DYNAMIC AID-GROWTH RELATIONSHIP IN NIGERIA: A TWO-GAP APPROACH

NİJERYA'DA DIŞ YARDIM VE BÜYÜME ARASINDAKİ DİNAMİK İLİŞKİ: GAP YAKLAŞIMI

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Abstract: ***This study aims to critically analyze the dynamic aid-growth interaction in Nigeria by revisiting the two-gap framework. The study utilized various unit root tests to verify the integration order of indicators utilized. The variables are integrated at a mixed level i.e. 1(0) and 1(1) thus, ARDL techniques were utilized to investigate the short and long-run interactions. Furthermore, a robustness check was carried out by utilizing FMOLS and DOLS. Findings of the FMOLS, and DOLS comply with the ARDL estimate. In the long run; (i) foreign aid, gross domestic saving and gross capital formation have positive and significant relationship with GDP growth while trade has an insignificant association with GDP growth; (ii) In the short run, all the independent variables have positive and significant link with GDP growth with the exemption of trade; (iii) the FMOLS and DOLS affirms the findings of the ARDL long-run estimate; and (iv) since trade has an insignificant relationship with GDP growth, this study refute the two-gap theory in the case of Nigeria. Recommendations are put forward based on the findings.***

Keywords: ***aid, growth, two-gap framework, ARDL, capital formation.***

Öz: ***Bu çalışma, Nijerya'daki yardımlar ve ekonomik büyüme arasındaki etkileşimi ikili açık yaklaşımı ile analiz etmeyi amaçlamaktadır. Çalışmada birim kök testleri bütünleşme sıralamsının belirlenmesi amacı ile uygulanmıştır. Yapılan testler, bütünleşmenin I(0) ve I(1) gibi farklı sıralamlarda gerçekleştiğini ortaya koymuştur. Bu nedenle kısa ve uzun dönem etkileşimi ortaya koymak için ARDL modelinden yararlanılmıştır. Doğruluğundan emin olmak için FMOLS ve DOLS analizleri uygulanmış ve elde edilen sonuçların ARDL bulgularını desteklediği görülmüştür. Uzun dönemde; (i) dış yardımlar, tasarruflar ve sermaye birikiminin GSYİH büyüme oranı ile pozitif ve anlamlı bir ilişkiye sahip olduğu ancak ticaretin analmlı bir ilişkiye sahip olmadığı; (ii) kısa dönemde ise ticaret hariç, tüm bağımsız değişkenler ile GSYİH arasında anlamlı ve pozitif bir ilişki olduğu; (iii) FMOLS ve DOLS sonuçları uzun dönem ARDL tahminlerini doğruladığı ve (iv) ticaret ve GSYİH arasında anlamlı bir***

ilişki bulunmaması nedeni ile çalışma ikili açık modelini Nijerya için doğrulanmadığı sonuçları elde edilmiştir. Bulgular doğrultusunda önerilere yer verilmiştir.

Anahtar Kelimeler: ***yardım, büyüme, ikili açık modeli, ARDL, sermaye birikimi.***

INTRODUCTION

Over the years, foreign aid is used mostly by developing countries for the improvement of their economy and poverty alleviation such countries include Japan, Germany, and South Korea after the Second World War. Though most developing countries failed to utilized foreign assistance effectively for economic growth. This is a result of corruption, political turmoil, thus, raising the question of whether foreign assistance causes growth. According to the Organization for Economic Cooperation and Development (OECD), the main purpose of Official Development Assistance (ODA) for developing nations is economic development and welfare. There are several ways through which aid can be disbursed, such as; bilateral means, donor to recipient, or via multilateral development agencies including World Bank (WB), International Monetary Fund (IMF), and the United Nations (UN). Foreign aid is classified into two namely grant and loan. The major focus of this paper is the grant.

Figure 1: Economic Growth

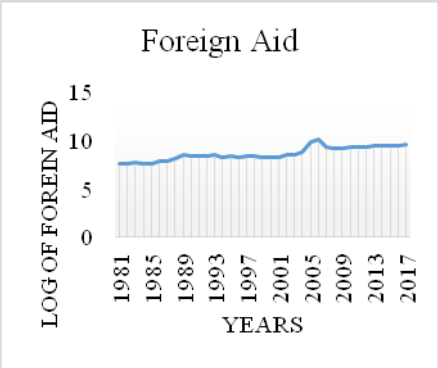

Figure 2: Foreign Aid

Nigeria is categorized as the biggest economy in Africa and ranked 27th globally with a gross domestic product standing at US$ 375biliion in 2017 (World Bank, 2020). Though GDP per Capita stood at US$ 1.986 in 2017, it falls from an all-time high of US$ 3.222 in 2014. The trend of GDP per capita and Net Official Development Assistance received between 1960 to 2017 is illustrated by fig.1 and 2 respectively. From Figs. 1 & 2, it is evident that between 1981 and 1982 the per capita GDP of Nigeria increased with a sharp decline in 1983 which is a result of the financial crisis it faced between 1983 and 1985. This decrease continues until 1991 before constant growth between 1991 and 2014 (World Bank, 2020). In regards to ODA, there is a steady increase in ODA from 1960 with a drastic jump in 2006 which is major as a result of debt relief for *Nigeria.* Over the years, Nigeria has continuously received foreign

assistance from several donors (World Bank, 2020). This ineffectiveness of aid towards GDP growth is a result of several factors including inconsistency policies, political crises, instability in macroeconomic variables, and poor framework by government. However, this study only focuses on the macroeconomic factors influencing economic growth in Nigeria. As a result of inconclusiveness in the Aid-Growth interaction, this paper empirically investigates mainly the Aid-Growth interaction in Nigeria by employing ARDL techniques, and the FMOLS, and DOLS as a robustness check to verify this interaction. Therefore, this paper is divided into five segments. Segment 2 illustrates reviews on literature; segment 3 portrays data and methodology used; segment 4 illustrates the estimation of data and interpretation; segment 5 presents conclusion and study recommendations.

1. LITERATURE REVIEW

This section of the paper is divided into two distinct parts namely; the theoretical background which entails the theoretical foundation of the study and the study synopsis which discuss in detail previous studies on the topic.

1.1. Theoretical Review

This paper revisited the two-gap which is an improvement over the Harrod-Domar growth model which states that the gap between investment and savings can be filled by foreign assistance. According to this theory, investment and saving gap (I-S), and the import and export gap (M-X) must be filled by developing economies. The notion behind this theory is that when this gap is filled that is the 1-S, and M-X, developing economies will experience economic growth (Chenery & Strout, 1966). In accountancy procedures, both identities are utilized for investment and savings (I–S), and import and export gap (M–X). As it is widely recognized, if a nation's saving is less than investment, the balance of payment deficit will arise. Also, the same thing will occur if the import is more than export in an economy. As Chenery (1967) stated, both investment and saving gap, and import and export gap can be breached by foreign assistance to attain necessary GDP growth in a country. Therefore, foreign assistance is vital to breach this gap. The equation below illustrates how foreign aid fills both the two gaps.

$$E = Y = I - S = M - X = F \quad (1)$$

In equation 1 equation domestic expenditure is illustrated by E, the output is denoted by Y, investments is represented by I, savings is indicated by S, imports is illustrated by M, X stands for export, and F for net capital inflow; foreign assistance F is needed to breach this gap.

1.2. Empirical Review

Many studies have been done on the association between foreign aid and GDP growth. However, the result various due to the different methodology utilized, the period of study, and country or countries of study giving birth to dissimilar result on Aid-

Growth interaction. This section is divided into three different segments based on the three perspectives found between foreign aid and GDP growth by several studies. The first perspective observed positive Aid-Growth interaction (Sohail, 2012; Kargbo, 2012; Paul *et al.*, 2016; Mohapatra *et al*., 2016; Minoiu & Reddy, 2009; Hotouom, 2015; Abdu, 2015; Ojiambo, 2013; Trinh, 2014; and Oyinbor *et al*., 2018). The second perspective observed negative Aid-Growth association (Dimanche, 2010; Kabete, 2008; Aghoutane & Karim, (2017); Ali *et al*., 2013; Sheikh, 2014; Girma 2015; Mbah & Amassoma, 2014). The last perspective observed insignificant Aid-Growth interaction (Tekin, 2012; Hossain & Mitra, 2013; Al Foul, 2013; Ramadhan *et al*., 2016, Fashina *et al*., 2018). The Table 1 below illustrates the study synopsis.

Table 1: Summary of the Study Synopsis

Investigator(s)	Nation (s) & Study Period	Econometric Model	Technique(s) Utilized	Findings
Aid-growth Positive Relationship				
Minoiu and Reddy, (2009)	Emerging economies 1973 to 2007	$Yt = \beta_0 + \beta_1 DEV.AIDT + \varepsilon_t$	OLS. & 2SLS.	AID→Y AID→Y
Sohail, (2012)	Many Emerging economies 1973 to 2007	$Yt = \beta_0 + \beta_1 AIDt + \beta_2 EDU.SECt + \varepsilon t$	Pooled OLS, & GMM.	AID→Y
Kargbo, (2012)	Sierra Leone, 1970 to 2007	$Yt = \beta_0 + \beta_1 AIDt + \beta_2 PI + \beta_3 POLt + \beta_4 PRORt + \varepsilon t$	ARDL	AID→Y
Mohamed *et al*., (2016)	India 1970 to 2014	$Y = \beta_0 + \beta_1 AID + \beta_2 PI + \beta_3 TOP + \beta_4 GCF + \beta_5 INF.R + \beta_6 GOEX + \varepsilon t$	ARDL, VECM, Granger causality & variance Decom.	AID→Y AID → EDU AID→ GOE AID→ TOP AID→ EDU
Paul *et al*., (2016)	Ghana 1972 to 2012	$Y = \beta_0 + \beta_1 FAID + \beta_2 LB + \beta_3 CAPt + \beta_4 GEP + \varepsilon t$	ARDL, VECM, & Variance Decomp.	LLP→Y FAID→Y
Kargbo, (2012)	Sierra Leone 1970 to 2007	$Y = \beta_0 + \beta_1 AIDt + \beta_2 PI + \beta_3 POLt + \beta_4 PRORt + \varepsilon t$	ARDL	FAID → Y

Hotouom (2015)	Tanzania. 1987 to 2013	$Y = \beta_0 + \beta_1(INVGDPt) + \beta_2 POPgr + \beta_3 FAIDt + \beta_4 POLİCYt + \beta_5(FAID*POL) + \varepsilon t$	VAR	FAID→Y INV→Y
Abdu, (2015)	India 1981 to 2011	$Y = \beta_0 + \beta_1 AIDt + \beta_2.GDS + \varepsilon t$	OLS & VAR	AID→Y GDS→Y
Ojiambo, (2013)	Kenya 1966 to 2011	$Y = \beta_0 + \beta_1 ODAt + \beta_2 PİV + \beta_3 MAC.POL + \beta_4 NS + \varepsilon t$	OLS	ODA→PINV ODA→Y INV→Y NS→Y
Trinh, (2014)	Vietnam 1993 to 2012	$Y = \beta_0 + \beta_1 ODAt + \beta_2 PINVt + \varepsilon t$	ARDL	ODA→Y INV→Y
Negative Aid-Growth Relationship				
Dimanche, 2010)	79 emerging economies	$Y = \beta_0 + \beta_1 ODAt + \beta_2 FDI + \beta_3 EDU + \varepsilon t$	PLSEM	ODA →Y ODA→FDI ODA→EDU
Kabete, (2008)	Tanzania 1990-2004	$Y = \beta_0 + \beta_1 AIDt + \beta_2 TDS + \beta_3 EXPt + \beta_4 NSt + \varepsilon t$	OLS	AID →Y EXP→Y NS →Y
Aghoutane & Karim (2017)	Morocco 1981-2014	$GDP = \beta_0 + \beta_1 ODAt + \beta_2 INV + \beta_3 EXPt + \varepsilon t$	Johansen Cointegration, & VECM.	FAID →Y
Ali *et al*., (2018)	Ethiopia 1991-2015	$Y = \beta_0 + \beta_1 ODAt + e$ $FAID = \beta_0 + \beta_1 FDIt + e$ $FAID = \beta_0 + \beta_1 UNEMPt + e$ $FAID = \beta_0 + \beta_1 COR.Rt + e$ $FAID = \beta_0 + \beta_1 DEM.Rt + e$	OLS	ODA→Y FDI→ ODA UEM→ODA COR→ ODA DEM→ODA
Sheikh, (2014)	Sub-Sahara.Africa economies 2000 to 2012	$Yt = \beta_0 + \beta_1 AIDt + \beta_2 FDI + \beta_3 EDU.SECt + \varepsilon t$	PLSEM	AID→Y EDU→Y FDI →Y
Girma, (2015).	Ethiopia 1974 to 2011	$Y = \beta_0 + \beta_1 FAID + \beta_2 GDS + \beta_3 POP + \beta_4 INVt + \beta_5 INF.R + \varepsilon t$	ARDL, & ECM,	FAID →Y POL→Y GDS→Y
Mbah & Amassoma (2014)	Nigeria. 1981 to 2012	$Y = \beta_0 + \beta_1 AID + \beta_2 INV + \beta_3 EXPt + \beta_4 IMPt + \varepsilon t$	OLS, Johansen Coint.	FAID →Y INV→Y
Aid-Growth Insignificant Relationship				
Hossain & Mitra, 2013	33 Africa emerging economies	$Y = \beta_0 + \beta_1 FAID + \beta_2 GDS + \beta_3 POP + \beta_4 INVt + \beta_5 INF.R + \varepsilon t$	Bounds Coint., Granger Causality	AID→ Y Y → TOP GOE → Y GCF → Y

			Test	TO → Y
Ramadhan *et al*., (2016)	Tanzania	$Y = \beta_0 + \beta_1 AID + \varepsilon t$	ARDL, Granger causality	AID→ Y
Tekin, (2012)	Less Developed economies	$Y = \beta_0 + \beta_{1F} AID + \varepsilon t$	Panel Granger causality	FAID→ Y
Al Foul, (2013)	Jordan, & Egypt	$Y = \beta_0 + \beta_1 AID + \varepsilon t$	Panel Coint. & Granger Causality	AID→ Y
Fashina *et al*., (2018)	Nigeria	$Y = \beta_0 + \beta_1 AID + \beta_2 GCF + \varepsilon t$	Engle-Granger, VECM	FAID→ Y GCF→ Y

Source: Investigators Compilation.

Though numerous studies have been carried out globally and in Nigeria about the Aid-Growth relationship showing different results. This study employs the FMOLS and DOLS has a robustness test to affirm the ARDL estimate utilizing yearly data covering 36 years (between 1981 and 2017) which has not been done before in the case of Nigeria.

2. DESCRIPTION OF DATA AND METHODOLOGY

This paper makes use of yearly data covering 37 years (1981 to 2017). The time-series data (GDP per Capita, Gross capital formation, trade, and Foreign aid and Gross domestic savings) utilized were logged. This is done to reduce skewness in the data. The GDP per Capita, gross domestic savings, and gross capital formation were obtained from the Central Bank of Nigeria database whereas the foreign aid, and trade data were sourced from the World bank database. Economic growth is a measure used in breaking down a nation's GDP per person. Globally, it is used when measuring a nation's prosperity.

2.1. Descriptive Statistics

For data to mirror a normal distribution, the skewness must be close to 0. Thus, looking at table 2 above, all the variables utilized mirror a normal distribution. Furthermore, the kurtosis must be less or equal to 3 for data to shows a normal distribution. Hence data used shows a normal distribution since its values are less than the 3 benchmarks.

Table 2: Data and Descriptive Statistics					
	Variables				
	Economic Growth	Foreign Aid	Gross Domestic Saving	Gross Capital Formation	Trade
	Y	FAID	GDS	GCF	TR
Mean	2.7507	8.2817	10.64832	11.04272	1.610088
Median	2.7426	8.1269	10.55306	10.95055	1.694432
Max	3.5087	10.058	11.16586	11.73349	2.639872
Min	1.9682	7.3163	10.10011	10.41451	0.732546
Std-Dev	0.4573	0.7067	0.308765	0.407222	0.469067
Skewness.	-0.1473	0.7503	0.115406	0.337195	-0.111714
Kurtosis.	2.0713	2.4746	1.760713	1.659207	1.242167
Jarque-Bera	6.1099	2.2940	3.472646	2.449874	0.537362
Pro.	0.0471	0.3175	0.293776	0.176167	0.537362
Ob.	37	37	37	37	37

Source: Investigators Compilation

2.2. Research Procedures

This study used the ARDL techniques to verify the long and short-run interaction between the dependent and the independent variables to verify interaction in the long run and short run. This study improved on the work of Kolawole, (2013) by incorporating gross domestic savings to his model and utilizing different techniques.

Thus, the economic function of this study is written as;

$$Y = f(FAID, GDS, GCF, TR) \quad (2)$$

The economic model of the study is described beneath;

$$Y = \vartheta_0 + \vartheta_1 FAID + \vartheta_2 GDS + \vartheta_3 GCF + \vartheta_4 TR \quad (3)$$

From the above economic model, the econometric model is formulated as

$$Y = \vartheta_0 + \vartheta_1 FAID + \vartheta_2 GDS + \vartheta_3 GCF + \vartheta_4 TR + \varepsilon \quad (4)$$

In equation 4, the constant term is represented by ϑ_0, whereas, long-term elasticity is indicated by $\vartheta_1, \vartheta_2, \vartheta_3, and\ \vartheta_4$ concerning the independent variables, and the error term of the model is denoted by ε. Furthermore, Y stands for GDP growth, *FAID* indicates foreign aid, GDS stands for gross domestic savings, GCF illustrates gross capital formation, and TR mirrors trade equation 4 will be utilized to verify the interconnection between GDP growth, and foreign aid, gross domestic savings, gross capital formation, and trade. It generally observed that non-stationary data gives an unreliable estimate, bias, and spurious regression result (Granger and Newbold, 1974). Hence, to eradicate

these problems, variables utilized were subjected to different unit root testa including; Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1981), Phillips–Perron (PP) (Perron & Ng, 1996), KPSS unit root test (Kwiatkowski *et al.* 1992) and more recent Zivot-Andrew (ZA) test proposed by Zivot & Andrews (2002). The advantage Zivot-Andrew unit root test has over the others is that it check for one structural break in time series. When the data are found to be stationary the next step is to check if they are cointegrated in the long-run. It is generally accepted that when data are stationary at a mixed level i.e. 1(O), and 1(I) and not 1(2) the ARDL cointegration test proposed by Pesaran *et al.* (2001) is more suitable to explore the cointegration in the long run. This test has an advantage because it generates a result that is reliable and not bias (Narayan & Smyth, 2004). ARDL test follows Narayan and Narayan (2005) F distribution utilizing critical value proposed by Pesaran and Timmermann (2005). The ARDL long-run interaction is written as follows;

$$\Delta Y_t = \vartheta_0 + \sum_{i=1}^{l} \vartheta_1 \Delta Y_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta FAID_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta GDS_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta GCF_{t-i} + \sum_{i=1}^{l} \vartheta_3 \Delta TR_{t-i} + \varepsilon_{t-i} \quad (5)$$

After the interaction in the long-run is established, ECM which is the error correction model proposed by Engle and Granger (1987) will be used to explore the interaction between Y, FAID, GDS, GCF, and TR by utilizing the coefficients in the short-run and ECT. This will lead to the incorporation of ECM into the ARDL. Thus, the new equation is depicted below;

$$\Delta Y_t = \vartheta_0 + \sum_{i=1}^{l} \vartheta_1 \Delta Y_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta FAID_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta GDS_{t-i} + \sum_{i=1}^{l} \vartheta_2 \ \Delta GCF_{t-i} + \sum_{i=1}^{l} \vartheta_3 \Delta TR_{t-i} + \varpi ECT_{t-1} \ \varepsilon_{t-i} \quad (6)$$

In equation 6 above, the first difference operator is illustrated by **Δ**, ϑ_i(i = 1…5) shows indicators coefficients in the short run, the maximum lag of the ARDL framework is denoted by ί, an error correction term is denoted by ϖECT_{t-1}, **ε** stands for error term and time is denoted by *t* Furthermore, as a robust test, The FMOLS and DOLS are utilized. The FMOLS and DOLS framework are also OLS estimators which are partial in their estimates as a result of problems such as; serial correlation multicollinearity, and endogeneity (Stock & Watson 1993; and Masih & Masih 1996).

3. INTERPRETATION OF DATA

Analyzing order of integration order is the first analysis carried out by utilizing ADF, PP, DF-GLS, KPSS, and Zivot-Andrews unit root tests to explore the interaction between GDP growth and foreign aid, Gross capital formation, and trade. The unit root tests were carried out at level and trend respectively.

Table 3: Unit root test

	At Level (Trend & Intercept)				
	Y	FAID	TR	GCF	GDS
ADF	-	-3.4954***	-	-	-
PP	-	-	-	-	-
DF-GLS	-	-3.5996**	-2.3053	-2.9038***	-
KPSS	0.1613**	-	0.1374***	-	-
ZA	-	-	-	-	-
	1st Difference (Trend & Intercept)				
ADF	-7.0659*	-	-7.3800*	-6.2939*	-6.0812*
PP	-6.7892*	-4.8387*	-7.5420*	-6.3650*	-4.6754*
DF-GLS	-3.8970*	-	-5.1479*	-	-6.2673*
KPSS	-	0.1670**	-	0.1290***	0.1517**
ZA	-9.1519* [2006]	-5.9011* [2009]	-9.4430* [1988]	-7.4573* [1985]	-7.819* [2007]

Notes: *,** and **stands for statistical significance at the 1% 5% , and 10%levels, correspondingly. [] stands for structural break year

Source: Investigators Compilation

Table 2 depicts the integration order of the indicators utilized. Since data are stationary at a mixed level i.e. I(0), and I(1) and not I(2), the Bounds test for cointegration based on the ARDL approach is employed.

3.1. ARDL Bound Test for Co-integration

Table 4: ARDL Bound Test for Co-integration		
Case 3: Unrestricted intercept. & no trend.		
Estimation of Model	Y = f(FAID, GDS, GCF, TR)	
Lag structure	3, 3, 1, 3, 3	
F-statistics	6.97*	
Level of Significance	Critical bounds levels	
	Lower Bound	Upper Bound
10%	2.45	3.52
5%	2.86	4.01
1%	3.74	5.06

The above table mirrors the ARDL bounds test results between Y, and FAID, GDS, GCF, and TR. The null hypothesis of no cointegration, in the long run, is rejected since the F-Statistic is more than the lower bound, and upper bound critical values. Therefore, in Nigeria, there is evidence of a long-run interaction between Y, and FAID, GDS, GCF, and TR. When cointegration between the dependent and independent indicators is confirmed, the next thing is to examine the long-run and short-run interaction between Y, and FAID, GDS, GCF, and TR using the ARDL technique. The next thing is to ascertain the long run and short-run relationship between the dependent and the independent variables.

3.2. ARDL Long and Short-run Estimates

Table 5: ARDL Long and Short-run Estimates		
Long-Run Estimation		
Variables	Coefficient	T-Prob.
Y	0.204	(2.623)**
FAID	0.004	(2.113)***
GDS	0.299	(14.787)*
GCF	0.674	(16.424)*
TR	0.001	(0.5162)
C	-4.085	(-5.0375)*
Short-Run Estimation		
ECT.(1)	-0.53	(-6.6015)*
D(FAID)	0.026	(3.200)*
D(GDS)	0.299	(17.203)*
D(GCF)	0.674	(19.759)*
R^2	0.99	
Adj. R^2	0.99	
S.E. of regression	0.01014	
Log-likelihood	120.6636	
Prob (F-stat)	0.0000	
Note: the significant levels of 1%, 5%, and 10% is represented by ∗, ∗∗ and ∗∗∗ correspondingly		

3.3. Robustness Check

This study employs the FMOLS, and DOLS to verify the robustness of the ARLD long-run estimates. As depicted in the table 5 the results of both FMOLS and DOLS concurs with the ARDL long-run estimates. The coefficients, p-value, and t-statistics are identical with the ARDL long-run outcome.

Table 6: Robust Check

	DOLS model		FMOLS model	
Variables	Coeff	T-Prob.	Coeff	T-Prob.
Y	0.204	(2.9651)*	0.2188	(4.1020)*
FAID	0.0309	(2.3762)**	0.0298	(2.9967)*
GDS	0.2372	(3.7952)*	0.3026	(20.777)*
GCF	0.6743	(18.481)*	0.6811	(21.888)*
TR	0.0005	(0.3780)	0.0003	0.3178
C	-4.0857		-3.9732	
R^2	0.99		0.99	
Adj R^2	0.99		0.99	
S.E. of regresion	0.0096		0.0098	
Note: 1% , 5%, & 10% significant are been denoted as *,**,** respectively				

The outcome of the FMOL and the DOL is in line with the estimate of ARDL long-run estimate as illustrated by table 5 and six respectively. At 10% level of significance, when other indicators are held constant, 1% increase in foreign aid will lead to 0.004% increase in GDP growth. This result is in line with findings of Minoiu & Reddy, (2009); Ismail & Adegbem, (2015); Geetilaxmi *et al*., (2016); Paul *et al*., (2016) and Oyinbor *et al*., (2018). Gross domestic savings positively influence GDP growth at a significance level of 1%. This simply shows that increase in GDP growth by 0,299% is a result of GDS when other indicators are held constant. This outcome aligns with the outcome of Abdu (2015), Kabete (2008), Ojiambo (2013), and Girma (2015). GDP growth will increase by 0.674% when other variables are held constant except for gross capital formation. Therefore 1% increase in gross capital formation will lead to economic growth. this perspective aligns with Geetilaxmi et al (2016) Hotouom (2015), Stella & Ditimi (2014) Sharif & Mitra, (2013) Fashina *et al.*, (2018), and Oyinbor *et al*., (2018). Also, trade does not have a significant influence on GDP growth. this finding does not correspond with the outcome of Geetilaxmi *et al*., (2016) and Sharif & Mitra (2013). Therefore, this study finding refutes the two-gap theory in Nigeria. The ECM is expected to be statistically significant and negative. The coefficient of the ECM is -0.53 and significant which is as expected. Therefore, 53% of discrepancies in the previous year can be changed by the present year. Hence, in the long-run, there is convergence to equilibrium.

3.4. ARDL Diagnostic Test

Table 7: ARDL Diagnostic Test

Tests	Value (Prob)
J–B normality test (E)	0.534 (0.765)
Breusch–Godfrey LM test (F)	0.339 (0.7176)
Heteroscedasticity test (G)	0.9873 (0.5121)
Ramsey RESET (H)	0.7283 (0.406)

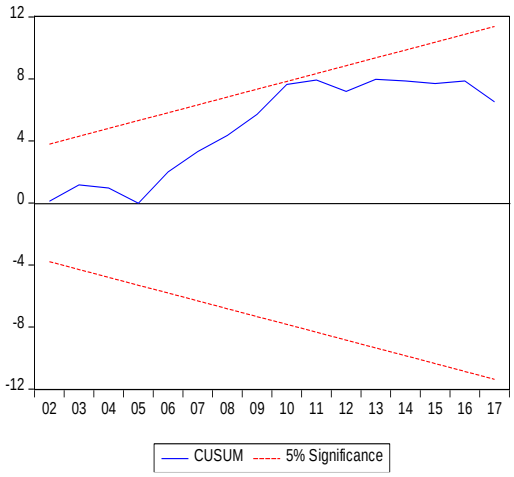

Figure 3: CUSUM

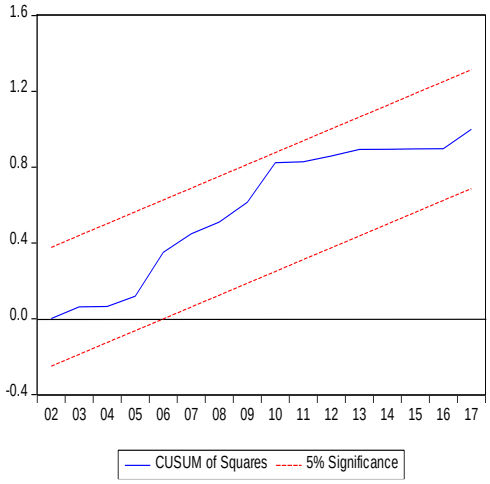

Figure 4: CUSUM of Squares

Based on the various diagnostics test; serial correlation test, normality test, and heteroscedasticity test, and Ramsey test carried out, the ARDL model is good. At a significance level of 5%, both the CUSUM and the CUSUM square show that the ARDL model is good. Therefore, policies can be recommended based on the findings of this study.

CONCLUSION, AND POLICY RECOMMENDATION

Due to the inconclusiveness in the Aid-Growth relationship, this study is exploring the Aid-Growth interaction in Nigeria based on the two-gap framework. Yearly data spanning between 1981 and 2017 was utilized to investigate this scenario. This research is premised on the two-gap theory which states that saving and investment gap, and import and export gap can be breached by foreign assistance. The investigators utilized the ARDL techniques to examine the long and short-run relationship between the dependent and independent indicators. Furthermore, the FMOLS and DOLS was used to verify the findings of the ARDL long-run estimate. Findings from this study reveal; (i) In the long run, foreign aid, gross domestic saving and gross capital formation have a positive and significant relationship with GDP growth while trade has an insignificant association with GDP growth; (ii) In the short run, all the independent variables have a

positive and significant link with GDP growth with the exemption of trade; (iii) the FMOLS and DOLS affirms the findings of the ARDL long-run estimate; and (iv) since trade has an insignificant relationship with GDP growth, this study refute the two-gap theory in the case of Nigeria. Recommendations are put forward based on the findings from this study. They are; (i) it is generally accepted that increase in savings will lead to an increase in investment thereby leading to GDP growth. Hence, to promote savings, interest must be raised for investment promotion; (ii) good relation should be maintained by Nigeria with various foreign aid donors to reduce aid fluctuation since it impacts GDP growth positively; (iii) proper accountability, honesty, and unbiased, should be maintained so that this funds will be channeled to infrastructure, investment and productive activities to improve GDP growth in the country. Though this study makes use of a robust test, further studies should be carried out with the inclusion of more variables to verify this interaction.

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