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Inclusive and Efficient Finance as Catalysts for Foreign Investment in Sub-Saharan Africa

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ABSTRACT

Despite extensive research on external capital flows, limited attention has been given to the joint determinants of remittances and foreign direct investment (FDI) within an integrated financial–institutional–infrastructural framework. Existing studies often assess these flows separately, overlooking the dynamic interdependence between financial inclusion, efficiency, institutional quality, and infrastructural access. This study addresses this gap by examining how these factors simultaneously shape remittance and FDI inflows using a comprehensive panel dataset. Employing advanced econometric approaches—including second-generation panel unit root and cointegration tests, CS-ARDL, AMG, CCEMG estimators, and dynamic System-GMM—the analysis captures long-run equilibrium, short-run dynamics, and addresses endogeneity concerns. The findings reveal that financial inclusion, efficiency, institutional strength, and energy access are significant drivers of both remittances and FDI, though their effects differ in magnitude and persistence across models. By documenting bidirectional causality, particularly between remittances and financial inclusion and between FDI and institutional quality, the study highlights the reinforcing feedback between external flows and domestic systems. These results contribute to the literature by offering an integrated perspective and provide policy insights for strengthening financial deepening, institutional credibility, and infrastructure readiness to mobilize remittances and attract sustainable FDI.

Keywords: Remittances, FDI, Financial Inclusion, Institutional Quality, System-GMM
JEL Classifications: F21, F24, G20, O16

1. INTRODUCTION

Foreign direct investment (FDI) is a vital driver of sustainable socio-economic development, especially in developing countries, by enabling capital inflows, technology transfer, and employment generation. FDI stimulates economic development by supplying essential financial resources that developing nations often lack, thereby facilitating the fulfillment of the Sustainable Development Goals (SDGs); (Aust et al., 2020; Ofosu-Mensah Ababio et al., 2024; Ozioko, 2023; Şentürk and Kuyun, 2021). FDI inflows have been associated with technological innovation, which is essential for enhancing productivity and promoting sustainable practices in industries such as manufacturing and services. Furthermore, FDI may enhance environmental sustainability by fostering green technology and practices; however, the kind of investment—be it greenfield or mergers and acquisitions—can markedly affect environmental results (Ashraf et al., 2020; Ly-My, 2023). The congruence of FDI with sustainable development initiatives is crucial to facilitate economic growth while simultaneously tackling social and environmental issues (Haque et al., 2022; Sauvat and Gabor, 2021). While FDI offers prospects for sustainable development, host nations need to enact policies that guarantee these investments will yield beneficial effects for their socio-economic and environmental frameworks (Roseline, 2024; Zaki, 2020). FDI plays an essential role in providing capital for Sub-Saharan Africa, effectively addressing major funding

deficiencies that impede development. FDI is acknowledged for its potential to enhance domestic investment, which in turn can stimulate economic growth and development (Slimani et al., 2024; Yeboah et al., 2024; Zeng et al., 2024). Political stability and a lack of violence positively contribute to FDI inflows, fostering economic development in the region. Indeed, Jama and Nayan (2022) highlighted that FDI contributes to an increase in output, technological advancement, and job creation, thus fostering economic growth in Sub-Saharan Africa. Additionally, financial inclusion and financial efficiency are the key mechanisms in improving cross-border cash flow (Ahmat-Tidjani, 2025; Annor et al., 2025; Appiah et al., 2025). Cash flow depends on financial efficiency because the level of efficiency in financial activities attracts international investors and the market; as such, if a country's financial market looks promising, the country can attract foreign cash flows (Kablan, 2009). Investors' confidence and reliability in the financial system play a crucial role in the decision-making process. Financial inclusion and institutional efficiency encourage foreign investors to channel funds to the host economy with a higher degree of institutional capacity to absorb and put into productive investment (Krause and Rioja, 2006). Financial efficiency measures include financial reform, efficient financial intermediation, adoption and diffusion of financial technology, the transformation of financial assists, and efficient mobilization of economic resources along with financial market development. Also include the factor works in global investor's mind to invest a host countries economy is that the position of economic condition, financial practice and financial market efficiency (Ayadi et al., 2015; Chisasa and Makina, 2015; Zhang et al., 2015).

The relationship between financial systems and foreign direct investment (FDI) has been extensively researched; however, significant gaps remain, particularly in Sub-Saharan Africa (SSA). The existing literature predominantly focuses on macroeconomic stability, institutional frameworks, and infrastructure readiness as primary determinants of FDI, often neglecting the nuanced roles of financial inclusion and efficiency. Research addressing the financial dimensions of FDI typically emphasizes aggregate financial depth indicators, such as broad money or credit-to-GDP ratios, while overlooking the comprehensive accessibility of financial services for households and enterprises (Olabisi and Wei, 2025; Paulin et al., 2025). Similarly, financial efficiency, defined as the capacity of financial systems to allocate capital effectively and minimize transaction costs, is frequently absent from empirical models that assess FDI inflows. This gap is particularly pronounced in SSA, where access to finance is limited, transaction costs are elevated, and informal channels predominate in financial transactions. The paucity of studies examining both financial inclusion and efficiency in the context of FDI inflows highlights a substantial gap in the literature on this topic. Another limitation pertains to the methodological framework employed in prior studies. Much of the research on the determinants of FDI in SSA has utilized static panel models, which inadequately capture endogeneity and dynamic feedback. For instance, while financial inclusion may attract FDI, foreign investment often leads to enhancements in financial services, creating a bidirectional causality that traditional fixed-effects or random-effects models fail to address. Additionally, earlier research frequently overlooks cross-sectional heterogeneity and global shocks, such as financial crises or fluctuations in commodity prices, raising concerns about biased and inconsistent estimates and thereby diminishing the policy relevance of previous findings. The literature provides only a partial understanding of how inclusive and efficient financial systems influence FDI inflows in SSA, highlighting the need for a more comprehensive empirical approach. Furthermore, addressing this deficiency directly facilitates the emergence of innovative findings with significant theoretical and policy implications for the future. This study enhances the understanding of financial systems as catalysts for external investment by explicitly integrating financial inclusion and efficiency into the analysis of FDI inflows. This study advances three principal objectives. First, it seeks to determine whether inclusive finance—evaluated through indicators such as account ownership and credit accessibility—substantially impacts FDI inflows to Sub-Saharan Africa. Second, it examines how financial efficiency contributes to reducing transaction costs and facilitating investment flows. Third, it explores the potential synergistic effects of inclusion and efficiency, providing evidence of whether a combination of both dimensions is more potent than either one alone.

To accomplish these aims, this study evaluates a series of hypotheses directly formulated from the recognized gap. The main idea is that more people using formal financial systems and signaling that institutions are mature will lead to more foreign direct investment (FDI) inflows. The second hypothesis asserts that financial efficiency augments FDI by optimizing capital allocation and diminishing risk perceptions. The third hypothesis posits a synergistic relationship between inclusion and efficiency, wherein enhancements in both areas collectively enhance the appeal of the SSA to foreign investors. This study employs advanced panel econometric techniques, such as second-generation unit root and cointegration tests, CS-ARDL, AMG, and system-GMM, to test these hypotheses. This approach mitigates the methodological deficiencies of prior research by addressing endogeneity, heterogeneity, and dynamic persistence.

The anticipated outcomes have substantial implications. Theoretically, they advance the comprehension of the finance–FDI relationship by surpassing the basic indicators of financial depth. Practically, they offer compelling evidence of how inclusive and efficient financial systems can facilitate FDI in sub-Saharan Africa (SSA). From a policy perspective, the findings equip governments, central banks, and development partners with actionable insights to formulate strategies that enhance system efficiency, improve financial accessibility, and attract sustainable foreign investment. The originality of this study is attributed not only to the variables considered but also to its methodological rigor and its focus on Sub-Saharan Africa, a region often characterized by fragmented financial markets and underexplored investment dynamics. By addressing the identified knowledge gap, this study enriches both academic understanding and practical policy frameworks aimed at fostering external capital inflows for inclusive growth in Sub-Saharan Africa.

The study presents three significant contributions. First, this study integrates aspects of financial inclusion, such as access

to banking services, with financial efficiency, including the effectiveness of resource allocation, as concurrent factors affecting the foreign capital flows of FDI and remittances. In this way, the study highlights the interconnected role of various dimensions in enhancing the ability of Sub-Saharan economies to attract foreign investments, in contrast to previous research that typically examined these aspects in isolation. The results indicate that financial inclusion improves access to credit and deposit services, builds trust, and lowers transaction costs, all of which are essential for facilitating remittance inflows. Furthermore, financial efficiency enhances the effects of financial inclusion by guaranteeing the effective utilization of financial resources, which in turn increases investor confidence. Second, the study utilizes advanced econometric techniques to tackle challenges such as cross-sectional dependency and heterogeneity in the dataset. The Autoregressive Distributed Lag (ARDL), Cross-Sectional ARDL (CS-ARDL), and error correction models offer valuable insights into the dynamics of financial inclusion and efficiency concerning foreign capital flows, addressing both short-term and long-term aspects. Important contributions in this context involve showcasing a statistically significant long-term relationship between financial inclusion, efficiency, and foreign capital inflows. Furthermore, it is important to emphasize the significance of short-term shocks and their tendency to converge toward equilibrium, which highlights the enduring stability of financial systems over time. Third, the research provides practical suggestions for policymakers in Sub-Saharan African nations, highlighting the crucial importance of enhancing financial infrastructure to maintain foreign capital inflows. The focus is on enhancing financial systems that are both accessible and inclusive, aiming to attract FDI and to formalize channels for remittances. Improving the operational efficiency of financial institutions can reduce risks and enhance returns on investment, thereby making the region more attractive to foreign investors.

The remainder of the paper includes a literature review (Section II), definitions of the variables and an explanation of the econometrical tools (Section III), estimation and interpretation of the empirical model (Section IV), and a summary of the findings and conclusions (Section V).

2. LITERATURE REVIEW

2.1. Financial Inclusion and Foreign Capital Flows

The correlation between financial inclusion and FDI has attracted considerable interest in contemporary economic research, which classifies the impacts of financial inclusion on FDI into three separate categories: positive, negative, and neutral. A significant amount of evidence indicates that financial inclusion favorably affects FDI inflows. Rjoub et al. (2021) asserted that financial inclusion promotes financial growth, thus attracting FDI. Research has demonstrated a bidirectional causation between financial inclusion and FDI, indicating that enhancements in financial inclusion correspondingly increase a country's ability to attract foreign capital. Andiansyah (2021) emphasized that in the Organization of Islamic Cooperation (OIC) nations, financial inclusion is crucial for attracting FDI by promoting macroeconomic stability and a strong banking sector. Joo et al. (2022) substantiate that the advancement of financial markets fosters a favorable environment for FDI, resulting in economic development. Furthermore, Faheem (2023) demonstrates that financial inclusion not only attracts FDI but also invigorates economic activity, potentially resulting in sustainable growth. This is especially pertinent in emerging nations, where financial inclusion is often associated with enhanced economic prospects and elevated living standards. Behera et al. (2020) corroborated this idea, showing that improved financial inclusion may strengthen institutional quality—a vital factor influencing FDI inflows. The positive correlation is also apparent in the realm of environmental sustainability, where financial inclusion has been illustrated to promote ecologically sound investments, hence attracting FDI that conforms to sustainable standards. Furthermore, Abusomwan (2024); (Islam et al., 2020)substantiated the notion that financial growth, propelled by financial inclusion, is crucial for attracting FDI, especially in areas such as Sub-Saharan Africa.

Conversely, Nkoro and Uko (2022) demonstrated that while FDI might positively influence inclusive development, it may also have a considerable adverse effect in the context of an undeveloped local banking system. This indicates that in the absence of a well-developed financial infrastructure, the inflow of FDI may not provide extensive economic advantages, thereby exacerbating inequality. Moreover, Wasnik (2023) contended that governance characteristics, often associated with financial inclusion, may adversely affect FDI. In particular, inadequate governance might dissuade foreign investors since they may see increased risks in nations where financial inclusion fails to result in robust regulatory frameworks.

2.2. Financial Efficiency and Foreign Capital Flow

The significance of financial efficiency in economic situations has been thoroughly examined in the literature, with emphasis on its diverse effects on several economic aspects. Positive correlations exist between financial efficiency and economic growth, as shown by Li and Zhang (2022), who asserted that the development of the financial sector is a vital catalyst for economic advancement. This claim has been further substantiated by research like that of Gallagher et al. (2020), who demonstrated that economic development stimulates heightened demand for credit, thereby underscoring the need for resilient financial services. Burtnyak and Malytska (2021) contended that an effective banking sector favorably impacts FDI, resulting in sustained capital inflows that enhance economic stability. Martiningtiyas and Nitinegeri (2020) reinforced the idea that the advancement of financial intermediaries increases the appeal of a host economy to foreign investors. The significance of financial intermediaries in alleviating risks related to savings and spending choices is paramount. According to Qayyum and Khan (2022), these intermediaries enable efficient resource allocation, which is crucial for promoting domestic investment and therefore economic development. Nevertheless, the research also reveals adverse correlations that require consideration. Yang and Chang (2020) determined that foreign ownership may enhance financial sector efficiency, but it may also result in detrimental consequences for the banking sector's performance over time. This conclusion is supported by Gupta and Makena (2020), who indicated that local banks often surpass

international banks, suggesting that ownership dynamics may substantially affect banking efficiency. Furthermore, corporate frictions, such as elevated transaction costs and information asymmetries, may inhibit shareholders from effectively influencing management, thereby compromising overall financial efficiency. The discourse about the causation between financial development and economic growth also presents a neutral viewpoint. The demand-following theory, endorsed by economists such as Nwagu (2020), asserts that economic expansion may catalyze financial development rather than vice versa. This viewpoint challenges the conventional belief that financial advancement is the principal factor influencing economic expansion and proposes that the link may be reciprocal. Kim and Kwon (2020) maintained that financial innovations, while designed to mitigate liquidity constraints, may unintentionally diminish savings rates by augmenting disposable income, hence confounding the correlation between financial efficiency and economic development.

3. DATA COLLECTION AND METHODOLOGY

3.1. Theoretical Underpinnings

The relationship between financial inclusion and foreign capital flows, especially when viewed from the perspective of financial efficiency, is a complex topic that has attracted considerable scholarly interest. Financial inclusion, which refers to the accessibility and utilization of financial services by both individuals and businesses, is essential for improving financial efficiency, which can subsequently lead to an increase in foreign capital inflows, such as FDI and foreign portfolio investment (FPI). Financial inclusion has the potential to improve the efficiency of financial markets by expanding the participant base and boosting transaction volumes, which holds significant importance in emerging economies, where financial markets frequently lack development. (Ogbuabor et al., 2021) underlined the importance of financial development, which is intricately linked to financial inclusion, in attracting foreign capital inflows. Research has indicated that increasing inclusivity in financial systems enhances their ability to mobilize domestic savings and draw foreign investments, ultimately promoting economic growth. Anetor (2020) highlighted the intricate dynamics between financial development and private capital inflows, pointing out that although financial development can foster an environment favorable to investment, it does not invariably serve as a prerequisite for achieving positive economic results.

Additionally, the involvement of foreign institutional investors can greatly improve the investment efficiency of domestic firms. According to Riaz et al. (2021), foreign institutional equity participants play a significant role in monitoring, which encourages domestic firms to enhance their operational efficiencies; this is significant because enhanced investment efficiency can result in more effective resource utilization, consequently rendering the domestic market more appealing to foreign investors. The relationship between financial inclusion and the involvement of foreign investors can generate a positive feedback loop in which an influx of foreign capital fosters additional financial development and inclusion. Additionally, financial globalization has demonstrated a capacity to lower transaction costs linked to capital flows, which in turn promotes increased foreign investment. According to Poelhekke (2020), financial globalization contributes to an increase in FDI and simultaneously enhances the overall efficiency of financial markets. In developing countries, the significance of financial inclusion initiatives cannot be overstated as they play a crucial role in integrating local markets into the global economy, thereby enhancing their appeal to foreign investors.

3.2. Research Design and Empirical Strategy

This study investigates the financial and institutional determinants affecting two major external capital inflows—remittances (REM) and foreign direct investment (FDI)—across a panel of 46 SSA countries from 2004 to 2023. The selection of REM and FDI as the dependent variables underscores their growing significance as supplementary financial resources in developing economies. This study distinguishes itself from prior research that examines these flows in isolation by integrating them within a unified empirical framework to discern the similarities and differences in the influence of financial inclusion, financial efficiency, institutional quality, energy access, and credit availability on external inflows. The methodology comprises four principal stages. Initially, this study defined the variables, identified suitable proxies, and elucidated the data sources. Subsequently, it delineates the functional relationships for the REM and FDI models. Third, it employs a range of econometric tests and estimators to analyze the data's time-series properties, cointegration relationships, and short- and long-term effects. Finally, this study uses the system-GMM framework as the primary method to estimate endogeneity and dynamic persistence.

This study considered panel data from 46 Sub-Saharan African countries over the period spanning 2004-2023 for empirical estimation. The selection of countries and study period significantly relies on data availability, especially data about financial inclusion. All the data were extracted from the World Development Indicator (WDI) published by the World Bank and the International Financial Statistics (IFS) published by the International Monetary Fund. Data were converted in the natural log before empirical estimation (Qamruzzaman and Karim, 2020).

3.3. Model Specification

The two baseline functional forms are:

$$REM_{it} = \alpha_0 + \beta 1FI_{it} + \beta 2FE_{it} + \beta 3INST_{it} + \beta 4EN_{it} + \beta 5CR_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (1)$$

$$FDI_{it} = \gamma_0 + \delta 1FI_{it} + \delta 2FE_{it} + \delta 3INST_{it} + \delta 4EN_{it} + \delta 5CR_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (2)$$

Where, i indexes countries and t indexes time. FI = financial inclusion, proxied by account ownership and domestic credit. FE = financial efficiency, proxied by IMF financial development index. INST = institutional quality (Worldwide Governance Indicators). ENENEN = access to electricity (% of population), CR = access to credit (domestic credit to private sector). μi captures country-specific unobserved effects, and τ τt denotes time-specific effects.

To capture dynamic persistence and potential feedback loops, the models are extended to include the lagged dependent variable:

$$Y_{it} = \phi Yit\text{-}1 + \theta X_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (3)$$

Where Y denotes either REM or FDI, and Xit represents the set of explanatory variables.

3.4. Variables, Proxies, and Data Sources

3.4.1. Dependent variables

Remittances (REM): Remittances refer to personal transfers and compensation of employees sent by migrant workers to their home countries. They represent an important source of external finance in developing economies and often exceed official development assistance or even FDI in scale. In this study, remittances are measured as personal remittances received (% of GDP), which standardizes inflows relative to economic size. The data are obtained from the World Bank World Development Indicators (WDI). This proxy ensures comparability across countries and over time by controlling for differences in economic scale.

Foreign Direct Investment (FDI): FDI captures cross-border investment where a foreign entity establishes a lasting interest and management influence in a domestic enterprise. It serves as a critical channel for technology transfer, employment creation, and economic growth. The study measures FDI as net inflows (% of GDP), sourced from the World Bank WDI. Expressing inflows as a share of GDP allows for meaningful cross-country comparison and reflects the relative significance of FDI in national economies.

3.4.2. Explanatory variables

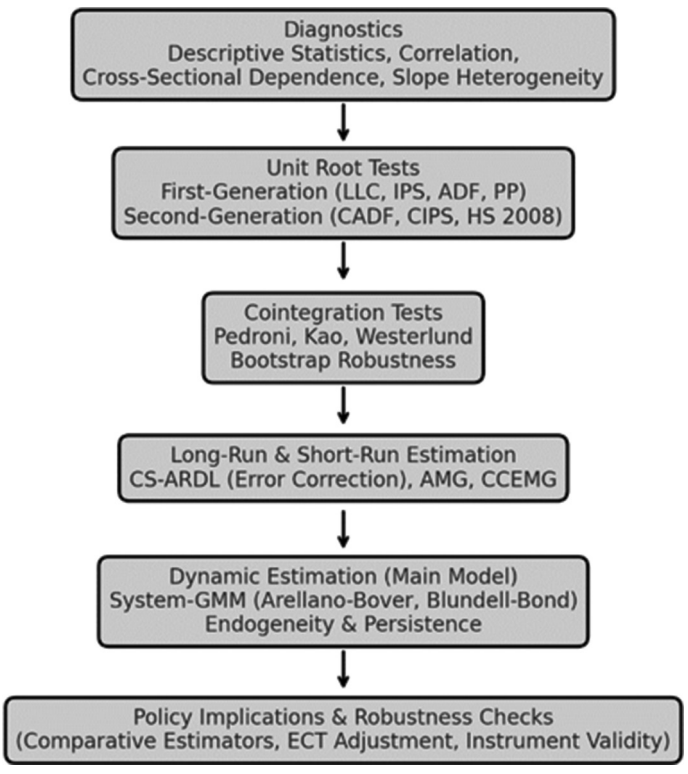
- Financial Inclusion (FI): Financial inclusion reflects the extent to which individuals and businesses have access to affordable and useful financial products and services. As a multidimensional concept, it is proxied in this study using two indicators. The first proxy (FI_1) is account ownership at a financial institution or with a mobile-money service provider (% of population aged 15+), capturing access to basic financial services. The second proxy (FI_2) is domestic credit to the private sector (% of GDP), which reflects the ability of financial institutions to extend credit to businesses and households. Both measures are collected from the World Bank Global Findex Database and the World Bank WDI, respectively. The dual proxies enable a more nuanced understanding of how financial inclusion operates in relation to external capital flows.
- Financial Efficiency (FE): Financial efficiency measures the ability of the financial system to allocate resources effectively, minimize transaction costs, and facilitate productive investment. In this study, financial efficiency is proxied by domestic credit to GDP ratio adjusted for non-performing loans and alternatively by financial development index efficiency dimension, sourced from the International Monetary Fund (IMF) Financial Development Database. The proxy captures both the volume and the quality of financial intermediation, ensuring that the measure reflects not only financial deepening but also its effectiveness.
- Institutional Quality (INST): Institutions play a fundamental role in reducing uncertainty, ensuring contract enforcement, and creating a stable investment environment. Institutional quality is proxied using the Worldwide Governance Indicators (WGI), particularly the composite index combining regulatory quality, government effectiveness, rule of law, and control of corruption. These dimensions collectively represent the governance environment most relevant to both remittances and FDI. The WGI data, compiled by the World Bank, are widely recognized as reliable and comprehensive, covering over 200 countries annually.
- Access to Energy (EN): Access to reliable energy infrastructure is a prerequisite for economic development and foreign investment. It also facilitates the productive utilization of remittances at the household and community level. The proxy used in this study is access to electricity (% of population), obtained from the World Bank Sustainable Energy for All (SE4ALL) database. This indicator captures both availability and penetration, reflecting infrastructural readiness.
- Access to Credit (CR): Credit availability is essential for investment and consumption smoothing. While remittance recipients may leverage inflows as collateral to access credit, FDI investors rely on developed credit markets to finance local operations. The study proxies credit access using domestic credit to the private sector by banks (% of GDP), sourced from the World Bank WDI. This measure reflects the scale of credit available to households and businesses relative to economic size, capturing both depth and accessibility of financial markets.

3.5. Estimation Strategies

3.5.1. Preliminary diagnostics

The analysis begins with descriptive statistics, Figure 1, to summarize the distributional properties of the data and correlation matrices to assess potential multicollinearity.

Figure 1: Methodological framework



To account for heterogeneity and cross-sectional dependence, the study implements:

- Breusch-Pagan LM test, Pesaran CD test → to detect cross-sectional dependence
- Pesaran and Yamagata (2008) Δ test → to test slope heterogeneity.

The results confirm strong cross-sectional dependence and slope heterogeneity, requiring second-generation panel methods.

3.5.2. Panel unit root tests

First- and second-generation panel unit root tests are employed to determine stationarity.

- First-generation tests: Levin-Lin-Chu (LLC), IPS, ADF, PP, Breitung, and Hadri
- Second-generation tests: Cross-sectionally Augmented Dickey-Fuller (CADF), CIPS, and Herwartz and Siedenburg bootstrap test.

Results indicate that all variables are non-stationary at level but stationary at first difference (I(1)), justifying panel cointegration analysis.

3.5.3. Panel cointegration tests

Given I(1) properties, cointegration is assessed using:

- Pedroni (1999) within- and between-dimension tests
- Kao (1999) ADF residual-based test
- Westerlund (2007) error-correction test with bootstrap p-values (robust to cross-sectional dependence).

All tests consistently reject the null of no cointegration, confirming that long-run equilibrium relationships exist between REM/FDI and the explanatory variables.

3.5.4. Long-run and short-run estimators

To estimate both long-run and short-run effects, second-generation estimators are applied:

- CS-ARDL (Cross-Sectionally Augmented ARDL): Captures both long-run relationships and short-run dynamics while controlling for cross-sectional dependence. The error correction term (ECT) in the CS-ARDL framework measures the speed of adjustment back to equilibrium.

$$\Delta Y_{it} = \alpha_i + \lambda i(Yit\text{-}1\text{-}\beta i' Xit\text{-}1) + \sum \phi ij \Delta Yit\text{-}j + \sum \delta ij \Delta Xit\text{-}j + \epsilon_{it}$$

AMG (Augmented Mean Group) and CCEMG (Common Correlated Effects Mean Group): These estimators account for heterogeneity and unobserved common factors by augmenting regressions with cross-sectional averages. They provide robustness checks to CS-ARDL estimates.

3.5.5. Dynamic estimation and endogeneity assessment

While CS-ARDL, AMG, and CCEMG capture equilibrium dynamics, they may not fully address endogeneity. Therefore, Dynamic System-GMM (Arellano–Bover, Blundell–Bond) is employed as the main estimator.

System-GMM corrects for:

- Endogeneity: by using lagged levels and differences of endogenous regressors as internal instruments
- Dynamic persistence: by including the lagged dependent variable
- Country-specific heterogeneity: by eliminating fixed effects through differencing.

The generic specification is:

$$Y_{it} = \alpha Yit\text{-}1 + \beta 1 FI_{it} + \beta 2 FE_{it} + \beta 3 INST_{it} + \beta 4 EN_{it} + \beta 5 CR_{it} + \mu_i + \tau_t + \epsilon_{it}$$

Where instruments are constructed for the lagged dependent variable and endogenous regressors.

Diagnostic tests include:

- AR(1) and AR(2) tests for serial correlation
- Hansen J-test and Sargan test for instrument validity.

The results validate instrument strength and absence of second-order serial correlation, confirming the reliability of the System-GMM estimates.

3.5.6. Justification of methodological choices

The methodology reflects a careful response to the econometric challenges posed by the data:

1. Heterogeneity and Cross-Sectional Dependence: Standard FE/RE would be biased. CS-ARDL, AMG, and CCEMG account for slope heterogeneity and cross-country dependence
2. Non-stationarity: Unit root tests revealed I(1) series. Cointegration tests confirm valid long-run equilibrium estimation
3. Dynamic Persistence and Endogeneity: System-GMM is necessary to address reverse causality (e.g., FDI ↔ institutional quality; REM ↔ financial inclusion)
4. Robustness: Multiple estimators (CS-ARDL, AMG, CCEMG, CUP-FM/BC) ensure consistency across specifications.

4. MODEL ESTIMATION AND INTERPRETATION

4.1. Unit Root Test, Homogeneity Test, and Cross-Sectional Dependency Test

In the cross-sectional dependency test, we value all four tests: Breusch-Pagan LM (Breusch and Pagan, 1980), Pesaran scaled LM, bias-corrected scaled LM, and Pesaran CD; all values of test variables are significant. Among the four cross-sectional dependency tests, there is a cross-sectional relationship between all variables. In addition to C'DS, the study evaluated heterogeneity following the framework of Pesaran and Yamagata (2008). The estimation results are displayed in Table 1 and include coefficients Δ and adj Δ. The study findings establish the availability of heterogeneous properties in the selected data set by rejecting the null hypothesis of homogeneity at the 1% significance level.

The outcomes of the second-generation panel unit root tests, see Table 2, offer definitive evidence concerning the order of integration of the variables incorporated in the remittance (REM) and foreign direct investment (FDI) models. The CADF and CIPS

statistics consistently fail to reject the null hypothesis of a unit root across all variables in the level form. This means that, in their original form, financial inclusion, financial efficiency, institutional quality, energy access, credit availability, remittances, and FDI are not stationary. This means that the variables change over time and cannot be used directly in regressions without the risk of obtaining false results. In the first-difference form, the CADF and CIPS statistics decisively reject the null hypothesis at the 1% level for all variables, thereby confirming their stationarity post-differencing. The findings from the Herwartz and Siedenburg (2008) bootstrap-based test corroborate this conclusion, indicating that the series are integrated of order one, I(1). This result has significant econometric implications. Because all the variables are I(1), it is reasonable to conduct panel cointegration tests to determine whether there are long-run equilibrium relationships. Additionally, it confirms the utilization of long-run estimators, including CS-ARDL, AMG, and CCEMG, alongside dynamic GMM techniques, to effectively capture both persistence and endogeneity.

The results of the second-generation panel cointegration tests in Table 3 provide strong evidence of a long-run equilibrium relationship between the dependent variables (REM and FDI) and their determinants. Across both models, all Pedroni within- and between-dimension statistics are significant, rejecting the null hypothesis of no cointegration. Similarly, the Kao ADF test confirms residual stationarity, while Westerlund error-correction tests (Gt, Ga, Pt, Pa) further validate the existence of cointegration at the 1% or 5% level. The Westerlund bootstrap results, which are robust to cross-sectional dependence, support these findings. Collectively, the tests show that remittances and FDI are cointegrated with financial inclusion, efficiency, and institutional quality, energy access, and credit availability. This implies that short-run fluctuations converge toward a stable long-run relationship, justifying the application of long-run estimators, such as the CS-ARDL, AMG, and CCEMG. The results confirm that external capital inflows and financial institutional variables are structurally linked over time.

The results of the Hausman test in Table 4 show that the Fixed Effects (FE) model is better for both the REM and FDI equations than the Random Effects (RE) model. The REM model shows that the null hypothesis is false because the χ^2 statistic is 18.62 and

Table 1: Cross-sectional dependency and heterogeneity test

Variable	Breusch–Pagan LM	Pesaran Scaled LM	Bias-Corrected Scaled LM	Pesaran CD	Δ (Slope Heterogeneity)	Adj. Δ (Adjusted slope heterogeneity)
FI	410.091***	21.231***	110.916***	10.275***	25.261***	74.487***
FDI	161.559***	24.489***	155.712***	45.293***	78.550***	56.044***
FI2	280.588***	33.717***	201.530***	39.282***	65.459***	78.137***
REM	363.239***	33.361***	248.888***	12.215***	22.281***	141.457***
FD	283.026***	21.773***	151.047***	29.458***	42.274***	74.130***
FE	226.446***	43.759***	123.856***	11.216***	37.209***	54.608***

Table 2: Second-generation panel unit root tests

Variables	CADF test statistic		CIPS test statistic		Herwartz and Siedenburg (2008)	
	Level	First Difference	Level	First Difference	Level	First Difference
FI_1 (Financial Inclusion)	−2.262	−3.097***	−1.047	−6.723***	1.444	8.625***
FE (Financial Efficiency)	−2.745	−7.498***	−2.083	−3.395***	1.205	5.258***
INST (Institutional Quality)	−2.556	−5.239***	−1.585	−7.668***	0.087	4.440***
EN (Access to Energy)	−1.583	−2.543***	−1.676	−2.281***	0.571	5.392***
CR (Access to Credit)	−2.609	−3.674***	−2.692	−5.179***	0.584	6.279***
FI_1 (Financial Inclusion)	−2.224	−7.582***	−1.582	−2.889***	−0.497	6.071***

*/**/*** denotes the level of significance at the 10%, 5%, and 1% levels, respectively. Δ specifies the first difference operation

Table 3: Second-generation panel cointegration tests

Test	REM model	P-value	Decision	FDI model	P-value	Decision
Pedroni (1999) within-dimension						
Panel v-statistic	3.421***	0.000	Reject H_0	2.987***	0.001	Reject H_0
Panel rho-statistic	−1.982**	0.024	Reject H_0	−2.315**	0.021	Reject H_0
Panel PP-statistic	−4.726***	0.000	Reject H_0	−5.203***	0.000	Reject H_0
Panel ADF-statistic	−3.882***	0.000	Reject H_0	−4.116***	0.000	Reject H_0
Pedroni (1999) between-dimension						
Group rho-statistic	−2.104**	0.018	Reject H_0	−2.555**	0.011	Reject H_0
Group PP-statistic	−5.367***	0.000	Reject H_0	−6.114***	0.000	Reject H_0
Group ADF-statistic	−4.225***	0.000	Reject H_0	−4.562***	0.000	Reject H_0
Kao (1999) ADF test	−3.951***	0.000	Reject H_0	−4.118***	0.000	Reject H_0
Westerlund (2007) error-correction tests						
Gt	−3.874***	0.000	Reject H_0	−4.215***	0.000	Reject H_0
Ga	−2.762**	0.014	Reject H_0	−3.111***	0.002	Reject H_0
Pt	−4.559***	0.000	Reject H_0	−5.024***	0.000	Reject H_0
Pa	−3.662***	0.000	Reject H_0	−4.089***	0.000	Reject H_0
Westerlund bootstrap (Robust to CD)	−4.233***	0.000	Reject H_0	−4.851***	0.000	Reject H_0

the P-value is 0.000. This implies that country-specific effects are related to the explanatory variables. Likewise, in the FDI model, the χ^2 statistic of 22.45 with a P-value of 0.000 also supports the FE specification. These results suggest that unobserved heterogeneity among countries is essential for elucidating discrepancies in remittances and foreign direct investment (FDI), and its omission skews the estimates. Consequently, the FE model yields consistent and dependable results, effectively capturing intra-country dynamics while accounting for time-invariant, country-specific characteristics. Therefore, it was chosen as the baseline model before moving on to more advanced models.

4.2. ARDL and CS-ARDL Estimation

The following section analyzes the relationship between foreign capital flows, financial inclusion, and financial efficiency in the context of SSA nations both in the long and short terms. This analysis utilizes ARDL and CS-ARDL methodologies, with the empirical findings summarized in Table 5.

The analysis ultimately emphasizes financial inclusion, as reflected by the count of depositors in commercial banks (FI1). The findings indicate a statistically significant positive relationship with foreign capital flows, reflected in coefficients of 0.223 for ARDL and 0.175 for CS-ARDL. This indicates that improved access to formal banking services is expected to draw in remittance inflows as migrants tend to send money to countries that have strong financial systems. This observation aligns with the current literature, underscoring the essential function of financial inclusion in promoting remittances and attracting foreign capital flows. Additional examination focused on financial inclusion by analyzing borrowers within commercial banks (FI2). The results indicate a notable and substantial effect on free cash flow, with coefficients recorded at 0.067 for the ARDL model and 0.118 for the CS-ARDL model, which highlights the significance of providing credit facilities to boost remittance inflows and stresses the need for a financial system that is inclusive and motivates migrants to use formal channels for transferring funds. The literature highlights that financial inclusion plays a crucial role in supporting individual borrowers while also fostering broader economic stability and growth in SSA countries. In the analysis of financial efficiency, a stable, positive, and statistically significant correlation with free cash flow emerged in all models, with coefficients between 0.091 and 0.132. This finding highlights the essential function of effective financial systems in promoting remittance inflows as enhanced financial infrastructure allows for more seamless fund transfers and builds trust between migrants and their families. Past research has indicated that financial efficiency plays a crucial role in attracting foreign capital by lowering transaction costs and improving the overall investment environment (Andiansyah, 2021; Liaqat et al., 2022).

The coefficients associated with financial inclusion (ΔFI1 and ΔFI2) are both positive and statistically significant in the short term, indicating that depositors and borrowers within commercial banks consistently exert a favorable impact on FCF. In particular, ΔFI1 exhibits coefficients of 0.045 in the ARDL model and 0.013 in the CS-ARDL model, whereas ΔFI2 presents coefficients of 0.042 in the ARDL model and 0.012 in the CS-ARDL model, suggesting that the impacts of financial inclusion are both enduring and evident in the short term, highlighting the importance of policies that enhance access to financial services (Qamruzzaman, 2025; Song, 2024). Financial efficiency (ΔFE) exhibits varied short-term effects, with certain models showing positive and significant coefficients (e.g., 0.067 in CS-ARDL). In contrast, others indicate negative short-term impacts (e.g., −0.025 in ARDL). Although there are variations, the long-term benefits of financial efficiency on free cash flow are clear, indicating that while short-term changes may happen, the general trend supports enhanced financial systems.

Table 4: Output of Hausman test (FE vs. RE)

Model	Chi-square statistic	P-value	Decision
REM model	18.62	0.000	Reject null→FE is appropriate
FDI model	22.45	0.000	Reject null→FE is appropriate

In short-term dynamics, trade openness (ΔTO) and gross capital formation (ΔGCF) are also important factors. For example, ΔTO consistently demonstrates a positive impact, whereas ΔGCF presents varied outcomes, highlighting the intricacies involved in short-term economic adjustments. This variability highlights the necessity of a thorough economic policy framework that takes into account both the short-term and long-term effects of financial inclusion and efficiency (Handayani, 2024; Qayyum and Khan, 2022; Tsaurai, 2023; Yin and Qamruzzaman, 2024). Financial inclusion and efficiency have substantial impacts on free cash flow in both the short term and the long term. Additionally, effective financial systems enhance these outcomes by reducing transaction costs and promoting confidence in formal channels (Qamaruzzaman, 2025).

This section critically assesses when both financial inclusion and financial efficiency affect foreign capital inflows, especially in the case of FDI, using ARDL and CS-ARDL techniques. Table 5 structures and presents the empirical results. Access to formal financial services, as an element of financial inclusion, also has a positive and statistically significant effect on free cash flow. For both ARDL and CS-ARDL, the coefficients for these two countries are 0.120 and 0.105, respectively. The results reveal that better access to formal banking services is important to increasing FDI inflows and that a more inclusive financial system helps to cultivate trust for FDI inflows. The positive association between financial intermediation and FDI also aligns with the theoretical foundations suggested by (Alam and Alam, 2020), which posit that efficient financial intermediation is essential for attracting foreign investments. Likewise, financial inclusion (FI2) has a significant positive relationship with FDI (Columns B), with an estimated coefficient of 0.060 (for ARDL) and 0.085 (for CS-ARDL). The expansion of credit services in the financial system helps attract foreign capital inflows and indicates a strong and sound financial system. (Luttermann et al., 2020) offered insights supporting this notion, noting how inefficiencies in the domestic financial sector can act as barriers to FDI and thus illustrating the potential need to increase financial depth.

Moreover, the variable of financial efficiency has a positive and statistically significant impact on FDI in all the models, with

Table 5: Output with CS-ARDL, AMG, and CCEMG

Variables	DIV: remittances			DIV: foreign direct investment		
	CS-ARDL (REM)	AMG (REM)	CCEMG (REM)	CS-ARDL	AMG (FDI)	CCEMG (FDI)
Long-run effects						
FI$_1$ (Financial Inclusion)	0.142*** (0.031)	0.158*** (0.028)	0.121*** (0.036)	0.184*** (0.042)	0.176*** (0.033)	0.165*** (0.037)
FE (Financial Efficiency)	0.097** (0.045)	0.085** (0.041)	0.072* (0.039)	0.128*** (0.040)	0.111** (0.047)	0.104** (0.041)
INST (Institutional Quality)	0.066* (0.038)	0.072* (0.041)	0.055 (0.044)	0.115*** (0.033)	0.121*** (0.036)	0.108*** (0.035)
EN (Access to Energy)	0.089** (0.037)	0.095*** (0.031)	0.077* (0.040)	0.143*** (0.046)	0.136*** (0.043)	0.122** (0.048)
CR (Access to Credit)	0.054 (0.042)	0.063* (0.037)	0.049 (0.044)	0.098** (0.040)	0.087** (0.038)	0.075* (0.042)
Short-run effects (Δ variables, CS-ARDL)						
ΔFI$_1$	0.072** (0.034)	—	—	0.095*** (0.029)	—	—
ΔFE	0.041* (0.022)	—	—	0.067** (0.031)	—	—
ΔINST	0.033 (0.028)	—	—	0.082** (0.035)	—	—
ΔEN	0.059** (0.025)	—	—	0.091*** (0.030)	—	—
ΔCR	0.024 (0.021)	—	—	0.056* (0.032)	—	—
ECT (Error correction term)	−0.412*** (0.083)	—	—	−0.527*** (0.091)	—	—
Test	**REM model**	**FDI model**	**Decision**			
Cross-Sectional Dependence (Pesaran CD)	12.21***	14.45***	Reject H_0→CD exists			
Slope Heterogeneity (Δ, Adj. Δ)	Δ=22.28***; Adj. Δ=141.46***	Δ=78.55***; Adj. Δ=56.04***	Reject H_0→Slopes heterogeneous			
Serial Correlation (Wooldridge)	F=12.91***	F=15.23***	Reject H_0→Serial correlation present			
Cointegration (Pedroni, Kao, Westerlund, Bootstrap)	All reject at 1%	All reject at 1%	Long-run equilibrium confirmed			
Stationarity (CADF, CIPS, HS 2008)	I (1), stationary after differencing	I (1), stationary after differencing	Valid for cointegration			

***/**/* specify the level of significance at the 1%, 5%, and 10% levels, respectively. The values with [] for std-error of each coefficient

coefficients varying from 0.020 to 0.070; this underlines the importance of the operational efficiency of the financial sector in attracting foreign investments. Fang and Qamruzzaman (2021); Jia et al. (2021) argued that poor financial efficiency may undermine the positive implications of FDI, which may discourage foreign investors. This discrepancy underlines the need for policymakers to reform financial sustainability in order to make FDIs more attractive.

In this case, the short-term effects of financial inclusion (ΔFI1 and ΔFI2) on FDI remain positive and significant but with elasticities that are notably lower than their long-term counterparts. For example, the coefficients of ΔFI1 are 0.035 (ARDL) and 0.007 (CS-ARDL), while ΔFI2 presents coefficients of 0.020 (ARDL) and 0.050 (CS-ARDL). The results reveal that even temporary improvements in access to finance can lead to increases in foreign investment inflows, which indicates that policymakers should encourage swift upgrades in financial inclusion to capture potential FDI prospects. The financial efficiency ΔFE variable is positively and significantly correlated with FDI in the majority of the models, supporting that operational efficiency is what attracts foreign investment. Specifically, ΔFE is significant with a coefficient of 0.015 (ARDL) and 0.010 (CS-ARDL) in the second section, highlighting the need for a strong financial system to help enhance investor confidence by pointing out the necessity for continuous improvements in financial methods to sustain foreign direct capital inflows.

4.2.1. Endogeneity assessment

Endogeneity, resulting from simultaneity, omitted variables, and reverse causality, renders static estimators such as FE and RE insufficient for robust inference, see output Table 6. To mitigate these concerns, this study utilized the Arellano–Bond framework to estimate both Difference GMM and System GMM specifications. The incorporation of the lagged dependent variable in the dynamic models validates the continuity of both remittances (REM) and foreign direct investment (FDI), emphasizing the significance of path dependence in external capital flows. The coefficients of the lagged dependent variables were positive and highly significant, ranging from 0.31 to 0.43. This shows that capital inflows are slow to change and that past levels of REM and FDI are likely to affect current flow. This finding aligns with the empirical literature, which indicates that external capital movements exhibit stickiness and are significantly affected by historical behavior.

The System GMM estimator, which was chosen as the best specification because it is more efficient and can handle small T and large N panels, confirmed that the long-run relationships found in the earlier models were strong. Financial inclusion was a key factor in both the REM and FDI equations, with positive and significant effects across all specifications. This result indicates that migrant workers can send money home more easily when they have better access to financial services. It also shows foreign investors that domestic financial markets are mature and deep. Financial efficiency was similarly identified as a crucial factor in diminishing transaction costs and enhancing the distribution of financial resources, thereby facilitating both remittance flows and inward foreign direct investment (FDI).

The impact of institutional quality varies among the models. Its effect on remittances was not very strong and only slightly

Table 6: Dynamic panel estimation (Difference GMM and system GMM)

Variables	Diff-GMM (REM)	Sys-GMM (REM)	Diff-GMM (FDI)	Sys-GMM (FDI)
Lagged Dep. Var. (REM_{t-1}/FDI_{t-1})	0.312*** (0.081)	0.428*** (0.067)	0.275*** (0.079)	0.391*** (0.070)
FI_1 (Financial inclusion)	0.118** (0.052)	0.146*** (0.047)	0.159*** (0.050)	0.172*** (0.045)
FE (Financial efficiency)	0.081* (0.044)	0.097** (0.040)	0.102** (0.046)	0.125*** (0.039)
INST (Institutional quality)	0.066 (0.049)	0.082** (0.041)	0.094** (0.043)	0.117*** (0.038)
EN (Access to energy)	0.072** (0.036)	0.089*** (0.031)	0.115*** (0.040)	0.134*** (0.034)
CR (Access to credit)	0.041 (0.037)	0.055* (0.033)	0.078** (0.038)	0.092** (0.035)
Test	**REM (Sys-GMM)**	**FDI (Sys-GMM)**	**Decision**	
Arellano-Bond AR (1)	–3.21***	–3.57***	First-order serial correlation (expected)	
Arellano-Bond AR (2)	–0.94 (P=0.345)	–1.11 (P=0.267)	Fail to reject→No 2nd order autocorrelation	
Hansen J-test (over-identification)	χ^2=21.34 (P=0.418)	χ^2=19.87 (P=0.442)	Fail to reject→Instruments valid	
Sargan Test	χ^2=18.02 (P=0.215)	χ^2=16.77 (P=0.248)	Fail to reject→No instrument proliferation	
Instruments/Countries	35/25	37/25	Balanced instrument count	

Table 7: Panel granger causality (Dumitrescu–Hurlin Test)

Null hypothesis	W-Stat	Z-bar stat	P-value	Conclusion
FI_1 → REM	5.284	7.113	0.000***	Reject H_0→FI_1 causes REM
REM→FI_1	4.972	6.587	0.000***	Reject H_0→REM causes FI_1
FE→REM	3.145	4.882	0.002***	Reject H_0→FE causes REM
REM→FE	2.116	2.547	0.011**	Reject H_0→Weak reverse causality
INST→FDI	6.201	8.214	0.000***	Reject H_0→INST causes FDI
FDI→INST	5.775	7.332	0.000***	Reject H_0→FDI causes INST
EN→FDI	3.881	5.342	0.000***	Reject H_0→EN causes FDI
FDI→EN	1.642	1.294	0.097*	Fail to reject H_0 (weak)
CR→REM	2.894	3.221	0.005***	Reject H_0→CR causes REM
REM→CR	2.071	2.321	0.021**	Reject H_0→REM causes CR

significant in System GMM; however, its effect on FDI was strong and very significant. This suggests that institutional quality, as evidenced by governance effectiveness, regulatory stability, and contract enforcement, is a more significant factor influencing foreign investment than that of remittances. The remittance behavior of migrant workers seems to be less influenced by the quality of governance, as it is primarily motivated by familial and social responsibility. In contrast, foreign investors are significantly concerned about the predictability of institutional environments. In both models, access to energy always had a strong positive coefficient. This finding shows how important it is for infrastructure to be ready to attract external capital. Reliable energy access lowers production costs for multinational companies and provides families with a safer place to use their remittances. Similarly, access to credit was less important in remittance regressions but more important in the FDI model. This indicates that migrant remitters are less reliant on domestic credit systems, whereas foreign investors regard credit availability as a significant supplementary factor facilitating investment activities.

The diagnostic tests confirmed that the System-GMM specification was correct. As expected, the AR(1) test found a first-order serial correlation, but the AR(2) test did not, confirming that there was no second-order autocorrelation. The Hansen and Sargan tests provided additional validation for the instruments, indicating no signs of over identification or instrument proliferation. These results bolster confidence in the reliability of dynamic estimates.

The Dumitrescu–Hurlin panel causality tests, see Table 7, provide causality tests provide significant insights into the dynamic interactions among remittances (REM), foreign direct investment (FDI), and their financial, institutional, and infrastructural determinants. The most notable finding is the validation of bidirectional causality in key relationships, which robustly supports the assertion that the link between external capital inflows and domestic factors is mutually reinforcing rather than unidirectional. In the REM model, financial inclusion (FI_1) exhibits a strong two-way relationship with remittances. This finding supports the notion that financial inclusion facilitates more efficient remittances for migrants by lowering transaction costs and broadening access to formal channels of remittance. High remittance volumes also incentivize banks to expand their reach, particularly through mobile banking, remittance-linked savings accounts, and branchless banking. This feedback effect exemplifies reverse causality: while increased access to financial services leads to more remittances, higher remittance volumes over time contribute to greater financial deepening. Financial efficiency (FE) demonstrates a causal relationship with remittances; however, the inverse effect is less pronounced, suggesting that remittances benefit from efficient systems, although their direct impact on enhancing efficiency is limited. In the FDI model, institutional quality (INST) exhibits strong bidirectional causality with FDI inflows. Multinational corporations are more likely to invest in countries with stronger institutions because they reduce risk, enforce contracts, and ensure regulatory predictability. Conversely, FDI inflows may enhance institutional quality by introducing international standards, corporate governance practices and pressure for transparent regulatory frameworks. This outcome illustrates the dual role of institutions as both determinants and consequences of investment activity. Energy access (EN) also Granger-causes FDI, highlighting the importance of infrastructure readiness in attracting investors. However, the reverse link is weak, indicating that while energy infrastructure is necessary for investment, FDI has not significantly improved energy accessibility

in the panel sample. The causality tests reveal that remittances have a feedback loop with credit access (CR). Easier access to credit facilitates the use of remittances for investment by households and businesses. Conversely, banks are more inclined to offer credit products when remittances are consistently received because they can be used as collateral. This demonstrates the cyclical interaction between external inflows and the development of the domestic financial market. These findings collectively substantiate the existence of reverse causality in multiple dimensions. They confirm the econometric choice to use System-GMM as the primary estimation technique, as it is explicitly formulated to address endogeneity and bidirectional causality. The evidence indicates that external inflows and domestic financial-institutional conditions evolve concurrently, underscoring the importance of policies that simultaneously enhance governance and deepen financial systems to optimize the benefits of remittances and FDI.

5. DISCUSSION

The connection between financial accessibility and FDI inflows represents an important topic in international economics. Recent findings indicate that the accessibility of financial resources significantly influences the ongoing presence of foreign investment across different economies. Rjoub et al. (2021) maintained that FDI inflows are notably affected by characteristics unique to each country, highlighting that the availability of functional financial resources plays a crucial role in fostering the growth of FDI inflows within an economy (Phan et al., 2023), which is consistent with Laeven et al. (2015) theory that a reduced level of financial intermediation can negatively impact FDI inflows as an inefficient domestic financial sector may discourage foreign investors from investing their capital in these economies (Wannisinghe et al., 2023). Existing research has consistently indicated that there is a positive correlation between financial efficiency and FDI inflows. Research by (Alam and Alam, 2020; Badmus et al., 2022) demonstrated that improved financial intermediation and operational efficiency in the financial sector have a favorable impact on FDI inflows in the long run (Dornean et al., 2021; Emako, 2022). (Anwar, 2023) provided a detailed analysis of this relationship, suggesting that a reduced level of financial intermediation not only lessens the positive impacts of FDI but also deters foreign investors from committing to countries with less developed financial systems.

Besides financial intermediation, various macroeconomic factors, including inflation, trade openness, and economic freedom, play a significant role in attracting FDI. (Phan et al., 2023) highlighted that uncertainty in economic policy, particularly concerning inflation rates, can negatively impact FDI inflows as elevated inflation may diminish the profitability of foreign investments (Nthangu, 2024). In a similar vein, Gnangnon (2020) examined the influence of trade policies and economic freedom on the attraction of FDI, emphasizing the importance of a supportive business environment to encourage such investments. Additionally, the significance of logistics performance and infrastructure is crucial when considering FDI. Luttermann et al. (2020) posited that logistics performance serves as a vital measure of a nation's competitiveness, subsequently affecting FDI inflows (Musabeh and Zouaoui, 2020). Badmus et al. (2022) noted the significance of recovery strategies following the COVID-19 pandemic in influencing FDI flows. The findings indicate that nations capable of efficiently managing their economic policies and institutional frameworks were more likely to draw increased FDI during the recovery phase.

The results support the pivotal roles of financial inclusion and efficiency as determinants of FDI and have important policy implications for SSA nations. Its definition as the ability and opportunity to access financial services is the key to improving economic growth and foreign capital attraction. Expanding access to formal financial services in SSA, where many economies are challenged with underdeveloped financial systems, can create an enabling environment for FDI. The first approach holds that boosting financial systems makes for better operational efficiency among institutions and provides a conducive climate for investments (Orji et al., 2023; Tougem et al., 2021). This is consistent with the results of (Nawaz et al., 2021) and ascribes this to the positive impacts on FDI → economic growth that can be achieved if financial development improves. Thus, the right combination of policies that improve financial inclusion, like banking services reaching out to the poorer sections of society for credit availability/error, can maximize foreign investments to SSA countries.

Creating a favorable regulatory landscape for trade and investment will further improve the appeal of SSA countries to foreign investors. This interaction between access, expeditiousness, and FDI is intricate, demanding all-round public policy responses that consider brief and enduring economic concerns. A scalable policy framework that attracts FDI must be established. In addition to the above reforms, increasing access to holistic financial services requires efficient and transparent financial institutions. Moreover, these results not only elaborate on economic growth but also implicate social and developmental issues. Promoting wealth sharing and wealth opportunities through financial inclusion can enhance the livelihood of individuals and the community. This is especially significant in SSA as economic disparities are stark. Broadening financial inclusion can empower marginalized and disadvantaged groups in SSA, thus supporting wider social development objectives (Olasehinde and Ajayi, 2022; Tougem et al., 2021).

These results contribute important evidence of the significant impact of financial inclusion and efficiency on FDI attraction, especially for countries in SSA. Policies expanding access to formal financial services, increasing credit provision, and improving the efficiency of financial institutions can leverage foreign capital inflows. All the described effects are enhanced by trade openness and high financial development, which has small but positive impacts on financial access. Thus, a mechanism to focus on financial systems is needed as it improves their role in attracting foreign investment, thus promoting economic development in SSA.

6. CONCLUSION AND POLICY SUGGESTIONS

6.1. Conclusion

This paper conducted a thorough analysis of the nexus between financial inclusion, financial efficiency, and foreign capital

inflows in SSA countries during the period from 2004 to 2023. The paper utilized state-of-the-art econometric techniques to examine both the short- and long-term dynamics of these relationships, identifying policy areas where sustainable economic development across the region can be nurtured. Improved access to formal financial services (e.g., deposits and credit with reduced transaction costs and enhanced trust in banks) increases the uptake of formal remittance channels. These factors improve SSA countries' capacity to attract foreign capital. In addition, when this financial inclusion is further strengthened with financial efficiency, defined as proper distribution and utilization of financial resources, this enhances operational performance, minimizes inefficiencies, and boosts investor confidence. The study therefore traces a stable long-term link between financial inclusion, financial efficiency, and inflows of foreign capital and reveals that short-term adjustments are beneficial for maintaining economic stability. The results indicate bidirectional causalities between financial inclusion and efficiency and foreign capital flows, highlighting the interdependence of these factors in fostering overall economic resilience and growth.

6.2. Policy Suggestions

First, to improve financial efficiency, it is essential to implement targeted reforms that guarantee the optimal distribution of resources within the financial sector. Enhancing the operational capabilities of financial institutions, minimizing transaction expenses, and promoting transparent governance are essential steps in this process. Policymakers need to establish regulatory frameworks that enhance efficient financial intermediation, thereby enabling both domestic and foreign investors to engage with increased assurance of the stability of the financial system. Investing in financial technologies that enhance operational efficiency and reduce inefficiencies will be crucial for reinforcing the financial infrastructure of the region.

Second, Governments should ensure that financial inclusion and efficiency initiatives are integrated with wider economic development objectives to realize their advantages fully. It is essential for policies to encourage trade openness and foster regional integration, as this approach can lead to the development of larger markets that are appealing to foreign investors. Furthermore, coordinating financial sector reforms with the Sustainable Development Goals will guarantee that investments contribute to growth that is both inclusive and environmentally sustainable. Policymakers need to prioritize the improvement of institutional quality, governance, and infrastructure in order to establish a stable and favorable environment for attracting foreign investments. Enhanced governance mitigates risks and builds trust, whereas investments in infrastructure address the logistical requirements of foreign investors and promote cross-border financial operations.

Third, an essential element is the emphasis on education and financial literacy, which enables individuals and businesses to engage in informed financial decision-making. This approach not only increases engagement in financial systems but also strengthens the ability to withstand economic disruptions. Policymakers need to engage in collaboration with international development organizations in order to obtain both technical and financial assistance aimed at enhancing capacity building and the implementation of best practices. Sub-Saharan African nations can enhance their financial ecosystems, draw consistent foreign capital, and foster long-term economic development by implementing a comprehensive and unified strategy.

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