

Role of Development Finance Institutions in Developing the Nigerian Agricultural Sector.

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ABSTRACT : This study investigates the role of development finance institutions (DFIs) in agricultural sector development in Nigeria. African Development Bank (AfDB), World Bank and International Development Association (IDA) were the underlying DFIs while agriculture value added formed the basis for measuring agricultural sector development. Data on the variables were sourced from World Development Indicators (WDI) and analyzed using error correction mechanism (ECM). The unit root test results indicate that all the variables are not stationary. However, they become stationary after first differencing and as such they all integrated of order one. The cointegration test results revealed that the variables have long run relationship. The result showed that the first and second lag of agriculture value added impacted negatively on its current. One-period lag of AfDB loan has significant positive relationship with current value of agriculture value added. The result showed that agriculture value added increased by 0.079 percent due to 1 percent increase in lag of AfDB loan. It was also found that the lagged values of World Bank and IDA loans exert significant negative impact on agriculture value added. The Parsimonious ECM revealed that the model has an adjustment speed of 59.2 percent. Based on the findings, it is recommended that policymakers should prioritize the allocation of AfDB loans into productive sectors of the economy with particular emphasis on agriculture with a view to driving the development process in the real sector.

Keywords: *Development finance, agriculture sector, Institutions, African Development Bank, World Bank and value addition*

I. INTRODUCTION

The role of Development Finance Institutions (DFIs) in fostering real sector development has received global recognition. The establishment of DFIs could be traced to the incidences of the Second World War in an attempt to provide mechanisms for international cooperation in managing the global financial system. Notably, there is a clear distinction between DFIs and other elements of the Global Financial Safety Nets (GFSN). This follows the popular believe that DFIs provide long term and very long term credits in addition to capacity building programs for Small and Medium Scale Enterprises (SMEs) whose credit needs are adequately catered for by the existing Deposit Money Banks (DMBs) or domestic capital markets. Thus, DFIs are helpful in boosting the level of growth and development in key aspects of the economy such as agriculture, manufacturing and infrastructure amongst others.

Marwa&Zhanje (2015) argue that much ambiguity and contention have surrounded the finance-development nexus. This could be traced to the absence of straight forward theoretical and empirical framework to address the puzzle surrounding the finance-development relationship (Aziakpono, 2012; Stolbov, 2012). From a broader perspective, DFIs are adjudged as enablers of growth and development in developing economies following their investment in the private sector. The financial resources offered to developing economies by DFIs are intended to make additional contribution to what the market can provide and trigger further investments in the overall economy.

Massa (2011) posits that the role of DFIs in fostering the development process is higher in lower-income countries than in higher-income countries. This could be linked to both theoretical underpinnings and empirical evidences from previous studies which identify DFIs as important drivers of economic and social development as they ensure the availability of long term and very long term credits as well as grants for private sector investment.

Despite increase in the inflow of financial resources from DFIs to Nigeria, the development effects of these resources has been characterized by controversies as no consensus has been reached in both academic and

business cycles on the effectiveness in boosting agricultural sector development. While some argue that DFIs have been helpful in the process of real sector development by making available resources for investment in neglected areas, pioneering investing in risk areas and building sustainable sources of income, others are of the view that fund provided by DFIs seem inadequate to foster growth and development of real sector. Thus, further debate and empirical studies on the finance-development nexus have emerged in recent time. In view of the foregoing, this study examines the role of DFIs in the process of agriculture sector development in Nigeria between 1990 and 2017.

II. REVIEW OF RELATED LITERATURE

2.1 Theoretical Framework

The financial intermediation theory credited to Goldsmith (1969), McKinnon (1973), and Shaw (1973) assumes that financial markets are playing a pivotal role in economic development. Thus, they attributed the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. This view contrasts with Robinson (1952) who argued that financial markets are essentially driven by the domestic industry and respond passively to other factors that produce cross-country differences in growth. According to Goldsmith (1969), he attributed the positive correlation between financial development and the level of real per capita Gross National Product (GNP) to the positive impacts that financial development has on encouraging more efficient use of the capital stock.

Shaw (1973) proposes a debt intermediation hypothesis, whereby financial intermediation between savers and investors resulting from financial liberalization and development increase the incentive to save and invest, stimulates investments due to an increased supply of credit, and raises the average efficiency of investment. In sum, Schumpeter sees financial institutions as an intermediary between innovators and owners of capital. Hence, once the bank offers loans, it permits the implementation of the new "creative ideas," which will stimulate economic growth and benefit the whole society. He further explains that banks loans are crucial in the initial stage of creating new combinations. At the advanced stage of enterprises growth, the revenue accrued from the production may finance the subsequent new combination.

2.2 Empirical Literature Review

The role of DFIs in promoting real sector development has remained subject of interest in many empirical studies. The findings from the studies varied overtime. For instance, Lorenzo and Daryna (2015) evaluated the interdependence between financial development and real sector output and the effect on economic growth. The study made use of panel data for 101 developed and developing countries between the period of 1970 and 2010. The study intended to show that the effect of financial development on economic growth was depended on the growth of private credit relative to the real output growth. The result of the study revealed that the effect of financial development on growth becomes negative, if significant increase in private credit is not complemented by growth in real output. The findings suggest that the positive effect of finance on growth is maximum under balanced growth of financial and real sector. Accelerated financial development that is not accompanied by real sector expansion reduces positive impact on growth; this effect might become negative if financial development grows significantly faster than real output.

Stephen and Olufemi (2015) examined the relevance of financial sector development on real sector productivity. The study employed the Ordinary Least Square (OLS) method in estimating the model. The result of the study showed that there is strong linear relationship between the financial sector and real sector because the coefficient of multiple determination was relatively high; suggesting that financial sector development is crucial for real sector productivity.

Mohammed and Santi (2018) investigated the relationship between financial and real sectors of Thailand with the volatility analysis of GDP caused by development of financial market. The GARCH model, Johansen-Juselius (1990) co-integration test, vector error correction model (VECM), and Granger causality testing approach were employed on time series data over the first quarter of year 1993 until the second quarter of year 2017. In keeping in tandem with past studies, both the elements of capital market (i.e. bonds and stock markets) as well as the money market (i.e. bank credit to private sector) has a positive link to the GDP. The results show that both markets help in promoting economic growth. The findings suggest that there exist inter dependency between real and financial sector's technologies which in turn illuminates the impact of financial market development on the GDP growth.

Megasan, Olunkwa and Yusuf (2018) explored the financial sector development and manufacturing performance in Nigeria from 1981 to 2015 period. The study utilized indicators such as manufacturing capacity utilization, manufacturing output and manufacturing value added were used to proxy manufacturing performance; while money supply as a percentage of GDP, domestic lending to the private sector and liquidity ratio were used as financial development proxies. The study employed the co-integration and error correction model (ECM) as a technique analysis. The study observed that credit to private sector and money supply positively but

insignificantly enhanced capacity utilization and output; but negatively impacted value added of the manufacturing sector in the short run. A slight improvement was seen in the long run where both money supply and credit to private sector exert positive impact on manufacturing output. The study therefore recommended for banks to make available certain percentage of their profits for industrial expansion in order to create linkages between both sectors.

Aiyetan and Aremo (2015) researched on the effect of financial sector development on manufacturing output growth in Nigeria. The study made use of Vector Autoregression (VAR) analysis to test whether or not financial sector variables stimulate the growth of output in manufacturing sector of the Nigerian economy, by maintaining interactions with some key macroeconomic variables in Nigeria using annual data spanning from 1986 to 2012. The study equally employed unit root and Johansen co integration test to examine the behavior of the macroeconomic data. The finding of the study suggests that relaxing financial development constraints and deepening the financial sector are crucial to boosting Nigeria's manufacturing output growth.

Osuji and Ozurumba (2013) analyzed the impact of International Financial Institution loans on the Nigerian economic performance. Loans from London Club, Paris Club, Multilateral Club and promissory notes were included into the model as explanatory variables while economic growth which serves as the dependent variable was measured using gross domestic product. The requisite data on the underlying variables spanned from 1969 to 2011 and were sourced from the Central Bank of Nigeria Statistical Bulletin. The study basically relied on the Vector Error Correction Model (VECM) approach for the analysis. The study revealed that London Club debt is positively related to economic growth while Paris Club, Multilateral Club, and Promissory debts contracted growth in Nigeria during the sampled period.

III. MATERIALS AND METHODS

3.1 Research Design

In this study, an ex-post facto research design is applied. This is because the data on each of the variables are already in existence and as such cannot be subjected to any type of manipulation.

3.2 Model Specification

This study adopted a multivariate model to examine the impact of DFIs development financing on agriculture value added in Nigeria. The model utilizes agriculture value added as the dependent variable while concessional loans from AfDB, World Bank and IDA were introduced into the model as exogenous variables. The functional forms of the models are expressed as:

$$AGV = f(ADL, WBL, IDA) \quad (1)$$

Where: AGV = Agriculture value added

ADL = AfDB loan

WBL = World Bank loan

IDA = International Development Association credits

The dynamic specification of the ECM is provided as follows:

$$\Delta \text{Log}(AGV) = \alpha_0 + \sum_{i=1}^q \theta_1 \Delta \text{Log}(AGV)_{t-i} + \sum_{i=1}^q \theta_2 \Delta \text{Log}(ADL)_{t-i} + \sum_{i=1}^q \theta_3 \Delta \text{Log}(WBL)_{t-i} +$$

$$\sum_{i=1}^q \theta_4 \Delta \text{Log}(IDA)_{t-i} + \phi \text{ECM}_{t-1} + e_{1t} \quad (2)$$

Where: Δ = first difference notation

α_0 = constant parameter

$\theta_1 - \theta_4$ = dynamic coefficients of the explanatory variables

ECM = error correction mechanism lagged for one period.

ϕ = error correction coefficient which measures the speed of adjustment.

3.3 Method of Data Analysis

The error correction mechanism (ECM) was applied for the estimation of both the speed of adjustment and short run dynamic coefficients. This followed the establishment of cointegration amongst the variables under investigation. More so, the variables were subjected to some diagnostics tests such unit root test, cointegration test and serial correlation among others. Notably, the Augmented Dickey-Fuller and Phillips-Perron procedures was utilized in the conduct of the unit root test. Again, the cointegration test procedure developed by Johansen and Juselius (1990) was applied in examining whether or not the variables have long relationship.

IV. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics for each of the variables in the model are shown in Table 1.

Table 1: Descriptive statistics for the variables in the model

	AGV	ADL	WBL	IDA
Mean	4.13E+10	10404341	1.95E+08	10566903
Median	2.86E+10	1145622.	2.03E+08	1196000.
Maximum	9.53E+10	50191820	3.92E+08	77287000
Minimum	1.53E+10	1872.000	6944000.	399000.0
Std. Dev.	2.56E+10	16361420	1.15E+08	16514859
Observations	31	31	31	31

Source: Source: Authors' computation from E-views 10

The results of the descriptive statistics indicate that agriculture value added was US\$41,300,000,000 on average. The result further revealed that AfDB and World Bank loans have mean values of US\$10,404,341 and US\$195,000,000 respectively whereas loans from IDA averaged US\$10,566,903. It is obvious from the result that, on the average, agriculture value added remained relatively large over the study. It is equally observed from the result that the underlying development finance institutions have in the past three and half decades remained important source of funding in the Nigerian economy. The standard deviation further revealed that agriculture and manufacturing value added as well as World Bank loan are convergence to their respective mean values. However, AfDB and IDA loans are divergent from their respective mean values. This is as a result of their associated high standard deviations.

4.2 Unit Root Test

The unit root test was conducted using ADF method. The results are reported in Table 2.

Table 2: ADF unit root test results

Variable	Results at levels	1 st difference test results	Order of integration
	t-statistic	t-statistic	
LOG(AGV)	-1.964 (0.601)	-5.398 (0.000)	I (1)
LOG(ADL)	-3.1336 (0.115)	-7.370 (0.000)	I (1)
LOG(WBL)	-1.434 (0.829)	-5.759 (0.000)	I (1)
LOG(IDA)	-2.352 (0.396)	-7.185 (0.000)	I(1)

Source: Authors' computation from E-views 10

The ADF unit root test results showed that none of the variables is stationary at levels because the associated probability values of the t-statistic are greater than 0.05. This implies that they all have a unit root and as such requires transformation for the actualization of stationarity. Therefore, the null hypothesis of unit root in the series is accepted. The evidence of unit root in the variables can be traced to common properties of time series data which tend to depict nonstationary behavior. Following the nonstationary process in each of the series, they were differenced once and found to be stationary. Thus, they variables are all integrated of order one I(1).

4.3 Cointegration Test Results

The results of the Johansen-Juselius cointegration test are reported in Table 3.

Table 3: Cointegration test result

Series: LOG(AGV) LOG(ADL) LOG(WBL) LOG(IDA)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.823373	87.11417	47.85613	0.0000
At most 1 *	0.623222	38.57010	29.79707	0.0038

At most 2	0.273515	11.23933	15.49471	0.1972
At most 3	0.078605	2.292275	3.841466	0.1300
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.823373	48.54408	27.58434	0.0000
At most 1 *	0.623222	27.33077	21.13162	0.0059
At most 2	0.273515	8.947056	14.26460	0.2906
At most 3	0.078605	2.292275	3.841466	0.1300

Source: Authors' computation from E-views 10

The cointegration test results revealed that the variables in the model are cointegrated. Both the trace and maximum Eigenvalue showed evidence of two cointegrating vectors. In view of this finding, the null hypothesis of no cointegration is rejected. Hence, the variables have long run relationship. Following the establishment of cointegration amongst the variables the condition for estimating the ECM is fulfilled.

4.4 Estimation of the Error Correction Model

The ECM was relied for estimating the dynamic behavior of the explanatory variables and underlying feedback effects of the forecast variable. Table 4 shows the results of the transformation of the models using the parsimonious ECM.

Table 4: Parsimonious ECM

Dependent Variable: DLOG(AGV)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(AGV(-1))	-0.592369	0.251675	-2.353701	0.0350
DLOG(AGV(-2))	-1.032125	0.231192	-4.464359	0.0006
DLOG(AGV(-3))	-0.603738	0.311302	-1.939393	0.0745
DLOG(ADL)	0.052325	0.027060	1.933661	0.0752
DLOG(ADL(-1))	0.079706	0.028895	2.758505	0.0163
DLOG(ADL(-2))	0.059165	0.042303	1.398617	0.1853
DLOG(ADL(-3))	-0.016150	0.013003	-1.242080	0.2361
DLOG(WBL)	-0.087477	0.056120	-1.558742	0.1431
DLOG(WBL(-1))	-0.157219	0.052933	-2.970164	0.0108
DLOG(WBL(-2))	-0.173912	0.075511	-2.303144	0.0384
DLOG(IDA(-1))	-0.128184	0.057113	-2.244407	0.0428
DLOG(IDA(-3))	0.188591	0.057402	3.285420	0.0059
ECM(-1)	-0.592287	0.165475	-3.579319	0.0034
C	0.165098	0.029990	5.505161	0.0001
R-squared	0.836380	Mean dependent var		0.061762
Adjusted R-squared	0.672761	S.D. dependent var		0.079886
S.E. of regression	0.045698	Akaike info criterion		-3.027354
Sum squared resid	0.027149	Schwarz criterion		-2.355439
Log likelihood	54.86928	Hannan-Quinn criter.		-2.827559
F-statistic	5.111737	Durbin-Watson stat		2.115019
Prob(F-statistic)	0.002995			
Post-estimation test results				
Test type	Test statistic		Prob. value	
Breusch-Godfrey Serial Correlation LM test	Chi-square statistic		0.9042	
White Heteroskedasticity Test	Chi-square statistic		0.6681	

Source: Authors' computation from E-views 10

The result showed that AfDB and IDA loans have significant positive relationship with agricultural value added. 1 percentage increase in AfDB loan leads to 0.0576 percent increase in agriculture value added. This result is in accordance with the findings of Massa (2011). Similarly, agriculture value added increases by 0.294 percent following 1 percent increase in IDA loan. This finding is in accordance with the result Simpasa, Shimeles and

Salami (2015). The result further revealed that World Bank loan does not significantly impact on agriculture value added. Both coefficient determination and F-statistic suggest that the overall model is statistically significant at 5 percent level of significance. The error correction coefficient (-0.5922) shows that the model is convergent and has a high adjustment speed. This indicates that in the long run, short run deviations can be corrected. With high R-squared (0.8363) and F-statistic (5.112), the regressors possess high explanatory power and jointly influence changes in agriculture value added. Additionally, the results of Breusch-Godfrey serial correlation and White's heteroscedasticity tests indicate that the error terms are not serially correlated and maintain constant variance over the study period. Again, the JarqueBera statistic from the normality test indicates that the residuals are normally distributed. These results of the diagnostics test reveal that the sufficient conditions for the reliability of the model are fulfilled.

V. CONCLUDING REMARKS

This study focused attention on the role of DFIs in agriculture sector development in Nigeria. The findings reveal that AfDB loans contribute positively to agriculture value added. This indicates that AfDB has been playing an important role in the process of funding sector. In addition to AfDB, loans from IDA have long term positive relationship with agriculture value added. This is indicative that the availability of loans from IDA has offered opportunity for improving the value chain in the agricultural sector. On the contrary, World Bank loans negatively impacted on agriculture value added. This is a deviation from the theoretical expectation as funding from the World Bank is perceived as a key funding source for driving the growth and development process in low developing countries. In view of the findings, it is concluded that AfDB has remained an important driver of agriculture sector development. Thus, it is recommended that policymakers should prioritize the allocation of AfDB loans into productive sectors of the economy with particular emphasis on agriculture with a view to driving the development process in the real sector.

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