
Effect of Foreign Remittances on Sub-national Economic Growth: a State-specific Analysis of Kerala

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Abstract:

Foreign remittances have emerged as a vital and sustained source of external finance for developing economies, and Kerala represents one of the most significant subnational examples of remittance-driven development in India. Over the last five decades, large-scale emigration from the state, particularly to the Gulf Cooperation Council (GCC) countries has profoundly influenced economic growth of Kerala and social landscape. While remittances have played a crucial role in enhancing household welfare, financing essential consumption and improving living standards, their long-run impact on economic growth remains an area requiring deeper empirical investigation. Against this background, the present study examines the long-run relationship between foreign remittances and Kerala's economic growth using annual time-series data from 1972 to 2023. Employing the Johansen cointegration framework and Error Correction Mechanism (ECM), the study finds evidence of a stable long-run equilibrium relationship between Net State Domestic Product (NSDP) and inward remittances. Though short-run adjustments were found to be statistically insignificant, the existence of cointegration indicates that remittance inflows have a meaningful long-term association with Kerala's growth trajectory. Trend

analysis further shows a consistent rise in remittances at an average annual rate of 13 percent, though their share in NSDP has displayed cyclical fluctuations in response to both global migration patterns and domestic economic conditions. The findings underscore the need for policy interventions aimed at channelising remittance income into productive avenues, strengthening financial inclusion and enhancing institutional mechanisms to ensure that remittances contribute to sustainable and broad-based economic development in Kerala.

Key Words: *Foreign Remittances; Economic Growth; Kerala Economy; Cointegration; NSDP; Migration; Time-Series Analysis.*

1. Introduction

Foreign remittances have emerged as one of the largest and most stable sources of external finance for developing economies. Unlike other capital inflows, foreign remittances are counter-cyclical, privately driven transfers that directly reach households, thereby influencing both microeconomic welfare and macroeconomic performance (Constantinescu & Schiff, 2014). The discussion on whether remittance flows translate into sustained economic growth remains active in economic literature, with empirical findings showcasing the role of institutional setup, level of financial development, and structural features in shaping the direction and magnitude of their impact.

Over the decades, millions of Indians have migrated abroad in search of better employment, education, and quality of life. India's emigration patterns have experienced a marked structural shift, transitioning from colonial-era indentured labour flows to contemporary movements dominated by highly skilled professionals and students, reflecting broader changes in global labour demand and human capital mobility (Sadiq & Tsourapas, 2024). The International Migrant Stock 2024 dataset confirms that India is one of the top countries in the world in terms of the number of emigrants. According to the United Nations Department of Economic and Social Affairs (2024), the number of Indian-born individuals living abroad has been steadily increasing. In 1990, it was 6.5 million, which increased to 8.4 million in 2000, and in 2024 it reached 18.5 million, reflecting India's position as the country with the largest diaspora globally.

According to the Ministry of External Affairs (2025), Government of India, there are over 35.4 million Non-Resident Indians (NRI) and Persons of Indian Origin (PIO) living across various countries. These emigrants are

spread across continents, with large populations in the Gulf Cooperation Council (GCC) countries, North America, Europe, Southeast Asia, and Oceania. There were 132,675 emigration clearances issued in the year 2021. In 2022, it was 373,425, and in 2024 it increased to 387,075 (Ministry of External Affairs, 2024).

India's inward remittances have witnessed a substantial rise, more than doubling from US\$ 55.6 billion in 2010–11 to US\$ 118.7 billion in 2023–24. Over this period, remittance inflows have played a pivotal role in financing approximately half of the country's merchandise trade deficit and have served as a critical buffer against external economic shocks. Notably, remittance receipts have consistently exceeded gross inward foreign direct investment (FDI) flows, underscoring their reliability as a stable source of external financing. Between 2021–22 and 2023–24, remittances grew at an impressive average annual rate of 14.3 per cent. As a share of GDP, these inflows have remained relatively stable, hovering around 3 per cent since 2000. Maharashtra accounted for the largest share of remittance receipts at 20.5 per cent, though this marked a decline from 35.2 per cent in 2020–21. Kerala followed closely, with its share rising significantly to 19.7 per cent from approximately 10 per cent during the same period, while Tamil Nadu registered a share of 10.4 per cent (Gajbhiye et al., 2025).

Within India, foreign remittances have assumed striking economic significance at the subnational level. Kerala, in particular, presents a unique case. Since the late 1970s, large-scale migration from Kerala, especially to the Gulf Cooperation Council (GCC) countries, has positioned the state as one of the highest remittance-dependent regions in the world. Successive migration waves have altered the socioeconomic fabric of the state, transforming household incomes, consumption patterns, savings behaviour, investment allocation, and labour market dynamics (Kannan & Hari, 2002;2020). While remittance inflows have boosted household welfare, reduced poverty, and financed education and better housing, conflicting views exist regarding their long-term developmental sustainability (Stojanov et al., 2019).

Against this background, a state-specific analysis becomes essential for two reasons. First, national-level assessments tend to mask the heterogeneity of remittance effects across highly diverse regions within India. Second, Kerala's distinct migration–development context offers an opportunity to understand how remittance-dependent economies can harness private cross-border flows

for productive transformation. The present study seeks to empirically assess the extent to which foreign remittances have affected Kerala's growth performance.

1.1. Review of Literature: The role of foreign remittances in shaping economic outcomes has attracted considerable attention in development economics. The literature identifies multiple channels through which remittances affect household welfare, macroeconomic growth, and labour markets, with the effects often conditioned by institutional and financial contexts. This section organizes the evidence thematically, focusing on (a) household welfare, (b) macroeconomic growth, (c) conditional effects, and (d) Kerala-specific migration literature.

1.1.1. Foreign Remittances and Household Welfare: A substantial body of research highlights the role of remittances in stabilizing household consumption and improving welfare. Ratha (2003) emphasises that remittances act as a lifeline for developing countries, smoothing consumption during economic shocks and supporting expenditures on education and health. Adams and Page (2005) provide cross-country evidence showing that remittances reduce poverty and enhance household welfare, an argument corroborated by Lopez-Cordova (2006) in the Mexican context. Similarly, Cox-Edwards and Ureta (2003) and Azizi (2018) note that remittances finance schooling and health, enhancing human capital accumulation. Other studies highlight the microeconomic mechanisms through which remittances improve welfare. Giuliano and Ruiz-Arranz (2009) and Aggarwal, Demirgüç-Kunt, and Martínez Pería (2011) show that remittances relax borrowing constraints, allowing households to invest in small businesses or housing. Parida, Mohanty, and Raman (2015) demonstrate how rural Indian households utilize remittances to augment both consumption and investment in human capital. In a similar vein, Mushi (2024) and Thapa-Parajuli, Kshetri, and Thapa (2025) provide evidence from Tanzania and Nepal, respectively, documenting improvements in income stability and poverty reduction due to remittance inflows. McKenzie and Sasin (2007) offer a comprehensive review confirming that remittances enhance household consumption, facilitate investment, and act as a buffer against income shocks. Nevertheless, some studies caution against potential negative effects. Chami, Fullenkamp and Jahjah (2003) argue that remittances may reduce labour supply at the household level and create moral hazard, thereby limiting productive investment. Acosta et al. (2006) also note that large inflows can affect labour participation and potentially disincentivize work among recipients.

1.1.2. Foreign Remittances and Macroeconomic Growth: Remittances also have important macroeconomic implications, although their effects on growth are context-specific. Giuliano and Ruiz-Arranz (2009) and Catrinescu et al. (2009) find that remittances can boost economic growth, particularly in economies with underdeveloped financial systems. Ratha (2003) and McKenzie & Sasin (2007) argue that remittances contribute to GDP growth, improve financial stability, and support development in capital-scarce environments. Conversely, studies report mixed or conditional outcomes. Chami, Fullenkamp, and Jahjah (2003) and Acosta, Lartey and Mandelman (2009) emphasize that remittances may appreciate the real exchange rate, harming tradable sectors, and may have negligible growth effects in economies with strong financial institutions. Shah (2024), in the context of India, finds that remittance inflows exert asymmetric effects on output, exchange rates, inflation, and stock returns, illustrating the nuanced macroeconomic consequences of remittance shocks. Rajan (2012) and Aggarwal, Demirgüç Kunt, and Pería (2011) argue that remittances are more effective in promoting growth where financial infrastructure is weak, acting as a substitute for underdeveloped banking systems.

1.1.3. Conditional Effects: Institutions, Finance, and Labor Markets: The literature highlights that the effects of remittances are not automatic but conditional on institutional, financial, and labour market settings. Giuliano and Ruiz-Arranz (2009) argue that financial development mediates the growth impact of remittances, while Catrinescu et al. (2009) emphasize the role of sound institutions and macroeconomic policies. Labour market effects of foreign remittances are particularly important. Remittances can reduce local labour supply (Chami, Fullenkamp & Jahjah 2003; Acosta, Lartey & Mandelman, 2009) but may also finance skill acquisition and entrepreneurial activity. McKenzie & Sasin (2007) shows that remittances influence labour market dynamics in the origin country, affecting wages and employment patterns. Anderson (2007), Sousa and García-Suaza (2018) further demonstrate how remittances can alter labour force participation, while Anwar, Mang, and Plaza (2025) illustrating regional heterogeneity in labour market responses and how remittances reshape work and migration decisions.

1.1.4. Kerala-Specific Migration Literature: Kerala presents a distinctive migration–development trajectory in the Indian context, where large-scale international migration, predominantly to the Gulf region and the resulting remittance inflows have played a central role in shaping economic and social

outcomes since the 1980s. Evidence from the long-term macro perspective indicates that remittances significantly contributed to the rise in per capita income and consumption levels in the state, enabling Kerala to surpass the national average by the end of the 1990s, while also generating exceptionally high savings rates comparable to those observed in East and Southeast Asian economies (Kannan & Hari, 2020). The magnitude of remittances has been such that, at various points, they exceeded government expenditure and value added in manufacturing and industry, underscoring their macroeconomic importance. At the sectoral level, remittance-induced consumption demand has driven a services-led growth process, particularly in non-tradable activities such as trade, transport, construction, tourism, telecommunications, health and education, while the manufacturing sector remained relatively weak in responding to rising household demand (Pushpangadan, 2017). Micro- and meso-level analyses based on Kerala Migration Survey and Migration Monitoring Study data further confirm the existence of a long-run relationship between remittances and economic growth, with short-run effects being relatively modest due to the predominance of remittance use for housing and household consumption (Prakash, Nauriyal, & Noushad, 2017). Remittances have also been shown to exert significant labour-market effects, including shifts in employment structure, rising reservation wages, and changes in labour force participation patterns of left-behind household members, particularly women, whose market participation tends to decline alongside increased engagement in non-market and household activities (Zachariah & Rajan, 2011a; Khan & Valatheeswaran, 2016). Distributional studies suggest that while remittances contribute to poverty reduction, asset accumulation and consumption smoothing, their long-term effects on inequality are more nuanced and depend on access to education, healthcare and migration networks (Pelletier, 2012). The vulnerability of Kerala's remittance-dependent economy has also been highlighted during periods of external shocks, such as the global recession, which led to return migration and temporary disruptions in remittance flows with measurable socio-economic consequences (Zachariah & Rajan, 2011b). More recent evidence points to emerging concerns regarding the limited role of remittances in strengthening fiscal sustainability, despite their large inflows, thereby raising questions about their productive absorption and long-term development impact (Sabu & Mohandas, 2025). Collectively, the literature characterises remittances in Kerala as a powerful driver of consumption-led growth and social welfare improvements, while simultaneously

revealing structural constraints, labour-market adjustments and fiscal challenges that condition their developmental effectiveness.

1.2. Statement of the Problem: Kerala has experienced significant economic and social changes because of remittance inflows. These changes include increased household income, better access to education and healthcare, and an improved standard of living. However, concerns remain about the long-term impact of these inflows on the state's economic growth trajectory. Despite the magnitude of remittances, Kerala still faces structural challenges such as limited industrial development, underemployment, and a heavy reliance on the service and construction sectors. Furthermore, remittances are vulnerable to global economic fluctuations and changing immigration policies in host countries. This poses risks to an economy that has come to rely heavily on external income. There is a need to move beyond descriptive studies and examine the long-run relationship between remittance inflows and economic growth. This research seeks to fill that gap by using empirical analysis to assess whether remittances have contributed to sustainable economic growth in the subnational context of Kerala.

1.3. Objectives: The purpose of the present study is to investigate the long-run relationship between remittances and economic growth in Kerala. The specific objectives are:

1. To examine the trends in foreign remittances in Kerala.
2. To analyse the long-run relationship between foreign remittances and economic growth in Kerala.

2. Methodology and materials

This study adopted a quantitative and analytical approach to examine the dynamics of emigration, remittances, and return emigration in Kerala, along with their relationship with the state's economic growth. For the analysis of trends in foreign receipts, the study period was 2000–01 to 2023–24, as the period earlier than this did not have any current relevance. The analysis of the relationship between NSDP and foreign remittances was based on data for a longer period from 1971–72 to 2023–24, facilitating a long-run analysis. The analysis was entirely based on secondary data drawn from various credible sources. The data on foreign remittances to Kerala for the period 1972–2020 were taken from Hari and Kannan (2020), as no official estimates were available for the period. For the period after 2020, foreign remittance data were taken from the Kerala Migration Survey (KMS) reports published

by the Centre for Development Studies (CDS). The NSDP data were taken from the RBI database.

Trend analysis was used to capture changes over time in key indicators such as emigration numbers and remittance inflows (in India as well as Kerala). To analyse the trends in emigration and remittances, the log-quadratic function with the following specification was used.

$$\text{Log}Y_t = a + bt + ct^2 + u_t$$

Y_t was taken as a continuous function of the variable time. $t[Y_t = f(t)]$ To avoid the problem of multicollinearity between t and t^2 , the variable was transformed as (Rao, 1980). With a positive, the sign of the coefficient value of denoted the trend in the growth rate, i.e., whether there was acceleration or deceleration in growth. The positive value of represented acceleration, and a negative value represented deceleration. If the value was zero, it meant that there was neither acceleration nor deceleration. The term represented the error term or stochastic term.

For the core objective of examining the long-run relationship between remittances and economic growth in Kerala, econometric techniques such as the Johansen cointegration test and the Error Correction Mechanism (ECM) were applied. The analysis was based on annual time-series data covering the period from 1972 to 2023, which allowed for a comprehensive understanding of the structural relationship between the variables over an extended historical timeframe. The study used the following econometric specification.

$$\Delta \log \text{NSDP}_t = \beta_1 + \beta_2 \Delta \log \text{remittance}_t + \beta_3 \text{ECM}_{t-1} + U_t$$

$\log \text{NSDP}_t$ Shows the growth rate

$\log \text{totalremittance}_t$ Shows the inward foreign remittance to the state

U_t is the error term

β_1 is the intercept term

β_2 is the coefficient

β_3 is the Error Correction Term

Economic growth was the dependent variable, which was measured in terms of Net State Domestic Product (NSDP), and remittances were considered as the only explanatory variable influencing growth. Before proceeding with the relationship analysis, the stationarity of the time-series data was tested

using the Augmented Dickey–Fuller (ADF) test. This was followed by the Johansen cointegration test to check whether a long-run equilibrium relationship existed between remittances and economic growth. The Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan–Quinn Information Criterion (HQC) were used to determine the number of lags in the cointegration test. In the presence of cointegration, an Error Correction Mechanism (ECM) was used to explore both short-run dynamics and long-run adjustment mechanisms.

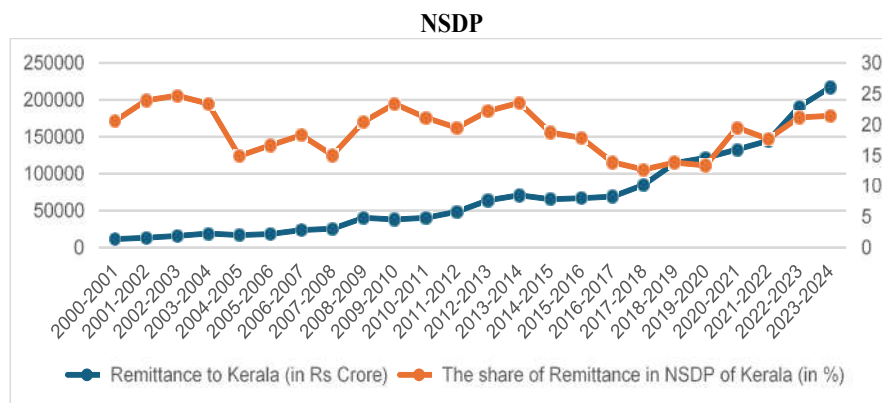
3. Results, Analysis and Discussion

3.1. Remittance in Kerala: Kerala has long been recognized for its significant reliance on remittances as a key component of its economy. Over the past few decades, a large segment of the state’s population has migrated to GCC and non-GCC countries in search of better jobs. This outmigration has led to a substantial inflow of remittances, which not only shapes the socio-economic landscape but also contributes significantly to household income, consumption patterns, investment behaviour, and overall economic development within the state.

Figure 1 presents the annual inflow of remittances to Kerala and their share in the Net State Domestic Product (NSDP) from 2000–01 to 2023–24. Remittances to Kerala exhibit a sustained long-term expansion from 2000–01 to 2023–24, rising from about Rupees 11,700 crore to nearly Rupees 2.17 lakh crore, but their relative importance in the state economy shows a cyclical pattern. The share of remittances in NSDP remained high through the early 2000s and up to 2013–14, generally fluctuating around 22 per cent, reflecting the centrality of migrant incomes in sustaining household consumption and regional growth during a period of structural transition within Kerala’s domestic economy. From 2014–15 onwards, however, this share declined steadily to nearly 13 per cent by 2019–20, suggesting both tightening labour-market conditions in the Gulf—which constrained migrant earnings as well as faster domestic output growth that reduced the proportional weight of remittances. The pandemic years marked a reversal of this trend, with the share spiking to nearly 20 per cent in 2020–21 and stabilising above 21 per cent by 2023–24, partly due to contraction of NSDP and support-driven transfers and partly due to shifts in global labour markets and exchange rate dynamics. Overall, the data indicate that while the absolute volume of remittances has continued to surge, Kerala’s dependence on these inflows

has oscillated in response to both global migration conditions and the state’s own growth trajectory

Figure 1: Foreign Remittances to Kerala in Rupees Crore and Remittances as Share of NSDP



Source: Kerala Migration Survey 2023; <https://iimad.org/wp-content/uploads/2024/06/KMS-2023-Report.pdf>

3.2. Growth of Remittance: Remittances are an important source of income to the state; they contribute greatly to the growth of the economy. This section attempts to analyse the growth of remittances and their trend. It is evident that the inflow of remittances has been flourishing over the last few decades. Kerala’s remittances increase from Rs. 11,712 crore in 2000–01 to Rs. 121,433 crore in the year 2023–24.

Table 1 exhibits the growth rate of remittances in Kerala during the period 2000–01 to 2023–24. There is a continuous increase in remittances during this period, except in the years 2004–05, 2009–10, 2014–15, and 2019–20. The growth rate becomes the lowest in the year 2004–05 (–11.9 per cent). The highest growth rate is observed in 2008–09, at 57.99 per cent. The intra-period comparison of the compound annual growth rate (CAGR) is done by taking each five-year period as a sub-period. The analysis shows that a CAGR of 19.69 per cent is achieved during the period 2005–06 to 2009–10. The lowest CAGR of 9.76 per cent is recorded during 2000–01 to 2004–05, as shown in Table 1.

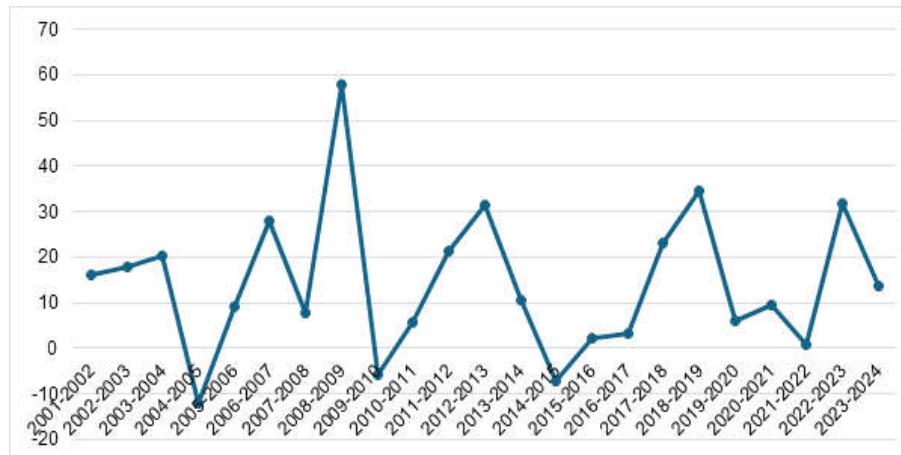
Table 1: Growth of Remittance (in per cent)

Period	CAGR (in %)
2000-2005	9.76
2005-2010	19.69
2010-2015	13.03
2015-2020	16.02
2020-2024	17.74

Source: Author’s estimation using World Bank data

Figure 2 shows that the annual growth rate of remittances to Kerala is highly volatile, with sharp spikes and occasional contractions, reflecting sensitivity to external shocks such as global economic conditions and migration cycles. Despite this volatility, remittance inflows exhibit recurrent phases of strong recovery, underscoring their continued importance to the state’s economy.

Figure 2: Annual Growth Rate of Remittance to Kerala (in per cent)



3.3. Trend in Remittance: This section attempts to analyse whether the growth in remittances in Kerala is accelerating or decelerating. The analysis is done by estimating the parameter ‘c’ of the log-quadratic function of the following form. The following econometric specification is used.

Table 2: Result of Trend Analysis of Remittance

	Coefficient	Std. error	t- ratio	p- value	DW	R ²
Constant	9.25592	0.0809996	114.3	7.86e-31 ***		
t	0.125675	0.0149288	8.418	3.60e-08 ***	1.266421	0.982354
t ²	-0.000130	0.0005797	-0.2259	0.8235		

Source: Author's estimation

Table 2 shows that the coefficient of the variable $t(b)$ is positive with a highly significant p-value, which represents an average increase in remittances of 13 per cent during the period. The coefficient of $t^2(c)$ is negative and statistically not significant at the 5 per cent level, showing neither acceleration nor deceleration in remittances.

3.4. Analysis of Long-run Relationship: The study has used the following econometric specification

$$\Delta \log NSDP_t = \beta_1 + \beta_2 \Delta \log remittance_t + \beta_3 ECM_{t-1} + U_t$$

$\log NSDP_t$ Shows the growth rate

$\log totalremittance_t$ Shows the inward foreign remittance to the state

U_t is the error term

β_1 is the intercept term

β_2 is the coefficient

β_3 is the Error Correction Term

3.4. 1. Estimation Results: The first step in cointegration analysis is to test the stationarity of the variables. Table 3 shows the results of the ADF test, or unit root test, conducted to understand the stationarity of the variables. The stationarity of the variables requires that the p-value must be less than or equal to 0.05. To make the variables stationary, the first difference of each variable is used. All variables are non-stationary at levels and stationary at first differences. Hence, both are I(1) series and therefore eligible for the Johansen cointegration test. The variables are non-stationary, and the error term must be stationary in the Johansen co integration test.

Table 3: Result of ADF

Variable	ADF Test statistic	P value	Whether Stationary
Log NSDP	4.27288	1	No
Log remittance	2.55675	0.9977	No
$\Delta \log$ NSDP	-3.82421	0.002682	Yes
$\Delta \log$ remittance	-2.87059	0.003987	Yes

Source: Author’s estimation

Table 4 shows the optimal lag-length selection criteria. All the selection criteria invariably show the lag order as 1, and therefore the study proceeds with a single lag. Following the confirmation of the integration properties, the Johansen procedure is applied to test for the existence of a cointegrating relationship. In the first step, a static long-run regression is estimated, with economic growth as the dependent variable and remittances as the independent variable.

Table 4: Lag Length Criteria

Table 4: Lag Length Criteria

Lags	Log lik	P(LR)	AIC	BIC	HQC
1	65.11003		-2.700827*	-2.581568*	-2.656152*
2	65.16652	0.75795	-2.659414	-2.500402	-2.599847
3	65.17218	0.91527	-2.616182	-2.417416	-2.541723
4	65.22718	0.74014	-2.575095	-2.336576	-2.485744
5	65.60083	0.38733	-2.547862	-2.269591	-2.44362
6	65.89312	0.44452	-2.517092	-2.199068	-2.397958

Source: Author’s estimation

Table 5 reports the results of Johansen co-integration analysis. The Johansen maximum likelihood co-integration test, conducted with an unrestricted constant and one lag over the period 1974–2024, provides strong evidence of a single long-run equilibrium relationship between total foreign remittances and Kerala’s NSDP. Both the trace and maximum eigenvalue statistics reject the null hypothesis of no co-integration at the 1 per cent level, confirming the presence of one cointegrating vector. Solving the cointegrating relation explicitly yields a long-run equilibrium equation of the form, $\ln(NSDP_t) = 0.945 \ln(REM_t)$ indicating a positive and near-unitary long-run elasticity of NSDP with respect

to remittances. The adjustment coefficients further reveal that deviations from long-run equilibrium are corrected primarily through changes in remittance flows, while NSDP exhibits a negligible speed of adjustment, suggesting weak exogeneity of output in the long-run relationship. Overall, the results indicate that remittances and NSDP are positively linked in the long run, with remittances acting as the principal equilibrating variable in the system.

Table 5: Johansen Co-integration Results between Remittances and NSDP in Kerala (1974–2024)

Component	Statistic / Variable	Estimate / Value
Co-integration tests	Trace statistic ($r = 0$)	20.101 ($p = 0.008$)
	Max-eigen statistic ($r = 0$)	18.662 ($p = 0.008$)
	Trace statistic ($r \leq 1$)	1.438 ($p = 0.230$)
	Max-eigen statistic ($r = 1$)	1.438 ($p = 0.230$)
Number of cointegrating vectors	r	1
Cointegrating vector (β)	$\ln(\text{Total Remittances})$	-1.2599
	$\ln(\text{NSDP})$	1.3328
Implied long-run relationship		$\ln(\text{NSDP}) = 0.945 \ln(\text{Remittances})$
Adjustment coefficients (α)	$\Delta \ln(\text{Total Remittances})$	0.1411
	$\Delta \ln(\text{NSDP})$	-0.0037
Renormalised β (on Remittances)	$\ln(\text{Total Remittances})$	1.0000
	$\ln(\text{NSDP})$	-1.0579
Renormalised β (on NSDP)	$\ln(\text{Total Remittances})$	-0.5771
	$\ln(\text{NSDP})$	1.0000
Log-likelihood		217.357
Eigenvalues		0.3064 ; 0.0278

Source: Author's estimation

The existence of a long-run equilibrium relationship among the variables, as established through the cointegration test, justifies the use of the ECM model. The Error Correction Mechanism is designed to capture both short-run dynamics and the speed of adjustment towards the long-run equilibrium. The ECM includes the lagged residual from the cointegrating regression as the error correction term. A negative and statistically significant coefficient of this term confirms that the system corrects deviations from the long-run path over time. The Error Correction Model (ECM) results reported in Table 6

confirm the presence of a stable long-run relationship between foreign remittances and Kerala’s Net State Domestic Product (NSDP) over the period 1974–2024. The estimated cointegrating vector, when normalised and expressed in levels, implies a positive long-run elasticity of NSDP with respect to remittances of approximately 0.95, indicating that remittance inflows contribute positively to economic output in the long run. The adjustment coefficients reveal asymmetric short-run dynamics. The error-correction term is negative and statistically significant in the remittance equation, suggesting that deviations from the long-run equilibrium are corrected primarily through adjustments in remittance inflows, with nearly 18 per cent of the disequilibrium corrected within one year. In contrast, the error-correction term in the NSDP equation is small and statistically insignificant, indicating weak exogeneity of output and a sluggish short-run response of economic growth to disequilibria. This pattern implies that while remittances and output are closely linked in the long run, short-run adjustments occur mainly through remittance flows rather than through immediate changes in economic activity. Overall, the results support the existence of a remittance-led long-run growth relationship in Kerala, with the transmission of remittance effects on output operating over longer horizons rather than through short-run fluctuations.

Table 6: Error Correction Model (ECM) Estimates between Remittances and NSDP in Kerala

Component	Variable / Statistic	Estimate
Cointegrating vector (β)	Ln (Total Remittances)	1.0000
	Ln (NSDP)	-1.0579 (0.0848)
Implied long-run relationship		Ln (NSDP) = 0.945 Ln (Remittances)
Adjustment coefficients (α)	Δ Ln (Total Remittances)	-0.1778***
	Δ Ln (NSDP)	0.0047
Short-run dynamics: Δ Ln (Total Remittances)	Constant	-0.2855**
	Error-correction term (EC_1)	-0.1778***
Short-run dynamics: Δ Ln(NSDP)	R^2 (Adj. R^2)	0.288 (0.273)
	Constant	0.1411***
	Error-correction term (EC_1)	0.0047
Model diagnostics	R^2	0.003
	Log-likelihood	71.906
	AIC / BIC / HQC	-2.585 / -2.357 / -2.498

Source: Author’s estimation

3.5. Findings: Major findings are,

1. The share of remittances in NSDP ranges from 12.68 per cent to 24.67 per cent during 2000–01 to 2023–24. Its share in NSDP reaches a maximum of 24.67 per cent in 2002–03.
2. Trend analysis shows that remittances increase on average by 13 per cent per annum during the period.
3. The empirical results from the Johansenco-integration analysis reveal that remittances and economic growth in Kerala are cointegrated, indicating a meaningful long-run association. The existence of a stable long-run relationship provides an important basis for future policy considerations aimed at leveraging remittance flows to promote sustained economic development.
4. The results of the Error Correction Model (ECM) indicate that short-run deviations from the long-run equilibrium between remittances and economic growth are corrected over time. The error correction term is negative and statistically significant, confirming the presence of a stable adjustment mechanism and implying that changes in economic growth respond to disequilibria in remittance inflows, thereby reinforcing the evidence of a long-run relationship between the two variables.

4. Conclusion

The existence of a stable long-run relationship between the state's economic growth and foreign remittances underscores the relevance of targeted policy interventions aimed at translating remittance-driven consumption into more sustainable forms of economic advancement. Strengthening channels for productive investment, improving financial inclusion, and developing appropriate institutional mechanisms may enhance the developmental impact of diaspora earnings over the long term. Kerala's experience suggests that remittances have functioned as an important source of economic resilience and growth; however, their contribution to structural transformation appears limited in the absence of complementary policy support. Carefully designed and coordinated policy measures could therefore facilitate a more effective utilisation of remittance inflows and contribute to a broader and more diversified economic base in the state.

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