

Effect of Foreign Direct Investment on Economic Growth in Anglophone ECOWAS countries: Generalized Method of Moment (GMM) Approach

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Abstract

This study explores the effect of foreign direct investment on economic growth in five Sub-Saharan African countries, specifically the Anglophone ECOWAS countries such as Gambia, Ghana, Liberia, Nigeria, and Sierra Leone, using the generalized method of moment (GMM) approach, descriptive statistics, and correlation matrix, for a panel data from 1984 to 2024. Specifically, the study analyzes the effect of foreign direct investment (FDI), trade balance (TRB), exchange. The correlation matrix results show that there is a positive correlation between foreign direct investment and economic growth, and the descriptive statistics results show that trade openness and real exchange rate have higher mean, maximum, and minimum values, as well as higher standard deviation, when compared to other variables. The findings highlight the necessity of implementing appropriate macroeconomic policies and institutional environment to maximize the growth-enhancing advantages of foreign direct investment in Sub-Saharan Africa.

Keywords: GDP, FDI, GMM Anglophone ECOWAS

1. Introduction

Foreign Direct Investment (FDI) has been identified as an instrument that contributes to the host country's economic growth's sustainability and acceleration (Sawalha, Elian, & Suliman, 2016). Firms can access new technology, establish cheaper manufacturing facilities, create new markets, and market channels, and gain intensive skills because of FDIs, according to Akonnor (2018). Through regulatory investment in enterprises, technological transfer, and a well functioning state-wide regulatory system, FDIs bring enormous benefits to host countries (Sharma, Umesh, Elangbam, & Achintatya, 2012). Investments from both domestic and foreign sources are necessary for a country to grow and develop.

Literatures on FDI explicitly acknowledge that host countries are deemed to benefit from FDI in different ways; first it is an important source of funding for development purpose, second, it allows transfer of superior technology and management skills, third, it stimulate investment and growth of through efficiency spill-overs, enhancing of employment generation or job creation and contribute to infrastructural advancement. In view of the above potential benefits attached to FDI, many countries have resolved to policy reforms geared towards creating enable environment for attracting more foreign investment (Tano & Hellian, 2017).

In an effort to prescribe policies that will increase economic growth and development, several scholars have assessed foreign direct investment effect in most of African countries economic growth. (Tano and Hellian., 2017; Dike.,2018; Anyawu., 2018; Bekalu., 2022; Sabina et al., 2024 and Sonny et al., 2024 among others). Moreover, the outcome of their studies was mixed with different findings. Some argued that Foreign Direct Investment has a significant effect on economic growth (Anyawu., 2018; Oduala., et al., 2022; Bekalu., 2022; Sonny et al.,2024; Sabina et al., 2024; among others). While others found that Foreign Direct Investment did not cause any reaction on economic growth in SSA countries and other developing countries (Obianuju et al., 2021 and Jugurnath., 2016 among others)

This study aims to investigate the potential effect of Foreign Direct Investment on five Anglophone Ecowas countries economic growth using panel data from 1984 to 2024. The period was chosen in order to capture the influence of previous recession that affects most of these Anglophone Ecowas economy in 2016 to 2017. The study improves on existing studies by extending it sample period to 2024 which made it possible to capture the recent global energy crisis on gross domestic product of the most countries



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The relevance of this study to policy formulation particularly in developing countries like Nigeria and others cannot be over emphasized as it would help the policy makers and government authorities to anticipate the likely effects of foreign direct investment on economic growth in the countries. It would also provide them with proper policy prescriptions for achieving economic growth and development of their countries. The study will also be beneficial the academia seeking to understand foreign direct investment and economic growth relations particularly in Anglophone Ecowas context. To achieve the aforementioned objective, the paper is structured into five sections. Section one presents the introduction. Next section reviews related literature on the nexus of between foreign direct investment and economic growth. Section three presents the methodology. Section four presents the findings and discussion, while section five gives the conclusion and policy implications.

The following research questions have been designed to guide the study;

- 1. How does foreign direct investment effect economic growth in Anglophone Ecowas countries?*
- 2. To what extent do exchange rate and trade balance effect economic growth in Anglophone Ecowas countries?*
- 3. What are the effects of population growth and inflation on effect economic growth in Anglophone Ecowas countries?*

I. OBJECTIVES OF THE STUDY

The broad objective of this study is to examine the effect of foreign direct investment effect economic growth in Anglophone Ecowas countries.

Specifically, this study seeks to:

- i. Investigate the effect of exchange rate and trade balance on economic growth in Anglophone Ecowas countries*
- ii. Analyze the impact of population growth and inflation on economic growth in Anglophone Ecowas countries.*

In accordance with study objectives the null hypotheses of this study are specified below.

- 1. H_{01} : Foreign direct investment does not have significant effect economic on growth in Anglophone Ecowas countries.*
- 2. H_{02} : Exchange rate and trade balance do not have significant effect on economic growth in Anglophone Ecowas countries.*



3. H_{03} : Population growth and inflation do not have significant effect on economic growth in Anglophone Ecowas countries.

1. LITERATURE REVIEW

Significant number of empirical literatures examined the impact of FDI on economic growth and has reported convergent and divergent views on the magnitude and direction of relationship between FDI and economic growth at country, cross-country and regional levels.

Buhari et al., (2024) examine the effect of China's FDI on industrialization in Africa based on the instrumental variables Generalized Methods of Moment (IV-GMM) model, using a sample of 36 African countries and data spanning from 2003 to 2020, they find that China's FDI slightly promotes industrialization in Africa. In isolation, the effect of China's FDI on industrialization is larger in high-recipient countries of China's FDI than in low-recipient countries due to disparity in the absorptive capacities of the countries. They further find that countries' characteristics such as domestic investment, financial development, infrastructure, human capital and institutional qualities, among others, play a significant role in promoting industrialization in Africa.

Sabina et al., (2024) explores the influence of Foreign Direct Investment (FDI) on the growth trajectory of the manufacturing sector in Sub-Saharan Africa. The research employs the panel Autoregressive Distributed Lag (ARDL) estimation technique on data spanning from 1985 to 2021. The findings reveal that FDI and TOP positively impact the manufacturing sector's growth in the long run, while GFCF exerts a negative influence. However, these effects are not observed in the short run. Conversely, Sonny et al., (2024) used Autoregressive Distributed Lag (ARDL) Approach for the annual time series data from 1985 to 2014 to investigate the impact of foreign direct investment (FDI) on economic growth in South Africa. The results of ARDL bounds test showed a negative long-run relationship between FDI and economic growth, while saving rate positively correlated with growth. Inflation and real interest rate also had negative long-run relationships.

Oduola et al (2022) examined the role of institutions on FDI for industrialization in a panel of 43 SSA countries for the period spanning from 1996 to 2018, the author used manufacturing value added per capita to capture industrialization and applied the pooled OLS, fixed effects and system GMM, the findings indicated that persistence level of industrialization determines, to a large extent, the current industrialization in SSA, and that FDI exerts a negative and significant impact on industrialization. In contrast Bekalu (2022) found long term significant positive relationship between foreign direct



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investment and economic growth in 22 sub-Saharan African countries through the use of pooled mean group (PMG) and autoregressive distributed lag (ARDL) approach for a panel data from 1988 to 2019.

Anyanwu and Ozurunma (2018) incorporated FDI stock in their assessment of the impact of human capital on industrialization in Africa for the period 1990 through 2011. The authors found FDI having an inverse and significant impact on industrialization.

Using panel data of 43 African countries from 1995 to 2015, Adegboye et al. (2016) investigated the effect of FDI on Africa's industrial performance. The authors applied both pool OLS and fixed effect least square dummy variable estimations. The empirical results indicate a positive and statistically significant impact of FDI on industrial performance, though the impact was negligible but significant from the result of both estimated models.

Conversely Jugurnath et al, (2016) found insignificant effect of foreign direct investment on 36 sub-Saharan African countries economic growth, through the use of panel regression analysis for the period of 2008 to 2014.

Tano and Hellian (2017) applied fixed effect and generalized method of moment (GMM) for the annual data from 2001 to 2015 to investigate the impact of foreign direct investment on economic growth in 36 sub-Saharan African countries and found significant negative effect of foreign direct investment on economic growth, but institution on the other way had positive effect on economic growth. Anyanwu (2017) investigates the key drivers of industrialization in northern Africa using data spanning from 1990 to 2014. The study used pooled panel OLS regression with year-fixed effects and the IV-2SLS models. Among the key findings of the study was the positive significant effect of inward stock of FDI on manufacturing development in the region. Dike (2018) also in his study found significant positive relationship between foreign agricultural investment and economic growth in the five SSA regions by applying dynamic vector error correction model from 1995 to 2016.

Using sample of developing countries, Mwitwa (2022) analyzed the impact of foreign direct investment (FDI) on Tanzania's economic growth rate using the Vector Error Correction Model and time series annual data from 1990 to 2020. The study found a positive correlation between real GDP growth rate and FDI inflow to GDP ratio, and a negative correlation between gross fixed capital formation to GDP ratio and the real GDP growth rate.



Ciobanu (2021) Used Autoregressive Distributed Lag (ARDL) and Granger Causality test for the quarterly time series data from 1991 to 2018 to examine the effects of foreign direct investment on economic growth in Romania. The findings showed that there was co-integration between the variables when real GDP and foreign direct investment were the dependent variables. Foreign direct investment, trade openness, and labour force make up the three primary elements that have significant positive impact on economic growth over the long term in Romania.

In Nigeria Sunday et al., (2021) examine the impact of Foreign Direct Investment on business growth in Nigeria the study used primary and secondary data. It adopted a descriptive research design, mostly quantitative data. Regression model and Pearson correlation coefficient were used to test the hypotheses of the study. It was found out that there is a positive relationship between foreign direct investment and business growth in Nigeria.

Obianuju et al., (2021) employs co integration and error correction techniques for the annual time series data from 1981 to 2015 to investigate the dynamic relationship between foreign direct investment (FDI) and industrialization in Nigeria. The findings show that FDI does not have a significant effect on industrialization in Nigeria either in the short run or the long run. Also, the empirical results reveal that trade significantly harms industrialization in Nigeria both in the short run and the long run.

Summary of Knowledge gap

On balance, it can be surmised that the evidence from existing body of literature seems to suggest a paucity of studies that examined the effect of foreign direct investment on economic in some Anglophone Ecowas countries. In addition, no empirical study has so far been published to examine this effect using fresh data covering the most recent economic recession that gripped most of Anglophone Ecowas countries the between 2016 and 2017

2. METHODOLOGY

3.1 Data Source

The data used essentially for this study is mainly annual time series collected from secondary sources covering the period of 1984 to 2024 (40 years) and the sources include publications of World Development Indicators (WDI). This is carried out in five Sub-Saharan African Countries specifically the Anglophone ECOWAS countries such as, Gambia, Ghana, Liberia, Nigeria and Sierra Leone. This time period was chosen in



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other to capture the independent effect of foreign direct investment, trade balance, exchange rate, population growth and inflation on economic growth in the context of global economic crises, post global economic crises and recession that these ECOWAS countries began to experience from august 2016.

Table 01:
Variable description, measurements and expected Signs

<i>Variables</i>	<i>Description</i>	<i>Measurement</i>	<i>Expected sign</i>
Dependent Variable			
GDP	GDP growth rate	Nominal value of the Gross Domestic Product	
Independent Variables			
FDI	Foreign direct investment	% of GDP	+
TRB	Trade balance	% of GDP	+
EXR	Exchange rate	%Δ in Normal exchange rate	+
POG	Population growth	% in population size	+
INF	Inflation rate	CPI	+

Source : Authors Computation (2026)
Data from 1984-2024

3.2 Empirical Model

The study follows the baseline empirical model adopted by (Philip & James, 2017) and (Bekalu, 2022) which captures the hypothesized relationship among the core variables under review. In doing so the international trade theory is consider with the followed models. The study modified the model by adding real exchange rate and inflation to capture their effect on economic growth of the five Anglophone African countries. Furthermore, the study used analytical model of Bhattacharya & Ghosh (2016) which uses Generalized Method of Moments (GMM) approach to estimate the dynamic panel data model. Arillano, & Bond, (1991), state that the dynamic panel model is a model that has a dynamic relationship characterized by the lag of dependent variable between the independent variables. There for the model is express on its functional form as;

$$LGDP_{it} = f(LFDI_{it}, TRB_{it}, EXR_{it}, LPOG_{it}, INF_{it}) \dots \dots \dots (1)$$

Thus, the econometrics form of the model is

$$LGDP_{it} = \alpha + \beta_1 LFDI_{it} + \beta_2 TRB_{it} + \beta_3 EXR_{it} + \beta_4 LPOG_{it} + \beta_5 INF_{it} + \mu_{it} \dots \dots \dots (2)$$



Where;

LGFP = Log of gross domestic product

LFDI = Log of foreign direct investment

TRB = Trade balance

EXR = Exchange rate

LPOG = Log of population growth

INF = Inflation rate

α , is constant while, $\beta_1, \beta_2, \beta_3, \beta_4$, are Parameters of the variables captured in the model, μ_i = Time specific effect, i = country index, t = time index and L = logarithm form. From equation 2 above the apriori expectations of coefficient are β_1 to $\beta_5 > 0$, The equation can be take after the dynamic panel data (DPD) model specification of kassim (2013) and Chang et al, (2011), from the above 2 equation to set model below

$$LGDP_{it} = \alpha + \sum_{j=1}^p \beta_{1j} LFDI_{i,t-j} + \sum_{j=1}^p \beta_{2j} TRB_{i,t-j} + \sum_{j=1}^p \beta_{3j} EXR_{i,t-j} + \sum_{j=1}^p \beta_{4j} LPOG_{i,t-j} + \sum_{j=1}^p \beta_{5j} INF_{i,t-j} + \alpha_i LGDP_{i,t-1} + v_i + \mu_{it} \dots \dots \dots (3)$$

Where v_i refers to country specific effect and μ_{it} is the error term.

The lagged dependent variable in equation 3 make traditional panel (fixed and random effect) not suitable for this study because there is correlation between the lagged variables and the unobservable country specific effect [$E(\text{Trade}_{i,t-j} v_i) \neq 0$] (Chang et al, 2011; Arellano and Bond 1991). Therefore the first difference of equation 3 should be used as suggested in the literature of Chang et al., (2011) and Arellano & Bond., (1991). By transforming the variables in first differentiating in equation 4, the fixed country-specific effect is removed, why because it does not vary with time.

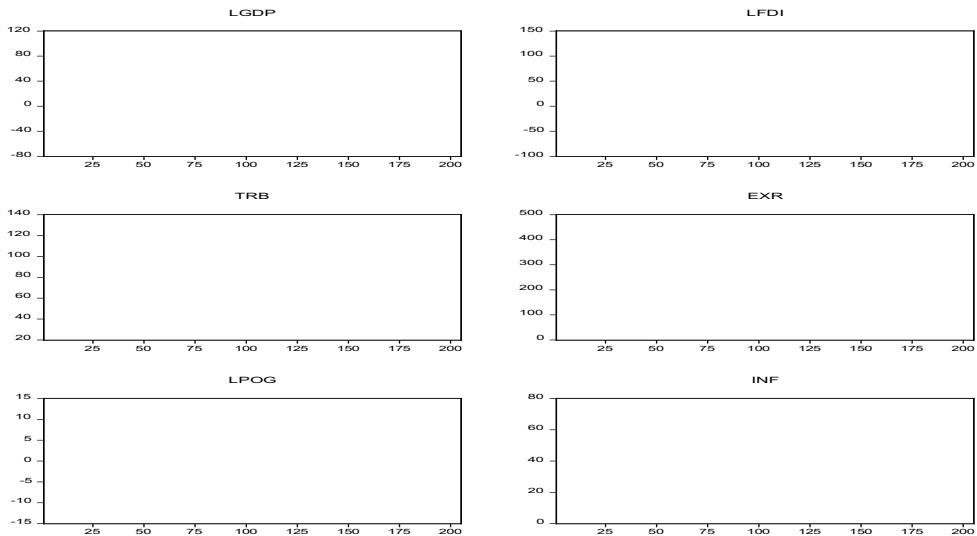
$$\Delta LGDP_{it} = \alpha + \sum_{j=1}^{p-1} \beta_{1j} \Delta LFDI_{i,t-j} + \sum_{j=1}^{p-1} \beta_{2j} \Delta TRB_{i,t-j} + \sum_{j=1}^{p-1} \beta_{3j} \Delta EXR_{i,t-j} + \sum_{j=1}^{p-1} \beta_{4j} \Delta LPOG_{i,t-j} + \sum_{j=1}^{p-1} \beta_{5j} \Delta INF_{i,t-j} + \alpha_i \Delta LGDP_{i,t-1} + v_i + \mu_{it} \dots \dots \dots (4)$$

Where Δ denotes first difference.

4. RESULTS AND DISCUSSION OF FINDINGS



Figure 01:
Graphical presentation of the variables (Real GDP, Foreign Direct Investment, trade balance, exchange rate, population growth and inflation rate) from 1984-2024 are in figure 1 below:



Source: World Development Indicators, World Bank (2024)

Figure 01 depicts the long-term behavior of significant explanatory variables. FDI has an overall rising but fluctuating trajectory, indicating vulnerability to global economic situations, commodity price cycles, and domestic policy contexts. Trade openness is gradually improving, aided by trade liberalization and regional integration efforts, albeit disrupted by external shocks. The real exchange rate remains volatile, owing mostly to foreign exchange limits, balance-of-payments pressures, and macroeconomic policy changes. Inflation remains variable, reflecting supply-side limits, currency rate pass-through effects, and fiscal pressures, while population growth continues to rise, putting pressure on economic growth if productivity and employment expansion do not keep pace.

Summary of insights: Overall, the Figure show that the variables' movements and trends are primarily driven by policy shifts, external shocks, and structural weaknesses, highlighting the importance of stable macroeconomic management and productive FDI in sustaining long-term economic growth in Anglophone ECOWAS countries.

Table 02 demonstrates that real exchange rate (EXR) appears to have higher mean, maximum and minimum values, it also has the higher standard deviation as

compared to other variables. Trade balance (TRB) ranked second; Furthermore the negative skewness of gross domestic product (GDP) shows that the distribution has a long left tail, implying that the distribution has a leftward skewed, while the positive skewness of all other variables indicates that their distribution has a long right tail, implying that the distribution is rightward skewed in the variable distributions. Furthermore, all variables have kurtosis values greater than 3, indicating that their distributions are more peaked than the normal distribution. The Jarque-Bera test results show that all of the series are not normally distributed, implying that they are significant at the 1% probability level, thereby rejecting the null hypothesis for the distribution of GDP, FDI, TRB, RER, POG and INF, as a result, the variables cannot be described as being normally distributed.

Table 02 :
Descriptive Statistics result

	LGDP	LFDI	TRB	EXR	LPOG	INF
Mean	4.247654	3.946146	60.03931	122.6659	2.634837	14.81180
Median	4.747645	3.101399	55.51019	103.6906	2.497573	10.81016
Maximum	14.66332	19.55059	131.4854	351.5425	4.202033	59.46155
Minimum	-8.130444	-1.071927	21.25662	67.82123	1.875000	0.844970
Std. Dev.	3.418413	3.315081	23.13482	50.22594	0.524641	12.30481
Skewness	-0.751340	1.534442	0.934716	1.717826	1.657957	1.618108
Kurtosis	6.426800	6.945880	3.514931	6.530313	5.543459	5.358761
Jarque-Bera	57.17079	102.0344	15.35304	99.08948	71.31327	65.48380
Probability	0.000000	0.000000	0.000464	0.000000	0.000000	0.000000
Sum	416.2701	386.7223	5883.853	12021.26	258.2140	1451.557
Sum Sq. Dev	1133.498	1066.007	51916.33	244696.6	26.69905	14686.61
Observations	98	98	98	98	98	98

Source: Authors Computation Using Eviews Version 10 (2026)

The result of correlation matrix from table 03 below shows that gross domestic product and foreign direct investment are positively correlated while exchange rate and population growth are negatively correlated with economic growth, further more inflation rate shows positive correlation with economic growth.

Table 03 :
Result of correlation matrix

Correlation	LGDP	LFDI	TRB	EXR	LPOG	INF
LGDP	1.000000					



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LFDI	0.245398	1.000000				
TRB	0.122842	-0.107318	1.000000			
EXR	-	-0.354684	0.084502	1.000000		
LPOG	-	-0.204347	0.416829	0.572875	1.000000	
INF	0.067177	-0.325475	0.267439	-0.067727	-0.141528	1.000000

Source: Authors Computation Using Eviews Version 10 (2026)

Table 04 :
Result of system GMM

Dependent Variable : LGDP			
Variables	Coefficient	t- statistic	P- Value
LFDI	0.148*	1.716	0.089
TRB	0.023*	1.754	0.082
EXR	-1.777**	-2.454	0.016
LPOG	0.008	1.516	0.132
INF	-0.007	-0.346	0.729
Constant	6.058	3.795	0.000
Observations	200		
Number of instruments	5		
Number of countries	5		
AR(1) test p-value			0.228
AR(2) test p-value			0.859
Hansen test			0.317

$R^2 = 0.89$, $Adj R^2 = 0.67$, $D.W = 1.710$, $J statistic = 8.074 (0.000)***$,

Note: **, & * indicate significance at 5 and 10 percent level respectively.

Source: Authors Computation Using Eviews output Version 10 (2026)

The result of system GMM is presented in Table 4 above. The Arellona- Bon test for serial correlation at the second order is verified, showing that the instruments used are valid and error term does not exhibit any serial correlation. The Hansen test of over identifying restrictions also indicates that the model is correctly specified and therefore accepts our specifications, implying that the model specification is valid.

The GMM result still confirms the robustness of previous studies regression by showing a significant positive effect of foreign direct investment (FDI) on economic growth (GDP) at the 5% probability level, implying that a percentage increase (decrease) in FDI resulted in an increase in five Anglophone African countries' GDP by roughly (0.148), this validated the findings of Sabina et al 2024 in some sub-Saharan African countries, Bekalu 2022 in 22 sub-Saharan African nations, Dike 2018 in 5 sub-



Saharan African region, and Mwitwa 2022 in Tanzania. The findings contrast those of Oduala et al., 2022, who reported a significant negative effect of foreign direct investment on economic growth in 43 sub-Saharan African nations, as well as those of Sonny et al., 2024 in South Africa, Ciobanu., 2021 in Romania, and Sunday., 2021 in Nigeria. The coefficient of trade balance (TRB) further shows a significant positive effect on gross domestic product in five Anglophone Ecowas countries at the 10% level of probability, indicating that a percentage increase (decrease) in trade balance will lead to an increase in Anglophone Ecowas country's GDP by (0.023). In contrast, exchange rates have a strong negative impact on economic growth in Anglophone African countries, indicating that a percentage rise (reduction) in population growth will result in a (-1.777) decline in the economic growth of five Anglophone Ecowas countries. Population growth (LPOG) and inflation rate have no substantial effect on Anglophone Ecowas countries' economic growth. As a result, the computed R² value of 0.89 indicates that the explanatory variables included in the model account for 89% of the total variation in economic growth (GDP), with the remaining 11% attributed to the influence of other variables not included in the model.

5. CONCLUSION AND RECOMMENDATIONS

With an emphasis in five Sub-Saharan African Countries specifically the Anglophone ECOWAS countries such as, Gambia, Ghana, Liberia, Nigeria and Sierra Leone, this study explore the effect of foreign direct investment on economic growth through the use of generalized method of moment (GMM) approach, descriptive statistics and correlation matrix, for a panel data from 1984 to 2024, the result of generalized method of moment (GMM) shows significant positive effect of foreign direct investment and trade balance on economic growth, while exchange rate shows significant negative effect on economic growth in the five Anglophone African countries, while population growth shows significant negative effect on economic growth. The result of correlation matrix further shows evidence of positive correlation between foreign direct investment and economic growth, and descriptive statistics result also shows the higher mean, maximum and minimum values, of trade openness and real exchange rate as well as the higher standard deviation as compared to other variables.

Recommendations:

Based on the results of this study, the following policy recommendations are proposed:

1. *Improve policies that attract productive FDI: To attract long-term and growth-enhancing foreign direct investment, governments should promote investor-*



friendly policies, improve regulatory openness, and assure political and macroeconomic stability.

2. *Promote Trade Openness and Export Diversification: Policies aimed at lowering trade barriers and diversifying exports beyond primary commodities should be undertaken to amplify trade openness's favorable influence on economic development.*
3. *Maintain exchange rate stability: Monetary authorities should undertake measures that enhance exchange rate stability and competitiveness in order to boost exports and attract foreign investment.*
4. *Address Population Growth Challenges. Governments should invest in human capital development, education, and job creation to offset the negative consequences of population expansion on economic performance.*
5. *Improve institutional quality. Improving institutional frameworks, governance, and infrastructure will increase absorptive capacity and make foreign direct investment more successful in driving long-term economic growth.*

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