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The Effect of Foreign Direct Investment and Trade Openness on Economic Growth: Evidence from Five African Countries

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Abstract

Through some empirical studies, the flow of FDI and trade openness have proven to support economic growth in developing countries. This paper examines the significance of FDI and trade openness in five African countries (Ghana, Morocco, Kenya, Uganda, and Zambia). The study employed the panel data analysis method using data from the World Bank for the period 1994-2019 for the five selected countries. The result from the Random effect model indicated that FDI positively supports growth, whereas trade openness harms economic growth in these countries. The outcome further revealed that Uganda enjoys more significance than the other countries using the countries' dummies through the pooled model estimation. We recommend that various governments focus more on exports, reduce imports, attract more FDI through incentives, and create a regulatory environment that is friendly to FDI.

Keywords

GDP, FDI, Trade openness, Economic growth, Africa.

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Introduction

Foreign direct investment (FDI) and international trade are potential macroeconomic indicators supporting economic growth in developing and developed nations. Fast-growing trade operations catalyze rising local demands, which in turn help to build large-scale industries and boost export levels (Khan and Khilji, 2011). Developing nations previously had laws restricting trade, but as time passed and globalization emerged, all these nations came to see the value of trade liberalization (Zaman et al., 2018). Many advanced and developing nations started to open their economies to global integration in the 1980s (Güriş and Gözgör, 2015). Most countries have not fully uncovered the significance of FDI and trade openness as the barriers to free trade still exist. International trade has been significant for most developing countries on the African continent as they can leverage consumption of certain goods and services they cannot produce. The relationship between FDI and trade may be the result of FDI's influence on trade through the promotion

of export expansion, or it may be the result of trade's influence on investment through the establishment of related services abroad and the adoption of a liberal trade policy regime because of export expansion (Thanh et al., 2019). Trade openness and FDI support technology and technical know-how in developing economies. By taking advantage of comparative advantages brought about by trade openness, open economies have cleared the way for the import of new technology and ideas from the rest of the world, leading to a better division of labour, new techniques of production, and new goods (Tahmad and Abdel, 2018). The recent global pandemic has caused many economies worldwide into recession, reducing the flow of FDI in African countries. Based on the projected gross domestic product (GDP) expansion and some investment-specific parameters, the flow of FDI to the African continent is expected to decrease by 25% to 40% in 2020 and recover in 2022 (UNCTAD, 2020). African countries have identified FDI as accumulating capital to support economic development. Numerous literature

and empirical findings found that FDI stimulates growth in developing countries. FDI is one of the explanatory variables that the modern domestic growth theory emphasizes as a determinant driving economic expansion (Zarria, 2021). According to the World Bank, FDI is also advantageous to the home country because it aids in market expansion, cost reductions, and other tariff reductions (UNCTAD, 2010). The higher aggregate inflow of FDI in Africa has raised expectations about its potential contribution to their development (OECD, 2011).

However, a resident of one economy (the direct investor) wants to acquire a long-term interest in a business located in another economy (Patterson et al., 2004); the goal of the foreign investment category is FDI (the direct investment enterprise). Since foreign investors frequently maintain tight control over the operations of affiliated companies due to ownership advantages linked to their proprietary assets and long-term interest, the underlying rationale for all such analytical exercises to capture the overall impact of FDI inflows has been the fundamental insight that FDI's impact and implications for the development of host economies are very different from those of foreign portfolio capital inflows that are more transient (Francis, 2010). The flow of FDI on the African continent increased rapidly in the 2000s. FDI inflow to the continent in the second half 1990s, and after increasing to a record of US\$ 10.5 billion in 1999, decreased to US\$ 9.1 billion in 2000 (Basu and Srinivasan, 2002). However, according to the World Bank, due to COVID-19, there has been a sharp decline in foreign private investment in Africa, with foreign direct investment (FDI) flows to the continent expected to shrink by about 16% in 2020. According to UNCTAD's World Investment Report 2022, FDI to African nations reached a record \$83 billion in 2021. This was more than twice as stated in 2020 when the COVID-19 epidemic significantly negatively impacted regional investment. Despite the rapid expansion, just 5.2% of all foreign direct investments (FDI) worldwide went to Africa, up from 4.1% in 2020. While FDI increased moderately in most African nations in 2021, a financial transaction within a single company in South Africa accounted for about 45% of the total.

Conversely, according to the World Bank, trade is the aggregate of exports and imports of goods and services measured as a share of GDP. This ratio is frequently referred to as the trade openness

ratio. Still, the term "openness" may be misleading because a low ratio may be caused by factors like the size of the economy and geographic distance from potential trading partners rather than high (tariff or non-tariff) barriers to foreign trade (OECD, 2011). However, the OECD indicated that the total value of goods and services traded internationally demonstrates how integrated a nation is into the global economy. Smaller nations are typically more interconnected; they specialize in fewer export industries and depend on imports more than larger nations to meet domestic demand. Additionally, trade integration is not solely determined by size. Geography, history, culture, trade policy, economic structure (particularly the proportion of non-tradable services), and integration in global production chains are additional factors that explain differences between nations. Measured trade may also include a sizeable portion of re-exports and intra-firm trade linked to the presence of multinational corporations (OECD, 2011). In the 1960s and 1970s, trade openness encouraged convergence, but after 1980, trade benefits largely went to the wealthier economies, with little benefit going to the less developed economies (Dowrick and Jane, 2004). Most of the trade's dynamic gains are derived through productivity growth, with increased investment making up a very modest portion. The simple outcome-oriented measures of trade openness only capture one aspect of trade openness: countries' share of trade, whereas the policy-oriented measures of trade openness used in earlier studies have been claimed to be subjective (Njindan, 2017).

Numerous researchers have jointly tested FDI and trade openness on economic growth through different methods and obtained different outcomes. The empirical results from past studies indicated that FDI and foreign trade could positively and negatively impact economic growth. According to (Sayef and Sofien, 2019) empirical findings of 24 Asian economies through the fixed and random effect models discovered that exports and foreign direct investment are harming the growth trajectory. Conversely, an empirical analysis based on 16 years of panel data from Southeast European nations by Fetahi-Vehapi et al. (2015), their estimation findings show that the baseline per capita income and other explanatory variables are necessary for the favorable effects of trade openness on economic growth; otherwise, there is weak evidence between these two variables. However,

Naveed and Shabbir (2006) used developed countries and discovered that openness is important and has a favorable impact on GDP per capita growth, but FDI seemed to have little impact. Furthermore, Sabir et al. (2019) used panel data for low, lower-middle, upper-middle, and high-income nations. Their findings support the notion that institutional quality influences FDI favorably across all nations. Consequently, Alam and Sumom (2020) investigated the causal relationship between trade openness and economic growth using 15 Asian nations. Their result demonstrated that trade openness has a favorable effect on economic growth. Chen and Gupta (2006) provided evidence through an empirical result that trade openness had a strong positive effect on Southern Development Community's economic growth. Additionally, Victor (2019) found a positive impact of trade openness in the Economic Community of West African States. Bajwa and Siddiqi (2011) stated that there is a long-term negative relationship between GDP and openness, as evidenced by the long-term elasticity magnitude between both being negative from 1972 to 1985. Conversely, empirical results of Brueckner and Lederman (2015) show that trade openness has a significant positive impact on Sub-Saharan African economies. Then Kumar's and Rani's (2018) results show that trade openness positively impacted growth, whereas FDI has a negative effect. On the other hand, the panel data analysis found trade openness to support high economic growth (Ulaşan, 2015). Liargova and Skandalis (2012) indicated that trade openness contributes positively to FDI in these nations in the long run in 36 developing countries. According to Quazi (2007), FDI in Latin America is strongly and significantly influenced by economic freedom. However, study by Kumari and Sharma (2017) indicated that fixed effect estimates show that market size, trade openness, interest rate, and human capital produce significant coefficients in connection to FDI inflow. The results show that the biggest factor affecting FDI inflow is market size. Conversely, Majeed and Ahmad (2009) confirmed that openness positively impacts FDI flows to developing nations. Ali's (2016), findings indicated a significant link between trade openness and foreign direct investment inflows. Positive and significant effects of trade openness on FDI inflows to South Asian nations. Boğa (2019) stated that in the long run, it has been discovered that factors such as GDP growth, trade openness, local credit, natural resources, and telecommunications infrastructure all affect FDI inflows in Sub-

Saharan African nations. However, only GDP growth and trade openness determine FDI inflows in the medium term. Zekarias (2016) concluded that FDI is a key driver of economic growth and a catalyst for conditional economic convergence in Eastern Africa.

Despite the significant number of works devoted to the study of FDI, trade openness, and economic development in developing countries, the findings have been ambiguous and contradictory. However, this study seeks to contribute to the existing hypothesis theory that FDI and trade openness support economic development. Consequently, the study is significant to the uncovered significance of FDI and international trade in developing economies. While the effects of FDI and trade openness have been captured in most studies on major economies in Africa, the impact of FDI and Trade openness on economic development in Uganda and Zambia remains insufficiently studied. Therefore, this study aimed to investigate the significance of FDI and trade openness in five African countries.

Materials and methods

To understand this study's goal through exploring the relationship between foreign direct investment and trade openness with the gross domestic product as a proxy for economic growth. This study aimed to investigate the significance of FDI and trade openness in five African countries. The study used annual data from 1994 to 2019 from the World Bank for five developing nations on the African continent, which include Ghana, Kenya, Morocco, Uganda, and Zambia. The reason for choosing these specific countries is because of regional balance since each of the countries is located within the various sub-regions of the African continent. Moreover, these countries depend heavily on FDI inflows for developmental projects. Consequently, these countries often experience a balance deficit from international trade, so assessing the impact of FDI and trade openness on economic growth is significant. The data may be limited due to variations in the availability of uniform data for all the countries. Lack of uniformity in the observations time range for all variables for the respective nations causes restrictions. The rationale for using data from 1994 to 2019 is because there was available data on FDI and trade openness for the selected countries. However, there were some missing data yearly for some of the countries in the early 90s, and it is ideal

for the study to be restricted to the available data. The chosen approach is based on the methods used in past literature (Wiredu et al., 2020; Batrancea et al.,2021; Mohan,2007), in which GDP was used as the proxy for economic growth. The model specification to be estimated in this study are as follows:

$$y_{it} = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_d x_{di} + \varepsilon_i$$

(Linear econometric equation)

$$\ln GDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 Trade_{it} + \varepsilon_{it}$$

The subscript t = time and i = country

Where $\ln GDP_{it}$ is the log of Gross domestic product in US\$. The gross domestic product also measures the market. FDI_{it} is foreign direct investment inflow in the current US\$, whereas it also represents total inflows. $Trade_{it}$ represents (export plus import) ratio to GDP. Gross domestic product is used as a proxy to assess the selected countries' economic growth. Furthermore, we first tested for the significance of the variables towards economic growth through the pooled model for a better understanding.

Consequently, a panel diagnostic test was performed to determine whether the pooled model was adequate over the fixed and random effect model. The panel diagnostic test shall determine whether the fixed or random effect model will be used as our final model. The model equations for fixed and random effects can be written as follows:

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} = \text{fixed effect model}$$

$$\ln GDP_{it} = \alpha_i + \beta_1 FDI_{it} + \beta_2 Trade_{it} + \dots + \varepsilon_{it}$$

In a fixed effect model, the levels are either predetermined or based on the data's experimental design. Often, a fixed impact has "few" levels. In the case of the fixed effect, conditional expectation (mean) of interest.

$$Y_{it} = \alpha_i + \beta X_{it} + \mu_{it} + \varepsilon_{it} = \text{random effect model}$$

$$\ln GDP_{it} = \alpha_i + \beta_1 FDI_{it} + \beta_2 Trade_{it} + \dots + \mu_{it} + \varepsilon_{it}$$

The levels in a random effect model come from the distribution of a random variable, most likely a normal one. An effect caused by randomness frequently has "many" levels. Estimates of the random effect's variance are made. The assumption is that fixed and random effect models are uncorrelated.

α in the pooled model equation is the constant term for the group of countries. The Pooled model assumes that the group has the same mean. However, the α_i in both Fixed and Random effect models

indicates the unknown intercept of each country. μ_{it} is the 'Between' variance, whereas ε_{it} is the 'Within' variance. Y_{it} is the explained variable, X_{it} represents explanatory variables, and β is the coefficient of the explanatory variable. The description of the group mean by numbers (1-5) is indicated in Table 1.

ID (group)	Country
1	Ghana
2	Zambia
3	Morocco
4	Uganda
5	Kenya

Source: Authors calculations

Table 1: Countries representation by ID number.

These ID numbers are unique identification codes for each country in our analyses. The study also employed the ADF unit root test to assess time series properties. This test helps to identify whether the time series is stationarity or non-stationarity. Conversely, multicollinearity was performed to investigate if some variables were not a perfect combination of each other.

Countries description

Ghana is in the West African region with a GDP of US\$ 77.59 billion as of 2021, a GDP per capita of US\$ 2,445, and a population of 31.07 in 2020. However, Kenya is in the Eastern part of Africa with a GDP of US\$ 110.35 billion in 2021 and a GDP per capita of US\$ 2,007 with a population of 53.77 million as of 2020. Consequently, Morocco is situated in the North of Africa with a GDP of 132.73 billion in 2021, GDP per capita of US\$ 3,497, and a population of 36.91 million as of 2020. Conversely, Uganda is also found in the Eastern part of the continent, with a GDP of US\$ 37.60 billion, GDP per capita of US\$858 in 2021 and a population of 45.74 million in 2020. Furthermore, Zambia is often considered part of southern African countries with a GDP of US\$ 21.20 billion per capita of US\$ 985 in 2021 and a population of 18.38 million in 2020.

Results and discussion

Table 2 displays the summary statistics of the time series variables, including their means, medians, standard deviations, minimum, and maximum.

The summary statistics cover all independent countries concerning this study. The output shows that trade openness has the highest mean and median

Variable	Mean	Median	S.D.	Min	Max
GDP	34.1	25.9	31.0	3.40	120.
Trade	61.1	60.1	18.5	27.8	116.
FDI	1.02	0.625	1.08	0.0100	3.88

Source: Authors calculations

Table 2: Summary statistics.

values, followed by GDP and FDI, respectively. However, Table 3 indicates the correlation matrix among the selected variables. The correlation coefficients at 5 % critical value (two-tailed) equal 0.1723 using all the observations.

GDP	Trade	FDI	
1.0000	0.1703	0.6847	GDP
	1.0000	0.3650	Trade
		1.0000	FDI

Source: Authors calculations

Table 3: Correlation matrix.

The output in Table 3 indicates that there is a positive relationship among the variables toward economic growth in each of the countries.

Collinearity test

Collinearity diagnostic test using Belsley-Kuh-Welsch (BKW) test is displayed in Table 4. The collinearity test shows the variance proportions of the variables using the lambda and Cond values. According to BKW, Cond greater or equal to 30 indicates strong near linear dependence and Cond between 10 and 30 shows moderately strong. Parameters estimates whose variance is mostly associated with problematic Cond values may be considered problematic.

The lambda is equal to eigenvalues of the inverse covariance matrix (smallest is 0.0375096), whereas Cond represents the condition index. Based on the result of the collinearity test in Table 4 shows no evidence of excessive collinearity.

ADF unit root test

However, testing for unit root the outcome shows that the variables are non-stationarity at a level whereas they became stationarity series at first difference. The ADF unit root test was carried out as the groups with a null hypothesis of all groups having unit root. The Dickey-Fuller test for all the variables was tested using the variant with constant, which has the equation $(1-L)y = b_0 + (a-1) * y(-1) + e$. Under the variant with constant has a Choi meta-test, which includes inverse chi-square, inverse normal and logit test.

Tables 5 and 6 indicate the details of the unit root results at a level and first difference.

The outcome of the unit root test at the level indicated a unit root presence in the variables because the p-values are greater than the 5 % significant level, and we failed to reject the null hypothesis. The assumption that a unit exists in the variables equals 1, and the asymptotic p-value is used to assess it. Any p-value greater than 5 % indicates a unit root presence.

Regression result

Table 7 indicates the regression coefficient outcome from the Pooled model. The coefficients of FDI and trade are significant at 1% in the Pooled ordinary least squares (OLS) output. FDI had a positive impact on the GDP trend towards economic growth. It also means that an increase in FDI will expand growth by 0.72% in these countries. However, the trade openness coefficient was negative, showing that trade harms the selected countries' economic growth. The coefficient of trade means that a rise in trade will lead to a 0.01% decrease in GDP.

$$\ln GDP_{it} = 2.984 + 0.722(FDI_{it}) - 0.011(Trade_{it})$$

The Pooled model R-squared shows that 51% of the variation is explained in GDP by the regressors (FDI and trade). The p-value of the F-statistics is significant at a 1% level. However, some studies over the years found that FDI positively correlates with economic growth, confirming our findings about FDI. For instance, Adedeji and Ahuru (2016) found FDI inflows to support economic growth positively in Sub-Saharan African countries. On the other hand, Gui-Diby (2014) also indicated that FDI inflows have a significant impact on economic growth in 50 African countries, and there was some dynamic in results because from 1980 to 1994, FDI inflows had a negative effect. In contrast, there was positive support from 1995 to 2009. Conversely, Ayenew (2022), Cinar and Nulambek (2018), and Wiredu et al. (2020) also found trade openness to positively support growth which does not confirm the coefficient of trade openness in our model. The significance

Lambda	Cond	Constant	GDP	Trade	FDI
3.356	1.000	0.006	0.017	0.006	0.017
0.448	2.736	0.046	0.110	0.033	0.172
0.159	4.597	0.003	0.797	0.013	0.664
0.038	9.458	0.944	0.076	0.949	0.147

Source: Authors calculations

Table 4: Belsley-Kuh-Welsch collinearity diagnostics.

Variables	Inverse Chi-square (10)	Inverse normal test	Logit test	Number of sample size
Trade	12.029 = p-value (0.283)	-0.901 = p-value(0.1837)	-0.869 = p-value (0.196)	1994-2019
Log of GDP	1.784 = p-value (0.998)	2.421 = p-value (0.992)	2.378 = p-value (0.988)	1994-2019
Trade	11.717 = p-value (0.304)	-0.134 = p-value (0.447)	-0.103 = p-value (0.459)	1994-2019

Source: Authors calculations

Table 5: ADF unit root at level.

Variables	Inverse Chi-square (10)	Inverse normal test	Logit test	Number of sample size
Trade	82.213 = p-value (0.0000)	-7.722 = p-value (0.0000)	-10.503 = p-value (0.0000)	1995-2019
Log of GDP	47.352 = p-value (0.0000)	-5.255 with a p-value of (0.0000)	-6.030 = p-value (0.0000)	1995-2019
FDI	98.395 = p-value (0.0000)	-8.376 = p-value (0.0000)	-12.569 = p-value (0.0000)	1995-2019

Source: Authors calculations

Table 6: ADF unit root after first difference.

Variables	Coefficient	Std. Error	t-ratio	p-value
constant	2.984	0.221	13.52	2.39e-26***
FDI	0.722	0.063	11.44	2.93e-21***
Trade	-0.011	0.004	-2.902	0.0044***

R-squared	0.51
Adjusted R-squared	0.50
F-statistic (2,127) = 66.3	P-value (F) 1.88e-20
Number of observations	130

Note: significant codes: *** 1%

Source: Gretl output using World Bank data

Table 7: Pooled model estimation.

of FDI inflows towards economic expansion is because of institutional reforms, investment incentives, and openness of the various economies to foreign investors. Formerly, investments were concentrated in the extractive industry, and FDI is now permeating the manufacturing and services sectors. For example, according to the United Nations, in 2016, the manufacturing industry accounted for around one-fifth of greenfield FDI projects, while the services sector accounted for about three quarters. In actuality, FDI is increasingly a significant funding source for economic diversification. However, for a deeper understanding, we further dummy the countries and re-assess their responses as individuals through the Pooled OLS, and the outcome is indicated

in Table 8. The output shows that both variables (FDI and trade) have significance in the individual countries. However, the significant level differs among the countries.

The coefficient of the variables with the countries dummy indicates that if trade openness and FDI inflows expand, growth will increase by 2.51% in Ghana, 2.39% in Zambia, 2.52% in Morocco, 3.6% in Uganda, and 3.5% in Kenya, respectively. The flow of FDI to Ghana has increased over the years due to the government's investment and trade policy reforms. However, Ghana has been a net importer for many years, reflecting the negative significance of trade openness in the country's economy. East Africa's greatest

Variables	Coefficient	Std. Error	t-ratio	p-value
FDI	0.655	0.0497	13.17	2.90e-25***
Trade	-0.008	0.004	-2.031	0.0444**
DCountry_1	2.510	0.339	7.397	1.89e-11***
DCountry_2	2.395	0.289	8.305	1.52e-13***
DCountry_3	2.515	0.183	13.72	1.46e-26***
DCountry_4	3.558	0.303	11.73	8.80e-22***
DCountry_5	3.499	0.229	15.22	4.61e-30***

R-squared	0.76
Adjusted R-squared	0.75
F-statistic (6,123) = 66.3	P-value (F) 3.28e-36
Number of observations	130

Note: significant codes: *** 1%, ** 5%
Source: Gretl Output using World Bank data

Table 8: Pooled model estimation with country dummies.

economy at the moment is Kenya. Currently, the nation generates almost 50% of the GDP of East Africa (Nicholas, 2022). As a result, it has been the top choice for many international investors looking to set up investment in Africa.

Consequently, the Morocco economy is witnessing a greater impact of FDI and trade liberalization because of the strong policies to support its economy. The Moroccan government implemented several structural, institutional, and regulatory reforms in financial and trade liberalization. The promotion of investment, including tax relief, judicial system reform, trade liberalization, industrial property strengthening, banking sector modernization, infrastructure development, and development of several free zones (Sfar and Mtar, 2017). Conversely, Uganda experiences a higher impact on trade openness and the flow of FDI from the pooled model because most of the agricultural projects that foreign companies invest in involve producing flowers for export markets. According to the Uganda Bureau of Statistics, the growth and processing of oil seeds into finished products, the growing, processing, spinning, and knitting of cotton, and the production and processing of livestock products like milk and hides.

Additionally, Zambia's key recipients of FDI inflows in the agriculture industry, tourism, and copper and cobalt extraction. Foreign direct investment (FDI) has traditionally been mostly contributed to by businesses or groups of businesses from nations like the United Kingdom and South Africa; however, FDI inflow from other nations has dramatically increased in the Zambian economy (Jere et al., 2017). International trade has been

a major challenge for most African countries as they import more than they export.

Panel diagnostic test

Assessing whether the pooled model is adequate, a panel diagnostic test was performed to check the quality of the model against the fixed and random effects model. The pooled model assumes the group has the same mean, whereas the fixed and random effects model identifies the groups to have different means. The diagnostic test is shown in Table 9.

Panel diagnostic test	Null hypothesis	P-value	Conclusion
F-test	Pooled model is adequate	1.16954e-18	Ho is rejected; the fixed effect model is adequate.
Breusch-Pagan specification test	Pooled model is adequate	1.21861e-86	Ho is rejected; the random effect model is adequate.
Hausman specification test	The random effect model is consistent	0.867017	Ho is not rejected; the random effect model is adequate.

Source: Gretl output using World Bank data

Table 9: Panel diagnostic test of the Pooled model.

Under the panel diagnostic test, using F-test compares the pooled model against the fixed effect model and a low p-value count against the null hypothesis, which states that the Pooled model is adequate. The p-value must be greater than the 5% significant level for an acceptance of the null hypothesis. The Breusch-Pagan specification test compares the Pooled model to the random effect model, whereas the Hausman specification test compares the random effect model to the fixed effect model. However, the F-test proves

that the fixed effect model is more appropriate than the Pooled model. The Breusch-Pagan specification also indicated that the random effect model is better than the Pooled model. In contrast, the Hausman specification result also displayed the random effect model as appropriate for the final model. Hence, the model estimation through the random effect in the final model.

Table 10 shows the output of the fixed effect model. The coefficients have the same sign as in the Pooled model. The joint on named regressors test statistic of 87.2382 with a p-value of 2.58129e-24, which is statistically significant at a 5% level. However, the test for differing group intercepts null hypothesis of the group having a common intercept is rejected because the p-value was 1.16954e-18 which is significant at 5%.

The least squares dummy variables (LSDV) estimator R-squared indicated 76% variation explained in the dependent variable (GDP) by the regressors (FDI and trade). The F-statistics of the overall model are significant. The coefficient of FDI indicates a positive impact on economic growth in the selected countries, whereas trade openness negatively affects growth. However, the outcome of the variable coefficients in the random effect model is indicated in Table 11.

$$\ln GDP_{it} = 2.898 + 0.657 (FDI_{it}) - 0.008 (Trade_{it})$$

The 'Between' variance of 0.581599 and 'Within' variance of 0.260766 with theta used for quasi-demeaning equal to 0.869799, and correlation

(y, yhat)² is 0.510049 from the random effect model means that country have different group means. Conversely, the Joint test on the regressors' asymptotic test statistic Chi-square was 178.414 with a p-value of 1.81096e-39, which means that the joint test's F-test is significant at a 1% level. The coefficients of FDI and trade in the Pooled model were higher than those in the random effect model. Consequently, the coefficients have the same signs as indicated in the Pooled OLS output: FDI coefficient with a positive sign and trade coefficient with a negative. The pooled and random effect results show that trade openness harms the country's economic growth. At a 5% significant level, the null hypothesis that the errors are normally distributed cannot be rejected since the p-value is 0.068 and greater than the critical value.

The pooled, fixed effect and random effect models confirmed a positive and statistically significant impact of FDI inflow on the selected countries' economies from 1994-2019. We affirmed the hypothesis that FDI supports economic growth in an economy in the long run. The findings about FDI conform with several studies in the Past (Haque et al., 2022; Aneyew, 2022; Zekarias, 2016). Consequently, our results did not confirm the hypothesis that Trade openness positively stimulates economic growth in the long run because the coefficient in the models had a negative sign which means that it harms development. Studies also found a negative impact on trade openness (Adu-Gyamfi et al., 2020).

Variables	Coefficient	Std. Error	t-ratio	p-value
constant	2.895	0.251	11.52	2.87e-21***
FDI	0.655	0.049	13.17	2.90e-25***
Trade	-0.008	0.004	-2.031	0.0444**

LSDV R-squared	0.76
Within R-squared	0.59
LSDV F (6, 123) =66.3	P-value (F) 3.28e-36
Number of observations	130

Note: significant codes: *** 1%, ** 5%
Source: Gretl Output using World Bank data

Table 10: Fixed Effect model estimation.

Variables	Coefficient	Std. Error	z	p-value
constant	2.898	0.419	6.922	4.46e-12***
FDI	0.657	0.049	13.33	1.58e-40***
Trade	-0.008	0.004	-2.088	0.0368**

Note: significant codes: *** 1%, ** 5%
Source: Gretl Output using World Bank data

Table 11: Random effect estimation.

Conclusion

The study investigates the linkage of FDI inflows, trade openness, and economic development in five selected nations (Ghana, Kenya, Morocco, Uganda, and Zambia) for 26 years. The data was collected from the World Bank on annual frequency from 1994 to 2019 and analyzed using summary statistics, correlation matrix, ADF panel unit root test, panel diagnostic test, and random effect estimation for the final findings. The individual significance using the countries dummy through a Pooled model shows that Uganda enjoys a high significance level from FDI and trade openness, followed by Kenya, Morocco, Ghana, and Zambia, respectively. The Hausman test of the panel diagnostic test revealed that the random effect estimation is the most preferred over the fixed effect model. The results from the random effect model indicated that FDI positively affects economic growth, whereas trade openness negatively impacts growth in the selected countries. The findings concluded that FDI inflows have a positive impact on the economies of the countries under study, which confirmed the hypothesis that FDI stimulates growth, but not in the case of trade

openness in the selected countries. This implies that the hypothesis that trade openness facilitates economic development is not validated in this study.

The findings have a higher practical implication for these economies. The policymakers in these countries should encourage and support domestic firms by providing incentives enabling them to produce on a large scale for domestic consumption and exports. Furthermore, governments need to ensure that their economies are attractive and favorable for investment to encourage the growth of FDI. This can be accomplished through infrastructure development and liberalization of national policies to create a regulatory environment that is friendly to FDI by easing restrictions on foreign ownership and market entry and enhancing market efficiency. Additionally, the limited observation because of a lack of uniform time range for the variables regarding the individual countries may hinder the dynamism of the findings. Future research works can consider other variables and increase the sample size for more in-depth analysis.

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References

- [1] Adedeji, G. D. and Ahuru, R. R. (2016) "Foreign Direct Investment and Economic Growth in Developing Countries: Panel Estimation for Sub-Saharan African Countries", *International Journal of Development and Management Review*, Vol. 11, pp. 39-50, ISSN 2734-3316. DOI 10.4236/tel.2016.64084.
- [2] Adu-Gyamfi, G., Nketiah, E., Obuobi, B. and Adjei, M. (2020) "Trade Openness, Inflation and GDP Growth: Panel Data Evidence from Nine (9) West Africa Countries", *Open Journal of Business and Management*, Vol. 8, pp. 314-328. ISSN 2329-3292. DOI 10.4236/ojbm.2020.81019.
- [3] Alam, J. K. and Sumon, K. K. (2020) "Causal Relationship between Trade Openness and Economic Growth: A Panel Data Analysis of Asian Countries", *International Journal of Economics and Financial Issues*, Vol. 10, No. 1, pp. 118-126. ISSN 2146-4138. DOI 10.32479/ijefi.8657.
- [4] Ali, A. (2016) "Foreign Direct Investment and Trade Openness: The Case of South Asian Economies", *International Journal of Innovation and Applied Studies*, Vol. 17, No. 2, pp. 513-521. ISSN 2028-9324.
- [5] Ayenew, B. B. (2022) "The effect of foreign direct investment on the economic growth of Sub-Saharan African countries: An empirical approach", *Cogent Economics & Finance*, Vol.10, No.1, p. 2038862. ISSN 2332-2039. DOI 10.1080/23322039.2022.2038862.
- [6] Bajwa, S. and Siddiqi, W. (2011) "Trade Openness and Its Effects on Economic Growth in Selected South Asian Countries: A Panel Data Study", *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, Vol. 5, No. 2, pp. 202-217.

- [7] Batrancea, L., Malar, M. R. and Ioan, B. (2021) "A Panel Data Analysis of Economic Growth Determinants in 34 African Countries", *Journal of Risk and Financial Management*, Vol. 14, No. 260. E-ISSN ISSN 1911-8074. DOI 10.3390/jrfm14060260.
- [8] Basu, A. and Srinivasan, K. (2002) "Foreign Direct Investment in Africa-Some Case Studies", International Monetary Fund Working Paper/02/61, p. 2-40. [Online]. Available: <https://www.imf.org/external/pubs/ft/wp/2002/wp0261.pdf> {Accessed: March 15, 2022}. DOI 10.5089/9781451848182.001.
- [9] Belesity, B. A. (2022) "The effect of foreign direct investment on the economic growth of Sub-Saharan African countries: An empirical approach", *Cogent Economics & Finance*, Vol. 10, No. 1, p. 2038862. ISSN 2332-2039. DOI 10.1080/23322039.2022.2038862.
- [10] Boğa, S. (2019) "Determinants of Foreign Direct Investment: A Panel Data Analysis for Sub-Saharan African Countries", *Emerging Markets Journal*, Vol. 9, No. 1, pp. 81-87. ISSN 2158-8708. DOI 10.5195/emaj.2019.175.
- [11] Brueckner, M. and Lederman, D. (2015) "Trade Openness and Economic Growth: Panel Data Evidence from Sub-Saharan Africa", *Economica*, Vol. 82, No. 1, pp. 1302-1323. ISSN 00130427. DOI 10.1111/ecca.12160.
- [12] Chen, P. P., and Gupta, R. (2006) "An Investigation of Openness and Economic Growth Using Panel Estimation", University of Pretoria Department of Economics Working Paper Series.
- [13] Cinar, M. and Nulambeh, N. A. (2018) "Foreign Direct Investment, Trade Openness and Economic Growth: A Panel Data Analysis for Sub-Saharan Africa", *Business and Economics Research Journal*, Vol. 9, No. 4, pp. 749-760. ISSN 2619-9491. ISSN 1309-2448. DOI 10.20409/berj.2018.136.
- [14] Dowrick, S. and Jane, G. (2004) "Trade Openness and Growth: Who Benefits?", *Oxford Review of Economic Policy*, Vol. 20, No. 1, pp. 38-56. E-ISSN 1460-2121, ISSN 0266-903X. DOI 10.1093/oxrep/grh003.
- [15] Fetahi-Vehapi, M., Sadiku, L. and Petkovski, M. (2015) "Empirical Analysis of the Effects of Trade Openness on Economic Growth: An Evidence for South East European Countries", *Procedia Economics and Finance*, Vol. 19, pp. 17-26. ISSN 2212-5671. DOI 10.1016/S2212-5671(15)00004-0.
- [16] Francis, S. (2010) "Foreign Direct Investment Concepts: Implications for Negotiations", *Economic and Political Weekly*, Vol. 45, No. 22, pp. 31-36. E-ISSN 2349-8846, ISSN 0012-9976.
- [17] Güriş, S. and Gözgör, K. (2015) "Trade Openness and FDI Inflows in Turkey", *Applied Econometrics and International Development*, Vol. 15, No. 2, pp. 54-62. ISSN 1578-4487.
- [18] Gui-Diby, L. S. (2014) "Impact of Foreign Direct Investments on Economic Growth in Africa: Evidence from Three Decades of Panel Data Analyses", *Research in Economics*, Vol. 68, No. 3, pp. 248-256. ISSN 1090-9443. DOI 10.1016/j.rie.2014.04.003.
- [19] Haque, M. A., Zhang, B. and Muhammad, U. A., (2022) "Sources of Financial Development and Their Impact on FDI Inflow: A Panel Data Analysis of Middle-Income Economies", *Economies*, Vol. 10, No. 182. ISSN 22277099. DOI 10.3390/economies10080182.
- [20] Jere, S., Kasense, B. and Chilyabanyama, O. (2017) "Forecasting Foreign Direct Investment to Zambia: A Time Series Analysis", *Open Journal of Statistics*, Vol. 7, pp. 122-131. ISSN 2161-7198. DOI 10.4236/ojs.2017.71010.
- [21] Kakar, K. Z. and Khilji, A. B. (2011) "Impact of FDI and Trade Openness on Economic Growth: A Comparative Study of Pakistan and Malaysia", *Theoretical and Applied Economics*, Vol. 18, No. 11(564), pp. 53-58. ISSN 1841-8678.
- [22] Kumari, R. and Sharma, K. A. (2017) "Determinants of foreign direct investment in developing countries: a panel data study", *International Journal of Emerging Markets*, Vol. 12, No. 4, pp. 658-682. ISSN 1746-8809. DOI 10.1108/IJoEM-10-2014-0169.

- [23] Liargovas, G. P. and Skandalis, S. K. (2012) "Foreign Direct Investment and Trade Openness: The Case of Developing Economies", *Social Indicators Research*, Vol. 106, pp. 323-331. ISSN 03038300. DOI 10.1007/s11205-011-9806-9.
- [24] Majeed, T. M. and Ahmad, E. (2009) "An Analysis of Host Country Characteristics that Determine FDI in Developing Countries: Recent Panel Data Evidence", *The Lahore Journal of Economics*, Vol. 14, No. 2, pp. 71-96.
- [25] Naveed, A. and Shabbir, G. (2006) "Trade Openness, FDI and Economic Growth a Panel Study", *Pakistan Economic and Social Review*, Vol. 44, No. 1, pp. 137-154. E-ISSN 2224-4174, ISSN 1011-002X.
- [26] Nicholas M. O. (2022) "Foreign Direct Investment and Economic Growth in Kenya: An Empirical Investigation", *International Journal of Public Administration*, Vol. 45, No. 8, pp. 620-631. ISSN 0190-0692. DOI 10.1080/01900692.2021.1872622.
- [27] Njindan, I. B. (2017) "Does Trade Openness Matter for Economic Growth in the CEE Countries?" *Review of Economic Perspectives*, Vol. 17, No. 1, pp. 3-24. DOI 10.1515/revecp-2017-0001.
- [28] OECD (2011) "*Trade openness, in OECD Science, Technology and Industry Scoreboard 2011*", OECD Library Statistics, Paris: OECD Publishing. DOI 10.1787/sti_scoreboard-2011-60-en.
- [29] Patterson, N., Montanjees, M., Motala, J. and Cardillo, C. (2004) "*Foreign Direct Investment Trends, Data Availability, Concepts, and Recording Practices*", International Monetary Fund, pp. 3-35. ISBN 1-58906-347-3.
- [30] Quazi, M. R. (2007) "Foreign Direct Investment in Latin America: A Panel Regression Study", *The International Journal of Business and Finance Research*, Vol. 1, No. 1, pp. 59-67. ISSN 2157-0698.
- [31] Ramesh, M. (2007) "A Panel Data Analysis of FDI, Trade Openness, and Liberalization on Economic Growth of the ASEAN-5", *The Empirical Economics Letters*, Vol. 6, No. 1, pp. 36-44. ISSN 1681-8997.
- [32] Rani, R. and Kumar, N. (2018) "Panel Data Analysis of Financial Development, Trade Openness, and Economic Growth: Evidence from BRICS Countries", *Emerging Economy Studies*, Vol. 4, No. 1. ISSN 2454-2148. DOI 10.1177/2394901518767023.
- [33] Rodrik, D., Subramanian, A. and Trebbi, F. (2002) "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development", NBER Working Paper 930, pp. 1-45. DOI 10.3386/w9305.
- [34] Sabir, S., Rafique, A. and Abbas, K. (2019) "Institutions and FDI: evidence from developed and developing countries", *Financial Innovation*, Vol. 5, No. 8. DOI 10.1186/s40854-019-0123-7.
- [35] Sayef, B. and Sofien, T. (2019) "The Impact of Trade Openness, Foreign Direct Investment and Domestic Investment on Economic Growth: New Evidence from Asian Developing Countries", *Economic Research Guardian*, Vol. 9, No. 1, pp. 46-54. ISSN 2247-8531.
- [36] Sfar, S. B. E. and Mtar, K. (2017) "The Effects of FDI on the Moroccan Economy: An Empirical Estimate from a Structural Model", *Asian Journal of Economic Modelling*, Vol. 5, No. 3, pp. 266-273. ISSN 2312-3656. DOI 10.18488/journal.8.2017.53.266.273.
- [37] Tahmad, M. I. and Abdel, H. A. (2018) "The impact of trade openness on foreign direct investment in Sudan by sector in the 1990-2017 period: an empirical analysis", *Economic Annals-XXI*, Vol. 172, No. 7-8, pp.14-21. ISSN 0013-3264. DOI 10.21003/ea.V172-03.
- [38] Thanh, D. S., Canh, P. N. and Schinckus, C. (2019) "Impact of foreign direct investment, trade openness and economic institutions on growth in emerging countries: The case of Vietnam", *Journal of International Studies*, Vol. 12, No. 3, pp. 243-264. ISSN 2071-8330. DOI 10.14254/2071-8330.2019/12-3/20.

- [39] Ulaşan, B. (2015) "Trade openness and economic growth: panel evidence", *Applied Economics Letters*, Vol. 22, No. 2, pp. 163-167. ISSN 1350-4851. DOI 10.1080/13504851.2014.931914.
- [40] UNCTAD (2020) "World investment report; International production beyond the pandemic", Paper presented at the Geneva, *United Nations Conference on Trade and Development*, pp. 1-268. ISSN 2225-1677.
- [41] UNCTAD (2010) "World investment report 2010: Investing in a Low-Carbon economy", Washington DC: *United Nation Conference on Trade and Development*, pp.1-221. ISBN 978-92-1-112806-2.
- [42] Victor, U. I. (2019) "Impact of Trade Openness on Economic Growth among ECOWAS Countries: 1975-2017", *CBN Journal of Applied Statistics*, Vol. 10, No. 1. ISSN 2476-8472. DOI 10.33429/Cjas.10119.4/6.
- [43] Zaman, Q., Donghui, Z., Yasin, G., Zaman, S. and Imran, M. (2018) "Trade Openness and FDI Inflows: A Comparative Study of Asian Countries", *European Online Journal of Natural and Social Sciences*, Vol. 7, No. 2, pp. 386-396. ISSN 1805-3602.
- [44] Zarria, F. (2021) "Effects of FDI and Trade Openness on Economic Growth in Morocco", *International Journal of Scientific Engineering and Science*, Vol. 5, No. 3, pp. 23-28. ISSN 2456-7361.
- [45] Zekarias, M. S. (2016) "The Impact of Foreign Direct Investment (FDI) on Economic Growth in Eastern Africa: Evidence from Panel Data Analysis", *Applied Economics and Finance*, Vol. 3, No. 1, pp. 148-161. ISSN 2332-7308. DOI 10.11114/aef.v3i1.1317.