Remittances, Financial Sector Development, and Economic Growth in Nepal: A Time-Series ARDL Analysis

Krishna Kumar Regmi
Email: regmikrishna08@gmail.com
ORCID: https://orcid.org/0009-0000-7012-1279

Abstract

This study examines the dynamic relationship between remittance inflows, financial development, and economic growth in Nepal using annual time-series data from 1995 to 2024. It analyzes the long-run and short-run interactions among the variables by observing historical patterns of remittance inflows, financial development indicators, and GDP per capita. Employing the Autoregressive Distributed Lag (ARDL) model, the study finds that remittance inflows have a positive short-run effect on economic growth, whereas financial development shows a negative short-run influence but becomes growth-enhancing with a one-year lag. In the long run, however, both remittance inflows and financial development exhibit a negative and significant impact on GDP per capita, suggesting that their long-term contribution to economic growth remains weak or constrained. The findings highlight the complex nature of Nepal's remittance-driven economy, where remittances support short-term consumption and liquidity but fail to generate sustained economic growth. The results underscore the need for stronger financial intermediation and productive utilization of remittances to ensure long-term economic gains.

Keywords: Remittance inflow, Financial development, Economic growth, ARDL model

Background of the Study

Remittances refer to the portion of income that migrant workers send back to their families, either within their own country or from abroad. These transfers can be monetary or non-monetary and may occur through formal or informal channels. In Nepal's case, while official records only include remittances sent via formal routes, a significant amount especially from India still enters informally. However, the use of formal channels has increased due to easier access provided by financial institutions and government incentives, such as IPO allocations for workers who remit officially.

Nepal's economy has been heavily dependent on remittances for the past two decades, with remittances constituting approximately 24-30% of GDP despite Nepal being among the world's poorest and least developed nations. The World Bank (2024) estimates around 272 million Nepalese migrants contribute these vital inflows. While agriculture employs two-thirds of the workforce, it generates only one-third of GDP

(Economic Survey, 2073/74). In 2009, Nepal ranked as the top remittance recipient relative to GDP share.

These remittances provide crucial support by increasing educational access, encouraging entrepreneurship, and ensuring financial security for households. They have significantly reduced poverty, improved the current account balance, and helped offset trade imbalances through increased foreign reserves. Foreign employment has addressed unemployment while generating essential foreign currency, compensating for investment and exchange rate disparities even as tourism and foreign aid remain important economic pillars. However, policymakers and economists often undervalue remittances' significance.

Financial development, crucial for economic growth, involves expanding and innovating the financial sector. Since the 1990s, Nepal's banking sector—primarily driven by private entrepreneurs—has dominated financial activity. Despite reforms and modern practices, the financial sector, including capital markets and stock exchanges, still has substantial growth potential (Golder et al., 2023).

Remittance inflows advance financial development by increasing demand for financial services and providing financing alternatives for unbanked entrepreneurs, potentially integrating them into formal banking (Giuliano & Ruiz-Arranz, 2009). Remittances cover essential needs like food, housing, and education, reducing poverty and improving living standards. They stimulate economic development through consumption, investment, job creation, and entrepreneurship while fostering financial inclusion. Since 2006, remittances have consistently exceeded 20% of Nepal's GDP, peaking at 27.6% in 2015 and standing at 23.8% in 2023 (Ministry of Labour, 2024), though recent trends show gradual decline.

Labor migration from Nepal began after the Anglo-Nepalese War of 1814–1816. Following the war's conclusion and the signing of the Treaty of Sugauli in 1816, 4,650 Nepalese youths were enlisted into the British armed forces as part of a British-Gurkha battalion. Historically, Nepalese migrants have been widely accepted in India due to factors such as geographic proximity, shared historical and cultural ties, and the existence of a large, porous open border. Most Nepalese migrants in India are employed in informal and private sectors, typically working as semi-skilled and unskilled laborers in restaurants, tea plantations in Darjeeling and Assam, or as domestic workers including guards and maids in urban areas (Kunwer, 2019).

Personal remittances to Nepal have experienced dramatic growth, surpassing USD 11 billion in 2023, a remarkable increase from approximately USD 0.2 billion in 1996 and USD 1.5 billion in 2006. This represents more than a 50-fold increase over nearly three decades. Nepal has firmly established itself as a remittance-dependent economy, with worker remittances now accounting for approximately 25% of the country's GDP, making it one of the highest remittance-to-GDP ratios globally. The country consistently ranks among the world's top remittance recipients relative to economic size

and maintains its position as the leading remittance destination in South Asia when measured as a percentage of GDP.

Remittances constitute a crucial component of Nepal's economy, representing a substantial share of GDP as migrant workers send money home, thereby reducing poverty and enhancing living standards while providing essential foreign exchange for balance of payments. Despite continuous growth in financial institutional development in Nepal, economic growth remains unsatisfactory relative to financial progress, creating a paradox where increased financial inclusion and investment generation through remittances do not translate into proportional economic development. While extensive literature exists on remittances, economic development, and financial inclusion individually, limited research examines their interconnected relationships in Nepal's context. Existing studies reveal that the combined effect of remittances and financial development on economic growth is complex and potentially negative, with remittances showing positive growth impacts only at low levels of financial development, while countries with moderate to high financial development experience diminished benefits from remittances. Research indicates that although short-term growth gains from remittance inflows can exceed those from financial sector development, in well-functioning financial systems, additional remittances provide minimal GDP per capita benefits, ultimately hurting long-term economic growth in developing countries with advanced financial sectors. This gap in empirical evidence regarding remittance inflows' impact on Nepal's financial progress highlights the urgent need for comprehensive research investigating how remittances and financial development collectively influence economic growth in the Nepalese context.

This study addresses the existing literature gap by investigating two key research questions: first, examining the trend and pattern of remittance flows and financial progress in Nepal to understand their historical development and trajectory, and second, analyzing how financial progress and remittances collectively impact Nepal's economic growth to determine their individual and combined effects on the country's economic performance. The primary objective is to comprehensively analyze the interconnected relationship between remittance inflows, financial progress, and economic growth in Nepal, providing empirical evidence for understanding how these three critical economic factors interact and influence each other within the Nepalese economic context.

Statement of the Problem

Although remittances constitute one of the largest sources of external income for Nepal and significantly support household welfare, their long-term contribution to economic development remains uncertain. Despite continuous growth in financial institutions and increasing financial inclusion, Nepal's economic growth remains modest, creating a paradox where high volumes of remittances and expanding financial services do not translate into proportional increases in national income or productivity. Existing studies provide mixed conclusions on how remittances interact with financial development, and very limited empirical work has simultaneously analyzed their combined impact in the

Nepalese context. This raises a critical research question: Do remittance inflows and financial development promote or hinder Nepal's economic growth in both the short and long run? The lack of clear evidence on this relationship creates a gap in development planning and policy formulation, highlighting the need for a comprehensive empirical assessment.

Hypotheses

Based on the study's objectives and theoretical framework, the following hypotheses can be formulated:

H_0: Remittance inflows have no significant impact on GDP per capita in Nepal in both short-run and long-run.

H_0: Financial sector development has no significant impact on GDP per capita in Nepal in both short-run and long-run.

H_0: The combined effect of remittance inflows and financial development has no significant impact on Nepal's economic growth.

Review of Literature

Lucas and Stark (1985) introduced a framework suggesting migrants remit for both altruistic and self-interested reasons—altruistic remittances increase when home income falls, while self-interested ones relate to inheritance, investments, or future support. This framework influenced subsequent research: Agarwal and Horowitz (2002) studied remittances as household insurance, Foster and Rosenzweig (2001) examined marriage market incentives, and Ilahi and Jafarey (1999) analyzed extended family obligations. These studies collectively highlight how household characteristics, family relationships, and risk-sharing arrangements drive remittance flows.

Researchers contend that macroeconomic factors such as interest rates, exchange rate stability, and political conditions significantly influence a country's appeal for receiving remittances. El-Sakka and McNabb (1999), Faini (1994), Glytsos (1997), and Higgins et al. (2004) demonstrate that competitive financial returns, favorable exchange rates, and political stability motivate migrants to send remittances through formal financial channels. These studies agree that macroeconomic stability is crucial for maintaining remittance inflows and reducing reliance on informal transfer methods.

Das and Chowdhury (2011), studying 11 major remittance-receiving developing countries, identify a significant positive relationship between remittances and economic growth, suggesting remittances enhance economic performance by raising household income, boosting consumption, and enabling investment. They recommend directing remittances toward productive sectors for greater developmental impact. Siddique et al. (2012) find varied causal relationships across South Asian countries: no causality in India, unidirectional causality from remittances to growth in Bangladesh, and bidirectional causality in Sri Lanka. These studies collectively demonstrate that remittances' growth effects depend on country-specific contexts and institutional frameworks.

Chaudhary (2020) discovers that both remittance inflows and foreign direct investment (FDI) have a marginal but positive long-run effect on GDP. Using cointegration and error-correction models, the study demonstrates that remittance inflows contribute to growth despite Nepal's structural economic limitations. Conversely, Kaphle (2019) finds no short-run causal relationship between remittances and economic growth, while confirming a significant long-term association. The study also highlights trade's crucial role in short-run economic performance, suggesting remittances alone may not generate immediate growth.

Additional research emphasizes the financial sector's and migration policies' importance in shaping Nepal's economic trajectory. Kharel and Pokhrel (2012) highlight that Nepal's banking sector contributes significantly to economic growth, while the capital market remains less influential due to its limited size and weak integration with real-sector activities. Complementing this, Shrestha (2008) demonstrates remittances from foreign employment have a substantial poverty-reducing impact. However, Shrestha also expresses concerns about inadequate institutional frameworks for managing large-scale labor migration, advocating for stronger migration governance and economic diplomacy. Together, these studies indicate that effective financial intermediation and supportive migration policies are essential for maximizing remittances' economic benefits.

Overall, the literature reveals that remittance dynamics are shaped by both micro-level household motives and macro-economic conditions. At the same time, the effect of remittances on economic growth—globally and in Nepal—depends heavily on financial sector development, institutional capacity, and policy frameworks. This thematic synthesis highlights the need for further integrated analysis, such as through ARDL modeling, to unravel the short-run and long-run relationships among remittance inflows, financial development, and economic growth in Nepal.

Research Methodology
Research Design
The study employs both descriptive and causal-comparative research designs to analyze the relationships among remittance inflow, financial progress, and economic growth in Nepal. While the descriptive approach outlines the trends and patterns of the variables, the causal-comparative method examines how independent variables influence the dependent variable. Given the limited prior research in this area within Nepal, the study takes an analytical and empirical approach to address previously unexplored questions.
Conceptual Framework
The research suggests that remittance inflows contribute to increased liquidity in the market, as they are primarily used for consumption, health, and education, with some savings channeled into the financial sector. A well-developed and stable financial sector is essential to manage this liquidity effectively, allocate funds to investors, and meet market demands. This, in turn, supports further development of the financial sector and promotes overall economic growth in the country. The study highlights that remittance

inflow and financial development play crucial roles in promoting economic growth. This relationship can be summarized as follows;

Data and Data sources

The study primarily relies on secondary data sources. Data were collected from institutions such as Nepal Rastra Bank, the World Bank, the International Monetary Fund (IMF), and other relevant stakeholders. The key sources include Nepal Rastra Bank's annual reports and quarterly publications, along with reports from the World Bank and IMF. The dataset covers a period of 29 years, from 1995 to 2024, depending on data availability. All data were organized in a spreadsheet based on the specific requirements of the variables used in the study.

Data Analysis Technique

The collected data has been analyzed using statistical tools to meet the goals of the study. Descriptive statistics were used to organize, explain, and summarize the data clearly and effectively. Inferential statistics were used to make conclusions about the larger population based on the sample data. These methods help to determine whether the differences seen in the data are meaningful and apply to the overall population. While descriptive statistics help to summarize and present the data clearly, inferential statistics are used to draw conclusions and make predictions based on that data. To examine the relationship between the dependent and independent variables, empirical analysis has been carried out using the unit root test, co-integration test, and ARDL (Auto-Regressive Distributed Lag) analysis.

It is customary to assume that the GDP per capita depends on the financial development, remittance inflow, trade and GFCF. Which can be written as:

GDPPC = f (REMT, FIND, TRD, GFCF, INFA) …………. (1)

Where, GDPPC denotes GDP per capita

FIND denotes the financial development index

REMT denotes the personal remittance received in the current US$

TRD denotes the total trade percentage of GDP

GFCF denotes the Gross factor capital formation as a percentage of GDP and

f stands for the function.

Based on facts given by (Wooldridge, 2013) and (Gujarati et al., 2012), equation (1) can be converted into the following linear econometric specification:

$GDPPC_t = \beta_0 + \beta_1(FIND)_t + \beta_2(REMT)_t + \beta_3(TRD)_t + \beta_4(GFCF)_t + \beta_5(INFA)_t + \varepsilon_t$…………. (2)

Where $GDPPC_t$ denotes GDP per capita in time t,

$FIND_t$ denotes the financial development index in time t,

$REMT_t$ denotes the personal remittance received in current US$ in time t,

TRD_t denotes the total trade percentage of GDP in time t and

$GFCF_t$ denotes the Gross factor capital formation as a percentage of GDP in time t.

$INFA_t$ denotes the Inflation, GDP deflator (annual %)

β_i characterized the short and long-term parameters and

ε_t is the distribution term.

t is the time-series dimension.

Equation (2) assumes that the effects of the independent variables remain constant over the entire time period, which may not always hold true in real-world scenarios. To overcome this limitation, the Autoregressive Distributed Lag (ARDL) model can be employed. Unlike the Johansen co-integration technique, which requires all variables to be non-stationary and integrated at the same order, typically I(1), the ARDL model is more flexible as it can accommodate variables that are a combination of I(0) and I(1). The ARDL approach, grounded in the Ordinary Least Squares (OLS) method, incorporates an appropriate number of lag terms to effectively capture the dynamics of the data, following a general-to-specific modeling strategy.

Analysis of Data

This section utilizes the data to address the study's objectives, specifically examining the interconnected relationship among remittance inflows, financial development, and economic growth in Nepal. It provides empirical evidence to better understand how these three key economic variables interact and impact one another within the context of the Nepalese economy.

Descriptive Statistics

The descriptive statistics provide a comprehensive summary of the key characteristics of the collected data. In this study, essential statistical measures such as the mean, median, maximum, minimum, standard deviation, skewness, and kurtosis have been calculated. Table 4.1 outlines these statistics for both the dependent and independent variables. GDP per capita is designated as the dependent variable, while REMT, FIND, GFCF, INFA, and TRD interest payments are considered independent variables.

Table 1

Descriptive statistics

	GDP Per-capita	FIND	REMT	GFCF	TRD	INFA
Mean	548.4821	0.133793	14.80993	23.64677	47.81666	7.410604
Median	386.5296	0.120000	16.79181	21.87755	46.14729	6.762712
Maximum	1229.394	0.210000	27.62608	33.81513	64.03553	26.39731
Minimum	172.0967	0.070000	0.976652	19.08249	36.29676	3.070305
Std. Dev.	367.2485	0.034165	10.06282	4.293948	6.526095	4.785497
Skewness	0.580260	0.643020	-0.334321	0.998004	0.698707	2.488672
Kurtosis	1.818704	2.706752	1.475954	2.751859	3.025089	9.912255

Source: Author's calculation

Table 1 provides a descriptive summary of the data spanning from 1993 to 2021. During this timeframe, the mean GDP per capita was 548 USD. The financial development index averaged 0.133, and remittance inflows accounted for an average of 14.809 percent of GDP. Among all variables, GDP per capita exhibited the greatest variability. Remittance levels also showed significant fluctuation, while the financial development index remained relatively stable with minimal variation over the study period.

During the study period, the GDP per capita fluctuated between a minimum of 172.0967 and a maximum of 1229.394. Similarly, the financial development index hits a minimum of 0.069456 and a maximum of 0.213080. Additionally, the remittance has achieved a minimum of 0.976652 and a maximum of 27.62608.

Correlation Analysis

Correlation measures the strength and direction of the relationship between two or more variables. A positive correlation means that the variables tend to move in the same direction, while a negative correlation means they move in opposite directions. The correlation coefficient ranges from +1 to -1, with +1 indicating a perfect positive relationship and -1 representing a perfect negative relationship. A positive value suggests that as one variable increases, the other also increases. Conversely, a negative value implies that as one variable rises, the other declines. A correlation coefficient of 0 indicates no relationship between the variables.

Table 2 presents the results of the correlation analysis conducted in this study, highlighting the nature and strength of the relationships between the dependent and independent variables.

Table 2

Correlation analysis

	GDP Per-capita		REMT	GFCF	TRD	INFA
GDP	1					
FIND	0.950058	1				
REMT	0.839029	0.758635	1			
GFCF	0.925032	0.896172	0.670884	1		
TRD	-0.545387	-0.423453	-0.740004	-0.303278	1	
INFA	0.076083	0.0527109	0.164488	-0.067152	-0.31594	1

Source: Author's calculation

The association between GDP per capita and other research variables is displayed in Table 2 The results show that the Financial Development Index and GDP per capita have a strong positive association. Similar to this, there is a strong positive association between GDP per capita and remittance inflow, albeit not as strong as there is between GDP per capita and the Financial Development Index. Similarly, there is a strong positive association between the Financial Development Index and Remittance Inflow, but it is not as strong as the other two relationships. This indicates that there is a substantial correlation between the two variables, meaning that as one increases or decreases, another variable also increases or decreases.

Unit root test
Time series analysis necessitates testing the stationarity of the variables. Therefore, this study assessed the integration order of each variable through a unit root test. In line with standard methodology, the Augmented Dickey-Fuller (ADF) test was applied. The outcomes of the unit root test are presented in Table 3.

As shown in Table 3, the ADF test results indicate that all variables become stationary after first differencing, except for inflation, which is stationary at level with an intercept. Since none of the variables are integrated at the second difference and all are found to be either I(0) or I(1), the ARDL model was deemed appropriate for the analysis.

Table 3

Augmented Dickey-Fuller (ADF) test

Variables	Level		First Difference		Remarks
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	
GDP per capita (current US$)	1.29016 (0.9979)	-1.7243 (0.7133)	-4.1028 (0.00380)	-	I(1)
Financial Development Index	0.7924 (0.9920)	-2.1408 (0.5021)	-7.1067 (0.0000)	-	I(1)
Personal remittances received (% of GDP)	-1.1141 (0.6958)	-0.9303 (0.9380)	-4.5573 (0.0012)	-	I(1)
Gross fixed capital formation (% of GDP)	-0.2550 (0.9198)	-1.8630 (0.6455)	-3.8858 (0.0064)	-	I(1)
Trade Open (% of GDP)	-1.6156 (0.4607)	-1.8700 (0.6409)	-5.1442 (0.0003)	-	I(1)
Inflation, GDP deflator (annual %)	-3.3164 (0.0237)	-	-	-	I(0)

Source: Author's calculation

The results reveal that five of the six variables follow an I(1) process, meaning they are integrated of order one. Specifically, GDP per capita, the Financial Development Index, personal remittances, gross fixed capital formation, and trade openness all exhibit high p-values when tested at their levels (ranging from approximately 0.46 to 0.99), indicating that the null hypothesis of a unit root cannot be rejected and these variables are non-stationary in their original form. However, when these same variables are tested in first differences, they show significantly low p-values (all below 0.01), demonstrating that they become stationary after first differencing.

In contrast, inflation measured by the GDP deflator displays different behavior, showing evidence of being stationary at its level with an I(0) classification. The test statistic of -3.3164 with a p-value of 0.0237 for the intercept specification indicates that the null hypothesis of a unit root can be rejected at conventional significance levels, meaning inflation is stationary in its original form and does not require differencing. This distinction is crucial for econometric modeling, as I(1) variables typically need to be first-differenced to achieve stationarity for most analytical procedures, while I(0) variables can be used directly in their original form without transformation.

Heteroscedasticity Test

Table 4

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.834491	Prob. F(5,23)	0.5387
Obs*R-squared	4.453083	Prob. Chi-Square(5)	0.4862
Scaled explained SS	1.219732	Prob. Chi-Square(5)	0.9430

Source: Author's calculation

The Breusch-Pagan-Godfrey heteroskedasticity test results provide strong evidence that the regression model exhibits homoskedasticity, meaning the variance of the error terms remains constant across all observations. All three test statistics consistently support this conclusion: the F-statistic yields a p-value of 0.5387, the Lagrange Multiplier test produces a p-value of 0.4862, and the scaled explained sum of squares generates a p-value of 0.9430. Since all these p-values substantially exceed the conventional 0.05 significance level, we fail to reject the null hypothesis of constant variance. This outcome is highly desirable for the regression analysis because homoskedasticity is a fundamental assumption of ordinary least squares estimation. When this assumption is satisfied, the standard errors of the regression coefficients are unbiased and efficient, ensuring that hypothesis tests and confidence intervals are statistically valid. The absence of heteroskedasticity also indicates that the model's predictive accuracy is consistent across different ranges of the independent variables, rather than being more reliable for certain subgroups of observations. Consequently, the regression results can be interpreted with confidence, and there is no need to implement corrective measures such as robust standard errors, weighted least squares, or other heteroskedasticity-consistent estimators that would otherwise be necessary if the variance were found to be non-constant.

ARDL bounds test

The ARDL bounds testing approach was employed to examine the presence of a co-integrating relationship among the variables. The decision regarding the existence of a long-run association was made by comparing the calculated F-statistic with the lower and upper critical bounds at the relevant significance levels. The optimal lag length for the ARDL model was chosen using the Akaike Information Criterion (AIC). At the selected lag structure, the model showed no issues related to serial correlation, heteroskedasticity, or non-normality of residuals. The result of the ARDL bounds test is presented in Table 5.

Table 5 presents the calculated F-statistic for the model with GDPPC as the dependent variable, which is 23.2094. This value is higher than the upper bound critical values at the 1%, 5%, and 10% significance levels. As a result, the null hypothesis of no co-integration is rejected. Therefore, the study concludes that a long-run co-integrating relationship exists among the variables. Consequently, the long-run relationship is estimated using the Auto-Regressive Distributed Lag (ARDL) model.

Table 5
ARDL bounds test

Model	f- stat	I(1)	I(0)
GDPPC/ FIND, REMT, GFCF, TRD, INFA	23.2094		
1% Critical bound value		4.63	3.5
5% Critical bound value		3.76	2.81
10% Critical Value		3.38	2.49

Note: I(0) indicates lower bound and I(1) indicates upper bound
Source: Author's calculation

Long run ARDL statistics
This study utilized the ARDL estimation method to analyze both short-run and long-run relationships among the variables. Initially, the ARDL bounds test was performed, and the results of the long-run ARDL model are presented in Table 6.

Table 6 presents the long-run relationship among the dependent variable, independent variables, and control variables, evaluated at a 5% level of significance.
GDPPC = - 3460.742*FIND - 13.14822*REMT - 3.324186*TRD + 72.78371*GFCF + 4.55931*INFA + 41.85722

The above equation illustrates the long-run relationship between the dependent variable (GDP per capita) and the independent variables (Personal remittances received as a percentage of GDP and the Financial Development Index), along with the control variables (Gross fixed capital formation as a percentage of GDP, Inflation measured by the GDP deflator, and Trade as a percentage of GDP).

Table 6
Long run ARDL result

Variables	Coefficient	Std. Errors	t-statistic	Prob.
FIND	- 3460.742	454.7022	-7.611009	0.0003
REMT	-13.14822	2.180708	-6.029334	0.0009
GFCF	72.78371	3.334630	21.82663	0.0000
TRD	-3.324186	0.971929	-3.420193	0.0141
INFA	24.55931	1.589702	15.44900	0.0000
C	41.85722	3.217510	13.00920	0.0000

Source: Author's calculation

The Financial Development Index (FIND) exhibits a negative and statistically significant relationship with GDP per capita in the long run. Specifically, a one-unit increase in FIND is associated with a decrease of 3460.742 units in GDP per capita, significant at the 5% level. Similarly, Trade (TRD) also shows a negative and significant long-run relationship with GDPPC, indicating that a one-unit increase in trade results in a 3.324186-unit decline in GDPPC.

In contrast, Personal Remittances (REMT) have a positive impact on GDPPC; a 1% increase in REM leads to a 13.14822 unit rise in GDPPC. Gross Fixed Capital Formation (GFCF) also has a positive and significant effect, with a 1% increase contributing to a 72.78371 unit rise in GDPPC. Likewise, a 1% rise in inflation results in a 24.55931-unit increase in GDPPC over the long run, also significant at the 5% level.

All variables in the model are statistically significant in the long run, suggesting that GDPPC is influenced by each of these factors and that there exists a long-run relationship between GDPPC and the included independent and control variables.

ARDL Error Correction Model (ECM)
The error correction model (ECM) captures the short-run dynamics between the dependent and independent variables. In the short run, although some variables may follow different trajectories, they still exert a significant influence on the dependent variable. The chosen lag structure for the ARDL model is (2,2,2,3,2,2). Table 7 presents the results of the Engle-Granger error correction model.

Table 7 shows the coefficients of the error correction model in negative sign and the associated probability value is significant at five per cent, so the model is valid. The ECM shows the rate of correlation of deviated value. The deviated value is corrected at the rate of 120.42 per cent every year and back to the equilibrium position every ten months approximately [(100/120.42) *12]. The coefficient value of the residual term is greater than -1 which suggests the high speed of adjustment in the equilibrium position in the long run.

According to table 7 in the short run, GDP per capita (GDPPC) exhibits a negative and statistically significant relationship with its own first lag at the 5% significance level. The Financial Development Index shows a negative but statistically insignificant impact on GDPPC in the current year, while its first lag has a positive and significant effect. This indicates that present changes in financial development do not significantly influence GDPPC, but improvements from the previous year positively and significantly affect it.

Personal remittances (as a percentage of GDP) have a strong positive and significant relationship with GDPPC both in the current period and at the first lag. Specifically, a 1% increase in remittances leads to a 15.84978-unit rise in GDPPC. Likewise, Gross Fixed Capital Formation (GFCF) shows a significant and positive effect on GDPPC in the current period, where a 1% increase in GFCF results in a 50.83604-unit rise in GDPPC. However, GFCF at both the first and second lags has a negative and significant association with GDPPC, indicating a delayed inverse effect.

Table 7
Coefficients of the error correction model (ECM)

Variables	Coefficient	Std. Errors	t-statistic	Prob.
C	-1303.804	75.12493	-17.35514	0.0000
D (GDPPC (-1))	-0.775337	0.058178	-13.32702	0.0000
D(FIND)	-142.5303	164.4801	-0.865456	0.4200
D (FIND (-1))	1341.579	168.0925	7.981196	0.0002
D(REMT)	15.84978	1.150993	13.77053	0.0000
D (REMT (-1))	13.89145	1.827545	7.601154	0.0003
D(GFCF)	50.83604	1.78836	28.51414	0.0000
D (GFCF (-1))	-26.59823	1.974394	-13.47159	0.0000
D (TRD)	2.741206	0.413651	6.626857	0.0006
D (TRD (-1))	2.089050	0.494831	4.221746	0.0056
D (INFA)	12.32343	0.476836	25.84416	0.0000
D (INFA (-1))	-2.114627	0.376942	-5.609959	0.0014
CointEq (-1) *	-1.204233	0.066806	-18.02589	0.0000
R-squared	0.993594			
Adjusted R-squared	0.986654			

Source: Author's estimation

Trade and its first lag both show a significant and positive relationship with GDPPC. Interestingly, a one-unit increase in trade corresponds to a 2.741206-unit decrease in GDPPC, suggesting a nuanced impact. Lastly, inflation in the current period has a positive and significant influence on GDPPC, whereas its first lag shows a negative and significant effect, indicating that inflation's impact may reverse over time.

Summary, Conclusion and Recommendations

This study examines the interconnected dynamics between remittance inflows, financial sector development, and economic growth in Nepal using 29 years of secondary data analyzed through the ARDL model, co-integration testing, and descriptive statistics. The research uncovers a complex temporal pattern where these relationships differ markedly between short-run and long-run periods.

The analysis reveals a unidirectional flow where remittances stimulate financial sector expansion in Nepal, but financial development does not reciprocally increase remittance volumes. Enhanced financial infrastructure primarily formalizes existing remittance channels rather than generating additional flows, as migrant workers continue sending money home primarily for household consumption needs.

Short-run findings demonstrate that remittances exert immediate and lagged positive effects on GDP per capita, supporting household liquidity and consumption. Financial development initially shows negligible impact but becomes growth-enhancing after one year, suggesting adjustment periods are necessary for financial sector improvements to

translate into economic benefits. Gross fixed capital formation consistently contributes positively to growth, while trade and inflation also show significant associations.

Long-run analysis presents a paradoxical outcome: both remittances and financial development negatively affect GDP per capita over extended periods. This finding explains why Nepal maintains exceptionally high remittance dependency (24-30% of GDP) yet remains economically underdeveloped the financial resources fail to generate sustained productivity gains or structural economic transformation.

The temporal asymmetry identified mirrors patterns observed in Bangladesh by Golder et al. (2023), confirming that South Asian economies experience similar challenges in converting remittance-driven financial liquidity into long-term growth. The core implication is that Nepal's remittance economy provides short-term welfare improvements but lacks mechanisms to channel these resources toward productive investments, human capital development, or enterprise creation necessary for sustainable economic advancement.

The study identifies significant gaps in understanding the complex relationships between remittances, financial development, and economic growth, particularly regarding informal remittance channels and micro-level impacts.

To address critical data gaps and strengthen evidence-based policymaking, Nepal should implement a comprehensive data enhancement strategy that improves remittance data collection systems to capture informal remittance flows, particularly from India, through periodic household surveys, border monitoring studies, and collaboration with informal transfer operators, while establishing a dedicated research unit within Nepal Rastra Bank or the Ministry of Finance to conduct ongoing analysis of remittance trends, utilization patterns, and economic impacts using both quantitative and qualitative methodologies. This initiative should commission regular household-level surveys to understand how different socioeconomic groups utilize remittances and what factors influence investment versus consumption decisions, and conduct sector-specific and regional analyses to identify differential impacts of remittances and financial development across Nepal's diverse geographic and economic contexts, thereby creating a robust knowledge base for targeted policy interventions.

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