Volume: 4, Issue: 6
Page: 53-70
2020

ISSN 2520-4750 (Online) & ISSN 2521-3040 (Print)

International Journal of Science and Business

# The Impact of FDI and Foreign Aid on the Economic Growth: Empirical Evidence from Sub-Saharan African Countries

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**Abstract:**
Many are the presumptions of the effect of Foreign aid on growth on one side and the effect of Foreign Direct investment (FDI) on the other side. Our research empirically examines the impact of FDI and Foreign Aid on economic growth of Sub-Saharan African countries. To do so, we answer three questions: What drives the economic growth in Sub-Saharan Africa? What are the impacts of FDI and Foreign Aid on economic growth? and which relationship does exist in one part between FDI and economic growth and the other part between Foreign Aid and economic growth? To tackle our objectives we formulated four hypotheses with Gravity model and Two Stages Generalized Method of Moment analysis. Our findings lead us to conclude: Firstly, three fundamental factors responsible for the economic growth: the country fundamentals (the population, the capital formation), the governance implication (governance effectiveness, Regulatory Quality), and the macro stabilities (Foreign Direct Investment, Foreign Aid, Trade) are responsible and the key factors for the growth in SSA. Secondly, FDI and Aid have a positive and highly significant effect on the GDP. Thirdly, FDI and Aid have short run relationship with the economic growth. And fourthly, our result fall in line with others which have found that domestic factors are vital in promoting the growth effects of FDI. Nevertheless, the findings of this study diverge from others in the literature studies. Even though other researches in the literature works hypothesize that FDI has no absolute positive effect on growth, this study finds that FDI plays a direct role in promoting growth.

**IJSB**
Accepted 17 May 2020
Published 31 May 2020
DOI: 10.5281/zenodo.3870562

**Keywords**: FDI, Foreign Aid, Economic Growth, Sub-Saharan Africa, Governance Effectiveness, Regulatory Quality

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## 1. Introduction

The concern of sustainable economic growth leading to development in Sub-Saharan Africa (SSA) countries remains a critical defy not only for the local governments in this region of but also for international institutions. In their concern of helping developing nations, they have already set up the economic and social programs, mainly with countries in SSA region considered as one of the poorest in the world. These helps are known as Foreign aid, or Official Development Assistance (ODA). They are designed according to the Development Assistance Committee (DAC) as "government aid to encourage and promote the economic development and welfare of developing countries"(OECD, 2014).One gauge of the effectiveness of ODA is economic growth and has been established by abundant experimental studies to be an indispensable requirement for the accomplishment of constant economic development and poverty reduction (Dollar & Kraay, 2002). Even though the prerequisite of economic growth is unquestionable, the thought that foreign assistance is desirable to encourage growth in developing nations remains extremely contentious (Snowdon, 2009).
Since 1950s the link between foreign aid and economic growth has been the subject of myriad studies following the first success of the Marshall Plan, this contributes as proof for rebuilding Europe after the world war II. The first researchers were optimistic Papanek (1973); Clemens et al. (2004); Burnside and Dollar (2000); Karras, (2006) and Asteriou (2009), conversely, succeeding studies reached contradictory conclusions, with numerous notable cross-country studies resulting that aid, in fact, had a negative impact on growth (Griffin & Enos, 1970; Easterly, 1999, 2009; Bhandari, 2007). These days on average the aid is seen to be effective, although there is still much debate because of the conditional aspects surrounding the aids. There is a large portion of the current literature that is dedicated on finding the environment in which aid is most effective.

The Foreign Direct Investment (FDI) as is an investment made by a firm or individual in one country into business interests located in another country has been also subject of myriad studies because of the controversial point of views. In case of Africa, in the aftermath of independence, the governments viewed Foreign Aid and FDI with great suspicion. National sovereignty was in part threatened because of multinational enterprises which were suspected of diminishing social welfare through the manipulation of price transfers and the formation of enclaves. With the globalization of markets, globalization, and the production and internalization of monetary policies, a radical change in the attitude of the countries of sub-Saharan Africa has been noted. These countries are now obliged, today, to seek non-traditional and non-debt-generating sources of investment. So the orientation towards FDI has taken place. These investments are seen to be more stable and less sensitive to the various financial crises. Additional financing opportunities can be created without adding to a country's external debt. The countries of sub-Saharan Africa, with very insufficient domestic resources, often encounter problems in financing their economic activity just like most of the countries in transition. The use of international credits is for many of them limited by the level of their debt and, despite promises such as those that were launched in Monterrey (in 2002) which are slow to materialize, development aid remains insufficient . In addition, it does not have the same interests as FDI (foreign direct investment) which can generate technology transfers, learning effects and allow easier access to international markets. At the same time, in the context of the opening of the capital markets, foreign investments increased sharply during the 1990s, and until 2000, before decreasing in 2001 and 2002. The mistrust with which multinational firms had to face until the 1970s seems to have given way to strategies to attract FDI. The debate has shifted from considering the rights of countries and

the obligations of firms to that of the rights of firms and the obligations of host countries (Brewer & Young, 1999); Brewer & Young, 2011). Host countries compete to offer the most attractive legal environment (investment code), economic policies, and production conditions. Knowing that FDI plays very important role in accelerating growth and economic transformation, therefore some developing countries in general, and particularly in sub-Saharan Africa are putting all their effort to welcome them. However, it is essential to introduce FDI into the development strategies of developing countries. For Africa, particularly SUB-SAHARAN AFRICA, FDI plays an essential role, all the more since a reduction in the gap between savings and investments can be envisaged while providing the resources necessary to reach the Millennium Development Goals (MDGs). As the poverty rate is considerable in this region, the MDGs remain essential. Stimulating economic growth by creating jobs, FDI reduce the poverty rate.

Our paper, titled the impact of FDI and Foreign Aid on the Economic Growth: Empirical Evidence from Sub-Saharan African Countries will seek to answer three questions: (1) what drives the economic growth in Sub-Saharan Africa? (2)What are the impacts of FDI and Foreign Aid on economic growth? (3) Which relationship does exist in one hand between FDI and economic growth and the other hand between Foreign Aid and economic growth? The general objective of this thesis is to empirically examine the impact of FDI and Foreign Aid on economic growth of Sub-Saharan African countries. To do this, we will try to achieve the following objectives: to identify the drivers the economic growth in Sub-Saharan Africa; to analyze the impacts of FDI and Foreign Aid on economic growth; to determine relationship does exist in one hand between FDI and economic growth and the other hand between Foreign Aid and economic growth and to determine the channels through which FDI has impacted economic growth in sub-Saharan Africa (accumulation of productive capital and / or total factor productivity).

## 2. Literature Review

### 2.1 Relationship FDI and Economic Growth

The effects of FDI on the economic growth of developing countries and particularly those of sub-Saharan Africa show great curiosity and attract more and more actors in the literature. Despite the diversity of the methods to tackle the FDI impacts on the economic growth, the position remains different at the level of the scientific sphere on this subject. Some authors positively view the influence of FDI on economic growth, while others argue that FDI degrades economic growth. Concerning the sub-Saharan Africa countries, known to be rich because of the availability of raw materials and business opportunities are included among the most attractive regions, governments and scholars see in FDI an opportunity to boost their economic growth while others strongly disagree because of their impacts and the channels in when others see the opposite. One of the advantages of FDI in this region of Africa comes from the socio-economic fallout while the negative influence relates to the non-protest environment, as well as the lack of infrastructure. In this sense we will treat this part considering the earlier analysis on the relationship made between FDI and economic growth. Thus, the basic articles Borensztein et al. (1998) and Alfaro (2003) and those related to the theme of the study are discussed.

#### *2.1.1 The negative effects of FDI on economic growth*

In this part, we will try to synthesize the papers which count on the negative effects of FDI on economic growth. We can observe the negative influence for example on environmental

degradation, the monopolization of certain sectors, and bankruptcy of certain local businesses. Researchers such Aitken & Harrison (1999) focused on the impact of FDI on economic growth through a micro-study carried out on Venezuelan companies from 1979 to 1989. One of the most important analyzes in their paper talks about the impact of FDI on local firms. According to Aitken & Harrison (1999), to determine the impact of FDI, the size of the companies and the type of owner remain important. As a result, it can be deduced that the arrival of FDI has a negative influence on national companies. Chauvet & Mesplé-Somps (2007) econometrically analyzes the impact of four sources of international funding on the inequalities of developing countries: trade flows, FDI, official development assistance and migrants' private transfers. The author concluded that trade is good for the poor in middle-income countries; FDI increases inequality; public aid is favorable to the middle classes in democratic countries; and migrant transfers reduce inequality. Comparing two groups of non-industrialized countries, one with in contact of FDI and the second group not, Prasad et al. (2007) found a positive correlation between the current account balances and the growth of non-industrial countries with no contact with FDI. This implies that a reduction in dependence on foreign capital improves economic growth. Besides, he also found that the developing countries are nations with a limited capacity to absorb foreign resources because it is directed to the most productive or profitable investments. Bresser-Pereira & Gala (2008) showed that the rise in FDI in the form of foreign savings negatively influences the development of a country. They supported their idea by the fact that FDI in the form of foreign savings leads to an appreciation of the exchange rate, a rise in wages and an increase in consumption. For Bresser-Pereira and Gala a competitive exchange rate is necessary to promote economic growth. ILIE (2014) argues that, although FDI has a positive contribution to the economic development of host countries, the possibility of negative impacts should also not be excluded. The negative impacts of FDI can be seen in various aspects such as wages, repatriation of profits, environmental problems, which must be considered in determining the pros or cons of FDI. These factors include, among others, the type of foreign investment and the long or short-term goals of the companies. The most important side effect of poverty is the underdevelopment. Many governments to solve the issue of poverty have emboldened the inward foreign direct investments. The international economics is therefore an essential in the field to deal with facts and the side- effects of foreign direct investments. According to Görg & Greenaway (2004) the Inward FDI can benefit the workers and the host countries because the workers in foreign firms obtain more training (knowledge spillover) than in local firms and as a result higher wages and from the country's point of view, governments are bidding to the incapacity of multinationals to protect its superior technology and management. The effect of knowledge spillover because of the sophisticated level of productivity of foreign affiliates and relations between local firms, also increase the aggregate country's productivity. Later in 2005 Görg & Strobl (2005) experienced that the entrepreneurs whose are trained or worked for multinationals pass on the knowledge that they have acquired to their own new firms leading then to higher growth of productivity than the other local companies. Furthermore, Joanna Scott-Kennel in 2004 did a survey on New Zealand found that FDI are a catalyst for local firm development (Scott-Kennel, 2004). BOUZID (2016) empirically studied the effects of the process of financial liberalization on Tunisia's economic growth from 1980 to 2015, his findings stated a negative relationship between financial liberalization and economic growth. In addition, Granger's causality test allows the author to conclude that a unidirectional relationship between the two variables exists.

2.1.2 The positive effects of FDI on economic growth

Most authors acknowledge that FDI contributes to the economic growth of countries either directly or indirectly. Generally, the socio-economic and political aspects are the most affected by this contribution concerning the countries receiving FDI. According to Findlay, FDI conveys technological progress in host countries and the consideration of "technological catch-up" between investor and host countries effectively confirms a positive influence of FDI on economic growth due to the technological progress which is one of the growth stimulators (Findlay, 1978). Balasubramanyam et al. (1996) and Agrawal (2005) argued about the fact that the FDI inflows can probably affect growth in developing nations both ways and the positive effect is conditional to openness to international trade. The findings corroborates Bhagwati's hypothesis concerning the volume and efficiency of FDI in export promotion economies to be more likely to exceed their levels in import substitution countries (Bhagwati, 1978). Regarding the characteristics host country, Borensztein et al. (1998) argued that FDI is an important medium for technology transmission only when the host country's human capital stock attains a certain threshold. Current research made by Nair-Reichert & Weinhold (2001) in which they employed a sample of 24 developing countries, found a positive relationship between FDI to economic growth with FDI the beginning point. In the same way Makki & Somwaru (2004) have examined the impact of FDI on economic growth with a sample of 66 developing countries have identified FDI as the main source in stimulating domestic investment and growth.

An empirical research on Bangladesh carried out by Hussain & Haque (2016) discloses the existence of a relationship between FDI, trade, and growth rate of per capita GDP. Besides, they also showed that trade and FDI have a considerable impact on the growth rate of GDP per capita. Some authors have demonstrated that the inflow of FDI has improved the total Factor of production (TFP) growth in India through positive spillover effects (Choi & Baek, 2017). Prior to Choi & Baek, a research conducted by Chakraborty & Nunnenkamp in 2008 discovered that for the entire Indian economy, the stocks of FDI and output are co-integrated in the long run (Chakraborty & Nunnenkamp, 2008). Some papers focused their research on explaining the variations in FDI flows from advanced to developing countries ("International Monetary Fund", 2010). Their results revealed that low-income countries are particularly sensitive to changes in the cost of borrowing in advanced countries (a fall in the borrowing rate leads to an increase in FDI). They also indicated that an increase of one percentage point in the growth of developed countries is associated with an increase of more than 30% in FDI outflows within two years to developing countries. These results lead the authors to conclude that the economic conditions of the advanced countries are important factors in this explanation. Agbloyor et al. (2013) empirically explored the causal link between financial markets and FDI in Africa and deduced that developed banking and stock systems are a source of attraction for FDI and vice versa. This refers to significant bi-directional causality between FDI and the financial markets. In addition, going in the same direction as Kholdy & Sohrabian (2008) and Agbloyor et al. (2013) argued that FDI can boost financial development in Africa. The positive effect of FDI is strongly and statistically significant. Kamara (2013) conducted a research on the impact of FDI on the growth of 44 SSA countries from 1981 – 2010 with a generalized method of moments (GMM). He took into account the existence of four channels through which FDI can influence the economic growth. These channels are mainly the human capital, financial development, infrastructure, and institutions. The results showed that the financial development and institutions improve the positive effects of FDI on growth; while human capital and infrastructure deteriorate the effects of FDI on growth.

Some researcher like Pegkas (2015) disclosed that FDI has a positive and significant impact on economic growth as economic theory predicts. For that reason, FDI plays a major role in economic growth in Eurozone. Also the case of Malaysia showed that the FDI has been an important source of economic growth, conveying in technology, capital investment, and management knowledge. Another study on Malaysia regarding the relationship between FDI and economic growth from 1970-2005 done by Mun et al. (2008, 2009) employing time series data discovered the existence and the significance relationship between economic growth and FDI inflows; and FDI has a direct positive impact on Real GDP.

Posu et al. (2007) focused on the effects of the impact of FDI on economic growth for the case of Nigeria. He concluded that FDI flows are important in the development of the mining, transport and communication sectors, not in agriculture, forestry, and fishing. The results also revealed an increase in FDI in one of the sectors leading to an increase in economic growth. This justifies the promotion of the rules and laws attracting FDI led by the Nigerian government.

## 2.2 Relationship between Foreign Aid and Economic Growth

Widespread body of review from theoretical to empirical on foreign aid and economic growth exists. They can be separated into three groups, specifically; negative or insignificant effects on growth, positive effects of aid on growth, and positive effects but conditional to certain country specific conditions.

### *2.2.1 The negative effects of Foreign Aid on economic growth*

According to scholars that state that the foreign aid has a negative impact on the economic growth, it is because of the fact that foreign aid increases a government's resource envelope, which frequently leads to a reduced government efforts to revenue collection from taxation. There can be a decline according to Adam & O'Connell (1999) in the country's mechanism of raising tax, bring out the need for additional aid while scattering the short-term beneficial effects of aid and creating a culture of dependency. The majority of economists who rejected foreign aid as means of promoting economic prosperity in poor countries relate it with the decreasing of government discipline (Levy, 1988). For other supporters of negative influence of foreign aid to growth proved that a constant increase in foreign aid inflow could decrease long-run capital accumulation and labor supply of aid beneficiary countries and by addition may decrease their rate of economic growth.

### *2.2.2 The positive effects of Foreign Aid on economic growth*

The proof that advocates a positive role of foreign aid on economic growth is significantly based on previous growth models that presupposed that physical capital accumulation plays an important role in the promotion of economic growth of a country. The growth model developed by Harrod (1939) and Domar (1946) is the most broadly used model in the determination of the relationship between aid and growth. Two decades later Chenery & Strout (1966) have extended Harrod-Domar model to creat Two-Gap model. The extensions state that foreign aid plays a significant function of covering foreign exchanges and saving gaps that limit the growth of emergent countries. Chenery and Strout model are trusted to weaken the physical capital accumulation in developing countries. The studies done by DOWLING & HIEMENZ (1983); SINGH (1985); Levy (1988) and Ghura et al. (1994) have again and again confirmed the positive and signifance impact of foreign aid on economic growth of the recipient countries. Further, Nyoni (1998) clarified the correlation between real exchange rate and foreign aid inflows. He concluded based on his research that firstly due to trade inflows the economic performance of Tanzania was increased. Secondary, the devaluation of the local currency cause real depreciation, however there was real appreciation because of

the increase of government expenditures. Therefore, the general results demonstrate that foreign aid does not cause Dutch disease in Tanzania. As conclusion, Tanzania can continue to have foreign aid use it for productive investment. Irandoust & Ericsson (2005) have studied the long run relationship between foreign aid, domestic savings and economic growth for four West African countries and one from East Africa (Nigeria, Niger, Togo, Senegal and Rwanda) from 1965 to 2000. The found a positive relationship between foreign aid and economic growth; and also a positive relationship between domestic savings and growth with a long run positive correlation between foreign assistance and development of the recipient country. While studying the growth impact of official development assistance for developing countries, Minoiu & Reddy (2010) discovered that the developmental aid promotes long run growth and found the effect to be significant, large and robust to different specifications and estimation techniques. Siddique & Majeed (2015) stated while investigating the relationship between trade (exports plus imports) on economic growth that Trade is also an increasing factor of economic growth beside the Foreign aid.

## 3. Research method and Methodology

### 3.1 Model

To examine the effect of foreign aid and FDI on economic growth of Sub-Saharan African countries, the theoretical growth model is constructed as follows:

$$Y_{it} = A_{i,t}\, K_{di,t}^{\alpha}\, K_{fi,t}^{\lambda}\, L_{i,t}^{\beta} \qquad (1)$$

Whereby: Y stands for the flow of output, A states the total factor productivity (enlighten the involvement of elements or factors that are excluded to the model for the output growth), $K_d$ stands for the domestic capital while $K_f$ is the foreign capital flows, L represents the labor force, λ states the variation in output to changes in foreign capital stock, and β represents the output variations to labor force changes. The subscript I and t stand respectively for the SSA countries and time. We denote the above model as:

$$Growth_{it} = \beta_0 + \beta_1 AID_{i,t} + \beta_2 FDI_{i,t} + \lambda Z_i + \varepsilon_{i,t} \qquad (2)$$

Whereby:

Growth: stands for the per capita GDP growth,

AID: represents the flow of net official development assistance (ODA);

FDI: represents the Foreign Direct Investment; and

Z: is the vector of control variables which include the level of human capital (measured by life expectancy at birth), technological growth (measured in terms of country's openness to international trade), labor force (measured by the total number of people in the country) and Governance Indexes. Our model is re-specified following the assumption of Arellano & Bover (1995) and Blundell & Bond (1998) of the Generalized Method of Moments (GMM).

The model is as follows:

$$\log y_{i,t} = \beta_0 + \beta_1 \log(y_{i,t-1}) + \beta_2 x_{i,t} + \beta_3 Z_{i,t} + \beta_4 \eta^t + \mu_i + \varepsilon_{i,t} \qquad (3)$$

Whereby:

Y: symbolize growth of per capita GDP which is the explained variable of the model.

$y_{i,t-1}$: is the lagged of the dependent variable.

X: is the vector of the explanatory variables (aid and FDI) and

Z: is the vector for all control variables. The possible control variables are the population growth, trade openness, gross fixed capital formation, human capital and governance indicators.

$\eta^t$: stands for the time-specific effect. $\mu_i$: stands for the county-specific effect.

ε: is the error term, with $\varepsilon \sim IID(0,\sigma_\varepsilon)$ and $E(\mu_i \varepsilon_{i,t}) = 0$. Respectively i and t stand for to cross sectional units and time.

We will use the Generalize Method of Moment (GMM) because of its aptitude to capture the country specific effects and potential endogeneity problem may occur and because of some independent variables which will in return lead to simultaneity bias. While difference GMM advised by Arellano & Bond (1991) is capable to account the probable simultaneity bias and correlation among lagged dependent variable and error term with the use of lagged levels of independent variables as instruments, the truth is that the model will still suffer from several econometric problems. Blundell & Bond (1998) and Alonso-Borrego & Arellano (1999) stated that in asymptotic samples, the lagged instruments of difference GMM turn out to be weak thereby causing biasness in the parameter estimation. Standing on Arellano & Bond (1991) the typical GMM conditions of no second-order autocorrelation for this study can be set as follows:

$$E\left[y_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \ldots T \quad (4)$$

$$E\left[x_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \ldots T \quad (5)$$

$$E\left[Z_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \ldots T \quad (6)$$

The key to solve the biasness problem and imprecision caused by difference GMM is the use of the system GMM as suggested by Arellano & Bover (1995) and Blundell & Bond (1998). It uses the lagged first difference of the variables as instrument. Nevertheless, this will only be only valid with the restriction of initial condition as prescribed by growth theories, which include Solow Model (Solow, 1956), and endogenous growth theories. The new conditions based on Arellano & Bover (1995) and Blundell & Bond (1998) for equation 3 are represented in equation 7 to 9 below:

$$E\left[(y_{i,t-s} - y_{i,t-1})(\mu_i - \varepsilon_{i,t})\right] = 0 \text{ for } s = 1 \quad (7)$$

$$E\left[(x_{i,t-s} - x_{i,t-1})(\mu_i - \varepsilon_{i,t})\right] = 0 \text{ for } s = 1 \quad (8)$$

$$E\left[(Z_{i,t-s} - Z_{i,t-1})(\mu_i - \varepsilon_{i,t})\right] = 0 \text{ for } s = 1 \quad (9)$$

The previous condition implies that even if there is a correlation between the lagged country-specific effect and the levels of explanatory variables, this won't correlate with their differences. As conclusion the estimation of our system will be more efficient. In the same way, even if the initial values of the explanatory variables diverge from their long- run value, they won't methodically correlate with country-specific effect. However, there is possibility that our system GMM suffer from problem of optimal instrument identification. The GMM instruments are likely to be over identified causing thereby the problem of over fitting the estimated model (Roodman, 2009b, 2009a). Nevertheless, Hansen (1982) advised J-test to detect the over-identification problem in system GMM. The test is done under the hypothesis of the existence of validity for all instruments, with zero expectation of empirical moments. It follows the distribution of Chi-square in association with a degree of freedom equal to number of used instruments that over-identifies the restriction. Another issue is the associated system GMM is the potentiality of second-order serial correlation. Nonetheless, it can be easily detected throughout the test of the differenced error term. Therefore, we use system GMM approach in support of the condition presented by equation 2 to 7 in order to minimize potential biasness in the estimated coefficients. More purposely, we will employ the two-step GMM (system) instead of one-step because of the fact that the one-step GMM assumes homoscedasticity of error residuals whilst the two-step relaxes this assumption (Arellano & Bond, 1991).

### 3.2 Variables description

Following table gives description and explanation of the the dependent and independent variables chosen for the estimation and modeling of the regression analysis.

**Table 1 Description of variables**

| Variables Description | Definition of Variables | Expected Sign |
|---|---|---|
| **GDP** | It is the monetary value of all finished goods and services made within a country during a specific period. **GDP** provides an economic snapshot of a country, used to estimate the size of an economy and growth rate. | |
| **Trade** | Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources | + |
| **Foreign Aid** | It is money that one country voluntarily transfers to another, which can take the form of a gift, a grant or a loan. In the United States, the term usually refers only to military and economic assistance the federal government provides to other governments. | + |
| **FDI** | It is an investment in the form of a controlling ownership in a business in one country by an entity based in another country. It is thus distinguished from a foreign portfolio investment by a notion of direct control. | + |
| **Population growth** | The "population growth rate" is the rate at which the number of individuals in a population increases in a given time period, expressed as a fraction of the initial population. | +/- |
| **Capital Formation** | It is a term used to describe the net capital accumulation during an accounting period for a particular country. The term refers to additions of capital goods, such as equipment, tools, transportation assets, and electricity. | + |
| **Government Effectiveness** | Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5 | + |
| **Rule of Law** | Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. | + |
| **Control of Corruption** | Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5 | + |
| **Political Stability and Absence of Violence/Terrorism** | Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5 | + |
| **Regulatory Quality** | Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. | + |

## 3.3 Data

A secondary data is used for the analysis and estimations of the model. The panel data is collected from worldwide governance indicator of World Bank from 1990 to 2018.

## 4. Results and Discussion

Table 2 and Table 3 present the correlation matrix and descriptive summary of all the variables in the model respectively.

**Table 2 Correlation Matrix**

| | lngdp | lnnet_trade | lnnet_aid | lnfdi | lnpop | lnhum_cap | gov_ef | r_law | c_cor | pol_stab | reg_qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **lngdp** | 1.0000 | | | | | | | | | | |
| **lnnet_trade** | 0.7272 | 1.0000 | | | | | | | | | |
| **lnnet_aid** | 0.6132 | 0.2361 | 1.0000 | | | | | | | | |
| **lnfdi** | 0.7647 | 0.7282 | 0.4101 | 1.0000 | | | | | | | |
| **lnpop** | 0.7959 | 0.3792 | 0.8009 | 0.5253 | 1.0000 | | | | | | |
| **lnhum_cap** | 0.9842 | 0.7703 | 0.5437 | 0.7909 | 0.7434 | 1.0000 | | | | | |
| **gov_ef** | 0.0923 | -0.0696 | -0.2831 | -0.1013 | -0.1824 | 0.0960 | 1.0000 | | | | |
| **r_law** | -0.0082 | -0.0460 | -0.4228 | -0.1092 | -0.3776 | 0.0104 | 0.9227 | 1.0000 | | | |
| **c_cor** | -0.0196 | -0.1096 | -0.3424 | -0.1063 | -0.2925 | -0.00799 | 0.9449 | 0.9374 | 1.0000 | | |
| **pol_stab** | -0.3467 | -0.1923 | -0.6509 | -0.3384 | -0.6967 | -0.3267 | 0.6513 | 0.7644 | 0.6366 | 1.0000 | |
| **reg_qual** | 0.0695 | -0.0649 | -0.3270 | -0.1113 | -0.2318 | 0.0693 | 0.9432 | 0.9486 | 0.9120 | 0.6800 | 1.0000 |

**Source:** World Bank Data

**Table 3 Descriptive Statistics**

| VARIABLES | (1) N | (2) mean | (3) Sd | (4) min | (5) Max | (6) Var | (7) Skewn | (8) Kurt |
|---|---|---|---|---|---|---|---|---|
| **Lngdp** | 957 | 22.4811 | 1.5551501 | 19.14561 | 27.06627 | 2.407156 | .4803296 | 3.162383 |
| **lnnet_trade** | 219 | 20.8795 | 2.056967 | 13.97292 | 24.58167 | 4.231112 | -.5095393 | 3.173256 |
| **lnnet_aid** | 951 | 19.5052 | 1.254464 | 15.56645 | 23.15968 | 1.573681 | -.3495194 | 2.903588 |
| **Lnfdi** | 875 | 18.30938 | 2.384212 | 8.283456 | 23.02867 | 5.684465 | -.7730427 | 3.903826 |
| **Lnpop** | 957 | 15.70714 | 1.606723 | 11.14918 | 19.09299 | 2.581559 | -.5028855 | 3.057542 |
| **lnCap_Form** | 876 | 20.90284 | 1.74198 | 14.48867 | 25.1747 | 3.034495 | .1253929 | 2.928322 |
| **Gov_Ef** | 593 | -.6249809 | .619541 | -1.775537 | 1.056994 | .383831 | .5024504 | 2.619541 |
| **R_Law** | 594 | -.5641211 | .6548403 | -1.852296 | 1.07713 | .4288159 | .3823739 | 2.51279 |
| **C_Cor** | 594 | -.5716465 | .6448014 | -1.805882 | 1.216737 | .4157689 | .7725753 | 2.820441 |
| **Pol_Stab** | 594 | -.3799587 | .88827 | -2.665278 | 1.28206 | .7890236 | -.3777276 | 2.503198 |
| **Reg_Qual** | 594 | -.5779202 | .6045145 | -2.236245 | 1.12727 | .3654377 | .1432763 | 3.034227 |

The mean value for Gross Domestic Product is 22.48, the deviation from the sample mean is 1.55, the least value or the minimum in this series is 19.14 while the maximum value is 27.06, and the dispersion among the observation in this series which is the variance is 2.40. The skewness value is 0.48 and we know that the skewness measures the value of the degree of asymmetric of this particular series. For a normal skewness the value is 0, so we can easily say that the Gross Domestic Product mirrors a normal distribution. The Kurtosis is 3.16, and we know for a data should be normally distributed, the value of Kurtosis must be 3, so as the Kutosis is leptokurtic and long-right tail since the skewness is positive.

The same explanation goes for all the variables, which we can summarize in this term:

**Trade:** Long-left tail skewness and leptokurtic

**Foreign Aid:** Long-left tail skewness and platykurtic

**FDI:** Long-left tail skewness and leptokurtic

**Population:** Long-left tail skewness and leptokurtic

**Capital Formation:** Long-right tail skewness and platykurtic
**Government Effectiveness:** Long-right tail skewness and platykurtic
**Rule of Law:** Long-right tail skewness and platykurtic
**Control of Corruption:** Long-right tail skewness and platykurtic
**Political Stability:** Long-left tail skewness and platykurtic
**Regulation Quality:** Long-right tail skewness and platykurtic
The number of observations for most of the variables is different which is taken into consideration and adjusted for during the estimation of the model.

### 4.1 Final Estimates and Discussion

This section presents the results of the final estimations and indebt analysis and discussion on the various outcomes associated with the paper objectives and hypothesis. The results of a two-step generalize method of moment estimation output table are reported as follows:

**Table 4 Two-Step Generalize Method of Moments Estimations**

| VARIABLES | (1) Lngdp | (2) Lngdp | (3) Lngdp | (4) Lngdp | (5) Lngdp |
|---|---|---|---|---|---|
| Lnnet_trade | 0.0770*** | 0.0386** | -0.0121 | 0.0894*** | 0.0738*** |
| | (0.0191) | (0.0197) | (0.0200) | (0.0193) | (0.0197) |
| Lnnet_aid | 0.111*** | 0.106*** | 0.102*** | 0.120*** | 0.0489*** |
| | (0.0216) | (0.0258) | (0.0294) | (0.0219) | (0.0180) |
| Lnfdi | -0.0209* | 0.0218 | -0.0193 | -0.0118 | 0.0120 |
| | (0.0123) | (0.0187) | (0.0174) | (0.0127) | (0.0134) |
| Lnpop | 1.756*** | 0.132*** | 0.0636** | 1.154*** | 2.485*** |
| | (0.401) | (0.0410) | (0.0314) | (0.163) | (0.420) |
| LnCap_Form | 0.419*** | 0.730*** | 0.883*** | 0.567*** | 0.408*** |
| | (0.0627) | (0.0452) | (0.0342) | (0.0476) | (0.0722) |
| Gov_ef | | 0.181 | | | -0.357*** |
| | | (0.135) | | | (0.132) |
| R_law | | 0.335** | | | 0.161 |
| | | (0.151) | | | (0.132) |
| C_cor | | -0.363*** | | | -0.0241 |
| | | (0.117) | | | (0.0931) |
| Pol_stab | | -0.0986** | | | -0.00789 |
| | | (0.0476) | | | (0.0353) |
| Reg_qual | | 0.169 | | | 0.397*** |
| | | (0.118) | | | (0.0723) |
| Constant | -18.30*** | 2.224*** | 1.515*** | -12.42*** | -29.37*** |
| | (6.221) | (0.462) | (0.460) | (1.920) | (6.810) |
| Country FE | YES | NO | NO | NO | YES |
| Time FE | YES | NO | YES | YES | YES |
| Hansen's J | chi2(0) = 3.6e-27 | (p = 0.0) | | | |
| Wooldridge test | for autocorrelation F( 1, 7) = | 92.124 | Prob > F = 0.0 | | |
| Observations | 169 | 103 | 169 | 169 | 103 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Our table presents different manipulations of the Generalize Method of Moments. In all the regression we have employed the two-step GMM instead of one-step, because the one-step GMM assumes homoskedasticity of error residuals whilst the two-step relaxes this assumption (Arellano & Bond, 1991). Beside we performed the Wooldridge test for autocorrelation and the over identification test (Hansen's J) Hansen (1982) with consideration of the Control of the Country and Time specific effects. Our results, taking into account the column (2), except FDI, Government Effectiveness and Regulatory Quality, all our

variable are highly statistically significant but at different level. Due to the fact of not controlling the Country and Time specific effects we will only focus on the last column (Column 5). Regarding the column (5), out of ten (10) variables, six are highly and statistically significant at 1% though in different direction (Net Trade, Foreign Aid, Population, Capital formation, Government Effectiveness and Regulatory Quality. A percentage change in the Trade is associated with 0.0738 % change in the same direction with the GDP in the short run at the 1% significant level on average ceteris paribus with an inelastic relationship. Our result is confirmed by the study conducted by Oluwatoyin Matthew on Trade Openness, Institutions and Economic Growth in sub-Saharan Africa (SSA) (Matthew & Adegboye, 2014). The author discovered that trade and institutions exert some influences on the growth of countries. Nevertheless, proof showed that not much has been done in relating institutions to trade in SSA. Also on the Relationship between Trade Openness and Economic Growth: The Case of BRICS Countries, Batsi Shayanewako got the same result (Shayanewako, 2018). However, He got not only a long run relationship for the case of BRICS countries but also a bi-directional causality from trade openness to economic growth with the test of cointegration. We therefore advice since there is a need to guarantee that contracts are made effortlessly enforceable, it will be very important to improve this tool in order to permit the trade liberalization in SSA countries. The motivation behind is that it will make the economic agents concerned in international trade as they are sure that the adverse selection challenges and the moral hazards and are removed or reduced. On top of that the world will discover that it is easier to trade with countries that are reputed for adequate contract enforcement more than others that are not so reputable.

The Foreign Aid is statistically significant at 1% level meaning a unite change in Foreign Aid is associated with about 0.05 unite change in the same direction with the GDP in the short run on average ceteris paribus. Hence, The Foreign Aid and Growth exhibit an inelastic relationship. This finding is supported by the research conducted by Tait et al. (2016) on the "Foreign Aid and Economic Growth in Sub-Saharan Africa with objective to examine empirically through fixed effect panel data analysis, the impact of foreign aid on growth in SSA. He got the same answer which indicates that aid positively affects in the long-term per capita GDP growth over the period 1970 to 2012, and the impact is not subject to diminishing marginal returns, nor is conditional on the level of freedom in the country. In addition, Gyimah-Brempong (1992) also through his research titled the Aid and economic growth in LDCs: Evidence from Sub-Saharan Africa, investigated the effects of aid on economic growth in Sub-Saharan Africa with the use of a disaggregated cross-national time-series aid data and a Least Squares Dummy Variables (LSDV) model, he found that the aid has a small but positive and significant effect on economic growth SSA directly and indirectly through increased domestic savings and investment. Aye Mengistu Alemu in foreign aid on economic growth in Africa: a comparison of low and middle-income countries with a GMM technique got the same answer (Alemu & Lee, 2015). Thus, this study demonstrates that the appreciation of foreign aid is faulty, at least in the case of low-income African countries. In reality the foreign aid is playing a critical role in invigorating economic growth through additional domestic sources of finance namely savings, there should be a strong monitoring so that the Foreign aid can be used for it real purpose.

The Population Growth is statistically significant at 1% level meaning a percentage change in population growth is associated with about 2.485% change in the same direction with the GDP in the short run on average ceteris paribus. Hence, Population Growth and the GDP

exhibit an inelastic relationship. In fact the relationship between the Population Growth and Economics GDP shows that the Low population growth in develop countries is likely to create social and economic problems while high population growth in developing countries may slow their development. The migration could help in the adjustment of the imbalances observed in many countries, since the lower the population growth with a limited migration the higher the economic inequality. Since the relationship between population growth and economic growth is controversial.

A unite change of the capital formation will lead to about 0.4 change of the GDP in the same direction holding other factor constant. Since the capital formation is highly significant at 1% and both GDP and Capital Formation exhibit in the short run an inelastic relationship. This result is supported by the findings of Olawale O. Akindele who conducted a research on the causal relationship between capital formation and economic growth in Nigeria between the periods of 1981- 2009 (Akindele, 2010). He proved both in the short run and long run there exist a positive relationship between economic growth (GDP) and capital formation with a first difference co-integrate and stationary for the two variables. In addition, Octavia-Maria Gibescu in his investigation on the gross fixed capital formation represent as a factor for supporting the economic growth in Romania, Bulgaria, Czech Republic, Poland and Hungary for the period 2003-2009 found a direct and strong connection between economic growth and gross fixed capital formation (Gibescu, 2010). The evidence here is that the capital formation is an important agent for accomplishing long run economic growth. Therefore the Capital formation should be encourage by all means, for the reason that it will affect economic growth and development positively as it granger caused economic growth Akindele (2010) all essential policies and strategies have to be enforced by the SSA governments to bring about increase in capital formation from time to time.

The Government Effectiveness is statistically significant at 1%. As interpretation, if the present Government Effectiveness in all the SSA countries is increased by a percentage the GDP in the SSA countries will decrease by about 0.357% in the short run holding other factors constant. This explains how bad the rules of society are in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence are formulated and executed in SSA. The FDI can be more attracted if there is a reform in the administrative regarding this Index. The presence of institutional variables negative sign guides us to ask if the inverse relationship between governance and economic growth is in fact admitted by the studies done on "good governance" that improved its indices to be positively correlated with the growth of GDP per capita. Nevertheless, how the positive effect of these negative institutional indicators on economic growth could be explained? Researcher such as Bardhan, (1997) and Nahia (2011) demonstrated the likelihood of a positive effect on FDI in the degradation of institutional variables as the "quality control" and "control of corruption". Certainly, the corruption can be favorable to companies wishing to finance investment activities however, come up against bureaucratic challenges because of excessive government regulations. In these conditions, some companies are prepared to bribe to speed up administrative procedures. Paul Bardhan can believe the fact that the corruption in this shape generates a time saver because it plays the role of facilitator in administrative proceedings (Bardhan, 1997). Other empirical research namely the one did by Peter Egger and Hannes Winner maintains the view of a positive effect of corruption on direct investments flows (Egger & Winner, 2005). The study showed that corruption may affect

positively in a short-term the entry of direct investment flows. Though the Control of Corruption shows no impact on the GDP, the fact proved that it does in reality.
The Regulatory Quality is statistically significant at 1%. Holding other factors constant the Regulatory Quality goes in the same direction with the GDP. Meaning a percentage increase in the Regulatory Quality, will also see the GDP increase by about 0.4% (0.397%), on average in the short run. That more efficient institutional setting leads to a situation, in which environmental quality improves together with economic development. These results are strengthened by the work of Bassam A. AlBassam on the Relationship between Governance and Economic Growth during Times of Crisis found a positive relationship between the Regulatory Quality and GDP (Al-Bassam, 2013).

## 5. Conclusion

In our research with a general objective to empirically examine the impact of FDI and Foreign Aid on economic growth of Sub-Saharan African countries, we answered three questions: What drives the economic growth in Sub-Saharan Africa; what are the impacts of FDI and Foreign Aid on economic growth and which relationship does exist in one hand between FDI and economic growth and the other hand between Foreign Aid and economic growth. Our findings lead us to conclude: In the case of our first objective which is to identify the drivers the economic growth in Sub-Saharan Africa, we discovered that the three fundamental factors that are responsible for the economic growth: the country fundamentals (the population, the capital formation), the governance implication (governance effectiveness, Regulatory Quality) and the macro stabilities (Foreign Direct Investment, Foreign Aid, Trade) are responsible and the key factors for the growth in SSA. Concerning the second objective: to analyze the impacts of FDI and Foreign Aid on economic growth. We find that both have positive and highly significance impact on the GDP. For the third objective expressed as to determine relationship does exist in one hand between FDI and economic growth and the other hand between Foreign Aid and economic growth. We discovered that both Foreign Direct investment and Foreign Aid have a positive and short run relationship with the economic growth. And for the last objective which is the forth to determine the channels through which FDI has impacted economic growth in sub-Saharan Africa (accumulation of productive capital and / or total factor productivity) our result fall in line with others which have found that domestic factors are vital in promoting the growth effects of FDI. Nevertheless, the findings of this study diverge from others in the literature. Even though other researches in the literature hypothesize that FDI has none absolute positive effect on growth, this study finds that FDI plays a direct role in promoting growth. The governments of the SSA countries need to be more involved in the daily life of the population in other to teach and educate thee for a better perception to which agents trust will be abided by the principles and rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Our results show that more efforts need to be done for the betterment of the institutional quality considering each sector's particularity. However, the most fundamental question one can ask concerned what we daily basics observe the efficiency of the aid and the poverty in Africa. Further, are there some facts that can be incorporated for future studies?

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**Cite this article:**

**Afolabi Tunde Ahmed & Imran Ur Rahman (2020).** The Impact of FDI and Foreign Aid on the Economic Growth: Empirical Evidence from Sub-Saharan African Countries. ***International Journal of Science and Business,*** *4*(6), 53-70. doi: https://doi.org/10.5281/zenodo.3870562

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