TECHNOLOGICAL SPILLOVERS FROM FOREIGN DIRECT INVESTMENT IN KENYA

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Introduction

Foreign Direct Investment (FDI) plays a vital role in the economic development of countries by providing access to capital, technology, and managerial expertise (Asongu et al. 2018). In recent years, Kenya has appeared as a prominent destination for FDI in Sub-Saharan Africa, attracting investments across various sectors such as manufacturing, telecommunications, finance, and infrastructure (Ideue 2018). The government of Kenya has actively pursued policies to encourage FDI inflows as a means to stimulate economic growth and foster technology development (Mungai 2021). Technological innovation is the economic function through which new technologies are introduced into production and consumption. Foreign Direct Investment (FDI) serves as a channel for technology transfer from multinational corporations (MNCs) to domestic firms in Kenya (Kotey 2019). MNCs often bring advanced technologies, managerial expertise, and best practices, which can

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significantly enhance the technological capabilities and competitiveness of local industries (Zhang *et al*. 2019). Through joint ventures, licensing agreements, and collaborations with local partners, FDI facilitates the diffusion of knowledge and skills, thereby contributing to technology absorption and innovation in Kenya (Wanjere 2022).

Moreover, various sectors in Kenya have experienced substantial technological advancements driven by FDI (Odhiambo 2022). For instance, the telecommunications sector has witnessed significant investments from international telecom companies, leading to the expansion of mobile networks, internet connectivity, and digital infrastructure (Chesula and Kilika 2020). This has not only improved access to communication services, but has also spurred innovation in mobile payments, e-commerce, and digital entrepreneurship (Ndung'u 2018). Similarly, the manufacturing sector has benefited from FDI through the introduction of new technologies and production methods, leading to increased efficiency, product diversification, and export competitiveness (Wei *et al*. 2020).

Furthermore, the government of Kenya has implemented a range of policies and incentives to attract FDI and promote technology development. These include tax incentives, investment promotion agencies, special economic zones, and industry-specific incentives aimed at encouraging investments in priority sectors such as agribusiness, renewable energy, and information technology (Thuita 2017).

Despite the positive impacts of FDI on technology development, Kenya faces several challenges, including inadequate infrastructure, regulatory constraints, bureaucratic red tape, and limited access to financing and skilled labour (Onyango 2017). Moreover, there are opportunities for enhancing technology development through strategic partnerships, knowledge exchange programs, and investment in research and development.

Literature review: theoretical review

The study reviewed both theoretical and empirical literature. Firstly, in this chapter, we will explore several prominent theories that provide a foundation for understanding the dynamics of FDI and technology development in Kenya.

Technology Transfer Theory

According to this theory, FDI serves as a channel for the transfer of advanced technologies, managerial know-how, and organizational practices from multinational corporations (MNCs) to domestic firms in host countries (Alfaro 2017). Through mechanisms such as licensing agreements, joint ventures, and collaborations, MNCs facilitate the diffusion of knowledge and skills, thereby enhancing the technological capabilities of local industries (Hansen and Lema 2019). In the perspective of Kenya, technology transfer theory suggests that FDI inflows contribute to the adoption and adaptation of new technologies, leading to improvements in productivity, efficiency, and competitiveness across various sectors of the economy.

Spill over Effects Theory

Which posits that FDI can generate positive externalities that spill over to domestic firms and industries. These spillovers may take the form of knowledge spillovers, where technological innovations and best practices disseminate throughout the local economy, benefiting not only the recipient firms but also their competitors and suppliers. In Kenya, spillover effects from FDI can lead to increased innovation, skill upgrading, and productivity growth in domestic firms, thereby contributing to overall technological development and economic performance (Te Velde 2019). However, the extent and nature of spillovers depend on various factors such as the absorptive capacity of domestic firms, the level of competition, and the nature of linkages between foreign and domestic enterprises.

Investment Climate Theory

The investment climate theory emphasizes the importance of a conducive environment for attracting and retaining FDI, which in turn promotes technology development and innovation (Qamruzzaman 2023). Factors such as political stability, regulatory transparency, rule of law, infrastructure quality, and access to finance play a crucial role in shaping the investment climate of a country (Nizam and Hassan 2018). Improvements in the investment climate through policy reforms, institutional strengthening, and infrastructure development are essential for maximizing the benefits of FDI for technology development and long-term growth (Wanjere 2022; Kipchirchir and Mose 2024).

Human Capital Theory

Human capital theory highlights the role of education, skills, and workforce development in driving technological advancement and innovation. Investments in human capital, such as education and training programs, are essential for building a skilled workforce capable of absorbing and utilizing advanced technologies brought in by FDI (Guimón *et al*. 2018). In Kenya, efforts to improve education quality, enhance vocational training, and promote lifelong learning are critical for maximizing the impact of FDI on technology development (Cheruiyot 2022). Moreover, policies that facilitate the mobility of skilled workers and encourage knowledge exchange between foreign and domestic firms can further strengthen the linkages between FDI and human capital development. In summary, these theoretical perspectives provide valuable insights into the complex relationship between FDI and technology development (Yang *et al*. 2022). By drawing on these theories, policymakers, investors, and practitioners can design strategies and interventions that leverage FDI to promote innovation, enhance productivity, and foster inclusive growth in the Kenyan economy.

Literature review: empirical review

The studies of Ali *et al*. (2023); Chan *et al*. (2023); Adikari *et al*. (2021); and Liang (2017) have found evidence of a positive relationship between FDI and technological innovation or productivity. These studies suggest that FDI inflows bring advanced technologies, managerial know-how, and best practices, which can enhance the innovative capabilities and productivity of domestic firms. Moreover, FDI promotes competition and spurs investments in research and development, leading to technological advancements and efficiency gains in the host economy (Alfaro and Chauvin 2020). Moreover, in Borensztein *et al*. (1998); Li *et al*. (2020); Read *et al*. (2021) the findings suggested that FDI had a positive impact on productivity growth, particularly in industries with high levels of R&D intensity and technology-intensive activities. Similarly, Singh (2019); and Zhang and Sun (2023) studies in emerging economies like China and India have shown how FDI inflows contribute to technological upgrading and innovation in sectors such as telecommunications, automotive, and electronics.

The empirical evidence underscores the importance of policy interventions aimed at attracting FDI and promoting technological development. Policies that enhance the investment climate, strengthen institutions, and

support human capital development are essential for maximizing the benefits of FDI inflows. Additionally, targeted policies to promote linkages between foreign and domestic firms, encourage R&D investments, and facilitate technology transfer can further catalyse technological development and innovation in host countries (Guimón *et al*. 2018; Zhang and Sun 2023).

In conclusion, empirical research provides robust evidence of the positive impact of FDI on technological development across different countries and industries. By understanding the mechanisms through which FDI influences innovation, productivity, and knowledge transfer, policymakers can design effective strategies to leverage FDI for sustainable economic growth and technological advancement. Table 1 shows FDI-technological innovations nexus.

Table 1 - Selected empirical studies

Author (s)	Sample (period)	Methods	Main findings
Borensztein *et al*. (1998)	Emerging countries (1970-1989)	ARDL	FDI has a positive effect on technological innovation
Adikari *et al*. (2021)	Sri Lanka (1990-2019)	ARDL	FDI has a negative effect on technological innovation
Yue (2022)	China (2000-2007)	OLS	FDI has a positive effect on technological innovation
Ali *et al*. (2023)	BRICS countries (2000-2020)	PMG	FDI has a positive effect on technological innovation
Li (2023)	China (2010-2019)	OLS	FDI has a positive effect on technological innovation
Kipchirchir and Mose (2024)	Kenya (1990-2021)	ARDL	FDI has a positive effect on technological innovation
Notes: ARDL: Autoregressive Distributed Lag; PMG: Panel Mean Group; GMM: Generalized Method of Moment; OLS: Ordinary Least Squares Regression.			

Source: Authors' compilation (2024).

Research Methodology

This chapter explains the research methodology and highlights the following elements: the relevant data sources, data collection methods, variable description, data analysis techniques, and econometric models used in

the analysis of the relationship between foreign direct investment and technology spillover in Kenya.

Data Collection Method

The study employed quantitative research design to investigate the FDI-innovation nexus in Kenya from 1980 to 2022. Kenya was chosen as the sample area since it is ranked as Africa's fifth largest recipient of FDI (Okello and Badj 2023; Kipchirchir and Mose 2024). The study adopted a time series data approach based on endogenous growth model. The time series secondary data was obtained from the Word Bank database and Kenya National Bureau of Statistics. Technological innovations were proxied for patent applications in line with previous empirical works (Adikari *et al*. 2021), while foreign direct investment was represented by FDI net inflow. In addition, human capital, economic growth and trade openness were used as the control variables. Table 2 provides a detailed description of study variables.

Table 2 - Measurements and variable definitions

Variables	Unit of Measurement	Definition	Data source	Expected sign
Dependent variable				
Technological innovation (TEC)	Numbers	Patent applications (residents and non-residents)	World Bank	Dependent Variable (Adikari *et al*. 2021)
Independent variables				
Foreign Direct Investment (FDI)	Percent	Foreign Direct Investment, net inflows (% GDP)	World Bank	Positive (Ali e*t al*. 2023)
Human capital (HUM)	Percent	School enrolment, primary (% gross)	World Bank	Positive (Li 2023)
Trade openness (TOP)	Percent	Trade (% GDP)	World Bank	Positive (Ali *et al*. 2023)
Economic Growth (GDP)	Constant 2015 US dollars	GDP *per capita* is Gross Domestic Product divided by midyear population	World Bank	Positive (Adikari *et al*. 2021)

Source: Authors' compilation (2024).

Model Specification

The study adopted below baseline model to analyse the relationship between FDI inflow and technological innovation in Kenya.

$$(1) \qquad TEC_t = f(FDI_t, HUM_t, TOP_t, GDP_t)$$

Where TEC shows the patent applications which are used as proxy for technological innovations in Kenya. FDI indicates the level of foreign direct investments inflows. GDP represents economic growth variables. TOP indicates trade openness. HUM shows the level of human capital and education. t- represents time dimensions. To eliminate skewness the data variables were transformed into logarithms. Hence, we can re-write the above equation as follows:

$$(2) \qquad InTEC_t = \beta_0 + \beta_1 InFDI_t + \beta_2 InHUM_t + \beta_3 InTOP_t + \beta_4 InGDP_t + \varepsilon_t$$

Where ϵt represent error term, β_0 shows the constant term and β_1 to β_4 are coefficients variables.

Data Analysis Technique

Phillips – Peron (PP) unit root test was employed to scrutinize stationarity in the sample series. F-Bounds cointegration test was applied to confirm presence of long-run relationship between study variables. Before estimation, lag length and best model estimator were identified.

Autoregressive Distributed Lag (ARDL) estimation method is used to analyse the determinants of technological innovation. ARDL is highly robust regardless of stationarity and endogeneity of study variables (Pesaran *et al*. 2001). Granger causality test was conducted to check for association between study variables. All models were subjected to diagnostic tests such as autocorrelation (Breusch-Godfrey test) and heteroscedasticity (Breusch-Pagan test) to avoid misleading conclusions.

ARDL Estimations

The study employed Autoregressive Distributed Lag (ARDL) estimation technique developed by Pesaran *et al*. (2001) to analyze the determinants of technological innovation in Kenya. The ARDL model used in research is specified in equation 3.

$$(3)\quad \Delta InTEC_t = \alpha_{01} + \sum_{i=1}^{p} \alpha_{1i} \Delta InTEC_{t-i} + \sum_{i=0}^{w} \alpha_{2i} InFDI_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta InCOV_{t-i} + \beta_{11} InTEC_{t-1} + \beta_{21} InFDI_{t-1} + \beta_{31} InCOV_{t-1} + \varepsilon_{1t}$$

A multivariate regression model was used to illustrate the long run relationship of the dependent and independent variables. The study used a regression model as follows:

$$(4)\quad InTEC_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} InTEC_{t-i} + \sum_{i=0}^{w} \alpha_{2i} InFDI_{t-i} + \sum_{i=0}^{w} \alpha_{3i} InCOV_{t-i} + \varepsilon_{it}$$

From cointegration result, long run relationship was confirmed and thus to obtain causality relationship using error correction term equation five was applied.

$$(5)\quad \Delta InTEC_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta InTEC_{t-i} + \sum_{i=0}^{w} \alpha_{2i} InFDI_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta InCOV_{t-i} + \phi_1 ECT_{t-1} + \varepsilon_{1t}$$

The lagged error correction term ECTt-1, in equation 5 measures the speed of adjustment to the long-run equilibrium and also the long-run causality relationship. Where COVt – Matrix of Control variables and ECTt-1 is the error correction term.

Results and Discussion

This chapter presents the empirical findings and discusses their implications in alignment with the study's objectives, following the methodologies discussed in chapter three. It begins with a presentation of the unit root test result, followed by the cointegration result, and finally, the ARDL estimation results.

Unit Root Test

The study applied Phillips-Perron (PP) unit root test to check if target variables are stationary or contain unit root. Table 3 shows the PP unit root outcome.

Table 3 - Unit root test results

Variable	Level		Variable	First difference		Order
	t-Statistics	P-Value		t-Statistics	P-Value	
TEC	-0.6957	0.4095	Δ *TEC*	-18.4839	0.0000	I(1)
FDI	-4.5505	0.0000	Δ *FDI*	-	-	I(0)
HUM	-1.1778	0.2144	Δ *HUM*	-21.8118	0.0000	I(1)
TOP	-1.1487	0.2244	Δ *TOP*	-6.4140	0.0000	I(1)
GDP	1.6998	0.9766	Δ *GDP*	-3.8295	0.0003	I(1)
Note: Null Hypothesis: data series has a unit root.						

Source: Authors' computation (2024).

The PP unit root test confirms that technological innovation, human capital, trade openness and economic growth are non-stationary, while the FDI is stationary. Considering most variables are integrated of order I(1), including dependent variables, the study proceeded to investigate long-run relationship.

Choice of Lag Length

Vector autoregression (VAR) lag selection criteria was applied to confirm lag length and best model estimator. The selection criteria is important in reducing residual correlation problem. The result of the VAR selection criteria is presented in Table 4.

Table 4 - VAR lag order selection criteria results

Lag	LogL	LR	FPE	AIC	SIC	HQIC
0	13.5006	NA	4.40e-07	-0.4474	-0.2319	-0.3707
1	96.6550	140.0494*	2.09e-08*	-3.5081	-2.2153*	-3.0481*
2	121.5220	35.3373	2.26e-08	-3.5011	-1.1309	-2.6578
3	141.9897	23.6994	3.48e-08	-3.2627	0.1849	-2.0360
4	180.4015	34.3684	2.61e-08	-3.9685	0.5564	-2.3585
5	215.3523	22.0741	3.55e-08	-4.4922*	1.1100	-2.4989

*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
AIC: Akaike Information Criterion
SIC: Schwarz Information Criterion

Source: Authors' computation (2024).

Based on VAR findings, a lag of 5 is the most appropriate, as it reported the minimum value. Akaike Information Criterion (AIC) estimation model was preferred since it had the lowest value when compared to other estimation criteria.

Cointegration Test

The F-bounds cointegration test, introduced by Pesaran *et al.* (2001), was used to explore the cointegration or long-run relationship between the study variables. Table 5 displays the F-bound cointegration test results.

Table 5 - F-Bounds test results

Narayan	Value	Significance Level	Bounds Critical values	
F-Statistics	6.4905		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).

Since F-statistics (6.49) is greater than the upper bound critical value (4.01), cointegration is confirmed. Based on the findings, the study proceeded to estimating long-run relationship.

Empirical 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 (1, 2, 4, 5, 2) based on the Akaike information criterion (AIC).

ARDL Long Run Form Result

The long run regression results of the effect of technological innovation on FDI are shown in Table 6.

Table 6 - Long run result

Variable	Coefficient	Std.Error	t-Statistics	Probability
FDI	1.6842	0.4092	4.1154***	0.0006
HUM	0.7725	0.2768	2.7906**	0.0117
TOP	-11.9049	3.0447	-3.9099***	0.0009
GDP	-16.1535	5.5086	-2.9324***	0.0085
Cons	69.3713	29.4836	2.3528**	0.0296
Econometrics Problems		Test	F-statistics	Probability
Serial Correlation		Breusch-Godfrey LM	1.3947	0.2852
Model misspecification		Ramsey RESET test	48.1296	0.0000
Heteroscedasticity		Breusch-Pagan-Godfrey	1.1477	0.3834
Goodness of fit		R-Squared	0.7814	
*Note: * p < 0.1, ** p < 0.05, *** p < 0.01 are significance levels, in which the null hypothesis is rejected. Dependent variable: TEC.*				

Source: Authors' computation (2024).

Foreign direct investment appears to exert a positive and significant effect on adoption of technology and growth in innovation. The study has identified a positive relationship between foreign direct investment and technological innovation in Kenya. Specifically, the result show that as FDI increases by 1 % in long run, technological innovation on average will increase by 1.68%. As Foreign Direct Investment (FDI) increase the stock of technology and innovation tend to increase in Kenya through spillover effects. More FDI inflow will bring higher innovation and stimulate technological advancement. This implies through learning experiences provided by supply linkages and technology licensing that domestic firms take on advanced techniques and management practices employed by foreign-owned and foreign-operated firms. Through joint ventures, licensing agreements, and collaborations with local partners, FDI facilitates the diffusion of knowledge and skills, thereby

contributing to technology absorption and innovation in Kenya (Wanjere 2022). As captured in theoretical literature competition and spillover effect originating from FDI inflow will influence technological transfer and innovations performance in Kenya. Our research results are similar with Ali *et al.* (2023) study in BRICS states and Li (2023) in China. However, our findings contrast with Adikari *et al.* (2021) study in Sri Lanka who reported a negative relationship.

From the result, as human capital increases the adoption and stock of technological innovation tend to increase. An increase in human capital formation by 1% will lead to an increase in technological innovation by 0.77%. This result implies education and human capital development has a substantial role in improving adoption of new technology and subsequent development of new innovations. The findings agree with similar study by Li (2023) in China. Host countries' human capital endowment will influence technological absorption and subsequent innovations.

Trade openness hindered technological innovation in Kenya. An increase in trade openness by 1 % reduced technological innovation by 11%. Li *et al.* (2021) argued that the trade mode dominated by primary products would drive many enterprises to reduce production costs by employing cheap labour, resulting in a decline in enterprises' attention to technological innovation. Considering Kenya is a primary producer, it may be affected by price fluctuations and high labour-intensive activities. This result contrasts a similar study by Ali *et al.* (2023) which reported a positive relationship. Trade will accelerate innovations through technology transfer, labour transfer, competition, economic growth and improved total productivity. Increase in volume of trade will catalyse increase in innovation technology.

As the country experiences economic growth (GDP) the stock of technology and innovations tend to diminish. This implies, increase in GDP growth by 1 % reduces technological innovation by 16%. In its present form, economic growth can hinder technological progress (through increasing returns to scale, reducing the rate of innovation) (Ayres 1996). Government's *economic growth* target constraints significantly inhibit enterprise *technological innovation*. The findings support a similar result by Ayres (1996), however, it goes opposite to Ali *et al.* (2023) findings in BRICS countries.

ARDL Short Run Form Results

Table 7 below shows the short run estimation results.

Table 7 - Short run results

Variable	Coefficient	Std.Error	t-Statistics	Probability
Δ *FDI*	*0.6980*	0.1648	4.2335***	0.0004
Δ *HUM*	*0.0224*	0.1093	0.2056	0.8392
Δ *TOP*	*-3.5398*	2.0397	-1.7354*	0.0988
Δ *GDP*	*20.3672*	9.3062	2.1885**	0.0413
ETC[4]	*-0.9683*	0.1544	-6.2677***	0.0000
Cons	69.3713	11.0613	6.2715***	0.0000
Econometrics Problems		Test	F-statistics	Probability
Serial Correlation		Breusch-Godfrey LM	1.3947	0.2852
Model misspecification		Ramsey RESET	48.1296	0.0000
Heteroscedasticity		Breusch-Pagan-Godfrey	1.1477	0.3834
Goodness of fit		R-Squared	0.7647	
*Note: * p < 0.1, ** p < 0.05, *** p < 0.01 are significance levels, in which the null hypothesis is rejected. Dependent variable: TEC.*				

Source: Authors' computation (2024).

Based on Table 7 result, the short run result for relationship between FDI and technological innovation are the same. As FDI inflow increase on average, technological innovation will grow. FDI inflow advances diffusion of knowledge, management practices and advanced technologies (Wanjere 2022). The findings agree with previous empirical studies by Wanjere (2022) in Kenya, Ali *et al.* (2023) study in BRICS states and Li (2023) in China. However, the same study contract Adikari *et al.* (2021) study in Sri Lanka who concluded FDI is detrimental to technology advancement.

Table 7 results have shown that short-run human capital development may not have much influence on technological innovations. This can be attributed to the quality of education offered in Kenya and lack of adequate investment in the education sector. Also, because effects from the education sector would have very long lags (Mose 2023). However, according to literature human capital leads to diffusion of technologies and efficient adoption of technology (Li 2023). The short run findings contradict long run result.

The regression result confirms that just like in the long run the effect of trade openness on technological innovation is negative and significant. According to Li *et al.* (2021) this can be attributed to Kenya's production

4 ECT: The coefficient of error term.

sector being dominated by primary products that drive many enterprises to reduce production costs by employing cheap labour, resulting in a decline in enterprises' attention to technological innovation. However, the findings contract similar findings by Ali *et al*. (2023).

Increase in economic growth will lead to advancement in technological innovations. This result contradicts the long run result. Economic growth involves utilization of new technology to uncover new ideas and improve productivity. Increase in output means increase in high technology spending which is connected with increase of need for high technology and innovations. The result supports empirical studies by Ali *et al*. (2023) while contradicting those by Ayres (1996) in BRICS member states.

The constant variable was positive and significant in the short-run and long-run implying unobservable determinants outside the model encourage technological innovations in Kenya. These findings show that the value of the overall coefficient of determination (0.76) is high enough, meaning that the regressors explained about 76 per cent of the variations in technological innovation development and the remaining percentage is explained by other unobservable random factors captured by the error term that also stimulate innovations. Further, the diagnostic 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.

The coefficient of error term (ECT) was significant and had an appropriate negative sign (-0.9683). This implies the speed of adjustment back to the equilibrium is about 0.9683, meaning any disequilibrium or shock the economy will be able to correct about 96% in the current year and thus it will take about one year to go back to the equilibrium after any shock. This means in Kenya any disequilibrium will exist for a short time. The significant ECT confirmed the long-run relationship between independent and dependent variables. Also, the model's long-term causality and lagged error correction term (ECT) are significantly negative.

Granger Causality Test

Pairwise causality test was adopted to test for short run relationship between FDI and technological innovations. Table 8 shows the Granger causality result.

Table 8 - Pairwise causality results

Direction	F-Statistic	P-Value	Status
FDI → TEC	2.71073**	0.0374	
TEC → FDI	0.10110	0.9956	One way causality

Source: Authors' computation (2024).

One way relationship running from FDI to technological innovation was detected. This implies that as FDI inflow increase, technological innovations will increase as well. As FDI inflow increase on average technological innovation will grow in short run. FDI inflow advances diffusion of knowledge, management practices and advanced technologies (Wanjere 2022).

Conclusion

Although the effect of Foreign Direct Investment (FDI) on economic growth has received a great deal of attention, less is known about the effect of FDI on technological innovations on host countries. In line with this argument, the study analyzed how FDI foster technological innovations in Kenya for the period from 1980 to 2022. The study employed advanced econometric methods such as unit root test, cointegration, lag length criterion and Autoregressive Distributed Lag (ARDL) estimation approach. The result from ARDL estimator indicates that increase in FDI and human capital formation leads to increase in technological innovation in Kenya. In contrast, trade openness and economic growth have significant negative effects on technological innovation in the long-run. Moreover, a one-way causal relationship exists between FDI and technological innovation. In conclusion, FDI has the potential to play a transformative role in Kenya's journey towards becoming a technology-driven economy.

As per result, FDI plays a substantial role in expanding technological innovations in Kenya. By adopting proactive policies and strategies that harness the benefits of FDI, Kenya can position itself as a hub for innovation, entrepreneurship, and technological excellence in the region. To maximize the benefits of FDI for technology growth, it is essential for Kenya to create an enabling environment that attracts investment, fosters innovation, and builds human capital. By implementing policies that enhance the investment climate, strengthen institutional capacity, promote research and development, support human capital development, and facilitate technology spillovers,

Kenya can leverage FDI as a driver of sustainable economic growth and technological advancement. Improvements in the investment climate through policy reforms, institutional strengthening, and infrastructure development are essential for maximizing the benefits of FDI for technology development and long-term growth.

Government and multinational corporations (MNCs) should adopt the mechanisms of licensing agreements, joint ventures, and collaborations to increase diffusion of knowledge. In Kenya, efforts to improve education quality, enhance vocational training, and promote lifelong learning are critical for maximizing the impact of FDI on technology development. Moreover, policies that facilitate the mobility of skilled workers and encourage knowledge exchange between foreign and domestic firms can further strengthen the linkages between FDI and human capital development. Then, the level of education and human capital development are very important to stimulate absorption of technology. Kenya needs to improve on the quality of education and increase accessibility to all citizens in order to improve digestion of technology. This study is limited to Kenya, and the same study could be done in other panels of countries.

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ABSTRACT

This study examines the role of foreign direct investment (FDI) inflow on technological innovation in Kenya. The result can help the government to formulate policies that attract FDI inflow to promote new technology, innovation, knowledge and financial capital inflow. It uses the Autoregressive Distributed Lag (ARDL) estimation approach with time series data from 1980 to 2022 for Kenya. The results indicate that foreign direct investment and human capital lead to an increase in technological innovation over the long term. On the other hand, trade openness and economic growth are found to negatively impact technological innovation in the long run. Additionally, the result indicates that there is a causal relationship, in the Granger sense, between FDI inflow and technological innovation. The government should develop policies designated to create an environment conducive to attract foreign direct investment. The policies should focus on encouraging joint ventures and collaborations with local partners, industry specific incentives, investment promotions and tax incentives. FDI inflows bring advanced technologies, managerial know-how, and best practices, which can enhance the innovative capabilities and productivity of domestic firms.

KEYWORDS

Foreign direct investment. Technological innovation. Patents.

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