

AN EVALUATION OF FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH OF NIGERIA: A CAUSALITY TEST

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ABSTRACT

The study investigates the impact of financial development variables on economic growth Nigeria. To achieve the objective of this study, data was collected from secondary sources and various econometric analysis such as Augmented Dickey Fuller (ADF) test, Granger Causality test, Co-integration and Error Correction Method (ECM) were employed on time series data from 1960-2008 and the results revealed Money Supply (MS) and Credit to Private Sector (CPS) are positively related to economic growth of Nigeria. The Johnsen and Granger tests shows Money Supply and Credit to private Sector (CPS) are co-integrated with GDP in Nigeria within the study period and the Granger tests indicated that all the exogenous variables Granger cause GDP and GDP Granger cause other variables in Nigeria. The paper concludes that the government should ensure a robust supervision of the financial sector to enable financial institutions provide the needed funds for the growth and development of the Nigerian Economy.

Keywords: Financial Development, Economic Growth, Granger Causality, Nigeria

INTRODUCTION

There are a number of reasons why the financial sector and its activities may influence the rate of economic growth. Financial intermediaries channel resources to the most profitable sectors of any economy. According to Nzotta (2004), financial institutions channel resources from surplus economic units to deficit units for investment purposes. This consists of the provision of loans and advances to the private and public sectors for the

purpose and for the growth of domestic output and promotion of the export trade, agricultural production and provision of infrastructure. Similarly, Jhingan (2004) argues that banks in developing economies play an effective role in their economic development. He says there is acute shortage of capital. People lack the initiative and enterprise. Means of transport are undeveloped. Industry depressed. Financial institutions help in overcoming these obstacles and promote economic development. Financial intermediaries monitor managers and exert corporate control ameliorating moral hazard risk. In particular, by providing liquidity, financial institutions permit risk averse savers to hold deposits rather in liquid but unproductive assets. This mobilization of savings allows increase in the amount of resources available to entrepreneurs.

The role of financial institutions in economic growth has attracted the attention of researchers and policymakers in the last century. There is a large body of literature, both empirical and theoretical, which have examined this issue. The findings of these studies are not without controversy; while some studies find that financial institutions development has been instrumental in accelerating economic growth, others have suggested that it has not been very significant. According to Beck et al (2000), Bekaert et al (2005), a long list of scholars posit, a causal association between finance and economic growth. La Porta et al (2000) argues that well developed capital markets- especially those imbued with rights that protect investors — promote the efficient allocation of capital to projects with high rates of return, in turn stimulating savings, investments and economic growth. Evidence from both single country (Guiso, Sapienza and Zingales (2004) and cross-country (Levine, 2006; Demirguc — Kurt and Levine (2001) studies suggest that economies with more developed financial markets begin to grow earlier, attain higher growth rates, and achieve higher levels of per capita income than economies with less developed financial markets.

The Levine (2005) and Beck (2009) argue that the positive effect of financial development over economic growth can be explained by five mechanisms, whose operations reduce the negative impact of information asymmetries among economic agents and the transaction costs involved in their activities. According to them, financial system (1) provides means of payments that facilitates a greater number of transactions', (2) concentrates the savings of a large number of investors, (3) makes possible the allocation of resources to their most productive economic use, through the effective evaluation and monitoring of investment projects, (4) improves corporate governance, and (5) contributes to risk management.

This paper is concerned with the long run determinants of economic growth in the context of Nigeria. It used the granger causality testing procedure to examine empirically the impact of the financial sector development on economic growth in Nigeria by employing data for the period 1960 to 2008. To achieve the objective of the paper, the paper was divided into five interconnected sections. The next section examined the theoretical and empirical literature on financial development and economic growth. The third section discussed the materials and methods used in the study. The fourth section contains the main findings and discussions, and the final section contains the conclusion and recommendations.

THEORETICAL AND EMPIRICAL LITERATURE

Financial Sector Development

Financial sector development is all the wholesale, retail, formal and informal institutions in an economy offering financial services to consumers, businesses and other financial institutions. According to Financial Sector Team of Department for international Development (2004), financial sector development includes everything from banks, stock exchanges, and insurers, to credit unions, microfinance institutions and money lenders. Liang and Reichert (2007) noted that endogenous financial development results directly

from economic growth. As an economy grows the aggregate demand for goods and services increases. To expand output, producers must look for efficient ways to raise capital. Consumers, on the other hand, will seek more efficient means to earn higher rates of return on their savings. Consequently, a more efficient financial market is required.

According to the endogenous growth theory all these functions of financial sector can effectively lead to increase in the rate of economic growth. By increasing the quality and probability of success of the undertaken innovation, they positively affect the level and progress of technology available in the economy.

The empirical results of the relationship between financial development and economic growth have been mixed. For example, Boulila and Trabelsi (2004) in their study of Tunisia during the period (1963-1987) found that causality goes from the real economy to the financial sector, while there is bidirectional causality in the total sample period (1962-1998). Christopoulos and Tsionas (2004) in their empirical study of ten developing countries found long term Granger causality from finance to economic growth, but not of reverse causality. Chang and Caudill (2005) study in Taiwan found that financial development Granger cause growth

There are also opponents on the relationship between financial development and economic growth. Shan et al. (2001) study of 9 OECD countries and China, found that financial development do not Granger Cause economic growth. Blanco (2009) study found that financial development does not have a causal effect on growth, but economic growth leads to financial development. In a similar vein, Hurlin and Venet (2008) using a data set for 63 countries do not find evidence of Granger causality from financial development to growth but of reverse causality.

Table 1: Summary of some Empirical Studies

Authors	Methods and Sample	Main Results
hang and Teng (2006)	A data set of China over the period 1952-2001 using multivariate vector autoregression (VAR) framework.	The empirical results suggest that there exists a unidirectional causality from economic growth to financial development.
Yang and Yi (2008)	The study utilized the superexogeneity methodology in Korea during period 1971-2002.	The results show that financial development control causes economic growth, but the reverse is not true. Their result provides evidence in favour of the finance causes growth view for the case of Korea while rejecting the growth causes finance view.
Dabos and gantmann (2010)	A panel data set of 27 developed and 71 developing countries using dynamic panel regression analysis during the period 1961-2007.	Their study reveals that financial development does not have a statistically significant effect on economic growth.
Mitchener and Wheelock (2011)	A data set on manufacturing industry level growth rates and banking concentration for US states during 1899-1929 using regression model.	The study reveals that concentration of banks boost economic growth.

MATERIALS AND METHODS

In this study, time series data sourced from Statistical Bulletin, Economic and Financial Review and Annual Reports and Statement of Accounts of the Central Bank of Nigeria (CBN) of various issues were made use of. The macroeconomic data cover gross domestic product (GDP), Money supply (M2) and credit to private sector (CPS) between 1960 and 2008 in Nigeria.

The Model: The model for this study used ranger causality test to ascertain the direction of causality between GDP, M2 and CPS between 1960 and 2008. Other econometric tests such as unit root test, co-integration test and vector error correction mechanism were also

performed to determine the stationarity of the data and long run relationship between the variables.

The test procedure as described by (Granger, 1969) is illustrated below:

$$GDP_t = \sum_{j=1}^K A_j FD_{t-j} + \sum_{j=1}^K B_j GDP_{t-j} + U_{1t} \dots \dots \dots (1)$$

$$FD_t = \sum_{j=1}^K C_j FD_{t-j} + \sum_{j=1}^K D_j GDP_{t-j} + U_{2t} \dots \dots \dots (2)$$

Equation (1) postulates that current GDP is related to past values of itself as well as that of FD and vice-versa for equation (2). Unidirectional causality from FD to GDP is indicated if the estimated coefficient on the lagged FPD in equation (1) is statistically different from zero as a group (i.e., $\sum A_i \neq 0$) and the set of estimated coefficients on the lagged GDP in equation (2) is not statistically different from 0 (i.e., $\sum D_j = 0$). The converse is the case for unidirectional causality from GDP to FD.

Feedback or bilateral causality exists when the sets of FD and GDP coefficient are statistically different from 0 in both regressions (Gujarati and Porter, 2009; Wooldridge, 2006).

The more general model with instantaneous causality is expressed as:

$$GDP_t + b_0 FD_t = \sum_{j=1}^K C_j PD_{t-j} + \sum_{j=1}^K D_j GDP_{t-j} + U_{it} \dots \dots \dots (3)$$

$$\sum_{j=1}^K \quad \quad \quad \sum_{j=1}^K$$

$$FD_t + C_0 GDP = \sum_{j=1} C_j FD_{t-1} + \sum_{j=1} D_j GDP_{t-j} + U_{2t} \dots\dots\dots (4)$$

Instantaneous causality occurs and knowledge of GDP will improve prediction or goodness of fit of the first equation for FD. In this study, a bivariate regression of the form presented below is estimated:

$$FD_t = \alpha_0 + \alpha_1 FD_{t-1} + \dots + \alpha_1 FD_{t-1} + B_1 GDP_{t-1} + \dots + B_1 GDP_{t-1} \quad (5)$$

$$GDP_t = \alpha_0 + \alpha_1 GDP_{t-1} + \dots + \alpha_1 GDP_{t-1} + B_1 FD_{t-1} + \dots + B_1 GDP_{t-1} \quad (5)$$

The equation for the second model is stated thus:

$$GDP_t = f(MSt + CPSt)$$

$$GDP_t = \alpha + \beta_1 MSt + \beta_2 CPSt + U_t \quad (7)$$

$$GDP_t = \alpha + \beta_1 MSt + \beta_2 CPSt + U_t \quad (8)$$

To avoid spurious regression outcomes on time series data, unit root test that affirms the stationary of the series and co-integration test that affirms at least one co integration equation were conducted. Sequel to the above, the OLS in equation (8) is re-specified to take care of possible short term disequilibrium as follows:

$$\Delta GDP_t = \alpha + \beta_1 \Delta MS + \beta_2 \Delta CPSt + \beta_3 U_{t-1} + \Sigma t \quad (9)$$

β_1, β_2 are expected to be greater > 0

Where: GDP = Gross Domestic product; MS = Money supply M2; CPS = Credit to private sector

Test for stationarity: To avoid spurious regressions which may arise as a result of carrying out regressions on time series data without subjecting them for test whether they contain unit root, we first subject the data to stationarity test by using the Augmented Dicker fuller

(ADF) tests. The econometric views (E-views package was employed) to carry out the regressions.

RESULTS AND DISCUSSIONS

This section shows the analysis of the results and discussions of the various econometric output.

Table 1 OLS Estimation Result

Dependent Variable: GDP

Method: Least Squares

Date: 07/24/11 Time: 15:13

Sample (adjusted): 1961 2008

Included observations: 48 after adjusting endpoints

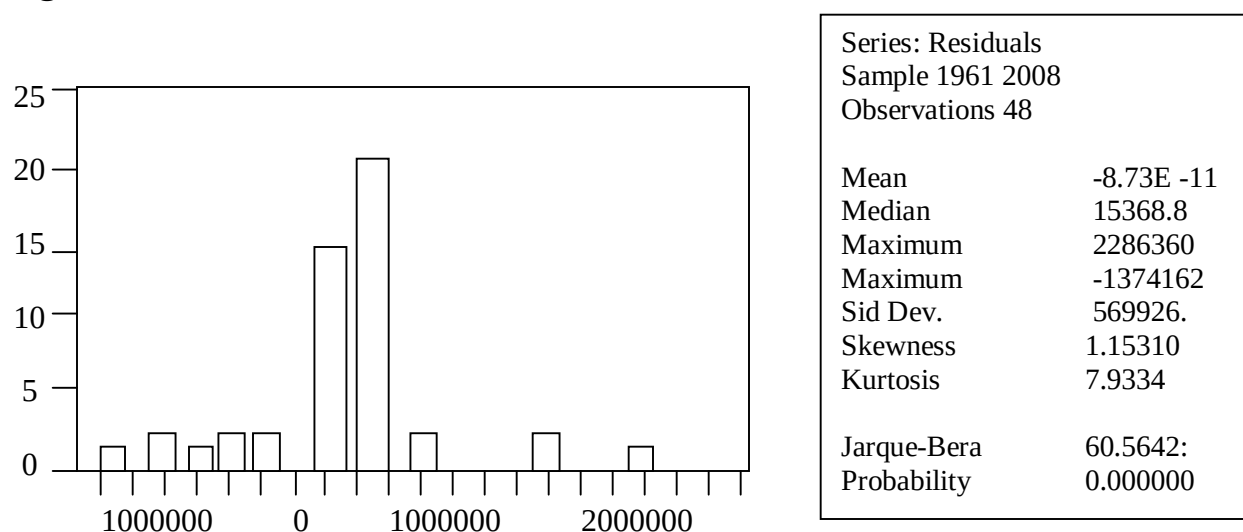
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MS	7.527957	0.498959	15.08731	0.0000
CPS	-4.423632	0.642299	-6.887189	0.0000
C	-24359.08	94867.98	-0.256768	0.7985

R-squared	0.985820	Mean dependent var	2229615.
Adjusted R-squared	0.985 190	S.D. dependent var	4786093.
S.E. of regression	582454.0	Akaike info criterion	29.44835
Sum squared resid	1.53E+13	Schwarz criterion	29.56530
Log likelihood	-703.7604	F-statistic	1564.244
Durbin-Watson stat	- 1.129765	Prob (F-statistic)	- 0.000000

The model estimation is: $GDP = \alpha_0 + \alpha_1 MS + \alpha_2 CPS + \varepsilon_t$ in estimating the regression model using the ordinary least squares method in the table 2, the individual exogenous variable MS is statistically significance as the t-Statistics is greater than the critical value at 5% and CP is not statistically significance at 5% level. In this paper, MS is the most significant determining factor of economic growth in the country within the study years. The model revealed that a slight increase in MS and CPS would inform a correspondent increase in GDP by 752%% and 442% decrease in GDP respectively. The model is 99% adjudged accurate and that the exogenous variables (MS and CPS) can explain the endogenous variable(GDP) by 99% while only 1% unexplained are captured by error and factors like change, policy, attitude and political change. In fact there is positive relationship between the MS and CPS and the performance of the Nigeria economy in the past and the presence because of possibilities of long run relationship.

The model established that there is very strong and high relationship among the variables estimating the dependent (GDP). The MS and CPS have positive relationship with the GDP. This expressed that the unit change in MS and CPS generate a correspondent increase in the Nigerian Economic growth. Based on the model parameters, the MS and CPS are statistically significant at 5%.

Fig.1



The histogram tested the normality of the series. The value of Jargue – Bera is greater than the chi-squares value at 5% level of significance, hence the series is normal.

Table 2

i. Breusch-Godfrey Serial Correlation LM Test:

F-statistic	18.77672	Probability	0.000001
Obs*R-squared	22.37726	Probability	0.000014

ii. Ramsey RESET Test:

F-statistic	0.506749	Probability	0.480307
Log likelihood ratio	0.549658	Probability	0.458458

iii. Ramsey RESET Test:

F-statistic	0.506749	Probability	0.480307
Log likelihood ratio	0.549658	Probability	0.458458

The null hypothesis for serial, heteroskedasticity and stability tests were rejected at 5% that the series has autocorrelation, presence of cross terms and the model is fitted and in functional form

Unit Root Test for GDP

At level

ADF Test Statistic	4.085868	1%	Critical Value*	-3.5778
		5%	Critical Value	-2.9256
		10%	Critical Value	-2.6005

*MacKinnon critical values for rejection of hypothesis of a unit root

1st order Difference

ADF Test Statistic	4.085868	1%	Critical Value*	-3.5778
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5%	Critical Value	-2.9256
10%	Critical Value	-2.6005

*MacKinnon critical values for rejection of hypothesis of a unit root

2nd order Difference

ADF Test Statistic	4.085868	1%	Critical Value*	-3.5814
		5%	Critical Value	-2.9271
		10%	Critical Value	-2.6013

*MacKinnon critical values for rejection of hypothesis of a unit root

Unit Root Test for MS

At level

ADF Test Statistic 1st order Difference

ADF Test Statistic	-4.659338	1%	Critical Value*	-3.5850
		5%	Critical Value	-2.9286
		10%	Critical Value	-2.6021

*MacKinnon critical values for rejection of hypothesis of a unit root

1st order Difference

ADF Test Statistic	3.170686	1%	Critical Value*	-3.5778
		5%	Critical Value	-2.9256
		10%	Critical Value	-2.6005

*MacKinnon critical values for rejection of hypothesis of a unit root

2nd order Difference

ADF Test Statistic	4.085868	1%	Critical Value*	-3.5814
		5%	Critical Value	-2.9271
		10%	Critical Value	-2.6013

*MacKinnon critical values for rejection of hypothesis of a unit root

Unit Root Test for CPS

At Level

ADF Test Statistic	-0.427704	1%	Critical Value*	-3.5850
		5%	Critical Value	-2.9286
		10%	Critical Value	-2.6021

*MacKinnon critical values for rejection of hypothesis of a unit root

2nd order Difference

ADF Test Statistic	5.921023	1%	Critical Value*	-3.5814
		5%	Critical Value	-2.9271
		10%	Critical Value	-2.6013

*MacKinnon critical values for rejection of hypothesis of a unit root

The Augmented Dickey-Fuller Unit Root test results for the series presented in the above revealed that all variable were non stationary at level but stationary at second difference as the ADF test value were greater than the critical values at 5% level of significant. Having established the stationary of the series, the next step is to carry out a co-integration test which is a necessary condition for carrying out a short and long run regression analysis using the Vector Auto-regression Model.

Johansen Co Integration Result

Date: 07/24/11 Time: 16:56

Sample: 1960 – 2008

Included observations: 45

Test

assumption:

Linear

deterministic

data

Series: DGDP DMS DCPS

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.727030	92.47316	29.68	35.65	None**
0.518605	34.04543	15.41	20.04	At most 1 **
0.025176	1.147405	3.76	6.65	At most 2

Normalized
Cointegrating
Coefficients: 2
Cointegrating
Equation(s)

DGDP	DMS	DCPS	C
1.000000	0.000000	-11.12682	242926.2
0.000000	1.000000	-1.387539	-7770.095

Log likelihood -1770.187

*(**) denotes rejection of the hypothesis at 5%(1%) significance level, L.R. test indicates 2 co-integrating equation(s) at 5% significance level.

Johnsen C-Integration Test

Using the Johnsen and Granger two stage techniques, the co-integration test result in table 2 below reveals that the residuals from the regression result are stationary at 1% level of significance. This means that MS and CPS are co-integrated with GDP in Nigeria within the study period. In order words, there exists a long run stable relationship between the dependent and independent variables. This finding also reveals that any short run deviation in their relationships would return to equilibrium in the long run- it also showed that the deterministic trend is normalized at most 2** with 3 co-integrating equations. See the table below.

Date: 07/24/11 Time: 17:02

Sample (adjusted: 1963 – 2008

Included observations: 46 after

adjusting endpoints

Standard errors & t-statistics in

parentheses

	GDP
GDP(-1)	0.997348 (0.16573) (6.01798)
GDP(-2)	0.247070 (0.19888) (1.24228)
C	-28139.25 (54191.1) (-0519318)
MS	2.067547 (0.60932) (3.39318)
CPS	-2.637428 (0.39934) (-6.60443)
R-squared	0.995972
Adj. R-squared	0.995579
Sum sq. residues	4.30E + 12
S.E. equation	323668.8
F-statistic	2534.247
Log likelihood	-646.2485
Akaike AIC	28.31515

Schwarz SC	28.51392
Mean dependent	2326455
S.D. dependent	4867719

The value of R-squared is 0.9959 implying that the independent variables can explain dependent variable at 99% with 1% unexplainable which could be accounted for random error and other social crisis. This adjudged the analysis is highly accurate. There is parameter significant in the estimated regression.

Estimation Proc:

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LS 1 2 GDP @ C MS CPS

=====

VAR Model:

=====

$GDP = C(1,1)*GDP(-1) + C(1,2)*GDP(-2) + C(1,3) + C(1,4)*MS + C(1,5)*CPS$

Granger Causality Test

Pairwise Granger causality Tests

Date:07/24/11 Time: 17:10

Sample: 1960 2008

Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
DMS does not Granger Cause DGDP	44	11.5914	1.7E-05
DGDP does not Granger Cause DMS		6.97292	0.00078
DCPS does not Granger Cause DGDP	44	1.11972	0.35354
DGDP does not Granger Cause DCPS		1.79092	0.16582
DCPS does not Granger Cause DMS	44	28.7873	8.8E-10
DMS does not Granger Cause DCPS		30.6182	4.0E-10

The result of in the Granger Causality table above revealed that the causality cause of DMS by GDP and DGDP granger cause DMS in b-directional form. The Granger

causality tests at 5% indicated that all the exogenous variables (MS and CPS) Granger cause GDP and GDP Granger cause other variables in Nigeria as they indicated significance at 5% level.

Conclusion

The purpose of this study is to investigate the relationship between financial development and economic growth in Nigeria. To capture this, time series macroeconomic data were culled from 1960-2008. The Augmented Dickey-Fuller unit root test shows that all variables were stationary at the second difference. The Johansen co-integration reveals co-integration of MS and CPS with GDP in Nigeria within the study period and Granger Causality shows all the exogenous variables causes GDP and GDP cause other variables as they indicated significance at 5% level.

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