

Foreign Aid, Domestic Investment and Consumption in Nigeria: A Causality Analysis

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Abstract : Foreign aid are originally provided as supplement to domestic investment in the recipient economies, however there are argument that in some instances foreign aid would rather promote domestic consumption in the recipient economies. This research therefore aimed at investigating the role of foreign aid in explaining the behaviour of domestic investment and consumption in Nigeria within the period 1981 to 2018. The research adopted the Toda – Yamamoto approach to causality and found that, multilateral aid explained the behaviour of domestic investment in Nigeria, but bilateral aid is not significant in explaining the behaviour of domestic investment in Nigeria. In addition, the research also found that both multilateral and bilateral aid are significant in explaining government consumption expenditure in Nigeria. Based on these findings, the researcher strongly recommends the use of multilateral channel of aid delivery against the traditional bilateral mode of aid delivery.

Key words : foreign aid, investment, consumption, bilateral aid and multilateral aid.

I. INTRODUCTION

Developing economies often suffer from poor level of capital formation which often arises due to low income and low savings. In order to deal with this problem of poor capital formation these economies look forward to foreign capital. Prominent among these foreign capitals is foreign aid. Foreign aid is provided to developing countries with the sole purpose of promoting economic development. Sachs (2005) argued that for the less developed countries to escape the poverty trap and achieve economic development there was the need for more infusion of aid into the developing countries of the world.

Nigeria as a developing economy has been a beneficiary of foreign aid for many years. According to the 2019 report of Organisation for Economic Co – operation and Development (OECD) Nigeria is ranked second among the top ten recipients of aid to Africa. The report further revealed that Nigeria received 5% of the total aid that flow to Africa from 2015 to 2017. According to World Development Indicators of World Bank, the Nigerian government has received on average \$33 million, \$55 million and \$2 billion as grants (excluding technical aid) between years 1981 and 1990, 1991 and 2000 as well as between 2001 and 2010 respectively. The world development indicators further revealed that Nigeria has received Official Development Assistances (ODA) in US dollars to the tune of; \$39 million, \$258 million, \$167 million,

\$1 billion and \$3 billion in the periods; 1981, 1991, 2001, 2011, and 2018 respectively.

The dual gap model of economic development argued that foreign aid can supplement the shortfall in domestic investment in the recipient economies thereby resulting to more capital formation and growth (Todaro & Smith, 2012; Jhingian, 2012). Griffin (1970) argued that aid may not actually promote domestic investment but may result in increased domestic consumption. However previous researches in the field of foreign aid have focused on the relationship between foreign aid and economic growth rather than looking at the efficacy of foreign aid in promoting domestic investment or the alternative which is foreign aid promoting domestic consumption. The focus of this research is to investigate how the inflow of aid helped explained the behaviour of domestic investment and consumption in Nigeria during the period 1981 to 2018.

Specifically this research is set to achieve the following objectives.

- I. To examine if the inflow of foreign aid to Nigeria was significant in explaining the behaviour of domestic investment in Nigeria.
- II. To investigate if the inflow of foreign aid to Nigeria was significant in explaining the behaviour of government consumption expenditure in the country.
- III. To ascertain if the inflow of foreign aid to Nigeria was significant in explaining the behaviour of private consumption expenditure in Nigeria.

II. LITERATURE REVIEW

I. Theoretical literature – Dual Gap Model

This theory was first formulated by Hollis Chenery and Micheal Bruno in 1962, then by Ronald Mckinnon in 1964, and popularised by Hollis Chenery and Alan M Strout in 1966. The central argument of this model is that developing countries face either a shortage of domestic savings to match investment opportunities or a shortage of foreign exchange to finance needed imports of capital and intermediate goods. The shortage of domestic savings refers to savings gap and the shortage of foreign exchange refers to foreign exchange gap. These two gaps are separate and independent; they are constraints in the attainment of a target rate of economic growth in developing countries. This theory further argued that one of these gaps will be binding on a developing country

at any given time. If, for instance, the savings gap is larger than the foreign exchange gap, it then becomes the dominant gap and binding constraint, as such growth is constrained by domestic investment and so foreign savings may be used as a supplement to domestic savings. On the other hand, if the foreign exchange gap is larger than the savings gap, it becomes the dominant gap and the binding constraint on the economy. This implies that growth is constrained by unavailability of income to import capital and intermediary goods needed for production. In the event of these two cases, this theory argued that foreign aid or development assistance is needed by the developing countries to fill in their foreign exchange or savings gap (Todaro & Smith, 2012; Jhimgan, 2012).

II. Empirical Literature

A. Foreign Aid, Domestic Savings and Investment.

Karamuriro, Ssemenda and Bbaale (2020) investigated the impact of foreign aid on domestic savings in Uganda for the period 1970 to 2016. They used error correction model and found that foreign aid has negative impact on domestic savings in Uganda both in the short run and long run. Igbinedion and Olele (2018) examined the nexus between foreign aid and domestic savings in Nigeria from 1980 to 2015. By using Johansen co integration and error correction model, they found that foreign aid complements domestic savings in Nigeria. Jean (2015) examined the extent to which foreign aid explained domestic savings and investment in Haiti for the period 1975 to 2010. The researcher used multiple linear regression model and found that foreign aid did not predict domestic savings and investment in Haiti.

Hem (2013) investigated the role of foreign aid in complementing domestic savings in Bangladesh, India, Nepal, Pakistan and Sri – Lanka for the period 1960 to 2000. The research used simultaneous equation system and found that foreign aid does not complement domestic savings. Eberechukwu (2012) investigated the chances of foreign aid having any impact on private investment in West Africa from 1975 to 2008. The research used fixed effect estimator and found that multilateral aid affects private investment positively but bilateral aid does not affects private investment positively. Dierk and Michael (2012) used panel co integration and causality analysis to ascertain the long run relationship between foreign aid and private investment in thirty nine (39) countries for the period 1970 to 1999. Their findings revealed that aid has a statistically significant negative effect on private investment.

Eregha and Irughe (2009) examined the impact of foreign aid on domestic savings in Nigeria from 1980 to 2007. The researchers employed ordinary least square method along with autoregressive model and their findings revealed that foreign aid has positive effect on domestic savings in Nigeria. Michael (2007) examined the relationship between foreign aid and savings in one hundred and nineteen (119) countries. Using reduced form ordinary least square techniques, the

researcher's findings revealed that aid is beneficial to savings. Synder (1990) examined the effect of foreign aid on savings in fifty (50) countries covering low and middle income countries for the period 1960 to 1980. The researcher used fixed effects model and ordinary least square estimation technique; the findings revealed that aid have relatively little influence on domestic savings.

B. Foreign Aid and Domestic Savings

Jonathan and Nicholas (2015) used fixed effect and instrumental variable regression to study the effects of aid on macroeconomic ratios in eighty eight (88) countries for the period 1971 to 2012. Their result revealed that aid leads to higher consumption. Chatterjee, Giuliano and Kaya (2012) examined the link between foreign aid and the compositions of government spending in sixty seven (67) aid – recipient countries for the period 1972 to 2000. By using general method of moments and instrumental variable estimation, the research found that aid has a strong positive impact on household consumption. Sarsour, Naser and Atallah (2011) evaluate the economic and social effects of foreign aid in Palestine in the period 1994 to 2009. By using ordinary least square regression techniques and descriptive analysis, the researcher found that most of foreign aid in Palestine was consumed.

Werker, Ahmed and Cohen (2009) examined the impact of transfers from wealthy members of organisation of petroleum exporting countries to poorer Muslim allies for the period 1960 to 2003. By using ordinary least square and two stage least square regression techniques, the researchers found that much aid is consumed primarily in the form of imported non capital goods. Arellano, Bulř, Lane & Lipschitz (2005) examined the effects of aid volatility on consumption in seventy three (73) aid – receiving countries from 1981 to 2000. The researchers used ordinary least square techniques and general method of moments. Their findings revealed that a permanent flow of aid finances mainly consumption and shocks in aid reflect basically in investment because of consumption smoothing.

In summary, the researcher has observed from empirical literatures that there are more researches that focused on the relationship between foreign aid and domestic savings rather than researches that focused on the relationship between foreign aid and domestic investment. Also, there are scanty literatures that focus specifically on the relationship between foreign aid and domestic consumption. Specifically the researcher could not find research on the relationship between foreign aid and domestic consumption in Nigeria. This above points raised revealed some of the existing gaps in the literature that need to be fill.

III. METHODOLOGY

This research is based on causal experimental research design. The causal experimental research design is used when the aim of the study is to find out if the past values of a variable say X

(independent variable) is relevant in determining the present value of another variable say Y (dependent variable). This research design is experimental in nature because the targets variables are allow to vary while other variables are held constant.

Thus, in line with this study design the variables used included: Official Development Assistance (ODA) as proxy to foreign aid, Bilateral Aid (BL), Multilateral Aid (ML), Domestic Investment (DI), Private Consumption Expenditure (PCE) and Government Consumption Expenditure (GCE). The data on DI, PCE and GCE were sourced from the Central Bank of Nigeria statistical bulletin for the year 2019, while data on ODA, BL and ML were sourced from the World Development Indicators (WDI) of the World Bank. These data cover the period 1981 to 2018. Considering the fact that these data are time series data, the researcher carried out the analysis in three stages. These stages included: Unit Root Test, Co integration Test and Granger Causality Analysis.

I. Unit Root Test

The essence of this test was to avoid running a spurious regression. In other to achieve a robust result on the status of stationeirity of the variables involved, the researcher used two techniques of unit root test. The Augmented Dickey Fuller Test and the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) Test. In the Augmented Dickey Fuller (ADF) test accepting the null hypothesis means non stationary while accepting the null hypothesis in the KPSS test means stationary. The KPSS test is a mirror test to the ADF test.

The ADF test is based on the following model.

$$\Delta y_t = \alpha y_{t-1} + x_t' \delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \dots + \beta_p \Delta y_{t-p} + v_t \dots\dots\dots 3.1$$

Where y in the model stands for the variables: ODA, BL, ML, DI, PCE and GCE.

The KPSS test starts with estimating the model in 3.2 where Y_t is the series and X_t is the exogenous variables.

$$Y_t = X_t \delta + \mu_t \dots\dots\dots 3.2$$

The KPSS test statistic is the Lagrange multiplier (LM) which is defined by model 3.3 and is calculated with the aid of the residuals obtained from equation 3.2.

$$LM = \sum_{t=1}^T S(t)^2 / (T^2 f_0) \dots\dots\dots 3.3$$

(Eviews, 2020a)

II. Co integration Test

The essence of this test is to determine the presence or absence of long run equilibrium relationship among the variables (ODA, BL, ML, DI, PCE and GCE). Given a group of non-stationary time series, this test aimed at finding the possibility of linear combination among the variables. In the event that, a linear combination exists among them, we would say the variables are Co integrated (i.e a long run equilibrium

relationship exist among the variables).The Co integration test used in this research was the Johansen Co integration test. The Johansen Co integration test can detect multiple co integrating vectors and it is more appropriate for multivariate analysis. It takes the starting point of Vector Auto regression (VAR) of order p given by the general formula below.

$$y_t = A_1 y_{t-1} + \dots\dots + A_p y_{t-p} + B x_t + \epsilon_t \dots\dots\dots 3.4$$

Where y is a vector of the non stationary series ODA, BL, ML, DI, PCE and GCE (Eviews, 2020b).

III. Granger Causality Test

Granger causality test or approach show how the current value of a series Y is explained by its lag values and the by the lag values of another series say X. This test answers the question whether X causes Y or Y causes X. Y is said to be Granger caused by X, if X helps to explained or predict the value of Y. The essence of adopting this method is based on the fact that this research seeks to explore the relevance of ODA, BL and ML in explaining the behaviour of DI, PCE and GCE in Nigeria during the era under review.

The causality test used in this research is the Toda Yamamoto approach to causality. The reason for using the Toda Yamamoto approach is to have a robust result that is capable of overriding the weakness associated with the normal Granger causality test. The normal Granger causality test would not guarantee a robust result if the series concerned are not stationery at levels but have to be difference once or twice to achieve stationary status. This is because the normal Granger causality test is based on the assumption of a normal distribution series which may not hold true in the event the series are at difference. In order to take care of this weakness the Toda Yamamoto approach was adopted.

The Toda Yamamoto approach to granger causality test is based on an augmented Vector Auto Regressive (VAR) model that generates asymptotic Wald test statistics in form of Chi – Square distribution. The augmented VAR model is given as:

$$K + d_{max} \dots\dots\dots 3.5$$

Where, K is the optimal lag length and d_{max} is the maximum order of integration of the variables involved. The presence of d_{max} further imply that the difference in the order of integration (in essence; I(0), I(1), or I(2)) of the variables is inconsequential for the test, all that is important is the maximum order of integration among the variables (Toda & Yamamoto, 1995).

IV. RESULTS AND DISCUSSION OF FINDINGS

The results of the data analysis are given below in three sections.

1. Results of Unit Root Test

Table I: Unit Root Test At 5% Level Of Significance

| SERIES | ADF TEST | | KPSS TEST | | Order of Int. |
|--------|----------------|-----------------|---------------|-----------------|---------------|
| | ADF Statistics | Critical Values | LM Statistics | Critical Values | |
| ODA | -5.302783 | -2.948404 | 0.136710 | 0.463000 | I(1) |
| BL | -5.039365 | -2.945842 | 0.090238 | 0.463000 | I(1) |
| ML | -4.651224 | -2.945842 | 0.217648 | 0.463000 | I(1) |
| DI | -5.986820 | -2.945842 | 0.351050 | 0.463000 | I(1) |
| PCE | -6.268921 | -2.945842 | 0.267003 | 0.463000 | I(1) |
| GCE | -6.653177 | -2.945842 | 0.295110 | 0.463000 | I(1) |

Source: Author's Compilation

The results on table I showed that all the variables are stationary at first difference and at 5% level of significance. This finding applies to the Augmented Dickey Fuller test and the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test. The result implies that the variables were not stationary at levels, but they had to be difference to be stationary. In essence the variables are now integrated of order one [I(1)].

II. Result of Co Integration Test

Judging from the fact that the variables were not stationary at levels, it has become necessary for the researcher to go further and investigate the chances of having linear combination among the variables. This result is shown in table II below.

Table II: Result of the Johansen Co integration Test

Series: ODA, BL, ML, DI, PCE & GCE

| Trace Test | | | | |
|---------------------------|-------------|--------------------------------|---------------------|--------|
| Hypothesized No. of CE(s) | Eigen value | Trace Statistic | Critical Value (5%) | Prob** |
| None* | 0.924974 | 232.0761 | 95.75366 | 0.0000 |
| At most 1* | 0.811813 | 141.4288 | 69.81889 | 0.0000 |
| At most 2* | 0.681470 | 82.96761 | 47.85613 | 0.0000 |
| At most 3* | 0.566759 | 42.92629 | 29.79707 | 0.0009 |
| At most 4 | 0.256876 | 13.65012 | 15.49471 | 0.0931 |
| At most 5 | 0.088907 | 3.258872 | 3.841466 | 0.0710 |
| Maximum Eigen value | | | | |
| Hypothesized No. of CE(s) | Eigen value | Max-Eigen Statistics Statistic | Critical Value (5%) | Prob** |
| None* | 0.924974 | 90.64732 | 40.07757 | 0.0000 |
| At most 1* | 0.811813 | 58.46119 | 33.87687 | 0.0000 |
| At most 2* | 0.681470 | 40.04132 | 27.58434 | 0.0008 |
| At most 3* | 0.566759 | 29.27616 | 21.13162 | 0.0029 |
| At most 4 | 0.256876 | 10.39125 | 14.26460 | 0.1875 |
| At most 5 | 0.088907 | 3.258872 | 3.841466 | 0.0710 |

Source: Author's Compilation

The results on table II showed that both Trace test and Max-Eigen test revealed four co integrating equations at 5% level of significance. This implies that, there exists long run equilibrium relationship among official development assistance, domestic investment and consumption in Nigeria.

III Causality Result

As stated earlier the test of causality conducted was the Toda :Yamamoto approach to causality, this result is given in table III.

Table III: Result of Toda – Yamamoto Approach to Causality

| Excluded | Dependent Variables | | |
|----------|----------------------|-----------------------|-----------------------|
| | DI Chi-Square (Prob) | PCE Chi-Square (Prob) | GCE Chi-Square (Prob) |
| ODA | 16.97915 (0.0020) | 18.98993 (0.0008) | 22.05708 (0.0002) |
| BL | 8.364819 (0.0791) | 8.878006 (0.0642) | 12.21214 (0.0158) |
| ML | 38.55348 (0.0000) | 31.37773 (0.0000) | 37.62918 (0.0000) |

Source: Author's Compilation

The result on table III revealed that past values of aggregate foreign aid and aid from multilateral source explained domestic investment and private consumption expenditure in Nigeria during the era under review. The results further indicate that aggregate foreign aid and aid from multilateral and bilateral source explained government consumption expenditure in Nigeria during the period of study. Details of the result on table III is contained in the appendix.

Thus the findings of this research are:

- (i) There is long run relationship among foreign aid, domestic investment and consumption in Nigeria.
- (ii) Aggregate aid and multilateral aid are significant in explaining the behaviour of domestic investment in Nigeria.
- (iii) Aggregate aid and multilateral aid are significant in explaining the behaviour of private consumption expenditure in Nigeria.
- (iv) Bilateral aid is not significant in explaining the behaviour of domestic investment or private consumption expenditure in Nigeria.

- (v) Aggregate aid, multilateral aid and bilateral aid are significant in explaining the behaviour of government consumption expenditure in Nigeria.

An important observation about the result on table III is the relevance of bilateral aid in explaining domestic investment and private consumption expenditure. According to the data on aid inflow to Nigeria as contained in the world development indicators, bilateral aid constituted a significant portion of the total aid that flows into Nigeria during the period of study. Despite this significant portion, bilateral aid does not explain domestic investment or consumption in Nigeria. On the other hand this result revealed that bilateral aid had been significant in explaining government consumption expenditure in Nigeria. This particular scenario point to the fact that all those bilateral aid that flows to Nigeria during this period either in the form of grants or concessional aid had only add to government consumption expenditure rather than promoting domestic investment. This could be the reason why the recent trend of aid delivery in less developed countries has tilted towards the multilateral and non government organisation channel rather than the traditional bilateral channel. This is an indication of the failure of bilateral aid in achieving target goals in less developed countries.

Multilateral aid constituted the smaller portion of the total foreign aid that flows into Nigeria, notwithstanding multilateral aid had helped in promoting domestic investment in the country. This may be attributed to its focus on project aid and bureaucracy in delivery. In some instances multilateral aid focused on skills acquisition, employment and poverty alleviation. Some of this instances include projects like: the United Nation Development Programme (UNDP) project on resilience for food security in Nigeria aimed at increasing incomes of local farmers; the World bank project on Nigeria for women aimed at skill acquisition and the Department for International Development (DFID) project on rural and agriculture markets development programme for northern Nigeria aimed increasing employment in northern Nigeria. This could be part of the reasons why multilateral aid promotes private domestic consumption in Nigeria.

The findings of this research in the aspect investment complement the findings obtained by Eberechukwu (2012). While the findings of this research in the aspect of consumption complement findings from other empirical researches like: Jonathan and Nicholas (2015); Chatterjee, Giuliano and Kaya (2012); Sarsour, Naser and Atallah (2011); Werker, Ahmed and Cohen (2009); Arellano, Bulř, Lane & Lipschitz (2005).

V. CONCLUSION AND RECOMMENDATIONS

Based on the above findings I conclude that foreign aid to less developed countries will promote domestic investment or consumption depending on the mode of delivery. In other words aid channel through multilateral sources are most likely to promote domestic investment while aid channel through the

bilateral sources are most likely to promote domestic consumption.

Based on this conclusion the researcher is arguing for more used of multilateral aid against the use of bilateral aid to provide aid to less developed countries.

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APPENDIX

| Sample: 1981 2018 | | | |
|---------------------------|----------|----|--------|
| Included observations: 33 | | | |
| Dependent variable: ODA | | | |
| Excluded | Chi-sq | df | Prob. |
| BL | 1.839248 | 4 | 0.7653 |
| ML | 7.175549 | 4 | 0.1269 |
| DI | 17.05326 | 4 | 0.0019 |
| PCE | 11.31108 | 4 | 0.0233 |
| GCE | 6.109783 | 4 | 0.1911 |
| All | 221.6847 | 20 | 0.0000 |
| Dependent variable: BL | | | |
| Excluded | Chi-sq | df | Prob. |
| ODA | 5.201033 | 4 | 0.2673 |
| ML | 0.814030 | 4 | 0.9366 |
| DI | 9.182590 | 4 | 0.0567 |
| PCE | 1.009809 | 4 | 0.9083 |
| GCE | 4.128110 | 4 | 0.3889 |
| All | 97.34730 | 20 | 0.0000 |
| Dependent variable: ML | | | |
| Excluded | Chi-sq | df | Prob. |
| ODA | 17.40194 | 4 | 0.0016 |
| BL | 30.01389 | 4 | 0.0000 |
| DI | 16.96363 | 4 | 0.0020 |
| PCE | 5.219424 | 4 | 0.2655 |
| GCE | 13.27504 | 4 | 0.0100 |
| All | 188.1215 | 20 | 0.0000 |
| Dependent variable: DI | | | |
| Excluded | Chi-sq | df | Prob. |
| ODA | 16.97915 | 4 | 0.0020 |
| BL | 8.364819 | 4 | 0.0791 |
| ML | 38.55348 | 4 | 0.0000 |
| PCE | 8.986111 | 4 | 0.0614 |
| GCE | 20.25597 | 4 | 0.0004 |
| All | 60.49740 | 20 | 0.0000 |
| Dependent variable: PCE | | | |
| Excluded | Chi-sq | df | Prob. |
| ODA | 18.98993 | 4 | 0.0008 |

| | | | |
|-------------------------|----------|----|--------|
| BL | 8.878006 | 4 | 0.0642 |
| ML | 31.37773 | 4 | 0.0000 |
| DI | 16.97851 | 4 | 0.0020 |
| GCE | 20.03587 | 4 | 0.0005 |
| All | 44.73454 | 20 | 0.0012 |
| Dependent variable: GCE | | | |
| Excluded | Chi-sq | df | Prob. |
| ODA | 22.05708 | 4 | 0.0002 |
| BL | 12.21214 | 4 | 0.0158 |
| ML | 37.62918 | 4 | 0.0000 |
| DI | 26.57829 | 4 | 0.0000 |
| PCE | 9.733327 | 4 | 0.0452 |
| All | 76.99553 | 20 | 0.0000 |