LEVERAGING ON SUSTAINABLE ECONOMIC DEVELOPMENT: DO FINANCIAL INFLOWS MATTERS?

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Abstract

ECOWAS (Economic Community of West African States) countries continue to face severe environmental sustainability issues, weak institutional frameworks, and ongoing economic instability despite large financial inflows. Even if foreign direct investment, remittances, and official development assistance can spur economic growth, it is still unclear how well they will support long-term sustainable development. Thus, this study examines how financial inflows support sustainable economic development in ECOWAS nations between 1990 and 2023. Using advanced econometric techniques—Cross-Sectional Augmented Autoregressive Distributed Lag (CS-ARDL), Augmented Mean Group (AMG), and Dumitrescu-Hurlin (D-H) causality estimators—the research addresses cross-sectional dependence, slope heterogeneity, and endogeneity. In both the short and long term, remittances consistently contribute positively to SED, while Foreign Direct Investment (FDI) exhibits mixed impacts, reflecting complex dynamics. Globalization and natural resource rents, however, predominantly hinder SED, pointing to governance and structural challenges. Causality tests reveal bidirectional links between FDI and SED, while remittances are influenced by SED rather than driving it. Future research could examine the interaction between governance structures and financial inflows in promoting sustainability. These findings underline the need for ECOWAS policymakers to optimize remittance flows, strengthen governance of FDI and natural resources, and adopt region-specific globalization policies as a means to balance economic growth with environmental and social objectives.

Keywords: Foreign Direct Investment; Remittances; Sustainable Economic Development; ECOWAS.

1. Introduction

For the Economic Community of West African States (ECOWAS), achieving sustainable economic development (SED) continues to be a top priority. The region nevertheless faces challenges with economic instability, inadequate institutional frameworks, and environmental degradation despite significant financial inflows in the form of official development assistance (ODA), personal remittances, and foreign direct investment (FDI). There are questions regarding the circumstances in which financial inflows contribute to long-term development because the anticipation that they would promote sustainability and economic progress has not been fully realised. This study therefore analyse the financial inflows tasks in promoting SED across ECOWAS countries by integrating environmental economic, and social development dimensions.

The ECOWAS region, comprising fifteen member states, has experienced significant growth in financial inflows over the past three decades, with total external financial flows reaching $165.3 billion in 2022 (AFDB, 2023). Foreign Direct Investment (FDI) in the region has shown notable volatility, rising from $3.6 billion in 1990 to peak at $18.3 billion in 2011, before stabilising at $14.5 billion in 2022, with Nigeria and Ghana accounting for approximately 65% of total inflows (UNCTAD, 2023). However, the Southern African Development Community (SADC) attracted $10 billion in FDI in 2022, marking a fourfold rise since 2017. Meanwhile, the East African Community (EAC) received $3.8 billion, with a more modest 9% growth from the previous year (UNCTAD, 2023). These numbers indicate that all three regions saw FDI growth over five years, with Southern Africa leading in both total FDI amounts and growth rate, followed by West Africa, and East Africa showing steady but slower progress.

Remittance flows have demonstrated more consistent growth, increasing from $1.9 billion in 1990 to $45.3 billion in 2022, representing approximately 5.5% of the region's GDP and surpassing both FDI and ODA as the largest source of external financing (World Bank, 2023). Equally, official development assistance has fluctuated between $12-15 billion annually over the past decade, with a significant portion directed toward social infrastructure and services (OECD, 2024). Specifically, in 2023, remittances accounted for an average of 7.6% of GDP in West Africa, compared to 6.8% in East Africa and only 3.7% in Southern Africa (World Bank, 2023).

Notably, Nigeria alone received approximately $21 billion in remittances, representing over 60% of West Africa's total inflows, and by 2021, remittance inflows to West African countries had surpassed the combined total of FDI and Official Development Assistance (ODA) (World Bank, 2023). However, these financial flows have not consistently translated into sustainable development outcomes, raising important questions about their efficacy and the conditions under which they contribute to or hinder sustainable economic development. For example, official development assistance, foreign direct investment, and remittances add differently to Sustainable Development Goals across ECOWAS, Southern Africa, and East Africa, with their relative importance varying by region. In ECOWAS, remittances totaling nearly $34 billion in 2022—more than double the combined ODA and FDI—account for 7.6% of GDP and critically support poverty reduction and inequality targets (UN OSAA, 2023). FDI demonstrates significant positive impacts on economic and social SDG pillars in East and Southern Africa, though negatively affects environmental sustainability goals (Mathews, 2023). For instance, remittances in sub-Saharan Africa reached over $54 billion in 2022, which was twice as much as foreign direct investment (FDI) flows but equal to the amount of official development assistance (ODA). A number

of Sustainable Development Goals (SDGs), including poverty alleviation, food security, and financial inclusion, are advanced by these remittances, which offer steady, countercyclical funding for household consumption, healthcare, education, and community development (World Bank/FAO, 2024). While ODA has a major impact on social SDGs and FDI primarily drives economic growth through capital formation and technology transfer, particularly in resource-rich nations, remittances stand out for their stability, direct impact on households, and alignment with SDG Target 10, which seeks to lower remittance transfer costs to less than 3% by 2030. This target remains unmet, as the current average transfer cost across Africa is about 5% (UN DESA, 2025).

Several structural challenges complicate the developmental impact of financial inflows. Climate change threatens economic stability, with projections indicating that climate-related events could displace 32 million people in West Africa by 2050, potentially reducing regional GDP by up to 15% (World Bank, 2023). Rapid demographic expansion, with the region's population expected to reach 570 million by 2050, is placing additional strain on infrastructure, public services, and labour markets (AfDB, 2023). Furthermore, weak financial and institutional frameworks limit the absorptive capacity of ECOWAS economies, preventing them from fully leveraging financial inflows for productive and sustainable investments. Given these challenges, there is a growing need to investigate the precise role of financial inflows in fostering SED.

FDI is often considered a key economic development pilot due to its potential to enhance productivity, facilitate technology transfer, and create employment (Ali et al., 2023). The endogenous growth theory suggests that FDI contributes to long-term economic expansion by fostering human capital development and innovation. However, pollution haven hypothesis warns that without tough environmental rules, FDI can lead to ecological degradation, undermining SED. Conversely, the Porter hypothesis argues that well-designed policies can ensure that FDI fosters green innovation. Remittances on the other hand, contribute to poverty alleviation, household consumption and investments in health and education (Nawaz et al. 2024).

The dual-gap theory posits that remittances help bridge savings and foreign exchange gaps in developing economies, enabling investments in infrastructure and productive sectors (Chenery & Strout, 1966). However, their effectiveness in promoting SED depends on their usage. While remittances improve human capital development, they are often directed toward consumption rather than long-term investment, limiting their transformative impact.

Although extensive research has examined financial inflows-economic growth association (see Adegboyega et al., 2024; Shittu et al., 2020; and Ogede et al., 2023), as relatively few studies assessed their impact on SED, particularly in ECOWAS countries. Existing studies often focus on short-term economic indicators while overlooking environmental and social sustainability. Notable exceptions include Osabohien et al., (2024), who investigated the effect of risk management operation as well as financial sector's stability on sustainable development of ECOWAS members between 2015 - 2022, and Kindo et al., (2024), who investigated the link among trade, environmental considerations, and sustainable development, using the Ghanaian context. Yet, these studies have mostly focused on individual nations or particular financial flows types, missing a thorough regional study that takes into account the interaction between various financial inflows and their combined impact on outcomes related to sustainable economic development. Additionally, the varied character of ECOWAS economies has not been

sufficiently recognised in the literature, with little emphasis placed on how variations in institutional quality impact how well financial inflows promote sustainable development. However, the present research builds on the previous work by focusing specifically on FDI and remittances while examining the contribution of FDI and remittances to sustainable development. In fact, FDI and remittances are vocal financing sources for sustainable development. FDI fosters innovation, creates quality jobs, and advances decarbonisation, offering potential for green technology transfer and economic growth, though its impact requires tailored policies to ensure positive environmental, social, and governance outcomes. Remittances—often exceeding FDI and aid—provide resilient external financing that directly reduces poverty (SDG 1), boosts food security (SDG 2), and boosts health and education (SDGs 3 & 4) through increased household incomes and financial inclusion. Together, both contribute significantly to achieving the UN Sustainable Development Goals.

This study traverses these gaps by adopting a multidimensional sustainability framework and employing advanced econometric techniques to assess financial inflows' short- and long-term effects on SED. Many existing studies assess economic development solely through GDP growth, failing to capture broader sustainability dimensions. This study employs net savings adjusted (NSA), excluding emissions damage (% of GNI), as a measure of SED. NSA incorporates economic, social, and environmental sustainability by reckoning for investments in human capital, natural resource depletion, and environmental degradation. This multidimensional approach allows for a robust evaluation of financial inflows' long-term contributions to sustainable development.

Most recent econometric techniques, including Augmented Mean Group as well as Cross-Sectional Augmented Autoregressive Distributed Lag estimators, are utilised to capture cross-sectional dependence, heterogeneity as well as spatial spillovers among ECOWAS countries. These methods provide robust short- and long-term insights while accounting for structural breaks caused by major regional events such as the 2007/2008 financial turmoil, commodity price shock of 2014 and COVID-19 pandemic.

The study makes three key contributions. First, it develops a panoramic framework to analyse the sustainability financial inflows impact, capturing proportional and in-proportional effects on economic, social, and environmental outcomes. Second, it explores complementarities and trade-offs among different types of financial flows, offering policy insights for achieving sustainable development. Third, it uses an improved methodology for measuring sustainability estimates in the West Africa nations. These contributions improve theoretical understanding, provide actionable evidence for policymakers, and produce a methodological framework compliant to other regions.

Other sections of the study are arranged as follows: Section 2 reviews relevant theories and literature related to financial inflows and sustainable development. Section 3 focuses on methodology and data sources. Section 4 discusses empirical findings. Section 5 concludes and provides policy implications and recommendations, with limitations of the study and suggestions for future research.

2. Literature review

2.1 Theoretical literature review

Through the improvement of economic, social, and environmental aspects, financial inflows such as remittances and foreign direct investment play important roles in sustainable economic development. The endogenous growth theory (Lucas, 1988) postulates that FDI contributes to SED through capital formation, technology transfer, and human capital development; this is consistent with the arguments made by Borensztein et al. (1998). However, the pollution haven hypothesis cautions that FDI may lead to ecological deterioration and jeopardize sustainability if strict environmental regulations are not in place (Cole, 2004). Nonetheless, according to Porter's premise, green innovation can be enhanced by well-crafted regulations that match FDI operations with environmental objectives (Porter & van der Linde, 1995). Discourse have shown mixed outcomes; for example, FDI enhances human capital and infrastructure in Nigeria (Gökmenoğlu et al. 2018) but institutional quality robustness is needed to avoid exacerbating inequality and environmental harm (Omri & Kahouli, 2014).

Conversely, remittances have an effect on SED by increasing household income, expanding access to healthcare and education, and lowering poverty. In order to bridge the savings and foreign exchange gaps required for sustained growth, the dual-gap theory highlights the need of remittances as a external funding source in developing economies (Chenery & Strout, 1966). According to Modigliani (1986), microeconomic viewpoints like the life-cycle theory emphasise their function in encouraging sustained investments in local economies and human capital development. Empirical evidence shows their positive contributions to education and health outcomes in ECOWAS countries (Adom et al., 2018), although weak regulatory environments may lead to unproductive use, limiting their long-term impact (Eke et al., 2022).

The dynamics of financial inflows and SED are further complicated by the links between factors like natural resource rents, globalisation, and economic growth. Resource allocation and institutional advancements are made easier by globalisation, which may improve SED (Requier-Desjardins et al., 2003). Dependency theory, however, warns against relying too much on outside financial flows since this could increase inequality and susceptibility to outside shocks (Prebisch, 1950). Rents from natural resources can finance development projects, but they can also cause governance problems and environmental damage, a phenomenon known as resource curse (Sachs & Warner, 1995). Economic growth adds another complexity, as it can either promote technological innovation and eco-friendly practices or exacerbate ecological degradation depending on governance quality (Galindo & Méndez, 2014; Zallé, 2019). These theoretical underpinnings are supported by empirical findings in the ECOWAS context. Studies reveal that FDI and remittances have varying impacts on SED based on institutional quality and regulatory frameworks (Dornean et al. 2021). The globalisation task and natural resources also remains ambiguous, as their effects are mediated by governance and structural factors. This interplay underscores the need for policies that align financial inflows with SED objectives, ensuring a stability between economic, social and environmental priorities.

2.2 Empirical review

A study by OrjI et al., (2022) for ECOWAS countries used panel fixed effect on quarterly data between 2000 to 2017 reveals that FDI, along with net domestic credit and gross capital formation, positively influences economic growth of the region, as the causal association between FDI inflows and financial development has been established, with evidence of both unidirectional and bidirectional causalities, suggesting that FDI not only contributes to growth but also enhances financial sector development. Similarly, Musibau et al., (2019) used pooled mean group (panel ARDL) approach showed that foreign capital inflows, including official development assistance have a negative effect on economic growth when institutional quality is low. But Daly et al., (2022) considered 24 developing countries for the period of 2002 and 2018, submitted that in the absence of strong institutions, financial inflows may not bring about sustainable development, as they can exacerbate issues like corruption and environmental degradation.

Combes et al. (2019) employed generalized method of moments for a sample of low- and middle-income countries over the period of 1980–2012 to examine the effect of financial flows and their composition on the real exchange rate on economic growth They revealed that net financial flows inhibit economic growth both proportionally and in proportionally. As a rise in gross financial flows improve real exchange rate, so do financial flows enhance economic growth regardless of the development level. Additionally, using West Africa data, Shittu et al., (2020) confirmed that foreign direct investment (FDI) boosts sub-region growth by using the autoregressive distributed lag estimator to investigate globalisation, political governance, and FDI effects on economic growth between 1996 and 2016. Political governance even amplifies the beneficial impact of foreign direct investment on economic growth.

In contrast, studies focusing on economic growth, the empirical literature underscores the multifaceted financial inflows effect on sustainable economic development. Financial development and finance are critical in promoting economic growth, with institutional quality and financial stability playing significant tasks. In the context of Chinese cities, using panel data regression, Gao et al., (2022) investigated the impact of financial development on sustainable growth and discovered that, through mechanisms like capital deepening and technological innovation, financial development has been demonstrated to significantly improve sustainable economic growth, especially in cities deemed large and medium-sized. Similarly, Păun et al., (2019) revealed financial sector development is essential for sustainable growth, as they facilitate capital accumulation and efficient resource allocation, which are critical for economic development. Anetor (2020) employed system generalized method of moments on data for twenty-eight SSA nations between 1995 and 2017, on the nexus between private capital inflows, financial development and economic growth. He found that FDI and financial development have been identified as significant contributors to economic growth, while other forms of financial inflows like portfolio investments and remittances have shown no significant impact. However, for low middle income countries between 1991 and 2020, Hunjra et al., (2022) employed multiple method (e.g Fixed Effects, Feasible Generalized Least Squares, and Bootstrap Panel Quantile Regression estimator), to investigate financial development effects on sustainable economic development and revealed that SED is positively influenced by FDI, tourism, financial development, trade openness, and natural resources. Financial development strengthens the effect of natural resources, while FDI enhances tourism's impact.

Using the Panel Smooth Transition Regression estimator, Guoyan et al., (2021) examined FDI-carbon emissions association using panel data from 17 nations in the Middle East and North Africa region during 1995-2016. Their results show that the association between the two variables is nonlinear. Indeed, the less developed economies in the region are the least stringent in environmental standards and attract the most polluting industries. However, they observe an inverse and significant impact between carbon emissions and FDI flows for countries with bigger development levels.

Employing data from one hundred and nine developing countries spanning 2000 to 2022 and employing system GMM Barkat et al., (2024) examined remittances task on Sustainable Development Goals (SDGs). Their results found significant direct effects of remittances on SDGs. Also, that financial inclusion as a moderating factor improves remittances' effects on SDGs. In addition, remittances, international aid, and government expenditure shows complementary roles in SDGs attainment. Using data of 78 Eurasian countries, Izadi and Madirimov (2023) applied a fixed effects regression model to analyse the nexus between FDI and SDG index on the ground of the neoclassical theory of FDI. They found a direct and significant FDI effect on the SDG index. Importantly, their results also reveal that FDI task is more decisive and fundamental among the lower income class of the countries than the higher income class. With ARDL estimator, Kindo et al., (2024) demonstrated that trade proportionately affects sustainable development in Ghana despite causing adverse environmental turmoil. Further, using data of Economic Community of Central African States, Onounga (2026) examined FDI impacts on sustainable development between 2015 and 2023. He discovered that FDI marginally improves sustainable development in the ten ECCAS nations, and that conditioned FDI by the debt burden also marginally distorts sustainable development.

However, Chand and Singh (2024) utilised three estimators-CS-ARDL, AMG and common correlated mean group (CCEMG). Their results showed that remittances enhance sustainable economic development, with per capita GDP and globalization pointing similar positive effects. Conversely, natural resource rents were found to exhibit a detrimental effect on sustainable economic development. Using additional method, D-H causality estimators, Islam, (2024); Islam and Alhamad (2022) reported that financial development, institutional/regulatory quality, trade openness as well as energy consumption have proportional impacts on economic growth of top 20 remittance-earning nations as well as top 10 remittance-earning economies.

Besides, financialisation which involves the increasing dominance of financial motives and interests, significantly impacts sustainable development. In the BICS (Brazil, India, China, and South Africa) countries, Yang et al., (2021) submitted that remittance inflows and financial development deteriorate environmental quality, while technological innovations help reduce the ecological footprint. Using GMM-PVAR methodology for analysis, Arthur et al., (2024) showed that FDI significantly and negatively influences sustainable development in the African nations from 1990 to 2020, particularly in low-income countries. Conversely, higher-income nations in the region show positive FDI effects on sustainable development.

Although the aforementioned offers a multitude of insights regarding the impact of FDI and remittances on sustainable development and economic growth, a number of gaps still exist. First, there is little discussion of how FDI and remittances affect sustainable economic development (SED), particularly in the ECOWAS region, despite the fact that several studies have shown that they have a favorable impact on economic growth. The

majority of current research frequently ignores the larger social and environmental factors that are crucial to reaching SED in favour of concentrating on traditional economic growth metrics like GDP. Second, previous studies emphasize how important institutional quality is in regulating how successful financial inflows are. The ways in which particular governance enhancements can strengthen their contribution to sustainable economic development (SED) are not sufficiently explored, nevertheless. Furthermore, whereas natural resource rents and globalisation are acknowledged as important determinants of financial inflows and their effects on SED, little is known about these factors in the context of ECOWAS. Last but not least, there aren't many comparative studies that use sophisticated econometric estimators, like CS-ARDL, AMG and D-H causality, to thoroughly assess the causal and dynamic relationships between financial inflows and SED across a range of dimensions, such as social inclusivity and environmental sustainability. These discrepancies highlight the necessity of thorough discussion that incorporates these factors and uses reliable procedures to produce useful information for decision-makers. Therefore, the current discourse examines the following hypotheses: (i) financial inflows and sustainable economic growth do not significantly correlate, and (ii) there is no causal correlation between financial inflows and sustainable economic development in ECOWAS.

3. Methodology

This discourse embraces a quantitative research method to investigate financial inflows impacts on sustainable economic development (SED) in ECOWAS countries spanning 1990 to 2023. The methodology incorporates advanced econometric techniques to analyse connections among key variables while addressing potential cross-sectional dependence, slope heterogeneity and endogeneity issues in panel estimation.

3.1 Empirical model specification

The study's foundation was endogenous growth theory, which emphasises financial inflows such as FDI and remittances, as well as globalization and natural resource rents, in fostering sustainable development. The empirical model hinges on the work of Chand and Singh (2024) and is specified as follows:

$$SED_{it} = \alpha_0 + \alpha_1 FI_{it} + \alpha_2 Z_{,it} + v_i + \varepsilon_{,it} \quad (1)$$

where SED measured by net savings adjusted (NSA), excluding emission damage as a percentage of GNI as a representative for sustainable economic development, FI stands for financial inflows (FDI and REM all extracted as a percentage of GDP) while Z signifies control variables that entails an array of supplementary variables that determine the adjusted net savings levels. Also, *i* designates a particular country and *t* is the corresponding time period, and v_i is an unobservable country-specific sway that accounts for cross-sectional unit heterogeneity. Further, equation (1) is expanded as:

$$SED_{it} = \alpha_0 + \alpha_1 FDI_{it} + \alpha_2 REM_{it} + \alpha_3 NRER_{it} + \alpha_4 GLO_{it} + \alpha_5 GDPk_{it} + v_i + \varepsilon_{,it} \quad (2)$$

Furthermore, the wide body of research that connects financial inflows, globalization, natural resource rents, and economic growth to sustainable economic development (SED) serves as the foundation for the variables and methodological decisions used in this study. Globalisation, for example, is widely known for enabling nations to optimize resource allocation and enhance productivity by focusing on sectors with competitive strengths (Requier-Desjardins et al. 2003). This avenue fosters operational efficiency and long-term growth, while also encouraging institutional improvements necessary for sustainable outcomes (Arslan et al., 2022). As such, globalisation is included in the analysis due to its direct effects on economic integration and development pathways in ECOWAS countries.

Another important factor that has a conflicting relationship with SED is economic growth. On the one hand, conventional growth methods frequently include extensive use of natural resources, which results in resource depletion and ecological deterioration (Zallé, 2019; Hunjra et al., 2022). However, expansion can also promote eco-friendly practices and sustainable development by encouraging technological innovation and effective resource management (Galindo & Méndez, 2014). In a similar vein, the inclusion of natural resource rents is supported by their unclear connection to SED, since development can be funded by resource riches, but sustainability and environmental damage are frequently worsened by poor governance (Haseeb et al., 2021; Qian et al., 2021; Arslan et al., 2022). Finally, because of their unclear but potentially revolutionary effect on SED, financial inflows such as FDI and remittances are included. Although FDI is praised for its contribution to knowledge transfer and capital formation, its advantages rely significantly on the institutional quality and governance of the host nation (Dornean et al., 2021; Zamani & Tayebi, 2022). Although their long-term impact on sustainability is still up for debate, remittances are associated with local investment and poverty reduction (Wang et al., 2023; Chand & Singh, 2024). By incorporating these variables, the discourse aims to provide a refinement understanding of their interplay and effects on SED in ECOWAS countries.

3.2 Data sources

This discourse utilizes annual panel data for 15 ECOWAS countries spanning 1990 to 2023, as data were collected from World Bank Development Indicators (WDI) for all variables utilised except globalisation indicators that is sourced from KOF Globalisation Index. The distinctive economic and social dynamics of the ECOWAS nations − which are marked by substantial natural resource riches, large levels of financial inflows, and differing levels of institutional development − are what led to their selection.

An excellent setting for researching the impact of financial inflows on sustainable economic development (SED) is ECOWAS, a regional bloc that is vital to West Africa's economic integration and sustainable growth. Additionally, the 1990–2023 era was chosen for strategic reasons since it encompasses important political and economic changes in the ECOWAS area.

Widespread economic liberalisation and structural adjustment programs began in many member states in the early 1990s, resulting in increasing financial inflows and policy changes. Also, the major world economic events that have had a significant impact on financial inflows and development paths, such as the recent COVID-19 epidemic and the financial crisis of 2007–2008, are also included in this time frame. The study's relevance to current policy discussions is further ensured by the timeline, which corresponds with the

development of global sustainability programs from the 1992 Rio Earth Summit on Sustainable Development Goals (SDGs) adoption in 2015. Table 1 provides the variables measurement as well as their respective avenues.

Table 1 - Measurement of Variables and their Origin.

Name/Abbreviation	Variable Description	Data Origin
Sustainable economic development (SED)	Net savings Adjusted, excluding particular emission damage (% GNI).	WDI
Foreign Direct Investment (FDI)	Foreign Direct Investment Ratio to GDP	WDI
Remittance (REM)	Remittance-to-GDP ratio	WDI
Economic growth (GDPK)	GDP per capita (constant, 2015 USD)	WDI
Natural resource rents (NRER)	Total natural resource rents (% of GDP)	WDI
Globalization (GLO)	Economic, social, and political dimensions of globalisation index	KOF
Foreign direct investment (FDI)	Foreign direct investment (% of GDP)	WDI

Source: Author's Compilation

3.3 Appraisal strategy

The appraisal strategy started by performing a pre-estimation diagnostic test such as Pesaran's test for cross-sectional dependence, unit root tests (CADF and CIPS), (Pesaran, 2004) and the Westerlund cointegration test, so as to validate the dataset's features and confirm long-run association presence among variables. The main analysis employs CS-ARDL model to investigate both short- and long-term impacts of financial inflows on SED, addressing issues of cross-sectional dependence and endogeneity, augmented mean group (AMG) approach is applied for robustness check while accommodating heterogeneity and common correlated effects. Finally, the Dumitrescu-Hurlin (D-H) causality test is used to determine directional links between variables, identifying causative factors that influence SED. This multi-method approach provides comprehensive and policy-relevant insights into the dynamics of financial inflows and their impact on SED across ECOWAS countries.

4. Results and discussion

4.1 Pre-estimation results

In order to validate the dataset and guarantee the robustness of the econometric analysis, pre-estimation diagnostics are essential. The results of crucial pre-estimation tests that were carried out to assess cointegration, unit root tests, slope homogeneity, and cross-sectional dependence are shown in this subsection. In order to effectively capture and explain the links between financial inflows, globalisation, natural resource rents, and sustainable economic development (SED), the diagnostics estimate results offer a basis for trustworthy estimation.

Cross-sectional dependence and Slope homogeneity tests Outcome

All variables show statistically significant dependence, according to the cross-sectional dependence tests-SED, REM, NRER, GLO, GDPK, FDI) with p<0.01 (see panel 1 of table 2). This suggests that economic and financial activities in ECOWAS countries are interconnected, likely influenced by shared regional policies, trade integration and external shocks. Consequently, econometric methods addressing cross-sectional dependence, such as CS-ARDL and AMG, are necessary for robust analysis. Panel 2, table 2 dispenses the outcomes of the slope homogeneity tests (Pesaran & Yamagata, 2008; Blomquist & Westerlund, 2013) as the slope homogeneity tests reveal significant heterogeneity (p<0.01) among the panel units. This implies that the effects of financial inflows on SED vary across ECOWAS countries due to differing institutional frameworks, economic structures and governance quality.

Table 2 - Estimates of Pesaran cross-sectional dependence and Slope homogeneity tests

Panel 1: Pesaran (2004) Cross-sectional dependence test		
Variables	CD-Test	Prob.
SED	3.974***	0.000
REM	24.275***	0.000
NRER	6.0703***	0.000
GLO	38.060***	0.000
GDPK	27.132***	0.000
FDI	9.895***	0.000
Panel 2: Slope Homogeneity Test		
Tests	Stat.	p-value
Pesaran & Yamagata (2008)		
$\hat{\Delta}$ (delta) test	11.124	0.000 ***
$\hat{\Delta}$ (delta) adj. test	12.532	0.000 ***
Blomquist & Westerlund (2013)		
Δ_{HAC}	7.795	0.000 ***
(Δ_{HAC}) adj.	8.782	0.000 ***

**p < 0.05 & ***p < 0.01; SED stands for Sustainable economic development; REM stands for workers remittances; GDPK represents Economic growth; NRER stands for natural resources rent; FDI represents foreign direct investment; and GLO stands for globalization
Source: Author's Compilation

Stationarity analysis

The stationary analysis for CADF and CIPS unit root estimates are shown in Table 3, as it reveals that both tests both show integrated of order one, I(1) all variables, meaning they become stationary after first differencing. This ensures the appropriateness of techniques such as CS-ARDL and Westerlund cointegration, which can handle mixed orders of integration. The finding of non-stationarity at levels but stationarity at first difference underscores the dynamic nature of financial inflows and their effect on SED over time.

Table 3 - Estimates of stationarity analysis.

	CADF			CIPS		
Variable	Level	First Diff.	Decision	Level	First Diff.	Decision
SED	-1.962	-4.486**	I(1)	-3.032**	-6.046**	I(1)
REM	-2.310**	-4.367**	I(1)	-2.704**	-5.620**	I(1)
NRER	-2.244	-4.658**	I(1)	-2.510**	-5.566**	I(1)
GLO	-2.468**	-4.289**	I(1)	-2.575**	-5.620**	I(1)
GDPK	-1.922	-3.558**	I(1)	-1.958	-4.805**	I(1)
FDI	-2.288	-4.471**	I(1)	-2.977**	-5.809**	I(1)

***p < 0.01 & **p < 0.05; critical values: -2.44 & -2.25 for 1% & 5% significance level respectively.
Source: Author's Compilation

Cointegration analysis

The cointegration analysis outcomes is shown in Table 4 with emphasis on Westerlund cointegration test that confirms the evidence of a long-term equilibrium association among the variables, with statistically significant results (p<0.01). The results dispense that financial inflows, globalization, natural resource rents and GDP per capita are fundamentally tied to SED in ECOWAS countries. The existence of cointegration validates the long-term focus of the study and highlights the necessity of consistent policy frameworks to sustain development objectives.

Table 4 - Westerlund's panel cointegration Estimates Outcome

Variable	Value	Z-Value	Prob.
G_τ	-4.336	-4.759	0.000***
G_τ	-14.663	-2.653	0.021***
P_τ	-13.061	-3.838	0.000***
P_σ	-14.249	-3.527	0.001***

**p < 0.05 & ***p < 0.01, respectively.
Source: Author's Compilation

5. Discussion of findings

5.1 CS-ARDL results on the role of financial inflows on SED

The CS-ARDL estimations for financial inflow tasks on SED are shown in Table 5. According to Table 5, a 1% increase in remittance inflows adds roughly 1.426% in the short term and 1.561% in the long term to sustainable economic development (SED). These significant positive impacts underscore the critical role of remittances in fostering SED by supporting household welfare, education, and local economic activities. The findings align with existing empirical and theoretical research in several ways. The positive contribution of remittances to SED corroborates studies like (Islam, 2024; Barkat et al., 2024; Chand & Singh, 2024), which highlight the role of remittances at contributing to economic growth and development by improving education and health outcomes. It against the work of Catrinescu et al., (2005), which demonstrates that remittances exert a weakly proportional effect on long-term macroeconomic growth.

On the other hand, Table 5 shows that a 1% increase in FDI is mainly linked to marginal short-term effects and does not have a statistically significant long-term influence on SED. This result implies that institutional frameworks and the quality of governance determine the developmental advantages of foreign direct investment in ECOWAS nations. The results are consistent with the research by Onounga (2026), which shows that although FDI can support SED, its advantages are frequently restricted and do not always result in sustainable development outcomes. For example, Afrin (2004) pointed out that there is a gap between FDI inflows and significant long-term development consequences, as FDI-led integration has not done much to support sustainable industrial development in developing nations. This limited impact of FDI contrasts with traditional growth theories (e.g., Borensztein et al., (1998), which typically assert that increased capital inflows, such as FDI, should lead to substantial economic growth and development. Traditional growth models often emphasise the capital accumulation task as a primary growth driver, if investments will lead to increased productivity and economic expansion. This divergence suggests that institutional weaknesses and structural factor in ECOWAS countries may dilute FDI's developmental benefits (Arthur et al., 2024).

Table 5 — CS-ARDL results on financial Inflows roles on Sustainable Economic Development (SED)

Variable	Long Run		Short run	
	Coefficient	t-Statistics	Coefficient	t-Statistics
L.SED			-0.024	-0.42
REM	1.561**	1.99	1.426**	2.09
NRER	-0.039	-0.21	0.015	0.08
GLO	-0.405	-1.59	-0.477**	-1.97
GDPK	0.023**	2.03	0.025**	2.19
FDI	-0.201	-0.69	0.024	-0.42
ECM(-1)			-1.024	-17.44

**p < 0.05 & ***p < 0.01, respectively.
Source: Author's Compilation

Further, globalisation has no substantial long-term effects, but it has an adverse and significant short-term effect (−0.477, p<0.05). For every 1% increase in its measure, it shows a 0.405% drop in SED; nevertheless, this effect is more noticeable in the near term (–0.477%). These results demonstrate how trade vulnerabilities and a lack of institutional capacity can initially upset local economies as a result of globalisation. However, dependence theory (Prebisch, 1950), which alerts developing nations to the risks associated with global market integration, is consistent with the negative association between globalisation and SED. The inverse link is in line with research reviewed by Al-Malki et al., (2024) and Qian et al., (2021), which emphasizes the obstacles and constraints that globalisation presents in advancing sustainable development outcomes. Globalization can worsen inequality between rich and developing countries, creating a type of economic dependency that impedes sustainable development, claims the dependency theory. Furthermore, this viewpoint shows that emerging nations frequently suffer negative consequences as they become more integrated into the global economy, including heightened susceptibility to external shocks, the loss of indigenous businesses, and growing

wealth disparity. In line with the resource curse hypothesis, which holds that inadequate governance frequently prevents resource wealth from translating into sustainable development outcomes, natural resource rents also have no discernible short- or long-term effects on SED as the finding aligns with Sachs & Warner (1995) resource curse hypothesis, emphasizing governance challenges as a barrier to leveraging resource wealth for sustainable development as well as study conducted by Shuayb et al., (2025) which underscores the importance of effective governance in managing resource wealth to foster sustainable development.

5.2 Estimates of augmented mean group

According to the AMG calculations, which are displayed in Table 6, a 1% increase in remittance inflows provides roughly 1.251% to sustainable economic development (SED), underlining their crucial function as a reliable source of funding for local investments and household welfare. FDI had a statistically significant beneficial impact on SED, with a 1% increase producing a 0.366% improvement, in contrast to the CS-ARDL results. This disparity implies that when ECOWAS countries' differences are taken into consideration, the advantages of FDI can become more obvious. The results also highlight the adverse effects of globalisation (–0.061%) and natural resource rents (–0.125%), consistent with the challenges of weak governance and structural vulnerabilities in the region. The findings on remittances align with prior studies such as (Adom et al., 2018), which underscore their contributions to education and health outcomes. The positive impact of FDI corroborates theoretical perspectives from endogenous growth models that emphasize technology transfer and capital accumulation as drivers of development (Borensztein et al., 1998).

Table 6 - Augmented Mean Group of financial Inflows role on Sustainable Economic Development

Variable	Coef.	Std. Error	t-Stat.
REM	1.251**	0.021	59.083
NRER	-0.125**	0.042	-2.933
GLO	-0.061**	0.018	-3.267
GDPK	0.012	0.013	0.862
FDI	0.366**	0.028	12.633

**p < 0.05 & ***p < 0.01, respectively.
Source: Author's Compilation

5.3 Dumitrescu Hurlin panel causality test results

The results of the Dumitrescu-Hurlin (D-H) panel causality test are displayed in Table 7. The findings indicate that FDI and sustainable economic development (SED) have a robust reciprocal relationship. This suggests that while FDI affects SED through technological transfer and capital inflows, stronger SED also draws more FDI by fostering an environment that is stable and conducive to investment. In a similar vein, there is bidirectional correlation between GDP per capita (GDPK) and SED, indicating that sustainability initiatives and economic growth are mutually reinforcing.

These results highlight how financial inflows and developmental outcomes are interdependent. Remittances, on the other hand, exhibit unidirectional causation, meaning

that SED affects remittance inflows rather than the other way around. This indicates that as ECOWAS countries achieve higher levels of SED, they attract more remittances from the diaspora, potentially due to improved financial infrastructure and trust in local economies. The absence of causality from remittances to SED highlights the relevance of creating an ideal environment for remittances to effectively contribute to sustainable development.

Table 7 - Dumitrescu Hurlin Panel Causality Estimates

H_0 Hypothesis:	Zbar-Stat.	Zbar Tilde Stat.	Decision
FDI >// SED	2.473**	1.865	Two-way Causality: (SED ↔ FDI)
SED >// FDI	3.233**	2.511**	
REM >// SED	6.602**	5.371**	One-way Causality: (SED → REM)
SED >// REM	-1.232	-1.281	
GDPK >// SED	5.021**	4.028**	Two-way Causality: (GDPK ↔ SED)
SED >// GDPK	2.175**	1.612	
GLO >// SED	1.911	1.387	Exogeneity
SED >// GLO	0.595	0.271	
NRER>// SED	-0.138	-0.352	One way Causality: (SED → NRER)
SED >// NRER	2.731**	2.083**	

**p < 0.05 & ***p < 0.01, respectively.
Source: Author's Compilation.

The findings are consistent with earlier studies highlighting the conditional influence of foreign direct investment on development achievements. According to a study by Omri and Kahouli (2014), FDI and economic development are correlated in both directions, depending on the caliber of the institutions involved. Conventional literature, which frequently depicts remittances as a direct driver of development, differs from the result that remittances are influenced by SED rather than driving it (Adom et al., 2018). This paradox emphasizes how important context-specific analyses are for comprehending the dynamics of financial inflows.

6. Summary of findings and conclusion

This discussion looks at how financial inflows affected 15 ECOWAS nations' sustainable economic development (SED) between 1990 and 2023. The study examines the effects of remittances, foreign direct investment (FDI), globalization, and natural resource rents on SED using the most contemporary econometric techniques, including the Cross-Sectional Augmented Autoregressive Distributed Lag, Augmented Mean Group, and Dumitrescu-Hurlin (D-H) causality tests. Remittances are repeatedly shown to stimulate SED in both the short and long term, highlighting their consistency as an essential external finance source. The varying consequences of FDI are a reflection of its reliance on development perspectives and institutional quality. Natural resource rents and globalization primarily have negative effects, exposing institutional weaknesses and governance issues. While

remittances are influenced by SED rather than influencing it, causality studies show a two-way relationship between FDI and SED.

Since not all financial inflows have an equal impact on long-term sustainable economic development, the study challenges traditional assumptions on growth. Although endogenous growth theory suggests that foreign direct investment (FDI) should promote long-term development by means of capital accumulation and knowledge transmission, the research indicates that FDI's effects are contingent on the context and conditional, requiring robust institutional frameworks to produce long-lasting outcomes. Furthermore, remittances effectively bridge savings and foreign exchange deficits in developing countries, as evidenced by their consistent positive influence on SED across both short and long time periods. This supports the dual-gap theory. This advances our theoretical understanding of remittances as steady, countercyclical finance systems that directly benefit household welfare and human capital development, thus addressing SDGs.

For sustainable development, ECOWAS nations need specialised approaches to financial inflow management rather than one-size-fits-all regulations. Strengthening FDI screening to prevent environmental damage while maximizing technology transfer, reducing remittance costs from 5% to 3% and rerouting these funds to productive investments, and reforming natural resource management through transparent revenue systems that prevent corruption are some of the top policy priorities. In order to attract productive financial flows, ECOWAS nations should invest in improving institutional quality, move away from GDP metrics and toward multidimensional sustainability frameworks, and implement protective measures during globalisation while gaining competitive advantages through industrial and educational policies.

Despite its contributions, this study contains a number of shortcomings that present opportunities for further investigation. First, possible non-linear relationships between financial inflows and SED are not taken into consideration. Second, the scope of study is limited by the emphasis on certain macroeconomic factors and financial inflows. Additionally, the topic of governance issues is covered, but it is not clear how institutional reforms improve the efficiency of financial inflows. Lastly, because of data limitations, the analysis only covers the years 1990–2023, leaving out any effects of recent changes in the global economy, such as post-pandemic recovery plans and climate legislation.

Future studies could solve the aforementioned issue by employing advanced econometric estimates, such as threshold or quantile regressions, to capture different effects across development levels. Also, future studies could also look at how financial inflows and governance frameworks combine to support economic sustainability. Lastly, these patterns might be captured by upgrading the dataset, increasing the findings' applicability to policymaking.

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