

Michael Appiah et al: Foreign investment &amp; growth in emerging economies: panel ARDL analysis

# Foreign investment & growth in emerging economies: panel ARDL analysis

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## ABSTRACT

Recently, the contributory role of foreign investment growth in Africa has been considered by researchers and policymakers. Studies in this area are not yet clear. Besides, foreign direct investment has emerged as a determining factor of economic growth. Concerning this evidence, the current study tries to investigate the contributions of foreign direct investment on economic growth or for developing the economy of Africa. This study used yearly panel data for the period 1995-2015 for 5 developing the economy of Africa. The results of Panel ARDL indicate that foreign direct investment has a positive effect on economic growth as well as a positive sign of trade openness, inflation, and labor. The study also stresses that, for increasing economic growth, there is a need to seek more foreign investments, increase trade openness and inflation, and at the same time, to improve the employment condition in the selected African developing countries.

## ABSTRAK

Akhir-akhir ini, peran kontribusi pertumbuhan investasi asing di Afrika telah dipertimbangkan oleh para peneliti dan pembuat kebijakan. Studi dalam bidang ini belum jelas. Selain itu, direct foreign investment telah muncul sebagai faktor penentu pertumbuhan ekonomi. Sehubungan dengan bukti ini, penelitian saat ini mencoba menganalisis kontribusi foreign direct investment pada pertumbuhan ekonomi atau untuk mengembangkan ekonomi Afrika. Studi ini menggunakan data panel tahunan untuk periode 1995-2015 untuk 5 mengembangkan ekonomi Afrika. Hasil Panel ARDL menunjukkan bahwa investasi asing langsung memiliki efek positif pada pertumbuhan ekonomi serta tanda positif keterbukaan perdagangan, inflasi, dan tenaga kerja. Studi ini juga menyatakan bahwa, untuk meningkatkan pertumbuhan ekonomi, ada kebutuhan untuk mencari lebih banyak investasi asing, meningkatkan keterbukaan perdagangan dan inflasi, dan pada saat yang sama, untuk meningkatkan kondisi pekerjaan di negara-negara berkembang Afrika yang dipilih.

## 1. INTRODUCTION

The effect of foreign investment (FI) on growth is one of the areas with enough investigation by many researchers around the world. All these have been a keen interest in developed countries while with fewer concerns on African nations. Foreign investment assumes a critical role in the improvement of the economy at large.

In this case, it relied upon foreign Investment to take overflow effect among all divisions within the economy of the host nation. This can be such as the export of goods and service increment, importing advanced technology, implementing

new advanced product developments, reducing the unemployment rate by the creation of employment, and increasing the financial and funds of local investors. The overflow effect could be much higher in a specific business setting. For example, they are enhanced development stock, abnormal state of human development, and financial sector development (Azman-Saini, Law, and Ahmad 2010; Herzer and Klasen 2008; Mah 2010).

Foreign Investment inflow in Africa is lower when compared to that of other regions of the world, although in recent years, there has been an incremental development. However, it is still the

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lowest worldwide. It demands improvement when to draw more FDI inflows into the region in the business setting such as human capital development and infrastructural development to have competitive returns from the FI overflow effects (Gohou and Soumaré 2012; Yamin and Sinkovics 2009). The business atmosphere in African nations has been insufficient since the infrastructure development stock and human capital are low. This can make a comparison to other regions of the world. Recently, A report demonstrates that 27% of African populace can get access to the internet; 22 % of African populace is used mobile devices. Besides that, transportation cost in Africa is the highest in the world. This is as well as access to electrical power in Africa which still the lowest (Minsat, Simpasa, Lusigi, & Losch, 2015).

It is more significant to examine the entire effects of foreign investment on growth. Most studies have focused on African countries (Almfraji, Almsafir, and Yao 2014; Sbia, Shahbaz, and Hamdi 2014). Studies related to this matter in Africa are not yet satisfactory. It is necessary to bridge the distance within Africa by supporting policymakers in decision making and intruding efficiency policies in the growth situation. Structural factors can affect economic growth and development. These are, for example, foreign direct investment and trade openness, stability factors, such as inflation, and labor. This present study investigates the importance of these variables in affecting economic growth and development using yearly data from 1995 to 2015 and Panel ARDL methodology.

The researcher organized this study as the following. Section 2 elaborates on the theoretical framework and hypotheses. Section 3 outlines the research methods. Section 4 provides the data and data analysis and discussion. All these provide details about various checks while comparing the results to other studies. Finally, Section 5 deals with the conclusion, implication, suggestion, and limitations.

## **2. THEORETICAL FRAMEWORK AND HYPOTHESES**

The theory can trace back the hypothetical connection between foreign investment and growth. This leads to growth and dependency theories. Growth theory proposes that foreign investment advances growth insisting that capital investment plays a role (Adams 2009).

The growth theories, however, stressed the

transfer of technology through foreign investment. For example, the developing nations need the necessary infrastructure, education, financial markets, including political stability (Adams 2009; Sánchez-Robles and Bengoa-Calvo 2002). Separated from technology exchange, FDI additionally goes with its hierarchical and administrative abilities, marketing knowledge, and market access through networks worldwide (Adams 2009; Balasubramanyam, Salisu, and Sapsford 1996; Kumar and Pradhan 2002). Nath (2009) contends that foreign investment plays a two-way work by adding up to capital requirement and expanding all-out total factor productivity.

Moreover, the dependency theories propose that over-reliance on foreign investment inflows can be an indication to create a negative effect on growth and salary dissemination in the case that FDI creates monopolies in the industrial sector. This, in turn, leads to the underutilization of residential assets (Adams 2009; Bornschier and Chase-Dunn 1985). This infers the economy controlled by foreigners and as opposed to growing naturally. It develops in a disarticulated manner (Amin and Pearce 1974). Third, the multiplier effect is feeble and prompts dormant growth in emerging nations (Adams 2009). Based on these theories, some researchers have numerous exact investigations he completed to look at the connection among FDI and economic growth, inter alia (Alfaro, Chanda, Kalemli-Ozcan, and Sayek 2004; Borensztein, De Gregorio, and Lee 1998; Campos and Kinoshita 2003; Zhang 2001). For instance, Zhang (2001) detail that foreign investment stimulates growth in nations where there are low levels of infrastructural development.

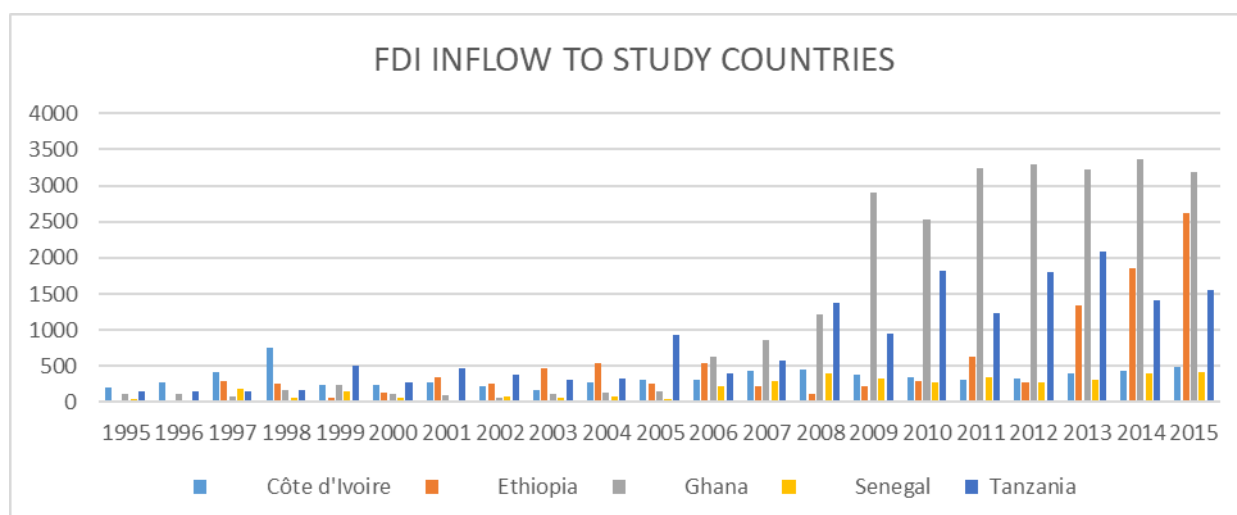
Balasubramanyam et al. (1996) presume that the upgrading impact of FDI is more grounded in nations where the labor force is educated and encouraging the exportation instead of importation. Campos and Kinoshita (2002) state that foreign investment in the form of technology transfer has a positive sign of growth. Likewise, Carkovic and Levine (2005) guarantee that small scale levels of foreign investment can impact on growth and be treated without doubt, as the more significant part in this study tries not to control concurrences predisposition among nations.

A few investigations discover the insignificant nature of foreign investment on growth, for instance, Akinlo (2004), who finds out that there is no significance between FDI and growth in Nigeria. Again, Ayanwale (2007) also confirms the insignificant nature of FDI on the growth of the

Nigerian economy. Hermes and Lensink (2003) conclude that foreign investment applies a critical adverse impact on the host nation. Comparative outcomes by Fry (1993) find out that FDI exerts no significant effects on growth. Finally, Sylwester (2005) talks about the insignificant position and relationship between FDI and economic growth.

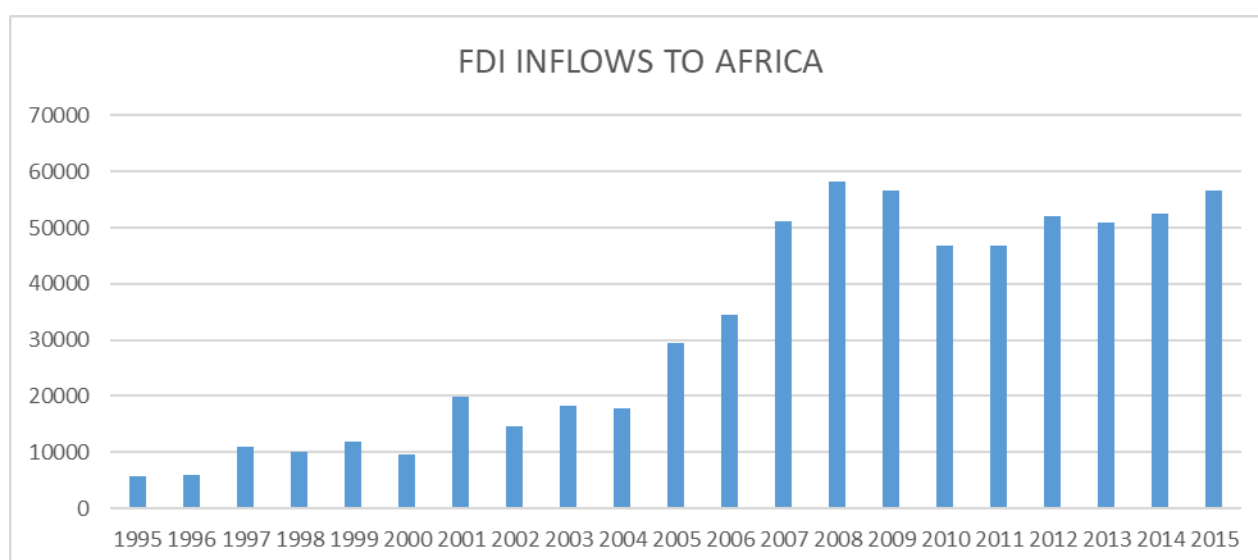
Considering the direction of causality, Elias (1992) contends that the evacuation of credit and

liquidity problems had supported foreign investment in the Latin American nations. De Mello Jr (1997) also argues that causality direction relies upon beneficiary nations. Nair-Reichert and Weinhold (2001) state that the impact of foreign investment on growth increased over the nations. This variation is for the most open economies. Hence, there is a requirement for the host nation on foreign investment inflows.



Source: The computed data form WDI Data Base. (WDI, 2018)

**Figure 1. FDI Inflows To Study Countries**



Source: Computed data from WDI Data Base (WDI, 2018)

**Figure 2. FDI inflows to Africa Billion USD**

**3. RESEARCH METHOD**

This study used panel data for five African countries, taken from the World Bank Development Indicators from the period 1995 to 2015. The selected countries for this investigation are Ghana, Ethiopia, Cote D' Voire, Senegal, and Tanzania, based on a report by www.africa.com stating them as the fastest growing economy in Africa. The variables used for this study include GDPPC,

which is Gross Domestic Product Per Capita as the dependent variable with Trade Openness (OPEN) as a proportion of export and import of gross domestic product per capita. Next is FDI as foreign direct investment, Inflation, which is proxies as the Consumer Price Index and LAB as total labor force all as explanatory variables.

**Table 1.**  
**Variable Description**

Variables	Unit/Proxy	Source
Gross Domestic Product Per Capita (GDPPC)	Current USD	World Development Indicators
Trade Openness (OPEN)	Current USD	World Development Indicators
Foreign Direct Investment (FDI)	BOP Current USD	World Development Indicators
Inflation (INF)	Percentage/Consumer Price Index	World Development Indicators
Labor (LAB)	Thousand	World Development Indicators

Source: Authors Computations from WDI Data Base. (WDI, 2018).

**The Growth Equation**

Following the contribution Barro (2001), Rahman (2011) and Solow (1956), they explained growth theories. Most writers identify growth modeling variables for estimation. The accompanying variables used in this study include trade openness, labor, foreign direct investment, human capital, and exchange rate, among others (Barro 2001; Obadan 2008; Obadan and Okojie 2010). The growth model in this investigation is as follows:

$$GDPPC_{it} = \alpha_{it} + \beta_1 OPEN_{it} + \beta_2 FDI_{it} + \beta_3 INF_{it} + \beta_4 LAB_{it} + \epsilon_{it} \dots\dots\dots(1)$$

where GDPPC is the real GDP, OPEN is trade openness, FDI is foreign direct investment, the INF is inflation, and LAB indicates the total labor force,  $\epsilon_{it}$  represents an error term. Then,  $\beta_1 - \beta_4$  are the factors to be assessed, I speak of the country while  $t$  infers to the period. Equation (1) states that GDP Per Capita is influenced by explanatory variables, which are trade openness (OPEN), foreign direct investment (FDI), inflation (INF), and total labor force (LAB).

**Panel Unit Root Test**

The researcher tested the variables for unit root using the Levin, Lin, and Chu (LLC). This can provide evidence by Tampakoudis (2013) when examining the links between GDP growth and sustainable development. The lag length section

was following the Schwarz information criterion (SIC). The, it estimated the unit root at both levels on a constant and at 1<sup>st</sup> difference constant.

**ARDL Test for Cointegration.**

This study employed ARDL, which is a cointegration method by Pesaran and Smith (1995), for examining the lagged values. Theoretical and empirical research focuses on the long-run relationship within the economy. Pesaran and Smith studied the procedure of ARDL models for the estimation of long-term connections with variables integrated at I (1). The analysis becomes a little complex when the variables are at different-stationary or integrated of order 1. The cointegration procedure for this study is more about the examination of the long-run relationship between I (1) variables. Subsequently, a higher number of different estimates and hypothesis testing is dependent on this, and precisely it is adopted for the investigation of my (1) variables (Pesaran and Smith 1995). Considering the study of Pesaran and Smith (1995), this study used the ARDL (p;q) model as the central equation:

$$\Delta \ln Y_t = \rho^0 + \sum_{i=0}^n \rho^1 \Delta \ln Y_{t-1} + \sum_{i=0}^n \rho^2 \Delta X_{t-1} \dots + \sum_{i=0}^n \rho^4 \Delta \ln X_{t-1} + \delta^1 \ln Y_{t-1} + \delta^2 \ln X_{t-1} \dots + \delta_4 \ln X_{t-1} + \epsilon_t \dots\dots\dots(2)$$

Where  $\rho$  and  $\sigma$  are the white-noise,  $\epsilon_t$  is the error term,  $X_{t-1}$  and  $X_t$  are the short run and the long-run coefficients of the model, respectively, and  $\Delta$  is the 1<sup>st</sup> difference operator; it denotes time period, and  $n$  is the maximum number of lags in the model, based on the AIC (Akaike Information Criterion) with  $X$  and  $Y$  as the vectors for cointegration test. The long-run and the short-run coefficient were estimated with much emphasis placed on the length, which talks about the main objective of the study, foreign investment, and growth in emerging

economies.

#### 4. DATA ANALYSIS AND DISCUSSION

In this section, the study analyzes the empirical model and interprets and discusses the results. The analysis begins with the results on the characteristics of the variables followed by the stationarity testing, thus the unit root estimations. Later, the study displayed the regression results by employing the Panel ARDL method indicating both the long and short-run results.

**Table 2.**  
**Descriptive Statistics**

Variables	Obs	Mean	Std. Dev.	Min	Max
LOGGDP	105	6.297	0.722	4.713	7.504
LOGFDI	105	19.622	1.180	15.981	21.936
LOGTRADE	105	22.080	0.785	20.906	23.556
LOGLAB	105	16.146	0.841	14.711	17.664
LOGINF	105	4.237	0.615	1.944	5.354

Source: The computed data

Table 2 shows the descriptive statistics for GDPPC as a proxy for economic growth, FDI as a proxy for foreign investment, trade used as trade liberalization, LAB used as Labor and CPI as a proxy for inflation with a natural logarithm effected on all the variables. It shows that there is a higher and a

lower mean of 22.080 and 4.237, respectively. It also shows a higher standard deviation of 1.180 for the sample countries. The variables also recorded a minimum value of 1.944 and a maximum value of 23.556.

**Table 3.**  
**Panel Unit Root Results**

Unit Root Variables	Level Intercept		1st Difference Intercept	
	T. Statistics	Prob	T. Statistics	Prob
LOGGDPPC	2.311	0.990	-3.419	0.000***
LOGOPEN	2.286	0.989	-3.414	0.000***
LOGFDI	-2.037	0.021**	-9.904	0.000***
LOGINF	5.019	1.000	-0.613	0.270
LOGLAB	6.107	1.000	-5.183	0.000***

Note: 1. Levin, Lin & Chu t\*. (\*\*\*) (\*\* and \*) indicate statistical significance at 1%, 5% and 10% respectively. Source: The computed data

The researcher estimated the variables for unit roots in level intercept and 1st Difference intercept as well. Then, the researcher checked the lag length selection criterion according to the Schwarz information criterion SIC. Table 2 above indicates the results of LLC unit root tests in 5 African countries. The findings from the test show that GDPPC, OPEN, INFLATION, and labor are

stationary at a level signifying that these variables are I (0) except for foreign direct investment. Besides, after estimating the test at 1st difference, all the variables both the dependent and independent variables became non-stationary, meaning the null hypothesis of unit root is rejected after the 1st Difference estimation; thus, the variables are correct at the order I (1).

**Table 4.**  
**ARDL Results (Selected Model: ARDL (1, 1, 1, 1, 1))**

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.*</b>
<b>Long Run</b>				
LOG (OPEN)	1.098	0.104	10.522	0.000***
LOG (FDI)	-0.101	0.031	-3.304	0.002***
LOG (INF)	0.367	0.106	3.461	0.001***
LOG (LAB)	-1.928	0.345	-5.588	0.000***
<b>Short Run</b>				
DLOG (OPEN)	0.160	0.120	1.330	0.188
DLOG (FDI)	0.031	0.029	1.079	0.284
DLOG (INF)	-0.005	0.002	-2.250	0.028**
DLOG (LAB)	-0.059	0.560	-0.106	0.916

NB: (\*\*\*), (\*\*) and (\*) indicate statistical significance at 1%, 5% and 10% respectively.

Source: The Computed data

Table 4 presents the overall reports on the estimation results from equation 1, indicating the contribution of foreign direct investment on economic growth in Africa. This study used GDPFC as a dependent variable in the equation with trade openness, foreign direct investment, inflation, and total labor force as the explanatory variables. It also used Panel ARDL method to determine the length and the short-run impact of the explanatory variables on the dependent variables, the selected ARDL model for this investigation is ARDL (1, 1, 1, 1, 1), with Akaike info criterion used as a lag selection criterion. The model estimated to come out with a Log-likelihood of 137.783 and a standard deviation as 0.127.

In the long run estimation, trade openness and inflation have a positive impact, while foreign investment and labor have a negative on economic growth. It indicates that there is a strong relationship between trade openness and economic growth with a coefficient of 1.098 and a probability of 0.000. It also indicates that trade openness is significant at a significant level of 1%. This is evidenced in a study by Koskei, Buigut, and Kibet (2013). Barro and Sala-i-Martin (1995) also confirmed that there is a positive relationship between trade openness and economic growth.

Again, Grossman and Helpman (1991) asserted the significant positive effects of trade openness on economic growth. Trade Openness stimulates the allocation of resources efficiently through relative advantage, and allows the transfer of knowledge and technical progress, and promotes competitions in both international and domestic markets (Chang,

Kaltani, and Loayza 2009). The results are not in line with a study by Durham (2004), who fails to confirm a positive relationship between trade openness and growth.

From the results stated above, it clearly shows that in the long run, there is a negative contribution of foreign direct investment on economic growth based that the coefficient value of -0.101. It means when they more and more used technology transfer and modern equipment and machinery in developing countries, they also can increase the economic growth in Africa. It can further show that although the results produce a negative outcome, it is, at the same time, statistically significant at 1%. Furthermore, when there is an increase in FDI inflows increases, it reduces economic growth in the sense that most of the profits realized by FDI companies and organizations and plowed away from the host country, leading to a reduction in growth. This is a result of intending experienced slower growth as a result of the plowed back profits, which needed to be injected into the economy. Most FDI companies dissolve and close down companies and organizations after enjoying the tax-free tax holiday s policies provided by the host countries. This gains support from a study conducted by Borensztein et al. (1998), stating the significant positive contribution of foreign direct investment on economic growth. Again, Su and Liu (2016) prove that there is indeed a positive sign of foreign direct investment on economic growth. Evidence from Sunde (2017) in his study shows that there is a direct relationship between economic growth and foreign direct investment.

In Africa, a significant determinant of macroeconomics has been inflation since the rate of inflation is very high in most African countries. For example, the results above portray that inflation has a positive effect on growth, in the long run, meaning a percentage increase will result in upward growth in the economy. It means that inflation is a serious determinant of economic growth in Africa. The cost of production is relatively high when there is a high rate of inflation, leading to high economic growth. It can also show that statistically, inflation has a significant impact on economic growth when the prob value is considered. The outcome further proves that inflation is like a two-edged sword, which can be a determinant of economic growth and economic recession at the same time. For example, since there be present a positive connection between inflation and economic growth in these countries, the "bad era of double-digit inflation rate" could be effectively applied to wear away the debt load. In other words, instead of disbursing billions of dollars in negotiation for "debt forgiveness," the governments and administrations of countries should "inflate away her debt" (Osuala, Osuala, and Onyeike 2013). America did the same during the Great Depression, Second World war, and in the 1970s debilitating recession (Chiakwehi 2011). Studies by Appiah, Amoasi, and Frowne (2019), Barro (1995), and Jones and Manuelli (1995) confirm this outcome in their studies. Gokal and Hanif (2004) and Pollin and Zhu (2006) prove a contradicting result that inflation affects economic growth negatively at the time they investigated growth and the effects of inflation.

Labor force plays a very vital role in the economic growth of most African countries. For example, in the results above, there is a positive sign of labor on economic growth. It provides evidence that labor is significant at a significant level of 1%, stating that there was a significant effect of labor on economic growth in Africa from 1995 to 2015. This gained support by a study conducted by Kapsos (2005) and Khan (2007) who prove that the employment elasticity of GDP growth in emerging countries to be positive at the worldwide level, again studied that total employment has grown between 0.3 and 0.38 for every 1% additional increase of GDP growth.

In the same vein, it shows that none of the explanatory variables, except for foreign investment and trade openness, is a short term measure and determinant for economic growth. All the variables are insignificant at all levels being it 10%, 5%, and 1%, excluding inflation, which is significant at 5%.

For an increase in economic growth, governments and administrations should consider inflation as a crucial factor in the long run.

## 5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This study examined the effects of trade openness, foreign direct investment, inflation, and labor on economic growth in 5 emerging African countries. It used yearly data for all the countries involved in the period 1995 to 2015 and the panel ARDL technique. It found that during the study, trade openness and inflation have a positive relationship and effect on economic growth in the long run as well as in the short run. The variable of interest, thus, foreign investment and trade openness, exhibits a positive relationship with growth.

From the investigation, it provides evidence that foreign investment cannot only affect the determinant of economic growth but more than that. It is essential for governments and administrations, for foreign companies, and the full benefits of foreign investment, that the host countries should introduce policies like tax holidays and tax rebates to enable more inflows.

It suggests that there must be more efforts to be placed on the exportation of goods and services as done by developed countries. Countries should apply strategies to help local firms and companies in the production of goods to increase the balance of trade surplus.

Without the requisite skilled labor with the required techniques, foreign investment inflows will not be successful. It is, therefore, advisable for the governments and administrations to improve and empower the labor market for a full contribution to foreign inflows.

The study has limitations such as, firstly, it deals with the choice of countries which do not reflect the entire emerging African countries on the African continent due to the unavailability of data. Besides, the choice of variables could not explain the major macroeconomic determinants. It is therefore also advisable that future research on the contribution of foreign investment on growth in Africa should cover all emerging African countries and other macroeconomic indicators.



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