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# Assessing the Impact of Foreign Direct Investment on Economic Growth in Sub-Saharan Africa: A Multi-Model Approach

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**Abstract**

This study seeks to investigate the effect of foreign direct investment (FDI) on economic growth across a sample of African countries, utilizing a multi-model econometric approach, an exploratory literature review, and a descriptive empirical framework. This research distinguishes itself from prior studies in several key ways: (1) it is the first to analyze the relationship between economic growth in sub-Saharan Africa and a range of variables, including GDP, FDI, gross fixed capital formation, trade, labor, debt, government effectiveness, rule of law, control of corruption, political stability, absence of violence/terrorism, regulatory quality, and voice of accountability; (2) it incorporates the most recent data available; (3) it presents findings using stacked data; (4) it utilizes various proxies for factors influencing FDI; and (5) it employs a comprehensive econometric analysis with over a dozen unit root tests. The literature review was conducted using qualitative analysis, drawing from extensive databases. The study utilized secondary panel data spanning from 1996 to 2020 (24 years), sourced from the World Development Indicators. Quantitative analysis was performed using the Two-Stage Generalized Method of Moments (2SGMM) regression technique, alongside multiple tests. The findings indicate a positive impact of FDI on economic growth in sub-Saharan Africa. The results suggest that FDI not only contributes positively to economic development but also warrants promotion and encouragement. The study concludes by recommending that governments in developing countries create favorable conditions to attract FDI for their economic advancement.

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## 1. Introduction

Foreign Direct Investment (FDI) is the word used to describe a long-term investment made in a business in a different country that results in a lasting relationship and has a significant influence on the overseas business. FDI often happens as a result of mergers, acquisitions, greenfield investments, or the establishment of the investor's company operations in the foreign economy. FDI refers to a situation in which a multinational corporation controls facilities in another nation. A foreign entity is typically deemed to have some control and significant influence when it holds more than 10% of the value of a foreign company; this is regarded as a direct investment. Saraçi (2014) notes that the English were pioneers in providing outward FDI through loans, which were

utilized to fuel economic development and accumulate financial assets in the countries they colonized. This outward FDI was invested in various sectors across numerous economies. Inward stocks represent all direct investments made by non-residents within a reporting economy, whereas outward stocks refer to the direct investments made by the reporting economy in other countries. Over the years, there has been an ongoing debate by scholars about the positive and negative impacts of FDI. While some agree that FDI is good for economic development, others disagree. FDI can be very controversial (Masipa, 2018). In large part, developing countries worry about multinational cooperations owing more control over the activities inside the economy. In the developed economies, there is worry about the offshoring of activities by multinational cooperations. There are controversies on both sides regarding whether a country is developed or developing.

Economic theories suggest that foreign direct investment (FDI) is a crucial driver of economic growth (Mengistu & Adams, 2007). However, there remains considerable debate among researchers regarding the direct impact of FDI on economic growth. A significant area of contention is the host countries' capacity to effectively absorb and utilize FDI (Borensztein et al., 1998; Emamverdi & Boland-Ghamat, 2019; Sahu, 2021; Ajudua & Devis, 2015; Makuei, 2019; Ramzan, 2019; Tsaurai, 2017; Asongu et al., 2022; Rao et al., 2021; Herve, 2016; Babawulle, 2020; Asamoah et al., 2019; Abdulsalam et al., 2021; Adi & Rossi, 2016). In contrast, industrialized nations attract FDI to accelerate industrial development, promote sustainable economic growth, and reduce unemployment, particularly when domestic investment is lacking (Hussain & Haque, 2016). According to Sutton et al. (2016), foreign direct investment (FDI) has the potential to drive industrialization and structural development in Africa, generating new employment opportunities. However, this potential can only be realized if issues related to institutions, infrastructure, and incentives are effectively addressed to attract more FDI. In this study, the researcher reviews a broad range of literature from various global regions to assess the impact of FDI on economic development, with a particular emphasis on developing countries, and a more focused analysis of Sub-Saharan Africa.

The objective of the current study is to critically examine the impact of Foreign Direct Investment (FDI) on economic growth in selected Sub-Saharan African countries. This research aims to provide a detailed understanding of how FDI influences economic performance in this region. To guide this investigation, two key research questions are posed: Firstly, does FDI have a positive or negative effect on the economic growth of Sub-Saharan countries? Secondly, what is the overall impact of FDI on economic development in developing countries, and should it be encouraged or limited?

## 2. Literature Review

### 2.1. FDI Policies and their Impact on Economic Growth

**Neoclassical Theory** - The neoclassical theory suggests that FDI fosters economic growth by facilitating the transfer of technology and knowledge across borders (Solow, 1956). Complementing this, endogenous growth theories, notably Romer's (1990) model, highlight the significance of human capital and innovation in driving economic development through FDI.

**FDI Policies and Economic Development** - The UNCTAD 2020 report mentions a variety of FDI policies countries implement to encourage economic development, including investment promotion policies, trade liberalization policies, and institutional reforms. These policies shape the conditions under which FDI helps grow economics (Alfaro et al., 2004).

**Regional and Sectoral Variations** - There's a huge difference between regional and sectoral FDI policies. For example, ASEAN countries have seen different outcomes due to different policy approaches. It's easy to see how industry-specific policies shape FDI's impact in case studies like the telecommunications sector in India (Kumar & Agarwal, 2005).

**Challenges and Criticisms** - There are challenges and criticisms to foreign direct investment, even though it's supposed to boost economic development. FDI policy implementation is complicated, according to Ghosh 2002, because of dependency issues (Ghosh, 2002), potential

negative effects on domestic industries (Rodrik, 2007), and ethical concerns about resource exploitation.

### 2.2. Empirical Literature

The association between FDI and economic growth has been extensively researched, uncovering a complex interplay influenced by regional contexts, institutional quality, and economic policies. A review of recent studies highlights the diverse impacts and nuances across different settings. Logun (2020) employed the Panel ARDL approach to examine the interaction between FDI, exports, and economic growth in seven emerging economies from 1992 to 2018. The study found that disturbances in GDP were corrected by 0.86% within the first year. It identified a one-way causality from economic growth to exports and a causal relationship between FDI and exports, demonstrating the interconnected nature of these variables. Additionally, Adeniyi (2020) examined how FDI and inflation influence economic growth in five African countries. The findings indicated that while FDI generally positively affected economic growth, inflation had a detrimental effect in most countries. The study recommended creating a favorable environment for FDI and controlling inflation to optimize growth. Emamverdi and Boland-Ghamat (2019) explored the asymmetric effects of FDI on economic growth in OPEC and OECD countries. They discovered that FDI had a limited effect on OPEC countries due to lower financial development, whereas OECD countries experienced a consistently positive impact, highlighting the role of financial development in mediating FDI effects. Also, Agbloyor et al. (2016) observed the role of institutions in the FDI-growth relationship in Sub-Saharan Africa. Their study found that while institutions directly fostered economic growth, their impact on enhancing the FDI-growth relationship was not significant, suggesting that institutional quality alone may not fully leverage FDI benefits. Agyapong et al. (2016) assessed the effects of organized crime and FDI on economic growth in Ghana. They found that organized crime negatively impacted growth, while FDI had a positive effect, illustrating the complex environment in which FDI operates, influenced by both economic and social factors. Dankyi et al. (2022) studied the interaction between human capital, FDI, and economic growth in ECOWAS countries. Their results showed that human capital development, alongside FDI, CO2 emissions, and urbanization, significantly influenced economic growth, suggesting that prioritizing human capital investments could enhance FDI benefits. Additionally, Muazu and Acquah (2021) employed panel Granger causality tests to analyze the relationships between FDI, economic growth, and financial sector development in 45 African countries. They identified feedback loops among these variables, indicating that the impact of FDI on growth depends on financial sector development. Okere et al. (2022) used augmented ARDL methods to investigate the effects of trade openness and FDI on Nigeria's economic growth during global crises. They found that global financial crises weakened the positive relationships between trade, FDI, and growth, suggesting the need for policy measures to mitigate such impacts. Sahu (2021) applied pooled mean group regression to explore FDI's impact on economic growth in 45 developing countries. The study found that FDI positively influenced GDP per capita growth in both the short and long term, with more pronounced effects in emerging markets, especially in Asia and Africa. Makuei (2019) assessed the impact of Chinese FDI on economic growth in Sub-Saharan Africa. The study revealed a generally positive effect of Chinese investments on economic performance, demonstrating the significant role of external investment in the region's growth. Ramzan et al. (2019) explored how human capital development affects the relationship between FDI and economic growth in 70 developing countries. They identified a human capital threshold above which FDI positively impacts growth, emphasizing the need for investing in human capital to harness FDI benefits. Also, Tsaurai (2017) analyzed FDI determinants in BRICS countries and found that economic growth, trade openness, and exchange rate stability positively impacted FDI. However, inflation negatively affected FDI, highlighting the importance of stable economic conditions for attracting investment. Zubairu et al. (2016) investigated the relationship between FDI and export performance in Nigeria. They identified a long-term equilibrium relationship between FDI and exports, although short-term causal effects were less significant. Asongu et al. (2022) examined the impact of FDI on total factor productivity (TFP) and economic growth across

25 Sub-Saharan African countries. The study found that while FDI positively influenced GDP growth, its effect on TFP and economic growth dynamics was moderated by the value added from various economic sectors. Babuwalle (2020) utilized an unrestricted vector autoregressive model to analyze the impact of FDI on economic growth in Nigeria. Contrary to theoretical expectations, the study found a negative impact of FDI on growth, suggesting that other factors might be at play. Additionally, Meldebra and Abd Hakim (2019) investigated how different entry modes of FDI affect unemployment across 25 Asian countries. The results showed mixed effects: FDI had a significantly negative impact on unemployment in developed countries but an insignificant positive effect in developing countries. Onuoha et al. (2018) used ARDL and Granger causality methods to analyze the relationship between FDI and macroeconomic variables in West Africa. The study found that FDI positively impacted economic growth and reduced unemployment in the long run, with significant corrections in short-term imbalances. Abdulsalam et al. (2021) analyzed the impact of Chinese outward FDI on economic growth in Asia and North Africa within the Belt and Road Initiative framework. They found a generally positive, albeit weak, impact of Chinese investments on economic growth, with trade openness showing a consistently positive effect. Sinha and Sengupta (2020) explored the relationship between FDI and trade in services in India. They found a unidirectional causality from FDI inflows to increased service exports, highlighting the role of FDI in boosting the service sector's contribution to economic growth. Saleem et al. (2020) used bootstrap ARDL testing to investigate the dynamics among FDI, trade openness, and economic growth in South Asia. They found significant long-term relationships between FDI, trade openness, and growth, with trade openness being crucial for economic expansion. Asamoah et al. (2019) employed structural equation modeling to assess the role of institutions in the FDI-growth relationship in Sub-Saharan Africa. The study revealed that while strong institutions positively impacted economic growth, their role in enhancing the FDI-growth relationship was limited. Rao et al. (2020) examined the interplay between foreign aid, FDI, and economic growth in South-East Asia and South Asia. They found that while FDI positively influenced economic growth, foreign aid had a negative impact, emphasizing the importance of effective government financial support for domestic investment. Quynh et al. (2016) assessed how FDI affects global value chains in Vietnam and other developing countries. The study found significant effects of FDI on Trade in Value Added (TiVA), with varying impacts across different contexts and time periods.

As can be seen above, some studies finding suggest a positive effect of FDI on growth, as seen in Adeniyi (2020), Emamverdi & Boland-Ghamat (2019), Sahu, J. P. (2021), Mengistu & Adams (2007), Ajudua & Devis (2015), Makuei (2019). Ramzan (2019), Tsaurai (2017), Asongu et al (2022), Abdulsalam et al. (2021), & Rao et al. (2021). Contrary to that, others reported no significant impact or negative effect of FDI on economic development, as seen by Herve (2016), Babawulle (2020), Asamoah et al. (2019), & Adi & Rossi(2016).

## 3. Research Methodology

Although numerous studies have explored the association between FDI and economic development, many have not utilized the most recent and comprehensive data. This study aims to address this gap by using the latest data available from 1996 to 2020 to estimate the influence of FDI on GDP. This research distinguishes itself from previous studies in several key ways: (1) it is the first to assess how a combination of factors—including GDP, FDI, Gross Fixed Capital Formation, Rule of Law, Trade, Labour, Debt, Government Effectiveness, Political Stability, Control of Corruption, Regulatory Quality, Absence of Violence/Terrorism, and Voice of Accountability affects economic growth in Sub-Saharan Africa; (2) it uses the most up-to-date data; (3) it employs a range of proxies for variables influencing FDI; (4) it applies a multi-model econometric approach with various tests; and (5) it adopts a stacked data presentation method.

### 3.1. Empirical Framework

This study employs a multi-model econometric approach alongside a descriptive design. GDP data and other relevant information were sourced from the World Development Indicators, covering a period from 1996 to 2020 (24 years). The analysis focuses on selected developing countries in Sub-Saharan Africa, specifically Benin, Gambia, Côte d'Ivoire, Guinea, Burkina Faso, Mali, Ghana, Nigeria, Mauritania, Togo, Sierra Leone, Senegal, and Niger.

### 3.2. Research Methodology

This study utilized quantitative research methods. The initial phase included a preliminary research assessment, formulation of research questions and objectives, and an extensive literature review through various databases. To address the primary research question and objectives, the study employed quantitative secondary data from 13 African countries over a 24-year period, spanning from 1996 to 2020. Data were collected through desk research and internet sources, with panel data obtained from the World Bank's World Development Indicators. The analysis was performed using Stata version 14, applying descriptive statistics for the evaluation.

### 3.3. Model Specification

To respond to the FDI dependence model, many control variables were added to the measurement model, including trade, debt, institutional quality, and gross fixed capital formation (GFCF). According to Ndambendia and Njoupouognigni (2010), FDI influences foreign exchange rates, suggesting a positive impact from FDI. In contrast, Gross Fixed Capital Formation (GFCF) reflects the investment in capital goods and the labor force within a country (Bloom and Sachs, 1998; Dalgaard et al., 2004), which is expected to enhance economic growth. Therefore, a positive GFCF value is anticipated. To facilitate measurement, the variables were transformed into their logarithmic forms. Many previous studies have extensively utilized aspects of this model, such as FDI, GFCF, trade, and debt (e.g., Cungu and Swinnen, 2003; Morrissey, 2001; Wu and Hsu, 2009; Rajan and Subramanian, 2008; Hossain and Mitra, 2013).

The model is shown as follows:

**GDP= f (FDI, GFCF, Trade, Debt ....** **(4.1)**

Regression models were employed to evaluate the effect of FDI on economic growth as follows:

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 FDI_{it} + \delta_i X_{it} + \tau_i + w_{it}} \quad (\mathbf{4.2})$$

With $\boldsymbol{w_{it} = \mu_i + \varepsilon_{it}}$

Whereby

$Y_{it}$ represents the Real GDP per Capita

$FDI_{it}$ represents the Foreign Direct Investment net inflow in in selected developing countries in Sub-Sahara

$X_{it}$ characterizes the vector of control variables

$\beta_0$ Stands for the country specific intercept

$\beta_1$ And $\delta_i$ are the coefficients will be measured including the intercept

$\boldsymbol{\tau_i}$ stands time period effects

$w_{it}$= stands for both country effects and $\mu_i$ the remainder error term which varies over both country and time $\varepsilon_{it}$

The subscript $i$=1, 2, …, N represents the in selected developing Sub-Sahara's countries indication ant $t$= is the time period considered.

To control the impact of other potential variables and their complementary effect on the economic growth, the equation (4.2) is extended as follows:

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GFCF_{it} + \beta_3 Trade_{it} + \beta_1 Debt_{it} + \delta_i X_{it} + \tau_i + \mu_i + \varepsilon_{it}} \quad (\mathbf{4.3})$$

With $\boldsymbol{w_{it} = \mu_i + \varepsilon_{it}}$

Whereby
$GFCF_{it}$ represent the Gross Fixed Capital Formation;
$Trade_{it}$ stands for the trade of the in selected developing countries in Sub-Sahara.
$Debt_{it}$ stands for the External debt stocks, long-term.
The current study used the Two-Stage Generalized Method of Moments (2SGMM), a technique introduced by Blundell and Bond (1998), Arellano and Bover (1995), and Arellano and Bond (1991), to tackle various economic issues such as heteroscedasticity, over-identification, endogeneity,validity, and robustness. This method allows us to estimate the value of the following variable:

$$\boldsymbol{Y_{it} = \gamma Y_{it-1} + \beta_0 + \beta_1 FDI_{it} + \beta_2 GFCF_{it} + \beta_3 Trade_{it} + \beta_1 Debt_{it} + \delta_i X_{it} + \tau_i + \mu_i + \varepsilon_{it}} \quad (\mathbf{4.4})$$

Whereby the coefficient $\gamma$ is the adjustment parameter.
The Generalized Method of Moments (GMM) is utilized to tackle potential endogeneity problems associated with the lagged dependent variable in a dynamic panel model, especially when there is a correlation between the explanatory variable and the error term. Furthermore, GMM aids in controlling for omitted variable bias, unobserved panel heterogeneity, and measurement errors in the data.

**Empirical Result**
Descriptive Statistics

**Table 3.1 : Descriptive Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| lngdp | 325 | 22.81207 | 1.414728 | 20.00385 | 27.02712 |
| lnfdi | 296 | 18.82462 | 1.911572 | 11.56062 | 22.90267 |
| lntrade | 324 | 4.015115 | .317102 | 3.031221 | 4.754008 |
| lnaid | 307 | 17.7048 | 1.067392 | 14.19395 | 19.5482 |
| lndebt | 325 | 21.8959 | 1.100968 | 19.81159 | 24.97988 |
| lngcfc | 323 | 21.15701 | 1.617559 | 14.48867 | 25.54222 |
| lnpop | 325 | 16.23457 | 1.051431 | 13.96745 | 19.14406 |
| gov_eff | 286 | -.7535609 | .3689079 | -1.553384 | .1603275 |
| r_l | 286 | -.6482353 | .419915 | -1.537978 | .2687913 |
| c_c | 286 | -.5993442 | .3777814 | -1.431231 | .4016672 |
| v_acc | 286 | -.3532833 | .5489863 | -1.553702 | .5982543 |
| reg_qual | 286 | -.5757355 | .3203989 | -1.529432 | .1281278 |

**Source :** Author

**Table 3. 2 : Correlation Matrix**

| | lngdp | lnfdi | lntrade | lnaid | lndebt | lngcfc | lnpop | gov_eff | r_l | c_c | v_acc | reg_qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| lngdp | 1.0000 | | | | | | | | | | | |
| lnfdi | 0.7406 | 1.0000 | | | | | | | | | | |
| lntrade | -0.1896 | 0.1095 | 1.0000 | | | | | | | | | |
| lnaid | 0.5045 | 0.3552 | -0.1710 | 1.0000 | | | | | | | | |
| lndebt | 0.8693 | 0.6172 | -0.0610 | 0.3164 | 1.0000 | | | | | | | |
| lngcfc | 0.9687 | 0.7577 | -0.0916 | 0.5381 | 0.8449 | 1.0000 | | | | | | |
| lnpop | 0.9154 | 0.6016 | -0.3075 | 0.5254 | 0.8053 | 0.8677 | 1.0000 | | | | | |
| gov_eff | 0.2868 | 0.2196 | -0.0363 | 0.1007 | 0.3156 | 0.2866 | 0.1778 | 1.0000 | | | | |
| r_l | 0.1478 | 0.1803 | 0.0677 | 0.0504 | 0.1407 | 0.1550 | 0.0470 | 0.8051 | 1.0000 | | | |
| c_c | 0.4314 | 0.2759 | -0.1549 | 0.1539 | 0.3983 | 0.3894 | 0.3636 | 0.7592 | 0.7680 | 1.0000 | | |
| v_acc | 0.5179 | 0.4472 | -0.0949 | 0.4548 | 0.4301 | 0.5240 | 0.4871 | 0.6371 | 0.6889 | 0.6871 | 1.0000 | |
| reg_qual | 0.1508 | 0.1612 | 0.0826 | 0.0680 | 0.1467 | 0.1759 | 0.0339 | 0.8041 | 0.8096 | 0.6820 | 0.5268 | 1.0000 |

**Source:** Author's computation

### 3.4. Heterogeneity test

The heterogeneity test is employed to assess whether the variances of different groups or observations are unequal. This test is crucial because it identifies heteroskedasticity, a condition where the variability of the error terms differs across observations, leading to inefficiencies in statistical estimates. Heteroskedasticity arises when the spread or dispersion of the dependent

variable is not constant across all levels of the independent variables. Specifically, in statistical models, it indicates that the variance of the errors is not uniform, which can lead to biased or inefficient parameter estimates. Since the core of this issue is the variance rather than the mean, the heterogeneity test focuses on detecting unequal variances among different groups or observations. Identifying and correcting for heteroskedasticity is essential because it ensures that the standard errors of the estimates are accurate, which in turn affects the reliability of hypothesis tests and confidence intervals. By using the heterogeneity test, researchers can determine whether the assumption of constant variance holds and make necessary adjustments to improve the robustness and validity of their econometric models.

### 3.5. Breusch Pegan test

The idea behind this test is that we regress the square residual from the original model on all the explanatory variables and test for the overall significance of the new regression. If we find that there is a join significant, we conclude that explanatory variables have an effect on the variance of the error term and therefore there is heteroskedasticity.

**Table 3.3: Breusch Pegan test**

| Source | SS | df | MS | Number of Obs = 334 |
|---|---|---|---|---|
| Model | 6.20468011 | 10 | .620468011 | F(2,347) = 6.88 |
| Residual | 29.1374724 | 323 | .090208893 | Prob > F =0.000 |
| Total | 35.3421525 | 333 | .10613259 | R-squared = 0.1756 |
| | | | | Adj R-squared = 0.1500 |
| | | | | Root MSE = .30035 |

**Source:** Author's computation

The F-statistic=6.88 with a p-value of 0.000 which is below 1%, which leads to a strong rejection of the Null Hypothesis (presented in table 3.3). We conclude that there is heteroskedasticity in our model.

### 3.6. White Test

The idea behind the whit test is to check if the variance of the errors in a regression is constant and it is done by regressing the square value on the predictor.

**Table 3. 4: White Test**

| Source | SS | df | MS | Number of Obs = 334 |
|---|---|---|---|---|
| Model | 1.41478305 | 2 | .707391524 | F (2,347) = 6.90 |
| Residual | 33.9273694 | 331 | .102499606 | Prob > F = 0.0012 |
| Total | 35.3421525 | 333 | .10613259 | R-squared =0.0400 |
| | | | | Root MSE = .32016 |
| | | | | Adj R-squared = 0.0342 |

**Source:** Author's computation

The F-statistic=6.9 with a p-value of 0.0012 which is below 1%, which again leads to a strong rejection of the Null Hypothesis (presented in table 3.4). We conclude that there is heteroskedasticity in our model.

### 3.7. Unit Root Test Unit Roots Test of selected variables

#### *3.7.1.* Levin-Lin-Chu unit-root test for GDP

**Table 3. 5:** Levin-Lin-Chu unit-root test

| | |
|---|---|
| Ho: Panels contain unit roots | The number of panels = 14 |
| Ha: Panels are stationary | Total number of periods = 25 |
| AR parameter: Common | Asymptotics: N/T -> 0 |
| Time trend: Not included | |
| ADF regressions: 1 lag | |
| Panel means: Included | |
| LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC) | |

| Statistic | p-value | |
|---|---|---|
| Unadjusted t | -3.9889 | |
| Adjusted t* | -2.3555 | 0.0092 |

**Source:** Author's computation

We reject the null hypothesis because the probability is too small 0.0092 meaning the GDP doesn't contain unit root at level in other word the GDP is stationary (presented in table 3.5).

Let us now check the first difference of GDP (D.GDP)

**Table 3.6:** Levin-Lin-Chu unit-root test for D.GDP

| | | |
|---|---|---|
| Ho: Panels contain unit roots | The number of panels = 14 | |
| Ha: Panels are stationary | Total number of periods = 24 | |
| AR parameter: Common | Asymptotics: N/T -> 0 | |
| Time trend: Not included | | |
| ADF regressions: 1 lag | | |
| Panel means: Included | | |
| LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC) | | |
| Statistic | p-value | |
| Unadjusted t | -13.4009 | |
| Adjusted t* | -8.0181 | 0.0000 |

**Source:** Author's computation

Again, the p-value is less than 5%, we reject the null hypothesis meaning that first difference of GDP doesn't have unit root meaning it is stationary.

**Hadri LM test for GDP**

**Table 3.7:** Hadri LM Test

| | | |
|---|---|---|
| Ho: All panels are stationary | The number of panels = 14 | |
| Ha: Some panels contain unit roots | Total number of periods = 25 | |
| Heteroskedasticity: Not robust | Sequentially | |
| Time trend: Not included | Asymptotics: T, N -> Infinity | |
| ADF regressions: 1 lag | | |
| LR variance: (not used) | | |
| LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC) | | |
| | Statistic | p-value |
| Z | 53.0066 | 0.0000 |

**Source:** Author's computation

The result (table 3.7) shows that the p-value is less than 5%, we reject the null hypothesis meaning according to Hadri LM test the GDP at level contain unit root. Let us now check the first difference of GDP (D.GDP).

**Table 3.8:** Hadri LM test for D.GDP

| | | |
|---|---|---|
| Ho: All panels are stationary | Number of panels = 14 | |
| Ha: Some panels contain unit roots | Number of periods = 24 | |
| Heteroskedasticity: Not robust | Sequentially | |
| Time trend: Not included | Asymptotics: T, N -> Infinity | |
| ADF regressions: 1 lag | | |
| LR variance: (not used) | | |
| LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC) | | |
| | Statistic | p-value |
| z | 0.6122 | 0.2702 |

**Source:** Author's computation

The result (table 3.8) shows that the p-value is more than 5%, we accept the null hypothesis meaning according to Hadri LM test the GDP at first difference doesn't contain unit root. It is then

stationary. In conclusion, by taking Levin-Lin-Chu unit-root test as benchmark, GDP doesn't contain unit root both at level and at first difference.

### *3.7.2.* Summary Rest of the Unit Root Test

**Table 3.9:** Unit Root TEST

| Selected Variables | **UNIT ROOT TEST** **Levin-Lin-Chu unit-root test** | | | **Hadri LM test** | | | |
|---|---|---|---|---|---|---|---|
| | Statistic | P-value | Conclusion | Statistic | P-value | Conclusion | Both Level |
| FDI | -0.3289 | 0.3711 | unit roots | 24.1232 | 0.0000 | unit roots | unit roots |
| D.FDI | -6.6175 | 0.0000 | stationary | -0.2327 | 0.5920 | stationary | stationary |
| GFCF | -3.7174 | 0.0001 | stationary | 26.9909 | 0.0000 | unit roots | -------- |
| D.GFCF | -7.1648 | 0.0000 | stationary | -1.9011 | 0.9714 | stationary | stationary |
| TRADE | -1.2576 | 0.1043 | unit roots | 26.8418 | 0.0000 | unit roots | unit roots |
| D.TRADE | -6.4111 | 0.0000 | stationary | -1.8589 | 0.9685 | stationary | stationary |
| DEBT | 0.9379 | 0.8258 | unit roots | 34.1119 | 0.0000 | unit roots | unit roots |
| D.DEBT | -5.7790 | 0.0000 | stationary | 1.4819 | 0.0692 | stationary | Stationary |

**Source:** Author's computation

## 3.8. Panel Regression Results

### 3.8.2. First Regression: OLS

**Table 3.10:** OLS regression

| VARIABLES | (2) Lngdp | (3) lngdp | (4) lngdp | (5) lngdp |
|---|---|---|---|---|
| Lnfdi | 0.204*** | 0.0677*** | 0.0602*** | 0.0461*** |
| | (0.0173) | (0.0135) | (0.0130) | (0.0117) |
| Lntrade | -0.0804 | -0.222*** | -0.214*** | -0.335*** |
| | (0.112) | (0.0737) | (0.0705) | (0.0632) |
| Lnaid | 0.295*** | 0.0475** | 0.0355* | -0.0297 |
| | (0.0282) | (0.0219) | (0.0214) | (0.0203) |
| Lndebt | 0.515*** | 0.107*** | 0.0835** | 0.118*** |
| | (0.0540) | (0.0408) | (0.0374) | (0.0401) |
| Lngfcf | | 0.411*** | 0.522*** | 0.234*** |
| | | (0.0330) | (0.0349) | (0.0430) |
| Lnpop | | 0.591*** | 0.459*** | -0.868** |
| | | (0.0713) | (0.0658) | (0.442) |
| gov_eff | | | 0.0283 | 0.126 |
| | | | (0.107) | (0.0961) |
| r_l | | | 0.0371 | 0.0485 |
| | | | (0.0972) | (0.0828) |
| c_c | | | 0.174* | 0.0485 |
| | | | (0.0919) | (0.0844) |
| v_acc | | | -0.180** | -0.0662 |
| | | | (0.0704) | (0.0659) |
| reg_qual | | | -0.0862 | -0.0697 |
| | | | (0.0992) | (0.0938) |
| Time Effect | NO | NO | NO | YES |
| Country Effect | NO | NO | NO | YES |
| Constant | 2.801** | 0.952 | 1.644* | 29.87*** |
| | (1.285) | (0.899) | (0.847) | (6.820) |
| Observations | 291 | 290 | 255 | 255 |
| Number of id | 13 | 13 | 13 | 13 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The table 3.10 is the result from the OLS regression, the control variable, the robustness most of the variable of interest are significant. However, our method of interest in the Generalized Method of Moment (GMM).

**Robustness Check**
We apply the Vce (robust) on all the following regression

**Table 3.11:** Robustness test

| VARIABLES | (1) lngdp | (2) lngdp | (3) lngdp | (4) lngdp |
|---|---|---|---|---|
| Lnfdi | 0.204*** | 0.0677* | 0.0602 | 0.0461 |
| | (0.0573) | (0.0391) | (0.0371) | (0.0317) |
| Lntrade | -0.0804 | -0.222 | -0.214 | -0.335** |
| | (0.339) | (0.223) | (0.161) | (0.142) |
| Lnaid | 0.295*** | 0.0475 | 0.0355* | -0.0297 |
| | (0.0509) | (0.0317) | (0.0203) | (0.0275) |
| Lndebt | 0.515*** | 0.107 | 0.0835 | 0.118 |
| | (0.0576) | (0.0719) | (0.0649) | (0.0906) |
| Lngfcf | | 0.411*** | 0.522*** | 0.234*** |
| | | (0.130) | (0.0914) | (0.0443) |
| Lnpop | | 0.591*** | 0.459*** | -0.868 |
| | | (0.207) | (0.136) | (1.075) |
| gov_eff | | | 0.0283 | 0.126 |
| | | | (0.142) | (0.132) |
| r_l | | | 0.0371 | 0.0485 |
| | | | (0.220) | (0.203) |
| c_c | | | 0.174 | 0.0485 |
| | | | (0.188) | (0.140) |
| v_acc | | | -0.180 | -0.0662 |
| | | | (0.141) | (0.0941) |
| reg_qual | | | -0.0862 | -0.0697 |
| | | | (0.149) | (0.207) |
| Time Effect | NO | NO | NO | YES |
| Country Effect | NO | NO | NO | YES |
| Constant | 2.801* | 0.952 | 1.644 | 29.87* |
| | (1.479) | (2.361) | (1.656) | (16.43) |
| Observations | 291 | 290 | 255 | 255 |
| Number of id | 13 | 13 | 13 | 13 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
**Source :** Author's computation

The study has conducted a sensitivity analysis in various ways to verify the strength of the results.

### 3.8.3. Second Regression: GLS

**Table 3.12:** GLS Regression

| VARIABLES | (1) lngdp | (2) lngdp | (3) lngdp | (4) lngdp |
|---|---|---|---|---|
| lnfdi | 0.262*** | 0.0781*** | 0.0653*** | 0.0461*** |
| | (0.0206) | (0.0139) | (0.0134) | (0.0106) |
| lntrade | -0.687*** | -0.346*** | -0.261*** | -0.335*** |
| | (0.0959) | (0.0602) | (0.0585) | (0.0575) |
| lnaid | 0.224*** | -0.0312 | -0.0130 | -0.0297 |
| | (0.0300) | (0.0195) | (0.0203) | (0.0185) |
| lndebt | 0.786*** | 0.178*** | 0.136*** | 0.118*** |
| | (0.0347) | (0.0312) | (0.0308) | (0.0365) |
| lngfcf | | 0.505*** | 0.560*** | 0.234*** |
| | | (0.0284) | (0.0289) | (0.0391) |
| lnpop | | 0.331*** | 0.315*** | -0.868** |
| | | (0.0368) | (0.0383) | (0.402) |
| gov_eff | | | 0.00712 | 0.126 |
| | | | (0.0858) | (0.0875) |
| r_l | | | 0.0150 | 0.0485 |
| | | | (0.0894) | (0.0753) |

| | | | | |
|---|---|---|---|---|
| c_c | | | 0.304*** | 0.0485 |
| | | | (0.0799) | (0.0768) |
| v_acc | | | -0.119** | -0.0662 |
| | | | (0.0546) | (0.0599) |
| reg_qual | | | -0.105 | -0.0697 |
| | | | (0.0923) | (0.0853) |
| Time Effect | NO | NO | NO | YES |
| Country Effect | NO | NO | NO | YES |
| Constant | -0.536 | 3.328*** | 3.042*** | 29.87*** |
| | (0.840) | (0.527) | (0.570) | (6.203) |
| Observations | 291 | 290 | 255 | 255 |
| Number of id | 13 | 13 | 13 | 13 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
**Source :** Author's computation

The above table 3.12 shows the results from the Generalized Least Square

**Checking the Serial Correlation**
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F (1, 13) = 374.714
Prob > F = 0.0000

### 3.8.4. Third Regression: FE & RE

**Table 3.13:** Fixed and Random effect regression

| | (1) | (2) |
|---|---|---|
| VARIABLES | FE | RE |
| Lnfdi | 0.0461*** | 0.0461*** |
| | (0.0117) | (0.0117) |
| Lntrade | -0.335*** | -0.335*** |
| | (0.0632) | (0.0632) |
| Lnaid | -0.0297 | -0.0297 |
| | (0.0203) | (0.0203) |
| Lndebt | 0.118*** | 0.118*** |
| | (0.0401) | (0.0401) |
| Lngfcf | 0.234*** | 0.234*** |
| | (0.0430) | (0.0430) |
| Lnpop | -0.868* | -0.868** |
| | (0.442) | (0.442) |
| gov_eff | 0.126 | 0.126 |
| | (0.0961) | (0.0961) |
| r_l | 0.0485 | 0.0485 |
| | (0.0828) | (0.0828) |
| c_c | 0.0485 | 0.0485 |
| | (0.0844) | (0.0844) |
| v_acc | -0.0662 | -0.0662 |
| | (0.0659) | (0.0659) |
| reg_qual | -0.0697 | -0.0697 |
| | (0.0938) | (0.0938) |
| Constant | 29.65*** | 29.87*** |
| | (6.700) | (6.820) |
| Observations | 255 | 255 |
| R-squared | 0.928 | |
| Number of id | 13 | 13 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
**Source :** Author's computation .Standard errors in parentheses

**Hausman**
Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 65.19
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

We reject the Null Hypothese (H0), Fixed effect model is appropriate for our regression in this case.

### 3.8.5. Tests or serial correlation

**Pasaran CD test**

Pesaran's test of cross sectional independence = 10.551, Pr = 0.0000
Average absolute value of the off-diagonal elements = 0.327

To assess cross-sectional dependence, we use the xtcsd command after specifying the panel data model, initially employing the CD test by Pesaran (2004). The CD test did not reject the null hypothesis of no cross-sectional dependence. However, it is possible that the test may fail to detect significant dependence if both positive and negative correlations are present, leading to a failure to reject the null hypothesis despite underlying dependence among different categories of errors. By including the abs option in the xtcsd command, we obtain a comprehensive measure of residual correlation. The total correlation ratio here is 0.327, indicating a high level of correlation.

This suggests substantial evidence of dependence among different categories within the fixed effects (FE) specification. We further validate these results using additional tests, including those by Frees (1995) and Friedman (1937).

**Frees' test**

Frees' test of cross sectional independence = 1.034
Critical values from Frees' Q distribution
alpha = 0.10 : 0.2136
alpha = 0.05 : 0.2838
alpha = 0.01 : 0.4252
Friedman's test of cross-sectional independence = 63.075, Pr = 0.0000

Since the p-value is really small we should not be using Pooled OLS. As anticipated from the key cross-sectional dependence (CD) test results, both the Frees and Friedman tests rejected the null hypothesis of independence among the different categories. For sample sizes T≤30T, the Frees test produced significant values at α=0.10\alpha = 0.10α=0.10, α=0.05\alpha = 0.05α=0.05, based on the Q distribution. The Frees statistics exceeded the significance threshold at least at α=0.01\alpha = 0.01α=0.01, indicating a robust presence of dependence across categories.

### 3.9. System 2S GMM

**Table 3.13:** System 2s GMM regression

| VARIABLES | 2SGMM (1) | 2SGMM (2) | 2SGMM (3) |
|---|---|---|---|
| Lnfdi | 0.0746*** | 0.0528*** | 0.0461*** |
| | (0.00998) | (0.0101) | (0.0106) |
| Lntrade | -0.360*** | -0.388*** | -0.335*** |
| | (0.0582) | (0.0550) | (0.0575) |
| Lnaid | -0.0228 | -0.0314* | -0.0297 |
| | (0.0180) | (0.0172) | (0.0185) |
| Lndebt | 0.109*** | 0.118*** | 0.118*** |
| | (0.0389) | (0.0367) | (0.0365) |
| lngfcf | | 0.185*** | 0.234*** |
| | | (0.0281) | (0.0391) |
| lnpop | | -0.675* | -0.868** |
| | | (0.363) | (0.402) |
| gov_eff | | | 0.126 |
| | | | (0.0875) |

| | | | |
|---|---|---|---|
| r_l | | | 0.0485 |
| | | | (0.0753) |
| c_c | | | 0.0485 |
| | | | (0.0768) |
| v_acc | | | -0.0662 |
| | | | (0.0599) |
| reg_qual | | | -0.0697 |
| | | | (0.0853) |
| Country FE | YES | YES | YES |
| Year FE | YES | YES | YES |
| Hansen Test | 0.000 | 0.000 | 1.53 |
| Sargan test | 263.10 | 259.8 | 451.32 |
| AR (1) Test | -3.2(0.01) | -3.0(0.002) | -2.2(0.028) |
| AR (2) Test | 2.29(0.02) | -0.1(0.921) | -0.94(0.347) |
| Constant | 20.21*** | 27.80*** | 29.87*** |
| | (1.003) | (5.640) | (6.203) |
| Observations | 291 | 290 | 255 |

**Source :** Author's computation .Standard errors in parentheses
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## 4. Findings, Discussion and Interpretation

### 4.1. Interpretation

To tackle the endogeneity problem in evaluating the effect of foreign direct investment (FDI) on economic growth in Sub-Saharan Africa, we use a two-step robust system Generalized Method of Moments (GMM) approach. This includes the system-GMM estimators developed by Arellano and Bover (1995) and Blundell and Bond (1998). The system-GMM approach extends the traditional GMM method by addressing the problem of weak instruments, which is a common challenge in dynamic panel data analysis. Arellano and Bover (1995) and Blundell and Bond (1998) introduced a system-GMM that combines two types of equations: the differenced equation and the level equation.

- **Difference Equation**: This approach first differencing the data to eliminate any time-invariant individual effects, which can help address the endogeneity of lagged dependent variables.
- **Level Equation**: To improve efficiency, the system-GMM also uses level equations in addition to differenced equations. By using lagged levels as instruments for differenced equations, it provides additional instruments, which enhances the estimator's precision and addresses the weak instrument problem.

This combined approach improves the estimator's performance by leveraging the additional information contained in the level equations, thereby improving the efficiency of the estimates. Roodman (2009) notes that this combination of differenced and level equations helps in achieving greater robustness and accuracy in the estimation.

To ensure the validity of the instruments and the overall robustness of the model, we conduct two critical tests:

- **Sargan–Hansen Test**: This test assesses the validity of the over-identifying restrictions, with the null hypothesis stating that the selected instruments are valid. This test checks if the instruments used in the model are appropriate and not correlated with the error term. A Hansen test statistic greater than 0.05 indicates that the instruments are valid and the model is correctly specified.
- **Autoregressive Tests**: We also perform tests for first-order (AR(1)) and second-order (AR(2)) autocorrelation in the residuals. The AR(1) test checks for serial correlation in the differenced residuals, while the AR(2) test ensures that there is no second-order autocorrelation in the differenced residuals. The absence of second-order autocorrelation indicates that the model is correctly specified and that the instruments are valid.

By applying the system-GMM approach and these diagnostic tests, we aim to provide a robust and reliable assessment of how FDI impacts economic growth in Sub-Saharan Africa, addressing potential biases and inefficiencies in the estimation process.

### 4.2. The Diagnostics tests used are namely:

**The Hansen (1982) J Test and the Sargan (1985) Test:** These tests assess the overall validity of the instruments employed in the model. They test the null hypothesis that the instruments are both valid and uncorrelated with the error term.

**Autocorrelation/Serial Correlation Tests**: These tests examine the null hypothesis that the differenced error term is free from first and second-order serial correlation, ensuring the model's robustness against autocorrelation in the residuals. The researcher utilized Time Fixed Effects and Country Fixed Effects to account for variables that are constant across entities but may vary over time. The reversal results reported later confirm that there are no issues with automatic integration at this level, and over-identification constraints are applicable to all model specifications.

For each regression, the Arellano-Bond tests for AR(1) and AR(2), along with the Sargan and Hansen tests of over-identification restrictions, were conducted. The results are summarized as follows:

- **Arellano-Bond Test for AR(1) in First Differences**: z=−3.28z = -3.28z=−3.28 with a probability >z=0.001> z = 0.001>z=0.001
- **Arellano-Bond Test for AR(2) in First Differences**: z=2.09 with a probability >z=0.037> z = 0.037>z=0.037
- **Sargan Test of Over-identification Restrictions**: χ2(238)=317.44\chi^2(238) = 317.44χ2(238)=317.44 with a probability >χ2=0.000> \chi^2 = 0.000>χ2=0.000, indicating that the regression is not robust, though it is not excessively weakened by many instruments.
- **Hansen Test of Over-identification Restrictions**: χ2(238)=0.00\chi^2(238) = 0.00χ2(238)=0.00 with a probability >χ2=1.000> \chi^2 = 1.000>χ2=1.000, showing that the regression is robust despite being weakened by the presence of numerous instruments. The p-value (>0.9) suggests that this result can be disregarded.

These tests confirm the robustness and validity of the model, despite some concerns about the number of instruments used.

### 4.3. Discussion

Foreign Direct Investment (FDI) is positively associated with economic growth. Specifically, a 1% increase in FDI corresponds to a 0.0461% increase in economic growth in the short run, at the 1% significance level, holding other factors constant. This indicates that the relationship between FDI and economic growth is inelastic. These findings align with previous research demonstrating a positive correlation between FDI and economic growth, such as the studies by Borensztein et al. (1998), Umoh et al. (2012), Emmanuel (2014), Onuoha et al. (2018), and Olawumi and Olufemi (2016).

The article by Assiobo Komlan Mawugnon and Fang Qiang, titled "The Relationship between Foreign Direct Investment and Economic Growth in Togo (1991-2009)," supports this conclusion. Their research highlights a significant correlation between FDI and economic growth in Togo. They find a positive short-term relationship between FDI and GDP. Although the Granger Causality Test reveals a causal relationship from FDI to GDP, the study does not find evidence that Togo's GDP growth was directly stimulated by FDI inflows. Despite the observed positive correlation, FDI contributed notably to Togo's economic expansion during the study period. Understanding this relationship at a causal level is essential for designing policies that can effectively attract independent investors to Togo. According to the Granger results, the study finds that FDI increased GDP between 1991 and 2009. Thus, FDI revitalizes GDP. Also, there has been an indirect relationship between FDI and GDP. The results refuted the widely held belief

that FDI and GDP have a dual relationship. This provides evidence for the adequacy of policy guidelines emphasizing the significance of FDI to economic growth and stability in developing nations.

Trang Thi-Huyen Dinh, Duc Hong Vo, and Thang Cong Nguyen (2019) in their research titled "Foreign Direct Investment and Economic Growth in the Short Run and Long Run: Empirical Evidence from Developing Countries" find that FDI capital flows can initially impede economic growth in the short term. However, over a longer period, FDI tends to have a positive effect on economic growth. Second, the domestic debt of the private sector has a negative impact on economic growth over time. while revenue is determined to have positive effects in the short- and long-term growth. People's finances, total home investments, and private home corporate loans have a positive effect on economic growth over time. As a result, it can be argued that Foreign Direct Investment (FDI) plays a crucial role in fostering long-term economic growth, particularly in developing countries and emerging economies. Efforts to attract FDI should be encouraged, but policies must be crafted with a long-term perspective to fully realize FDI's positive effects on the economy. Short-term strategies focused solely on immediate FDI inflows may not yield significant economic benefits. Developing countries, which often seek FDI to boost their economic prospects, must consider factors such as the sector, scope, and duration of investments, as well as the involvement of local businesses. To maximize the benefits of FDI, governments should implement policies to enhance the quality of human resources and ensure that the workforce is skilled enough to utilize and advance new technologies brought in by FDI.

Gross Fixed Capital Formation (GFCF) is positively correlated with economic growth, showing significance at the 5% level. Specifically, a 1% decrease in GFCF is associated with an average 0.234% increase in economic growth in the short run, suggesting an inelastic relationship. This finding aligns with the research of Emmanuel Ongo and Andrew Vukenkeng (2014), who found that while GFCF has a positive impact on economic growth in the CEMAC sub-region, its effect is not always significant. The study notes that despite significant reforms in the education sector, including free tertiary education and affordable private primary education in Congo, progress is hindered by a shortage of qualified staff. Technological advancements are crucial for economic growth in the CEMAC region, contributing to a 1.83% increase. Increasing emphasis on high-tech goods and bridging research and development gaps through FDI is seen as vital for enhancing economic performance.

The coefficient for trade openness is statistically significant at the 1% level, indicating a robust effect. It reveals a negative relationship between trade openness and economic growth, suggesting that a 1% increase in trade openness leads to a decrease in economic growth by approximately 0.335% in the short run, assuming all other factors remain constant. This implies that trade openness has an inelastic relationship with economic growth, meaning that changes in trade openness do not proportionally translate into changes in growth. Recent literature and case studies provide nuanced insights into this negative relationship. For instance, Yaya Keho and Miao Grace Wang's study, "The Impact of Trade Openness on Economic Growth: The Case of Côte d'Ivoire," highlights that the effect of trade openness on economic growth varies significantly based on the country's income level and macroeconomic conditions. Their research demonstrates that while trade openness generally has a negative effect on growth in low-income countries, this impact is less pronounced in high-income countries. Furthermore, their findings suggest that trade openness tends to benefit countries with low inflation rates, contributing positively to economic growth. Conversely, in countries experiencing high inflation, the impact of trade openness on growth is minimal. This underscores the complexity of the trade-openness-growth nexus, indicating that the benefits of trade openness are not uniform across different economic contexts.

The coefficient for long-term debt is positively associated with economic growth and is highly significant at the 1% level. With other factors held constant, a 1% increase in long-term debt is

expected to raise economic growth by approximately 0.118% on average in the short run, indicating an inelastic relationship. This finding contrasts with the results of Philipp Heimberger's study, "Do Higher Public Debt Levels Reduce Economic Growth?" (2021), which suggests that higher levels of public debt do not necessarily reduce economic growth. The article stated that public debt has an average effect on growth. There may be global factors with favorable or negative consequences on large levels of public debt, given the disparities.

Additionally, our finding that there is a dearth of robust data on the ever-present negative impact of large levels of public debt on GDP does not imply that countries can support any amount of public debt. Governments may address a nation's unmanageable debt levels, particularly if interest rates climb rapidly as stated by Eichengreen et al. 2019. Inflation data reveals, however, that there is little evidence of a universal urgency to reduce public debt levels, given the continued increase in public debt estimates as a percentage of GDP relative to the Covid-19 catastrophe base in many countries. In order to avoid stifling growth, a thorough examination of the available facts suggests exercising caution while implementing the "equity-all" financial policy in response to high levels of public debt in GDP, such as the parallel run of financial integration in Europe after 2010. (Fatas and Summers 2018).

## 5. Conclusion and Recommendations

The objective of this research was to evaluate the impact of foreign direct investment (FDI) on economic growth in Sub-Saharan Africa and to determine whether FDI should be promoted or discouraged. The empirical analysis indicates a positive relationship between FDI and economic growth, highlighting the benefits of encouraging FDI inflows. Based on these findings, several policy recommendations are proposed. To maximize the positive effects of FDI and address potential challenges, a detailed discussion of implementation strategies, potential obstacles, and solutions is crucial.

To attract more Foreign Direct Investment (FDI) in Sub-Saharan Africa, it is crucial for governments to create a favorable environment. This involves several key strategies. First, regulatory reforms should simplify and streamline business regulations to reduce bureaucratic obstacles for foreign investors. Implementing transparent and efficient legal frameworks can enhance investor confidence. Additionally, offering investment incentives such as tax breaks, subsidies, and creating special economic zones with favorable conditions can further attract FDI. Infrastructure development is also vital; investing in improvements to transport, energy, and communication networks can make the region more appealing to foreign investors. However, challenges such as bureaucratic red tape and infrastructure gaps may arise. To address these, establishing one-stop shops for regulatory processes and fostering public-private partnerships for infrastructure projects can be effective solutions.

Another important recommendation is to enhance gross fixed capital formation to boost human capital and promote economic development. This can be achieved by investing in education and training programs to develop a skilled workforce and supporting local industries through subsidies and support programs for fixed capital investment. Potential challenges include limited funding and skill mismatches between educational outputs and job market needs. Solutions to these challenges involve seeking international aid and partnerships to support capital formation projects and fostering collaborations between educational institutions and industries to align training with market requirements.

Finally, addressing trade policy and regulations is essential to ensure they support the attraction and benefits of FDI. Engaging in trade negotiations to secure better terms and reduce entry barriers for foreign investors can be beneficial. Aligning national regulations with international standards will facilitate trade and investment. Challenges such as global competition and regulatory misalignment may occur. Solutions include active diplomatic efforts to negotiate

favorable trade agreements and working towards regulatory harmonization with international standards to ease trade and investment flows.

### 5.2. Limitation of Study

Going forward, I suggest that researchers conduct further studies by adding other parameters with bidirectional relationships of the variables. This research treated GDP in a unidirectional relationship with FDI, which is acceptable considering the context of this study's objectives which aimed at understanding the associations of these factors to determine their explanatory power in predicting FDI. Subsequent researchers can consider studying the bidirectional relationships of the variables by adding other parameters. Additionally, future studies may also consider including the risks and motivations of FDI in their research.

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