

## FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: GRANGER CAUSALITY FOR NIGERIA

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### *Abstract*

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*This paper examines the causal relationship between Financial Development and Economic Growth in Nigeria for the period of 1981-2016; include financial indicators and examine their effects on economic growth provided by real GDP. The study used Augmented Dickey Fuller (ADF) test to examine the stationary status of the series. Moreover, Granger Causality and Johansen co-integration test were employed to check the direction of causality and relationship between financial development and Economic Growth. The result indicates that all series were stationary after the second difference  $I(2)$ ; however, there exist a stable relationship between financial development and economic growth. Furthermore, there is significant pass through between financial deepening to economic. This implies that during the period of study financial development stir up economic growth. The study reveal that money supply contribute significantly to economic growth in Nigeria and Finally, credits to private sectors make little contribution to economic growth in Nigeria.*

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*Keywords: Causality, Development, Economic, GDP, Growth, Indicator*

### **1.1 Introduction**

The precise link and direction of causation between financial development and economic process has remained at the middle of empirical debates for many years. The controversy arguably gathered momentum with the empirical works of [1] who, during a cross-country study conspiring of knowledge from 77 countries over the period of 1960-1989, found that the amount of economic development stimulates economic growth. [2] with the same data but a threshold regression confirm the positive relationship between the level of financial depth and economic growth for countries with high income per capital but no significant relationship for low-income countries, which is consistent with the non-monotonic relationship implied within the model.

The authors, using [1] data underline that the question of causality cannot be satisfactory addressed in a very cross-section frame work. More specifically, they conclude that;

Some scholars have also approached the topic from the perspective of time series in a bid to find a common ground of consensus but there also, the result have been contentions. For instance, [3] using a panel of information for 48 US States from 1982-1994, find a feedback effect between the real and financial sector that helps to explain international difference in output per capital [4] using the VAR technique on 10 developing countries with yearly data from the 1950's to the 1990s find two cointegrating vectors identified as long-run financial depth and output relationship linking financial development to economic development.

Economic growth has long been considered as important goal of economic policy with a considerable body research dedicated to explaining how this goal can be achieved. One of the earliest works on banking performance and economic growth was by [5] who argued that financial (banking) services are paramount in promoting economic growth. In his view, production requires credit to materialize and one can only become an entrepreneur in keeping with [5], is typical debtor during a capital society.

Based on this strong background laid [5], lots of empirical works are conducted especially in advanced economics to determine the relationship between banking sector performance and economic growth. Most of these empirical studies

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focused on explanatory variables selected based on their relevance to policy makers or because of other theoretical predictions. Indeed, it could be said that empirical literature/works on the purported relationship between banking sector performance and economic growth is broad in advanced economic transition economies of Central and Eastern Europe and the Baltics.

In Nigeria empirical works that focused explicitly on banking performance (financial sector) and economic growth have yielded mixed results, some if these works suggest that financial development has impacted positively and significantly on economic growth [6] while others reported on insignificant relationship between banking sector performance and economic growth [7]. Major problems in these works are the authors' selection of explanatory variables that do not explicitly underpin banking sectors performance. An example is [8] work on banking industry performances and the Nigerian economy where banking was used as one of the explanatory variables in his modeling. Given multiple channels of accessing banking services such as internet banking; telephone banking; mobile banking; and use of Automated teller Machine (ATM) and point of sales machines (POS); the relevance of the number of bank branches as a determinant of economic growth is clearly uncertain. Therefore, a case can be made for a more robust empirical modeling with variables that are broader and that underpin actual banking performance.

[9] Also suggest that financial development has been intensively studied in developed countries, with result indicating a powerful positive relationship between growth and financial development. They also affirm that studies in developing countries are sparse and where exist, tend to support a negative and insignificant relationship between banking sector performance and economic growth. Giving the foregoing there still exist a pursuit gap for an empirical evaluation of the impact of banking sector performance on economic growth using more robust and broad based explanatory variable. This paper investigates how financial sectors (commercial bank's performance) affect economic growth using data from Nigeria. The study seeks to accomplish (i) asses the trend of bank credit and economic growth and (ii) evaluate the character of the relationship between financial and economic growth and fit an appropriate model to the variable (financial development and GDP) and make recommendation supported the findings.

## 2.2 Research Methodology

### 2.1 Data

The data set used for work covers the period of 1981 to 2016, culled from Central Bank of Nigeria (CBN) statistical bulletin 2016 on the following variables; Gross Domestic Product (GDP), Credit to Private Sector (CPS), Money Supply M2, Financial Deepening. The time lag was chosen base on the availability of data on all the selected variables while the number of observations were considered large enough to produce reliable results. The dependent variable is the GDP, whereas the independent variables are the financial indicators.

### 2.2 Unit Root

When building and testing economic models, it is conventionally assumed that the underlying variables are stationary but this is often not always the true. Hence, before estimating our model, we check for the statistic components of the process. This becomes necessary because time series econometricians observed that regression result emanating from macro-economic variables are likely to be 'spurious' (i.e we may have high coefficient of correlation value while the variables under study don't seem to be even correlated if the statistic properties of the data aren't examined). Hence, the statistic properties of the data are examined using the Augmented Dickey-Fuller (ADF) test at 5% level of significance. The ADF test conducted on each of the variables relies on the null hypothesis of existence of Unit Root. The non-rejection of the null hypothesis implies the need for appropriate differencing to induce stationarity. In conducting the ADF test, each variable is regressed on a constant, a linear deterministic trend, a lagged variable and q lags of its first difference. The specification of ADF test is given below;

$$X_t = \alpha + \beta_t + \gamma X_{t-1} + \sum_i \delta_i \Delta X_{t-1} + \mu_t \quad (1)$$

Where  $X_t$ , is the levels of the variables into consideration, t denotes time trend and  $\mu_t$  denote the error term assumed to be normally randomly distributed with mean zero and constant variance.

### 2.3 Granger Causality Test

Granger Causality is employed to examine the causality between two variables. Causality is concerned with the direction of the influence between two variables. The most idea behind this test is that it enables one to grasp whether the independent variable can cause the variation within the dependent variable and vice-versa. Causality test I important because two variables may correlate without one causing changes or influencing the opposite. In this study, causality test are going to be conducted to explore the mechanism between financial development indicators and therefore the Gross Domestic Products. When time series X Granger causes Y, the patterns in X approximately repeated themselves in Y after some time lag. Thus,

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past values of X Cn be used for the prediction of future values of Y. a statistic X is claimed to Granger-cause Y if it may be shown through a series of t-test and F-test on lagged values of X (and with lagged values of Y inclusive), that those X values provides significant information about future values of Y. Granger defines the causality base on wo principles; the cause happens before to its effects and the cause has a unique information about the future values of its effect. If a time series is a stationary process, the test is performed using the level values of two (or more) variables. The variables are non-stationary, and then the test is done using the first (or higher) differences. The number of lags to be included is based on an information criterion such as the Akaike information criterion, or the Schwartz information criterion. Any lagged value of one of the variables is retained within the regression if it's significant in line with a t-test and therefore the other lagged values of the variable jointly add explanatory power to the model per an F-test. Then the null hypothesis of no Granger Causality isn't rejected if and given that no lagged values of an explanatory variable have been retained within the regression in practice it may be found that neither variable Granger Causes the other or that each Granger-causes the opposite.

**2.4 Cointegration Test**

The test for presence of cointegration among the variables a procedure developed by [10] was used. The target of cointegration test is to determine whether a bunch of non-stationary series cointegrated or not. In line with [11], two or more different series might not themselves be stationary but some linear combination of them may indeed be stationary with the generalization to more than two series.

Technically speaking, two variables are going to be cointegrated if they need future relationship between them. The technique of cointegration is borne out of need to integrate short run dynamics with long-run equilibrium. Thus, the existence of cointegration implies that long-run relationship exists among non-stationary variables. In the course of this study, the Johansen test of cointegration want to examine the existence of long-run relationship between GDP and the Financial Indicators in the model if all of them were integrated of the same order. The hypotheses to be tested under cointegration are;

$H_0$ : There exist no cointegration between GDP and financial indicators

$H_1$ : There exist cointegration between GDP and financial indicators.

**3.0: Results and Discussions**

The tables below are the results of the analysis performed in line with the methodologies discussed in the preceding section for the study.

**Table 3.1: Unit root test**

Variables	Level	1 <sup>st</sup> Difference	2 <sup>nd</sup> Difference
	ADF test Stat	ADF test Stat	ADF Test Stat
GDP	-2.962746(0.0514)	-0.508847(0.8771)	-10.31986(0.0000)
CPS	3.407490(1.0000)	-6.831166(0.000)	-
FDI(M2)	-0.587247(0.8609)	-5.173604(0.0002)	-
MS	1.735337(0.9995)	-0.53294(0.9465)	-3.595584(0.1038)

**Table 3.2: Granger Causality Test**

Hull Hypothesis	Observation	F-Statistic	P-value
CREDIT TO PRIVATE SECTOR does not Granger Cause CPS GDP		2.56421	0.0943
CPS GD does not Granger Cause CREDIT TO PRIVATE SECTOR	34	0.40126	0.3697
FINANCIAL DEEPENING M2 does not Granger Cause CPS GDP	34	1.03005	0.3697
CPS GDP does not Granger Cause FINANCIAL DEEPENING M2		0.72270	0.4940
GDP AT CURRENT BASIC PR does not Granger Cause CPS GDP		7.86275	0.0019
CPS GDP does not Granger Cause GDP AT CURRENT BASIC PR	34	2.19884	0.1291
MONEY SUPPLY2 M2N does not Granger Cause CPS GDP		10.7454	0.0003
CPS GDP does not Granger Cause MONEY SUPPLY2 M2N	34	1.03282	0.3687
FINANCIAL_DEEPENING M2 does not Granger Cause CREDIT TO PRIVATE SECTOR	34	1.61530	0.2162
CREDIT TO PRIVATE SECTOR does not Granger Cause FINANCIAL DEEPENING M2		2.12589	0.1375
GDP AT CURRENT BASIC PR does not Granger Cause CREDIT TO PRIVATE SECTOR	34	13.983	6.E-05
CREDIT TO PRIVATE SECTOR does not Granger Cause GDP AT CURRENT BASIC PR		1.66132	0.2075
MONEY SUPPLY2 M2 N does not Granger Cause CREDIT TO PRIVATE SECTOR	34	22.4414	1.E-06
CREDIT TO PRIVATE SECTOR does not Granger Cause MONEY SUPPLY2 M2 N		6.60069	0.0043
GDP AT CURRENT BASIC PR does not Granger Cause FINANCIAL DEEPENING M2		5.26221	0.0112
FINANCIAL DEEPENING M2 does not Granger Cause GDP AT CURRENT BASIC PR	34	3.70280	0.0370
MONEY SUPPLY2 M2 N does not Granger Cause FINANCIAL DEEPENING M2		4.79308	0.0159
FINANCIAL_DEEPENING M2 does not Granger Cause MONEY SUPPLY2 M2 N	34	0.17197	0.8429
MONEY SUPPLY2 M2 N does not Granger Cause GDP AT CURRENT BASIC PR	34	0.28271	0.7558
GDP AT CURRENT BASIC PR does not Granger Cause MONEY SUPPLY2 M2 N		8.93398	0.0009

**Table 3.3: Johansen Cointegration Tests**

Cointegrating Equation(s):	Log likelihood	-867.9207
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Normalized cointegrating coefficients (standard error in parentheses)

	CREDIT_TO_PRI	FINANCIAL_DEEGDP_AT_CURRE	MONEY_SUPPL
_CPS_GDP_____	VATE_SECTO	PENING_M2_	NT_BASIC_PR
	Y2__M2__N_		
1.000000	0.4604021	0.654249	0.610174
	(0.00046)	(0.01727)	(7.0E-05)
			0.543387
			(0.00068)

#### 4.0 Discussion of Results

For the gross domestic product, after checking for unit root at level we found a probability value of  $p = 0.0514$  which by implication, unit root is present. The data is then difference once and increased probability value of 0.8771 was found indicating the presence of unit root. After taking the second difference probability value of 0.0000 was found and from hence, the data is stationary. For the other independent variables, credit to private sector gave a probability value of 1.000 at levels, and 0.000 after taking the first difference. Money supply gave a probability value of 0.9995, 0.9465, and 0.0138 at levels, first difference, and second difference respectively and the model is now stationary and therefore we check for cointegration at (1 1) and we noticed there is cointegration between the variables. To test for causality the Granger causality was used and we found that a bi-directional Causal relationship exist between GDP and CPS/GDP, money supply and credit to private sectors, GDP and financial deepening which specifically shows a significant pass through from real domestic saving to economic growth and a uni-directional relationship between money supply and GDP.

#### 5.0 Conclusion and Recommendation

Credit to private sector, financial deepening and money supply are important financial development indices that drives the economy. The empirical result after analysis shows evidence a long-run of bi-directional causality between economic growth and financial development. The relationship runs financial development to economic growth and vice versa and that financial development indices are cointegrated.

Flowing from the empirical finding of this study, the following recommendations were made as useful guide for policy makers and researchers. Since financial development indices cause's economic growth, it is therefore pertinent to formulate policies that can encourage domestic savings and money supply, thereby raising the requisite capital needed to stir economic activities in the country. This finding is in line with King and Levine supply-lending hypothesis; Government should formulate policies and empower institutions that can boost domestic investments. This can be achieved through increasing loans and credit to the private sectors.

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