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FROM TRANSFERS TO TRANSFORMATION: OPTIMISING REMITTANCE-DRIVEN GROWTH THROUGH DOMESTIC INVESTMENT IN ECOWAS

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Abstract *This study examines how remittances and domestic investment jointly drive economic growth in 15 ECOWAS countries from 2000 to 2022 using panel FMOLS. After confirming cross-sectional dependence and cointegration, results show that remittance inflows have a direct positive effect on GDP per capita. More importantly, the interaction between remittances and domestic investment is positive and significant, indicating that remittances amplify growth when channeled into capital formation. Domestic investment, labour, capital and population also promote growth, while inflation is detrimental. The findings suggest that policies aimed at lowering remittance costs, creating diaspora investment vehicles, and improving macroeconomic stability can transform remittances from consumption transfers into engines of productive investment in ECOWAS.*

Keywords Remittances, Domestic Investment, Economic Growth, ECOWAS, FMOLS

JEL Classification: *F24, E22, O40, O55, C23*

1.0. Introduction

Economic prosperity and improved wellbeing depend on growth, which has been relatively stable across Africa, including the ECOWAS sub-region, over the last three decades (UN, 2022). However, this falls far short of development needs given rising poverty, high public debt, weak exports, and other structural bottlenecks coupled with weak governance—such as inadequate infrastructure and limited industrial diversification—that continue to hamper productive capacity (UN, 2022). Average GDP growth in ECOWAS hovers around 3–5% over the period, increasing modestly from 2.9% (2019) to 3.5% (2021), which remains insufficient to absorb the region's growing labour force and reduce

unemployment, let alone generate the fiscal space needed for social investments. Inadequate funding underpins this poor performance, with UNECA (2019) noting that African countries require roughly an 11% annual GDP increase over the next decade to close the financing gap. Consequently, both domestic and external sources—including remittances—have been tapped. External funds are primarily sought to bridge the domestic savings-investment gap, complementing local resources. Inflows of remittances, aid, FDI, portfolio investment, and loans have varied considerably over recent decades. While FDI is recognized as a growth driver (World Bank, 2021; Eregha and Nwokoma, 2014), its inflows—and those of FPI—are undermined by insecurity, militancy, weak enabling environments, and the 'contagion effect' (Edo, 2011)—wherein firms relocate because others do, further eroding investor confidence across the region. Consequently, FDI to ECOWAS fell by 15% to $9.6 billion, with Nigeria and Ghana dropping by 43% (to $2bn) and 8% (to $3bn), respectively (UNCTAD, 2019). Furthermore, unproductive loans have become a drag, causing debt overhang and crowding-out effects. Conversely, remittances have maintained a steady upward trend, competing as one of the largest external funding sources for ECOWAS (World Bank, 2022), largely driven by rising emigration of citizens seeking better fortunes abroad and channeling income back home, often providing a vital cushion for households during economic downturns, though their impact depends on utilisation.

Investment—whether domestic or foreign—is widely recognised as a major driver of economic growth and sustainable performance (Asiedu, 2002). It facilitates technological advances in goods, markets, or processes, thereby expanding production capacity through new equipment that raises labour productivity (Solow, 1956; Ouedraogo and Kouaman, 2014). Beyond productivity, investment (private and public) brings multiple benefits: job creation, higher per capita income, poverty reduction, improved living standards, and GDP growth.

Available data (World Bank, 2009, 2017, 2021, 2022) indicate that domestic investment in Sub-Saharan Africa has risen gradually—from about US$112 billion in 2000 to US$154 billion in 2005, and further to US$269 billion (2010) and US$332 billion (2015) (WDI, 2017). Yet this increase remains relatively modest, and the ECOWAS sub-region records the lowest domestic investment globally between 2000 and 2016, measured by gross fixed capital formation, compared with regions like the Middle East, North Africa, Central Asia, and Latin America and the Caribbean. In fact, Latin America's domestic investment exceeded that of SSA and ECOWAS by more than six times in 2000. More recent reports (World Bank, 2021) attribute ECOWAS's weak domestic investment to poor tax systems, weak institutions, high lending rates, low savings, and related constraints. Given the substantial remittance inflows to ECOWAS countries, the growth benefits of these flows have generated considerable debate. Beyond mixed empirical findings on remittances' growth effects, this study specifically examines the desirability of such inflows, their impact on the economy through domestic investment, and the threshold level of domestic

investment that conditions the remittances-growth nexus.

The remaining sections of this paper are organized as follows. Section two is devoted to the literature review, while Sections three and four cover the theoretical framework, model specification, methodology, and data sources. The final two sections—Sections four and five—present the estimated results alongside their interpretation, and the summary, conclusions, and recommendations, respectively.

2.0. Literature Review

2.1. Theoretical Literature

Several theoretical perspectives have been advanced to explain labour migration and remittances, spanning macro-level frameworks—optimistic, pessimistic, two-gap, and endogenous growth models—and micro-level household motives. The optimistic view (Kindleberger, 1965; Todaro, 1969; De Haas, 2010) portrays return migrants as agents of change who introduce financial capital, ideas, and entrepreneurship, thereby fostering development through enhanced incomes, investment, and economic take-off (Beijer, 1970; Massey et al., 1993). Conversely, the pessimistic perspective (Lipton, 1980; Binford, 2003) contends that migration and remittances perpetuate underdevelopment by cultivating dependency and moral hazard in recipient economies (Olufemi &Ayandibu, 2014).

At the household level, remittance motives encompass altruism, self-interest, family agreements, portfolio management, and savings targets. Altruism, driven by concern for left-behind relatives (Johnson & Whitelaw, 1974; Lucas & Stark, 1985), often intersects with self-interest tied to inheritance or anticipated return (Chami & Fischer, 1996). Family-based contractual arrangements, including co-insurance and loans, position left-behind members as investment agents (Lucas & Stark, 1985), while portfolio considerations respond to macroeconomic factors such as exchange rates and inflation (Nwajiuba, 2005), and savings targets are shaped by economic conditions and transfer efficiency (Puri&Ritzema, 1999). Given migration's complexity, these motives—which vary with household circumstances (UNCTAD, 2013)—are best viewed as complementary rather than oppositional.

2.2. Empirical Literature

A growing body of empirical research has examined the remittances-growth nexus, yielding mixed and context-dependent findings. Kaphle (2018) confirmed a long-run relationship between remittances, trade, and growth in Nepal, though no short-run causal link was established. Khan, Teng, and Khan (2019) found that remittances, FDI, and domestic savings positively influenced Pakistan's growth in the long run, while consumption and inflation had negative effects. Sutradhar (2020) observed a negative impact in Bangladesh, Pakistan, and Sri Lanka, yet a positive effect in India, with an overall significant negative combined effect across South Asian emerging economies. In West Africa, Adjei et al. (2020) found a positive and significant effect of remittances on growth in seven countries, alongside trade openness and investment, recommending channelling remittances into productive ventures.

Conversely, Igbinedion (2020) found that the remittance-led growth hypothesis was not validated for Nigeria, as remittance variations adversely affected growth. Collaku (2021) reported that a 1% increase in remittances raised GDP by 0.12% in Kosovo, while Okorie, Nwabufo, and Christiana (2022) found a positive and significant contribution in Nigeria. Abdulai (2022) confirmed long-run relationships in Ghana, though unemployment negatively mediated the effect of remittances on growth. Maune and Matanda (2022) uncovered both unidirectional and bidirectional causality in Zimbabwe, with remittances positively impacting GDP despite slower growth pre-dollarization. Bucevska (2022) provided evidence of a considerable positive impact in six SEE countries, while Chowdhury et al. (2022) revealed an aggregate negative impact in Bangladesh, Sri Lanka, and Vietnam, attributed to excessive consumption and unproductive investment. Zardoub and Sboui (2023) found ambiguous effects of financial flows on growth in developing countries. Bucevska and Naumoski (2023) identified bidirectional causality between remittances and growth in most SEE6 countries. Khan and Gunwant (2024) projected a decline in remittance inflows to Yemen, underscoring the need for policy intervention. Recently, Topxhiu and Krasniqi (2025) found that remittances significantly drove growth in Western Balkan countries, with stronger effects in less financially developed economies, while Issa and Bouchoucha (2025) demonstrated that remittances directly and negatively affected growth in MENA countries, yet interacted positively with human capital and domestic investment. The empirical literature reveals considerable heterogeneity, with outcomes varying by region, methodology, institutional quality, and the extent to which remittances are channeled into productive investments. While some studies affirm a positive direct effect, others find negative or conditional impacts, underscoring the importance of policy frameworks that enhance human capital, strengthen domestic investment, and improve the business environment to maximise the developmental potential of remittance inflows. In West African sub-region, Adegdoyega and Ogede (2026) examine the determinants of sustainable economic development (SED) in ECOWAS from 1990 to 2023 using CS-ARDL, AMG, and D-H causality estimators. Their findings indicate that remittances consistently enhance SED in both the short and long run, whereas FDI exhibits mixed effects, and both globalization and natural resource rents impede SED—underscoring governance deficits. Causality tests reveal bidirectional relationships between FDI and SED, while remittances respond to rather than drive SED. Adeleke et al. (2026) focus on female migration and remittances in ECOWAS (1990–2020), employing Prais–Winsten and FGLS estimators. Their results show that a 1% increase in female migration raises household poverty by 0.476%, while a 1% rise in remittances reduces poverty by 0.414%, with the joint moderating effect yielding a 0.009% poverty reduction. These adverse migration effects imply distress-driven movement, necessitating policies that generate domestic employment and skills development for women. Conversely, Sokunbi et al. (2025), using panel ARDL on 16 West African countries (1991–2023), find that migration positively impacts sustainable growth, though remittances exert a significant negative long-term effect,

highlighting the need for effective migration management and productive channeling of funds into SMEs, infrastructure, and education.

3.0. Methodology

3.1. Theoretical Framework

The theoretical basis of this model is endogenous growth theory, as formalized within the Romer (1990) framework. It posits long-run economic growth as a function of forces internal to the economy—particularly those that shape the opportunities for, and motivations to, create technological knowledge. Formally, the accumulation of knowledge is governed by the R&D production function $\dot{A} = \lambda A_A A$ where A denotes the existing stock of technological ideas, H_A is the human capital allocated to the research sector, and λ is the productivity parameter of the research process. This specification yields a long-run growth rate of technology given by $gA = \dot{A}/A = \lambda H_{A,}$ which in turn directly determines the growth rate of total factor productivity. The theory embeds this technological progress into the final goods sector through the production function $Y = H_Y^{\alpha} L^{\beta} \int_0^A xi^{1-\alpha-\beta}\, di$ wherein expansions in the variety of intermediate inputs xi —driven by increases in A—raise aggregate output and productivity. Endogenous growth theory thereby elucidates the specific channels through which economic factors can influence the pace of technological progress and, consequently, the long-term growth rate. Crucially, because innovations arise from research and development expenditures undertaken by profit-seeking firms, the allocation of human capital H_A to R&D is determined by the equilibrium arbitrage condition $\lambda V = w_H$, where$V$ represents the discounted value of a patented innovation (derived from future monopoly rents) and w_H is the prevailing wage for research labor. Hence, economic policies with respect to trade, competition, education, taxation, and intellectual property can systematically alter the private costs and benefits of R&D—by affecting $V, w_H, or\ \lambda -$ and thereby shift the equilibrium level of H_A and the endogenous rate of innovation. Consequently, the relevant explanatory variables of interest can be incorporated into the structural framework as shift parameters operating directly through the technological knowledge stock—defined here as the aggregate level of total factor productivity, A (Rao, 2010).

Within the Romer (1990) endogenous growth framework, both domestic investment (DIVT) and remittances (REMT) operate as structural shift parameters influencing the technological frontier. DIVT accelerates productivity by embodying new technologies in physical capital and improving research efficiency (λ). REMT drives growth by relaxing liquidity constraints to expand human capital allocated to R&D (H_A)and by lowering country risk, which raises the net present value of innovation (V) (Chami, Fullenkamp, &Jahjah, 2005).Synthesizing these mechanisms, and following the reduced-form specification of the technology frontier advanced by Rao (2010), the evolution of total factor productivity$A$can be explicitly expressed as a function of these key covariates. Both

DIVT and REMT serve as shift parameters that alter either the research efficiency λ, the effective human capital stock H_A, or the discounted value of innovation V Hence, the long-run growth rate of technology—and by extension, per-capita output—is theoretically contingent upon the synergistic interplay between physical capital deepening (DIVT) and external financial flows (REMT), rendering them indispensable determinants in the empirical specification of the growth model as depicted below:

$$A_t = A_0 e^{g^T} REMT_t^{\beta_1}, DIVT_t^{\beta_2} \quad (1)$$

Where; REMT is remittance inflow and DIVT captures domestic investment.

Transformation and further simplification of the above model result in the Dynamic Ordinary Least Square equation as specified below;

$$RGPC_{it} = \beta_o + \sum_{j=i}^{n} \beta_j RGPC_{i,t-j} + \beta_{it} X'_{it} + \mu_{it} \quad (2)$$

Where; $RGPC_{it,}$= real gross domestic product per capital (a proxy for economic growth rate), β_o= overall intercept term, $RGPC_{i,t-j}$= lagged of real gross domestic product per capital, X'_{it}= vector of explanatory variables, μ= error term, i= country index, t= time in years here.

3.2. Model Specification

From equation (2) and in line with the hypothesis of this study, the following dynamic models are specified in functional and explicit forms;

$$RGPC_{it} = \beta_o + \beta_1 RGPC_{t-1} + \beta_2 REMT_{it} + \beta_3 LABF_t + \beta_4 CAPT_{it} + \beta_5 INFL_{tt} + \beta_6 POPG_{it} + \mu_{it} \quad (3)$$

To properly capture the interaction effect of remittances and domestic investment on Economic Growth, the following models is configured:

$$RGDP_{it} = \beta_0 + \beta_1 RGDPC_{i-1} + \beta_2 REMT_{it} + \beta_3 DIVT_{it} + \beta_4 LABF_{it} + \beta_5 CAPT_{it} + \beta_6 INFL_{it} + \beta_7 POPG_{it} + \prod(\alpha_1 DIVT_{it} * REMT_{it}) + \mu_{it} \quad (4)$$

Where the variables of interest are represented as RGPC = real gross domestic product per capital; $RGPC_{t-1}$ = one period lag of real gross domestic product per capital; REMT = remittances inflow; $REMT_{t-1}$ = one period lag of remittances inflow; DIVT = domestic investment; $DIVT_{t-1}$ = one period lag of domestic investment. The control variables include: LABF = labour; CAPT = Capital; INFL =inflation rate (level of macroeconomic stability); POPG = population growth rate,

μ_{it} = error term which consist of unobserved individual specific effects and observed specific errors and t = time trend. Equation 3 formalizes the direct level-effect of remittance inflows on economic growth within the ECOWAS sub-region, while Equation 4 extends this baseline specification by introducing an interaction term—thereby capturing the conditional (moderating) influence of domestic investment on the remittance-growth nexus.

3.3. Variable Definitions, Measurement, and Expected Sign Predictions

Economic growth is proxied by real GDP per capita growth, a choice underpinned by its standard indicative power and frequent empirical application (Jung, 1986; Arestis & Demetriades, 1996; Orji et al., 2014). Constructed upon the Solow (1956) framework, the model specifies physical capital (K), labour (L), and technology (A) as the primary factors governing the steady-state growth path, with capital accumulation maintaining its status as a fundamental expansionary driver. Turning to the explanatory variables, remittances—understood as cross-border private monetary transfers by migrants—are hypothesized to bear a positive sign, premised on their complementary role in financing both consumption and investment outlays (Ocharo, 2015; Kumar & Stauvermann, 2014). Similarly, labour quality, approximated by the secondary school enrolment ratio, is anticipated to exert a positive effect, underscoring its indispensability in the production process and aligning with robust empirical support (Kularatne, 2002; Fedderke, 2000).

3.4. Estimation Techniques and Data Sources

The estimation technique employed is the Fully Modified Ordinary Least Square which is among the two main OLS-based estimators; FMOLS (Fully Modified Ordinary Least Square) and DOLS (Dynamics Ordinary Least Square). The main difference between FMOLS and DOLS is on the treatment of serial correlation in regression analysis. While FMOLS correct for serial correlation with Newey-West, DOLS employs more lagged and lead variables in correcting for serial correlation.

FMOLS was developed by Hansen and Philips (1990) and extended by Phillips (1995) to the vector case (VAR) integrating both stationary and non-stationary explanatory variables in the long-term relationship. The FMOLS estimates directly cointegrating relationships with a modification of the ordinary least square (OLS) by adjusting for endogeneity and serial correlation issues that may arise using the ordinary least square estimation technique. FMOLS is mainly employed having established a cointegration among variables in a model to establish the long run association. The FMOLS method is advantageous to the Engle-Granger (EG) techniques in addresses simultaneity biases. With the fully modified corrections, the FMOLS is helps to bring to fore the relevance and magnitude of the influence of one variable to another. This no doubt accord FMOLS as technique with less of a "black box" employed in most empirical analysis (Philips, 1995). Researches such as Hansen and Phillips 1990; and Hargreaves, 1994; attest to the usefulness of FMOLS in

most empirical analysis. This implies that the FMOL estimator performs better compared to other techniques of estimating cointegrating relations

3.5. Data Sources

This study employs annual secondary data for a panel of fifteen ECOWAS member countries. The relevant variables are sourced from the World Bank's World Development Indicators (WDI, 2022) and the International Monetary Fund (IMF, 2022). These databases were selected for their comprehensive coverage of country-level data—a rationale previously endorsed by Balde (2010).

4.0. Result Presentation and Discussion

4.1. Descriptive Statistics

Descriptive statistics showing the basic characteristics and statistics for the variables in the study are reported in table 4.1 for ECOWAS.

Table 4.1: Descriptive Statistics

Variables						*Normality Test*	
	Obs	***Mean***	***std. dev.***	***Skewness***	***kurtosis***	***JB-stat***	***Prob.***
real GDP per capita	343	4255.646	4.021	-1.394	14.281	1652202.000	0.000***
remittance inflows	343	5.012302	4.918	1.509	6.199	328.745	0.000***
domestic investment	343	18.27715	7.134	0.788	5.665	45.453	0.000***
labour force participation	343	64.2078	7.881	0.183	2.401	8.129	0.017**
capital stock	343	19.51792	6.912	1,000	5.468	130.129	0.000***
inflation rate	343	6.922346	6.19	3.065	21.554	12102.590	0.000***
population growth	343	841.2081	0.696	-0.519	3.348	1652202.000	0.000***

*JB-stat : Jarque-Bera Statistics; Obs = Number of observations; *** = 1% significance level; ** = 5% significance level; Prob. = probability value. Note: real GDP per capita growth (annual percentage); Remittance inflows (percentage of GDP); Domestic Investment (percentage of GDP); Labor force participation rate, total (% of total population ages 15+), Gross fixed capital formation (% of GDP), inflation rate (annual percentage), population growth rate (annual percentage*)
Source: Author's Computation.

Table 4.1 reports summary statistics for the core variables. Real GDP per capita averages 4255.6 over the period, with a modest standard deviation (4.02) indicating low temporal dispersion. The negative skewness signals observations lie predominantly above the mean, while kurtosis exceeds 3, denoting a leptokurtic (peaked) distribution; the Jarque–Bera statistic is strongly significant at 1%, rejecting normality. Remittances (mean 5.0%, std 4.9) and domestic investment (mean 18.27715, std 7.1) exhibit analogous patterns—low skewness, excess kurtosis, and non-normality at the 1% level. The remaining variables (labour force participation, capital stock, inflation, and population growth) display broadly similar features; however, labour force participation departs from this pattern, with kurtosis below 3 (platykurtic) and a Jarque–Bera statistic significant only at 5%, in contrast to the 1% significance observed elsewhere.

4.2. Cross- Sectional Dependence Test

The implementation of cross-sectional dependence tests stems from the recognition that national economies within a given geographical bloc are rarely isolated, given that bilateral trade in goods and services, alongside deeper financial integration, generates palpable spillover effects across borders. This phenomenon is not, however, limited to direct commercial interactions; it may equally originate from common external shocks or from inherent misspecification errors within the empirical model itself (Chudik and Pesaran, 2013). Given that unaccounted cross-sectional dependence compromises the reliability of standard panel estimators, conducting these diagnostic checks is standard practice to safeguard against inferential biases (Breusch and Pagan, 1980; Phillips and Sul, 2003).

Table 4.2: Cross-Section Dependence Test for Variables

Variables	*Breusch-Pagan LM*	*Pesaran scaled LM*	*Bias-corrected scaled LM*	*Pesaran CD*
Rgpc	142.151*** (0.009)	2.564* (0.010)	1.987** (0.047)	1.465 (0.143)
Remt	329.124*** (0.000)	15.466*** (0.000)	14.889*** (0.000)	1.201 (0.230)
Divt	191.606*** (0.000)	5.976*** (0.000)	5.399*** (0.000)	2.792*** (0.005)
Labf	635.092*** (0.000)	36.580*** (0.000)	36.003*** (0.000)	8.344*** (0.000)
Capt	304.044*** (0.000)	13.735*** (0.000)	13.158*** (0.000)	-0.415 (0.678)
Infl	170.290*** (0.000)	4.505*** (0.000)	3.929*** (0.000)	4.362*** (0.000)
Popg	460.202*** (0.000)	24.511*** (0.000)	23.934*** (0.000)	8.002*** (0.000)

*degree of freedom = 105. *** = 1% significance level; Prob. = probability value*

Table 4.2 presents the results of cross-sectional dependence tests—Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM, and Pesaran CD—applied to each variable across ECOWAS member states. With 105 degrees of freedom, the associated p-values (denoted Prob.) are evaluated against conventional significance levels, where *** indicates 1% significance. For the Breusch-Pagan LM test, all variables yield p-values below 1%. The same holds for the Pesaran scaled LM and the bias-corrected variant, with the sole exception of real GDP per capita, which is significant at 10% and 5% respectively. By contrast, the Pesaran CD test registers significance at the 1% level for only four variables—domestic investment, labour force participation, inflation, and population growth. Collectively, the evidence points to the presence of cross-sectional dependence among the sample countries. Although such dependence can be addressed through procedures like first-differencing or

Cochrane-Orcutt, its existence does not necessarily compromise estimation efficiency if the chosen estimator explicitly accommodates slope heterogeneity, reflecting the diverse structural characteristics of individual economies (Beqiraj, Fedeli& Forte, 2018; Ade, Rossouw & Gwatidzo, 2019).

4.3. Test of Stationarity

The importance of stationarity of time series used in regression borders on the fact that a non-stationary time series is not amenable to generalization to other time periods apart from the present. This makes forecasting based on such time series to be of little practical value. Moreover, regression of a non-stationary time series on another non-stationary time series may produce spurious estimates

Table 4.3.Panel Unit Root Tests for Variables

Variables (levels and first difference(d))	***homogeneous unit (assume common unit root process) root***		***heterogeneous unit root (assume individual unit root process)***		
	LLC	**BRT**	**IPS**	**ADF-F**	**PP-F**
Rgpc	-5.601*** (0.000)	-1.996** (0.023)	-2.516*** (0.006)	52.291*** (0.007)	84.187*** (0.000)
d(rgpc)	-3.094*** (0.001)	2.366 (0.991)	-5.553*** (0.000)	57.480*** (0.002)	127.466*** (0.000)
Remt	-1.352 (0.088)*	2.911 (0.998)	0.710 (0.761)	28.022 (0.569)	41.622* (0.077)
d(remt)	-3.094*** (0.001)	2.366 (0.991)	-2.786*** (0.003)	57.480** (0.002)	127.466*** (0.000)
Divt	-9.498*** (0.000)	2.025 (0.979)	-2.860** (0.002)	51.147*** (0.009)	59.909*** (0.001)
d(divt)	-2.470*** (0.007)	0.808 (0.791)	-0.966 (0.167)	40.810* (0.090)	122.737*** (0.000)
Labf	7.315*** (0.000)	2.850 (0.998)	4.500 (1.000)	22.031** (0.053)	7.373 (1.000)
d(labf)	8.930 (1.000)	9.156 (1.000)	2.291* (0.089)	54.627** (0.004)	37.725 (0.157)
Capt	-6.274*** (0.000)	1.767 (0.961)	-2.441*** (0.007)	52.352*** (0.007)	40.906* (0.089)
d(capt)	-3.911*** (0.000)	1.156 (0.876)	-2.776*** (0.003)	56.870*** (0.002)	113.181*** (0.000)
Infl	-2.579*** (0.005)	1.246 (0.894)	-0.270 (0.394)	33.292 (0.310)	53.417*** (0.005)
d(infl)	-3.911*** (0.000)	1.156 (0.876)	-2.776*** (0.003)	56.870*** (0.002)	113.181*** (0.000)

Popg	-4.753*** (0.000)	2.158 (0.985)	1.332 (0.909)	32.931 (0.326)	11.954 (0.999)
d(popg)	-2.867*** (0.002)	3.532 (1.000)	-0.846 (0.199)	41.944* (0.072)	22.645 (0.830)

LLC = Levin, Lin and Chu t; BRT = Breitung t-stat; IPS= Im, Pesaran and Shin W-stat; ADF-F= ADF Fisher chi-square; PP-F= PP – Fisher chi-square. ***/**/* = 1%/5%/10% significance levels. Note: Probability value for Fisher test iscomputed using an asymptotic chi-square while the probabilities values of other tests were computed by assuming asymptotic normality. probability values in parenthesis*

Source: Author's Computation.

Table 4.3 reports panel unit root tests, comprising homogeneous (LLC and Breitung) and heterogeneous (IPS, ADF-Fisher, and PP-Fisher) procedures. Under LLC, all variables are stationary either in levels or first differences at the 1% significance level; Breitung identifies only real GDP per capita as level-stationary at 1%. Among the heterogeneous tests, IPS shows all variables except population growth rate to be stationary at levels or first differences, while ADF-Fisher finds all variables stationary without exception. PP-Fisher, however, indicates stationarity for all variables except labour force participation and population growth rate.

4.4. Panel Cointegration Test

Co-integration analysis helps to establish the existence of a long run relationship among the variables as employed in the model. This is often conducted after conducting stationary test for the existence or other wise of a unit root.

Table 4.4: Panel Cointegration Tests

Kao Residual Cointegration Test (Homogeneous Cointegration Test)		
	t-Stat.	**Prob.**
ADF	-7.968	0.000***
Residual variance	29.797	
HAC variance	22.657	
ADF Test Equation Robustness Check		
RESID(-1)	-1.305	0.000***
D(RESID(-1))	0.309	0.000***
Pedroni Residual Cointegration Test(Heterogeneous Cointegration Test)		
Common AR Coefficients (within dimensions)		
Panel rho-Statistic	3.198	0.999
Panel PP-Statistic	-10.435	0.000***
Panel ADF-Statistic	-1.282	0.100
Individual AR Coefficients (between dimensions)		
Group rho-Statistic	4.719	1.000
Group PP-Statistic	-12.281	0.000***
Group ADF-Statistic	-1.553	0.060*

****/**/* = 1%/5%/10% significance levels. AR = Autoregressive/ REDID = Residual/ D = difference operator*

Source: Author's Computation.

Table 4.4 presents the panel cointegration test results. The within-dimension columns report statistics derived from estimators that pool the autoregressive coefficient across countries, whereas the between-dimension columns display statistics based on averaging individually estimated country-specific coefficients. The within-group, between-group, and ADF test statistics collectively indicate that the null hypothesis of no cointegration is rejected, predominantly at the 1% significance level.

4.5. Panel Fully Modified Ordinary Least Square (FM-OLS) Estimates

Table 4.5 reports the result of the effects of remittances on economic growth in ECOWAS sub-region (model 1) and the effect of the interaction of remittances inflow and domestic investment on economic growth in ECOWAS sub region (model 2).

Table4.5: Panel Fully Modified Ordinary Least Square (FM-OLS)Estimates

Variables	Model 1	Model 2
remittance inflows	0.222*** (0.001)	0.171*** (0.008)
domestic investment	0.572*** (0.001)	0.572*** (0.000)
remittance*domestic investment		0.151** (0.018)
labour force participation	5.339*** (0.000)	5.482*** (0.000)
capital stock	0.593*** (0.000)	0.580*** (0.000)
inflation rate	-0.119*** (0.001)	-0.116*** (0.000)
population growth	0.746*** (0.000)	0.788*** (0.000)
Diagnostic Statistics		
R-squared Adjusted R-squared	0.217 0.117	0.218 0.112
Long-run variance	0.193	0.170

****/**/= 1%/5%/ significance levels*

Source: Author's Computation

Table 4.5 presents the estimation results for both models. In Model 1, remittance inflows exert a positive and statistically significant effect on economic growth at the 1% level, with a coefficient of 0.222—indicating that a one-unit increase in remittances raises economic growth by approximately 0.222 units. Domestic investment likewise displays a positive and highly significant (1%) impact, with a unit

increase yielding a 0.572-unit rise in growth. Labour force participation also demonstrates a strong positive effect at the 1% level, where a one-unit increase corresponds to over 5 units of growth, underscoring the productivity contribution of labour in the region. Capital stock exerts a positive effect (0.59 units per 1% increase, significant at 1%), while inflation exhibits a growth-inhibiting influence: a one-unit rise reduces growth by about 0.119 units, reflecting inflationary pressures beyond the single-digit threshold. Population growth shows a positive coefficient of 0.764 (significant at 1%), suggesting a favourable demographic effect.As argued by Bloom, Canning, and Sevilla (2023), a nation can experience accelerated economic growth when its working-age population exceeds the share of dependent children and older adults, provided that appropriate policy measures are in place. This demographic dividend is particularly evident within the Economic Community of West African States (ECOWAS), where population growth effectively augments the labor supply, thereby facilitating the realization of these anticipated economic benefits

In Model 2, which incorporates an interaction term between remittances and domestic investment, the direct effect of remittances remains positive (0.171, 1% significance), as does that of domestic investment (0.572, 1% significance). The interactive term itself is positive and statistically significant at the 5% level, with a coefficient of 0.151, indicating that remittances and domestic investment mutually reinforce each other to spur economic growth. Labour force participation (coefficient >5, 1% significance), capital stock (0.58 per 1% increase, 1% significance), and population growth (0.788, 1% significance) all retain their positive and significant effects, while inflation continues to exert a negative impact (−0.116, 1% significance), reaffirming its dampening effect on growth.Synthesizing the above estimates, both models exhibit a consistent pattern, differing only by the inclusion of the interaction term in Model 2. This consistency extends to the diagnostic statistics: Model 1 yields an R^2 of 0.217 and an adjusted R^2 of 0.117, while Model 2 records an R^2 of 0.218 and an adjusted R^2 of 0.112—indicating that approximately 21% and 11% of the systematic variation in the dependent variable is explained by the respective explanatory variables.

4.6. Policy Implications of Empirical Findings

Several policy insights emerge for the ECOWAS sub-region. First, cross-sectional dependence confirms economic interdependence among members, necessitating bias-corrected estimation techniques. Remittances exert a significant—though conditional—positive growth effect (cf. Bucevska, 2022; Olubiyi, 2014 vs. Lim & Simmons, 2015; Jongwanich, 2007). At the micro-level, they ease welfare deficits by financing consumption, education, and housing; however, aggregate gains remain suboptimal, as inflows often finance imported goods and foster dependency rather than productive investment—a diversion exacerbated by inflationary pressures and macroeconomic instability that deter risk-adjusted capital allocation.Domestic investment robustly drives growth, conditional on stable

macroeconomic fundamentals (e.g., Iheonua, 2019; Ouedrago&Kouaman, 2014). A key contribution is the positive interaction between remittances and investment, confirming a pass-through channel wherein remittances complement domestic capital formation.

5. Summary, Recommendations and Conclusion

5.1. Summary of Findings

Building upon the Endogenous Growth Model, the empirical specification, estimated via the Fully Modified Ordinary Least Squares (FMOLS) technique, yields several key findings that directly address the research questions. First, remittance inflows exert a positive and statistically significant effect on economic growth across the ECOWAS sub-region. Second, when interacted with domestic investment, these inflows produce a significant positive joint effect, revealing a complementary role in which remittances reinforce the growth contribution of domestic capital formation. Collectively, these results underscore the conditional and interactive nature of remittances, domestic investment, and their combined influence on regional growth dynamics.

5.2. Recommendations

Based on the empirical findings, several policy recommendations emerge for stakeholders across the ECOWAS sub-region. First, to fully realize the positive growth effects of remittance inflows, authorities should prioritize measures that facilitate cross-border transfers and reduce associated frictions, notably through cost reduction and expanded formal remittance corridors. The policy rationale is grounded in observable multiplier effects: for every dollar of diaspora investment directed toward manufacturing or agro-processing, the government captures economic spillovers exceeding 50 percent of the original sum. This benefit-cost dynamic directly validates the complementarity between diaspora-financed investment and domestic capital formation, reinforcing their synergistic contribution to productive capacity. Policy efforts should simultaneously focus on redirecting remittance flows toward infrastructure and diaspora investment through diaspora bonds, public-private partnerships, and fiscal incentives. Crucially, domestic investment (DIVT) functions as the key transmission channel through which these external resources are converted into productive capital. Furthermore, reducing remittance costs from the Sub-Saharan African average of 7.8 percent to the global target of 3 percent would liberate approximately 5 percent of remitted value for reallocation toward productive capital formation, thereby directly augmenting domestic investment (DIVT) and amplifying developmental outcomes. Complementing these measures, a stable macroeconomic environment is indispensable: concrete actions to curb persistent inflation and exchange rate volatility would not only spur domestic investment but also amplify the growth dividend from remittances. In parallel, strengthening institutional frameworks and upholding sound macroeconomic fundamentals are essential to sustain diaspora confidence, as prolonged instability tends to erode investor sentiment and diminish developmental payoffs. Finally, regional policy coordination across

ECOWAS member states should be enhanced, with harmonised frameworks that enable collective action to optimise remittance utilisation and ensure that the resulting growth benefits are equitably distributed throughout the sub-region. Together, these complementary strategies offer a coherent pathway for translating remittance-driven growth potential into tangible and sustainable developmental outcomes.

5.3. Conclusion

This study empirically examines the remittances–investment–growth nexus in ECOWAS from 2000 to 2022, over the 23-year study period. Preliminary diagnostics confirm cross-sectional dependence, mixed stationarity, and long-run cointegration, justifying the application of FMOLS estimation, which effectively accounts for endogeneity and serial correlation. The findings establish two key outcomes: remittances exert a positive growth effect and their interaction with domestic investment amplifies this effect, reflecting a complementary synergy. These effects are particularly noteworthy for policy design and targeted interventions. Overall, these results reject the stated null hypotheses and affirm the study's central propositions, thereby offering policy-relevant insights.

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