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MACROECONOMIC INDICATORS AND CAPITAL FORMATION GROWTH IN NIGERIA: A NEW EVIDENCE

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ABSTRACT

This paper estimates the impact of macroeconomic indicators on the growth of capital formation in Nigeria. Adopting the Autoregressive Distributed Lag Model (ARDL), the empirical findings showed that Foreign aid which is proxied by Overseas Development Assistance (ODA) and Domestic Private Investment (DPI) had positive impact on capital formation growth in Nigeria, while exchange rate, trade openness, and external debt had negative impact for the period under review. The study therefore recommends that aid, especially from the West should not be highly depended upon as a major source of revenue for the development of the economy. Other macroeconomic determinants of capital growth that government should encourage include; savings, investment and the quality of institutions.

Contribution/Originality: This study tests the impact of macroeconomic indicators on the growth of capital formation in Nigeria within the framework of the Autoregressive Distributed Lag Model (ARDL).

1. INTRODUCTION

Many developing countries, especially in Africa have been confronted by low level of savings and capital formation. Some studies have however argued that the capital formation of a country can be improved by the inflow of foreign aid which is vital for economic growth (Sothan, 2018). Some of the vital objectives of foreign aid include the halting of world poverty, boost capital formation and improve the living standards of people especially in developing countries (Hussain *et al.*, 2017). This is essentially the basic need of Africa. Interestingly, Africa has been one of the great recipients of foreign aid in the global community. The report put forward by OECD in 2009 shows a terrifying statistics that in 2008, the total foreign aid from members of Development Committee (DAC) increased in real terms by 10.2% in the tune of US$110.8 billion. Subsequent annual records have it that it further increased to the tune of US$130 billion in 2010. In 2013, foreign aid further increased by 6.1% in real terms which was adjudged as the highest level ever recorded. There was also a provision by foreign donors in at the magnitude of US$ 134.8 billion in the form of net official development assistance which was a rebound following falling rates after two years of global financial/economic crisis. On the other hand, there was also a rise in bilateral trade in favour of Africa and Sub Saharan Africa by the magnitude of 10.6% and 10% respectively. Africa justifiably needs significant foreign inflow to hedge the cascading and deteriorating living standards of the people. Studies have

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confirmed that during the 1980s, the per capita income of the average Sub Saharan African fell consistently at an annual rate of 2.2% while consumption per capita deteriorated by 14.8%. On the same vein, the volume of import rose by an annual rate of 4.3% while the volume of export was fixed, which was not healthy for the economy. In the 90s, the growth rate per capita was also seen to falling continuously until it reached its negative levels. It is also documented that about 79% to 80% of Sub Saharan Africa countries were identified as countries that has low human investment capacity and were also categorized as highly indebted (Bakare, 2011). Based on the above analysis, it becomes justifiable to assert that Africa needs assistance beyond the domestic resources as it will be a great move to help them escape the strap of economic decadence (Riddle, 2007).

Domestically, the situation in Nigeria also calls for concern. For example, Nigeria which was in the early years of 1970 ranked as one of fifty richest countries has deteriorated so terribly to the extent of being categorized as one of the twenty five poorest nations of the world under the timing of the 21st century. A terrifying economic irony exists in Nigeria as it is categorized as the 6th largest exporter of crude oil and yet has the 3rd largest number of impoverished people as its inhabitants (Igbuzor, 2013). Subsequent years have shown signs for urgent foreign assistance to countries categorized as developing to which Nigeria belongs.

Developing countries like Nigeria are indeed characterized by low level of income, high level of unemployment, very low industrial capacity utilization, and high poverty level just to mention a few of the various economic problems these countries are often faced with. In addressing these problems, foreign aid has been suggested as a veritable option for augmenting the meagre domestic resources. While some countries that have benefited from foreign assistance at one time or the other have grown such that they have become aid donors (South Korea, North Korea, China etc.), majority of countries in Africa like Nigeria have remained backward. Nigeria has continued to benefit from all sorts of foreign assistance and in fact still collect at least as much as the amount collected in the early 1980s, yet socio-economic development has remained dismal. While there could be so many factors both qualitative and quantitative explaining these unfavourable trends, the incessant socio-political crisis, policy inconsistencies, macroeconomic instability and bad governance evident in many developing countries which are indeed indicators of poor policy framework, should give one a pause (Salisu, 2007).

Foreign capital enters a country in the form of private capital and/or public capital. However, public foreign aid has been found to be more effective in accelerating economic development than private foreign capital. Thus, financial needs of developing countries like Nigeria are so great that private foreign investment can only partially solve the problem of financing. For instance, foreign private investment has been found to contribute minimally to social expenditures in such spheres as education, public health, medical programmes, technical training, research and so forth. Such schemes directly and indirectly contribute to economic efficiency and productivity of the economy in the long-run and could, therefore be financed with the help of grants received from advanced countries and international organizations. Thus, foreign aid is expected to facilitate industrialization, in building up economic overhead capital, boosting economic growth and productivity and creating larger employment opportunities in a country like Nigeria.

As earlier stated, Nigeria has been a beneficiary to global foreign aid disbursed to African countries. Annually, she receives an overseas development assistance that runs into millions and billions of dollars, but whether such inflow translates into improved gross capital investment which is a necessary condition for economic growth remains a mirage. For instance, the foreign aid received by Nigeria in 1980 was valued at $34.4million and slightly increased to $39.25 million in 1981 with a corresponding level of gross capital investment valued at N133.2200 billion. In 1982, the amount of foreign assistance in favour of Nigeria economy reduced to $34.95million with a corresponding level of gross capital investment at the value of N103.3100 billion. This record appeared to reveal an unseen correlation between foreign aid and gross capital investment in Nigeria which supports existing literature that asserts a link between foreign aid and growth goes via capital investment. However a closer look at the aid-investment annual statistics in Nigeria further contradicts the link assumption. From 1986 and beyond, the aid-

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capital investment assumed link raised some doubts in Nigeria economy. The value of official aid inflow was $58.12 million in 1986 which was an increase against its value in 1985 which was $31.71 million. This increase did not receive a commensurate increase in gross capital investment in Nigeria as it rather reduced from N40.93000 billion in 1985 to N35.54000 billion in 1986. This abysmal relationship continued as revealed in the 1989/90 foreign aid data where aid was $344 million in 1989 and reduced to $255million in 1990 and with a corresponding value of gross capital investment recording N28.94000 in 1989 and increasing to N40.12000 billion in 1990. This reverse and unstable relationship between foreign aid and gross capital investment calls for empirical exploration. Going deeper into the 1990s, the foreign aid reduced by almost 40% from 1993 to 1994, but the reduction of gross capital investment reduced just by a fraction less that 20%. In the millennium era, this unstable relationship between foreign aid and gross capital formation continued. The statistical evidence shows that between 2000- 2003, the level of aid increased from $173.7 million to $308.2 million which represented over 70% increase. This same progressive trend was not experienced in the level of gross capital investment as it reduced from N41.34000 billion to N7.940000 billion in 2003. This inverse trend was also present between 2011/12 as statistical records has it that foreign aid inflow was $1.7 billion and $1.9 billion in 2011 and 2012 respectively while the gross capital investment recorded N126.9400 billion and N101.7000 billion in 2011 and 2012 respectively. Can this undertone reason for poor growth in Nigeria?

Economic theories have identified capital formation as the basic problem of most developing countries, most especially African countries like Nigeria and foreign aid is adjudged to play a vital role in capital formation which is essential for economic growth. The objective of foreign aid has been to end extreme world poverty, increase capital formation and enhance living standard in developing countries, which is exactly what Nigeria needs. However, the contribution of foreign aid to the growth of capital formation of Nigeria has received dismal attention from researchers and experts. Major focus has been on impact and contribution of foreign aid on economic growth in Nigeria. In most cases, findings from foreign aid-growth nexus breeds weak and risky conclusion because many macroeconomic variables that influence growth are not considered and secondly channels through which growth is generated is neglected. It is pertinent to access if foreign aid contributes to the growth rate of capital formation which is an engine of economic growth or not. Specifically, this study intends to ascertain the key macroeconomic determinants of the growth rate of capital formation in Nigeria within the period 1980-2014.

2. LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Pro Aid Theory: Capital Diffusion

According to the proponents of this theory, they assert that the third world countries will only improve if organization methods, capital and technology from developed capitalist countries are trickled down to countries categorized as developing. According to this theory, underdevelopment is an expression of backwardness and that for developing countries to come at par with the developed countries, the modern economic growth principles, institutions and systems of the developed countries must be infused in them. This theory further perceives underdevelopment as a sheer result of low capital and technological deficiency and that foreign aid will serve as a fulcrum to inject the capital vacuum and launch the developing country into the path of development. They thus see underdevelopment as a capital deficiency disease which can be ameliorated by foreign aid. Hence, foreign aid is measured by auxiliary capital and is indispensable for speedily facilitating growth and development of the economy.

2.2. Theory of Dependence

The theory of dependence asserts that the main cause of underdevelopment in less developed countries is traceable to their dependence on developed countries. The origin of this theory is anchored on the writings and assertions of few economists from Latin America. The concept of dependency depicts a situation whereby an

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economy is subjected only to the extent whereby another 'better' economy grows and expands. This concept further shows a relationship of dependence whereby two economically differentiated economies relate but with a dominance platform. In other words, it a relationship where some dominant countries expand while the dependent weak country or economy only expands as a reflection of the expansion of the former which has both negative or positive tendencies on the dependent economy.

2.3. Neoclassical Counter-Revolution Theory

According to this theory, three factors are responsible for the underdevelopment experienced in poor countries. These factors are firstly, due to resources poorly allocated, secondly incorrect prices without genuine policies and thirdly excess state intervention and involvement by governments in developing countries. The prominent writes on the neo-classical counter revolution theory which includes Kruger, Lord Peter, Bauer, Lan Little, Deepak lal, Harry Johnson, Bella Balassa, Jagdish Bhagwati and Anne argued that the main reason why these developing nations are experiencing underdevelopment is attributed to the excess involvement of government in economic activity and that this delays the level of economic growth in these developing countries. On this note, the neoliberals advocate for a free market through an explicit allowance of competitive free markets, privatization of enterprises owned by the state, expanding exports through the promotion of free trade, creating a welcoming environment and atmosphere for foreign investors and minimizing the involvement of the government in economic activities. They assert that with this, the economy will not just grow but also grow efficiently.

2.4. Two Gap Theory

According to this theory, the main obstacle that prevents an economy from attaining its desired heights in economic growth and development is the issue of foreign exchange and savings gap. The foreign exchange and savings gap are two different and self-regulating limitations to the accomplishment of a mark rate of growth countries categorized as less developing. The distinctiveness linking the two gaps, aligns on the path of accounting measures and systems. It is a common acquaintance that if a country channels its resources more into investments than it channels it into savings, there is bound to be an occurrence of balance-of-payments deficit. On the other hand, if imports exceed exports, it implies an excess of resources used by an economy over resources supplied by it. The economy can accomplish the intended growth rate by ensuring that the savings gap is filled with foreign aid resources. Similarly, there is a postulation of a fixed relationship connecting targeted foreign exchange necessities and net export income. If net export income falls diminutive of foreign exchange necessities, there is an appearance of a foreign exchange gap and it can be filled by foreign aid (Mark, 1981).

2.5. Three Gap Theory

This theory refers to the gap that is found to be in existence between investment and savings, fiscal responsibilities and trade. The gap that exists between government revenues and government expenditures is referred to fiscal gap. This theory also asserts that the fiscal gap forms a part of the element of savings gap. Due to debt service, it becomes difficult for the government to enhance private investment because resources for investment and imports are not sufficient enough. Evidence shows that the expenditures of the government in Sub Saharan African countries have been truncated by external debt service notwithstanding some initiatives. In this context, foreign aid or resources will be needed to close the fiscal gap through and can be utilized through the conventional budgetary allocation by the government.

2.6. Empirical Literature

In this section of the paper, previous studies carried out on the concept of foreign aid and related variables are reviewed. In the research conducted by Muhammad (2005) he carried out an examination on the link connecting

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external aid and economic growth at the disaggregate levels for the years 1972–2006, and ascertained if external aid is a go-ahead or a nuisance for Pakistan. To estimate the long-run relationships among the variables, he adopted the ARDL method of cointegration. The estimations show that foreign aid has a negative and insignificant impact on economic growth. In addition, the study suggested that macroeconomic variables like export earnings, domestic investment and foreign investment inflows are significant factors contributing to the growth of Pakistan economy. In another study, Adnan (2008) evaluated and explored whether external aid provided to Pakistan had been a "blessing" or a "curse". The research carried out a critical examination of the magnitude and state of foreign debt and external aid in Pakistan. In the light of the findings of the study, the researcher recommends that from their analysis of the effectiveness of aid from donor countries, that initial errors of aid and debt burden should be ameliorated and aid inflow should be suspended until the right platform for its proper utilization is established.

Tadesse (2011) carried out a research on the effect of foreign aid on the growth of Ethiopian economy applying the Engel-Granger cointegration analytical technique. He employed the multivariate analysis to analyze the unanswered question of aid efficiency and effectiveness (usually assessed by its effect on the level of economic growth and development) in Ethiopia using a time series statistics covering the period 1970 to 2009. In the course of estimation, he came to a conclusion that foreign assistance/aid entered alone positively contributes to the growth of Ethiopia economy. However, the interface between aid its associated policy has not produced a positive effect on growth which has the implication that the venomous shock of bad policies in constraining aid effectiveness. The overall effect of aid on economic growth over the period considered turns out to be macro-economically harmful due to paucity of good policies. Daniel (2011) applied an ARDL bounds test approach to empirically investigate how foreign aid and trade openness impacts on the economic growth in the post-liberalization period in Ghana. The finding reveals that foreign aid and trade openness inflow contributed positively and significantly on the growth of Ghana economy in the post liberalization period in the long and short run.

In another study conducted by Joseph (2013) he evaluated the relationship between foreign aid and revenue domestically generated and to also analyze their impact on the growth of Ghana economy form 1970-2011. To estimate the long and short run dynamics of the model, the study adopted the ARDL method of cointegration. Based on the regression analysis, it was found that domestically generated revenue had more impact on economic growth than foreign aid. Girma (2015) carried out an empirical investigation on the impact of foreign aid on growth of Ethiopian economy with the application of times series secondary data for the period 1974-2011. The paper following previous recent literatures ascertained whether aid is effective only in an environment that has relative macroeconomic stability. The study adopted the ARDL method of co-integration suggested by Pesaran and Shin (1995). Findings from this study show that foreign aid has a negative effect on economic growth in Ethiopia but has a positive effect on the case of aid policy interaction when accompanied by stable macroeconomic policy environment.

Zeshan *et al.* (2014) investigated the relative effect of external debt and aid on economic growth of Pakistan. They utilized time series in an annual data form covering the period 1970-2010. The result indicated a long-run negative relationship between Gross Domestic Product and external debt while there exists a positive long run relationship between foreign aid and Gross Domestic Product (GDP). The results also indicated that external debts have more relative impact on economic growth than external aid. The suggestion that was generated from these findings was that each elected administration should first complete the development project of the previous administration and then plan and start theirs and also ensure there is political peace and tranquility.

Bashir (2013) evaluated the effect exacted by foreign aid in the form of official development assistance (ODA) and foreign direct investment (FDI) on real growth in Nigeria over the period 1980 to 2011. By means of the Two-Gap model and an assortment of econometric techniques which include Augmented Dickey Fuller (ADF) test, Johansen co-integration test, Granger causality test and Error Correction Method (ECM), empirical outcome reveal that there is Granger no-causality between any pair of the variables. Findings of the study also established a

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negative association between FDI and real growth as ODA exacts no significant effect on real growth in the country. Incorporating other exogenous variables to foreign aid, Steve *et al.* (2013) empirically examined the effect of foreign assistance, external debt and domestic debt on economic growth in Nigeria for the years1981-2010. Cointegration and error correction mechanism were engaged to establish the long run liaison among the variables and correct for disequilibrium in the short run. The frugal error correction results show a positive relationship between the dependent variable, domestic debt and foreign aids. On the other hand, there is a negative relationship between economic growth rate and external debt. A raise in domestic debt and foreign aid inflows brought about 2.5 and 0.79 percent economic growth respectively. Muse (2015) carried out an empirical assessment of the control of deregulation on the relationship between foreign aid and fiscal performance in Nigeria. The theoretical affix which yielded the equation which described external aid as function of important fiscal variables and other macroeconomic variables was derived from the renowned two-gap model. Chow test statistic was used to scrutinize if there is any structural changes since the adoption of deregulation that has significantly affected the relationship between foreign aid and fiscal behaviour. The result shows that deregulation has positively and significantly affected the impact of fiscal behaviour in Nigeria on foreign aid convenience. But the effect has been short-lived lately owing to the current extreme fall in external aid available to Nigeria despite the sustained increase in both government revenue and expenditure. The study therefore suggested that estimation of other shocks that can affect the fiscal behaviour in Nigeria should be analyzed with a view to getting the reason why deregulation fails to maintain positive relationship that exists between fiscal behaviour and external aid in Nigeria.

Conclusively, from the existing literature reviewed, the empirical relationship between the growth rate of capital formation and other macroeconomic variables has not been adequately addressed. An attempt to provide answers to these issues is the gap this paper intends to fill.

3. METHODOLOGY

3.1. Theoretical Framework

The theoretical anchor for this research is the two gap theory. According to this theory, the main obstacle that prevents an economy from attaining its desired heights in economic growth and development is the issue of foreign exchange and savings gap. The foreign exchange and savings gap are two different and self-regulating limitations to the accomplishment of a mark rate of growth in countries categorized as less developing. The distinctiveness linking the two gaps, aligns on the path of accounting measures and systems. On the other hand, if imports exceed exports, it implies an excess of resources used by an economy over resources supplied by it. The economy can accomplish the intended growth rate by ensuring that the savings gap is filled with foreign aid resources. Similarly, there is a postulation of a fixed relationship connecting targeted foreign exchange necessities and net export income. If net export income falls diminutive of foreign exchange necessities, there is an appearance of a foreign exchange gap and it can be filled by foreign aid.

According to the two-gap model decomposed in econometric terms, required imports measured in physical units (M*) is given by:

$$M^* = \alpha + \beta Y + \psi I + v \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where in (1), Y represents physical quantity of production measured in index form, I is the physical quantity of investments and v represents macroeconomic disturbances.

On the other hand, the two-gap model asserts that maximum savings in the same units as investment (S*) is given by:

$$S^* = a + b\frac{Py}{Pi}Y + c\frac{Pm}{Pi}F + d\frac{Pe}{Pi}E + u, \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

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Where F is the foreign transfer which represents variables like foreign aid, foreign debt or imports in physical units and E represents exports in physical units. The P's represents the price for respective goods measured in physical units, foreign exchange price for capital inflows (Foreign Aid, Foreign Debt, etc) and interest for foreign loans/debt. The two gap model assumes in (2) that savings gets a constant marginal share of $P_Y Y$ while income from exports may have a differential effect and foreign transfer has a separate effect.

In the context of the Two-Gap model, three accounting identities involve actual imports (M), actual savings/investment/capital (S) and local consumption (C):

$$F = M - \frac{Pe}{Pm} E, \quad (3)$$

$$P_M M + P_Y Y = P_c C + P_I I + P_e E, \quad (4)$$

$$P_Y Y - P_C C = P_I S \quad (5)$$

However, Exports (M) and Foreign Transfers (Foreign Aid and Imports) are assumed Exogenous:

$$E = \bar{E} \quad (6)$$

$$F = \bar{F} \quad (7)$$

And actual savings/investments/capital is less than maximum or at most equal to maximum savings when augmented by foreign transfer

$$S \leq S^* \quad (8)$$

3.2. Model Specification

The objective of the study is to ascertain the key macroeconomic determinants of the growth rate of capital formation in Nigeria. The corresponding model for this objective is the conventional linear econometric model. We omit equations (9) and (10) which show the functional and mathematical forms of the model and then specify the long run equation (11)

$$GRCF_t = \alpha_0 + \alpha_1 \ln ODA_t + \alpha_2 \ln PGR_t + \alpha_3 \ln EXR_t + \alpha_4 \ln TRADEOP_t + \alpha_6 \ln EXTD_t + \alpha_7 \ln DPI_t + \alpha_8 INFR_t + U_t \quad (11)$$

The estimation of (11) will be carried out with the autoregressive distributed lag technique under the framework of UECM. The autoregressive distributed lag model for GRCF function in (11) is specified thus:

$$\Delta GRCF_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta GRCF_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln ODA_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta \ln PGR_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta \ln EXR_{t-i} + \sum_{i=0}^{n} \beta_{5i} \Delta \ln TRADEOP_{t-i} + \sum_{i=0}^{n} \beta_{6i} \Delta \ln EXTD_{t-i} + \sum_{i=0}^{n} \beta_{7i} \Delta \ln DPI_{t-i} + \sum_{i=0}^{n} \beta_{8i} \Delta INFR_{t-i} + \alpha_1 GRCF_{t-1} + \alpha_2 \ln ODA_{t-1} + \alpha_3 \ln PGR_{t-1} + \alpha_4 \ln EXR_{t-1} + \alpha_5 \ln TRADEOP_{t-1} + \alpha_6 \ln EXTD_{t-1} + \alpha_7 \ln DPI_{t-1} + \alpha_8 \ln INFR_{t-1} + U_t \quad (12)$$

Where:

GRCF = Growth Rate of Capital Formation (this measures the rate at which the gross fixed investment (capital formation) of the country increases year after year. In this research. It can be derived through the application of the log function on capital formation.); ODA = Overseas Development Assistance (this is the amount

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of capital inflow in the form of aid).; PGR = Population Growth Rate (this measures the rate at which the population grows); EXR= Real Exchange Rate (This measures the price of a currency on an international platform. In this study, it is the price at which 1 dollar is bought in Naira); TRADEOP = Trade Openness (this is the ratio of Exports plus Imports to GDP); EXTD = External Debt (this is debt owed to external sources); DPI = Domestic Private Investment; INFR = Inflation Rate (this measures the aggregate price level).

t-i = Subscripts of the exogenous variables representing lags; Δ= First Difference Operator; ln = Logarithm; U = Error Term

The advantage of adopting the ARDL model of estimation is that the effect of the independent macroeconomic variable(s) on the dependent macroeconomic variable is rarely instantaneous as it normally responds with a lapse of time. Such lapse of time is taken care of and captured by the ARDL method of estimation and also ARDL-UECM can be used for variables that are $I(0)$ or $I(1)$ and not for $I(2)$.

4. EMPIRICAL RESULTS

In a research involving the use of time series data, it is ideal to carry out stationarity tests on the series to be used. This is justified on the grounds that data not found stationary has the tendency of yielding spurious regression results and thus misleading policy projections. Below are the variables made stationary with their corresponding order of integration.

4.1. Unit Root Tests

Table-4.1.1. Phillips-Perron (PP) Unit Root Test

Variables	PP Test Stat at Level	Critical Value at 5%	PP Test Stat at First Difference	Critical Value at 5%	Order of Integration
TRADEOP	-1.211172	-3.442474	-5.213674	-1.943157	I(1)
EXTD	-1.211172	-3.442474	-5.213674	-1.943157	I(1)
DPI	-2.707327	-3.442474	-4.804533	-1.943157	I(1)
INFR	-3.069089	-3.442474	-5.636651	-3.442712	I(1)
GRFC	-2.421552	-2.882279	-4.971493	-1.943157	I(1)
EXR	-2.370813	-3.442474	-6.045330	-1.943157	I(1)

Source: Eviews Computation

Table 4.1.1 is a table displaying the variables used in the research with their various levels of stationarity using the Phillips-Perron (PP) statistic. The table reveals their stationarity levels at level and difference form with their corresponding levels of statistic values. On the average, the tables shows the variables are all integrated at first difference, hence, they are all integrated at I(1) process.

Table-4.1.2. Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Unit Root Test

Variables	KPSS LM Stat at Level	Critical Value at 5%	KPSS LM-Stat at First Difference	Critical Value at 5%	Order of Integration
TRADEOP	0.157461	0.146000	0.215361	0.463000	I(1)
EXTD	0.157461	0.146000	0.421999	0.463000	I(1)
DPI	0.148170	0.146000	0.076259	0.463000	I(1)
INFR	0.149411	0.146000	0.287760	0.463000	I(1)
GRFC	0.149693	0.146000	0.142538	0.463000	I(1)
EXR	0.177788	0.146000	0.129137	0.463000	I(1)

Source: Eviews Computation

Table 4.1.2 is a table displaying the variables used in the research with their various levels of stationarity using the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root test statistic. The table reveals their stationarity levels at level and difference form with their corresponding levels of statistic values. On the average, the tables shows the variables are all integrated at first difference, hence, they are all integrated at I(1) process.

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4.2. Cointegration Analysis

To evaluate if there exists a long run relationship among the variables in the model, the Bound Test (BT) approach under the instrumentality of the F-statistics was adopted. The table below is a summary table of the bounds test approach.

Table-4.2.1. ARDL Bounds Test

F-Statistic	Lower Bounds I(0) (5%)	Upper Bounds I(1) (5%)
4.442795	2.45	3.61

Source: Authors' Compilation from Eviews' Output

Table 4.2.1 above also reveals that the computed F-statistics of the bounds test yielded 4.442795 with corresponding lower bounds value of 2.45 and upper bounds value of 3.61. Since the computed F-statistics lies above the upper bounds at 5% level of significance, it indicates the rejection of null hypothesis of no long-run relationship. Hence, the variables in model two are also cointegrated.

4.3. ARDL Long-Run Elasticities

Since the bounds test approach of cointegration has confirmed that there exists a long run relationship among the variables, it is thus pertinent to estimate the long-run estimations using the ARDL approach. Below is the summary of the analysis.

Table-4.3.1. Dependent Variable: LOG (GRCF)

Variable	Coefficient	T-Statistics	Probability
LOG (ODA)	0.010778	2.665410	0.0088
EXR	-0.002553	-0.700468	0.4852
TRADEOP	-0.081782	-1.085300	0.2804
DPI	0.290408	3.046740	0.0030
INFR	0.007230	1.828919	0.0704
LOG(EXTD)	-0.317541	-3.890252	0.0002
C	10.374517	8.248261	0.0000

Source: E-views Computation

The regression summary output in table 4.3.1 is an estimation of the effect of macroeconomic variables on the growth rate of capital formation. It shows that ODA has a positive and significant contribution to the growth rate of capital formation in Nigeria. Thus, a N1 Billion increase in ODA leads to 0.010778% growth rate in Capital Formation in Nigeria. This conforms to economic expected sign given that an increase of ODA inflow serves as an augmenting variable to boost domestic capital. Furthermore, the result shows that Exchange Rate and Trade Openness (TRADEOP) and External Debt (EXTD) yielded negative coefficients. This entails that increase in these variables do not contribute positively to GRCF. Inflation (INFR) has a positive but insignificant relationship with log (GRCF), this entails that there exists a positive contribution from inflation on the average to growth of capital formation. Finally, the coefficient of Domestic Private Investment (DPI) yielded a positive and significant coefficient at the magnitude of 0.290408 with a corresponding t-statistics of 3.046740. This suggests that DPI contributes positively to the growth rate of capital formation. Specifically, N1 Billion increase in Domestic Private Investment leads to 0.29% growth rate in capital formation in Nigeria. This indeed conforms to economic a priori expectation because there exists a direct link between Domestic Private Investment and Growth Rate of Capital Formation (GRCF).

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Table-4.3.2. Short-Run Dynamics (Error Correction Model)

Variable	Coefficient	T-Statistics
D(GRCF(-1))	0.586756	8.063408
D(ODA)	-0.000000	-1.560363
D(EXR)	-0.000269	-0.906765
D(EXTD)	0.094659	-3.386827
D(EXTD(-1))	0.034764	4.426467
D(DPI)	-0.000000	-1.311001
D(INFR)	-0.008022	-3.141812
D(INFR(-1))	-0.005423	2.100276
ECM(-1)	-0.055558	-2.876899

Source: E-views Computation

From the bounds test cointegration analysis, it was concluded that there exists a long-run relationship among the variables. Here, the error correction analysis is carried out to estimate the short-run dynamics and the speed of adjustment mechanism. From table 4.3.2 above, it can be clearly seen that the error correction coefficient is negative (-0..055558) as required. This entails the speed of adjustment to attain long-run equilibrium is 5.5%. This is however slow but significant.

4.4. Serial Correlation Test (Breusch-Godfrey Serial Correlation LM Test)

Breusch-Godfrey serial correlation LM test was adopted in conducting the serial correlation test. An observation of the tables above shows that the corresponding probability values of the F-Statistics and Chi-Square are greater than 5%. Hence, we accept the null hypothesis that there is no serial correlation in the models which entails that the model is free from the problem of autocorrelation.

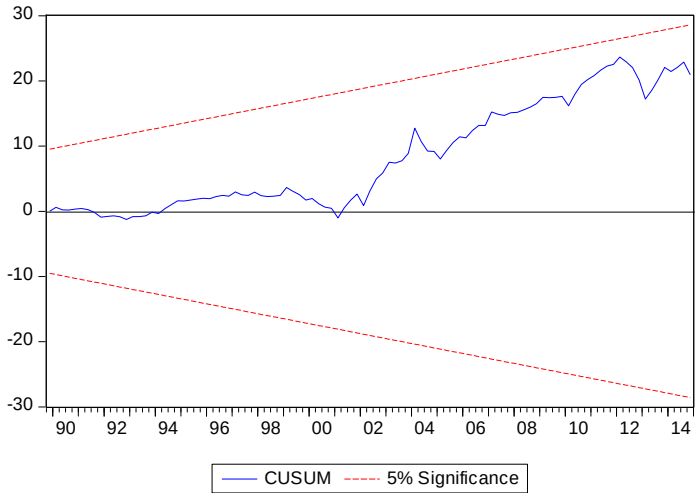
Table-4.4.1. Breusch-Godfrey serial correlation LM test

F-Statistics	Prob. F(2, 102)	Obs*R-Squared	Prob. Chi-Square(2)
1.097491	0.3377	2.884853	0.2364

Source: Authors' Compilation from Eviews' Output

4.5. Test of Model Stability (CUSUM and CUSUMsq)

The Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMsq) which is used to evaluate the stability of the regression coefficients shows that the coefficients are stable using the CUSUM test. This is informed by the empirical fact that the blue variable line is bounded by the red lines at 5% level of significance under the framework of the CUSUM test. We therefore accept the null hypothesis that the parameters are stable. Hence, the coefficients of the model do not change systematically. Even though the CUSUM of squares blue lines fell out of the red line boundary between 1994 and 2004, the stability of the model bounced back immediately after that period.



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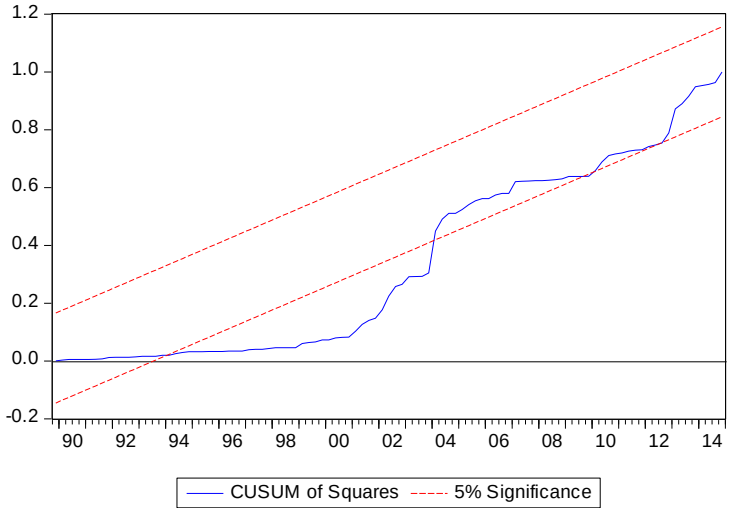

Figure-4.2. CUSUM and CUSUMsq Test

Source: Authors' Compilation from Eviews' Output

5. POLICY IMPLICATION OF THE FINDINGS AND CONCLUSION

This study has been able to carry out an empirical analysis of the impact of foreign aid on capital formation in Nigeria covering the period 1980-2014. The Autoregressive Distributed Lag Model (ARDL) technique was adopted in the study. The results show that growth rate of capital formation is positively and significantly affected by foreign aid for the years under analysis.

Based on the findings of the study, the study therefore recommends that efforts must be made towards the implementation and effective utilization of foreign aid. An appropriate policy measures that would monitor the maximum and effective utilization of foreign aid is required. Again, transparency should be the key word for all aid relationships. Donors and recipient economies must make efforts to better disclose the terms of credit agreements. In some cases even though the terms of agreement have underlying political influences, disclosure of such agreements to policy makers can help promote better monitoring of implementation. This increases the chances of preventing exploitation, maintaining quality control and ensuring that the best interests of the recipient economies are being sought. Furthermore, Nigeria must strive to take their economic destiny into their own hands and gradually cease to be highly dependent on foreign aid. Aid, especially from the West should not be highly depended upon as the main source of revenue for the development of our economy. From the literature, there are other determinants of capital growth that government should encourage and these include; savings, investment, productivity, fiscal discipline and the quality of institutions. These are keys to speeding up the growth of capital formation in a country like Nigeria.

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