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Institutional Quality, Foreign Direct Investment (FDI), and Economic Growth in Africa: A Threshold Analysis

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Abstract: This study examines the role of institutional quality in the foreign direct investment (FDI) economic growth nexus using panel data from 48 African economies over the 2007 to 2021 period. The novelty of this work is the Quadratic effect (non-linear relationship) of FDI and institutional quality on economic growth. This study employed secondary data to examine the nexus of variables across several cross-sections and periods to analyze the results for the selected African countries. For the quantitative data analysis, a panel data econometric model based on the generalized method of moments (GMM) estimation is employed to highlight the Quadratic effect (non-linear relationship) of institutional quality and FDI on the growth of African Economies. This model is useful for studying the impact of variables that vary over time. The findings imply that attracting FDI requires institutional efficiency. Therefore, improved institutional quality and a remarkable increase in FDI are important influences on Africa's economic growth. The study finds that FDI inflows had a significant impact on economic growth in Africa and therefore recommends that, as countries embrace FDI flows, the governments of these countries need to ensure stability and quality of their institutions. Primarily, political stability and improvement of institutional facilities are needed to further attract and retain the inflow of FDI to attain desired economic development. In furtherance, governments should ensure that foreign capital flows into other sectors of the economy, like the real sector, and not just extractive, to enhance domestic investment in Africa.

Keywords: Institutional quality; Foreign direct investment; Economic growth; Nexus; Quadratic effect

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1. Introduction

Over the last 30 years, global foreign direct investment (FDI) has significantly increased, particularly in developing economies. This trend aligns with the Schumpeterian theory of creative destruction, which links financial development to economic growth. FDI is generally expected to benefit host countries through technology transfer, job creation, and capital accumulation. African countries have introduced financial reforms

to attract FDI, seeing modest success. In 2016, developing economies captured over 40% of global FDI, though Africa's share remained limited. Challenges persist, especially in fragile and conflict-affected states. Despite being relatively minor global recipients, many African nations have seen rising FDI inflows in recent decades.

Empirical studies show mixed outcomes: some indicate a positive impact of FDI on growth and employment, while others note varying effects over time. For instance, Osabohien *et al.* (2020), using the fully modified ordinary least squares (FMOLS), posited that FDI positively impacts employment levels and economic growth. Gui-Diby (2014) found both negative and positive impacts in different periods. Recent declines in global FDI returns and slower international production growth pose challenges, particularly in Africa.

This study investigates the FDI-economic growth relationship in 48 African countries from 2007 to 2021 using a Generalized Method of Moments (GMM) panel data approach. It also explores the non-linear (quadratic) effect of institutional quality on FDI and growth. Evidence points to an inverted U-shaped relationship—initial FDI boosts growth, but excessive FDI can hinder it, especially in the presence of weak institutions. The study emphasizes the need to treat developing economies distinctly from developed ones when analyzing FDI's impact and aims to identify country-specific factors influencing FDI inflows. The paper is structured into five sections covering literature, methodology, results, and policy recommendations.

2. Literature review

2.1. Introduction

This section reviews recent relevant theoretical and empirical literature on the nexus between FDI and economic growth, with a particular focus on the non-linear (quadratic) dynamics of this relationship and the moderating role of institutional quality. The review emphasizes contemporary evidence from Africa, where structural constraints and institutional heterogeneity shape development outcomes. The section moves beyond descriptive synthesis to provide analytical insights into how institutional frameworks condition the effectiveness of FDI.

2.2. Theoretical framework

The theoretical foundation of the FDI-growth nexus continues to draw from Dunning's (1980, 1998) eclectic paradigm, which posits that multinational enterprises invest abroad based on ownership, location, and internalization (OLI) advantages. However, recent literature increasingly reconceptualizes institutional quality as a central determinant of location advantages, rather than a peripheral factor. Contemporary studies, such as Delevic and Heim (2017), challenge the conventional view that the integration of Europe naturally leads to increased FDI inflows for transitioning European economies, based on OLI benefits. They argue that increased FDI is feasible only when institutions are robust. Although the concept of institutions has not been formally integrated into FDI theoretical models (Ross et al., 2019), institutional distance significantly influences FDI location choices (Shirodkar & Konara, 2017). This suggests that governance quality, regulatory efficiency, and political stability significantly influence investors' risk assessment and location decisions in developing economies.

Institutional theory and the new institutional economics (NIE), developed by Various scholars, including Douglass North and Oliver Williamson, highlight key concepts: Transaction Costs and Property Rights. Effective institutions reduce transaction costs and ensure secure property rights, which are crucial for attracting FDI. Institutional Quality: Good governance, political stability, and efficient legal systems create a favorable environment for investment and economic growth. Regulatory Framework: Transparent and predictable

regulations enhance investor confidence and economic performance. Significance: NIE underscores the importance of institutional quality in shaping economic outcomes, particularly in attracting and benefiting from FDI. Recent empirical work demonstrates that strong institutions reduce transaction costs, enhance contract enforcement, and improve allocative efficiency, thereby strengthening the growth effects of FDI. For instance, evidence from Sub-Saharan Africa shows that institutional structures significantly determine whether FDI translates into meaningful economic growth.

At the same time, dependency theory by Raúl Prebisch and André Gunder Frank remains relevant in explaining Africa's structural position in the global economy. Contemporary evidence indicates that FDI inflows in Africa are still disproportionately concentrated in the extractive sectors, reinforcing concerns about enclave development and limited spillover effects. This suggests that without a strong institutional framework, FDI may perpetuate structural imbalances rather than promote inclusive growth.

Endogenous growth theory complements this perspective by identifying the mechanisms through which FDI contributes to long-term growth, including technological diffusion, human capital development, and innovation. However, recent studies emphasize that these benefits are conditional on absorptive capacity, particularly institutional quality and human capital development.

Overall, modern theoretical perspectives converge on a critical insight: FDI is not inherently growth-enhancing; its impacts are mediated by institutional and structural conditions.

2.3. The FDI-economic growth nexus: Contemporary evidence

The relationship between Foreign Direct Investment (FDI) and economic growth is central to achieving the United Nations Sustainable Development Goals (SDGs) by 2030 (Ejemeyovwi et al., 2018). Particularly in Africa. Sustainable development in the region hinges on strengthening human capital and institutional quality, including political stability and governance (Osabuohien et al., 2018). These are critical for attracting FDI and stimulating both foreign and domestic investment. While the Human Development Index (HDI) in Africa can benefit from enhanced institutional structures, there is limited research on the non-linear (quadratic) effects of FDI on economic growth, prompting further investigation into this area.

Empirical evidence supports the positive influence of FDI on economic growth (Osabohien et al., 2020). FDI contributes to capital accumulation, enhances productivity through technology transfer, and facilitates integration into global value chains (Nuzhat, 2009). However, contemporary findings reveal that these benefits are neither uniform nor automatic. A growing body of evidence suggests that the effectiveness of FDI depends heavily on complementary factors such as institutional quality, financial development, and trade openness. For example, recent research finds that while FDI inflows are a "cornerstone for economic development," their impact varies significantly across African economies due to institutional and structural differences.

Moreover, new empirical studies highlight the efficiency dimension of FDI. Evidence from sub-Saharan Africa indicates that although foreign capital inflows are substantial, they are associated with governance challenges. At the global level, recent trends further underscore the complexity of the FDI growth relationship. FDI inflows into Africa increased significantly in 2024.

Critically, recent literature also revisits the potential negative effects of FDI. Studies showed a negative correlation between the challenges related to institutional quality and the amount of foreign direct investment (FDI) that countries attract (Adegboye, 2014; Adegboye et al., 2020). This suggests that countries with poorer institutional quality are likely to receive lower levels of FDI inflows (Chand, 2014; Adegboye et al., 2020).

These include crowding out of domestic investment, profit repatriation, and limited spillovers in resource-dependent economies. Empirical evidence suggests that such negative outcomes are more pronounced in countries with a weak institutional environment, where regulatory inefficiencies and corruption undermine the developmental impact of foreign investment.

Thus, the contemporary consensus is that the FDI growth nexus is context-dependent, with institutional quality acting as a key transmission mechanism.

A brief evaluation of the research Sub-question: What is the foreign direct investment (FDI) economic growth (EG) nexus?.

Institutional quality and economic growth in Africa: Institutional quality has emerged as a central variable in explaining both FDI inflows and economic performance in Africa. Recent empirical studies consistently demonstrate that governance indicators -such as rule of law, regulatory quality, and political stability- significantly influence investment decisions and economic outcomes. A 2024 study on African economies finds that institutional quality, alongside market size and trade openness, is a key determinant of FDI inflows. Similarly, evidence from West African Economic and Monetary Union (WAEMU) countries shows that institutional quality plays a critical role in enhancing the growth effects of investment (Croi et al., 2020).

However, the literature also highlights persistent institutional challenges across the continent. Weak governance structures, policy inconsistency, and corruption continue to deter investments and reduce the effectiveness of FDI. Empirical findings suggest that countries with poor institutional quality not only attract less FDI but also derive fewer developmental benefits from existing inflows. Emphasizing that institutional quality affects not just the quantity but also the quality and sectoral composition of FDI. Countries with stronger institutions tend to attract diversified Investments, while those with weaker institutions attract resource-seeking FDI with limited spillover.

This distinction is crucial for understanding why FDI has produced uneven development outcomes across African economies despite increasing inflows.

2.4. Non-linear (quadratic) relationship between FDI and economic growth

Emerging literature increasingly supports the existence of non-linear (quadratic) relationship between FDI and economic growth. This perspective challenges the traditional linear assumption that more FDI always leads to higher growth. Recent empirical studies suggest that at low levels of institutional development, FDI may have limited or even negative effects due to weak absorptive capacity, poor governance, and inadequate infrastructure. However, as institutional quality improves, the marginal impact of FDI becomes increasingly positive.

This threshold effect implies that institutional quality acts as a conditioning variable, determining whether FDI contributes positively or negatively to economic growth, following a quadratic pattern, where benefits increase only after a certain level of institutional and economic development is achieved.

For African economies, this finding has significant policy implications. It suggests that strategies should focus on attracting institutional frameworks and enhancing absorptive capacity.

2.5. Synthesis and research gap

The reviewed literature provides several important insights.

First, FDI remains a critical driver of economic growth, particularly in developing economies. Second, the impact of FDI is highly conditional on institutional quality, which influences both the volume of inflows and

their developmental outcomes. Third, recent evidence increasingly supports a non-linear relationship between FDI and growth; few have simultaneously integrated the non-linear (quadratic) effects of FDI and institutional quality within a unified empirical framework, particularly in the African context.

Moreover, existing studies often focus on either FDI or institutions in isolation, without adequately capturing their interactive and dynamic effects on economic growth. There is also limited empirical work that explicitly models threshold effects and diminishing returns of FDI in relation to institutional development.

This study addresses these gaps by examining the quadratic relationship between FDI and economic growth while incorporating institutional quality as a moderating variable.

By doing so, it contributes to the literature in three key ways:

1.It advances understanding of the non-linear dynamics of the FDI-growth nexus.

2.It provides Africa-centered empirical evidence on the role of institutional quality.

3.It offers relevant policy insights for maximizing the developmental impact of FDI.

3. Methodology

3.1. Data and sources

Based on data availability, the study obtained variables from 48 economies in Africa spanning 2007 through 2021. Countries with limited data were excluded from the study. The data and their sources are presented in the table below. Also, relevant statistical data were sourced from the following sources: UNCTAD (United Nations Conference on Trade and Development), World Bank Databank, United Nations Commodity Trade Statistics (UNCTS) Database, the International Monetary Fund (IMF), and publications of national central banks and other agencies of the governments of the selected countries.

3.2. Empirical specification

The study used the following equation adopted below to examine the nexus between FDI and Economic Growth Nexus:

$$EG_{i,t} = \alpha + \beta_1 FDI_{i,t} + \beta_2 Pop_{i,t} + \beta_3 TO_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $EG_{i,t}$ refers to economic growth of country i in year t; $Pop_{i,t} is population of country i in year t$;

The study's first objective is to examine the nexus between Foreign Direct Investment (FDI) and economic growth in African economies. The econometric model for this objective includes economic growth, measured by GDP or GNI growth rate, as the dependent variable. The independent variables are FDI, population growth, and trade openness. This model aims to establish the direct relationship between FDI and economic growth while controlling for population growth and trade openness. By including these control variables, the model accounts for other significant factors that may influence economic growth, thereby isolating the specific impact of FDI.

To examine the quadratic effect of FDI on Economic Growth, square the FDI variable following the extant literature as follows:

$$EG_{i,t} = \alpha + \beta_1 FDI_{i,t} + \beta_2 FDI_{i,t}^2 + \beta_3 Pop_{i,t} + \beta_4 TO_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where: EG is economic growth, FDI is foreign direct investment, pop is population, and TO is trade openness

The second objective delves into analyzing the quadratic effect of FDI on economic growth, capturing potential non-linearities in this relationship. The model extends the previous one by adding a squared term for FDI (FDI^2) to the list of independent variables. This inclusion allows the model to test whether the impact of FDI on economic growth changes at different levels of FDI. Such a non-linear relationship might suggest diminishing or increasing returns to FDI as its levels vary, providing a more nuanced understanding of how FDI influences economic growth in different contexts.

Role of Institutional Quality on Economic Growth

$$\text{Growth } \square = \square + \square GE\square + \square 2PS\square + \square 3RQ\square + \square 4POP\square + \square 5TO\square + \square \quad (3)$$

Where: GE is government effectiveness, PS is political stability, RQ is regulatory quality, Pop is population, TO is trade openness.

To address the third objective, the study examines the function of institutional quality on economic growth. This model focuses on three key metrics for evaluating institutional quality: government effectiveness, political stability, and regulatory quality. These variables are included as independent variables along with population growth and trade openness. By analyzing the coefficients of these institutional quality indicators, the model seeks to determine how improvements or deteriorations in institutional quality affect economic growth. This approach highlights the importance of robust and effective institutions in fostering an environment conducive to economic development.

Combined Effect of FDI and Institutional Quality on Economic Growth

$$EG_{\square} = \square + \square_1 FDI*GE_{\square} + \square_2 FDI*PS_{\square} + \square_3 FDI*RQ_{\square} + \square_4 POP_{\square} + \square 5TO\square + \square \quad (4)$$

Where: EG is economic growth, FDI*GE, FDI*PS, FDI*RQ, is foreign direct investment combined with all the variables as defined in equation …… (1) and (2)

The fourth objective combines the previous analyses to investigate the combined effect of FDI and institutional quality on economic growth. This comprehensive model includes both the linear and quadratic terms for FDI, as well as the institutional quality indicators (government effectiveness, political stability, and regulatory quality), along with population growth and trade openness as control variables. By integrating these factors into a single model, the study aims to provide a holistic view of how FDI and institutional quality interact to influence economic growth. This combined approach helps to identify whether strong institutions can enhance the positive effects of FDI on economic growth or mitigate any potential negative impacts.

The study aims to examine how an excellent institutional framework will create a permissive condition for inflows that will invariably lead to economic growth in African countries. The major rationale for the selection of variables is hinged on the fact that for economic growth to be attained in Africa, institutional framework and investment components (FDI inflows and local investments) should be present in the model alongside FDI inflow and the institutional or governance variables (GE, political stability). The study intended to include other institutional variables such as control of corruption, the rule of law, and regulatory quality. It is important for this study to examine how the quality of institutions creates an enabling environment to attract foreign capital inflow. Relatively, increased investment components and quality of institutions could explain the tangible and substantial rise in economic development.

In Conclusion, economic growth research is an intricate field that has developed over time. Institutional Quality in recent decades has been proposed as an essential tool for sustained economic growth and equitable development (Huh & Park, 2018). In Africa, many nations have implemented numerous reforms and policy

programs to achieve collective Institutional quality. The main factors that can determine economic growth range from public expenditure, trade openness, and foreign direct investment to non-economic factors. We have to mention that more determinants are refined and disaggregated to be used in new and advanced models. As these quantitative models are tested and produced, it is necessary to reexamine the preconceived notions and adjust theoretical discrepancies.

3.3. Descriptive statistics

The dataset below comprises various economic indicators, including Foreign Direct Investment

(FDI), Private Remittance (PR), Gross Domestic Product (GDP), Gross National Income (GNI),

Government Effectiveness (GE), Political Stability (PS), and Regulatory Quality (RQ). Population (POP) and Trade Openness (TO) are control variables.

For FDI, the mean value stands at 4.558, indicating the average level of foreign direct investment. This value has a considerable spread, with a standard deviation of 8.547, implying significant variability around the mean. The FDI ranges from a minimum of 1.055 to a maximum of 5.248, showcasing the diversity of investment levels. The variance, a measure of dispersion, is relatively high at 73.045, signifying a wide distribution. The skewness of 5.953 suggests a rightward skew, indicating that there may be some high values skewing the distribution. Moreover, the kurtosis of 54.504 is substantially higher than a normal distribution, suggesting a heavy-tailed distribution with potential outliers.

Moving to Private Remittance (PR), its statistics echo those of FDI. The mean PR is 3.443, with a standard deviation of 5.241, indicating moderate variability around the average. The range extends from a minimum of 0.229 to a maximum of 4.203. The variance is 27.466, reflecting a moderately spread-out distribution. Skewness is positive at 2.689, indicating a rightward skew, while kurtosis of 11.750 suggests a distribution with heavier tails compared to a normal distribution.

Gross Domestic Product (GDP) as an economic growth indicator displays similar patterns. The mean GDP is 1.106 with a standard deviation of 4.831, signifying a considerable degree of variability. The range extends from a minimum of -0.282 to a maximum of 3.523. The variance is 23.338, indicating notable dispersion. Skewness is negative at -2.711, suggesting a leftward skew, possibly due to lower GDP values. Kurtosis of 25.063 indicates a distribution with heavier tails.

The Gross National Income (GNI) statistics parallel those of GDP. The mean GNI is 0.999, with a standard deviation of 5.146, signifying substantial variability. The range spans from a minimum of -0.359 to a maximum of 3.309. The variance is 26.478, indicating a wide dispersion. Skewness is close to zero at 0.207, suggesting a relatively symmetric distribution. Kurtosis of 20.546 signifies a distribution with heavier tails.

The assessment of institutional quality and control variables reveals generally weak institutional performance across the dataset. Government Effectiveness (GE) has a mean of -0.822 with a standard deviation of 0.661, a range from -1.254 to -0.520, skewness of 0.417, and kurtosis of 3.268, indicating low effectiveness with slight right skew and moderately heavy tails. Political Stability (PS) records a mean of -0.590, standard deviation of 0.913, a range from -1.166 to 0.014, skewness of -0.432, and kurtosis of 2.705, reflecting moderate variability and a slight left skew. Regulatory Quality (RQ) shows a mean of -0.733, standard deviation of 0.643, ranges from -1.106 to -0.356, skewness of 0.029, and kurtosis of 3.525, indicating low but consistently distributed regulatory quality. Among control variables, Population (POP) has a mean of 63.321 million, standard deviation of 39.579 million, and ranges from 40.036 to 85.530 million, suggesting significant

demographic variation. Trade Openness (TO) is more stable, with a mean of 2.456, standard deviation of 0.971, range from 2.039 to 3.014, and variance of 0.971, indicating moderate dispersion. Overall, the data reflect institutional weaknesses alongside considerable demographic and economic diversity across the sampled countries.

Table 1. Descriptive statistics and correlation matrix. Objectives 1 and 2 for Tables 1 and 2: Examining FDI and economic growth nexus and determining the quadratic effect (non-linear relationship)

	FDI	PR	GDP	GNI	GE	PS	RQ	POP	TO
Mean	4.558	3.443	1.106	0.999	-0.822	-0.590	-0.733	2.456	63.321
SD	8.547	5.241	4.831	5.146	0.661	0.913	0.643	0.971	39.579
minimum	1.055	0.229	-0.282	-0.359	-1.254	-1.166	-1.106	2.039	40.036
maximum	5.248	4.203	3.523	3.309	-0.520	0.014	-0.356	3.014	85.530
variance	73.045	27.466	23.338	26.478	0.437	0.834	0.413	0.971	1566.534
Skewness	5.953	2.689	-2.711	0.207	0.417	-0.432	0.029	-1.061	0.934
Kurtosis	54.504	11.750	25.063	20.546	3.268	2.705	3.525	6.874	5.203

The correlation matrix reveals generally weak relationships between Foreign Direct Investment (FDI) and other economic indicators. FDI, as expected, perfectly correlates with itself (1.0000). It shows weak positive correlations with Private Remittance (PR) at 0.1245, Gross Domestic Product (GDP) at 0.0787, and Gross National Income (GNI) at 0.0067, suggesting minimal associations. Institutional quality indicators also exhibit weak correlations: Government Effectiveness (GE) at 0.0566, Political Stability (PS) at 0.1335, and Regulatory Quality (RQ) at 0.0270, indicating limited influence of FDI on these variables. Population (POP) shows a weak negative correlation of -0.1766, implying a slight inverse relationship with FDI. Trade Openness (TO) has a slightly stronger positive correlation at 0.1265, suggesting some connection with FDI inflows. Overall, the correlations are generally weak, highlighting the complex interplay of other factors influencing these economic variables beyond FDI alone.

Table 2. Correlation analysis

	FDI	PR	GDP	GNI	GE	PS	RQ	POP	TO
FDI	1.0000	-	-						
PR	0.1245	1.0000	-						
GDP	0.0787	0.0422	1.0000	-					
GNI	0.0067	-0.0124	0.6606	1.0000					
GE	0.0566	-0.0826	0.1564	0.1087	1.0000				
PS	0.1335	0.0722	0.0629	0.0434	0.5037	1.0000			
RQ	0.0270	-0.0398	0.1461	0.1127	0.5052	0.6451	1.0000		
POP	0.0593	-0.1766	-0.0423	-0.0087	-0.2926	-0.2274	-0.2339	1.0000	
TO	0.1265	0.0694	0.0024	0.0180	0.3822	0.3902	0.3017	-0.1616	1.000

Pairwise correlation matrix:

Table 3. The combined effect of capital flow and institutional quality on economic growth

GDP	Module 1	Module 2	Module 3	Module 4
CONS.	-2.059(0.233)	-2.086(0.233)	-1.914(0.330)	-1.959(0.283)
LI	0.842(0.051)	0.085(0.048)	0.085(0.048)	0.085(0.052)
FDI	0.010(0.089)	-	-0.242(0.020)	-
PR	-	0.006(0.060)		-0.051(0.056)
FDI^2		-	0.001(0.038)	-
PR^2		-		0.002(0.063)
POP	-0.932(0.072)	-0.934(0.072)	-0.939(0.072)	-0.939(0.072)
TO	0.082(0.000)	0.083(0.000)	0.083(0.000)	0.083(0.000)
Wald Chi^2	21.41(0.000)	21.33(0.000)	21.29(0.000)	21.29(0.000)
Sargan Test	151.267(0.000)	151.450(0.000)	150.593(0.000)	1.51.613(0.000)
Observation	624	624	624	624

The CONS values, representing the GDP intercepts when all predictors are zero, vary across modules: -2.041 (0.027) in Module 1, -1.958 (0.045) in Module 2, -2.046 (0.026) in Module 3, -2.059 (0.027) in Module 4, -2.036 (0.028) in Module 5, and -2.298 (0.017) in Module 6. These differences indicate varying baseline GDP levels, with standard errors reflecting the precision of each estimate. The LI coefficients, capturing the influence of past GDP on current GDP, also show minor variation: 0.086 (0.047) in Module 1, 0.082 (0.056) in Module 2, 0.086 (0.045) in Module 3, 0.085 (0.049) in Module 4, 0.083 (0.055) in Module 5, and 0.087 (0.043) in Module 6, suggesting a consistent but modest effect of lagged GDP across modules.

In Module 1, the interaction between Foreign Direct Investment and Government Effectiveness (FDIGE) shows a very small positive coefficient of 0.001 on GDP, accompanied by a high standard error of 0.078. This indicates a minimal and statistically uncertain impact, making it difficult to draw any definitive conclusions about its influence on economic growth.

The analysis across Modules 1 to 6 highlights the interaction effects of FDI and Remittances with institutional quality indicators on GDP. In Module 2, the FDI-Political Stability (FDIPS) interaction shows a positive coefficient of 0.076 with a low standard error of 0.028, indicating a reliable positive impact on GDP. In Module 3, the FDI-Regulatory Quality (FDIRQ) interaction yields a smaller positive coefficient of 0.017 and a moderate standard error of 0.058, reflecting a weaker and less certain effect. Module 4 examines Remittances-Government Effectiveness (PRGE), showing a minimal positive coefficient of 0.003 with a high standard error of 0.071, indicating a negligible and uncertain impact. In contrast, Module 5's Remittances-Political Stability (PRPS) interaction has a positive coefficient of 0.059 with a low standard error of 0.021, suggesting a more robust positive effect on GDP. Module 6, evaluating Remittances-Regulatory Quality (PRRQ), reveals a negative coefficient of -0.088 with a moderate standard error of 0.068, implying a potentially adverse but uncertain influence on GDP.

Across all modules, population (POP) coefficients are negative and vary slightly, ranging from -0.941 to -0.895, with standard errors between 0.061 and 0.084, indicating a consistent but varied negative relationship with GDP. Trade openness (TO) consistently shows a positive effect on GDP, with coefficients between 0.081 and 0.085, all having zero standard error, denoting highly precise estimates. The Wald Chi-squared statistics are

strong across all modules (ranging from 21.31 to 22.82, $P = 0.000$), confirming that the models are statistically significant. Similarly, the Sargan Test values (ranging from 150.123 to 152.024, $P = 0.000$) affirm the validity and robustness of the instrumental variables used in these regressions.

Table 4. The combined effect of capital flow and institutional quality on gross national income

GDP	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
CONS.	-2.041 (0.027)	-1.958 (0.045)	-2.046 (0.026)	-2.059 (0.027)	-2.036 (0.028)	-2.298 (0.017)
LI	0.086 (0.047)	0.082 (0.056)	0.086 (0.045)	0.085 (0.049)	0.083 (0.055)	0.087 (0.043)
FDIGE	0.001 (0.078)	-	-	-	-	-
FDIPS	-	0.076 (0.028)	-	-	-	-
FDIRQ	-	-	0.017 (0.058)	-	-	-
PRGE	-	-	-	0.003 (0.071)	-	-
PRPS	-	-	-	-	0.059 (0.021)	-
PRRQ	-	-	-	-	-	-0.088 (0.068)
POP	-0.941 (0.069)	-0.968 (0.061)	-0.942 (0.069)	-0.938 (0.071)	-0.959 (0.064)	-0.895 (0.084)
TO	0.083 (0.000)	0.0848 (0.000)	0.084 (0.000)	0.083 (0.000)	0.085(0.000)	0.081 (0.000)
Wald Chi^2	21.31 (0.000)	22.82 (0.000)	21.47 (0.000)	21.34 (0.000)	22.04 (0.000)	22.56 (0.000)
Sargan Test	151.001 (0.000)	150.123 (0.000)	151.258 (0.000)	151.775 (0.000)	150.788 (0.000)	152.024 (0.000)
Observation	624	624	624	624	624	624

Source: Author's computation using data from WDI.

The regression results for GNI estimation across Modules 1 to 6 reveal several key insights. The baseline estimates, represented by the CONS values (intercepts), vary slightly across modules, ranging from -1.923 in Module 3 to -1.754 in Module 2. These values indicate different starting levels of GNI, with standard errors suggesting moderate uncertainty. The lagged GNI (LI) coefficients, which range from 0.064 to 0.073, demonstrate a consistent and modest positive influence of past GNI on current GNI, supported by low standard errors indicating high reliability.

In terms of interaction effects, FDIGE (FDI × Government Effectiveness) in Module 1 shows a coefficient near zero with a standard error of 0.035, indicating a negligible and uncertain impact on GNI. In contrast, FDIPS (FDI × Political Stability) in Module 2 presents a coefficient of 0.106 with a low standard error of 0.011, signifying a strong, positive, and reliable effect on GNI. The interaction between FDI and Regulatory Quality (FDIRQ) in Module 3 has a coefficient of 0.025 with a higher standard error of 0.054, suggesting a weak and uncertain influence. Remittance-based interactions also show mixed results. PRGE (Remittances × Government Effectiveness) in Module 4 and PRPS (Remittances × Political Stability) in Module 5 exhibit coefficients of 0.032 and 0.040 respectively, but both are accompanied by relatively high standard errors, indicating moderate yet uncertain impacts. PRRQ (Remittances × Regulatory Quality) in Module 6 yields a coefficient of 0.062 with a standard error of 0.050, pointing to a moderately positive but still somewhat uncertain effect on GNI.

Regarding control variables, population size (POP) shows a consistently negative relationship with GNI across all modules, with coefficients ranging from -0.457 to -0.438. However, high standard errors suggest uncertainty in determining the exact magnitude of this impact. Trade openness (TO), on the other hand, displays a consistently positive influence on GNI, with coefficients between 0.059 and 0.062. The low standard errors associated with these values underscore the reliability of this positive relationship.

Model diagnostics further reinforce the analysis. Wald Chi-squared statistics, ranging from 9.88 to 12.36 with *P*-values below 0.05, indicate that the regression models hold moderate statistical significance in explaining variations in GNI. Additionally, the Sargan Test results across all modules exhibit high and statistically significant values ($P = 0.000$), affirming the validity of the instrumental variables used and confirming the models are free from over-identification problems.

Overall, the interaction between FDI and Political Stability stands out as the most significant and reliable positive influence on GNI. Other governance-related interactions, whether through FDI or Remittances, generally exhibit weaker and more uncertain effects. Meanwhile, trade openness consistently supports higher GNI levels, and population size appears to have a mildly negative but uncertain impact on GNI across the modules.

Table 5. Combined effect of capital flow and institutional quality on gross national income

CONS.	Module 1 -1.820 (0.354)	Module 2 -1.754 (0.368)	Module 3 -1.923 (0.328)	Module 4 -1.809 (0.359)	Module 5 -1.846 (0.347)	Module 6 -1.766 (0.370)
LI	0.073 (0.009)	0.064 (0.014)	0.069 (0.010)	0.072 (0.010)	0.0715 (0.010)	0.072 (0.010)
FDIGE	-0.000 (0.035)	-	-	-	-	-
FDIPS	-	0.106 (0.011)	-	-	-	-
FDIRQ	-		0.025 (0.054)	-	-	-
PRGE	-	-		0.032 (0.072)	-	-
PRPS	-	-	-		0.040 (0.066)	-
PRRQ	-	-	-	-		0.062 (0.050)
POP	-0.457 (0.470)	-0.473 (0.452)	-0.444 (0.483)	-0.437 (0.490)	-0.443 (0.484)	-0.438 (0.490)
TO	0.059	0.062	0.062	0.060	0.061	0.061
	(0.010)	(0.011)	(0.012)	(0.012)	(0.012)	
Wald Chi^2	12.36 (0.015)	10.29 (0.036)	10.06 (0.039)	10.13 (0.038)	10.38 (0.035)	
Sargan Test	163.807 (0.000)	165.070 (0.000)	164.564 (0.000)	164.583 (0.000)	164.337 (0.000)	
Observation	624	624	624	624	624	

Source: Author's computation using data from WDI.

4. Conclusion and recommendations

Based on the findings, the study revealed that FDI is crucial for Africa's economic growth, prompting efforts to attract more investment for sustainable development. The quality of institutions in recipient countries significantly impacts the success of FDI. African economies heavily reliant on natural resources to attract FDI are inefficient, as the Predominant Factors influencing FDI include infrastructure, market size, legal systems, stability, technology disparities, unequal capital distribution across sectors, and the macroeconomic environment. Institutions are crucial for economic growth, prompting the search for optimal policies for better financial performance and GDP growth. Countries with poorer institutional quality tend to attract less FDI, indicating a negative correlation between institutional strength and FDI inflows. The Quadratic effect (non-linear relationship) analysis revealed that Foreign Direct Investment (FDI) and its squared term, FDI^2, indicate that an increase in the squared term of foreign direct investment (FDI^2) is associated with a very marginal increase of approximately 0.001, meaning that as FDI increases, the effect on GDP becomes increasingly positive,

potentially suggesting an inverted U-shaped relationship.

This study examined how the quality of institutional establishment influences the inflow of foreign capital and its subsequent influence on African economies' economic development. The findings revealed that political stability and the absence of violence significantly boost both Foreign Direct Investment (FDI) and domestic investment. The influx of foreign investment is crucial for Africa's economic growth. The presence of accountability and control of corruption (ACC) and political stability creates a favorable environment that attracts foreign investors, promoting economic growth across the continent.

Also, it recommends that, as countries embrace FDI flows, their governments must ensure the quality of their institutions. Primarily, enhancement of infrastructural facilities to further attract and retain the inflow of FDI to attain desired economic development. In furtherance, governments should ensure that foreign capital flows into sectors of the economy, like the real sector and not just extractive industries, to enhance DOMINV for Africa, as selected countries require this to boost economic growth and development. It will also invariably turn around the minimal level of FDI contributions essential for sustainable economic growth and development.

Thirdly, Favorable Policies on domestic sector investment, productive institutional effectiveness, and stability in African countries should be strengthened. Meaning, Key government strategies should prioritize strengthening institutional infrastructure to encourage greater participation of foreign investors, which in turn will enhance domestic investment (DOMINV). By improving institutional facilities, the performance of the domestic investment sector can be boosted, enabling African countries to gradually reduce their dependency on foreign capital. As domestic investments grow, this will drive economic growth and lead to improved living standards for African citizens. The study concludes that robust institutional quality, political stability, and a conducive environment are essential for attracting FDI, which will ultimately foster economic development across Africa.

Lastly, it provokes discussions among African States towards adopting new progressive, efficient institutional frameworks in line with Africa's overarching development agenda. To reduce infrastructure or institutional deficits. It encourages scrutiny of potential shortcomings (in both theory and practice), for the purpose of ensuring a more robust and comprehensive growth tool is further complete and reliable for Africans.

Disclosure statement

The authors declare no conflict of interest.

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Appendix

Table 3.4.1 Data source and detailed variable measurement

Variable	Variable Measurement	Frequency	Source
Dependent Variables	Economic Growth: EG	Annually	WDI
	Gross Domestic Product: GDP and Gross National Income	Annually	WDI
Independent Variable	Foreign direct investment, private remittances (PR) inflows (current USD)	Annually	WDI
	Institutional quality (IQ): Government Effectiveness (GE) Regulatory quality (RQ) & political Stability (PS)	Annually	WDI
Control Variable	Population: (pop)	Annually	WDI
	Trade Openness: (TO)	Annually	WDI

Source: WDI Database

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