

# *Foreign Development Assistance and Macroeconomic Policy Stance: The Underlying Levers of Growth in Emerging SSA Countries*

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The economic growth of emerging Sub-Saharan African countries is investigated in this study, with the aim of determining the relative impacts of foreign development assistance (FDA) and macroeconomic policies. The GMM and VECM models are respectively employed in estimating the long-run and short-run impacts. The short-run results indicate that FDA strongly complemented fiscal policy only, in facilitating economic growth within the period 1980–2019. The long-run results, on the other hand, show that FDA complemented both monetary and fiscal policies in driving growth. The results further reveal that exchange rate played a non-complementary role, and economic growth did not respond significantly to its own lag. Generally, the estimated impacts conform to theoretical expectations of the models. The results are also considered reliable for policy making. The possible policy measures emanating from the estimation results include sustenance of FDA inflow, reinforcement of monetary policy framework, maintenance of fiscal policy framework, enhancing efficiency of the exchange rate system, and allowing market forces to drive the economy.

*Key Words:* development assistance, macroeconomic policies, economic growth, developing countries

*JEL Classification:* E51, F21, F43, O55

 <https://doi.org/10.26493/1854-6935.20.353-374>

Received: 1 January 2022 · Accepted: 19 February 2022  
Published online: 31 December 2022 © Author

## **Introduction**

Economic growth in less developed economies of the world has remained slow for several decades, in spite of the contributions of various factors

such as foreign development aid and macroeconomic policies, among others. Over time, development assistance has been able to substantially increase the amount of resources available to facilitate economic growth in these economies, while the countries have also applied macroeconomic policies to facilitate growth (Chowdhury and McKinley 2007). In particular, monetary and fiscal policies have consistently been applied to drive economic growth. However, it is still unclear how foreign development assistance works with macroeconomic policies to facilitate economic growth in most developing countries. Since the early 1990s, the inflows of development assistance have been greatly encouraged by the political and economic reforms in most of the developing countries, which have created a conducive environment for advanced countries to supply more foreign aid (Tuman and Ayoub 2004). Today, the countries of East Europe, Africa, and Asia, where reforms have taken place, are the major recipients of foreign development assistance. The reforms have also enabled the countries to fine-tune macroeconomic policy framework for efficiency and better performance.

So far, previous research studies on economic growth in developing countries, such as Mahembe and Odhiambo (2019), Aghoutane and Karim (2017), etc., have not given adequate attention to how foreign development assistance (FDA) works with macroeconomic policies to facilitate growth in developing countries. Thus, more research work needs to be done, in order to shed more light on this issue. This study therefore attempts to address the issue, with the aim of producing new evidence that would be useful for policy making in Sub-Saharan Africa (SSA), as well as other developing regions of the world.

The study employs the general method of moments model (GMM) to evaluate the long-run impacts of FDA and macroeconomic policies on economic growth, while the vector error correction model (VECM) is used to determine the short-run impacts and adjustments. In terms of scope, the study covers the emerging economies in SSA, and the period 1980–2019. The emerging economies are the top five, in terms of their contributions to total GDP of the region (International Monetary Fund 2019). The economies and their respective contributions are Nigeria (18.1%), South Africa (15.1%), Kenya (4.0%), Angola (3.7%), and Ethiopia (3.7%). These countries are assumed to be large recipients of foreign development assistance. They are listed as eligible recipients of official development aid (ODA) by the Organization for Economic Co-Operation and Development (OECD). Furthermore, it is assumed that the coun-

tries have been consistent in using macroeconomic policies to facilitate growth. Finally, it is assumed that the countries have experienced highly unstable economic growth over time.

The study is structured into six sections comprising introduction, literature review, descriptive analysis, model specification, estimation/analysis of results, and conclusion.

## **Literature Review**

### **THEORETICAL REVIEW**

Development economists of the 1970s, represented by Lewis (1979), argued that development assistance is needed to improve infrastructure and facilitate economic growth in developing countries. Contemporary economists have also expressed the same view that development aid can play a significant positive role in economic growth when it is properly channelled into productive ventures. This view is championed by Sachs (2005), who contended that large scale aid can work to improve the welfare of countries when it is targeted and effectively utilized. He described aid as a big push required to overcome the specific economic problems confronting developing countries. Barder (2011) described human development as a major channel that foreign aid can pass through to impact positively on economic growth, while Easterly (2009) and Deaton (2013) argued that development aid not properly channelled may fail to impact positively on economic growth.

The theoretical framework for analysing the effect of macroeconomic variables on economic growth has over time evolved from the neoclassical growth theory propounded by Solow (1956) and Swan (1956). The theory focused on how supply factors (capital and labour) determine equilibrium economic growth, and ignored the demand factors that are also important in determining growth. As such, changes in demand-related factors like financial inflows, macroeconomic policies, and others have no effect on long-run growth.

However, the endogenous growth model, pioneered by Romer (1986), introduced financial conditions into the growth theory, through which macroeconomic policies can also influence growth. Otani and Villanueva (1989) further expanded the endogenous growth model by including external borrowing, through which macroeconomic policies can affect growth. In so doing, long-run economic growth was posited to be highly dependent on changes in macroeconomic policies, particularly monetary and fiscal policies. It was further posited that monetary policy impacts

positively on growth if it does not generate strong inflation. Similarly, fiscal policy is a potentially strong driver of economic growth if it does not conflict with monetary policy and create inflation. Min-Chang (2018) also posited a theoretical argument which states that fiscal policy has a strong positive impact on long-run growth, if it does not create a high debt burden with negative effects.

#### EMPIRICAL REVIEW

The role of foreign development assistance has been a topical issue in the growth process of developing countries, which several researchers have investigated. Some of the studies have found the role to be favourable on economic growth, while others found it unfavourable. Mallik (2008) investigated the role in the six poor African countries of Mali, Malawi, Niger, Sierra Leone, Togo, and the Central African Republic. The study found a negative long-run effect over a period of thirty-five years, which is contrary to the finding of Refaei and Sameti (2015) that indicated a positive relationship in Iran during the period 1980–2012. The positive effect of foreign development assistance on economic growth is corroborated in a study of eighty-two developing countries, covering the period 1981–2013, where Mahembe and Odhiambo (2019) discovered that foreign aid and growth converged in the long-run. In Ghana, Appiah-Konadu et al. (2016) tested the hypothesis which states that foreign aid promotes growth in developing countries, using the ARDL bounds test, and found long-run convergence between foreign aid and economic growth. The speed of adjustment towards convergence was found to be moderate. In the case of Morocco, Aghoutane and Karim (2017) used a VECM model to investigate the impact and discovered that foreign aid promoted growth in the short-run, but the impact became negative in the long-run. The finding on short-run impact tends to support Martinez (2015), who found a modest positive impact of foreign aid on growth in one hundred and four developing countries. On the other hand, the finding on long-run impact supports M'Amanja and Morrissey (2005), who revealed a significant negative impact in Kenya over the period 1964–2002.

The role of macroeconomic policy in the economic growth of developing countries has also been investigated in several studies. Monetary and fiscal policies are often deployed to maintain economic growth and stability. Over time, these policies have tended to exert considerable impact on economic growth in these countries, which has, however, remained highly contentious. In a study of Nigeria, covering the period 1980–

2011, Baghebo and Stephen (2014) found that monetary policy played an important role in encouraging investment and economic growth, which was further confirmed in a study by Ufoeze (2018) on the same country, where the effect of monetary policy on economic growth was also found to be significantly positive. In a study to ascertain the relationship between monetary policy and growth in Uganda, Twinoburyo and Odhiambo (2017) discovered that expansionary monetary policy had significant positive impact on growth within the period 1983–2014. This finding was replicated in Malaysia, where Akalpler and Duhok (2018) found that monetary policy affected growth positively, though the effect was considered to be moderate. In South Africa, Precious and Makhetha-Kosi (2014) carried out a study on the role of monetary policy in economic growth, which showed a positive impact during the period 2000–2010. The finding is in consonance with that of Nouri and Samimi (2011) that revealed a positive impact in Iran during the period 1974–2008, and is corroborated by Aliyev et al. (2020) in a study of Azerbaijan within the period 2005–2018. In contrast, Amarasekara (2008) revealed that monetary policy adversely affected economic growth in Sri Lanka over the period 1978–2005, because it was targeted more at containing inflation.

Some studies also examined the role of fiscal policy in the economic growth of developing countries, with mixed results. The strategic role of fiscal policy in economic growth was investigated in a study of the Tajikistan economy, where Brownbridge and Canagarajah (2008) revealed that higher levels of government spending translated into stronger economic growth and poverty reduction. In a more recent study, Tun (2019) investigated fiscal policy in Myanmar and found a significant positive long-run impact on growth within the period 1979–2016. This finding is comparable to that of Senekovič, Kavkler, and Bekő (2019) that also showed a positive role of fiscal policy in economic growth of the G7 countries, and of Ali, Ahmad, and Khalid (2010) that again revealed a significant positive impact of fiscal deficit on growth in Pakistan, within the period 1972–2008. In South Africa, Ocran (2011) discovered a moderate positive effect of fiscal expenditure on output growth in the period 1990–2008. This result is comparable to that of Ismal (2011) which showed a strong positive impact in Indonesia during the same period, as well as of Osuala and Jones (2014), that revealed a positive relationship between fiscal policy and growth in Nigeria, within the period 1986–2010. However, Eid (2020) found that government expenditure in Qatar had asymmetric ef-

fect on growth, with positive effect in some sectors and negative effect in others.

#### GAP IN LITERATURE

The literature survey in this section shows that economic growth is influenced positively or negatively by foreign development assistance (FDA) and macroeconomic policies. However, previous studies did not give adequate attention to how FDA works with macroeconomic policies in driving the economic growth of African countries. Therefore, this current study attempts to build on the existing knowledge by determining whether or not FDA complements macroeconomic policies in facilitating economic growth, with particular focus on emerging Sub-Saharan African countries. The investigation is intended to bridge the perceived gap in previous studies and add to the expanding knowledge on economic growth in developing countries.

#### Descriptive Analysis

##### FOREIGN DEVELOPMENT ASSISTANCE

Foreign development assistance has continued to flow from advanced economies to less developed economies, mostly in SSA, helping to ameliorate macroeconomic instability in the region. Inflows to the five emerging economies of SSA have increased significantly in the last two decades (figure 1).

*Nigeria* is currently the largest economy in SSA, with a significant part of fiscal revenue accruing from crude oil exports. The economy has experienced fluctuations in the level of development assistance, with an inflow of \$0.17 billion in 2000, which rose to an all-time high of \$11.4 billion in 2006, and subsequently dropped to \$3.3 billion in 2018. The period 2000–2004 witnessed particularly poor inflows, with an average of \$0.31 billion.

*South Africa*, on the other hand, is the most highly indebted country in SSA, depending largely on external borrowing to sustain its economy. In addition to borrowing, the economy receives development assistance, which has also fluctuated from \$0.49 billion in 2000, to a peak of \$1.42 billion in 2015, but declined to \$0.91 billion in 2018. The initial period of 2000–2007 recorded unimpressive inflows, but significantly improved in the period 2008–2018.

*Kenya* also received development assistance, which is far larger than that of South Africa. The inflow rose steadily from \$0.51 billion in 2000, to the highest level of \$3.31 billion in 2013, but dropped slightly to \$2.49

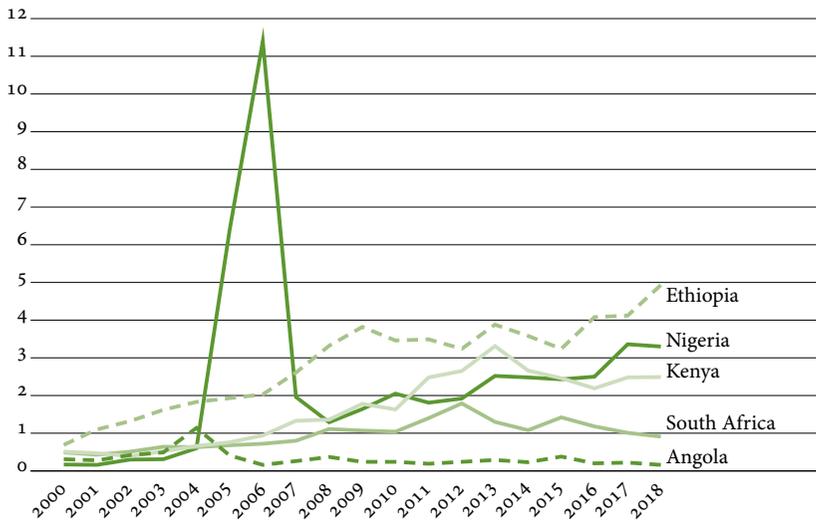


FIGURE 1 Official Development Aid and Assistance to Emerging Sub-Saharan African Economies (based on data from the World Bank, <https://data.worldbank.org/indicator/DT.ODA.ALLD.CD>)

billion in 2018. The trend was particularly impressive in the period 2001–2018.

*Angola*, like *Nigeria*, depends predominantly on oil export. The economy recorded abysmal performance in the inflows of development assistance, which was relatively low during the period. The inflows declined significantly from \$0.31 billion in 2000, to the lowest level of \$0.16 billion in 2018, which is also the overall lowest among the five economies. It follows that the economy has been a poor recipient of foreign development assistance.

*Ethiopia* experienced impressive inflow, as the economy is reported to be the highest recipient of development assistance among the top five economies. It recorded the lowest inflow of \$0.69 billion in 2000, which rose astronomically to the highest level of \$4.93 billion in 2018. This level is the overall highest among the five economies.

All the economies, together, recorded appreciable inflows of development assistance within the period 2000–2018. The aggregate inflows increased from \$2.09 billion in 2000, to a peak of \$15.52 billion in 2006, but dropped to \$11.93 billion in 2018. The period 2005–2018 is quite remarkable, as the aggregate inflows stayed above \$7.0 billion. This is a clear indication that SSA economies benefited largely from foreign development assistance during the period.

### ECONOMIC GROWTH

Sub-Saharan Africa experienced significant economic growth within the period 2000–2019, driven largely by Ethiopia with an average growth rate above 10 percent (figure 2). Some of the countries, however, witnessed a decline in growth rate that necessitated the application of macroeconomic policies to defend the economy. The decline, in most cases, was caused largely by external shocks arising from the global financial crisis and oil price slump.

*Nigeria* is currently the leading economy in SSA, with an impressive GDP growth rate of 5.1 percent in 2000, which rose to a record high of 8.1 percent in 2009. The growth rate, however, dropped to a record low of –1.6 percent in 2016, and remained below the IMF/World Bank recommended minimum growth rate of 6 percent, as a result of the oil market crash. The country, being a major world exporter of crude oil, has tended to depend largely on oil revenue, thus making the economy highly vulnerable to oil market shocks. This suggests that the dependence on the oil sector needs to be reduced, by deploying macroeconomic policies to development of the non-oil sector.

*South Africa* was the most dominant economy in Africa up to 2007, and currently ranks as the second largest economy in SSA. The economy has been considerably unstable, as the growth rate rose from 4.2 percent in 2000, to 5.6 percent in 2006, and fell to its lowest level of –1.5 percent in 2009. It only improved marginally to 0.2 percent in 2019, indicating that the economy has been struggling to come out of depression. The economic growth predicament is attributed to several factors, such as the global financial crisis of 2008–2009, and the turbulent global oil market.

*Kenya* is ranked as the ninth largest economy in Africa, although it is the leading economy in the eastern part of SSA, as of 2019. The GDP growth rate rose from an abysmal rate of 0.6 percent in 2000, to the highest rate of 8.4 percent in 2010. Thereafter, it recorded a slight drop to 5.4 percent in 2019. Election crises in the country and the global financial crisis accounted for the growth rate of less than 1 percent in 2002 and 2008. The impressive growth performance of the economy within the period 2010–2019 may be attributed to significant political and economic reforms, which created a stable macroeconomic environment. The country has thus become one of the fastest growing economies in SSA.

*Angola* is highly dependent on oil export, which is the main driver of growth and development in the country. The growth performance, which

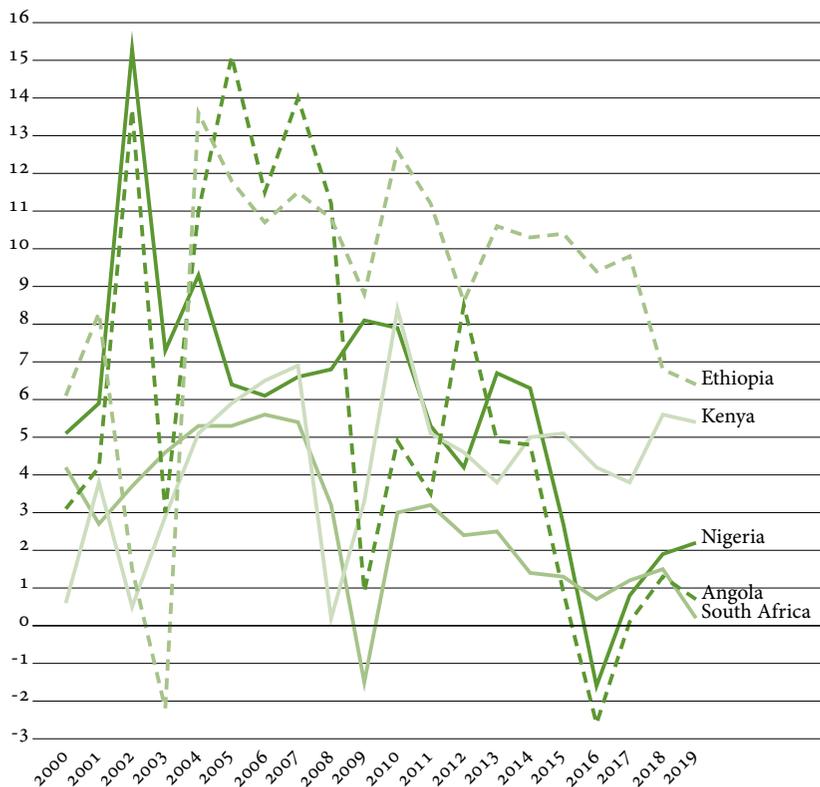


FIGURE 2 GDP Growth in Selected SSA Economies (based on data from the World Bank, <https://databank.worldbank.org/source/world-development-indicators>)

stood at 3.1 percent in 2000, rose astronomically to a peak of 15.1 percent in 2005, and dropped to a record low of  $-2.6$  percent in 2016. The period 2002–2008 witnessed outstanding performance, with the average growth rate exceeding 10 percent. The economy was severely affected by the slump in global oil price, which led to the unprecedented decline in growth rates towards the end of the period.

*Ethiopia* dominated all other economies in growth performance during the period, with an outstanding average growth rate of over 10 percent. The economy is ranked among the fastest growing economies in the world. Although it experienced a slight hiccup in 2002–2003, the growth performance remained far above the IMF/World Bank recommended minimum growth rate of 6 percent for developing countries. The highest growth of 13.6 percent was recorded in 2004, while the lowest growth rate of  $-2.2$  percent occurred in 2003. The impressive growth per-

formance of this economy can be attributed largely to inflows of capital through external borrowing and foreign aid. The inflows were effectively deployed into infrastructure development, which led to rapid economic growth.

### Model Specification

#### THEORETICAL FOUNDATION

The Neoclassical model of economic growth (Solow 1956; Swan 1956) posited that growth (ECG) depends positively on capital-labour ratio ( $k$ ), suggesting that only supply factors drive economic growth, as presented below.

$$\text{ECG} = f(k), f' > 0.$$

Subsequently, the endogenous growth model (Romer 1986) linked the supply factors with demand side factors, thus providing a basis for other relevant variables ( $Z$ ) to influence economic growth, as shown below.

$$\text{ECG} = f(k), k = f(Z), \text{ hence,}$$

$$\text{ECG} = f(Z), Z = 1, 2, \dots, n \text{ variables.}$$

The growth model, therefore, accommodates other relevant exogenous variables, apart from the neoclassical postulated variables. The current study is built on this foundation, with the purpose of determining the effects of foreign development assistance and macroeconomic policies on economic growth.

#### GENERALIZED METHOD OF MOMENTS MODEL (GMM)

Based on the foregoing exposition, relating growth to other exogenous variables, the GMM model linking growth to foreign development assistance and macroeconomic policies can be constructed in two stages. The first stage shows the functional and stochastic relationships between the endogenous and exogenous variables, as follows.

$$\text{ECG}_{it} = f(\text{FDA}_{it}, \text{MOP}_{it}, \text{FIP}_{it}, \text{EXR}_{it}), \quad (1)$$

$$\text{ECG}_{it} = \alpha_0 + \sum_{j=1}^4 \alpha_j X_{it} + \mu_{it}. \quad (2)$$

Equation (1) represents the functional relationship between the endogenous variable and exogenous variables, while equation (2) is the econometric specification of the relationship. The endogenous variable

in the model is  $ECG_{it}$  (economic growth), while the exogenous variables are  $FDA_{it}$  (foreign development assistance),  $MOP_{it}$  (monetary policy),  $FIP_{it}$  (fiscal policy), and  $EXR_{it}$  (exchange rate). The vector  $X_{it}$  contains all the exogenous variables, and  $\mu_{it}$  is the error term. The parameters  $\alpha_j$  ( $j = 1, 2, 3, \dots, 4$ ) are elasticity coefficients of the corresponding exogenous variables.

The second stage involves transformation of the model into the generalized method of moments model (GMM), proposed by Arellano and Bond (1991), and extended by Blundell and Bond (1998). The main feature of the GMM model is that it relates the endogenous variable to its own lag and the lags of exogenous variables, as presented below.

$$ECG_{it} = \beta_0 + \beta_1 ECG_{it-1} + \sum_{j=2}^4 \beta_j X_{it-1} + \tau_{it} + u_{it}, \tag{3}$$

$$\Delta ECG_{it} = \lambda_0 + \lambda_1 \Delta ECG_{it-1} + \sum_{j=2}^4 \lambda_j \Delta X_{it-1} + \omega_{it}. \tag{4}$$

The moment conditions are:

1.  $\varepsilon(w_{it}) = \varepsilon[F(ECG_{it}, X_{it-1}, \lambda)] = 0$ ; zero expected residual of exogenous variables.
2.  $\varepsilon(Y' w_{it}) = \varepsilon(Y' w_{it}, \lambda) = 0$ ; zero expected residual of instrumental variables ( $Y$ ).
3. The unknown parameter  $\lambda$  determines whether expected residuals are significantly close to zero or not.
4. There is the optimum parameter  $\lambda^*$  that ensures expected residuals become zero.

Equation (3) is the GMM model with country fixed effect  $\tau_{it}$ , which is eliminated by casting the variables in first difference form, denoted by the  $\Delta$  operator, as indicated in equation (4). The correlation among the exogenous variables is minimized by including instrumental variables during estimation. Such instruments must be strong correlates of the endogenous variable. Higher lags of the endogenous variable are commonly used as instruments, e.g.  $ECG_{it-2}$  and  $ECG_{it-3}$ , which are usually not reported in the analysis of estimation results. The model is expected to be well behaved when the moment conditions are satisfied, that is, the expected value of the random error term becomes zero for exogenous variables and instrumental variables. All variables in the model, except exchange rate,

bear positive *a priori* relationship with economic growth. The relationship with exchange rate is uncertain.

### VECTOR ERROR CORRECTION MODEL (VECM)

In order to determine the short-run effects and adjustment of variables, the VECM model is specified where all variables are endogenous. The model shows a simultaneous interrelationship among the variables, with each variable related to its own lag and lags of other variables. Following Engle and Granger (1987), the model is derived by transforming the conventional vector auto-regressive model (VAR) in equation (5) into the dynamic vector error correction model (VECM) in equation (6), by including the first difference operator  $\Delta$ , and the error correction term  $ECT_{it-1}$ .

$$Z_{it} = \pi_0 + \sum_{j=2}^4 \pi_j Z_{it-1} + \varepsilon_{it}, \quad (5)$$

$$\Delta Z_{it} = \eta_0 + \sum_{j=2}^4 \eta_j \Delta Z_{it-1} + ECT_{it} + u_{it}, \quad (6)$$

The vector  $Z_{it}$  in the model is a composition of endogenous variables, while the matrix  $Z_{it-1}$  contains the lagged endogenous variables. Since all variables are endogenous, the problem of endogeneity is completely eliminated.

## Model Estimation and Analysis of Results

### ESTIMATION TECHNIQUES

The panel unit root test is employed to ascertain stationarity of variables, which is a condition that would enable the model to produce consistent and unbiased estimates. The test involves the three techniques of LLC, IPS, and HD, proposed respectively by Levin, Lin, and Chu (2002), Im, Pesaran, and Shin (2003), and Hadri (2000). The co-integration test is also employed to ascertain the long-run convergence of the variables, which would ensure that estimates are reliable for the purpose of forecasting and policy making. The co-integration test employed in this study was proposed by Pedroni (2004), which has four vital indices of variance ratio, rho statistic, PP statistic, and ADF statistic. The GMM estimator is used to determine the long-run impacts of variables on economic growth, while the VECM estimator is employed to evaluate the short-run impacts. Both estimators have been employed in previous studies to produce reli-

able estimation results for developing economies. The test for structural stability is conducted by employing the maximum likelihood estimator, following Yu, Jong, and Lee (2008).

The estimation is undertaken for the period 1980–2019, with data obtained from the World Bank Open Database, World Development Indicators, and OECD Statistics. The following measures of variables are used in the study: economic growth (GDP growth rate), foreign development assistance (foreign development aid from OECD), monetary policy (percentage change in money supply), fiscal policy (percentage change in fiscal expenditure), and exchange rate (exchange rate per dollar).

**PANEL UNIT ROOT AND CO-INTEGRATION TESTS**

These preliminary tests were conducted to confirm that variables in the model possess desirable empirical properties. The results are reported in table 1, where LLC and IPS produced significant FDA values of 2.94 and 3.04, respectively. Similarly, the LLC and HD produced significant FIP values of 2.87 and 0.88, respectively. It follows that only two variables are stationary in levels, and thus possess expected empirical properties. However, the three test indices show significant values for all variables in first differences, which indicate they are all stationary. Therefore, the null hypothesis of non-stationarity is rejected; hence, the variables are suitable for empirical estimation. In the case of the co-integration test, the Pe-

TABLE 1 Panel Unit Root and Co-Integration Test Results

Unit root test	Variable	Level			First difference		
		LLC	IPS	HD	LLC	IPS	HD
	ECG	0.68	0.77	1.99	6.06*	3.81*	0.78*
	FDA	2.94*	3.04*	2.01	4.12*	5.02*	1.04*
	MOP	1.05	0.98	1.98	6.33*	2.96*	0.99*
	FIP	2.87*	1.22	0.88*	7.05*	4.43*	1.17*
	EXR	0.93	1.03	2.55	5.17*	3.71*	1.06*
Pedroni co-integration test	Variance ratio (%)	Rho statistic		PP statistic	ADF statistic		
	Critical range:	Critical range:		Critical range:	Critical value =		
	$0 \leq r \leq 5$	$0 \leq \sigma \leq 1$		$1.5 \leq p \leq 5$	1.95		
		2.11*	0.86*	3.05*	2.96*		

NOTES Sample size: 5 countries, estimation period: 1980–2019, observations: 200. In LLC and IPS tests, larger statistics indicate more stationary variables. In the HD test, smaller statistics indicate more stationary variables. \* Variables are stationary (unit root test) and convergent (co-integration test).

droni variance ratio of 2.11 percent falls within the critical range. Similarly, the rho statistic of 0.86, PP statistic of 3.05 and ADF statistic of 2.96 fall within the critical level. These are indications that all the variables move toward convergence. Therefore, the null hypothesis is rejected, which further confirms that the variables are suitable for estimation.

### GMM ESTIMATION

The GMM model was estimated to determine the long-run effect of exogenous variables on economic growth. The estimation results, reported in table 2, show how the exogenous variables interacted with one another to influence economic growth. The estimate of  $\Delta\text{FDA-1}$  is 0.19, which is positive and significant at 5 percent, indicating that foreign development assistance impacted favourably on economic growth. The estimate

TABLE 2 Estimation Results (GMM Model)

Dependent variable	Explanatory variable	Explanatory variable					
		Intercept	$\Delta\text{ECG-1}$	$\Delta\text{FDA-1}$	$\Delta\text{MOP-1}$	$\Delta\text{FIP-1}$	$\Delta\text{EXR-1}$
$\Delta\text{ECG}$	Intercept†	1.05* (3.27)	0.02 (1.11)	0.19* (2.96)	0.11* (1.92)	0.14* (4.01)	0.22 (1.24)
	$\Delta\text{ECG-1}$	1.28* (2.02)	–	0.49 (1.33)	0.69* (2.04)	0.12 (1.26)	1.01 (0.93)
	$\Delta\text{FDA-1}$	0.41 (1.18)	0.66 (1.08)	–	1.11* (3.19)	0.85 (1.31)	–0.37 (–1.04)
	$\Delta\text{MOP-1}$	2.11* (4.05)	0.92 (1.14)	1.19* (2.88)	–	0.95* (9.12)	1.13* (3.32)
	$\Delta\text{FIP-1}$	1.12* (1.99)	0.51 (1.27)	–0.85 (–1.11)	0.94* (8.22)	–	0.55 (0.98)
	$\Delta\text{EXR-1}$	0.84 (1.22)	0.71 (1.08)	–0.62* (–1.98)	1.15* (2.22)	0.48 (1.03)	–
	Diagnostics	Sargan $\chi^2$ statistic (0.05 < p ≤ 1)	5.96 (0.34)	4.02 (0.63)	6.22 (0.58)	3.66 (0.49)	4.46 (0.66)
A-B(1) $\chi^2$ -statistic (0 < p < 0.1)		1.09 (0.18)	0.99 (0.13)	1.11 (0.15)	1.06 (0.16)	0.95 (0.19)	1.01 (0.14)
A-B(2) $\chi^2$ -statistic (0.25 < p ≤ 1)		1.21 (0.26)	1.37 (0.39)	1.06 (0.58)	1.18 (0.42)	0.97 (0.61)	1.13 (0.48)

NOTES † The main focus of empirical analysis; \* significant at 5 percent; \*\* significant at 1 percent, *t*-statistics in parenthesis.

of  $\Delta MOP-1$  (0.11), representing the impact of monetary policy, is also significant at 5 percent. However, the impact is exceeded by that of foreign development assistance. The estimate of  $\Delta FIP-1$  (0.14) indicates positive and significant impact of fiscal policy at the 1 percent level, which is stronger than that of foreign development assistance and monetary policy. Exchange rate ( $\Delta EXR-1$ ) is the only variable that had unimpressive impact on economic growth, as shown by the estimate 0.22, which is insignificant at 5 percent. The adjustment of economic growth to its own lag ( $\Delta ECG-1$ ) is positive, but insignificant. The other results in the table represent various effects of interaction among the variables.

Generally, foreign development assistance, over the period 1980–2019, can be considered to have significantly complemented monetary and fiscal policies in facilitating economic growth of the emerging Sub-Saharan African countries. All the variables in estimation results satisfy theoretical expectations. In the diagnostics,  $p$ -values of Sargan statistics fall within critical range, hence the null hypothesis of no auto-correlation in residuals of instrumental variables can be accepted. The  $p$ -values of  $A-B(1)$  statistics did not fall within the critical range of the null hypothesis, but they fall within the range in  $A-B(2)$  statistics, indicating acceptance of the null hypothesis of no auto-correlation in residuals of exogenous variables. The GMM estimator is therefore valid, hence the estimates can be considered unbiased and reliable.

#### VECM ESTIMATION

The estimation of the VECM model is undertaken to further determine the short-run inter-dependence among the variables, since all the variables are endogenous. The estimation results, reported in table 3, show that the foreign development assistance ( $\Delta FDA-1$ ) estimate of 0.13 is positive and significant at the 5 percent level. It indicates that the effect on economic growth is appreciable. The monetary policy ( $\Delta MOP-1$ ) estimate of 0.04 is, however, not significant at 5 percent, while the fiscal policy ( $\Delta FIP-1$ ) estimate of 0.23 is highly significant at 1 percent. All the three variables conform to theoretical expectations. However, the significant effect of foreign development assistance is greater than that of monetary policy, but lesser than fiscal policy. The estimate of exchange rate ( $\Delta EXR-1$ ) is 0.07, which indicates insignificant impact on economic growth at the 5 percent level. The estimate of  $\Delta ECG-1$  (0.09) is also insignificant, suggesting that growth did not significantly respond to its lag. Other estimates represent the several interactive effects of variables that eliminated

TABLE 3 Estimation Results (VECM)

Dependent variable	Explanatory variable						
	Intercept	$\Delta ECG-1$	$\Delta FDA-1$	$\Delta MOP-1$	$\Delta FIP-1$	$\Delta EXR-1$	ECT-1
$\Delta ECG\ddagger$	1.08* (2.33)	0.09 (1.13)	0.13* (3.02)	0.04 (1.06)	0.23* (6.14)	0.07 (1.32)	-0.28 (-1.33)
$\Delta FDA$	0.91 (1.07)	0.02 (0.96)	0.16 (1.13)	-1.02* (-2.41)	0.22 (1.25)	-0.08 (-1.06)	-0.31 (-1.04)
$\Delta MOP$	1.26 (1.25)	2.20 (1.19)	-0.44* (-2.21)	1.15 (1.33)	0.04 (0.88)	0.03 (1.10)	-0.77* (-3.19)
$\Delta FIP$	0.77 (1.14)	0.02 (0.74)	0.66* (3.31)	0.12 (0.87)	0.09 (1.27)	0.21 (0.93)	-0.39 (-1.18)
$\Delta EXR$	0.05 (1.11)	0.03 (1.06)	0.07 (1.21)	-0.35* (-2.54)	-1.16 (-0.95)	0.42 (1.31)	-0.27 (-0.93)

NOTES Diagnostics:  $R^2$  (adjusted) = 0.88,  $F$ -statistic = 29.06\*\*, Sargan statistic 2.72 (>1.65), Arch statistic = 0.22, Durbin's  $h$  = 2.02. † The main focus of empirical analysis; \* significant at 5 percent; \*\* significant at 1 percent,  $t$ -statistics in parenthesis.

the problem of endogeneity. It is also observed that the short-run adjustment of economic growth towards a steady state is slow, as indicated by the error correction term (ECT-1) estimate of -0.28, which represents a periodic adjustment speed of less than 30 percent.

The short-run estimation results are largely consistent with the long-run results. The impact of foreign development assistance on economic growth in the emerging Sub-Saharan African countries is quite significant, and also complementary to that of monetary and fiscal policies. The reliability of the results is confirmed by the various diagnostic statistics. The adjusted  $R$ -square of 0.88 is an indication that all the variables accounted for about 88 percent of systemic variation in the model. The  $F$ -statistic of 29.06 shows that the explanatory power of the model is significant at 1 percent. The Sargan statistic of 2.72, Arch statistic of 0.22, and Durbin's  $h$ -statistic of 2.02, all suggest that auto-correlation and spuriousness are considerably minimized. The VECM estimator is therefore valid, hence the estimates can be considered reliable.

#### LONG-RUN STRUCTURAL STABILITY

Long-run estimation results are considered useful for the purpose of policy making when structural stability exists in a model. The maximum likelihood estimator is commonly employed to test for structural stability. It involves splitting the entire period of study into two sub-periods, by choosing a suitable break point (Yu, Jong, and Lee 2008). The break

TABLE 4 Maximum Likelihood Structural Stability Estimates

Exogenous variable	All period (1980–2019)		Sub-period 1 (1980–2000)		Sub-period 2 (2001–2019)	
	(1)	(2)	(1)	(2)	(1)	(2)
	Intercept	0.19	0.95	0.27	1.37	0.24
ECG-1	0.22	1.16	0.31	1.41	0.28	1.29
FDA-1	0.17	0.91	0.25	1.25	0.30	1.30
MOP-1	0.23	1.23	0.33	1.43	0.29	1.31
FIP-1	0.18	1.19	0.29	1.32	0.31	1.33
EXR-1	0.20	1.14	0.52*	2.20	0.27	1.36

NOTES Column headings are as follows: (1) coefficient, (2) asymptotic *t*-statistic. \* Significant at 5 percent level.

TABLE 5 Maximum Likelihood Reliability Estimates

Alternative break point	Structural break parameter estimate		Normalized bias statistic	Standard deviation	Root mean square error
	Rho 1	Rho 2			
	1997	0.03			
1998	0.05	0.04	0.38	0.15	0.20
1999	0.07	0.05	0.42	0.13	0.22
2000	0.06	0.08	0.39	0.16	0.24
2001	0.05	0.07	0.41	0.14	0.27
2002	0.04	0.08	0.37	0.15	0.26
2003	0.06	0.06	0.40	0.16	0.24

NOTES Alternative break points are distributed evenly around the year 2000.

point in this study is the year 2000, which was characterized by extensive structural reforms in all countries under investigation. In table 4, the maximum likelihood estimates of the whole period and sub-periods are not significant at the 5 percent level. Again, the sub-period estimates of each variable are not significantly different. Therefore, the null hypothesis of no structural break is accepted, hence the long-run estimation results may be considered suitable for policy making. In table 5, the parameter estimates (Rho 1 and Rho 2), normalized bias statistic, standard deviation and root mean square error show insignificant variation in values, which validates the maximum likelihood estimator; hence, the structural stability estimates remain unbiased and reliable.

POLICY PERSPECTIVES OF ESTIMATION RESULTS

The analysis of short-run and long-run estimation results revealed that foreign development assistance exerted significant positive impact on

economic growth in the five emerging economies of Sub-Saharan Africa, and complemented the role of macroeconomic policies. The impact is observed to be more significant than that of monetary policy, but less significant than fiscal policy. On the other hand, exchange rate did not complement the role of macroeconomic policies, following its insignificant impact on growth. Furthermore, economic growth did not significantly respond to its own lag. These findings necessitate the following policy measures:

1. Foreign development assistance needs to be sustained in order to foster its complementary role in facilitating the economic growth of Sub-Saharan African countries. This can be achieved by maintaining a stable political environment.
2. Monetary policy framework should be reinforced to focus more on economic growth, without relegating other macroeconomic objectives.
3. Fiscal policy framework should be maintained and focused on economic growth, without conflict with monetary policy.
4. The exchange rate system can be made to operate more efficiently, by removing possible official constraints, to enable it to impact significantly on economic growth.
5. Economic growth can be encouraged to adjust faster by allowing market forces to operate and allocate resources efficiently.

### **Conclusion**

Various studies have revealed several factors that accounted for economic growth in developing countries over the years. However, adequate study has yet to be undertaken on how foreign development assistance works with macroeconomic policies in facilitating the economic growth of Sub-Saharan African countries. The current study, therefore, employed the GMM and VECM models to investigate the issue, in the five emerging Sub-Saharan African economies, within the period 1980–2019. The short-run and long-run results revealed that foreign development assistance exerted positive and significant impact on economic growth, which is largely complementary to the impact of macroeconomic policies. The impact is greater than that of monetary policy, but lesser than fiscal policy. Exchange rate is the only variable that failed to make meaningful impact on economic growth. It was also observed that economic growth did not significantly respond to its lag. Therefore, the role of foreign development

assistance and macroeconomic policies, over the period 1980–2019, can be considered highly complementary and quite beneficial to economic growth of the emerging Sub-Saharan African countries. Furthermore, the structural stability of the model confirmed the usefulness and reliability of the empirical results to policy making.

The results produced by the two estimation methods conform largely to theoretical expectations, which state that foreign development assistance, monetary policy, and fiscal policy are positively related to economic growth, while exchange rate is uncertain. The possible policy measures emanating from the estimation results include sustenance of foreign development assistance, reinforcement of monetary policy framework, maintenance of fiscal policy framework, enhancing the efficiency of the exchange rate system, and allowing market forces to drive the economy.

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