

# Article A Comparative Analysis of the Determinants of Foreign Direct Investment: The Case of Top Ten Recipients of Foreign Direct Investment in Africa

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Abstract: Through mechanisms including knowledge transfer and productivity spillovers, foreign direct investment (FDI) is viewed as a critical driver of growth in developing economies. However, the majority of African nations require capital inflows, particularly foreign direct investment (FDI), as a result of insufficient capital accumulation. The capacity of African governments to deliver top-notch infrastructure and social services has been diminished as a result. However, there has not been any independent research on how FDI inflows have affected Africa's top 10 nations between 1970 and 2021. Most studies on the subject overlooked the impact of institutional quality on FDI inflows and omitted pertinent indicators of infrastructure development. The purpose of this article is to present a comparative analysis of the factors influencing the top ten beneficiaries of FDI in Africa. The ARDL bound test was employed to confirm the co-integration of the variables over the long term. The major goal is to confirm the relationship between the short- and long-term determinants of foreign direct investment in the top ten African recipients. This estimation was performed based on the unique characteristics of each country to make comparisons and inferences easier. The results of the limit test demonstrated the existence of a long-term connection between the examined determinants. The study found that infrastructure gaps, poor domestic savings, and price inflation were some of the mitigating factors preventing FDI from entering these countries. Additionally, the study found poor governance, which may impede the growth of effective institutions and capital inflows. It is crucial that these nations undertake both fiscal and monetary policies in order to address these issues, draw in private investments that allow for significant economic activity, and boost their economies' prosperity.

Keywords: Africa; FDI; inflows

JEL Classification: F11; F13; F17

# 1. Introduction

The majority of African nations desire capital inflows, notably foreign direct investment (FDI), due to their insufficient capital accumulation. The capacity of African governments to deliver top-notch infrastructure and social services has been weakened as a result. Due to mechanisms including knowledge transfer and productivity spillovers, foreign direct investment (FDI) is viewed as a key engine of growth in developing economies (Okara 2023; Busse and Groizard 2008; Njuguna 2008; Loungani and Razin 2001). Loans are another source of capital inflows; however, they come with higher debt servicing costs for African nations (Onyeiwu 2004). In the United States, for instance, the median public debt-to-GDP ratio increased from 32% in 2010 to 57% in 2022 because of poor growth and high debt buildup. Most African nations desire capital inflows, notably foreign direct investment (FDI), because of insufficient capital accumulation within their nations. Loans are another source of capital inflows, but increasing debt servicing costs fall on African nations (Onyeiwu 2004). As an illustration, weak economic growth combined with high



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**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). public debt accumulation has increased the median public debt-to-GDP ratio from 32% in 2010 to 57% in 2022.

Capital inflows in the form of FDI are evaluated based on a variety of characteristics, including economic growth rate, government policy and labor markets, inflation, trade openness, foreign reserves, and natural resource availability (Djokoto and Wongnaa 2023; Collier et al. 2019; Onyeiwu 2004). To put it another way, the primary deterrents to FDI in the African continent are human capital development, government consumption expenditure, GDP per capita, and credit to the private sector (Ajide and Ibrahim 2022; Asiedu 2002). However, other researchers ascribe FDI inflows to good governance structures or quality institutions (Fon et al. 2021; Tan et al. 2023). Julio and Yook (2016) previously stated that FDI flowing into a country capitalizes on the quality of domestic institutions, whereas Opuala-Charles and Oshilike (2023), Morgan et al. (2022), and Keeley and Ikeda (2017) linked FDI inflow to the ease of doing business in terms of access to electricity, financial development, exchange rate volatility, and civil conflict or political instability. Despite various economic reforms put in place by African countries to facilitate FDI inflows, their initiatives have been less significant (Asiedu 2006). Thus, what could have been accounted for are the increased unemployment and poverty that have been seen as a result, which has led to macroeconomic imbalances such as high inflation, which is caused by rising food and energy costs as well as weaker currencies and sluggish investment growth alongside and poor social indicators among these economies (World Bank 2023). For instance, Sub-Saharan Africa's (SSA) economic growth dropped from 4.1% in 2021 to 3.6% in 2022 and is forecast to drop even more to 3.1% in 2023 (World Bank 2023). The poor performance of these indicators could be attributable to unsustainable growth, over the long run, to boost shared prosperity to decrease extreme poverty.

Given the potential of FDI, all governments work to adopt investment-friendly policies to entice these crucial resources for development (Njuguna and Nnadozie 2022). For instance, trade policies are created in growing markets and developing nations to promote domestically produced items with added value, diversify exports, and boost domestic industries' competitiveness. The African Continental Free Trade Agreement (AfCFTA), which attempts to reduce trade tariffs and non-tariff obstacles, was established because of this and other considerations. Investors in AfCFTA signatory nations could thereby have access to a larger market for goods and services offered throughout Africa (Morgan et al. 2022). Empirically, there has been some disagreement over how FDI has affected African nations. For instance, Gupta et al. (2023) emphasized the positive effect institutional quality has on FDI inflows into South Africa. Ajide and Ibrahim (2022) claim that improved infrastructure and higher returns on investment have little to no effect on FDI in Sub-Saharan Africa (SSA). This emphasis proves that quality institutions matter to FDI inflows and sustainable growth (Fon et al. 2021; Keeley and Ikeda 2017).

South Africa, Rwanda, Egypt, Mauritius, Côte d'Ivoire, Ghana, Nigeria, Kenya, Tunisia, and Algeria are the top ten receivers of FDI inflows in Africa, according to the World Bank report. For instance, the World Bank reported that these nations received more than USD \$300 billion from 2011 to 2020 (Larnyoh 2021). This FDI inflow to these African countries reached a record USD \$83 billion in 2021, according to UNCTAD's World Investment Report (2022), which is relatively substantial to engender significant growth. However, disparities in domestic policies and FDI inflows vary across sectors in African countries (Morgan et al. 2022), as do the related impacts. The focus of these countries is because of their strategic position and policy prescription over the years. Serven and Solimano (1992) emphasized the importance of good governance in driving FDI inflows to developing nations. FDI inflows have also been connected to price stability and gross domestic savings in studies (Al-matari et al. 2021). The empirical literature justified the necessity for an empirical analysis of the determinants of FDI inflows among Africa's top ten recipients. For example, a study by Meressa (2022) used fixed-effects (within) regression, and the results showed that infrastructure, government effectiveness, economic growth, control over corruption, trade openness, political stability, human capital, and

financial development have positive effects on the inflow, while external debt, inflation, and regulatory quality failed to show a significant effect.

Mohammed (2022) utilized fully modified ordinary least squares (FMOLS) to analyze the data and discovered that while corruption has a negative impact on FDI in the region, financial growth and trade openness have favorable effects on FDI. The size of the market (GDP per capita), the extent of trade openness, and the absence of political risk, according to Abimbola and Oludiran (2018), all help to draw in more FDI. According to a panel data analysis of FDI inflows, infrastructure, human capital, financial development, macroeconomic stability, exchange rates, and political stability also have an impact (Adelakun 2011). Youssouf (2017) used Bayesian Averaging of Maximum Likelihood Estimates, and the results suggest that FDI is most significantly influenced by natural resources and market size, while inflation, infrastructure, human capital, and trade openness have only a marginally significant impact. However, political turmoil and corruption have little impact on FDI inflows. Using the Hausman Specification Test based on random effects, Sane (2016) demonstrated that the stabilization of the macroeconomic environment, government consumption spending, domestic credit to the private sector, interest rates, gross fixed capital formation, exchange rates, the index of economic freedom, as well as natural resources and market size are the main FDI driving factors in the ECOWAS. Given the empirical augmentations, empirical research on the variables affecting FDI inflows among the top 10 recipients in Africa was required. The innovation herein is to test the extent to which the drivers of the inflows of FDI can be generalized for the top beneficiaries of FDI in Africa. The hypothesis is that, despite ranking among the top ten beneficiaries of FDI in Africa, factors that drive the inflow of FDI in these countries impact differently in terms of their magnitude, direction, and significance.

### Theoretical Framework

This study is based on the Eclectic Paradigm theory of Dunning (1998), which highlights ownership advantages, location advantages, as well as the impact of economic, political, and social aspects of the host country in luring foreign investment. There are a variety of features in the nations under examination that may affect the kind and volume of investment inflows. Aside from the Eclectic Paradigm theory, the FDI Market Size theory is emphasized on the size of the market measured using gross domestic product as a determining factor in FDI attraction (Anyanwu 2011; Kumari and Sharma 2017; Dondashe and Phiri 2018; Ebire et al. 2018; Jaiblai and Shenai 2019). From another perspective, scholars identified the availability of infrastructure, political instability, corruption, unstable exchange rate, and economic performance as the primary factors that usually motivate investment decisions of foreign investors (Seetanah and Khadaroo 2009; Vijayakumar et al. 2010; Jadhav 2012; Jadhav and Katti 2012; Nourzad et al. 2014; Türedi 2018; Shaari et al. 2020). Adeyeye et al. (2016) also cite relative pricing stability, often one-digit inflation, as a strategic predictor of FDI inflows.

Following the Eclectic Paradigm theory, *FDI* Market Size theory, and the empirical studies (see, Fon et al. 2021; Ajide and Ibrahim 2022; Morgan et al. 2022; Gupta et al. 2023), the determinants of *FDI* in Africa have the following implicit form of the model:

$$FDI = f(GOV, GFCF, GDS, EPC, GDP, EXR, CPI)$$
(1)

where GOV = governance quality, GFCF = gross fixed capital formation, GDS = gross domestic savings, EPC = electric power consumption, GDP = gross domestic product, EXR = exchange rate, and CPI = consumer price index.

## 2. Materials and Methods

This study used yearly data spanning between 1970 and 2022. Arising from various arguments in the literature, this study considers the variables inflation, consumer prices (annual %) (CPI), official exchange rate (LCU per USD, period average) (EXR), electric power consumption (kWh per capita) (EPC), gross domestic savings (current USD) (GDS),

governance quality (GOV) (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance), gross domestic product (constant 2015 USD) (GDP), gross fixed capital formation (constant 2015 USD) (GFCF), and foreign direct investment and net inflows (BoP, current USD) (FDI) across the selected countries. There are other germane variables that affect FDI inflows such as natural resources, trade, human capital development, etc. (Suleman et al. 2015; Kaliappan et al. 2015; Vinesh et al. 2014). However, the choice of these variables in this study is hinged on the theoretical ground and extant literature (Adeyeye et al. 2016; Sane 2016; Youssouf 2017; Abimbola and Oludiran 2018; Jaiblai and Shenai 2019; Shaari et al. 2020). While acknowledging that 'trade' has also been validated in the literature as a determinant of FDI, its omission and the choice of the selected variables are informed by the availability of the data for each of the countries under consideration. Except for EXR and CPI, a change in each of the variables on the right-hand side of Equation (1) is expected to increase the inflows of FDI. Also, most empirical results have produced conflicting results. It is therefore imperative to undertake this similar study from a different perspective. For uniformity in variable measurement and frequency, all data were sourced from the World Bank's Development Indicators (WDI) and International Monetary Fund (IMF) from 1970 to 2022 in South Africa, Egypt, Ghana, Morocco, Mauritius, Ethiopia, Nigeria, Tunisia, the Republic of Congo, and Algeria. For Rwanda, access to electricity (% of the population) was used against the non-availability of data on electric power consumption.

Figures 1 and 2 below represent the percentage of FDI inflows into each of the selected African countries relative to the total inflows of FDI into the continent across the sub-sample of 1970 to 1995 and 1996 to 2022. The partitioning of the sample into two sub-samples is mainly for the sake of clarity and mainly applicable to the figures as the sub-samples were later collapsed into a whole in the section for estimation and an empirical analysis. The illustration seems to be suggesting that the trends in the inflows of FDI are episodic across the two sub-samples, which could be associated with the prevailing economic situation, such as the behavior of macroeconomic indicators, and social and political climate of the periods under consideration. This further depicts that certain fundamentals determine the decision of foreign investors into channeling foreign investment into African countries. Notwithstanding, South Africa, Nigeria, Egypt, Ghana, and Morocco still account for the large proportion of the FDI inflows while Algeria, Tunisia, Kenya, Mauritius, and Kenya follow suit. Given these dynamics, it becomes imperative to conduct an empirical investigation among these countries to ascertain which of the factors and which countries involve the attraction of FDI inflows.



**Figure 1.** Percentage of FDI inflows to total FDI into top ten selected African countries (1970–1995). Source: World Bank's Development Indicators (World Bank 2023).



**Figure 2.** Percentage of FDI inflows to total FDI into top ten selected African countries (1996–2022). Source: World Bank's Development Indicators (World Bank 2023).

#### Econometric Method

The study transformed the variables into their natural logarithm. This was performed to reduce skewness and deviation. It is necessary to ascertain the stationarity properties of the variables. To do this, this study used ADF and PP unit root tests. It is necessary to examine series co-integration features by determining their stationarity magnitude (Adebayo 2020; Eminer et al. 2020). Furthermore, the study had to confirm that after the stationary test, thus, the Auto-Regressive Distributed Lag Model (ARDL) proposed by Pesaran et al. (2001) was utilized. Thus, the ARDL bound test was used to verify co-integration in the long run amongst variables. The main task was to verify the short-run and long-run connection among the determinants of foreign direct investment in the top ten recipients in Africa. This estimation was carried out based on individual country peculiarity for ease of comparison and inference was drawn.

The framework of ARDL is a system for co-integration having all lagged endogenous parameters and current and lagged exogenous regression factors (Beton and Adebayo 2020; Kalmaz and Kirikkaleli 2019). The specification generally accepted for the ARDL approach with variables under consideration is depicted in Equation (2):

$$Y_t = \gamma_{oi} + \sum_{i=1}^p \phi_i Y_{t-1} + \sum_{i=0}^q \partial_i X_{t-1} + \varepsilon_{it}$$

$$\tag{2}$$

where the vector is represented by  $Y_t$ , other variables are depicted by  $(X_{t-1})$ , the order of integration is indicated by I(0) or I(1), the variable of both endogenous and exogenous coefficients is indicated by  $\emptyset$  and  $\partial$ , respectively, the constant term is represented by  $\gamma$ , the optimal lag order of both dependent and predictor variables is represented by p and q, and stochastic terms are denoted by  $\varepsilon_{it}$ . The ARDL framework is supported for other co-integrating designs attributable to the capability to perceive the vectors co-integrating in a series with an equilibrium equation in the long run. Furthermore, validation of the ARDL does not incorporate the unit root before testing of co-integration, because of I(0) and I(1) variables. Equation (3) represents the equation to be used for the investigation of the long-run interaction between the dependent (*FDI*) and independent variables.

$$FDI_{2i,t} = \alpha_0 + \alpha_1 GOV_{i,t} + \alpha_2 GFCF_{i,t} + \alpha_3 GDS_{i,t} + \alpha_4 EPC_{i,t} + \alpha_5 GDP_{i,t} + \alpha_6 EXR_{i,t} + \alpha_7 CPI_{i,t} + \varepsilon_{i,t}$$
(3)

where  $\alpha_0$  is the constant term and  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ ,  $\alpha_4$ ,  $\alpha_5$ ,  $\alpha_5$ ,  $\alpha_6$ , and  $\alpha_7$  are the long-run elasticities of FDI with respect to governance quality, gross fixed capital formation, gross domestic savings, electric power consumption, gross domestic product, exchange rate, and consumer price index, respectively.  $\varepsilon$  is the error term, and  $\varepsilon$  represents the time. To obtain information about the short-run deviation from its long-run equilibrium in our model, we also employed the error correction model (*ECM*), which was developed by Engle and Granger (1987), stating that there is an error correction mechanism to correct short-term imbalances. The *ECM* model is represented with Equation (4) as follows:

$$\Delta FDI_{2t} = \beta_o + \sum_{i=1}^{p} \beta_{1i} \Delta FDI_{2t-i} + \sum_{i=1}^{p} \beta_{2i} \Delta GOV_{t-1} + \sum_{i=1}^{p} \beta_{3i} \Delta GFCF_{t-1} + \sum_{i=1}^{p} \beta_{4i} \Delta GDS_{t-1} + \sum_{i=1}^{p} \beta_{5i} \Delta EPC_{t-1} + \sum_{i=1}^{p} \beta_{6i} \Delta GDP_{t-1} + \sum_{i=1}^{p} \beta_{7i} \Delta EXR_{t-1} + \sum_{i=1}^{p} \beta_{8i} \Delta CPI_{t-1} + \lambda ECM_{t-1} + \varepsilon_t$$
(4)

where  $\beta's$  denote the parameter of error correction,  $\Delta$  stands for the changes of the variables they are attached to, and  $\lambda$  represents the speed of adjustment of the short run to reach the long-run equilibrium while  $ECM_{t-1}$  is the error correction term.

# 3. Results and Discussion

# 3.1. Descriptive Statistics

The results of descriptive statistics (the mean and standard deviation) are presented in Table 1. The results of the descriptive statistics show that there are significant differences in the average levels of foreign direct investment (FDI) into the countries and period under study, with South Africa leading with an average of USD \$3450.92 million and Egypt and Nigeria following in that order with USD \$2601.3 million and USD \$2110.44 million, respectively. Algeria, Nigeria, and South Africa are the top three economies in terms of average gross domestic savings (GDS), with values in the millions of USD \$2,554,484, \$125,374.3, and \$37,810.81. South Africa, Mauritius, and Egypt are the nations with the greatest average electricity consumption, with respective values of 3791.80, 1157.89, and 899.37 KWh. The top three economies in Africa in terms of GDP are Nigeria, South Africa, and Egypt, which are reflected in the average values during the period. The average GDP for the time under consideration is USD \$246,007.7, \$227,549.8, and \$177, 955.7, respectively.

Country	FDI (USD Million)		GDS (USD Million)		EPC (kWh per Capita)		GDP (USD Million)		GFCF (USD Million)		CPI (%)		OEXR (N:USD)		GOV (Index)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Tunisia	561.03	1.13	3863.97	0.69	839.84	0.57	26,007.14	0.54	5228.34	0.53	6.33	0.48	1.19	0.59	0.58	0.81
Rwanda	66.19	1.53	252.26	1.29	11.32	1.16	4188.44	0.75	731.17	1.23	7.74	0.84	364.98	0.82	-1.28	-0.81
Nigeria	2110.44	1.14	125,374.30	1.08	93.18	0.37	246,007.70	0.58	96,152.23	0.80	18.16	0.84	90.24	1.24	-0.99	-0.08
Morocco	1046.98	1.12	11,659.67	0.82	519.77	0.57	54,104.11	0.64	14,179.18	0.71	4.37	0.91	7.93	0.26	-0.13	-0.70
Mauritius	126.92	1.36	868.70	0.68	1157.89	0.72	6315.07	0.61	1311.04	0.56	7.49	0.93	21.03	0.54	0.36	1.28
Kenya	230.68	1.65	3249.98	1.16	131.18	0.26	39,740.95	0.57	6662.35	0.80	11.31	0.70	51.38	0.71	-0.68	-0.28
Ghana	911.91	1.46	2707.55	1.81	319.49	0.24	24,851.10	0.72	17,021.32	0.13	28.35	0.96	1.12	1.58	-0.10	-0.91
South Africa	3450.92	2.29	37,810.81	0.62	3791.80	0.18	227,549.80	0.35	35,686.40	0.43	8.73	0.50	5.66	0.85	0.78	0.65
Algeria	672.91	1.18	2,554,484.00	1.19	759.06	0.66	100,378.30	0.44	36,531.06	0.53	8.54	0.87	48.38	0.89	-0.84	-0.36
Egypt	2601.30	1.24	11,053.34	0.77	899.37	0.56	177,955.70	0.67	25,150.53	0.75	10.71	0.58	4.58	1.07	-0.31	-0.53

Table 1. Descriptive Statistics.

Source: Extract from E-view 12.0.

When infrastructure investment is measured using GFCF, Nigeria, South Africa, and Algeria come in first, second, and third, with USD \$96, 152.23, \$36,586.4, and \$36,531.06, respectively. Ghana, Nigeria, and Kenya rank among the top three countries in the con-

sumer price index, a metric for ascertaining the inflationary growth, with 28.35, 18.16, and 11.31 percent, respectively. The official rate at which the country's domestic currencies exchange to the dollar indicate that on average, the countries with the highest exchange rates are Rwanda (364.98), Nigeria (90.24), and Algeria (48.32). The index for governance quality showed that Mauritius, Tunisia, and South Africa are the best rated with index values of 1.28, 0.81, and 0.65, respectively.

## 3.2. Stationarity Test

The results in Table 2, Panel A hold the ADF unit root test while Panel B represents the Dickey–Fuller GLS unit root to validate the ADF result. The results reveal that all the series were stationary at both the level (i.e., I(0)) and first difference (i.e., I(1)), thus exhibiting a mixed order of integration among the variables under consideration and this outcome spread across the selected countries. At this point, the rule of thumb must be observed by considering that all the series are of different orders of integration. Given the bivariate model and outcome of the stationarity test discussed above, the appropriate technique is Autoregressive Distributive Lag.

Table 2. Unit root test results.

	Panel A: ADF Unit Root Test									
Country	FDI	GDS	EPC	GDP	GFCF	СРІ	OEXR	GOV	d <sub>max</sub>	
Tunisia	<0.01 **	<0.01 **	<0.01 *	<0.01 *	<0.01 **	<0.01 **	<0.01 **	<0.01 **	I(1)	
Rwanda	<0.01 **	<0.01 **	<0.01 **	<0.01 **	<0.01 **	<0.01 *	<0.01 **	<0.01 **	I(1)	
Nigeria	<0.01 **	<0.01 **	<0.01 **	<0.01 **	>0.05 *	<0.01 *	<0.1 **	>0.01 *	I(1)	
Morocco	<0.01 **	<0.01 *	<0.01 *	<0.01 **	<0.01 **	<0.01 **	<0.01 **	<0.01 **	I(1)	
Mauritius	<0.01 **	<0.01 *	<0.01 **	<0.01 **	<0.01 **	<0.01 *	<0.01 **	<0.01 **	I(1)	
Kenya	>0.01 **	>0.01 **	>0.01 **	>0.01 **	>0.01 **	>0.01 *	<0.01 **	<0.01 **	I(1)	
Ghana	>0.01 **	>0.01 **	>0.01 *	>0.01 **	<0.01 **	>0.01 *	>0.01 **	>0.01 *	I(1)	
South Africa	>0.05 *	<0.01 **	>0.05 *	<0.01 **	>0.01 **	<0.01 **	<0.01 **	<0.01 **	I(1)	
Algeria	>0.05 *	<0.01 **	<0.01 **	>0.01 *	<0.01 **	>0.01 *	>0.01 **	<0.01 **	I(1)	
Egypt	<0.01 **	<0.01 **	>0.01 *	<0.05 *	<0.01 **	<0.01 **	>0.01 **	<0.01 **	I(1)	
Country				Panel B: D	F-GLS Unit	Root Test				
Tunisia	<0.01 **	<0.01 *	>0.01 **	>0.01 **	<0.01 **	<0.01 **	<0.01 **	<0.01 **	I(1)	
Rwanda	<0.01 **	>0.01 *	<0.01 **	<0.01 **	<0.01 **	>0.01 *	<0.01 **	>0.01 *	I(1)	
Nigeria	<0.01 **	<0.01 **	<0.01 **	>0.01 **	<0.05 **	>0.01 *	<0.01 **	>0.01 *	I(1)	
Morocco	<0.01 **	>0.01 **	>0.01 **	<0.01 **	<0.01 **	<0.01 **	<0.01 **	>0.05 *	I(1)	
Mauritius	<0.01 **	<0.01 **	>0.01 **	>0.01 **	>0.01 **	>0.01 *	<0.01 **	<0.01 **	I(1)	
Kenya	<0.01 **	>0.01 **	<0.01 **	>0.05 **	<0.01 **	>0.01 *	<0.01 **	<0.01 **	I(1)	
Ghana	<0.01 **	<0.01 **	>0.01 **	<0.01 **	<0.01 **	<0.01 *	>0.01 **	>0.01 *	I(1)	
South Africa	>0.01 *	<0.01 **	>0.01 **	<0.01 **	>0.01 **	>0.01 *	<0.01 **	<0.01 **	I(1)	
Algeria	>0.01 *	<0.01 **	<0.01 **	<0.01 **	<0.01 **	>0.01 *	<0.05 **	<0.01 **	I(1)	
Egypt	>0.01 **	< 0.01 **	< 0.01 **	>0.01 **	< 0.01 **	>0.01 **	< 0.01 **	>0.01 *	I(1)	

Source: Extract from E-view 12.0. Note: Probability values are reported using 5% level of significance while \*, \*\*, and \*\*\* denote stationarity at level (I(0)), first difference (I(1)), and second difference (I(2)), respectively. The  $d_{max}$  gives us the maximum order of integration for the individual countries.

## 3.3. ARDL Bounds Test

Table 3 presents a summary of the ARDL Bounds Test for the panel of countries involved in the analysis. Using the comparison of the F-Statistic and the lower and upper bounds estimates, respectively, the study infers the following: Given the F-Statistic at 1 percent is higher than the upper bounds for the 10 countries, the study rejects the null hypothesis of no co-integration between the variables in the models. Therefore, there existed a long-run relationship between all variables in the relationship being estimated.

Country	<b>F-Statistics</b>	Signif.	Lower Bound I(0)	Upper Bound I(1)
Tunisia	5.339386	1%	2.96	4.26
Rwanda	8.736953	1%	2.73	3.90
Nigeria	4.236122	1%	2.73	3.90
Morocco	6.481428	1%	3.31	4.63
Mauritius	6.929383	1%	2.73	3.90
Kenya	6.623438	1%	2.73	3.90
Ghana	4.370192	1%	2.96	4.26
South Africa	5.128838	1%	2.96	4.26
Algeria	5.864881	1%	2.96	4.26
Egypt	9.061308	1%	2.73	3.90

### Table 3. Bounds Test.

Source: Extract from E-view 12.0.

#### 3.4. ARDL Short-Run and Long-Run Estimates

The short-run estimates of the ARDL model are given in Panel A of Table 4 as 10%, 5%, and 1%, respectively. Only the GDP, CPI, EXR, and GOV variables are statistically significant in Tunisia, whereas EPC, GFCF, CPI, EXR, and GOV variables are statistically significant in Rwanda. GDS, EPC, GDP, and EXR were important in Nigeria. Statistical significance can be seen in the CPI, EXR, and GOV series in Morocco, the EPC, GFCF, EXR, and GOV series in Mauritius, and the GDS and GOV series in Kenya. GDP, GFCF, and CPI were found to be significant in South Africa; GDP, EXR, and GOV were significant in Ghana; and GDS, EPC, GDP, EXR, and GOV were significant in Algeria. In Egypt, EPC, GDP, GFCF, and EXR series were significant relative to other parameters included in the model. The error correction term (ECT) values and p-values indicate that the speed of adjustment to the long-run horizon is significant. In Panel B, the long-run relationship for the estimated model is presented at 10%, 5%, and 1%, respectively. From the results, the Tunisian estimates indicated that GDP, CPI, EXR, and GOV were statistically significant in the long run. In Rwanda, GDS, GFCF, CPI, EXR, and GOV were significant throughout the long term, whereas in Nigeria, GDS, EPC, GDP, and OEXR were. GDS, CPI, EXR, and GOV were important in Morocco. EPC, GFCF, EXR, and GOV were significant in Mauritius as well. EPC and GOV were statistically significant over the long term in Kenya. GDP and OEXR are statistically significant in Ghana. In Algeria, GDS, EPC, GDP, EXR, and GOV were statistically significant, whereas in South Africa, GDS, GFCF, and CPI were the only long-term significant parameters. In Egypt, the following variables were statistically significant over the long run: GDS, EPC, GDP, GFCF, and EXR.

Panel A Short-Run Estimates								
Country	GDS	EPC	GDP	GFCF	CPI	OEXR	GOV	ECM
Tunisia	-0.4055	-0.2708	3.7376	0.5341	-0.5196	-1.2789	1.5635	-0.8482
	(0.1994)	(0.6967)	(0.0104) *	(0.4133)	(0.0731) *	(0.0620) *	(0.0227) *	(0.0000) *
Rwanda	-0.2683 (0.1026)	0.9160 (0.0033) *	-1.8800 (0.1398)	2.1709 (0.0005) *	0.3285 (0.0531) *	-2.4901 (0.0000) *	1.9906 (0.0072) *	-0.9583 (0.0000) *
Nigeria	0.8060	1.7369	-1.6274	-0.1251	0.0760	0.4257	-0.8137	-0.7158
	(0.0030) *	(0.0096) *	(0.0154) *	(0.7820)	(0.5232)	(0.0003) *	(0.5332)	(0.0000) *
Morocco	4.0634	2.6566	-3.8926	-0.1098	-0.7274	-2.9599	5.2205	-0.9980
	(0.0076) *	(0.5551)	(0.1561)	(0.9174)	(0.0689) *	(0.0406) *	(0.0507) *	(0.0000) *
Mauritius	-0.0039	-5.7859	2.1974	5.2813	0.1233	1.9035	2.4432	-0.9199
	(0.9912)	(0.0001) *	(0.3153)	(0.0001) *	(0.3887)	(0.0110) *	(0.0559) *	(0.0000) *
Kenya	1.0570	-9.0323	2.3020	0.7808	0.5918	-0.0959	6.8251	-0.4472
	(0.1280)	(0.0610) *	(0.4563)	(0.2733)	(0.1903)	(0.9133)	(0.0327) *	(0.0000) *
Ghana	0.1170	0.4088	3.1298	-0.1505	-0.0044	-0.5624	1.3029	-0.5455
	(0.4121)	(0.2385)	(0.0004) *	(0.8899)	(0.2605)	(0.0012) *	(0.2663)	(0.0000) *
South	5.7453	-3.7756	2.5128	-5.9752	-0.2925	0.2269	5.3829	-0.7213
Africa	(0.0152) *	(0.2153)	(0.7549)	(0.0326) *	(0.0205) *	(0.3234)	(0.1436)	(0.0000) *
Algeria	-3.1075	-20.879	51.1164	0.6359	-0.0537	3.2924	-14.677	-0.7074
	(0.0582) *	(0.0007) *	(0.0005) *	(0.7746)	(0.9245)	(0.0143) *	(0.0010) *	(0.0000) *
Egypt	-1.7598	18.3110	-16.9375	2.0952	-0.0342	0.2884	-1.6093	-0.8298
	(0.0882)	(0.0006) *	(0.0008) *	(0.0001) *	(0.2117)	(0.0329) *	(0.2327)	(0.0000) *
Panel B Long-Run Estimates								
Tunisia	-0.4780	-0.3193	4.4065	0.6296	-0.6125	-1.5078	1.8-	433
	(0.2013)	(0.6970)	(0.0098) *	(0.3976)	(0.0683) *	(0.0637) *	(0.01	69) *
Rwanda	-0.2799	0.9559	-1.9619	2.2655	0.3428	-2.5985	2.0	772
	(0.1212)	(0.0057) *	(0.1694)	(0.0009) *	(0.0520) *	(0.0000) *	(0.01	28) *
Nigeria	1.1260	2.4266	-2.2735	-0.1747	0.1061	0.5946	-1.1	1368
	(0.0026) *	(0.0068) *	(0.0209) *	(0.7819)	(0.5210)	(0.0003) *	(0.55	324)
Morocco	4.0713	2.6618	-3.9002	-0.1101	-0.7288	-2.9657	5.2	307
	(0.0067) *	(0.5541)	(0.1471)	(0.9174)	(0.0725) *	(0.0378) *	0.04	78) *
Mauritius	-0.0043	-6.2893	2.3886	5.7408	0.1341	2.0691	2.6	558
	(0.9912)	(0.0000) *	(0.2944)	(0.0001) *	(0.3877)	(0.0141) *	(0.06	71) *
Kenya	0.9214	-7.8732	2.0066	0.6806	0.5159	-0.0837	5.9-	493
	(0.1218)	(0.0576) *	(0.4537)	(0.2699)	(0.1880)	(0.9132)	(0.02	72) *
Ghana	0.2145	0.7494	5.7372	-0.2758	-0.0080	-1.0309	2.3885	
	(0.4226)	(0.2279)	(0.0000) *	(0.8900)	(0.3015)	(0.0008) *	(0.2604)	
South	7.9652	-5.2345	3.4837	-8.2839	-0.4055	0.3146	7.4628	
Africa	(0.0502) *	(0.2607)	(0.7558)	(0.0781) *	(0.0325) *	(0.3332)	(0.1844)	
Algeria	-4.3926	-29.5147	72.2562	0.8989	-0.0759	4.6540	-20.7476	
	(0.0641) *	(0.0024) *	(0.0020) *	(0.7719)	(0.9241)	(0.0203) *	(0.0059) *	
Egypt	-2.1207	22.0665	-20.4113	2.5249	-0.0412	0.3476	-1.9	9394
	(0.0950) *	(0.0013) *	(0.0018) *	(0.0000) *	(0.2392)	(0.0432) *	(0.24	479)

Table 4. ARDL Results.

Source: Extract from E-view 12.0. Note: The first figure in each cell is the estimated coefficient while the value in parenthesis is standard error. This study uses 10%, 5%, and 1% level of significance upon which the statistical significance of the estimated variables can be examined. The (\*) denotes rejection of no statistical significance.

Based on a priori expectations, a unit change in all parameters is anticipated to elicit a positive effect on FDI inflows into the various countries. The results obtained indicate a deviation to this relationship in both the short run and long run. In Tunisia, a unit change in the parameters GDP, GFCF, and GOV elicited an increase in FDI while others were negative; with Rwanda, all others were in conformity to a priori with the exception of declines to FDI from a unit change in GDS, GDP, and EXR, respectively. The FDI model for Nigeria indicated that a unit change in GDP, GFCF, and GOV resulted in a decrease in the level of FDI inflows into Nigeria-other things being equal while other parameters resulted in increases. Morocco's results indicate that a unit change in GDP, GFCF, CPI, and EXR contributed to a decline in FDI; while in Mauritius, only a unit change in GDS and EPC resulted in declines in FDI inflows. Similarly, in Kenya, a unit change in EPC and OEXR resulted in a decrease in FDI inflows. In Ghana and South Africa, respectively, a unit change in GFCF, CPI, and EXR and EPC, GFCF, and CPI, respectively, holding all others constant, led to falls in inflows of FDI. A unit change in GDS, EPC, CPI, and GOV in Algeria resulted in a decline in FDI inflows while in Egypt, a unit change in GDS, GDP, CPI, and GOV led to decreases in FDI inflows.

Finally, the empirical data reveal that insufficient savings remain a serious issue that has hampered capital inflows to some of the African countries under consideration. Because private enterprises usually rely on independent power generation, the finding emphasizes the necessity of infrastructure, notably the availability of energy. The findings across the studied countries reveal that the current level of productivity and investment is clearly insufficient to influence foreign investment inflows. Although output growth and domestic investment continue to be important variables in facilitating capital inflows, they are insufficient to impact domestic capital inflows. This could be due to noncompetitive public products on the global market, which are necessary for increasing national output and wealth. The result as shown in Table 5 below, also demonstrates a significant level of price instability, as evidenced by the positive value of the consumer price index. Foreign investors value exchange rate stability, although it is typically based on the country's export potential translating into significant foreign exchange revenues and a strong currency. Given the lack of economic diversification and expertise in many of the countries under study, foreign exchange inflows via trade are frequently restrained, resulting in exchange rate volatility. This reality is unsettling for FDI inflows. Finally, while these countries have accomplished some level of institutional transformation with high-quality governance, much work remains to be done, especially in Nigeria, Ghana, South Africa, Algeria, and Egypt.

	Linearity Test	Autocorrelation Test	Heteroscedasticity Test
	Ramsey RESET	Arch Test	Breusch-Pagan-Godfrey
Tunisia	0.103288 (0.7496)	0.061485 (0.8052)	2.254619 (0.1184)
Rwanda	0.141208 (0.7096)	1.915811 (0.1729)	0.225503 (0.7994)
Nigeria	2.785011(0.0734)	0.005294 (0.9423)	1.159702 (0.3237)
Morocco	7.091459 (0.0012)	0.159733 (0.6912)	1.979679 (0.1570)
Mauritius	0.052524 (0.7733)	1.425341 (0.2386)	0.57056(0.5712)
Kenya	8.366309 (0.0064)	0.000471 (0.9828)	1.788986 (0.1821)
Ghana	0.008886 (0.9254)	0.206341 (0.6517)	0.451776 (0.6397)
South Africa	0.51077 (0.4805)	0.396977 (0.5317)	2.065398 (0.1457)
Algeria	31.89554 (0.0000)	2.029547 (0.1609)	0.699147 (0.5044)
Egypt	0.579195 (0.4532)	1.054388 (0.3098)	0.061359 (0.9406)

Table 5. Post-Estimation Results.

Source: Extract from E-view 12.0.

The Linearity RESET Test is used to ensure that the models' specifications are valid. The F-values and probability values of the ARDL models are tiny, hence the linearity null hypothesis is maintained and the models are appropriately characterized. The F-Statistics for the serial correlation results are not significant because the likelihood is greater than the level of significance of 5% and the null hypothesis of no serial correlations is accepted. Furthermore, because the test does not rule out the null hypothesis of heteroscedasticity, it reveals that the residuals in the models have a continuous distribution. In addition, we discover that growing inflation, insufficient savings, a lack of infrastructure, and weak governance are all deterrents to FDI inflows in several of the African economies studied. This finding agrees with Ajide and Ibrahim (2022) and Mohammed (2022); however, it contrasts with Meressa (2022) and Abimbola and Oludiran (2018). However, we find some significant evidence that GDP, a measure of market size, has huge and favorable impacts, which is consistent with Sane's (2016) findings but contradicts Keeley and Ikeda's (2017) findings. Furthermore, according to Sane (2016) and Youssouf (2017), investment metrics such as GFCF and even GDS influence FDI inflows in certain countries.

## 4. Conclusions

African nations have historically had great potential for development, growth, and transformation, but have typically been constrained by a lack of financial resources. There are now more options being investigated for financing the crucial investment for economic transition as a result of government deficit financing and the rising public debt. A crucial source of long-term capital comes from abroad, historically from the West and more recently from China and other comparable nations attempting to assert their influence. Several nations are vying to be receivers of the rising inflows of foreign cash throughout the continent. In fact, the basic, secondary, and tertiary sectors of the continent may all be affected by FDI inflows. However, it is critical to recognize that several factors influence the direction and magnitude of capital inflows into a country. This is critical considering the various factors that encourage multinational corporations and governments to invest abroad. We show results that give credence to the fact that our discovery of inflation, insufficient savings, a lack of infrastructure, and weak governance as factors limiting FDI inflows cannot be generalized for all of the investigated African economies. This particularly supports our hypothesis that these factors are likely to impact the inflows of FDI differently for the different African economies investigated, both in terms of the significance and the direction of the impacts. In sum, it can be inferred that the performance and attraction of FDI to specific economies are related to several peculiar dynamics of the drivers of the FDI, which are likely to vary for the individual economies. Future studies may want to test the validity of this position across other potential determinants of FDI, such as trade and natural resources, among others.

### Recommendations

- 1. Resolving macroeconomic imbalances and fostering an environment that allows the private sector to fill in for current infrastructural gaps and spur output growth are advised for these countries' governments.
- Governments should actively seek out and direct capital inflows into industries that genuinely boost output and employment at the national level, while minimizing inflows into the most quickly recouping investments, particularly the extractive industries, which are frequently enclave-like in nature.
- 3. To encourage more effective government operations, it is crucial to boost institutional development above everything else. The governance quality should be improved as a strategy to remove structural barriers to the activity of the private sector, particularly the adoption of a framework of investor-friendly policies customized to the local conditions in each nation.

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