Foreign Direct Investment and Growth in Kenya

Abstract

The study investigates how foreign direct investment (FDI) affects economic growth in developing countries, with a focus on Kenya.Theoretical literature argues that FDI can transfer great advantages to host country, however, empirical studies show that the benefits of FDI vary greatly across countries. Kenya has traditionally been one of the largest recipients of FDI in Africa, foreign investors provide intangible assets to support operation of the domestic firms. However, recently Kenya has experienced dwindling FDI levels. The study investigated the contribution of foreign direct investment to economic growth in Kenya using Autoregressive Distributed Lag (ARDL) regression approach. Secondary time series data for Kenya were used during empirical analysis. The time series data is from 1990-2021. It was established that the contribution of FDI to economic growth is estimated to be positive and significant in Kenya.Notably, the results show that short-run to long-run FDI induces economic growth. Accordingly, Kenya must have more effective FDI strategies and pursue macroeconomic policies that attract FDI into the country, particularly by productively opening the market and allowing FDI inflow, to boost investment and economic growth through foreign exchange earnings and spillover effects.

Keywords: Foreign direct investment, economic growth, foreign exchange, spillovers

JEL Classification: F21, F23, F43

Introduction

Across most developing countries foreign direct investment (FDI) has proved to be resilient during financial crises and more recently during the Covid-19era (Benetrix et al., 2023). In contrast to other forms of foreign capital inflow, FDI has been stable in developing statesand has contributed much by complementing negligible domestic investment in those economies. Most empirical studies on foreign direct investment and economic growth is founded on endogenous and neoclassical growth theories. The empirical relationship has been explored on determinants of FDI or determinants of economic growth, the role of FDI on economic growth and the causality between economic growth and FDI. According to neoclassical growth theory FDI has had minimal contribution towards economic growth. In contrast, endogenous growth theories recognize the significance of FDI inflow on growth via capital transfer, technology spillover,foreign exchange earnings and human capital development through training and skills acquisition (De Mello, 1999; Ofori & Asongu, 2022). Further, empirical literature document that FDI is an important source of capital that complements domestic private investment,generate new employment opportunities and stimulate technology transfer and spillovers (De Mello, 1999; Asongu et al.,2021; Benetrix et al., 2023).In contrast, Griffith et al. (2008) reported a negative relationship between FDI and growth in Caribbean countries. This has been attributed to limited knowledge transfers and weak research and development spillovers in those Caribbean states. Furthermore, most empirical studies acknowledge that the effect of FDI is limited by the absorptive capacities of the host countries, financial development, institutional and structures development, and therefore the effects differ across countries. Furthermore excessive FDI inflow, poor governance quality and high transaction costs will reduce the benefit of FDIon host country

(Ofori & Asongu, 2022). From available empirical information, many studies have been conducted on the relationship between FDI level and economic growth, but there is no consensus. This ambiguity in the empirical literature highlights the need for further research on the subject, to enhance further understanding.

At global stage inequality occurs in FDI level, African countries have received less foreign direct investment in comparison to Asia, Latin America and Caribbean states (UNCTAD, 2022). However, the minimal FDI inflow has improved infrastructure, domestic investment and human capital development in Africa. Despite all the positive effects, the FDI inflow faces challenges like poor financial development, poor savings, corruption, high inflation rate, political instability and deprived trade policies (Musimbi & Mose, 2023; Okello & Badj, 2023). In 2020, Kenya was Africa's fifth largest FDI recipient.However, despite Kenya being ranked number five in Africa, EY (2021) and World Bank (2023) report declining FDI inflow in 2020 compared to the period between 2011 and 2017 in Kenya, and this has been attributed to Covid-19pandemic. Particularly, between 2011 and 2016, FDI inflows were, on average, above 0.5% of the GDP. Further, between 2019 and 2021, FDI decreased year on year from $1.1bn in 2019 to $717m in 2020 to $448m in 2021, continuing a general pattern of decline (UNCTAD, 2022). However, in contrast most East African countries have recorded rise in FDI inflow, where on average FDI inflow increased by 35% between 2019 and 2021, to a total of $8.2bn. Kenya's dwindling foreign investment has been underpinned on high corruption rate, political unrest after general election and uncompetitive returns when compared to neighbouring countries. Kenya's FDI stock is majorly concentrated in financial sectors, information and technology, wholesale and retail and manufacturing sector. In aggregate, between 2015 and 2021, Kenya's total stock of FDI stood at $10.4bn and major foreign investors are from UK, Mauritius, the US, South Africa and France. Until the Covid-19 period, Kenya was one of the fastest growing economies in Africa with an accumulative annual gross domestic product (GDP) growth rate of 5.4 % between 2010 and 2022 (World Bank, 2023). Kenya's GDP growth trajectory has been underpinned by rise in FDI inflow, growth in agriculture and construction sector, financial sector growth and human capital development.However, despite Kenya receiving substantial FDI coupled with a developed financial sector, human capital development and improved domestic FDI strategies and policies, still Kenya faces several development challenges such a high perceived corruption rate, uncompetitive returns,political unrest, income inequality, high youth unemployment, poverty, and the economy continue to register dismal performance with mixed income growth (Mose, 2020; UNCTAD, 2022; World Bank, 2023).

Literature Review

Asongu et al. (2021) acknowledged the main theories of FDI, such as classical theory, dependence theory, middle path theory and product theory. The classical theory argues that FDI can be beneficial to the host country's economy in many ways: stimulate the development of domestic infrastructure, improve transfer of payment, transfer of capital skills, increase foreign earnings, technology spillover and expansion of tax revenue for the government (De Mello, 1999; Benetrix et al., 2023). In contrast, advocates of dependence theory maintain FDI can slow growth. The dependence theory is built on a Marxist foundation that perceives globalization via exploitation of cheap labour, expansion of foreign market, introduction of capitalism system, introduction of obsolete technology and exploitation of primary resources from developing countries will slow growth. The advocates of dependence theory hold that FDI can negatively influence economic growth through local political and economic elites collaborating with foreign investors to exploit citizens of host countries; Multinationals can distort domestic investment by using capital-intensive

technology to cause unemployment increase, income inequality and change taste and preferences; Finally, most foreign investors will send back profits generated to their motherland and thus crowd out local assets and domestic investment (Griffith et al., 2008; Jensen, 2008; Taylor & Thrift, 2013). With opposing views, the middle path theory was developed as a cautions theory that focuses on the development consequences of FDI. Middle path theory encourages a mixture of regulations and openness. The host economy should pursue strategies that attract FDI but also put in place strategies and policies that reduce the negative effect of FDI on the host economy (Blin&Ouattara, 2009; Gammoudi et al., 2016; Asongu et al., 2021).

Endogenous and neoclassical growth theories acknowledge the role of FDI on economic growth. According to neoclassical growth theory FDI has had minimal contribution towards economic growth. Solow growth model recognizes the role of FDI level on an economy via change in savings rate, population growth rate, and rate of technological progress (Solow & Swan, 1956; De Mello, 1999; Ofori & Asongu, 2022). FDI level is able to influence technological progress of a country via technological transfer and spillover. Adjusted Solow model supports FDI led growth through technology spillover and human capital development. Human capital augmented version of the Solow-Swan model explain that failure of FDI to flow to poor country lead to low marginal product of capital and less human capital development in these countries and thus harming economic growth (Solow & Swan, 1956). Further, endogenous growth theories recognize the significance of FDI level on growth via capital development and technology spillover (De Mello, 1999; Ofori & Asongu, 2022). Endogenous growth theory holds that investment in technical progress, innovation, human capital and knowledge will lead to growth through internal forces. Thus FDI is able to influence growth through foreign capital transfer to the host country via growth in knowledge and technical skills (Ofori & Asongu, 2022).

Many substantial empirical studies have explored the effect of FDI on economic growth. For instance, Benetrix et al. (2023) conducted a study in selected developed and low-income countries for the period between 1990 and 2009 using different baseline estimation methods. Benetrix et al. (2023) observe that FDI has a positive connection with economic growth in nations that experience high global value chains and have low initial levels of human capital and financial development. The study identified the key role of human capital and financial development in attracting FDI to developing nations. Ofori & Asongu (2022) conducted a panel data estimation in sub-Saharan Africa for the period 1990-2020 based on a generalized method of moments (GMM) estimator. From the result, FDI was able to generate economic growth in both the long-run and short-run. However, the study noted most of the positive effect results will depend on the country's governance dynamics. The study concluded that a country with strong institutional and governance quality will gain more from FDI inflow and thus grow its economy.In contrast, Griffith et al. (2008) estimated the effect of FDI level on the economic growth of Caribbean countries using descriptive analysisfor the period between 1995 and 2005. The finding indicated that FDI had an insignificant effect on the growth of Caribbean countries. This poor performance of FDI can be underpinned by poor institutional and structural changes complemented by weak human capital development and research and development spillover. In addition, Okello and Badj (2023) conducted a similar study in Kenya using the ordinary least squares method for the period from 1970 to 2019. The study aimed to investigate the relationship between growth and foreign direct investment. The findings show that the association between FDI and economic growth is negative and not significant. The negative result was attributed to the fact Kenya's history as an import-substituting country and the counter effect of the implemented trade policies to spur economic growth. From the above review, several empirical studies have established a

significant and not significant relationship between FDI and economic growth as shown in Table 1. Table 1 displays the empirical review of selected studies.

Table 1: Empirical review

Year of publication	Author (s)	Sample area	Estimation Method/Data	Period of Study	Status
1999	De Mello	OECD and Non-OECD countries	PML;Panel data	1970-1990	Positive; significant
2005	Li & Liu	84 Developed and developing countries	Single equation OLS; Panel data	1970-1999	Positive; insignificant
2008	Griffith et al.	Caribbean states	Descriptive; Panel data	1975 – 2005	Positive; insignificant
2009	Blin & Ouattara	Mauritius	ARDL; Time series data	1975-2000	Positive; Significant
2018	Mamingi & Kareem	Caribbean states	GMM; Panel data	1988-2013	Positive; insignificant
2020	Sarker & Khan	Bangladesh	ARDL; Time series data	1972-2017	Positive; Significant
2020	Wiredu et al.	Côte d'Ivoire, Ghana, Nigeria, and Senegal	Pooled OLS; Panel data	1998-2017	Negative; significant
2022	Odhiambo	African states	ARDL; Panel data	1980-2018	Positive; Significant
2022	Ofori & Asongu	Sub-Saharan Africa states	GMM; Panel data	1990 – 2020	Positive; Significant
2023	Benetrix et al.	Developed and developing states	Baseline study; Panel data	1990-2009	Positive; Significant
2023	Okello & Badj	Kenya	OLS; Time series data	1970-2019	Negative; insignificant

Source: Authors' compilation (2024)

Data and Methodology

This study adopted a longitudinal research design to analyze the effect of FDI on economic growth in Kenya for the period 1990 to 2021. Kenya was chosen as the study area since it has been receiving substantial amount of FDI, particularly in 2020 Kenya was ranked as Africa's fifth-largest recipient of FDI (Okello & Badj, 2023).The secondary data was collected from statistical abstracts, World Development Indicators and the World Bank database. The study adopted a time series regression model based on the endogenous growth theory and used annual data covering the period 1990-2021for Kenya.The study analysed a production function where economic growth is estimated using FDI as the main input to capture the fraction of goods and services produced by foreign firms. The estimation model is founded on the endogenous growth model as formulated by Borensztein et al. (1998). Borensztein et al. (1998) and Alfaro et al., (2004) explored and concluded that FDI will grow the economy via technical advancement complemented with growth in human capital, institutions and infrastructure development. To examine the relationship between FDI and growth, this study specifies the model as shown in equation 1.

$$\ln Y_t = \alpha_0 + \alpha_1 \ln F_t + \alpha_2 \ln C_t + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [1]$$

Where;

Y_t– Economic growth;

F_t– Foreign Direct Investment;

C_t – Matrix of Control variables;

t– time dimension;

μ_t– Stochastic term;

ln– Natural log;

α_0– Constant term;

$\alpha_1 and\ \alpha_2$– Coefficients are associated with the logarithms of F and C, respectively.

The economic growth variables were selected from Mamingi and Borda (2015) and Gisore (2021) empirical studies on macroeconomic determinants of economic growth in selected countries.Apart from FDI, the control variables in the matrix include trade openness, climate change and exchange rate. Since macroeconomic policies affect growth performance through their impact on trade openness, exchange rate and climate change variables, these effects are used in the growth equation to capture the impacts of such policies, strategies and conditions. The variables were transformed into logarithms to reduce the serial correlation problem. Table 2 describes these estimation variables.

Table 2: Data and VariableDefinitions

Variables	Description	Expected sign	Data source
1. Left-hand side variable			
lnY=Economic Growth	Changes in real GDP	Independent Variable	Statistical Abstracts
2. Right-hand side variable			
lnF=Foreign Direct Investment	FDI, net inflows	Positive (Ofori & Asongu, 2022)	World Bank-World Development Indicators
lnT=Trade openness	Total trade per GDP	Positive (Malefane & Odhiambo, 2018)	World Bank-World Development Indicators
lnX=Exchange rate	Kenyan shilling per US dollar	Negative (Nyoni et al., 2021) Positive (Rodrik, 2008)	World Bank-World Development Indicators
lnO=Climate change	Carbon dioxide emissions (metric tons per capita)	Positive (Tol, 2009; Espoir et al., 2023)	World Bank-World Development Indicators

Source: Authors' compilation (2024)

The regression model was estimated using the autoregressive distributed lag (ARDL) estimator to correct for both potential endogeneity and serial correlation problem (Pesaran et

al., 2021). Before ARDL estimation, it is necessary to scrutinize the stationarity and cointegration statistics of the sample data, ARDL approach rejects any series integrated of order 2 or higher. Equation 2 regression ARDL model was used to investigate therelationship.

$$\Delta \ln Y_t = \alpha_{01} + \sum_{i=1}^{p} \alpha_{1i} \Delta \ln Y_{t-i} + \sum_{i=0}^{w} \alpha_{2i} \Delta \ln F_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta \ln C_{t-i} + \beta_{11} \ln Y_{t-1} + \beta_{21} \ln F_{t-1} + \beta_{31} \ln C_{t-1} + \mu_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [2]$$

To examine the long-run relationship equation 3 was applied as shown below.

$$\ln Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \ln Y_{t-i} + \sum_{i=0}^{w} \alpha_{2i} \ln F_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \ln C_{t-i} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [3]$$

Further, since the variables are cointegrated, the causality test was obtained using error correction model derived from ARDL equation 4 specification:

$$\Delta lnY_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta lnY_{t-i} + \sum_{i=0}^{w} \alpha_{2i} \Delta lnF_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta lnC_{t-i} + \emptyset_1 ECT_{t-1} + \varepsilon_{1t}. [4]$$

The lagged error correction term ECT_{t-1}, in equation 4 measures the speed of adjustment to the long-run equilibrium.

Finally, since autocorrelation (Breusch-Godfrey test) and heteroscedasticity (Breusch-Pagan test) problems are common in time series data,the two econometric problemswere tested and corrected for to avoid misleading findings.

Empirical Result and Discussion

Unit Root Test Results

Phillips-Perron (PP) unit root test was conducted to check whether a time series variable is stationary or contains a unit root. Table 3 displays the unit root results of the sample data.

Table 3: Unit Root TestResults

PP (Level)			PP(First difference)			
Variable	**t-Statistics**	**P-Value**	**Variable**	**t-Statistics**	**P-Value**	**Status**
LnY	-1.396	0.571	ΔlnY	-5.749	0.0000	I(1)
LnF	-0.924	0.767	ΔlnF	-8.500	0.0000	I(1)
LnT	-1.489	0.526	ΔlnT	-5.375	0.0001	I(1)
LnO	0.671	0.989	ΔlnO	-5.673	0.0001	I(1)
LnX	-4.159	0.003				I(0)

Source: Authors' computation (2024)

The PP unit root test confirms that economic growth, FDI, trade openness and climate change are non-stationary while the exchange rate is stationary at the level.Therefore it implies the three variables need to be differentiated to be stationary. Stationary implies the variable has a constant mean and variance over time.ARDL was the preferred estimation method since it is

applicable in a mixed order of integration (Pesaran et al.,2001). From the result, the study proceeded to test for cointegration using the ARDL bounds test.

Choice of Lag Length

Information criterion is usually used to compare and choose among different models with the same independent variable. To reduce residual correlation, optimal lag length and model selection criteria were determined before conducting the bounds cointegration test.The result of the information criteria is presented in Table 4.

Table 4: Information Criteria Results

Lag	LogL	LR	FPE	AIC	SIC	HQIC
0	16.561	NA	3.01e-07	-0.826	-0.588	-0.753
1	142.963	198.631	2.23e-10	-8.069	-6.641	-7.632
2	169.845	32.643	2.35e-10	-8.203	-5.586	-7.403
3	199.784	25.662	2.89e-10	-8.556	-4.749	-7.392
4	277.212	38.714*	2.91e-11*	-12.301*	-7.305*	-10.774*

Note *Indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

HQIC: Hannan-Quinn information criterion

FPE: Final Predictor Error

Source: Authors' computation (2024)

Based on the results of the information criteria lag of four is the most appropriate. This is because of the lowest value of AIC (-12.301) and SIC (-7.305) among all models.Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) are the most commonly used criteria to measure how well the models fit the given data. Further, AICwas selected as the ideal criterion to be used in the analysis because it has the lowest value when compared to SIC. In addition, AIC performs better in small sample data sets than SIC.

ARDL BoundsCointegration Test

ARDL bounds test of Pesaran et al. (2001) was used to explore the cointegration or long-run relationship between the study variables. Table 5 displays the bound cointegration test results.

Table 5:Bounds Co-Integration Test Results

Narayan	Value	Significance Level	Bounds Critical values	
F-Statistics	6.65		I(0)	I(1)
		1%	3.74	5.06
K	4	5%	2.86	4.01
		10%	2.45	3.52

Note*: Null hypothesis: No level relationship.*

Source: Narayan (2004) and Authors' Computation (2024)

Based on the results of the bounds cointegration test long-run relationship exists between the variables at a 5 percent level of significance. The findings are confirmed by calculated F-statistics (6.65) which is greater than the upper bound critical value (4.01) obtained from Narayan (2004) critical values table for ARDL cointegration. Based on the findings, there is a need to evaluate long-run and short-run relationship between the study variables.

Regression Results

Following the confirmation of the long-run panel cointegration relationship between sample data, the study estimated the long-run and short-run coefficients of the chosen ARDL model (4, 4, 3, 4, 4) based on the Akaike information criterion (AIC). The results estimated ARDL long-run and short-run coefficients are displayed in Table 6.

Table 6: Estimated ARDL Long Run and Short Run Coefficient

Long run Coefficients			**Short run Coefficients**		
Regressors	**Coefficient**	**t-statistics**	**Regressors**	**Coefficient**	**t-Statistic**
Cons	8.502	3.046**	Cons	8.499	8.178***
lnF	0.086	7.350***	ΔlnF	0.016	6.161***
lnT	-0.441	-11.689***	ΔlnT	0.218	7.735***
lnO	0.392	5.361***	ΔlnO	0.189	6.622***
lnX	0.010	0.201	ΔlnX	-0.362	-6.604***
			ΔlnY	-0.399	-3.166**
			ECT(-1)	-0.770	-8.153***
Econometrics Problems		Test Statistic		F-statistics	Probability
Serial Correlation		Breusch-Godfrey LM test		0.808	0.553
Model misspecification		Ramsey RESET test		0.009	0.930
Heteroscedasticity		Breusch-Godfrey LM test		0.978	0.583
Goodness of fit		Adjusted R-Squared	0.984	R-Squared	0.989

Note: * p < 0.1, ** p < 0.05, *** p < 0.01 are significance levels, in which the null hypothesis is rejected.Dependent variable: lny

Source: Authors' computation (2024)

Table 6 regression result shows that FDI has a positive effect on economic growth in Kenya in the long run, as expected. The result is significant, specifically, it indicates that with a percentage point increase in FDI, the rate of economic growth in the host country will increase by about 0. 09.The effect was modest, 0.09, suggesting untapped avenues for FDI to contribute to growth in Kenya. As expected FDI is growth enhancing and supports domestic investment, underpinning the preposition that sources of foreign exchange earning such as FDI will stimulate investment and growth as argued by Alfaro et al. (2004) and Asongu et al. (2018) empirical studies. Empirical literature document that FDI is an important source of capital that complements domestic investment, generate new employment opportunities and stimulate technology transfer and spillovers (Borensztein et al., 1998; De Mello, 1999; Alfaro et al., 2004). Further, FDI can stimulate growth if it does not compete for the product market or financial market with domestic investment (Asongu et al., 2018). The findings obtained are similar to Asong et al. (2018), Ofori and Asongu (2022), and Benetrix et al. (2023) that they attributed to the ability of FDI to grow productive capacity of the host country, technological transfer, human capital development, financial sector development and infrastructural development. This study findings, contrasts a study by Griffith et al. (2008) in Caribbean states that reported a negative relationship attributed to weak institutions,

underdeveloped human capital and slow technology spillover.In addition, Okello and Badj (2023) findings show that the connection between FDI and economic growth is negative and not significant in Kenya. The negative result was underpinned to the fact Kenya's history as an import-substituting country and the counter effect of the implemented trade policies to spur economic growth. The long-run and short-run results were identical, both had positive and significant effects. In the short-run FDI had a positive and significant result. This confirms in the short term FDI inflow can contribute to economic growth. This is appropriate since the increase in FDI inflow will increase employment opportunities and thus provide income to the population. As income increases, consumption will increase with the increase in demand for local goods and services and output (Borensztein et al., 1998). According to Makki and Somwaru (2004), FDI is an important catalyst for economic growth in developing countries via human capital growth, private investment growth and institutional development.

The results, presented in Table 6, show that trade openness led to decline in economic activities by about 0.44 in the long run.The sign obtained although significant is different from our expectations. According to Musila and Yiheyis (2014), the effect of trade openness on economic growth is negative due to unfriendly trade openness policies. This result is different from those reported by Malefane and Odhiambo (2018) that more openness or outward trade orientation accelerates economic growth. However, this finding is similar to that of Moyo and Khobai (2018), and Heshmati and Farahane (2020) who concluded that trade openness threatened growth in SADC member states. Several studies have attributed this negative effect to poor financial development in most developing countries, rising levels of imports and growing trade deficit (Moyo & Khobai, 2018; Heshmati & Farahane, 2020). The long-run result contradicts the shot-run result, which reported a positive relationship between trade openness and growth in Kenya. Results reported in Table 6 show that trade yields economic growth in the short run. It means, countries that are open to trade are likely to attract greater amounts of FDI and also lead to growth in total trade and thus accelerate production and grow output (Makki & Somwaru, 2004; Malefane & Odhiambo, 2018). The short-run result agrees with a similar study in four West African countries by Wiredu et al. (2020). Trade will lead to faster productivity growth, particularly for open countries and sectors engaged in global value chains. Trade will allow the country to specialize in one single commodity and thus attract FDI to the same sector. Export growth is an important component that provides foreign exchange to a country. Further, with the global value chain in trade, it will likely attract FDI investors to the host country in order to maximize benefits (Benetrix et al., 2023).

The results from the long-run regressions displayed in Table 6 reveal a positive relationship between climate change and economic growth, as expected.Based on the findings growth in carbon dioxide emissions as a result of activities in the agriculture and energy sector leads to an increase in output and thus economic growth. Considering Kenya is still developing, the demand and consumption for fossil energy and CO2 emissions are expected to continue upward trend (Hamilton & Kelly, 2017).During the early stages, economic growth is associated with increasing carbon emissions as a result of growth in domestic and foreign investmentactivities (Tol, 2009). However, as technology, economies of scale, innovation, regulations and income grow carbon emissions tend to reduce (Espoir et al., 2023). In regression, reported in Table 6, the interaction term between climate change and economic growth is positive and statically significant in the short run. Implies in a short-term increase in energy consumption and agricultural activities will cause global warming at the same time grow output.

Based on the result in Table 6 the coefficient of exchange rate was positive but not significant in Kenya. An increase in the exchange rate did not lead to a substantial increase in economic growth in Kenya. The results obtained are positive but are insignificant, and do not support the position that excessive shifting of exchange rate regimes has affected economic growth in Kenya (Azid et al., 2005).In addition, several empirical studies conducted in developing countries have supported the idea that the depreciation of currency stimulates economic growth by enhancing net exports via an increase in total demand in foreign countries. In contrast, as reported in Table 6, the exchange rate hurts economic growth with an index of 0.36 in the short run. Structural economists confirm that there is a negative and significant relationship between exchange rates and economic growth (Nyoni et al., 2021). Particularly in Kenya, the input structure of production depends on imports, so an appreciation of the exchange rate makes import production equipment more expensive and thus harm growth in the short run (Rodrik, 2008).

The constant variable was positive and significant in short-run and long-run implying unobservable sources of growth outside the model also inspire economic growth in Kenya. Based on short-run result the initial level of GDP has negative effect on current GDP and this can be underpinned by rising inflation rate and demand for more leisure by labourerswhich depress economic growth. This means countries with high initial growth will experience low growth, indicating convergence. The coefficient of error term (ECT) was significant and had an appropriate negative sign (-0.770). This implies the speed of adjustment back to the equilibrium is about 0.770, meaning any disequilibrium or shock the economy will be able to correct about 77% in the current year and thus it will take about one and half years to go back to the equilibrium after any shock. This means in Kenya any disequilibrium will exist for a short-time. Based on the findings, the declining FDI inflow during Covid- 19 era will have only short-term effect.

These findings show that the value of the overall coefficient of determination (0.98) is high enough, meaning that the regressors explained about 98 per cent of the variations in economic growth during the study period and the remaining percentage is explained by other unobservable random factors captured by the error term that also stimulate economic growth.This test statistic signifies that the null hypothesis of homogeneity of variances is accepted. These results imply that the heteroscedasticity problem is absent in the model. Further, this test result tells us that the model is free of both autocorrelation and heteroscedasticity problems and implies that the estimates of the regression coefficients in question are consistent and efficient and the standard errors are unbiased.

Result of Granger Causality Test

The short-run Granger causality and ECM long-run causality results are displayedin Table 7below.

Table 7: Causality Results

Short-run model (pairwise Granger causality test)			
Direction	F-Statistic	P-Value	Status
$F \xrightarrow{\quad} Y$	0.348	0.8425	One way causality
$Y \xrightarrow{\quad} F$	3.369**	0.0303	
Long-run model (ARDL-ECM causality test)			

Direction	ECT	t-Statistic	P-Value	Status
$F \longrightarrow Y$	-0.770	-8.153***	0.0012	One way causality

Source: Authors' computation (2024)

As reported in Table 7, there is one causality running from economic growth to FDI in the short run. This implies that economic growth will stimulate FDI inflow to Kenya. This finding is in line with the theoretical literature that economic growth presents profit potential for foreign investors because it motivates them to launch new products and increase investment. Thus investors pursue horizontal FDI aimed at profitmaking via internal market and economy of scale. The finding agrees with the study of Odhiambo (2022), the relationship between FDI and economic growth was unidirectional, going from economic growth to FDI due to Kenya's strong economic growth (Blin&Ouattara, 2009; Odhiambo, 2022). In the long run, as reported by ECT, there is a long-run one-way causality from FDI to economic growth. This indicates that FDI causes economic growth via improved innovation, technology transfer, learning, competitiveness and human capital development.

Conclusion

The estimate for the coefficient of foreign direct investment (FDI) is positive as expected for both short-run and long-run period in Kenya. Meaning during the study period, an increase in FDI inflow led to a rise in economic growth in Kenya. The findings in our study suggest that FDI has a positive influence on economic growth in Kenya. The positive effect is mostly driven by a stable exchange rate, openness, friendly trade policies, improved research and development,ready market and demand, better human capital and well-developed financial sector. This component may have been key in attracting FDI to Kenya during pre and post-covid-19. This finding is the same as past empirical studies and does confirm the preposition that sources of foreign exchange earnings such as FDI stimulate domestic investment and are growth enhancing.However, other empirical studies have observed that excess inflow of FDI will bring some potential risk to the economy owing to adverse selection. Thus the policy recommendations for developing countries should focus on improving the investment climate for all kinds of capital, domestic as well as foreign. From the result, Kenya needs to continue employing macroeconomic policies and pursue strategies that will attract FDI inflow to the host country. Kenya need to build confidence of foreign investors by introducing domestic policy changes that allow for foreign ownership on service sector, information and communication technology and financial sector companies. Kenya should also encourage signing of memorandum of understanding between host and foreign countries to growth the FDI partnership.For further studies, it will be interesting to examine how FDI inflow in different sectors of the economy contributes to economic growth in Kenya. The benefits of FDI vary greatly across primary, manufacturing and service sectors. The sectoral analysis will be useful for policy-making and stimulate knowledge about the role of FDI in economy. Further research on determinants of FDI would be necessary to inform policymakers, particularly against FDI fragmentation due to the COVID-19 pandemic.

References

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., &Sayek, S. (2004). FDI and economic growth: the role of local financial markets. Journal of International Economics, 64(1), 89–112.

Asongu, S, Akpan, U.,& Isihak, S. (2018). Determinants of foreign direct investment in fast-growing economies: evidence from the BRICS and MINT countries. Financial Innovation, 4 (26), 1-17.

Azid, T., Jamil, M., Kousar, A., & Kemal, M. (2005). Impact of Exchange Rate Volatility on Growth and Economic Performance: A Case Study of Pakistan, 1973-2003. *The Pakistan Development Review*, 44(4), 749–775.

Benetrix, A., Panizza, U., & Pallan, H. (2023). The elusive link between FDI and economic growth. World Bank. https://blogs.worldbank.org/developmenttalk/elusive-link-between-fdi-and-economic-growth.

Blin, M.,& Ouattara, B. (2009). Foreign direct investment and economic growth in Mauritius: Evidence from bounds test cointegration. Économie Internationale, 117(1), 47-61.

Borensztein, E., De Gregorio, J & Lee, W. (1998). How does foreign direct investment affect economic growth?*Journal of International Economics*, 45 (1), 115-135.

De Mello, L. (1999). Foreign direct investment-led growth: evidence from time series and panel data.*Oxford Economic Papers*, 51(4), Oxford, Oxford University Press.

Espoir, K., Sunge, R., & Bannor, F. (2023). Exploring the dynamic effect of economic growth on carbon dioxide emissions in Africa: evidence from panel PMG estimator. *Environmental Scienceand Pollution Research,* 30(52), 112959–112976.

EY (Ernst &Young). (2021). Africa Attractiveness Report 2021.Ernst and Young publishers.

https://www.ey.com/en_za/attractiveness/21/africa-attractiveness-report-

Gammoudi, M., Cherif, M., & Asongu, A. (2016). FDI and growth in the MENA countries: are the GCC countries different? African Governance and Development Institute WP/16/015, Yaoundé

Griffith, R. Waithe, K.&Craigwell, R. (2008). The significance of foreign direct investment to Caribbean development, St. Augustine [online]. Accessed on 10/12/2022. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.485.9 604&rep=rep1&type=pdf.

Hamilton, T., & Kelly, S.(2017). Low carbon energy scenarios for sub-Saharan Africa: an input-output analysis on the effects of universal energy access and economic growth. Energy Policy, 105(3), 105303–105319

Heshmati, A. & Farahane, J. (2020). Trade and Economic Growth: Theories and Evidence from the Southern African Development Community. IZA Discussion paper, NO. IZA DP No. 13679, Germany.

Jensen, M. (2008). Nation-states and the multinational corporation: a political economy of foreign direct investment. Princeton University Press, Princeton.

Li, X.,& Liu, X. (2005). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. World Development, 33(3), 393-407.

Makki, S. & Somwaru, A. (2004). Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries. American Journal of Agricultural Economics, 86(3), 795-801.

Malefane, R.,& Odhiambo, M. (2018). Impact of Trade Openness on Economic Growth: Empirical Evidence from South Africa. International Economics, 71(4), 387- 416.

Mamingi, N., & Kareem, M. (2018). Foreign direct investment and growth in developing countries: evidence from the countries of the Organisation of Eastern Caribbean States, CEPAL Review.https://repositorio.cepal.org/items/133e0885-a268-46c0-bb39-cfa333e78445.

Mamingi, N., & Borda, P. (2015).The determinants of economic growth in the countries of the Organisation of Eastern Caribbean States. *Journal of Eastern Caribbean Studies*, 40 (2), 63-98.

Mose, N. (2020). An analysis of optimal devolved government size for growth: Armey curve in Kenya. Brazilian Journal of African Studies, 5(10), 63-78.

Moyo, C. & Khobai, H. (2018). Trade Openness and Economic Growth in SADC Countries. Munich Personal RePEc Archive, Paper No. 84254, https://mpra.ub.uni- muenchen.de/84254.

Musila, J. & Yiheyis, Z. (2014). The impact of trade openness on growth: The case of Kenya. Journal of Policy Modeling, 37 (2), 342–354.

Musimbi, D., & Mose, N. (2023). Inflation-Induced savings in Kenya. *DBA Africa Management Review*, 13(1), 10-19.

Narayan, K. (2004). Reformulating critical values for the bounds F -statistics approach to cointegration: an application to the tourism demand model for Fiji. Department of Economics Discussion Papers, No. 02/04, Monash University, Australia.

Nyoni, T., Mose, N., & Thomi, J. (2021). International tourism and economic growth in Zimbabwe: An ARDL - Bounds testing approach. Asian Journal of Economics, Business and Accounting, 21(6), 61-81.

Odhiambo. M., (2022). Foreign Direct Investment and Economic Growth in Kenya: An Empirical Investigation. International Journal of Public Administration, 45(8), 620-631.

Ofori, K. & Asongu, A. (2022). Repackaging FDI for Inclusive Growth: Nullifying Effects and Policy Relevant Thresholds of Governance, ZBW – Leibniz Information Centre for Economics, Kiel, http://hdl.handle.net/10419/248546.

Okello, A. & Badj, K. (2023). Foreign Direct Investment and Economic Growth in Kenya. Research project. Jonkoping University, Sweden. https://www.google.com/search?client=firefox-b-d&q=Jonkoping+university

Pesaran, M., Shin, Y., & Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289 – 326.

Rodrik, D.(2008). The real exchange rate and economic growth. Brookings Papers on Economic Activity, 39 (2), 365–439.

Sarker, B., & Khan, F. (2020). Nexus between foreign direct investment and economic growth in Bangladesh: an augmented autoregressive distributed lag bounds testing approach. *Financial Innov*ation 6(10), 2-18.

Solow, R. & Swan, T. (1956). Economic Growth and Capital Accumulation. Economic Record, 32(2), 334-361.

Taylor M., & Thrift, N. (2013). The geography of multinationals: studies in the spatial development and economic consequences of multinational corporations. Routledge, Abingdon-on-Thames.

Tol, R. *(*2009).The Economic Effects of Climate Change.Journal of Economic Perspectives, 23 (2), 29-51.

UNCTAD. (2022). World Investment Report, UNCTAD publication.

https://unctad.org/publication/world-investment-report-2022

Wiredu, J., Nketiah, E. & Adjei, M. (2020). The Relationship between Trade Openness, Foreign Direct Investment and Economic Growth in West Africa: Static Panel Data Model. *Journal of Human Resource and Sustainability Studies*, 8(1), 18-34.

World Bank. (2023). Overview Kenya. Washington, D.C. The World Bank Group.

https://www.worldbank.org/en/country/kenya/overview.