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Development Finance Models and Sustainable Growth of Nigeria: A Granger Causality Approach

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Abstract

One of the primary goals of policy makers is to build an economy that is relatively stable. As such, to ensure that the economy is relatively stable, policy makers embark on series of financial (economic) reforms. However, even with the concerted efforts to improve the state of the Nigerian economy, the Nigeria is still under-developed. Hence, the paper aimed at examining the effects of development finance on sustainable growth of Nigeria using the granger causality approach. The development finance measures are private sector credits, broad money supply (BMS), Interest rate volatilities, and trade openness while sustainable growth measured by RGDP. The study spanned from 1989 to 2021. The study reported that, both private credits and broad money supply bi-granger cause sustainable growth but trade openness only cause sustainable growth. However, Interest rate volatilities did not influence sustainable growth nor growth did. Hence, the paper concludes that, both private sector credits and broad money supply precedes growth just as growth precedes both private sector credits and broad money supply while trade openness is a precondition for economic growth. As such, it is imperative for the apex regulatory body to instruct Nigerian banks to give more credits to the private sector. Lastly, the efforts should be made to improve the degree to which the Nigerian economy is open to trade. Lastly, the rising high cost of borrowing should be reduced.

Keywords: Development Finance Models, Sustainable Growth, Granger Causality Approach

Introduction

One of the primary goals of policy makers is to build an economy that is relatively stable. As such, for an economy to be relatively stable, policy makers embark on series of financial (economic) reforms. This is in recognition of the fact that; a developed (financially resilient, strong, efficient, and dogged) financial sector (DFS) spurs growth. However, this submission has gotten huge criticism in that, scholars in support of the demand following approach argues

that, effeicent financial sector is not traceable to the growth of the real sector then such growth is negligible. Hence, the issue as to whether a DFS spurs growth or growth spurs financial sector's development (FSD) remains though intriguing yet most controversial issues within the finance discipline. To unravel these controversies, three (3) major theories were propounded by finance scholars. These theories later culminated into three (3) major schools of thoughts. The first school of thought centers on the supply-leading approach (SLA) otherwise known as the finance-led approach as promoted by Mckinnon (1973) & Shaw (1973). Accordingly, the SLA stresses that, the financial sector is growth inducing and that for the financial sector to perform this role; the financial sector must be developed. Further, a robust, healthy (well-functioning), resilient, and dogged financial sector is a precondition for economic growth (Mckinnon, 1973; & Shaw, 1973).

To further revalidate the above claim, Osuji, Erhijakpor, and Oziwele (2023) submit that, a robust banking system helps to facilitate growth and not the other way round. As a result, if the supply of financial facilities is increased, the economy will grow. By extension, the reason behind the under-developed state of the African (Nigerian) economy is due to the under-developed state of the African (Nigerian) financial sector. The rationalization is that, if the African (Nigerian) sector can brace up to responsibility, the African (Nigerian) economy would surely grow. Justifiably, a highly resilient financial sector can help to drive the overall economic system by mobilizing savings, extending credits to investors, creates as well as expand liquidity, encourages capital accumulation, transfer funds (resources) from non-productive sector to highly productive sectors and at the same time provide the enabling business environment for young entrepreneurs to strive. According to the World Bank Report in 2019, a highly developed financial sector triggers the stability of an economy since it encourages more capital to flow into the economy in the form of foreign investment and at the same time help to revitalize hailing industries. Kerimov (2021) added that, a DFS helps to reduce financial vagaries while ensuring that the three hallmarks of an efficient financial intermediation process being cost, convenience and confidence are not eroded.

Conversely, the demand following approach as championed by Robinson in 1952, stresses that, the more the demand (desires) for financial services increases (deepens), it triggers the financial sector advances. Put differently, the more the economy advances (GROWS), the more the need more financial services and products increases which of course lead to greater FSD. By implication, a developed financial sector not traceable to the real sector's growth is a waste of economic resources. As such, real sector's growth creates ample opportunity for the financial sector to grow. Consequently, Nigerian financial market will only grow if the real sector is open to growth.

The last school of thought termed the development approach as championed by Patrick in 1966, stresses that, the assumptions of the SLA only hold through in the initial developmental stage and as the real sector expands, the SLA assumptions must have to give way for the DFA to prevails (Patrick, 1966).

Furthermore, the positions of the aforementioned theories are revalidated by extant empirical documentation. Justifiably, empiricists are yet to agree on whether a robust financial

sector spurs growth or growth spurs FSD even till date. Notably, one major challenges which most of these studies failed to address which led to the divergent findings is that, most of these studies used a single FSD proxy. Another factor that may have caused these divergent findings is the trade policies in place which most of the studies did not capture. Consequently, this paper underscores the interactive roles an open trade policies has on both DFS has on economic growth (RGDP) of Nigeria using the Granger Causality Approach (GCA). This indeed is a departure from extant empirical documentation as it is first of its kind to test both the supply leading and demand following approaches with emphasis on development finance.

The remaining sections of the paper are structured tin four. While the first and section reviewed extant empirical documentations and method used; the third and fourth section dealt with the result presentation and discussions and concluding remarks and recommendations.

Literature Review

The term "development finance" otherwise known as financial sector development has no universal definition. Simply put, it therefore entails the development finance is an aspect of finance that deals with development issues. Put differently, it involves establishments of programmes and policies that are targeted at solving societal problems. Broadly speaking, it is deliberate efforts made by both public and private sector to encourage, supports, and catalyze the holist development of an economy via public and private sector investments in infrastructural development of an economy (World Bank Report, 2019). More so, it involves government deliberate efforts to improve the state of the economy (Sokang, 2018). Again, it is described as the process of improving the quantity, quality, & services which the financial intermediaries (capital, banks and money markets) render to the public (Sarker, & Khan, 2020). It therefore involves an accumulation of more financial assets by financial intermediaries (Puatwoe & Piabuo, 2017).

Although, there are myriads of variables that are used as development finance proxies but the paper only consider variables such as Interest rate volatilities (ITRS), BMS, domestic private sector credit. Specifically, the Interest rate volatilities (ITRS) accounts for the difference between bank deposit (BAD) & bank lending (BAL) rates. Justifiably, a wide ITRS suggests that, the financial intermediation process is quite inefficient. However, a low ITRS suggests that, the financial intermediation process is efficient. Both cases have series of policy implication to the stability of the country such that, a stable economy is one with low ITRS while economy with wide gyration (unstable economy) is one with wide ITRS. Meanwhile, higher volumes of money in circulation through the expansion monetary policies of the government have the tendencies to improve the state of the Nigerian economy.

Furthermore, domestic private sector credit denotes the credit facilities at the disposal of the private sector. This can be in the form of loans, purchases of debt (non-equity) securities, trade credits, alongside other accounts receivables. Notably, the more the private sector accumulates more credit, the more stable the economy becomes. Ultimately, a well-implemented financial sector reform help facilitates credit availability which consequently

result to high inclusive growth and development. Meanwhile, an economy's growth is termed sustainable; if the country's RGDP being the monetary value of all final products produced yearly is stable over time. Again, sustainable growth is considered as a stable growth rate.

Theoretical Issues

The theories put forward by the finance-led growth (FLGT) pioneers such as Schumpeter, (1911); Kuznets (1955); and Patrick (1966) are divergent. For instance, Schumpeter (1911) argued that, a stable/efficient financial system promotes economic stability via its financial intermediation channel while Kuznets (1955) theorizes that the financial sector expands when the economy reaches the middle stage of its development process and then move unto maturity. Lewis (1956) however argues that, at the initial stage, financial sectors emerge as a byproduct of economic expansion before generating genuine economic activity.

Furthermore, the supply-leading approach/theory theorizes that, a relatively stable (healthy) financial sector promotes economic stability while the growth-led (demand-following) hypothesis, however, contends that as the more the economy becomes relatively stable, more people would seek for financial services. However, Patrick (1966) harmonized the views of both the growth-led (demand-following) and supply-leading theory hypothesis theorizing that, the assumptions of SLA only hold through in the initial developmental stage of an economy in that, as the real sector of the economy expands, the SLA assumptions must have to give way for the DFA to prevails (Patrick, 1966).

Empirical Review

Mehar (2023) studied the degree which monetary policy affects economic development and growth of 186 emerging countries over 18 years. The paper adopted the panel least square approach was. The amount of total domestic private sector loans, the ratio of tax revenue to GDP, the amount of domestic private sector loans, the tax-to-GDP ratio, infrastructure investment, external outstanding debt, and foreign direct investment (FDI) are all the monetary policy measures which are the regressor while the regressed is RGDP. The researchers reported that, external debt and private sector lending to specifically improve the economic development and growth of the sampled countries.

Again, Taddese Bekele and Abebaw (2023) studied the extent to which the financial sector grows impacts on the growth of 25 SSA countries from 2010 and 2017. Specifically, three dynamic panel models (GMM estimation technique) were considered with focus on banking sector efficiency, depth, and accessibility. The financial system's depth, accessibility, and efficiency were measured using return on assets, commercial bank branches per 100,000 adult population, and credit given to the private sector, respectively. They clearly demonstrated that the depth, accessibility, & efficiency of the financial sector positively and statistically significantly influence the economic growth of these nations.

Using a panel of four North African nations, Asante, Takyi, and Mensah (2023) examined the connections among financial development, openness to trade, and the growth of North African nations from 1991 to 2015. They reported that, the more the North African nations are open to trade, the more they grow.

Similarly, Tongurai and Vithessonthi (2023) ascertained if there exist a bi-directional between trade (financial) openness & development of 164 selected countries from 1960 to 2020. They reported that, trade (financial) openness did not influence development instead relative financial openness and relative bond market development, however, have a negative and reciprocal connection.

Olorogun (2023) investigated between sustainable economic growth in SSA & private sector development. In addition to the DOLS, FMOLS, and CCR statistical model analysis, unit root (Canova & Hansen, Kwiatkowski-Phillips-Schmidt-Shin & Perron) tests & Johansen cointegration from 1978 to 2019 were included in the regional dataset, which was sourced from World Bank Open Data. There were yearly time series in the dataset. They confirmed that, private sector loan extension improved the development of the sampled countries.

Olagunju and Isiaka (2021) examined the effect of Nigeria's cash reserve requirements on banks' profitability during a 31-year period, from 1988 to 2018. The analysis took into account quantitative secondary data from the 2018 edition of the CBN Bulletin. For the empirical test, the Granger Causality Test, Cointegration Test, Unit Root Test, & multiple regressions technique. Using the Johanson cointegration test, it was discovered that, a long-term correlation between cash reserve requirement and the profitability of banks in Nigeria. It was also shown that there is no correlation, either one way or the other, between the profitability of banks in Nigeria and the necessity for cash reserves.

Iyoha and Okim (2017) demonstrated that trade policies enhanced the growth of ECOWAS member countries from 1990 to 2013. Again, Nwadike, Ani, and Alamba (2020) further confirmed that the more open the Nigerian economy is to trade, the more the GDP grows from 1970 to 2011. Again, Agbogun and Ehdiedu (2022) reported that, the more the countries that are OPEC members are open to trade, the more the countries grew within the reviewed periods. However, Oshiobugie (2022) reported that import penetrations decreased the countries that are OPEC members' extent of competitiveness between 1992 and 2021 but export penetration did no.

Based on the above, the following Hypotheses were formulated:

H_{O1}: Private sector credit ratios do not bi-granger cause (influence) the growth of the Nigerian economy

H_{O2}: Broad money supply do not bi-granger cause (influence) the growth of the Nigerian economy

H_{O3}: Interest rate volatilities do not bi- granger cause (influence) the growth of the Nigerian economy

H_{O4}: Trade openness do not bi-granger cause (influence) the growth of the Nigerian economy

Research Method

Research Design and Data Source

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This paper adopts the Expost facto (after the factor) research design since the target development finance, trade policies, and economic stability variables are existing data (secondary in nature) and have occurred in retrospect. The paper uses the time-series data and was drawn from the World Bank online data base from 1989 to 2021. The various development finance variables reviewed are private sector credits, trade openness (Exports less Imports/GDP).

Estimation Technique and Variable Measurements

The paper aligned with the Granger Causality approach with a view to examine if the development finance variable either uni-granger or bi-granger cause the dependent variable or the other way round. The estimation techniques which the paper used are the Granger causality test. This test used to assess whether one series can forecast the future values of other. When one time series A Granger-causes another time series B, it indicates that A's historical values offer more insight into B's future values than do B's historical values.

Furthermore, the regressing the corresponding indices on m-lag data of the indicator and m-lag values of the benchmark index is how the two-variate Granger causality test is carried out. If solely if no postponed benchmarks are kept, however, the null assumption—that the baseline index does not Granger-cause the selected index—is accepted. The folllowing steps are to check if the benchmark index's coefficients of m-lag values are simultaneously equal to zero using an F-test. Each F-test's p-values are shown in a table. The data were provided by CBN Bulletin, 2021 and World Bank Data Bank, 2021. The estimated model is in equation 1 to 8:

Model 1:

$RGDP = a_0 + a_1PSC + \mu_t$ - Eq. 1

$PSC = a_0 + a_1RGDP + \mu_t$ - Eq. 2

Model II

$RGDP = a_0 + a_1BMS + \mu_t$ - Eq. 3

$BMS = a_0 + a_1RGDP + \mu_t$ - Eq. 4

Model III

$RGDP = a_0 + a_1ITRS + \mu_t$ - Eq. 5

$ITRS = a_0 + a_1RGDP + \mu_t$ - Eq. 6

Model IV

$RGDP = a_0 + a_1TROP + \mu_t$ - Eq. 7

$TROP = a_0 + a_1RGDP + \mu_t$ - Eq. 8

Where:

RGDP =Real Gross Domestic Product

PSC =Private Sector Credits

BMS =Broad Money Supply

ITRS =Interest rate volatilities

Table 1: Variable Measurement

Study Variable	Observations	Measurements	Aprioiri Expectation
RGDP	Real Gross Domestic Product	Volumes of RGDP	Nil
PSC	Private Sector Credits	Proportion of PSC to GDP	Bi-directional
BMS	Brad Money Supply	Proportion of BMS to GDP	Bi-directional
ITRS	Interest rate volatilities	Lending Rate less Deposit Rates	No-directional
TROP	Trade Openness	Sum of Trade (Imports and Exports) to GDP	Uni-directional

Source: Researcher's Compilation (2023)

Results and Discussion

Preliminary Analysis

Descriptive Statistics

The descriptive statistics evidenced the mean, maximum, minimum, standard deviation, and observations. This is presented in table 2:

Table 2: Descriptive Statistics

Study Variable	Mean	Maximum	Minimum	Std. Dev.	Observations
RGDP	4,5189.39	10,2543.8	1,082.56	2,850.67	33
PSC	15.91	70.38	10.70	12.43	33
BMS	26.20	58.95	5.74	15.60	33
ITRS	8.96	58.33	-7.90	8.16	33
TROP	37.60	64.88	10.30	11.12	33

Source: Eviews Output (2023)

Table 2 reported an average RGDP value of ₦4,5189.39 billion but deviated (fluctuated) by ₦2,850.67 suggesting low variation. Meanwhile, the highest and least RGDP values are ₦10,2543.8 and ₦1,082.56 billion. Also, average PSC value of 15.91% but deviated (fluctuated) by 12.43% suggesting low variation. Meanwhile, the highest and least PSC values are 70.38% and 10.70% respectively. More so, average BMS value of 26.20% but deviated (fluctuated) by 15.60% suggesting low variation. Meanwhile, the highest and least BMS values are 58.95% and 5.74% respectively.

Lastly, average ITRS and TTROP value of 8.96% and 37.60% but deviated (fluctuated) by 8.16 and 11.12% suggesting low variation. Meanwhile, the highest and least ITRS and TTROP values are 58.33 & 64.88% and -7.90 & 10.30% respectively.

Confirmatory Test: Unit Root Analysis

When doing a stationarity test, data is often tested for stationarity since time series that are non-stationary (unit root) cannot be generalized to other periods of time other than the present, stationary time series are crucial when using regression. Consequently, forecasting using these time series has limited applicability. Furthermore, erroneous results may arise from the regression of one non-stationary time series on another non-stationary time series. Since the set is a time series, it was first necessary to look at the time series attributes to determine whether or not the chosen variables have unit roots or are stable in level. This has to do with the ADF approach applied to the unit root test. The estimate is in table 3:

Table 3: Unit Root Test

Variables	ADF T-statistics	Mackinnon Critical Value 1%	5%	10%	Status	Decision
RGDP	-3.4506	-3.8573	-3.0403	-2.6605	1(1)	**Stationary**
PSC	3.8831	-3.9203	-3.0655	-2.6734	**1(1)**	**Stationary**
BMS	-6.0424	-4.0044	-3.0988	-2.6904	**1(1)**	**Stationary**
ITRS	-3.4960	-3.8867	-3.0521	-2.6665	**1(1)**	**Stationary**
TROP	-6.2969	-3.8861	-3.0521	-2.6665	**1(1)**	**Stationary**

*MacKinnon (1996) one-sided p-values.

Source: Adapted from E-Views 9.0 (2023)

The estimate in table 3 show that all the series were integrated (exhibited stationarity) at order 1 (first difference). This is in conformity with other researches concerning economic variables. This suggests the need to further subject the model to cointegration test with the intention to test if the variables exhibit long run effect or not.

Cointegration Test

The next step for the researchers is to ascertain if the series in the study are co-integrated after proving that they are stable at 1(1). The main goal here is to determine whether variables have a long-term relationship or not. Engle & Granger (1987) reported that, cointegration test is conducted if variables stationary. The Engle-Granger Single Equation (EGSE) is in table 4:

Table 4: Results of Engle-Granger Single Equation Cointegration Test

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
RGDP	-3.7206	0.5027	-36.9484	0.0000
PSC	-2.9146	0.8001	-67.0417	0.0000
BMS	-3.4561	0.6023	-30.4927	0.0000
ITRS	-3.6013	0.5476	-32.1016	0.0000
TROP	-3.0788	0.7408	-11.3336	0.8181

Source: E-Views 9.0 output (2023)

From Table 4 using the Engle-Granger cointegration procedure, both models have at least five cointegration and two cointegration exist between them respectively. This premised from the significance of at least five variables and at least two variables in each of the test using the z-statistic. Consequently, the model evidenced that, development finance has a long run effect on economic growth of Nigeria.

Regression Estimate

The Granger Causality (G-Causality) test was used to test the research hypotheses. Accordingly, the G-Causality test by Granger and Newbold (2014) was to establish the relationship between variables. It uses F-stat and P-value of F-stat to know which variable granger causes the other. The G-Causality Test is presented thus:

Table 5: Granger causality Test (RGDP)

Sample: 1989 2021				
Lags: 1				
Null Hypotheses (H0):	**Obs**	**F-Statistic**	**Prob.**	**Decision**
PSC < Cause RGDP	33	4.99054	0.0437	PSC > RGDP
RGDP < PSC		4.99054	0.0437	RGDP > PSC
BMS < RGDP	33	6.89375	0.0191	BMS > RGDP
RGDP < BMS		5.64276	0.0313	RGDP > BMS
ITRS < RGDP	33	3.04763	0.1013	ITRS < RGDP
RGDP < ITRS		0.05689	0.8147	RGDP < ITRS
TROP < RGDP	33	3.36494	0.0896	TROP < RGDP
RGDP <TROP		5.51347	0.0354	RGDP < TROP

NB: <does not Granger Cause; & > Granger Cause

Source: E-Views Version 9.0 (2023)

From the Granger Cause estimate presented in table 5, PSC granger causes RGDP while RGDP granger causes PSC. By implication, PSC bi-granger causes RGDP. This suggests that, if an economy must grow, more credits must be extended to the private sector. Similarly, the higher the credits extended to the private sector, the more developed the economy becomes. This supports the both the demand and supply leading hypothesis. This is in tandem with the Aprioiri expectation of this study. Meanwhile, BMS granger causes ECG while growth granger causes BMS. This suggest that, the more money is in circulation, the more the economy grows while the more the economy grows the money funds flows through the economy provided that such money revolves around the Nigerian banking industry. Meanwhile, trade openness granger causes growth but economic growth could not granger cause trade openness. The study reaffirmed that, for economy to grow, the economy must first be open to trade and not the other way round. This has some policy implication in the Nigerian context. This is in tandem with the demand following approach but deviated from the supply leading approach. It also supports the findings of Agbogun and Ehiedu (2022); Iyoha and Okim (2017); Nwadike, Ani, and Alamba (2020). However, Oshiobugie (2022) reported that two trade policy parameters

(imports) decreased the OPEC member countries' competitiveness of OPEC member countries from 1992 to 2021, while the more OPEC member countries export crude, the more competitive the member countries become.

Lastly, Interest rate volatilities could not granger cause growth while growth could not granger cause Interest rate volatilities. This suggests that, wide Interest rate volatilities did not significantly improve growth and that, the reason behind the wide spread is not attributed to growth. This did not support the Aprioiri expectation.

Concluding Remark and Recommendations

From the various outcomes, the paper concludes that, private sector loans and money supply precedes growth just as growth precedes both private sector credits and money supply while trade openness is a precondition for growth. As such, it is imperative for the apex regulatory body to instruct Nigerian banks to give more credits to the private sector. Also, efforts should be made to reduce the high currency outside the shores of the Nigerian banking industry. Again, the efforts should be made to improve the degree to which Nigeria is open to trade. Lastly, the rising high cost of borrowing should be reduced.

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