broad money supply) had a significant impact on economic growth. This paper observes that in the last decade of the study, the years 2004 to 2007 were found strange. This period recorded the highest average annual growth rate in loan disbursement to the private sector, yet the same period recorded the worst average annual growth rate in the manufacturing capacity utilization rate. At this juncture, this paper suggests that a component analysis of the real sector of the Nigerian economy be carried out with a view to having a better understanding of the inverse relationship between the loans to the private sector and the performance of the manufacturing sector. In addition, this paper suggests the expansion of the model used above to accommodate more explanatory variables. The use of more advanced econometric tests such as the Johansen VAR estimation technique or the component analysis approach may be used for a more robust empirical test of the causal link between financial intermediation and economic growth in Nigeria.

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